

APPROVED

Sept 05 2021

BOARD OF RECREATION AND PARK COMMISSIONERS

BOARD REPORT

NO. 24-190

DATE September 05, 2024

C.D. 7

BOARD OF RECREATION AND PARK COMMISSIONERS

SUBJECT: HANSEN DAM RECREATION AREA – DISCOVERY CUBE LOS ANGELES COURTYARD CAROUSEL CANOPY PROJECT – APPROVAL OF FINAL PLANS – ADOPTION OF INITIAL STUDY/MITIGATED NEGATIVE DECLARATION (SCH NUMBER 2024070697) AND RELATED FINDINGS PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

B. Aguirre	_____	M. Rudnick	_____
B. Jones	_____	for *C. Santo Domingo	<u>DF</u>
C. Stoneham	_____	N. Williams	_____

General Manager

Approved X Disapproved _____ Withdrawn _____

RECOMMENDATIONS

1. Approve the final plans and specifications, substantially in the form attached to this Report as Attachment No. 1 and as described in this Report, for the Hansen Dam Recreation Area – Discovery Cube Los Angeles Courtyard Carousel Canopy Project (Project);
2. Review, consider and adopt the Initial Study/Mitigated Negative Declaration (IS/MND) for the Project, finding that on the basis of the whole record of proceedings concerning the Project, including the Draft IS/MND and all comments received, on file in the Board Office and in custody of the Department of Recreation and Parks (RAP) Planning, Construction and Maintenance Branch located at 221 North Figueroa Street, Suite 400, Los Angeles, California, that there is no substantial evidence that the Project will have a significant effect on the environment or effects have been mitigated to a level less than significant, that all potentially significant environmental effects of the Project have been properly disclosed and evaluated in the IS/MND in compliance with the California Environmental Quality Act (CEQA) and the State and City CEQA Guidelines, and reflects the Department of Recreation and Parks' independent judgment and analysis;
3. Review, consider and adopt the Mitigation Monitoring and Reporting Plan (MMRP), attached to this Report as Attachment No. 2, that specifies the mitigation measures to be implemented in accordance with CEQA Guidelines Section 15074(d);
4. Direct RAP staff to file a Notice of Determination (NOD) for the adopted IS/MND with the Los Angeles County Clerk and the California Office of Planning and Research within 5 days of the approval of this Report;

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5. Authorize RAP's Chief Accounting Employee or designee to prepare a check to the Los Angeles County Clerk in the amount of \$75.00 for the purpose of filing an NOD; and,
6. Authorize RAP staff to make technical corrections as necessary to carry out the intent of this Report.

SUMMARY

The Discovery Cube Los Angeles is an approximately 57,000 square foot museum and science center located at 11800 Foothill Boulevard, in the Lake View Terrace community of the City of Los Angeles. The Discovery Cube is located on a 2.5-acre site within the 1,450-acre Hansen Dam Recreation Area.

LEASE AGREEMENT

On December 10, 2012, the Board of Recreation and Park Commissioners (Board) approved a Lease Agreement with the Discovery Science Center of Los Angeles (DSCLA), a non-profit organization based in the City of Santa Ana in Orange County, for the use, operation, and maintenance of a children's museum and environmental awareness learning center at Hansen Dam Park, proposed to be called the Discovery Science Center of Los Angeles, as further described in Board Report Nos. 12-327 and 17-245. DSCLA remains the name of the legal entity that is the lessee/operator under the Lease Agreement, but the facility is now known as the Discovery Cube Los Angeles (referred to in the Lease Agreement as "the Center"). The Center opened to the public on November 13, 2014. The Lease Agreement was executed on January 4, 2013, and has a term of thirty years, with an option to extend for an additional twenty-year term. The Lease Agreement obligates DSCLA to operate and maintain a children's museum and environmental awareness learning center located within Hansen Dam Park at the facility formerly known as the Children's Museum of Los Angeles. The Lease Agreement requires DSCLA, working in cooperation with the City, to raise and make available the funds necessary to (i) make improvements to the existing building, and (ii) design, fabricate and install the Center's exhibit program. DSCLA is also responsible for any costs associated with the long-term operation and maintenance of the Center, including all security, maintenance, and custodial services costs. The City may, but has no obligation to, assist DSCLA in identifying and securing funding for the operation and maintenance of the facility. The City has no obligation to perform any maintenance or to make any repairs to the facility at any time during the term of this Lease Agreement. Pursuant to the terms of Article 5 of Exhibit E ("Improvements and Exhibits Agreement") of the Lease Agreement, any modifications to the plans and design for the Center's exhibit program, when completed, must be submitted to RAP for review, and presented to the Board for consideration, prior to any construction taking place at the site.

MEMORANDUM OF UNDERSTANDING

In 2017, the Board approved a Memorandum of Understanding (MOU) between RAP and DSCLA for the transfer of Proposition K maintenance funds for the Discovery Cube Los Angeles. Prior to the approval of the MOU, RAP had applied for all Proposition K funds with the intent to transfer any awarded funds to DSCLA.

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Per the MOU, DSCLA is now able to directly submit applications for Proposition K funds without RAP being the pass-through entity, provided that any Proposition K applications DSCLA prepares are submitted to RAP for consideration prior to submittal to the Proposition K program. Any funds awarded for the maintenance of the Center and permanent exhibits are to be expeditiously paid or transferred directly to DSCLA.

PROJECT SCOPE

Conceptual approval of seven outdoor exhibits and related site improvements was previously obtained in Board Report No. 23-066. All the proposed improvements would be located within the current boundaries of DSCLA's Lease. A portion of the proposed improvements are located on federally-owned land managed by the United States Army Corps of Engineers (USACE), and USACE has expressed support for the Project, as further described in Board Report No. 23-066.

The scope of work for this proposed Project consists the demolition of a portion of the existing structure (the 1,000 square foot "party room") and its replacement with a 36-foot diameter carousel and a fully sprinklered canopy structure that shelters the carousel. The canopy structure, standing nearly 18 feet tall, and located adjacent to the main entrance of the Discovery Cube Los Angeles building, supports a full array of solar panels that feed into the existing facility's solar power system. The carousel, located near the courtyard entrance, features colorful animals representing protected and endangered species. A rendering of the proposed Project is attached to this Report as Attachment No. 3

The remaining exhibits which were conceptually approved under Board Report No. 23-066 will be presented to the Board at a future date when the final plans are prepared.

PROJECT FUNDING

The proposed Project is to be funded with funds provided directly to DSCLA by the State of California.

TREES AND SHADE

One strawberry tree is proposed to be removed as part of this Project.

ENVIRONMENTAL IMPACT

The proposed Project includes the demolition of an existing structure and its replacement with a carousel and a canopy structure with solar panels to shelter the carousel. The proposed Project is the first phase of a larger project which is anticipated to include the following:

- An outdoor amphitheater stage covered bench seating area;
- A 1,250 square feet flex space pavilion;
- A Los Angeles River and San Gabriel River exhibit;

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- A Fire Ranger Training Camp exhibit featuring a splash pad for children and a helicopter for patrons to explore; and
- A Cube structure and a drought tolerant plants garden with an exhibition featuring current day local wildlife to dinosaurs of our past and stormwater runoff improvements.

California Public Resources Code Section 21159.27 mandates that a project may not be divided into smaller projects to qualify for one or more exemptions from the California Environmental Quality Act (CEQA). Therefore, after reviewing the project (both the first phase and the subsequent phases described above), staff recommended that, since the proposed project could have potentially significant environmental effects, but they could be mitigated to a level less than significant, an Initial Study/Mitigated Negative Declaration (IS/MND) on the entire project should be prepared, in accordance with the requirements of the CEQA.

The IS/MND (SCH Number 2024070697) was circulated to all interested parties and responsible agencies for a 20-day review and comment period from July 1 2024 to July 22, 2024. No comments concerning potential environmental effects were submitted during the public comment period.

The Draft IS/MND identified environmental impacts from construction activities related to biological resources, cultural resources and geological resources that required mitigation measures to reduce these impacts to less than significant. A Mitigation Monitoring and Reporting Program (MMRP) has been prepared that specifies all the mitigation measures identified in the IS/MND, which will either reduce to a level of insignificance or eliminate the potentially significant environment impact of the proposed Project. The mitigation measures include precautions to protect migratory nesting birds in the vicinity of the proposed Project and actions to implement in case of archeological or paleontological findings during construction. The Project also includes measures to limit construction noise by requiring preferred equipment.

An MMRP has been prepared that specifies all the mitigation measures identified in the MND, which will either reduce or eliminate the potentially significant environment impact of the Project, in accordance with Section 15097 of the State CEQA Guidelines. The MMRP is included as Attachment No. 2 to this Report.

Based on these documents, Staff recommends that the Board adopt the IS/MND. RAP staff will file a Notice of Determination (NOD) with the Los Angeles County Clerk and the California Office of Planning and Research within 5 days of the approval of this Report.

FISCAL IMPACT

The approval of this Project will not have an impact on RAP's General Fund. The costs for the construction of the proposed Project are anticipated to be funded by funding sources other than RAP General Fund. Because the improvements are located within the boundaries of the DSCLA Lease area, DSCLA will provide any repairs or maintenance once the improvements have been installed.

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STRATEGIC PLAN INITIATIVES AND GOALS

Approval of this Board Report advances RAP's Strategic Plan by supporting:

Goal No. 3: Create and Maintain World Class Parks

Outcome No. 1: Newly developed open space park projects and the redesign of signature City Parks

Result: The installation of outdoor exhibits at the Discovery Cube Los Angeles will engage the community and enhance the park user's experience.

This Report was prepared by Fernando Torres, Civil Engineering Associate, Planning, Maintenance and Construction Branch; and reviewed by Darryl Ford, Superintendent, Planning, Construction and Maintenance Branch, Department of Recreation and Parks.

LIST OF ATTACHMENTS

- 1) Attachment No. 1 – Final Plans and Specifications
- 2) Attachment No. 2 – Mitigation Monitoring and Reporting Plan (MMRP)
- 3) Attachment No. 3 – Project Rendering



PROJECT:
**COURTYARD CAROUSEL
 CANOPY ADDITION**
 DISCOVERY CUBE LOS ANGELES

CLIENT:
 DISCOVERY CUBE LOS ANGELES
 11800 FOOTHILL BLVD.
 LOS ANGELES, CA. 91040

CONSTRUCTION DOCUMENTS

NOTES

INDEX OF DRAWINGS:

GENERAL		STRUCTURAL	
CS-1	COVER SHEET, INDEX OF DRAWINGS, PROJECT TEAM & GENERAL INFORMATION	S001	GENERAL NOTES
G101	GENERAL NOTES & ABBREVIATIONS	S002	GENERAL NOTES
G103	SIGNAGE PLAN AND DETAILS	S003	GENERAL NOTES
G200	CODE ANALYSIS	S101	TYPICAL DETAILS
G200-B	CODE ANALYSIS - 1ST FLOOR OCCUPANT LOAD	S102	TYPICAL DETAILS
G200-C	CODE ANALYSIS - 2ND FLOOR OCCUPANT LOAD	S103	TYPICAL DETAILS
G201	ZONING EXEMPTION MEMO	S201	FIRST FLOOR FOUNDATION/ FRAMING PLAN
G202	SOILS REPORT APPROVAL LETTER	S204	ROOF FRAMING PLAN
		S301	SECTIONS AND DETAILS

CIVIL	
C0.0	GENERAL NOTES
C0.1	GENERAL NOTES
C1.0	DEMO PLANS
C1.1	GRADING PLAN
C1.2	LID EXHIBIT
C2.0	DETAILS

ARCHITECTURAL	
A100	SITE PLAN
A101	ENLARGED SITE PLAN
A120	DEMOLITION PLAN
A121	DEMOLITION REFLECTED CEILING PLAN
A130	DEMOLITION ELEVATIONS & SECTIONS
A201	PROPOSED FLOOR PLAN @ CAROUSEL
A201-A	DIMENSIONAL PLAN @ CAROUSEL
A201-B	CANOPY DIMENSIONAL PLAN
A203	BEAM PLAN @ CAROUSEL
A204	ROOF PLAN @ CAROUSEL
A211	REFLECTED CEILING PLAN @ CAROUSEL
A301	EXTERIOR ELEVATIONS @ CAROUSEL
A311	BUILDING SECTIONS @ CAROUSEL
A312	BUILDING SECTIONS @ CAROUSEL
A410	WALL SECTIONS @ CAROUSEL
A411	WALL SECTIONS @ CAROUSEL
A601	WALKWAYS PLAN & SECTIONS @ CAROUSEL
A701	DOOR & WINDOW SCHEDULES & DETAILS
A810	DETAILS
A811	DETAILS & ICC REPORTS

PARCEL PROFILE:

ADDRESS:	11800 N FOOTHILL BLVD
PIN NUMBER:	210B165 540
LOT AREA:	12,108.0 SQ FT
APN:	2528002901
TRACT:	TR 15781
BLOCK:	NONE
LOT:	FR LT 1
ARB:	NONE
ZONING:	C2-1VL

ADDRESS:	11798 W FOOTHILL BLVD
PIN NUMBER:	210B165 325
LOT AREA:	25,600.8 SQ FT
APN:	2528002902
TRACT:	TR 15781
BLOCK:	NONE
LOT:	FR LT 1
ARB:	NONE
ZONING:	C2-1VL

ADDRESS:	11770 W FOOTHILL BLVD
PIN NUMBER:	11744 W FOOTHILL BLVD
LOT AREA:	210B169 361
APN:	59,043.0 SQ FT
TRACT:	2528002900
BLOCK:	THE MACLAY RANCHO
LOT:	NONE
ARB:	PT 59
ZONING:	9
	OS-1XL

PROJECT DESCRIPTION:

THE COURTYARD CAROUSEL CANOPY IS A 4,000 SF FULLY SPRINKLERED CANOPY STRUCTURE; STANDING NEARLY 18 FT. TALL; ADJACENT TO THE MAIN ENTRANCE OF THE DISCOVERY CUBE LA FACILITY. IT IS AN EXPOSED METAL DECK OVER WIDE FLANGE STEEL BEAMS WITH PURLINS SET ATOP 12" DIAMETERS STEEL COLUMNS WITH CONCRETE PIER FOOTINGS. ON THE TOP SIDE OF THE METAL DECK IS A FULL ARRAY OF SOLAR PANELS THAT FEED INTO THE EXISTING FACILITY SOLAR POWER SYSTEM. THE PURPOSE OF THE CANOPY IS TO PROVIDE SHELTER FOR THE MAIN ENTRANCE TO THE MUSEUM FACILITY AND THE ADJACENT UPCOMING NEW INSTALLATION OF A 36 FT DIAMETER CAROUSEL WITH 30 HORSES AND 1 SPINNING TUBE AND 1 ADA CHARIOT.

PROJECT TEAM:

OWNER
 DISCOVERY CUBE LOS ANGELES
 11800 FOOTHILL BLVD.
 LOS ANGELES, CA 91040

ARCHITECT
 JOHN SERGIO FISHER & ASSOCIATES (JSFA)
 5567 RESEDA BLVD. SUITE 209
 TARZANA, CA 91356
 PHONE: 818.344.3045
 FAX: 818.344.0338
 PRINCIPAL-IN-CHARGE:
 JOHN FISHER, AIA

CIVIL ENGINEER
 TETRA TECH
 290 VALLEY STATION DR. SUITE 102
 BUELLTON, CA. 93427
 PHONE: (805) 542-9052 |
 MOBILE: (805) 305-0150
 PRINCIPAL-IN-CHARGE:
 JASON L. FUSSELL, PE, PLS, LEED AP, ENV. SP.

STRUCTURAL ENGINEER
 ENGLEKIRK STRUCTURAL ENGINEERS
 888 SOUTH FIGUERO ST. 18TH FL.
 LOS ANGELES, CA 90017
 PHONE: 323.733.6673
 PRINCIPAL-IN-CHARGE:
 DIANA ERICKSON NISHI, SE

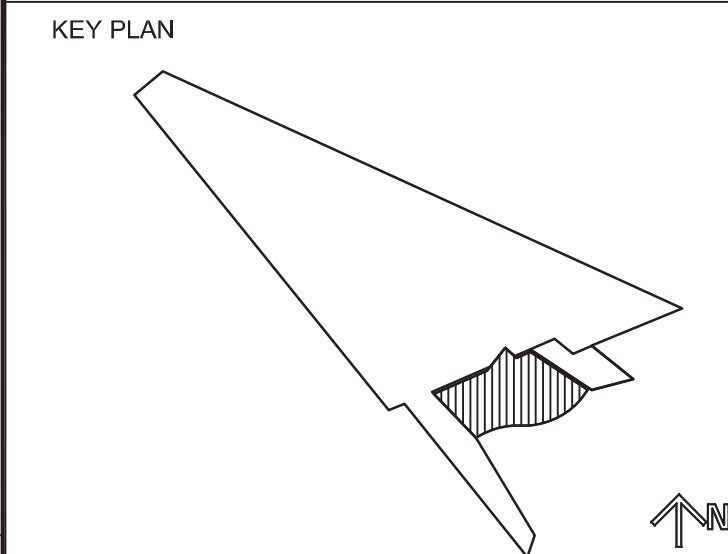
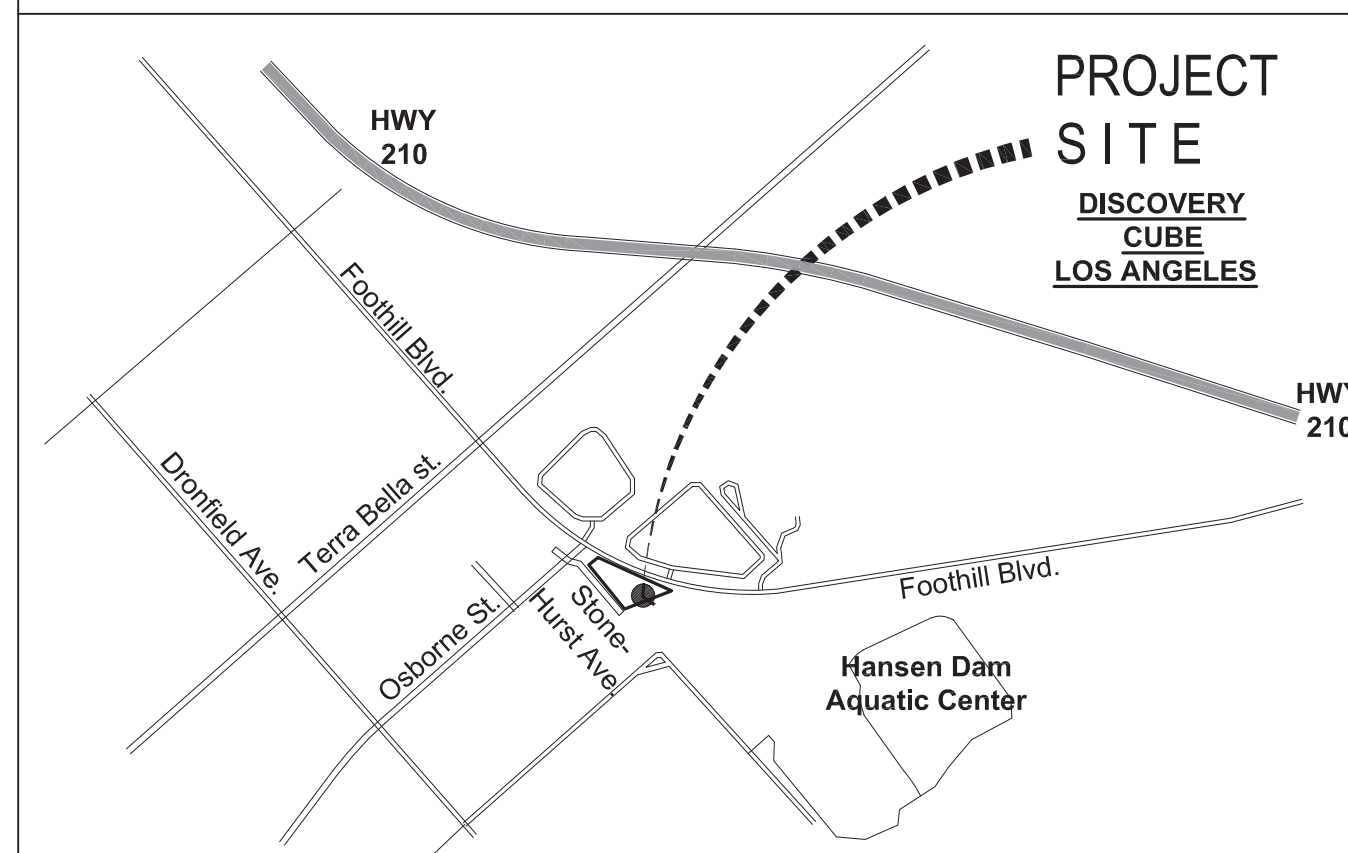
ARCHITECTURAL LEGEND:

	NEW STUD WALL
	EXISTING WALL TO BE REMOVED
SPACE IDENTIFICATION	
	ROOM NAME
	ROOM NUMBER
DOOR & WINDOW IDENTIFICATION	
	DOOR NUMBER
	WINDOW NUMBER
GRADE REFERENCES	
	EXIST. ELEV.
	NEW ELEV. (T.W. - TOP OF WALL)
	FINISH FLOOR ELEVATION (BELOW CARPET)
REFERENCES	
	PLAN BLOW-UP
	SHEET #
	BLDG. SECTION LETTER SHEET WHERE SECTION IS DRAWN
	WALL SECTION REFERENCE NUMBER LEGEND
	DETAIL REFERENCE NUMBER SHEET WHERE DETAIL IS DRAWN
	MATERIAL LEGEND NUMBER LEGEND ON SAME SHEET
	STRUCTURAL GRID LINES
	INTERIOR ELEVATION #
	SHEET #
	EXIT SIGN
	PROJECT NORTH ARROW
	EXTERIOR ELEVATION #
	CEILING
	CEILING HEIGHT A.F.F.

UNDER SEPARATE PERMIT:

- OBTAIN SEPARATE PERMIT FOR THE FOLLOWING:
- FIRE SPRINKLER SYSTEMS (NFPA-13)
 - ELECTRICAL, MECHANICAL, PLUMBING WORK
 - DEMOLITION
 - SIGNAGE
 - PHOTOVOLTAIC PANELS

VICINITY MAP:



**STORMWATER MITIGATION
 LOW IMPACT DEVELOPMENT (LID)
 APPROVED WITH CONDITIONS**

This set of plans and specifications must be at the jobsite during construction

Stormwater Observation Report (SOR) is required prior to issuance of Certificate of Occupancy or final sign off.

Total Pages **2**

Digitally Signed By: *M. Fragoso* Date: 03/19/2024
 Department of Public Works - Bureau of Sanitation
 Watershed Protection Division

**City of Los Angeles, Department of Building & Safety
 DISABLED ACCESS APPROVED PLANS**

By: NORLITO MEDRANO, CASp Date: 03/22/2024
 Certification No. 581 EXP 06/28/26
 Application No./Permit No.: 23010-20000-04364

This set of plans and specifications has been reviewed and is approved for compliance with state and local laws and ordinances related to accessibility to public accommodations and housing.

The stamping of this set of plans and specifications shall not be held to permit or to be an approval of the violation of any provisions of federal, state, and local laws and ordinances related to accessibility to public accommodations and housing.

PLANS APPROVED
 City of Los Angeles
 Department of City Planning

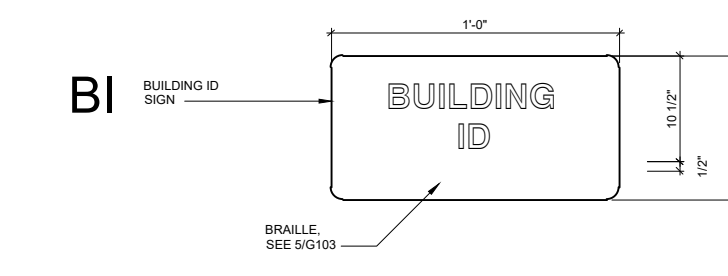
DATE: 03/22/2024 PAGE NO. 1 of 6
 POSE NO: 23010-20000-04364
 CASE NO: ZA-2005-5816-ZV-SPR
 PLANNER: Ruben Vasquez

Client:
DISCOVERY CUBE LOS ANGELES

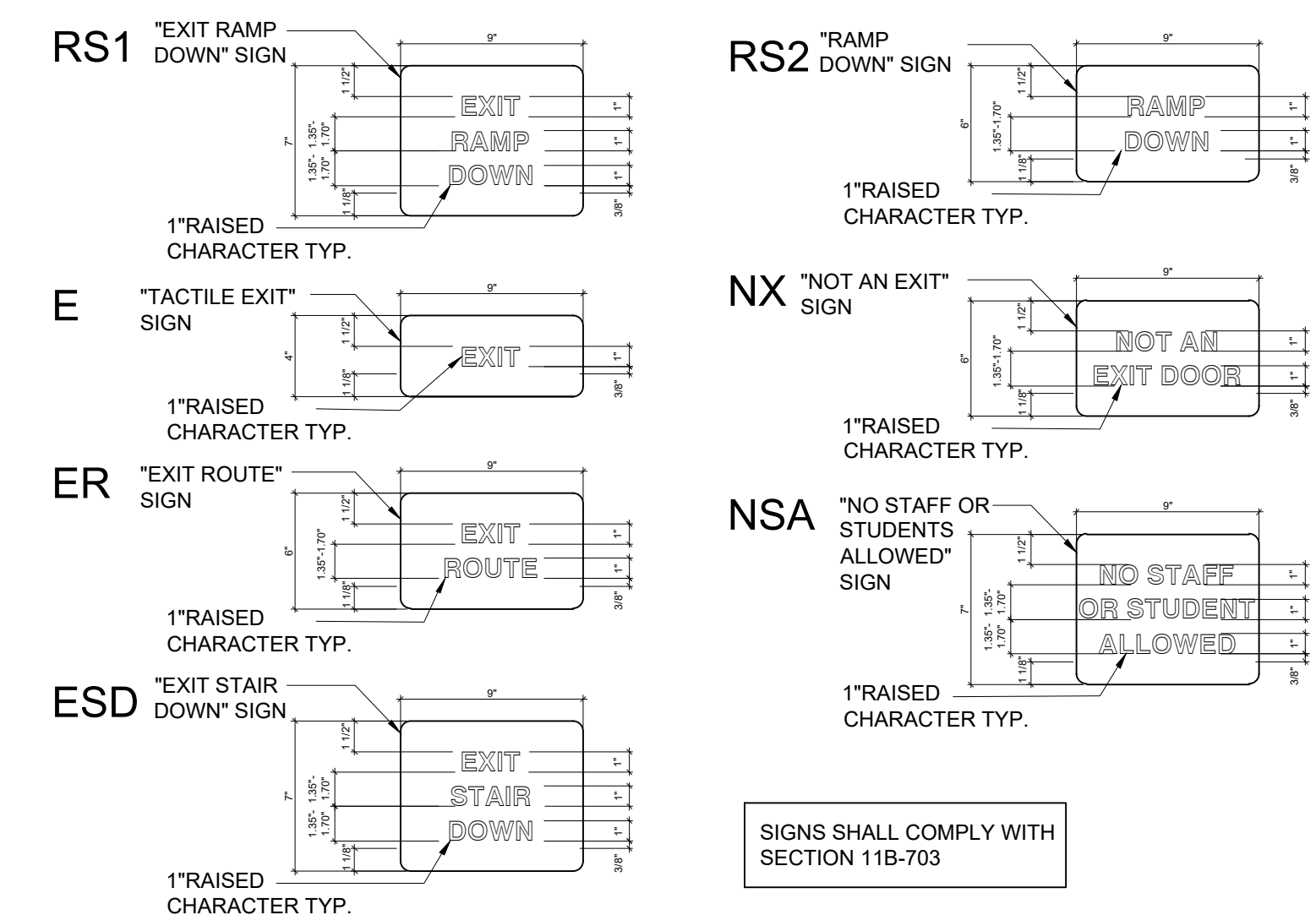
Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
COVER SHEET

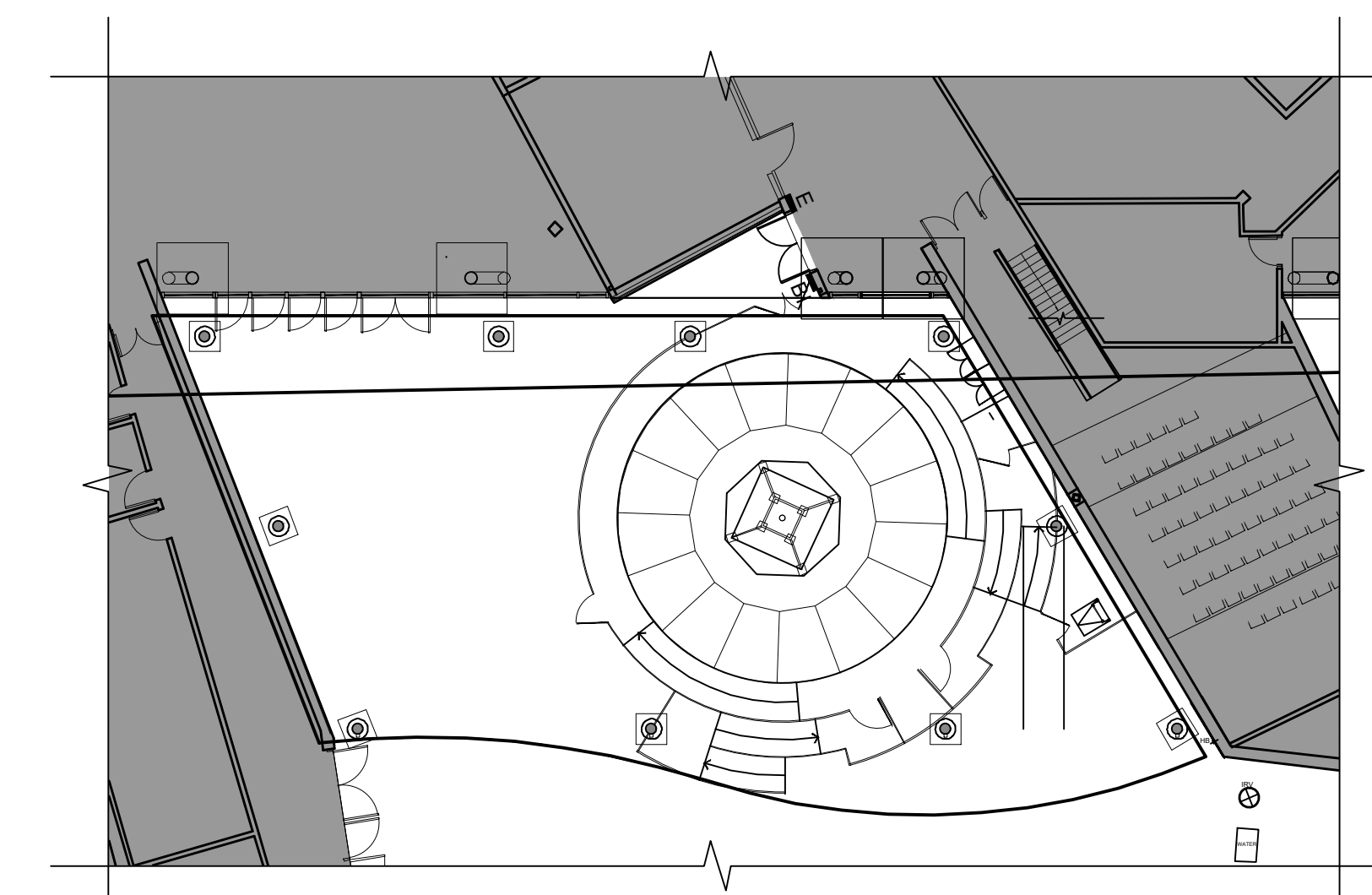
Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: N/A



3 BI: BUILDING ID SIGN
SCALE: NTS



2 TACTILE EXIT SIGNS-E,ER,ESD & NX
SCALE: NTS



1 FIRST FLOOR PLAN
SCALE: 1/16"=1'-0"

City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS

By: **NORLITO MEDRANO, CASp** Date: **01/29/2024**

Certification No: 554 - EXP: 04/29/26
Application No./Permit No.: **23010-20000-04364**

- This set of plans and specifications has been reviewed and is approved for compliance with state and local laws and ordinances related to accessibility to public accommodations and housing.
- The stamping of this set of plans and specifications shall not be held to permit or to be an approval of the violation of any provisions of federal, state, and local laws and ordinances related to accessibility to public accommodations and housing.

KEYNOTES

SIGNAGE SCHEDULE

BI	TACTILE BUILDING ID SIGN, SEE 8/G104
E	TACTILE EXIT SIGN, SEE 1/G104

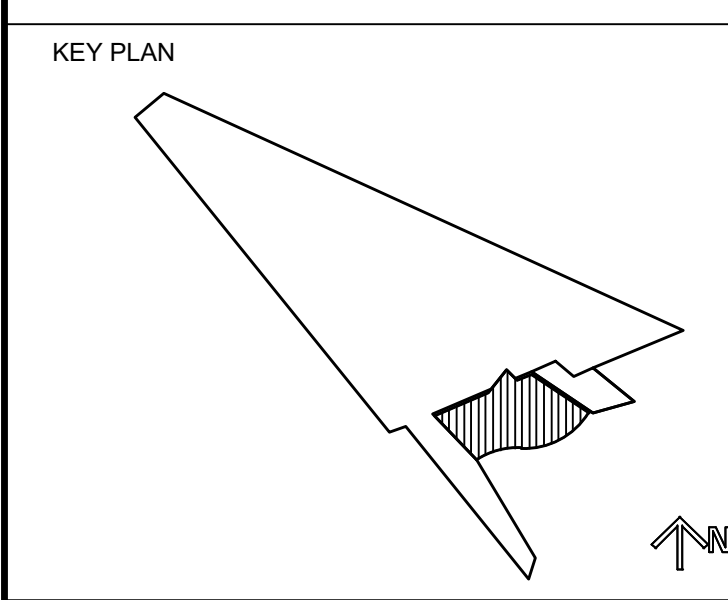
LEGEND

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/24

The enclosed drawings, designs, ideas and arrangements, as contracted with their clients and consultants, are and shall remain the property of John Sergio Fisher & Associates Inc. No part thereof shall be copied, disclosed to others, or used in connection with any other work of project without the written consent of the above. Visual contact with these prints shall constitute conclusive evidence of these restrictions.

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(818) 344-3045
fax (818) 344-0338
E-mail: mail@jsfarchs.com
Architecture & Planning
John Fisher AIA



Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040
Drawing Title
SIGNAGE PLAN & DETAILS

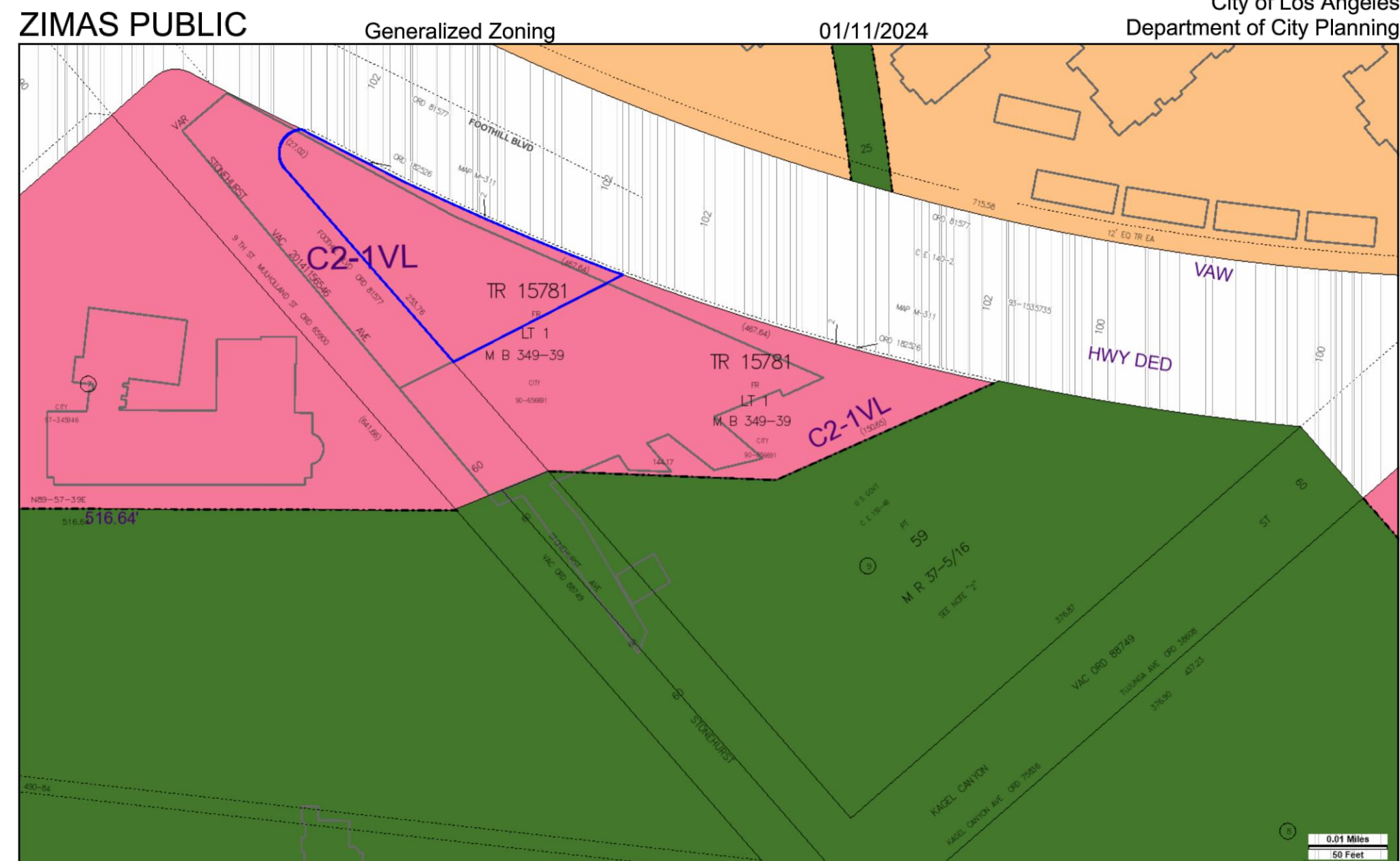
Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN

BUILDING DATA SUMMARY: (CBC TABLE 503) (LABC 504.3, 504.4, 506.2)

PIN NUMBER	210B 165 540		
ASSESSOR PARCEL NO.	2528002901		
TRACT	TR 15781		
LOT	FR LT1	12,108 SF	
ZONING	C2-1VL		
PIN NUMBER	210B 169 361		
ASSESSOR PARCEL NO.	2528002900		
TRACT	THE MACLAY RANCHO		
LOT	PT 59	59,043 SF	
ZONING	OS-1XL		
OCCUPANCY	(E) MIXED USE		
	(E) EXHIBIT / LOBBY	GROUP A-2.1	
	(E) CAFE / THEARE	GROUP A-3	
	(E) OFFICES	ACCESSORY TO ASSEMBLY	
	(E) RETAIL SPACE	GROUP M, MERCANTILE	
	(E) STORAGE	GROUP S1, STORAGE	
(N) CANOPY	GROUP A-2.1		
AUTOMATIC SPRINKLER REQUIRED: YES (PER SECTION 903.2.1) NFPA 13 FIRE SPRINKLER SYSTEM: WET PIPE SPRINKLER SYSTEM			
CONSTRUCTION TYPE (E) BUILDING:	(E) II - 1HR (SUPERVISED AUTOMATIC SPRINKLER SYSTEM)		
CONSTRUCTION TYPE (N) CANOPY:	IIB NON COMBUSTIBLE (SPRINKLERED)		
	EXISTING	PROPOSED	
HEIGHT (PER TABLE 504.3)	(E) 45'	NO CHANGE	NO HEIGHT INCREASE
NO. OF STORIES (PER TABLE 504.4)	(E) 2	NO CHANGE	NO STORY INCREASE
BUILDING AREA SUMMARY			
(E) FIRST FLOOR	37,605 SF		
(E) FIRST FLOOR EQUIP ENCLOSURE	1,995 SF		
(E) FIRST FLOOR TOTAL	39,600 SF		
(E) SECOND FLOOR	18,035 SF		
(E) TOTAL BUILDING AREA	57,635 SF		
DEMOLITION - FIRST FLOOR BUILDING	-727 SF		
ADDITION - FIRST FLOOR CANOPY		4,000 SF	
PROPOSED FIRST FLOOR AREA		42,873 SF	
PROPOSED TOTAL BUILDING AREA		60,908 SF	
FLOOR AREA RATIO: 1.5 TO 1			

(E) PARKING: 265 TOTAL SPACES AVAILABLE, 250 REQUIRED
7 ACCESSIBLE SPACES (INCLUDING 4 VAN ACCESSIBLE)

(E) PLUMBING FACILITIES		Water Closets		Urinals		Lavatories		Drinking Fountain	
		Provided	Required	Provided	Required	Provided	Required	Provided	Required
Male		7	12		10				
		22			17				4
	Unisex	1	1		1				



Address: 11800 N FOOTHILL BLVD
 APN: 2528002901
 PIN #: 210B165 540

Tract: TR 15781
 Block: None
 Lot: FR LT 1
 Arb: None

Zoning: C2-1VL
 General Plan: Neighborhood Commercial



BUILDING CODE SUMMARY:

APPLICABLE CODES

-THE APPLICABLE BUILDING CODES FOR THIS PROJECT ARE:

2019 CALIFORNIA ADMINISTRATIVE CODE (CAC), PART 1, TITLE 24 CCR
 2019 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 CCR
 (2015 INTERNATIONAL BUILDING CODE, VOL. 1 & 2, AND 2016 CALIFORNIA AMENDMENTS)
 2019 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 CCR
 (2014 NATIONAL ELECTRICAL CODE AND 2016 CALIFORNIA AMENDMENTS)
 2019 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24 CCR
 (2015 IAPMO UNIFORM MECHANICAL CODE AND 2016 CALIFORNIA AMENDMENTS)
 2019 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 CCR
 (2015 IAPMO UNIFORM PLUMBING CODE AND 2016 CALIFORNIA AMENDMENTS)
 2019 CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24 CCR
 2019 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24 CCR
 (2015 INTERNATIONAL FIRE CODE AND 2016 CALIFORNIA AMENDMENTS)
 2019 CALIFORNIA EXISTING BUILDING CODE (CEBC), PART 10, TITLE 24 CCR
 (2015 INTERNATIONAL EXISTING BUILDING CODE AND 2016 CALIFORNIA AMENDMENTS)
 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGreen), PART 11, TITLE 24 CCR
 2019 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24 CCR
 TITLE 19 CCR, PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS
 2013 ASME A17.1/CSA B44-13 SAFETY CODE FOR ELEVATORS AND ESCALATORS

APPLICABLE STANDARDS

NFPA 13 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS (CA AMENDED) 2016 EDITION
 NFPA 14 STANDARD FOR THE INSTALLATION OF STANDPIPE & HOSE SYSTEMS (CA AMENDED) 2013 EDITION
 NFPA 17 STANDARD FOR DRY CHEMICAL EXTINGUISHING SYSTEMS 2013 EDITION
 NFPA 17A STANDARD FOR WET CHEMICAL EXTINGUISHING SYSTEMS 2013 EDITION
 NFPA 20 STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION 2016 EDITION
 NFPA 22 STANDARD FOR WATER TANKS FOR PRIVATE FIRE PROTECTION 2013 EDITION
 NFPA 24 STANDARD FOR THE INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES 2016 EDITION
 NFPA 72 NATIONAL FIRE ALARM AND SIGNALING CODE (CA AMENDED) 2016 EDITION
 NFPA 80 STANDARD FOR FIRE DOORS AND OTHER OPENING PROTECTIVES 2016 EDITION
 NFPA 2001 STANDARD ON CLEAN AGENT FIRE EXTINGUISHING SYSTEMS 2015 EDITION
 UL 300 STANDARD FOR FIRE TESTING OF FIRE EXTINGUISHING SYSTEMS FOR PROTECTION OF COMMERCIAL COOKING EQUIPMENT 2005 (R2010)
 UL 464 AUDIBLE SIGNALING DEVICES FOR FIRE ALARM AND SIGNALING SYSTEMS, INCLUDING ACCESSORIES 2003 EDITION
 UL 521 STANDARD FOR HEAT DETECTORS FOR FIRE PROTECTIVE SIGNALING SYSTEMS 1999 EDITION
 UL 1971 STANDARD FOR SIGNALING DEVICES FOR THE HEARING IMPAIRED 2002 EDITION
 ICC 300 STANDARD FOR BLEACHERS, FOLDING AND TELESCOPIC SEATING AND GRANDSTANDS 2012 EDITION

FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE (CBC TABLE 602): FOR CONSTRUCTION TYPE IIB WITH OCCUPANCY GROUP E

FIRE SEPARATION DISTANCE = X (FT)	FIRE RESISTANCE RATING
X ≤ 5	1
5 < X ≤ 10	1
10 < X ≤ 30	0
X ≥ 30	0

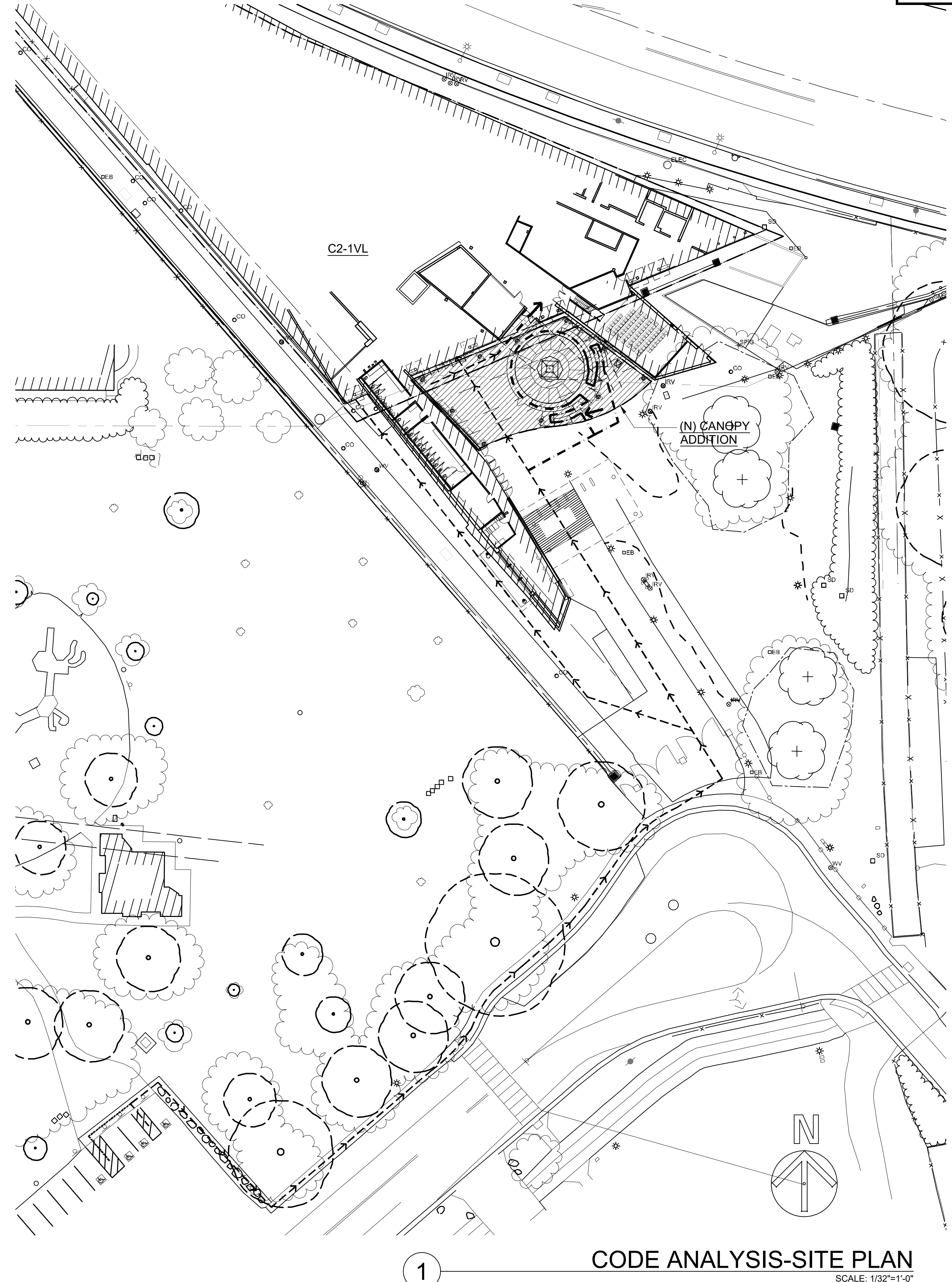
FIRE-RESISTANCE RATING REQUIREMENTS PER CBC TABLE 601:

STRUCTURAL FRAME 0-HOUR
 BEARING WALLS - EXTERIOR 0-HOUR
 BEARING WALLS - INTERIOR 0-HOUR
 NONBEARING WALLS - EXTERIOR 0-HOUR
 NONBEARING WALLS - INTERIOR 0-HOUR
 FLOOR CONSTRUCTION & SECONDARY MEMBERS 0-HOUR
 ROOF CONSTRUCTION & SECONDARY MEMBERS 0-HOUR

City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS

By: NORLITO MEDRANO, C.A.S.P. Date: 01/29/2024
 Application No./Permit No.: 23010-20000-04364

This set of plans and specifications has been reviewed and is approved for compliance with state and local laws and ordinances related to accessibility to public accommodations and housing. The stamping of this set of plans and specifications shall not be held to permit or to be an approval of the violation of any provisions of federal, state, and local laws and ordinances related to accessibility to public accommodations and housing.



KEYNOTES

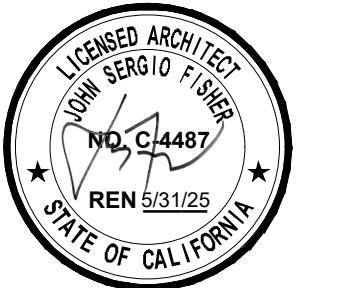
--- (N) ACCESSIBLE PATH OF TRAVEL
 --- (E) ACCESSIBLE PATH OF TRAVEL PER 13016-101-26087
 [Hatched Box] EXISTING BUILDING
 [White Box] NEW ADDITION

SUBMITTALS:

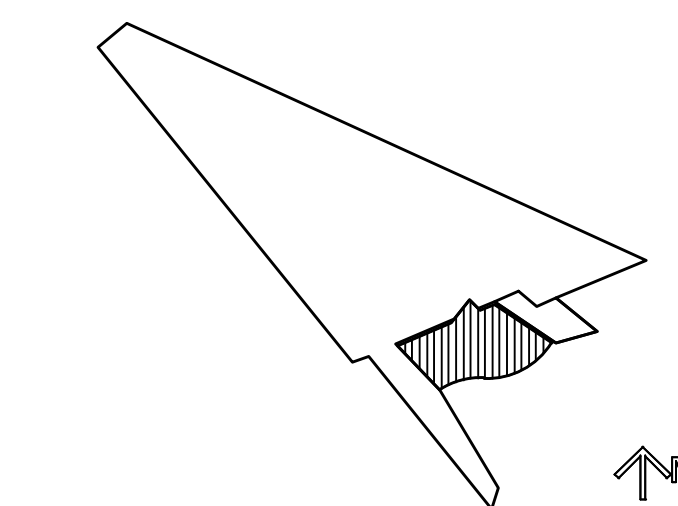
NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/26/24

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John Sergio Fisher & Associates Inc. **jsfa**
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 Tarzana California 91356
 (818) 344-3045
 fax (818) 344-0338
 E-mail: mail@jsfarchs.com
 Architecture & Planning
 John Fisher AIA



KEY PLAN



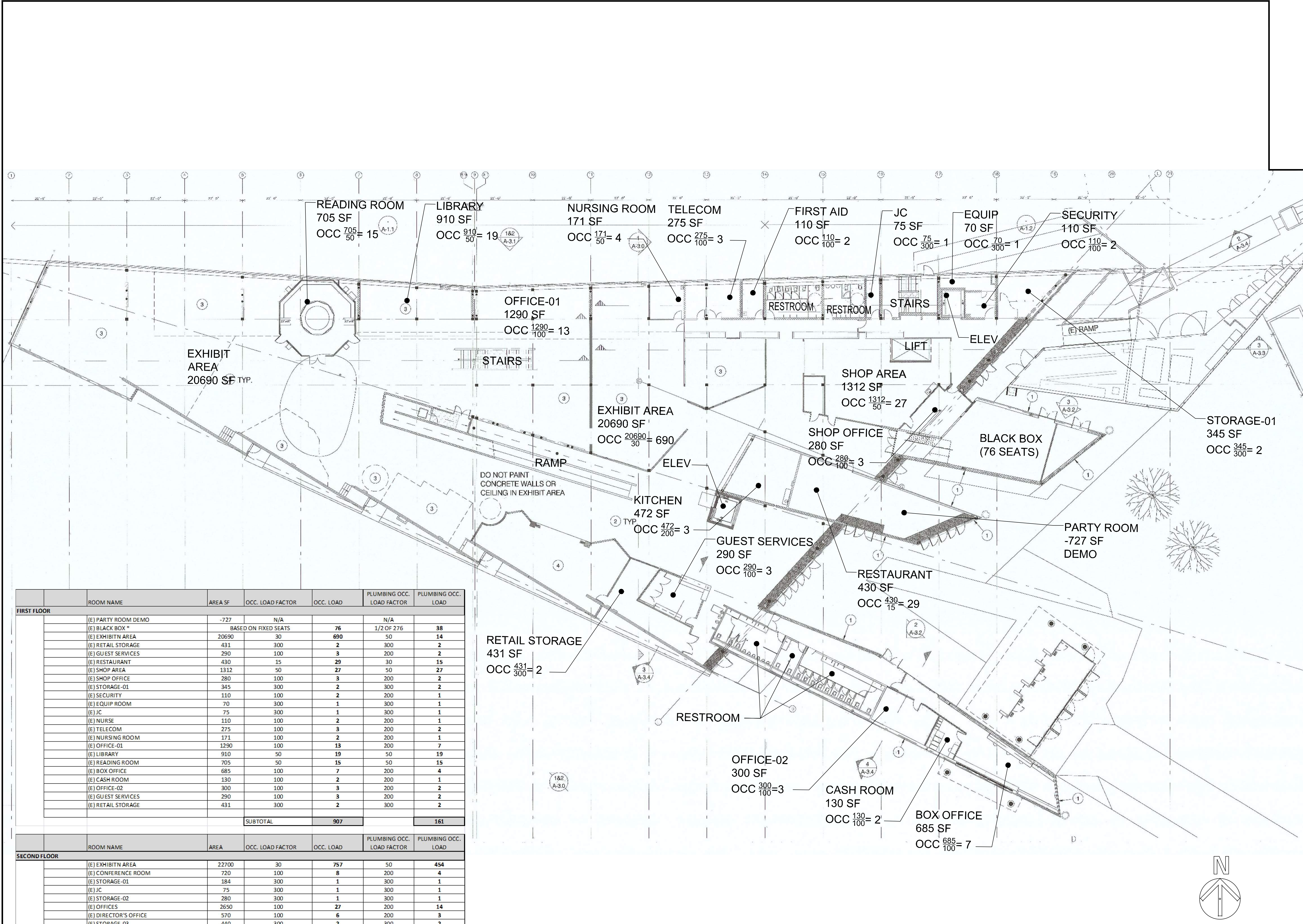
Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA 91040
 Drawing Title: **CODE ANALYSIS**

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: **G200**

CODE ANALYSIS-SITE PLAN
 SCALE: 1/32"=1'-0"



FIRST FLOOR	ROOM NAME	AREA SF	OCC. LOAD FACTOR	OCC. LOAD	PLUMBING OCC. LOAD FACTOR	PLUMBING OCC. LOAD
	(E) PARTY ROOM DEMO	-727	N/A		N/A	
	(E) BLACK BOX * BASED ON FIXED SEATS			76	1/2 OF 276	38
	(E) EXHIBIT AREA	20690	30	690	50	14
	(E) RETAIL STORAGE	431	300	2	300	2
	(E) GUEST SERVICES	290	100	3	200	2
	(E) RESTAURANT	430	15	29	30	15
	(E) SHOP AREA	1312	50	27	50	27
	(E) SHOP OFFICE	280	100	3	200	2
	(E) STORAGE-01	345	300	2	300	2
	(E) SECURITY	110	100	2	200	1
	(E) EQUIP ROOM	70	300	1	300	1
	(E) JC	75	300	1	300	1
	(E) NURSE	110	100	2	200	1
	(E) TELECOM	275	100	3	200	2
	(E) NURSING ROOM	171	100	2	200	1
	(E) OFFICE-01	1290	100	13	200	7
	(E) LIBRARY	910	50	19	50	19
	(E) READING ROOM	705	50	15	50	15
	(E) BOX OFFICE	685	100	7	200	4
	(E) CASH ROOM	130	100	2	200	1
	(E) OFFICE-02	300	100	3	200	2
	(E) GUEST SERVICES	290	100	3	200	2
	(E) RETAIL STORAGE	431	300	2	300	2
	SUBTOTAL			907		161

SECOND FLOOR	ROOM NAME	AREA	OCC. LOAD FACTOR	OCC. LOAD	PLUMBING OCC. LOAD FACTOR	PLUMBING OCC. LOAD
	(E) EXHIBIT AREA	22700	30	757	50	454
	(E) CONFERENCE ROOM	720	100	8	200	4
	(E) STORAGE-01	184	300	1	300	1
	(E) JC	75	300	1	300	1
	(E) STORAGE-02	280	300	1	300	1
	(E) OFFICES	2650	100	27	200	14
	(E) DIRECTOR'S OFFICE	570	100	6	200	3
	(E) STORAGE-03	440	300	2	300	2
	SUBTOTAL			803		480
	Total OCC			1710		641

KEYNOTES

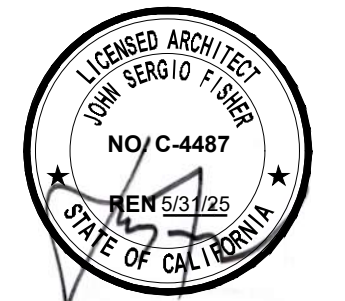
LEGEND

SUBMITTALS:

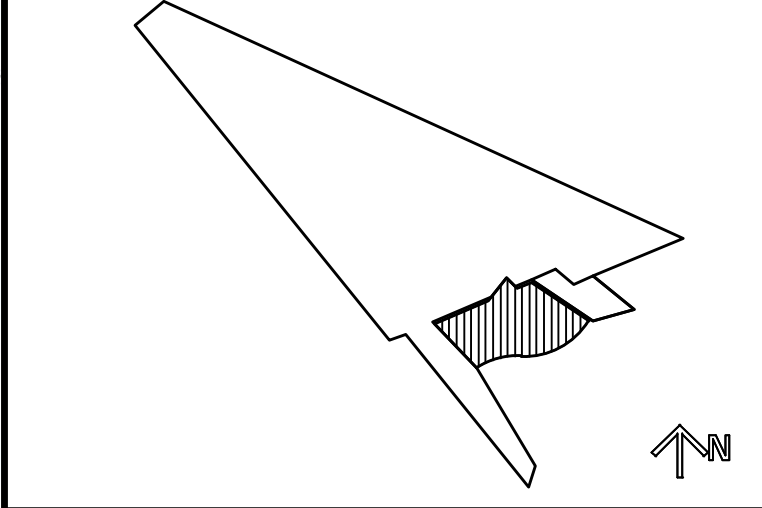
NO.	DESCRIPTION	DATE
1	LADRS RESUBMITTAL	1/24/2024
2	LADRS RESUBMITTAL	2/22/2024

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 E-mail: mail@jsfarchs.com
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 John Fisher AIA



KEY PLAN



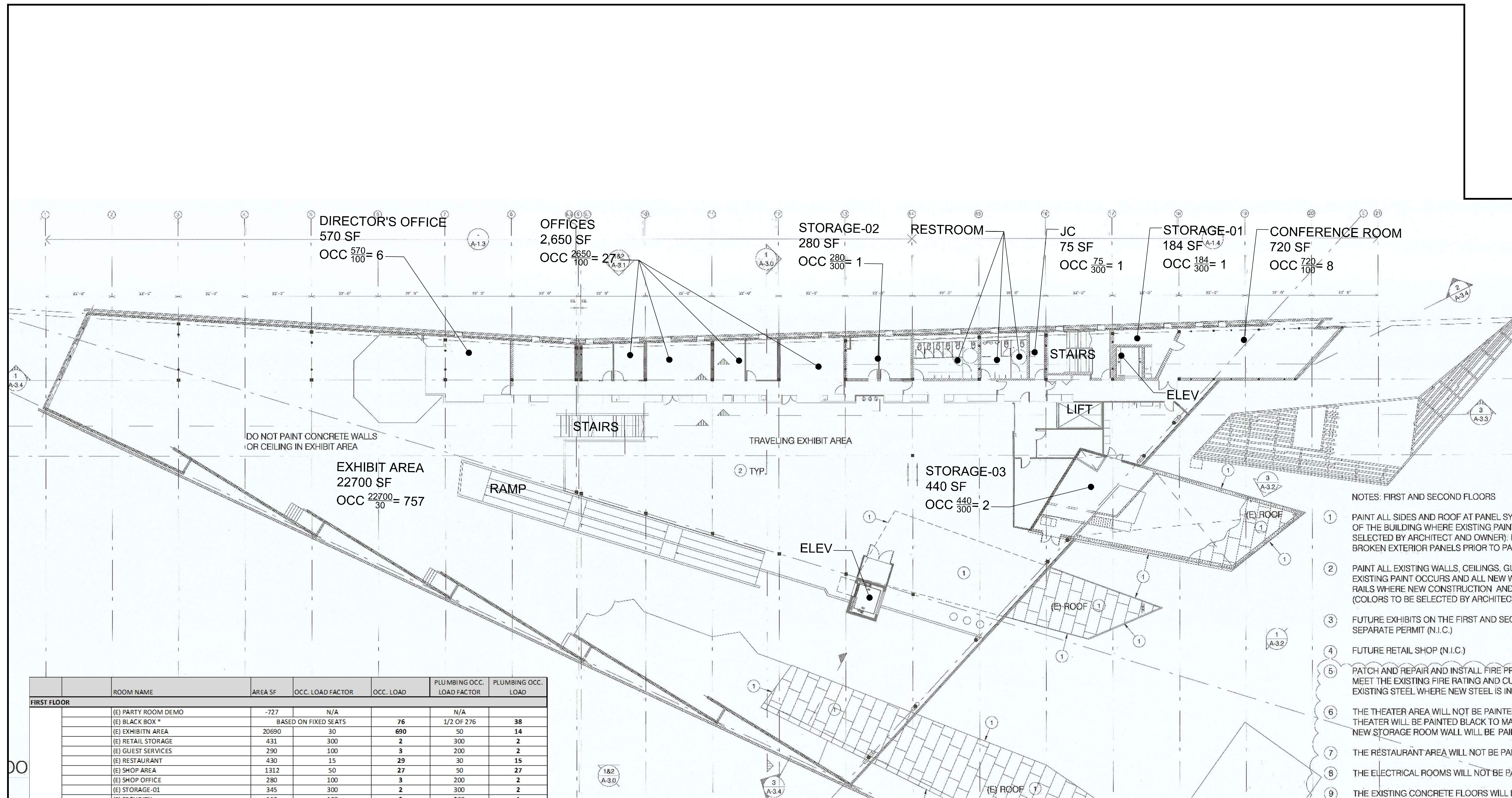
Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA 91040
 Drawing Title
**CODE ANALYSIS - FIRST FLOOR
 OCCUPANT LOAD**

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: **G200-B**

1 FIRST FLOOR OCCUPANT LOAD
 SCALE: 1/16"=1'-0"



DO NOT PAINT CONCRETE WALLS OR CEILING IN EXHIBIT AREA

EXHIBIT AREA
22700 SF
OCC $\frac{22700}{30} = 757$

FLOOR	ROOM NAME	AREA SF	OCC. LOAD FACTOR	OCC. LOAD	PLUMBING OCC. LOAD FACTOR	PLUMBING OCC. LOAD
FIRST FLOOR	(E) PARTY ROOM DEMO	-727	N/A		N/A	
	(E) BLACK BOX *	BASED ON FIXED SEATS		76	1/2 OF 276	38
	(E) EXHIBIT AREA	20690	30	690	50	14
	(E) RETAIL STORAGE	431	300	2	300	2
	(E) GUEST SERVICES	290	100	3	200	2
	(E) RESTAURANT	430	15	29	30	15
	(E) SHOP AREA	1312	50	27	50	27
	(E) SHOP OFFICE	280	100	3	200	2
	(E) STORAGE-01	345	300	2	300	2
	(E) SECURITY	110	100	2	200	1
	(E) EQUIP ROOM	70	300	1	300	1
	(E) JC	75	300	1	300	1
	(E) NURSE	110	100	2	200	1
	(E) TELECOM	275	100	3	200	2
	(E) NURSING ROOM	171	100	2	200	1
	(E) OFFICE-01	1290	100	13	200	7
	(E) LIBRARY	910	50	19	50	19
	(E) READING ROOM	705	50	15	50	15
	(E) BOX OFFICE	685	100	7	200	4
	(E) CASH ROOM	130	100	2	200	1
(E) OFFICE-02	300	100	3	200	2	
(E) GUEST SERVICES	290	100	3	200	2	
(E) RETAIL STORAGE	431	300	2	300	2	
	SUBTOTAL			907		161

FLOOR	ROOM NAME	AREA	OCC. LOAD FACTOR	OCC. LOAD	PLUMBING OCC. LOAD FACTOR	PLUMBING OCC. LOAD
SECOND FLOOR	(E) EXHIBIT AREA	22700	30	757	50	454
	(E) CONFERENCE ROOM	720	100	8	200	4
	(E) STORAGE-01	184	300	1	300	1
	(E) JC	75	300	1	300	1
	(E) STORAGE-02	280	300	1	300	1
	(E) OFFICES	2650	100	27	200	14
	(E) DIRECTOR'S OFFICE	570	100	6	200	3
(E) STORAGE-03	440	300	2	300	2	
	SUBTOTAL			803		480
	Total OCC			1710		641

- NOTES: FIRST AND SECOND FLOORS
- PAINT ALL SIDES AND ROOF AT PANEL SY OF THE BUILDING WHERE EXISTING PAINT SELECTED BY ARCHITECT AND OWNER). BROKEN EXTERIOR PANELS PRIOR TO PA
 - PAINT ALL EXISTING WALLS, CEILINGS, GU EXISTING PAINT OCCURS AND ALL NEW V RAILS WHERE NEW CONSTRUCTION AND (COLORS TO BE SELECTED BY ARCHITEC
 - FUTURE EXHIBITS ON THE FIRST AND SEC SEPARATE PERMIT (N.I.C.)
 - FUTURE RETAIL SHOP (N.I.C.)
 - PATCH AND REPAIR AND INSTALL FIRE PR MEET THE EXISTING FIRE RATING AND CU EXISTING STEEL WHERE NEW STEEL IS IN
 - THE THEATER AREA WILL NOT BE PAINTED THEATER WILL BE PAINTED BLACK TO MA NEW STORAGE ROOM WALL WILL BE PAI
 - THE RESTAURANT AREA WILL NOT BE PA
 - THE ELECTRICAL ROOMS WILL NOT BE P
 - THE EXISTING CONCRETE FLOORS WILL I

KEYNOTES

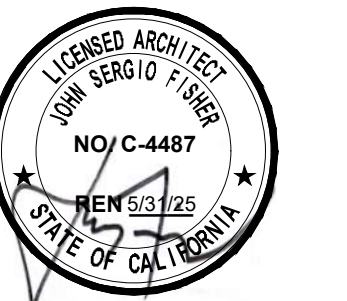
LEGEND

SUBMITTALS:

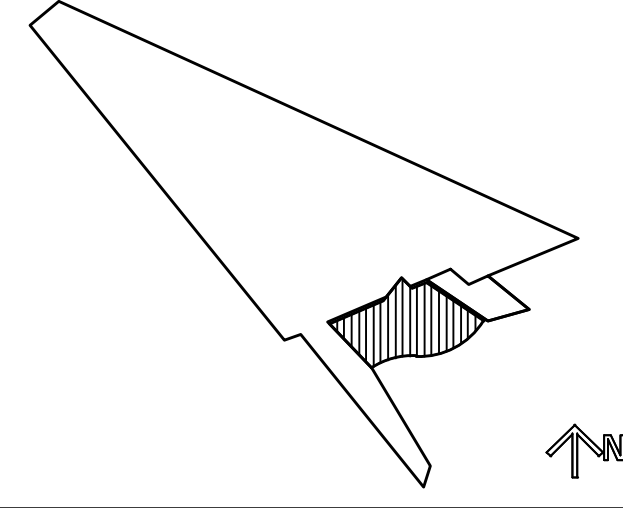
NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/2024
2	LADBS RESUBMITTAL	2/22/2024

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E-mail: mail@jsfarchs.com
Architecture & Planning
John Fisher AIA



KEY PLAN



Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040
Drawing Title
CODE ANALYSIS - SECOND FLOOR OCCUPANT LOAD

Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: **G200-C**

1 SECOND FLOOR OCCUPANT LOAD
SCALE: 1/16"=1'-0"

Further, any Department of Recreation and Parks project, including facilities leased to, or operated and/or managed by private operators and any accessory use or building, shall not be subject to any Department of City Planning entitlements for development, including but not limited to the following:

- A. Project Permit Compliance
- B. Zone Change (Changes to zones will continue to be reflected during the community plan update process.)
- C. Conditional Use Permit (The sale of alcoholic beverages for on or off-site consumption requires approval by the RAP Board. Department of Recreation and Parks will be responsible for coordinating directly with the California Department of Alcoholic Beverage Control regarding license authorizations.)
- D. Variance
- E. Adjustment
- F. Site Plan Review
- G. Previously approved entitlements having a Sunset Clause

All other City regulations for development projects, not administered or regulated by Chapter 1 of the Los Angeles Municipal Code, shall continue to be enforced by each respective City department, unless otherwise stated by said department. All Department of Recreation and Parks projects that require building permits for construction, including tenant improvements, shall be subject to all current building code regulations as enforced by the Department of Building and Safety.

In addition, this memorandum does not supersede any State of California or Federal regulations, including but not limited to, the California Coastal Act (California Government Code Sections 30000-30900), the Subdivision Map Act (California Government Code Sections 66410-66499.58), or the Americans With Disabilities Act.

Finally, the Department of City Planning and the Department of Recreation and Parks will jointly write a Memorandum of Understanding for the purpose of maintaining communication regarding all proposed park projects. Department of Recreation and Parks staff has agreed to convene with Department of City Planning staff on a quarterly basis, as needed, to solicit urban design feedback for all proposed park projects to ensure consistency with applicable design guidelines and adopted plans.

DEPARTMENT OF
CITY PLANNING
CITY PLANNING COMMISSION
SAMANTHA MELLMAN
PRESIDENT
VAHED KHORRAM
VICE PRESIDENT
DAVID H. J. AMBRIZ
CAROLINE CHOE
RENEE DARE WILSON
KAREN MACX
MAE MITCHELL
VERONICA PADILLA CAMPOS
DANA M. PERLMAN
ROCKY WILES
COMMISSION CHIEF MANAGER
(213) 978-1300

CITY OF LOS ANGELES
CALIFORNIA
ERIC GARCETTI
MAYOR

EXECUTIVE OFFICES
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LOS ANGELES, CA 90012-4801
VINCENT P. BERTONI, AICP
DIRECTOR
(213) 978-1273
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DEPUTY DIRECTOR
(213) 978-1272
ISA M. WEBER, AICP
SWIFT DIRECTOR
(213) 978-1274

http://planning.lacity.org

Date: December 6, 2018

To: Michael Shull, General Manager, Department of Recreation and Parks
Frank M. Bush, General Manager, Department of Building and Safety
Ralph M. Terrazas, Fire Chief, Fire Department
Gary Lee Moore, City Engineer, Department of Public Works, Bureau of Engineering

From: Vincent P. Bertoni, AICP, Director of Planning

Subject: Department of Recreation and Parks Authority under City Charter

In response to recent discussions involving management and staff from Department of Recreation and Parks, Department of City Planning and the City Attorney's Office, all parties concur that the City of Los Angeles Charter establishes broad authorization for the Department of Recreation and Parks to pursue parks and recreational facilities located on property owned or controlled by the City for public recreation, including facilities leased to, or operated and/or managed by private operators and any accessory use or building, within the City of Los Angeles. This memorandum does not apply to privately owned and operated park projects. The following Charter Sections (only applicable language listed) provide the aforementioned authority:

Section 590. Powers and Duties of the Department.

The Department of Recreation and Parks shall have the power and duty:

- (a) to establish, construct, maintain, operate and control, wherever located:
 - (1) all parks of the City of Los Angeles;
 - (2) all recreational facilities, museums, observatories, municipal auditoriums, sports centers and all lands, waters, facilities or equipment set aside or dedicated for recreational purposes and public enjoyment; and
 - (3) all property acquired by it or assigned to its jurisdiction for public recreation.
- (b) to design, construct and operate, lease, rent or sell concessions or privileges to be exercised for the benefit, education, amusement, convenience or enjoyment of the public, in connection with any function, site or facility under the jurisdiction of the department;
- (c) to establish schedules of charges for special services;
- (d) to promote public recreation and cooperate with other public agencies and organizations for that purpose; and

- (e) to establish, maintain and operate playgrounds or other recreational facilities upon portions of public streets, under terms and conditions provided by ordinance.

Section 591. Board of Recreation and Parks Commissioners.

The Board of Recreation and Park Commissioners shall have the power:

- (a) to control all recreation and park sites;
- (b) to control, appropriate and expend all money in the Recreation and Parks Fund and authorize the City Treasurer to invest any surplus funds under its control in accordance with Section 303(b); and
- (c) to organize the work of the department into divisions and to appoint an administrative officer for each division or for any group of divisions.

Section 594. Control and Management of Recreation and Park Lands.

- (a) Management and Control. The Department of Recreation and Parks shall operate, manage and control all property now or hereafter owned or controlled by the City for public recreation, including parks, and shall have power in the name of the City to acquire and take by purchase, lease, condemnation, gift, in trust or otherwise, any and all property necessary or convenient for recreation, including park purposes.
- (b) Acquisition of Property. No real property shall be acquired by the City for recreation sites, including parks, unless first approved by the Board of Recreation and Park Commissioners.
- (c) Restrictions on Transfer of Dedicated Parks. All lands heretofore or hereafter set apart or dedicated as a public park shall forever remain for the use of the public in whole; but the board may authorize use of the lands for any park purpose, and for.....
- (d) Transfer to Purposes other than Recreation and Park Purposes. No sites under the management and control of the department shall be devoted or transferred to any other purpose in whole or in part, except in compliance with.....

As stated in Section 591 of the Los Angeles Charter, the Board of Recreation and Park Commissioners (Board) has the power to control all City-owned and operated parks and recreational facilities. In addition, all proposed park projects require approval by the Board, thus ensuring consistency with adopted City plans. The Board shall have the authority to determine appropriate locations for park projects, uses associated with park projects, accessory structures and buildings, and any off-street parking to satisfy park project needs. This authorization exempts Department of Recreation and Parks projects, including facilities leased to, or operated and/or managed by private operators and any accessory use or building, from the regulations of Chapter 1 of the Los Angeles Municipal Code and any General Provisions and Zoning chapters that may be adopted subsequent to this memorandum, including but not limited to the following:

- A. Use for each zone (Parks and recreational facilities shall be permitted in all zones.)
- B. Restriction for each zone (Parks and recreational facilities, including any accessory use or building, shall be permitted in all zones.)
- C. Area for each zone (The area of each structure and/or building shall not be restricted in all zones.)
- D. Specific Plans
- E. Districts, including Overlays
- F. Off-street parking
- G. Height
- H. Signs

FORM GEN. 160 (Rev. 7-99) CITY OF LOS ANGELES
INTERDEPARTMENTAL CORRESPONDENCE

DATE: November 29, 2023

TO: Department of Building and Safety

FROM: Darryl Ford, Superintendent
Planning, Construction, and Maintenance Branch
Department of Recreation and Parks

SUBJECT: DISCOVERY CUBE LA - SOLAR SHADE STRUCTURE AND CAROUSEL

Pursuant to the letter, dated December 6, 2018, issued by Department of City Planning, it is agreed that the City of Los Angeles Charter exempts the Department of Recreation and Parks (RAP) projects from the regulations of Chapter 1 of the Los Angeles Municipal Code (CH 1 LAMC).

Project Name: Discovery Cube LA - Courtyard Carousel Canopy
Project Address: 11800 N. Foothill Boulevard, Los Angeles, CA 91342
Zoning Case Number: Z23VN15021

Scope of Work: Installation of a 4,000 SF fully sprinklered solar panel canopy structure that provides shelter for the main entrance to the museum facility and the upcoming installation of a 36 ft. diameter Carousel.

Since the proposed project is within RAP's property, it is exempt from the regulations of CH 1 LAMC. Please contact my staff, Cammie Neo, at (213) 202-2662 or cammie.neo@lacity.org if you have any questions.

cc: Cammie Neo, RAP
Fernando Torres Jr., RAP
Luis Almonte, Discovery Cube
Steve Sandland, Discovery Cube

Attachments:
1. Department of Recreation and Parks Authority under City Charter

KEYNOTES

LEGEND

SUBMITTALS:

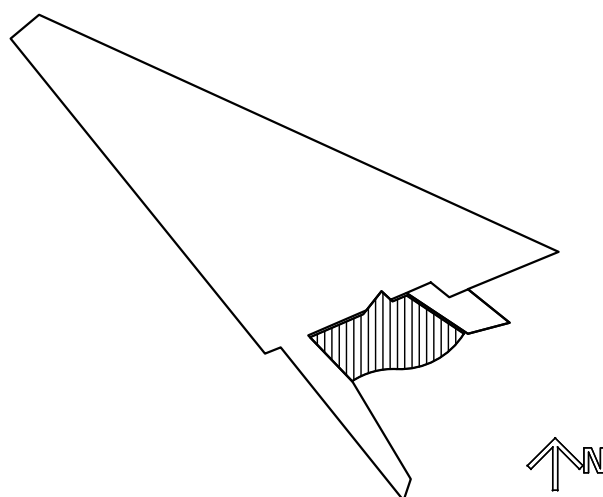
NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/2024
2	LADBS RESUBMITTAL	2/22/2024

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Tarzana California 91356
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fax (818) 344-0338
E-mail: mail@jsfarchs.com
Architecture & Planning
John Fisher AIA



KEY PLAN



Client: DISCOVERY CUBE LOS ANGELES

Job Name: COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA 91040
Drawing Title
ZONING EXEMPTION MEMORANDUM

Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN



Grading Pre-Inspection Report

Address: 11800 N FOOTHILL BLVD
Council District: 7 Permit Application: 24030-20000-00679

Work Description:
The courtyard carousel "detached" canopy addition is about a 3,500 SF canopy structure; standing nearly 18 feet tall; fully fire sprinklered adjacent to the main entrance of the discovery cube la facility. It is an exposed metal deck over wide flange steel beams with purlins set atop 12" diameters steel columns with concrete pier footings. On the top side of the metal deck will be a full array of solar panels that feed into the existing facility solar power system. The purpose of the canopy is to provide shelter for the main entrance to the museum facility and the adjacent upcoming new installation of a 36 feet diameter carousel with 30 horses and 1 spinning tube and 1 ADA chariot.

Inspector/Telephone: GERMAN RODRIGUEZ MENDOZA, (818) 374-4359
Inspection District: VN
Inspection Date: 02/08/2024

Property Posted: Yes Posting Date: 02/08/2024 Posting Fees Paid? Yes
Tract: TR 15781
Block: Lot(s): LT 1 ARB: County Ref No: M B 349-39

Approved Graded Lot: No Bearing Value:
Fill Over 100 Feet: No Buttriss Fill: No
Slope of Surface: Descending Natural Soil Classification 1804.2:
Cut: degrees Height: ft in
Fill: degrees Height: ft in
Natural: degrees Height: flatft Slide Area: No
atworkareain
Sewer Available: N/A PSDS Sized Per Code: Unknown
Site is Below Street Roof Gutters: No
Condition of Street for Drainage Recommended Termination of Drainage street or
Purposes a/c approved device.
Driveway Grade: % - Maximum Rough Grade Allowed: %

GRADING APPROVAL TO ISSUE PERMIT(S)
OK TO ISSUE. SEE BELOW FOR COMMENTS.

X DO NOT ISSUE UNTIL BELOW REQUIREMENTS HAVE BEEN SATISFIED.

- 1. A grading permit is required for excavation..
2. A retaining wall permit is required.
3. OSHA permit required for vertical cuts 5 feet or over.
4. All footings shall be founded in undisturbed natural soil per Code.
5. Design for expansive soil or submit a soils report to the grading division per information bulletin P/BC 2008-116 and 91.1805.8.
6. In the event excavations reveal unfavorable conditions, the services of a soils engineer and/or geologist may be required.
7. Geological and Soils report(s) are required. Submit three copies (1 original and 2 copies), with appropriate fees, to the Grading Section for review and approval.
8. Incorporate all recommendations of the approved Geological and Soils report(s) and Department letters dated 01/30/2024 log#129227 into the plans. Geologist and Soils Engineer to sign plans.
9. Site is subject to mudflow. Comply with provisions of Section 91.7014.3. Geological and soils report required.
10. Buildings shall be located clear of the toe of all slopes which exceed a gradient of 3 horizontal to 1 vertical as per Section 91.1805.3.1.
11. Footings shall be set back from the descending slope surface exceeding 3 horizontal to 1 vertical as per Section 91.1805.3.7.
12. Swimming pools and spas shall be set back from descending and ascending slopes as per Section 91.1805.3.3.
13. Department approval is required for construction of , on or over slopes steeper than 2 horizontal to 1 vertical.
14. Provide complete details of engineered temporary shoring or slot cutting procedures on plans. Call for inspection before excavation begins.
15. All concentrated drainage, including roof water, shall be conducted, via gravity, to the street or an approved location at a 2% minimum. Drainage to be shown on the plans.
16. A Registered Deputy Inspector is required.
17. All fill or backfill shall be compacted by mechanical means to a minimum 90% relative compaction as determined by ASTM method D-1557. Subdrains shall be provided where required by Code.
18. Specify on the plans "The soils engineer is to approve the key or bottom and leave a certificate on the site for the grading inspector. The grading inspector is to be notified before any grading begins and, for bottom inspection, before fill is placed. Fill may not be placed without approval of the grading inspector."
19. Existing non-conforming slopes shall be cut back at 2:1 (26 degrees) or retained. All concentrated drainage, including roof water, shall be conducted, via gravity, to the street or an approved location at a 2% minimum. Drainage to be shown on the plans.
20. All cut or fill slopes shall be no steeper the 2:1 (26 degrees).
21. Stake and flag the property lines in accordance with a licensed survey map .
22. Approval required by the Department for .
23. Approval required by the Department of Public Works, Urban Forestry Division, for native tree protected ORD. 177,040. Phone # (213) 847-3077
24. This is a preliminary pre-inspection only - base on limited information. When complete plans (and possibly calculations and/or required reports) are submitted for a permit, a new pre-inspection and fee will be required.

** Additional requirements: This gpi shall be part of approved plans. soils approval letter dated 1/30/24 log #129227

Construction of new occupied buildings or major additions to buildings on sites located in any of the Seismic Hazard Zones (liquefaction, Landslide or Alquist-Prilo Fault Zone) will require a geology and/or soil engineering report. For questions call (213) 482-0480.

Page 3
11800 N FOOTHILL BLVD

- 15. Footings supported shall be reinforced with a minimum of four (4), 1/2-inch diameter (#4) deformed reinforcing bars. Two (2) bars shall be placed near the bottom and two (2) bars placed near the top of the footing.
16. Pile caisson and/or isolated foundation ties are required by LAMC Sections 91.1809.13 and/or 91.1810.3.13. Exceptions and modification to this requirement are provided in Information Bulletin P/BC 2020-030.
17. When water is present in drilled pile holes, the concrete shall be tremied from the bottom up to ensure minimum segregation of the mix and negligible turbulence of the water (1808.8.3).
18. Existing uncertified fill shall not be used for lateral support of deep foundations (1810.2.1).
19. Slabs placed on approved compacted fill shall be at least 3 1/2 inches thick and shall be reinforced with 1/2-inch diameter (#4) reinforcing bars spaced a maximum of 16 inches on center each way.
20. The seismic design shall be based on a Site Class D, as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check.
21. The structure shall be connected to the public sewer system per P/BC 2020-027.
22. All roof, pad and deck drainage shall be conducted to the street in an acceptable manner in non-erosive devices or other approved location in a manner that is acceptable to the LADBS and the Department of Public Works (7013.10).
23. An on-site storm water infiltration system at the subject site shall not be implemented, as recommended.
24. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS (7013.10).
25. The soils engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading (7008, 1705.6 & 1705.8).
26. All friction pile or caisson drilling and excavations shall be performed under the inspection and approval of the geologist and soils engineer. The geologist shall indicate the distance that friction piles or caissons penetrate into competent [material] bedrock in a written field memorandum. (1803.5.5, 1705.1.2)
27. Prior to pouring concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the work inspected meets the conditions of the report. No concrete shall be poured until the LADBS Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)
28. Prior to excavation an initial inspection shall be called with the LADBS Inspector. During the initial inspection, the sequence of construction; [shoring; ABC slot cuts; underpinning;

Page 4
11800 N FOOTHILL BLVD

- pile installation;] protection fences; and, dust and traffic control will be scheduled (108.9.1).
29. Installation of shoring, underpinning, slot cutting and/or pile excavations shall be performed under the inspection and approval of the soils engineer and deputy grading inspector (1705.6, 1705.8).
30. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the soil inspected meets the conditions of the report. No fill shall be placed until the LADBS Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be included in the final compaction report filed with the Grading Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Division of the Department upon completion of the compaction. In addition, an Engineer's Certificate of Compliance with the legal description as indicated in the grading permit and the permit number shall be included (7011.3).
31. No footing/slab shall be poured until the compaction report is submitted and approved by the Grading Division of the Department.

YING LIU
Geotechnical Engineer II

Log No. 129227
213-482-0480

cc: Applicant
Tetra Tech, Project Consultant
VN District Office

JAVIER NUÑEZ PRESIDENT



OSAMA YOUNAN, P.E. GENERAL MANAGER SUPERINTENDENT OF BUILDING

JOSELYN GEAGA-ROSENTHAL VICE PRESIDENT

KAREN BASS MAYOR

JOHN WEIGHT EXECUTIVE OFFICER

JACOB STEVENS MOISES ROSALES NANCY YAP

SOILS REPORT APPROVAL LETTER

January 30, 2024

LOG # 129227
SOILS/GEOLOGY FILE - 2

Discovery Cube
2500 N. Main Street
Santa Ana, CA 92705

TRACT: TR 15781
LOT(S): FR LT1
LOCATION: 11800 N FOOTHILL BLVD

Table with 4 columns: CURRENT REFERENCE REPORT/LETTER(S), REPORT No., DATE OF DOCUMENT, PREPARED BY. Rows include Soils Report and Addendum Report.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed discovery cube exhibits and courtyard carousel canopy.

The earth materials at the subsurface exploration locations consist of up to 7.5 feet of uncertified fill underlain by silty to clayey sand.

The consultants recommend to support the proposed structure(s) on conventional, mat-type, and drilled-pile foundations bearing on compacted fill underlain by competent native undisturbed soils.

The referenced reports are acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis () refer to applicable sections of the 2023 City of LA Building Code. P/BC numbers refer to the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

- 1. The soils engineer shall review and approve the detailed plans prior to issuance of any permit. This approval shall be by signature on the plans that clearly indicates the soils engineer has reviewed the plans prepared by the design engineer; and, that the plans included the recommendations contained in their reports (7006.1).
2. All recommendations of the report(s) that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

Page 2
11800 N FOOTHILL BLVD

- 3. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans (7006.1). Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.
4. A grading permit shall be obtained for all structural fill and retaining wall backfill (106.1.2).
5. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density. Placement of gravel in lieu of compacted fill is only allowed if complying with LAMC Section 91.7011.3.
6. If import soils are used, no footings shall be poured until the soils engineer has submitted a compaction report containing in-place shear test data and settlement data to the Grading Division of the Department; and, obtained approval (7008.2).
7. Compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the bottom of footings or a minimum of three feet whichever is greater (7011.3).
8. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill (1809.2, 7011.3).
9. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction (7013.12).
10. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the General Safety Orders of the California Department of Industrial Relations (3301.1).
11. Excavations shall not remove lateral support from a public way, adjacent property or an existing structure. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)
12. Prior to the issuance of any permit that authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation (3307.1).
13. Unsurcharged temporary excavations shall be trimmed back at a gradient not exceeding 1.5(H):1(V), as recommended.
14. All foundations shall derive entire support from compacted fill underlain by competent undisturbed soils, as recommended and shall be approved by the geologist and soils engineer by inspection.

KEYNOTES

LEGEND

SUBMITTALS:

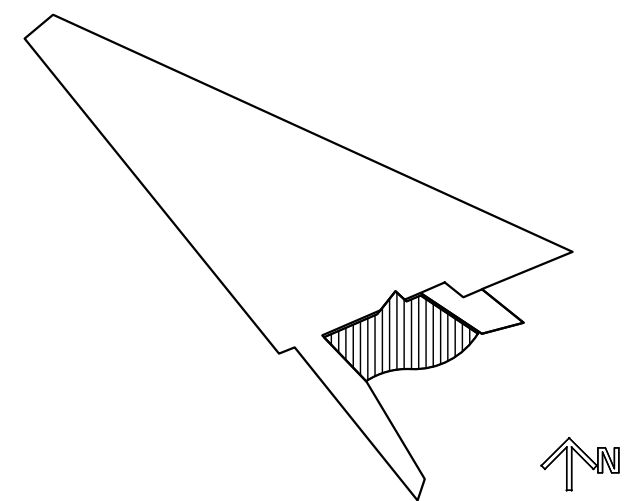
Table with 3 columns: NO., DESCRIPTION, DATE. Rows show LADBS RESUBMITTAL dates.

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KEY PLAN



Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040
Drawing Title
SOILS REPORT APPROVAL AND GPI

Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN



STANDARD GENERAL NOTES

- THE CONTRACTOR AGREES THAT, IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
- CONTRACTOR TO IDENTIFY POINT OF CONTACT FOR THE PROJECT MANAGER PRIOR TO CONSTRUCTION.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN PERMITS NECESSARY TO PERFORM THE WORK SHOWN IN THESE PLANS FROM THE APPROPRIATE AGENCIES, AND TO COMPLY WITH THEIR CONDITIONS AND REQUIREMENTS.
- THE CONTRACTOR SHALL TAKE EFFECTIVE ACTION TO PREVENT THE FORMATION OF AN AIRBORNE DUST NUISANCE AND SHALL BE RESPONSIBLE FOR ANY DAMAGE RESULTING FROM THEIR FAILURE TO DO SO.
- THE CONTRACTOR SHALL PROVIDE FOR INGRESS AND EGRESS FROM PRIVATE PROPERTY ADJACENT TO WORK THROUGHOUT THE PERIOD OF CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN, OR OTHER DEVICES NECESSARY TO PROVIDE FOR SAFETY.
- THE CONTRACTOR SHALL POST EMERGENCY TELEPHONE NUMBERS FOR POLICE, FIRE, AMBULANCE, AND THOSE AGENCIES RESPONSIBLE FOR MAINTENANCE OF UTILITIES IN THE VICINITY OF THE JOB SITE.
- ANY EXTRA CONSTRUCTION STAKING NECESSITATED SOLELY BY THE CONTRACTOR'S NEGLIGENCE WILL BE CHARGED TO THE CONTRACTOR ON A TIME AND MATERIAL BASIS, AND PAID FOR BY THE CONTRACTOR.
- EXISTING UNDERGROUND UTILITIES AND IMPROVEMENTS ARE SHOWN IN THEIR APPROXIMATE LOCATIONS BASED UPON RECORD INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME OF PREPARATION OF THESE PLANS. LOCATIONS MAY NOT HAVE BEEN VERIFIED IN THE FIELD AND NO GUARANTEE IS MADE AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL NOTIFY COMPANIES AT LEAST 2 WORKING DAYS IN ADVANCE OF CONSTRUCTION. TO FIELD LOCATION UTILITIES, CALL UNDERGROUND SERVICE ALERT NORTH(U.S.A NORTH), AT 811. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE EXISTENCE AND LOCATION OF UTILITIES SHOWN ON THESE PLANS OR INDICATED IN THE FIELD BY LOCATING SERVICES. ANY ADDITIONAL COST INCURRED AS A RESULT OF THE CONTRACTOR'S FAILURE TO VERIFY LOCATIONS OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION SHALL BE BORNE BY THE CONTRACTOR AND IS DEEMED INCLUDED AND MERGED IN THE CONTRACT PRICE. ALL EXISTING UTILITIES AND IMPROVEMENTS THAT BECAME DAMAGED DURING CONSTRUCTION SHALL BE COMPLETELY RESTORED TO THE SATISFACTION OF THE LOCAL AGENCY ENGINEER, AT THE CONTRACTOR'S SOLE EXPENSE.
- THE EXISTENCE OF UNDERGROUND UTILITY INFORMATION SHOWN ON THE PLANS UTILIZED FIELD SURVEYS, CCTV INVESTIGATIONS, AND OR GPR SCANNING UNDER THE DIRECTION OF AND PROVIDED BY THE CONTRACTOR. THE INFORMATION INCLUDED UTILITIES OF AN UNKNOWN NATURE AND/OR SOURCE. FURTHER, THE CONTINUITY OF THE EXISTING STORM DRAIN SYSTEM WAS NOT ABLE TO BE DETERMINED BASED ON THE INFORMATION PROVIDED. THUS, LOCATIONS(S) OF UTILITIES ARE NOT DEEMED TO BE EXACT OR COMPLETE NOR DOES THE ENGINEER GUARANTEE THE ACCURACY OR COMPLETENESS OF UTILITY LOCATIONS SHOWN. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES AS THEY ARE ENCOUNTERED DURING CONSTRUCTION AND NOTIFY THE ENGINEER OF RECORD (EOR) OF ANY VARIANCE FROM THE INFORMATION INDICATED ON THE PLANS. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE ACCEPTABLE CONVEYANCE AND CAPACITY OF STORM WATER FLOWS THROUGH MODIFIED SEGMENTS OF THE SYSTEM AND INTERFACE WITH EXISTING SYSTEMS SUCH THAT IT PROVIDES APPROPRIATE DISCHARGE FROM THE SITE AT PERIMETER LOCATIONS.
- NEITHER THE PLANS, SPECIFICATIONS, NOR CONTRACT DOCUMENTS SPECIFY NOR RECOMMEND THE USE OR INSTALLATION OF ANY MATERIAL OR EQUIPMENT WHICH IS MADE FROM, OR WHICH CONTAINS ASBESTOS FOR USE IN THE CONSTRUCTION OF THESE IMPROVEMENTS. ANY PARTY INSTALLING OR USING SUCH MATERIALS OR EQUIPMENT SHALL BE SOLELY RESPONSIBLE FOR ALL INJURIES, DAMAGES, OR LIABILITIES, OF ANY KIND, CAUSED BY THE USE OF SUCH MATERIALS, OR EQUIPMENT.
- THE CONTRACTOR SHALL MEET AND FOLLOW ALL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS IN EFFECT AT THE TIME OF CONSTRUCTION.
- SHOULD IT APPEAR THAT THE WORK TO BE DONE OR ANY MATTER RELATIVE THERETO IS NOT SUFFICIENTLY DETAILED OR EXPLAINED ON THESE PLANS, THE CONTRACTOR SHALL CONTACT THE PROJECT MANAGER FOR SUCH FURTHER EXPLANATIONS AS MAY BE NECESSARY.
- CONTRACTOR SHALL ARRANGE, INSTALL, AND PAY FOR ANY TEMPORARY UTILITIES, INCLUDING BUT NOT LIMITED TO TELEPHONE, ELECTRIC, SEWER, WATER, WATER, ETC. THE CONTRACTOR IS TO COORDINATE ANY SUCH UTILITY NEEDS WITH THE GOVERNING/LOCAL UTILITY AGENCIES.
- APPLICABLE CIVIL/SITE WORK CODES INCLUDE BUT MAY NOT BE LIMITED TO:
2022 CALIFORNIA BUILDING CODE
2022 CALIFORNIA ELECTRICAL CODE
2022 CALIFORNIA MECHANICAL CODE
2022 CALIFORNIA PLUMBING CODE
2022 CALIFORNIA ENERGY CODE
2022 CALIFORNIA FIRE CODE
2022 CALIFORNIA GREEN BUILDING CODE
2021 INTERNATIONAL BUILDING CODE
NFPA 13, NFPA 55, NFPA 30, NFPA 70, NFPA 70A
- ALL CONSTRUCTION SITES SHALL BE INSPECTED BY THE CITY TO VERIFY THAT BMP'S ARE INSTALLED, MAINTAINED, AND EFFECTIVE. ALL CONSTRUCTION SITES SHALL BE INSPECTED PRIOR TO COMMENCEMENT OF ANY LAND DISTURBANCE ACTIVITIES AND PRIOR TO A RAIN EVENT ANTICIPATED TO PRODUCE 1/2" IN A 24-HR PERIOD.
- DRAINAGE FACILITIES SHALL BE PROVIDED TO CONVEY STORM WATER TO SWALE OR TO A PUBLIC STORM DRAINAGE SYSTEM. ADEQUATE TEMPORARY MEASURES SHALL BE TAKEN TO CONTROL STORM WATER AND SEDIMENT DURING GRADING OPERATIONS IN CONFORMANCE WITH THE ACCEPTED SWPPP.
- ALL WORK SHALL BE DONE AND DOCUMENTED IN CONFORMANCE WITH APPLICABLE REQUIREMENTS SET FORTH BY THE CITY OF LOS ANGELES FOR THE PREVENTION OF POLLUTANTS IN STORM WATER DISCHARGES FROM THE CONSTRUCTION SITE AND THE CONTRACTOR'S MATERIAL AND EQUIPMENT LAYDOWN AND STAGING AREAS. APPLICANT SHALL INCORPORATE BEST MANAGEMENT PRACTICES TO PREVENT SEDIMENT RUNOFF AND OTHER POTENTIAL POLLUTANTS FROM ENTERING THE STORM DRAINAGE SYSTEM WHICH SHALL BE MAINTAINED ON-SITE AT ALL TIMES.

- THIS PROJECT SHALL BE MADE PART OF THE ONGOING OVERALL SITE SWPPP.
- DISCREPANCIES, OMISSIONS, OR CONFLICTS BETWEEN THE CIVIL SITE PLANS AND STRUCTURAL PLANS OR THE PROJECT SPECIFICATIONS OR CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER OF RECORD FOR RESOLUTION PRIOR TO STARTING OR PROCEEDING WITH ANY ASSOCIATED WORK.

PROJECT SPECIFIC NOTES

- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SAVE AND PROTECT ANY EXISTING SURVEY MONUMENTS WHICH ARE NOT IDENTIFIED FOR REMOVAL AND REPLACEMENT ON THE PROJECT PLANS.
- ALL WORK SHALL BE IN ACCORDANCE WITH THE PLANS AND THE DISCOVERY CUBE PROJECT SPECIFICATIONS. USE BUREAU OF ENGINEERING STANDARD DRAWINGS AND SPECIFICATIONS TO ADDRESS CONSTRUCTION ELEMENTS NOT COVERED IN THE PROJECT PLANS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL PROCURE FROM THE CITY OF LOS ANGELES AND ALL OTHER APPLICABLE AGENCIES, ALL PERMITS AND LICENSES, PAY ALL CHARGES AND FEES AND GIVE ALL NOTICES NECESSARY (TWO WORKING DAYS MINIMUM) FOR INSTALLATION OF APPLICABLE IMPROVEMENTS DELINEATED HEREON.
- THE CONTRACTOR SHALL NOTIFY THE PROJECT MANAGER, ARCHITECT, AND CITY INSPECTOR AT LEAST 24 HOURS PRIOR TO STARTING WORK.
- CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRIC AND FIBER OPTIC SERVICE WITH LOS ANGELES POWER AND THE PROJECT MANAGER.
- FOR SITE ELECTRICAL WORK, SEE ELECTRICAL PLANS.
- CONTRACTOR SHALL EXERCISE ALL NECESSARY CAUTION TO AVOID DAMAGE TO ANY EXISTING TREES AND SURFACE IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE AND SHALL BEAR FULL RESPONSIBILITY FOR ANY DAMAGE THERETO.
- ALL TRASH, DEBRIS, ROOTS, TREE REMAINS AND OTHER RUBBISH FROM DEMOLITION WORK SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE SO AS TO LEAVE THE CONSTRUCTION AREAS NEAT WITH THE FINISHED APPEARANCE FREE FROM UNSIGHTLY DEBRIS. NO BURNING SHALL BE PERMITTED. TREE STUMPS SHALL BE COMPLETELY REMOVED TO A MINIMUM 24" BELOW EXISTING GRADE. ALL ROCKS GREATER THAN 1/2" IN DIAMETER SHALL BE REMOVED FROM THE UPPER 8" OF SOIL AT ALL PLANTER AREAS DURING FINE GRADING OF THE SITE.
- CONTRACTOR TO MAINTAIN CONTINUITY OF SUBSURFACE DRAINAGE SYSTEMS. SUBSURFACE DRAINAGE WAS NOT LOCATED DURING THE INVESTIGATION OF THE EXISTING UTILITIES. SUBSURFACE DRAINAGE INFRASTRUCTURE IS ANTICIPATED TO BE REQUIRED BUT NOT A PART OF THIS PLAN SET.
- REFER TO THE ARCHITECTURAL PLANS FOR LIMITS OF EQUIPMENT TYPE WITHIN PROXIMITY TO THE EXISTING BUILDING.
- CONTRACTOR TO COORDINATE UNDERGROUND UTILITY OUTAGES DURING UTILITY RELOCATING WITH TETRA TECH AND THE PROJECT MANAGERS AHEAD OF CONSTRUCTION.
- CONTROL DATA IS NOT INTENDED TO BE CALLED OUT ON THIS PLAN SET. ALL HORIZONTAL CONTROL INFORMATION IS INTENDED TO BE CONVEYED TO THE PROJECT CONTRACTOR AND PROJECT SURVEYOR THROUGH AUTOCAD (.DWG) FILES PREPARED BY TETRA TECH.
- DISCREPANCIES, OMISSIONS, OR CONFLICTS BETWEEN THE CIVIL SITE PLANS AND ARCHITECTURAL PLANS OR THE PROJECTS SPECIFICATIONS OR CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER OF RECORD FOR RESOLUTION PRIOR TO STARTING OR PROCEEDING WITH ANY ASSOCIATED WORK.

GRADING NOTES

- ALL TRENCHES IN PUBLIC RIGHT-OF-WAY SHALL BE BACKFILLED AND PAVED WITHIN 24 HOURS OF EXCAVATION. STEEL PLATES MAY BE PLACED OVER UNBACKFILLED TRENCHES BEYOND THE 24 HOUR PERIOD WITH SPECIFIC APPROVAL OF CITY ENGINEER. STEEL PLATING MUST MEET REQUIREMENTS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL GRADING SHALL BE PERFORMED IN SUCH A MANNER AS TO COMPLY WITH THE STANDARDS ESTABLISHED BY THE AIR QUALITY MAINTENANCE DISTRICT FOR AIRBORNE PARTICULATES.
- GRADING WORK SHALL CONSIST OF ALL CLEARING, GRUBBING, AND STRIPPING, IMPORT/EXPORT OF SOIL, EMBANKMENT EXCAVATION, SPREADING, COMPACTION, AND CONTROL OF FILL AND ALL SUBSIDIARY WORK NECESSARY TO COMPLETE THE GRADING TO CONFORM TO THE LINES, GRADES, AND SLOPES AS SHOWN ON THE PLANS. ALL IMPORTED SOIL TO BE TESTED AND APPROVED BY THE GILBANE PROJECT MANAGER AND PROJECT GEOTECHNICAL ENGINEER.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CARRY OUT THE CUT, FILL, AND EXPORT OPERATIONS NECESSARY TO MEET THE DESIGN GRADES AND CONSTRUCTION OF FACILITIES SHOWN ON THE PLANS. ANY EXCESS MATERIAL RESULTING FROM GRADING OPERATIONS BECOMES THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE.
- ALL WORK SHALL FOLLOW THE RECOMMENDATIONS OF THE PROJECT GEOTECHNICAL INVESTIGATION.
- CONTRACTOR TO COORDINATE GEOTECHNICAL INSPECTIONS WITH THE PROJECT MANAGER. THE CONTRACTOR SHALL NOTIFY THE PROJECT MANAGER, AT LEAST 48 HOURS IN ADVANCE OF SUCH INSPECTIONS, TO ENSURE THE AVAILABILITY OF THE GEOTECHNICAL ENGINEER.

CONSTRUCTION SOLID WASTE MANAGEMENT NOTES

- ALL CONSTRUCTION AND DEMOLITION (C&D) PROJECTS OVER 5,000 SQUARE FEET SHALL TRACK AND DIVERT A MINIMUM OF 65% OF THE DISCARDS CREATED DURING THE PROJECT. DIVERSION IS ACHIEVED THROUGH RECYCLING OR REUSE. ALL CONTRACTORS AND SUB-CONTRACTORS ARE RESPONSIBLE FOR THE PROPER MANAGEMENT OF THE C&D DEBRIS ON THE PROJECT SITE. THIS MAY INVOLVE SEPARATING RECYCLABLE MATERIALS FROM NONRECYCLABLE MATERIALS BEFORE HAULING TO A RECYCLING OR DISPOSAL FACILITY IN ORDER TO ACHIEVE 65% DIVERSION.
- THROUGHOUT THE PROJECT UPLOAD ALL WEIGHT TICKETS FOR DEBRIS GOING TO SALVAGE, RECYCLING AND DISPOSAL FACILITIES INTO THE ONLINE WASTE TRACKING SYSTEM. WEIGHT TICKETS MUST STATE THE PROJECT ADDRESS AND THE MATERIAL TYPE ON THE TICKETS MUST MATCH WHAT IS ENTERED INTO THE SYSTEM. FAILURE TO OBTAIN AND TRACK WASTE DIVERSION WILL AFFECT THE PROJECT'S DIVERSION RATE AND MAY RESULT IN PENALTIES. PENALTIES ASSESSED SHALL BE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR TO RESOLVE. PROJECTS

THAT FAIL TO ACHIEVE THE 65% DIVERSION RATE ARE SUBJECT TO A FINE EQUAL TO THE DIVERSION SHORTFALL MULTIPLIED BY THE SQUARE FOOTAGE OF THE PROJECT, MULTIPLIED BY \$1. FINE SHALL BE PAID PRIOR TO THE PROJECT CLOSEOUT.

- AT A MINIMUM OF TWO WEEKS PRIOR TO FINAL BUILDING INSPECTION, UPLOAD ALL WEIGHT TICKETS AND SUBMIT THE CWMP REPORT ONLINE FOR FINAL REVIEW. EVIDENCE OF FINAL APPROVAL IS REQUIRED WHEN REQUESTING THE FINAL INSPECTION.
- FAILURE TO ABIDE BY THESE DEBRIS BOX/HAULING REQUIREMENTS IS A VIOLATION OF LOS ANGELES CITY CODE AND IS SUBJECT TO A FINE.

NOTES:

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADS RESUBMITTAL	12/8/2023
2	LADS RESUBMITTAL	2/22/2024

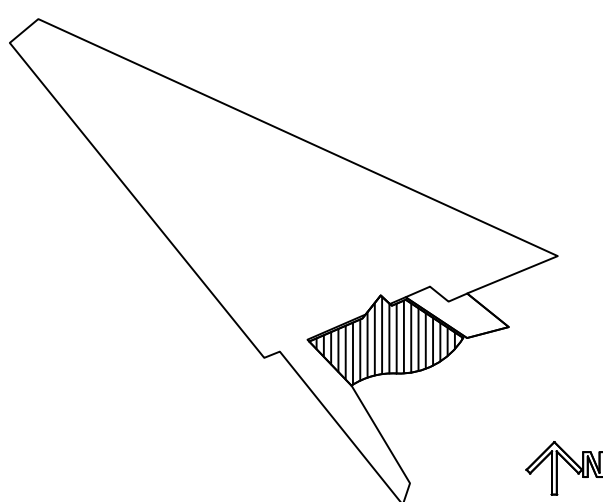
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KEY PLAN



Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040

Drawing Title
GENERAL NOTES

Project No.: 2209

Phase: CONSTRUCTION DOCUMENTS

Date: SEPTEMBER 29, 2023

Scale: NA

C-0.0

GEOTECHNICAL NOTES

- NEITHER THE CITY OF LOS ANGELES, NOR THE ENGINEER WARRANT OR GUARANTEE THE RESULTS OF ANY GEOTECHNICAL OR SUBSURFACE INVESTIGATIONS(S) PERFORMED FOR THIS PROJECT AS BEING REPRESENTATIVE OF THE SITE BEYOND THE ACTUAL LOCATION OF THE TEST SPECIMEN(S) AND ASSUME NO RESPONSIBILITY FOR THE MANNER IN WHICH THIS INFORMATION MAY BE USED OR THE CONCLUSIONS REACHED IN UTILIZING THE INFORMATION AS CONTAINED OR REFERENCED IN THE CONTRACT DOCUMENTS.

FURTHER THE CITY OF LA AND THE ENGINEER NEITHER WARRANT NOR GUARANTEE THE CONCLUSIONS REACHED, RECOMMENDATIONS MADE OR TEST RESULTS PRESENTED AS PART OF THE GEOTECHNICAL OR SUBSURFACE INVESTIGATION(S) AS BEING REPRESENTATIVE OF THE ENTIRE SITE.

THE CONTRACTOR IS ADVISED THAT IT SHALL BE THEIR SOLE RESPONSIBILITY TO SUPPLEMENT ANY INFORMATION SO PROVIDED WITH ADDITIONAL SUBSURFACE INVESTIGATION(S) AND/OR TESTING, AT THE SOLE EXPENSE OF THE CONTRACTOR, IN ORDER TO ASSURE THEMSELVES THAT THE INFORMATION PROVIDED IN THE CONSTRUCTION DOCUMENTS IS REPRESENTATIVE OF THE CONDITIONS TO BE ENCOUNTERED WITHIN THE LIMITS OF THE PROJECT AT THE TIME OF CONSTRUCTION.

SUCH INVESTIGATION(S) SHALL BE UNDERTAKEN AND COMMENCE ONLY UPON OBTAINING APPROVAL, IN WRITING, FROM THE CITY AND THE CLIENT..

- THE GEOTECHNICAL ENGINEER SHALL BE NOTIFIED PRIOR TO CONSTRUCTION TO:

- REVIEW THE FOUNDATION PLANS AND SPECIFICATIONS PRIOR TO CONSTRUCTION TO EVALUATE WHETHER THE RECOMMENDATIONS MADE BY THE GEOTECHNICAL REPORT HAVE BEEN IMPLEMENTED, AND TO PROVIDE ADDITIONAL OR MODIFIED RECOMMENDATIONS, AS NEEDED. THIS WILL ALLOW THE GEOTECHNICAL ENGINEER TO CHECK IF ANY CHANGES HAVE OCCURRED IN THE NATURE, DESIGN, OR LOCATION OF THE PROPOSED IMPROVEMENTS AND PROVIDES THE OPPORTUNITY TO PREPARE A WRITTEN RESPONSE WITH UPDATED RECOMMENDATIONS.

- PERFORM CONSTRUCTION MONITORING TO CHECK THE VALIDITY OF THE ASSUMPTIONS MADE FOR THE GEOTECHNICAL REPORT. EARTHWORK OPERATIONS SHALL BE PERFORMED UNDER THE OBSERVATION OF A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER TO CHECK THAT THE SITE IS PROPERLY PREPARED, THE SELECTED FILL MATERIALS ARE SATISFACTORY, AND THE THE PLACEMENT AND COMPACTION OF THE FILLS HAS BEEN PERFORMED IN ACCORDANCE WITH RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT AND THE PROJECT SPECIFICATIONS. SUFFICIENT NOTIFICATION MUST BE GIVEN TO THE GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.

- EXCAVATIONS SHALL BE ADEQUATELY SHORED, BRACED, AND SHEETED SO THAT THE EARTH WILL NOT SLIDE OR SETTLE AND SO THAT ALL EXISTING IMPROVEMENTS OF ANY KIND WILL BE FULLY PROTECTED FROM DAMAGE. ANY DAMAGE RESULTING FROM A LACK OF ADEQUATE SHORING, BRACING, AND SHEETING, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND THEY SHALL EFFECT NECESSARY REPAIRS OR RECONSTRUCTION AT THEIR OWN EXPENSE. WHERE THE EXCAVATION FOR A CONDUIT, TRENCH, AND/OR STRUCTURE IS FIVE FEET OR MORE IN DEPTH, THE CONTRACTOR SHALL PROVIDE ADEQUATE SHEETING, SHORING, AND BRACING OR EQUIVALENT METHOD, FOR THE PROTECTION OF LIFE, OR LIMB, WHICH SHALL CONFORM TO THE APPLICABLE CONSTRUCTION SAFETY ORDERS OF THE DIVISION OF INDUSTRIAL SAFETY OF THE STATE OF CALIFORNIA. THE CONTRACTOR SHALL ALWAYS COMPLY WITH OSHA REQUIREMENTS.

- SUBGRADE COMPACTION SHOULD BE PERFORMED PRIOR TO FILL PLACEMENT, FOLLOWING CUTTING OPERATIONS, AND IN AREAS LEFT AT GRADE AS FOLLOWS. TO ACCOMPLISH THIS, THE CONTRACTOR SHOULD:

- SCARIFY TO A DEPTH OF AT LEAST 4 INCHES.

- MOISTURE CONDITION SOIL TO AT LEAST 125/110 PERCENTAGE POINTS OVER THE OPTIMUM MOISTURE CONTENT FOR FINE GRAINED/ SANDY SOILS.

- COMPACT THE SOIL TO AT LEAST 90 PERCENT RELATIVE COMPACTION. COMPACT THE UPPER 6 INCHES OF FINISH PAVEMENT SUBGRADE TO AT LEAST 90 PERCENT RELATIVE COMPACTION PRIOR TO AGGREGATE BASE PLACEMENT.

- A GEOTECHNICAL ENGINEER, LICENSED IN THE STATE OF CALIFORNIA IS TO BE RETAINED BY THE CONTRACTOR TO PERFORM CONSTRUCTION MONITORING TO ASSURE THE VALIDITY OF THE ASSUMPTIONS MADE IN THE GEOTECHNICAL REPORT PREPARED AT THE SITE. EARTHWORK OPERATIONS SHOULD BE PERFORMED UNDER THE OBSERVATION OF A REPRESENTATIVE TO CHECK THAT THE SITE IS PROPERLY PREPARED, THE SELECTED FILL MATERIALS ARE SATISFACTORY, AND THAT THE PLACEMENT AND COMPACTION OF THE FILLS HAS BEEN PERFORMED IN ACCORDANCE WITH RECOMMENDATIONS AND PROJECT SPECIFICATIONS.

- THE CONTRACTOR SHALL NOTIFY THE PROJECT MANAGER, AT LEAST 48 HOURS IN ADVANCE OF ANY/ALL SPECIAL INSPECTION(S), TO ENSURE THE AVAILABILITY OF THE GEOTECHNICAL ENGINEER. PER GEOTECHNICAL REPORT, THE GEOTECHNICAL ENGINEER OF RECORD, EARTHWORKS OPERATIONS, SHALL BE NOTIFIED OF SPECIAL INSPECTION PRIOR TO THE FOLLOWING ACTIVITIES:
 - PRIOR TO BACKFILL AND COMPACTION OF SUBGRADE
 - OBSERVATION OF CONTROLLED DENSITY FILL
 - OBSERVE FOOTING, PIER, OR FOUNDATION EXCAVATION PRIOR TO CONCRETE PLACEMENT

- SPECIFIC TRENCH BACKFILL RECOMMENDATIONS SHALL BE FOLLOWED PER THE PROJECT GEOTECHNICAL INVESTIGATION TITLED

- IF ADEQUATE COMPACTION IS NOT FEASIBLE DUE TO CONSTRUCTION RESTRICTIONS, CONTROLLED DENSITY FILL (CDF) MAY BE USED IN LIEU OF ENGINEERED FILL.

- CONTRACTOR TO VACUUM TRUCK, CLEAR TRASH AND DEBRIS, FROM STORM DRAIN INLETS TO POINT OF CONNECT IN BOWERS ROAD. REFER TO EXISTING CCTV REPORT FOR EVIDENCE FOUND OBSTRUCTIONS

TREE PROTECTION GUIDELINES

- FOR THE PURPOSE OF SAFEGUARDING TREES DURING CONSTRUCTION, THE FOLLOWING CONDITIONS SHALL APPLY TO ALL SUCH TREES EXCEPT FOR TREES FOR WHICH A REMOVAL PERMIT HAS BEEN ISSUED.
- DAMAGE TO ANY TREE DURING CONSTRUCTION SHALL BE IMMEDIATELY REPORTED BY A PERSON CAUSING THE DAMAGE OR THE RESPONSIBLE CONTRACTOR TO THE GILBANE PROJECT MANAGER AND THE CONTRACTOR SHALL TREAT THE TREE FOR DAMAGE IN THE MANNER SPECIFIED BY THE CITY ARBORIST.
- OIL, GASOLINE, CHEMICALS, AND OTHER CONSTRUCTION MATERIALS WHICH MIGHT E HARMFUL TO CERTAIN TREES SHALL NOT BE STORED WITHIN THE TREE DRIPLINE.
- DRAINS SHALL BE INSTALLED ACCORDING TO THE CITY SPECIFICATIONS SO AS TO AVOID HARM TO

TREES DUE TO EXCESS WATERING.

- WIRES, SIGNS, AND OTHER SIMILAR ITEMS SHALL NOT BE ATTACHED TO TREES.
- CUTTING AND FILLING AROUND THE BASE OF TREES SHALL BE DONE ONLY AFTER CONSULTATION WITH THE CITY ARBORIST AND THEN ONLY TO THE EXTENT AUTHORIZED BY THEM.
- NO PAINT THINNER, PAINT, PLASTER, OR OTHER LIQUID OR SOLID EXCESS OR WASTE CONSTRUCTION MATERIALS OR WASTEWATER SHALL BE DUMPED ONTO THE GROUND ANYWHERE.
- BARRICADE SHALL BE CONSTRUCTED AROUND THE TRUNKS OF TREES AS DIRECTED BY THE CITY ARBORIST SO AS TO PREVENT INJURY TO TREES MAKING THEM SUSCEPTIBLE TO DISEASE CAUSING ORGANISMS.
- NOTIFY THE CITY ARBORIST PRIOR TO TRENCHING OR CUTTING IN THE GROUND NEAR THE ROOTS.
- TREE MITIGATION SHALL BE 2:1. NEW TREES SHALL COME FROM A 24" SIZED BOX. TREES REMOVED BETWEEN FEBRUARY 12 AND AUGUST 31 SHALL BE UNDER THE SUPERVISION OF A CITY APPROVED ORNITHOLOGIST.

FIRE PROTECTION NOTES

- THE UNDERGROUND PIPING, VALVES, AND FITTINGS SHALL BE INSTALLED AND RESTRAINED PER CITY OF LOS ANGELES FIRE REQUIREMENTS.
- THE UNDERGROUND PIPING SHALL HAVE A MINIMUM DEPTH PER CITY STANDARDS.
- BACKFILL FOR PIPES SHALL BE CONTROLLED DENSITY FILL (CDF) PER CITY SPECIFICATIONS. REFER TO CITY SPECIFICATIONS FOR TRACER WIRE MATERIAL AND MARKINGS.
- ALL METAL PIPING, VALVES, JOINTS, AND FITTING SHALL BE LISTED FOR FIRE PROTECTION SERVICE AND SHALL BE INSTALLED, SUPPORTED, ANCHORED, CLEANED, AND FUSION EPOXY COATED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AS APPLICABLE AND APPROVED BY CITY OF SANTA CLARA FIRE DEPARTMENT. ALL BOLTS FOR USE AT OR BELOW GRADE SHALL BE STAINLESS STEEL, TYPE 316 OR BETTER. ALL METAL PLACED BELOW GROUND OR IN CONTACT WITH SOILS SHALL BE FUSION EPOXY COATED, 6-9 MIL. AND PROTECTED WITH SCOTHKOTE 206N FUSION BOUND EPOXY COATING OR EQUAL. ALL VALVES SHALL BE MUELLER NRS RESILIENT WEDGE GATE VALVES, UL/FM RATED.
- REQUIRED INSPECTIONS: PLEASE PROVIDE TWO WORKING DAYS NOTICE FOR INSPECTION REQUESTS.
- THE FOLLOWING INSPECTIONS SHALL BE OBTAINED FROM THE FIRE PREVENTION BUREAU:
 - UNDERGROUND/HYDRO INSPECTION: A PRE-POUR INSPECTION IS REQUIRED PRIOR TO INSTALLATION OF THRUST BLOCKS. UNDERGROUND HYDROSTATIC TEST AND INSPECTION IS REQUIRED PRIOR TO COVERING THE SYSTEM (BACKFILL OF PIPING BETWEEN JOINTS IS PERMITTED PRIOR TO THE HYDROSTATIC TEST). THE HYDROSTATIC TEST SHALL BE CONDUCTED AT A MINIMUM PRESSURE OF 200 PSI FOR 2 HOURS.
 - FLUSH OF THE UNDERGROUND SYSTEM IS REQUIRED PRIOR TO CONNECTION TO FIRE SPRINKLER PIPING. THE FLUSH SHALL BE WITNESSED BY THE FIRE INSPECTOR. CONTRACTOR MATERIAL AND TEST CERTIFICATE IS REQUIRED AS PER NFPA 24, 2016.

LOCATIONS OF ALL FIRE DEPARTMENT CONNECTIONS, POST INDICATOR VALVES, RISERS AND ASSOCIATED EQUIPMENT AND PROTECTION SHALL BE VERIFIED WITH THE FIRE CHIEF'S OFFICE FOR PROPER PLACEMENT PRIOR TO INSTALLATION.

- THE COLOR OF THE POST INDICATOR VALVE AND FIRE DEPARTMENT CONNECTION SHALL BE AS REQUIRED AND APPROVED BY THE FIRE DEPARTMENT.
- FIRE DEPARTMENT CONNECTIONS (FDC's) SHALL BE PROVIDED WITH AN ALL-WEATHER SIGN INDICATING THE ADDRESS AND SYSTEM COMPONENTS SERVED.
- SUBMIT PLANS FOR THE FIRE PROTECTION UNDERGROUND SYSTEM PRIOR TO THE EXCAVATION OR INSTALLATION OF THE SYSTEM. NO WORK IS PERMITTED WITHOUT APPROVED PLANS FROM THE CITY OF SANTA CLARA FIRE DEPARTMENT.
- ALL UNDERGROUND WORK SHALL BE PERFORMED BY A LICENSED (C-16, C-34, OR A) CONTRACTOR. CONTRACTOR SHALL PROVIDE CITY OF SANTA CLARA FIRE CHIEF WITH A COPY OF THEIR LICENSE UPON SUBMITTAL OF THE UNDERGROUND PLANS.
- ALL MATERIALS SHALL BE LISTED AND/OR APPROVED FOR FIRE SERVICE APPLICATIONS AND SHALL BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF NFPA 24, 2016, EDITION.
- ALL UTILITY CROSSINGS ARE BASED ON AVAILABLE DESIGN AND SURVEY DATA. CONTRACTOR TO FIELD VERIFY WHETHER FIRE WATER LINE IS TO BE INSTALLED OVER OR UNDER OTHER UTILITIES AND ENSURE THAT ALL PIPE COVER AND CLEARANCE REQUIREMENTS ARE MET DURING INSTALLATION.
- ANY NEW OR EXISTING PIPE DAMAGED DURING CONSTRUCTION SHALL BE REPLACED PRIOR TO ANY ASSOCIATED PIPING BEING PUT INTO SERVICE.
- CONTRACTOR SHALL COORDINATE WITH CITY OF SANTA CLARA FIRE CHIEF FOR VERIFICATION OF WATER SUPPLY INFORMATION.
- CONTRACTOR SHALL PROVIDE COMPLETED CONTRACTOR'S MATERIAL AND TEST CERTIFICATION PER REQUIREMENTS OF NFPA 24, 2016 FOR UNDERGROUND UPON THE SUCCESSFUL COMPLETION AND APPROVAL OF ALL REQUIRED TESTS AND INSPECTIONS FROM THE CITY OF SANTA CLARA FIRE CHIEF.
- ALL DIP FITTINGS WITH BE PROVIDED WITH THRUST RESTRAINT. MECHANICAL JOINT RESTRAINT FOR PVC PIPE SHALL BE EBAA IRON SERIES 2000PV.
- NO METAL, PIPING, OR OTHERWISE SHALL BE IN DIRECT CONTACT WITH EARTH, PER CITY SPECIFICATIONS.
- ALL VALVES SHALL BE MUELLER A02360 RESILIENT WEDGE GATE VALVES - SL X SL.

C.3 TREATMENT FACILITIES CONSTRUCTION NOTES

- THIRD PARTY REVIEW AND CERTIFICATION OF INSTALLATION AND COMPLETED STORMWATER TREATMENT MEASURES IS REQUIRED. THIRD PARTY REVIEWER MUST BE A CIVIL ENGINEER, ARCHITECT OR LANDSCAPE ARCHITECT REGISTERED IN THE STATE OF CALIFORNIA AND MUST HAVE A CURRENT TRAINING ON STORMWATER TREATMENT DESIGN.
- AT BEGINNING OF CONSTRUCTION, THE PROJECT APPLICANT SHALL ARRANGE FOR A SITE VISIT

(INSPECTION) BY A THIRD-PARTY REVIEWER ACCEPTABLE TO THE CITY. THE THIRD PARTY REVIEWER WILL RECOMMEND THE REQUIRED NUMBER OF SITE INSPECTIONS AT DIFFERENT INTERVALS OF CONSTRUCTION.

- THE 3RD PARTY SHALL REVIEW ALL INSTALLED STORMWATER TREATMENT MEASURES AND CERTIFY THAT THEY HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED BUILDING PLANS.
- SOILS IN THE BIORETENTION FACILITIES SHOULD MEET THE BIOTREATMENT SOIL MIX (BSM) SPECIFICATIONS PER SCVURPPP C.3 STORMWATER HANDBOOK, APPENDIX C. A MINIMUM PERCOLATION RATE OF 5 INCHES/HOUR AND A MAXIMUM PERCOLATION RATE OF 10 INCHES/HOUR ARE REQUIRED (INITIAL INFILTRATION RATE MAY EXCEED THIS TO ALLOW FOR TENDENCY OF INFILTRATION RATE TO REDUCE OVER TIME). PLANTING SOIL LAYER SHOULD BE AT LEAST 18 INCHES DEEP. CONTRACTOR TO SUBMIT MATERIAL CERTIFICATES SIGNED BY THE MATERIAL PRODUCER, CERTIFYING THAT SOIL COMPLIES WITH, OR EXCEEDS, SPECIFIED REQUIREMENTS.
- PERMEABLE DRAIN ROCK SHALL BE CLASS 2 PERMEABLE ROCK PER CALTRANS STANDARD SECTION 68-1.025. THE MATERIAL SHALL BE WASHED AND FREE FROM CLAY OR ORGANIC MATERIAL.
- PERFORATED PIPE SHALL BE SOLVENT WELD PVC SDR 35 (OR APPROVED EQUAL) WITH PERFORATIONS FACED DOWN. LOCATION OF THE PIPE VARIES, SEE PLAN.
- INSTALLATION OF POROUS PAVEMENT AND/OR VAULTS SHALL BE DONE PER STANDARD DETAILS AND SPECIFICATIONS. THIRD PARTY REVIEWER OR VENDOR SHALL INSPECT THE POROUS PAVEMENT AND/OR VAULTS INSTALLATION (INCLUDING IF NECESSARY, PERFORMING PERCOLATION TEST) AND SUBMIT THEIR CONCURRENCE LETTER TO THE CITY.
- INSTALLATION OF INTERCEPTOR TREES AS A TREATMENT CONTROL MEASURE SHALL BE INSPECTED TO VERIFY THE ACCURACY OF LOCATION, SPECIES AND NUMBER OF INTERCEPTOR TREES.
- FOR ANY LINER PENETRATIONS, RADIAL CUT THE LINER FOR PIPE. MASTIC AND SEAL WITH PIPE CLAMP TO ENSURE WATER-TIGHT SEAL.

NOTES:

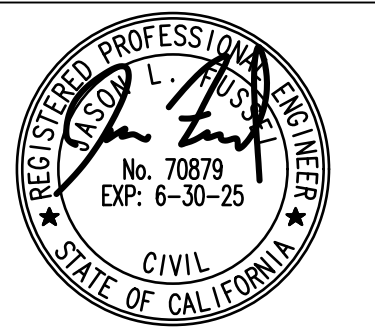
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NO.	DESCRIPTION	DATE
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2	LADRS RESUBMITTAL	2/22/2024

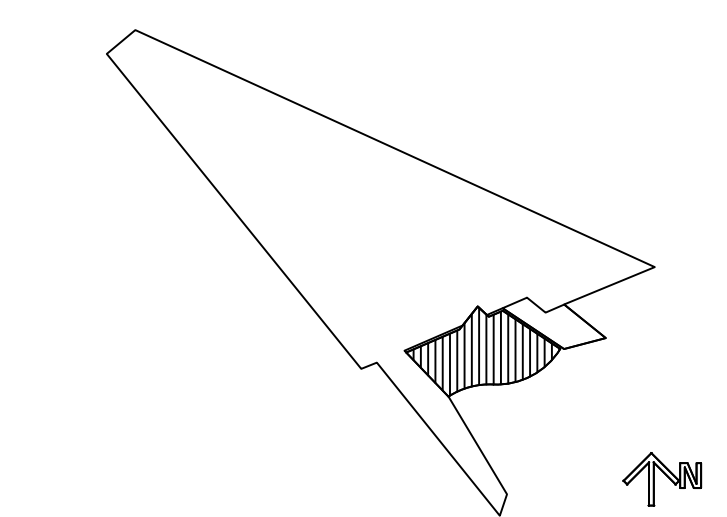
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 fax (818) 344-0338
 E-mail: mail@jstfarchs.com
 Architecture & Planning
 John Fisher AIA

jdfa



KEY PLAN



Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040

Drawing Title
GENERAL NOTES

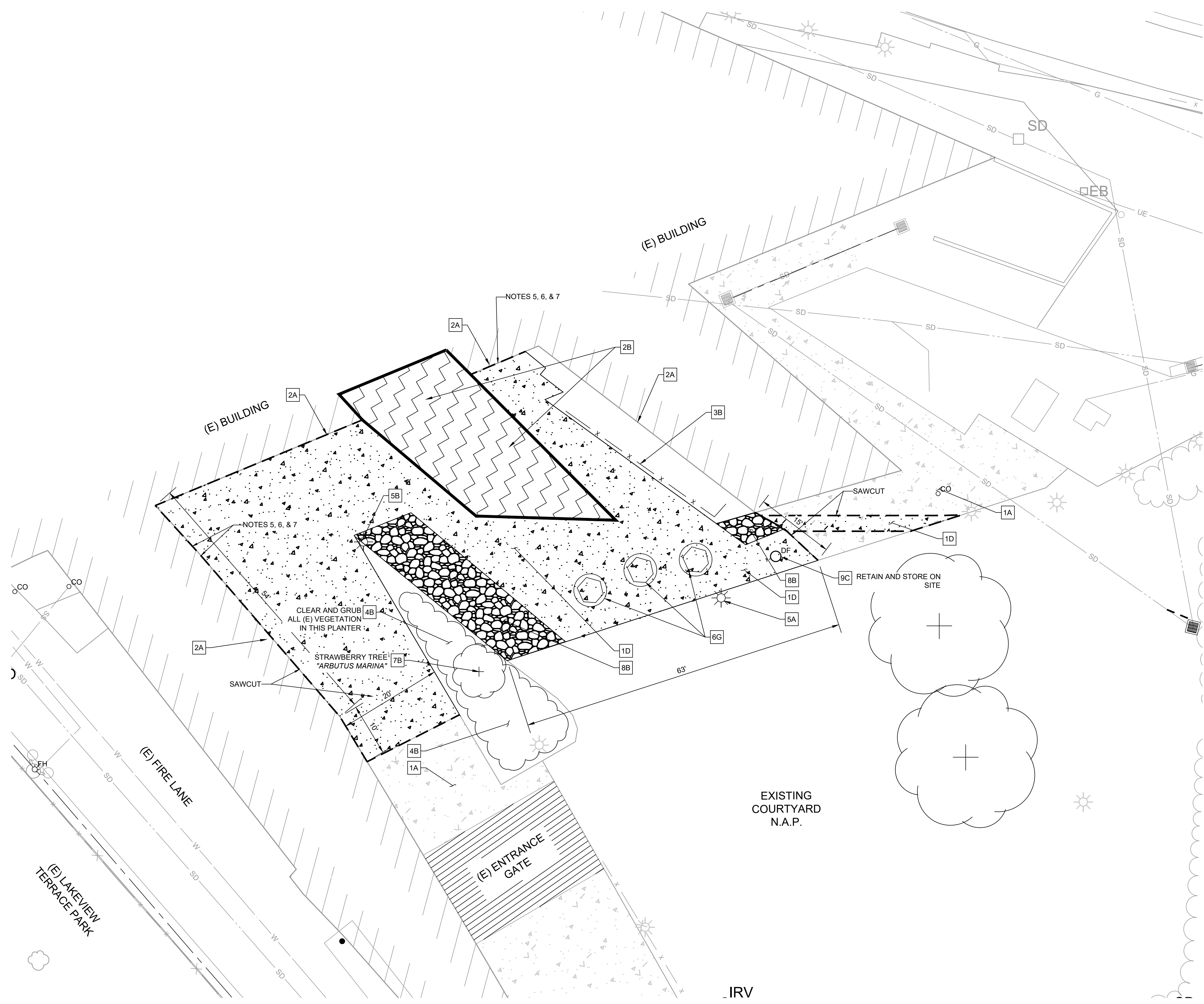
Project No.: 2209

Phase: CONSTRUCTION DOCUMENTS



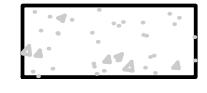
Date: SEPTEMBER 29, 2023

Scale: **NA**

C-0.1



LEGEND:

-  REMOVE CONCRETE PAVEMENT
-  REMOVE PERVIOUS CONCRETE PAVEMENT
-  EXISTING CONCRETE PAVEMENT, RETAIN AND PROTECT

GENERAL NOTES:

1. EXISTING CURB, GUTTER, AND SIDEWALK IMPROVEMENTS (INCLUDING UTILITIES, TREES, ETC.) TO BE PROTECTED IN PLACE UNLESS NOTED OTHERWISE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL UTILITY WORK WITH THE UTILITY COMPANIES.
3. ALL EXISTING UNDERGROUND UTILITIES SHALL BE PROTECTED IN PLACE UNLESS NOTED OTHERWISE.
4. THE LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND BASED UPON RECORD DRAWINGS. ACTUAL CONDITIONS MAY VARY.
5. GENERAL CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES IN PLACE UNLESS OTHERWISE NOTED INCLUDING BUILDING ARCHITECTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS (ETC).
6. GENERAL CONTRACTOR TO REPAIR ANY DAMAGES TO EXISTING SLABS, WALLS, OR FOUNDATIONS THAT MAY OCCUR DURING DEMOLITION.
7. THE CONTRACTOR SHALL PROVIDE A CLEAN, STRAIGHT SAW CUT ALONG ALL DEMOLITION LINES. SAWCUT EXISTING SLAB TO A MINIMUM DEPTH OF 1-1/2". THE CONTRACTOR SHALL NOT OVER CUT EXISTING SLABS AT CORNERS.

NOTES:

SUBMITTALS:

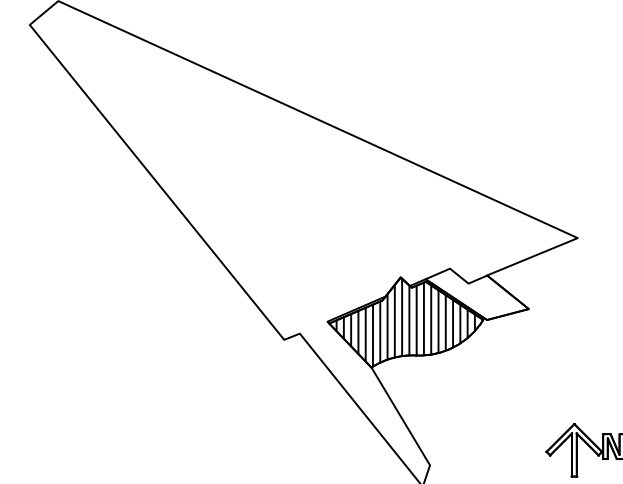
NO.	DESCRIPTION	DATE
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2	LAIRS RESUBMITTAL	2/22/2024

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John Sergio Fisher & Associates Inc. **jsfa**
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 fax (818) 344-0338
 E-mail: mail@jsfarchs.com
 Architecture & Planning
 John Fisher AIA



KEY PLAN



Client: **DISCOVERY CUBE LOS ANGELES**

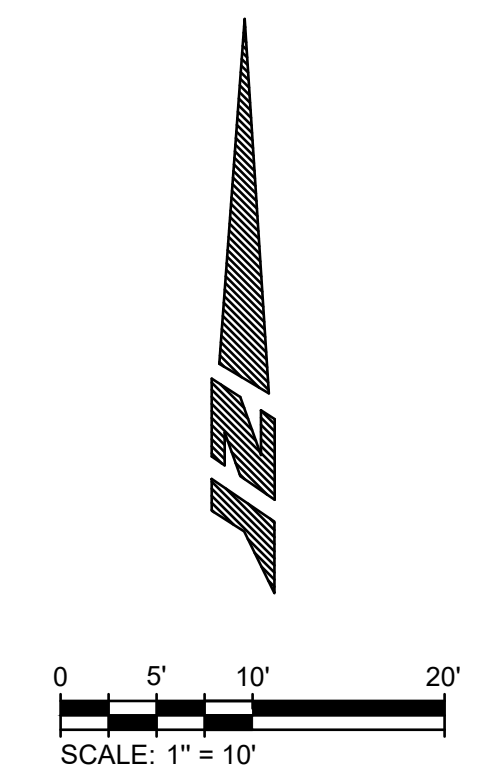
Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA 91040
 Drawing Title: **DEMOLITION PLAN**

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: 1" = 10'

DISPOSITION NOTES	
A	PROTECT IN PLACE
B	REMOVE
C	REMOVE, SALVAGE, & REINSTALL
D	REMOVE & RECONSTRUCT
E	ADJUST TO GRADE
F	ADJUST TO GRADE BY OTHERS
G	RELOCATE BY OTHERS

CONSTRUCTION NOTES	
1	CONCRETE PAVEMENT
2	EXISTING BUILDING
3	EXISTING FENCING
4	EXISTING LANDSCAPED PLANTER
5	EXISTING LIGHT
6	EXISTING PICNIC TABLES
7	EXISTING TREE
8	PERMEABLE CONCRETE PAVEMENT
9	EXISTING DRINKING FOUNTAIN



811 Know what's below. Call before you dig.






Underground Service Alert of Southern California
 TWO WORKING DAYS BEFORE YOU DIG

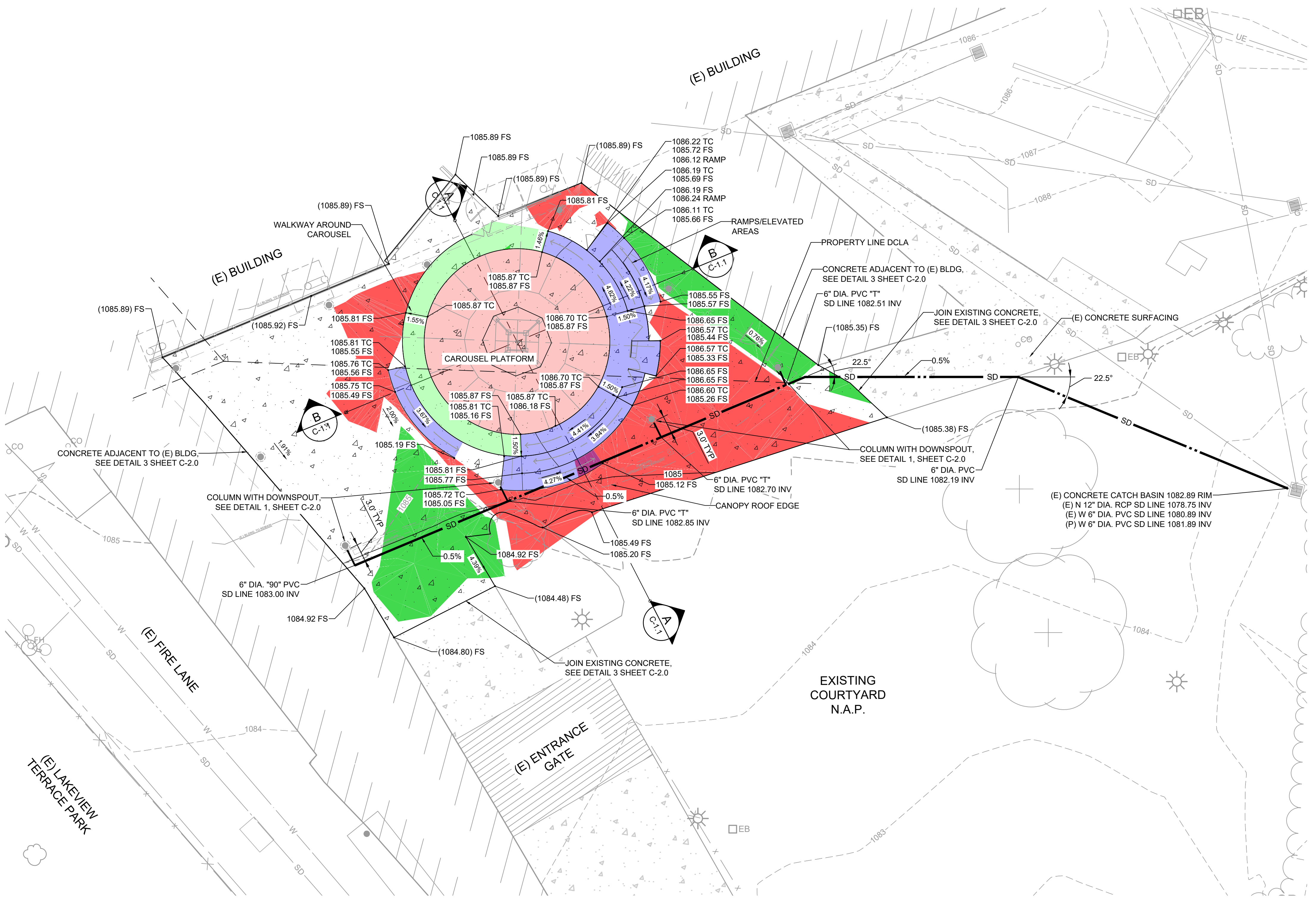
NOTICE TO CONTRACTOR
 PURSUANT TO ASSEMBLY BILL 4216 NO EXCAVATION PERMIT IS VALID UNLESS THE CONTRACTOR CONTACTS AND OBTAINS A DIG ALERT TICKET NUMBER. CALL 811 AT LEAST TWO WORKING DAYS PRIOR TO COMMENCING EXCAVATION.

www.DigAlert.org

NOTES:

LEGEND:

-  PROPOSED PORTLAND CEMENT CONCRETE, PER DETAIL
-  EXISTING PAVEMENT, RETAIN AND PROTECT
-  PROPOSED RAMPED/ELEVATED AREAS
-  PROPOSED CAROUSEL PLATFORM
-  PROPOSED WALKWAY AROUND CAROUSEL
- FS FINISHED SURFACE
- TC TOP OF CURB
- INV INVERT
- 1083 PROPOSED SURFACE CONTOUR
- SD PROPOSED STORM DRAIN LINE, SEE DETAIL 4, SHEET C-2.0
- (10.00) XX EXISTING SURFACE
- 10.00 XX PROPOSED SURFACE
- 2.0% PROPOSED SURFACE SLOPE



SUBMITTALS:

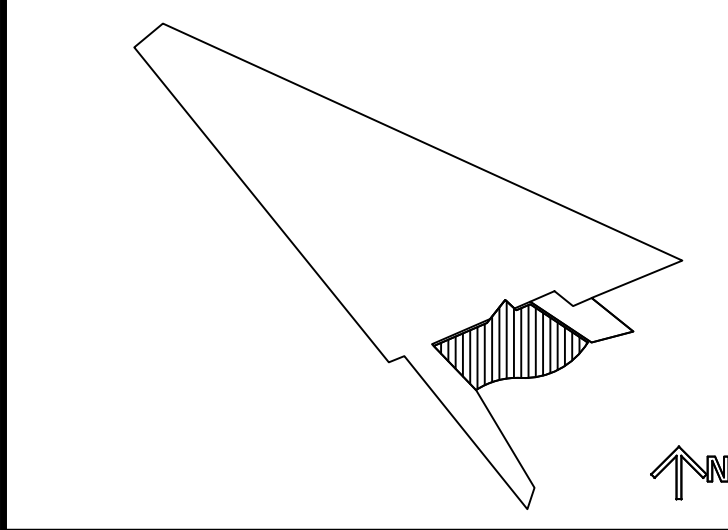
NO.	DESCRIPTION	DATE
1	LADRS RESUBMITTAL	12/8/2023
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KEY PLAN

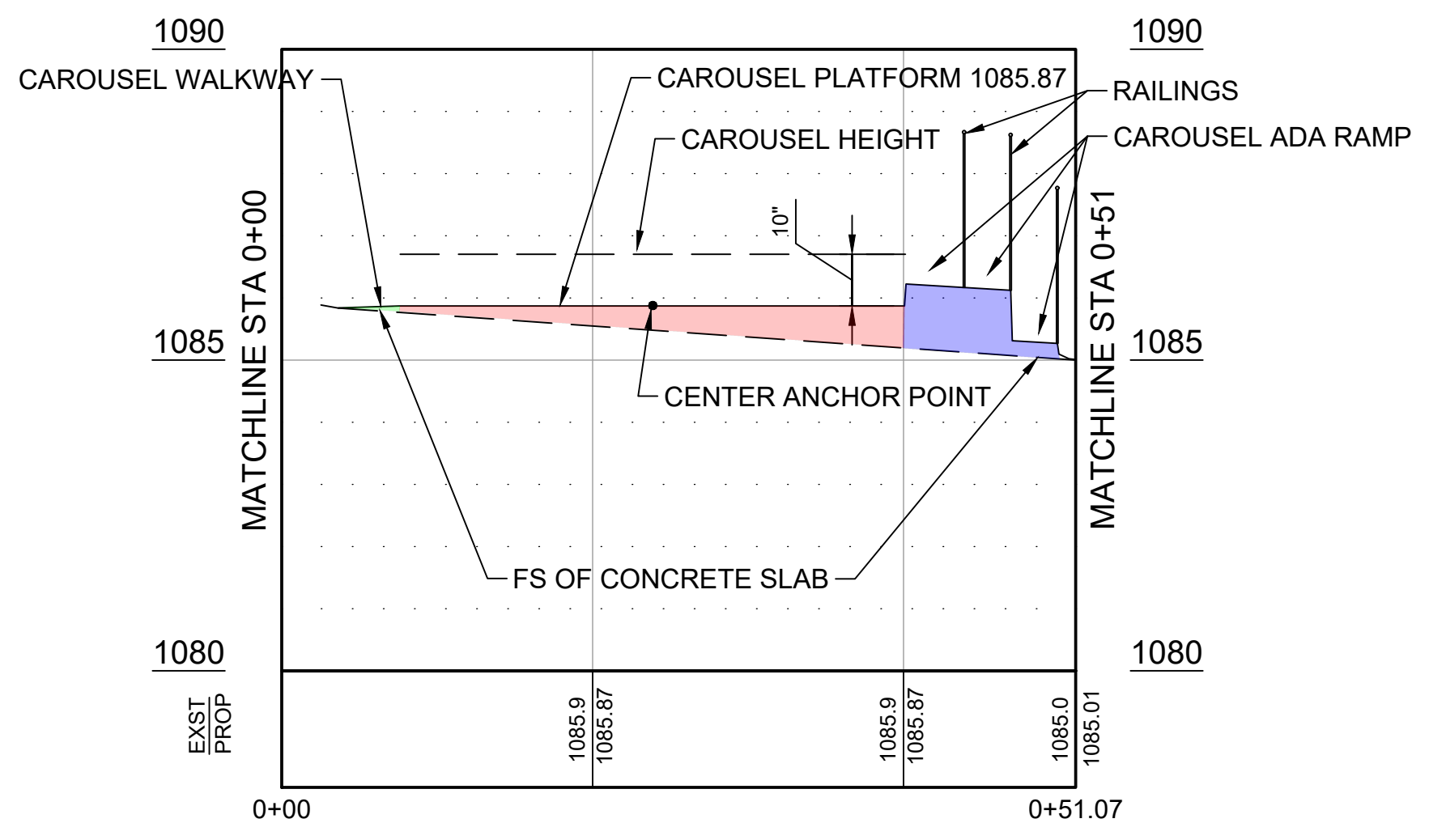


Client:
DISCOVERY CUBE LOS ANGELES

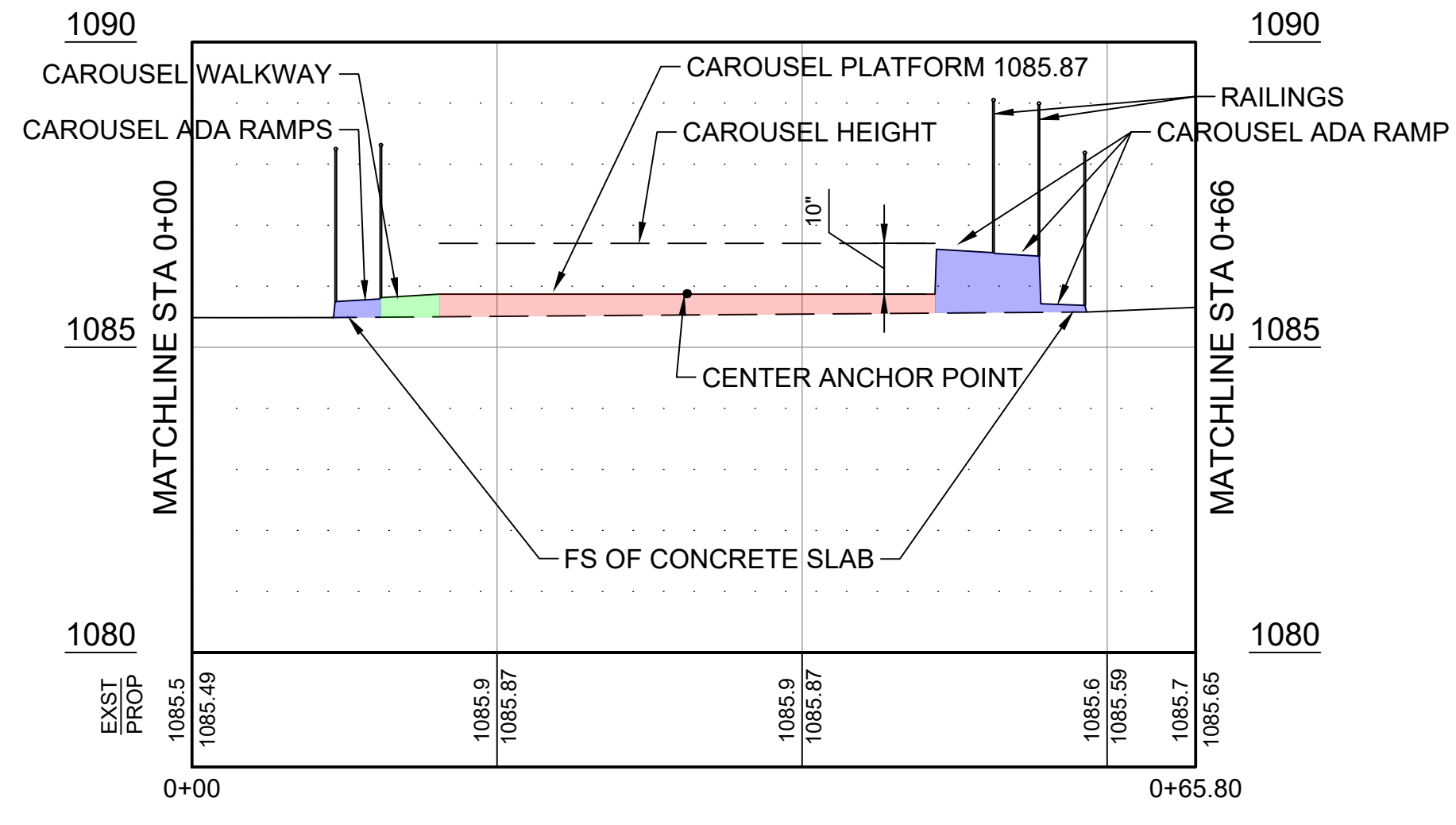
Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
GRADING PLAN

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: 1" = 10'



PROFILE A-A CAROUSEL ELEVATION
 SCALE: HORIZ: 1"= 20' VERT: 1"= 5'



PROFILE B-B CAROUSEL ELEVATION
 SCALE: HORIZ: 1"= 20' VERT: 1"= 5'

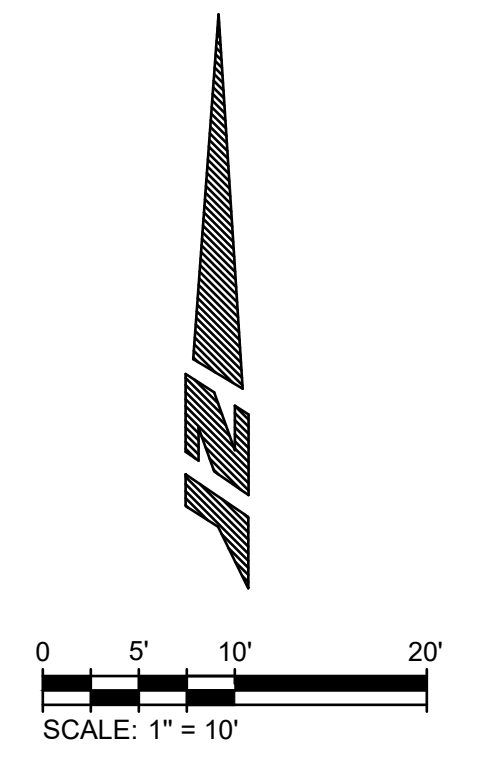
CUT/FILL REPORT	
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FILL	17.85 CY
NET	2.74 CY FILL

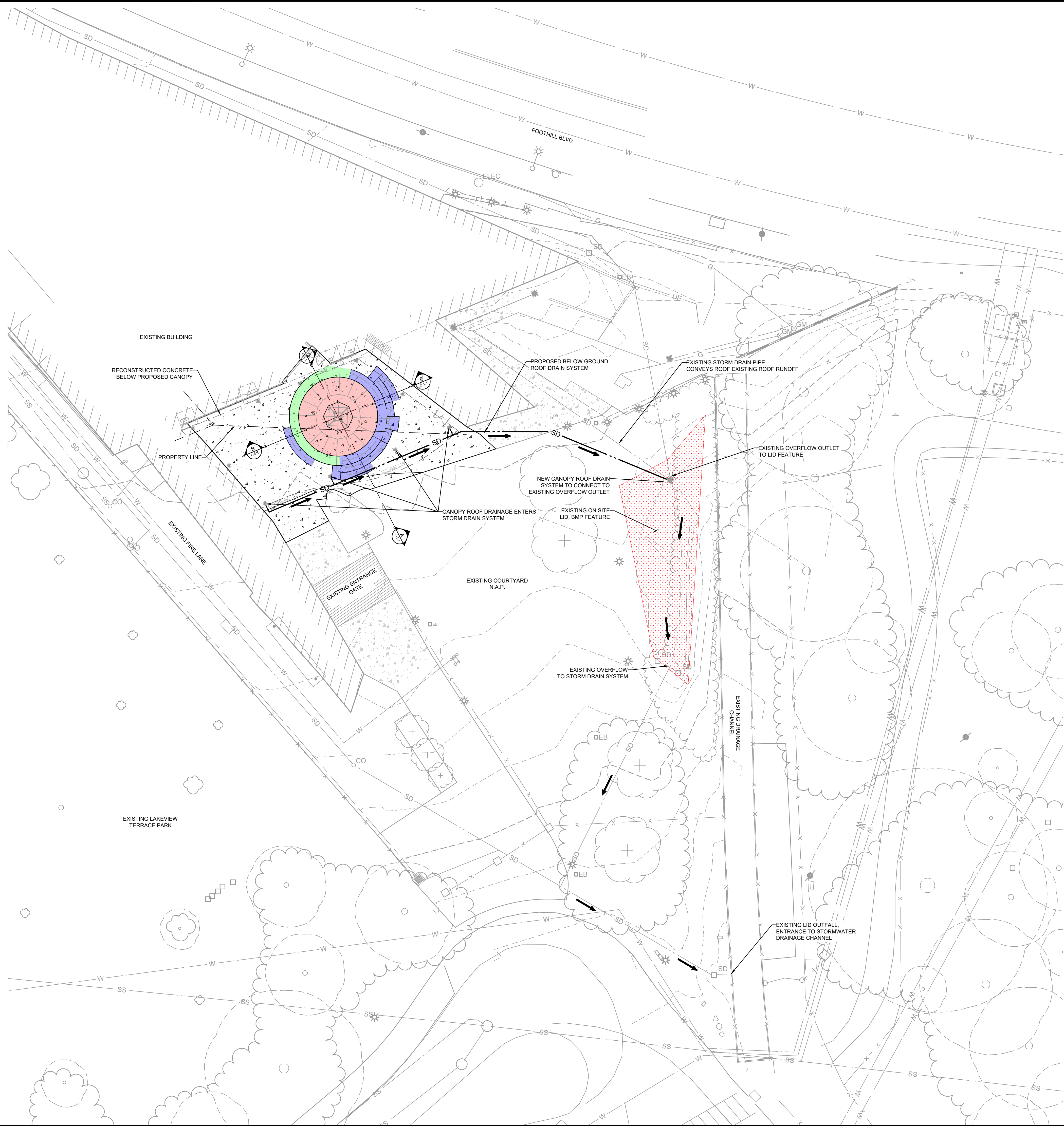


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NOTICE TO CONTRACTOR
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LEGEND:

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- PROPOSED CAROUSEL PLATFORM
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- (10.00) XX EXISTING SURFACE
- 10.00 XX PROPOSED SURFACE
- 2.0% PROPOSED SURFACE SLOPE

NOTES:

SUBMITTALS:

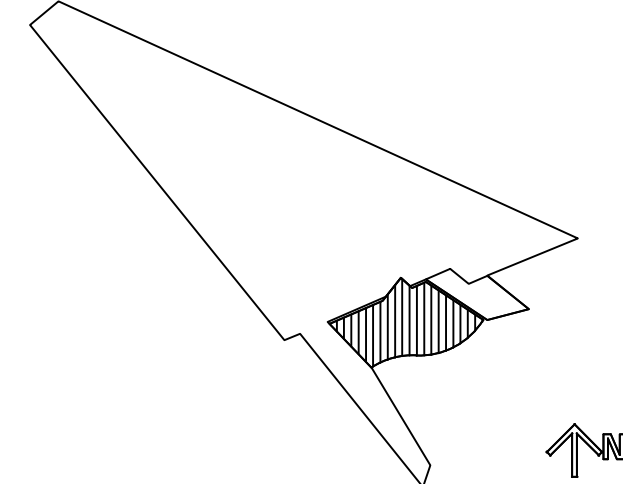
NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	12/8/2023

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 Architecture & Planning
 John Fisher AIA



KEY PLAN



Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
LID EXHIBIT

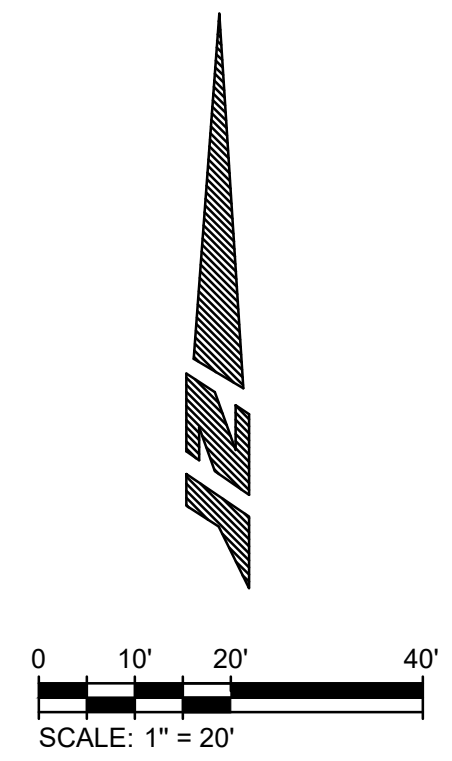
Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: 1" = 20'



This set of plans and specifications must be at the jobsite during construction
 Stormwater Observation Report (SOR) is required prior to issuance of Certificate of Occupancy or final sign off.

Total Pages **2**

Digitally Signed By: M. Frago Date: 03/19/2024
 Department of Public Works - Bureau of Sanitation
 Watershed Protection Division



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 BEFORE YOU DIG**



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EXISTING FIRE DEPARTMENT CONNECTION AND PIV

ADDRESS: 11798 W FOOTHILL BLVD
 PIN NUMBER: 210B165 325
 LOT AREA: 25,600.8 SQ FT
 APN: 2528002902
 TRACT: TR 15781
 BLOCK: NONE
 LOT: FR LT 1
 ARB: NONE
 ZONING: C2-1VL

PRIMARY PATH OF TRAVEL
 I certify that the primary path of travel to the area of alteration from the public way and accessible parking space as indicated on the plans does not include steps or a slope exceeding 1:20 except where access is provided by ramp with 1:12 maximum slope or a disabled accessible elevator. I understand that if the primary path of travel is found not to be as indicated, significant delays may result.
 Signature: _____ Position: Principle
 Print Name: John sergio Fisher Date: 3/12/24

SANITARY FACILITIES, DRINKING FOUNTAINS, PUBLIC TELEPHONES & SIGNS
 I certify that the sanitary facilities, drinking fountains, public telephones and signs serving the area of renovatio, structural repair, alteration or addition are in compliance with all provisions of Division I, New Building. I understand that significant delays may result if these accommodations are found not in compliance
 Signature: _____ Position: Principle
 Print Name: John sergio Fisher Date: 3/12/24

Los Angeles Fire Department
 Fire Development Services
Hydrants & Access
APPROVED PLANS
 By: John Conneally, Insp. II, #446 Date: 02/23/24
 Transaction ID Number: H24-115624 23010-20000-04364
 The approval of these plans and/or specifications does not exempt them from strict compliance with all other pertinent sections of the Municipal Code and other laws and regulations.

PROPERTY LINE
 ARMY CORPS OF ENGINEERS

City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS
 By: NORLITO MEDRANO, CASE No. 03/22/2024
 Certification No. 564 - EXP. 06/29/25
 Application No./Permit No.: 23010-20000-04364
 This set of plans and specifications has been reviewed and is approved for compliance with state and local laws and ordinances related to accessibility to public accommodations and housing.
 The stamping of this set of plans and specifications shall not be held to permit or to be an approval of the violation of any provisions of federal, state, and local laws and ordinances related to accessibility to public accommodations and housing.

METRIC/ETES

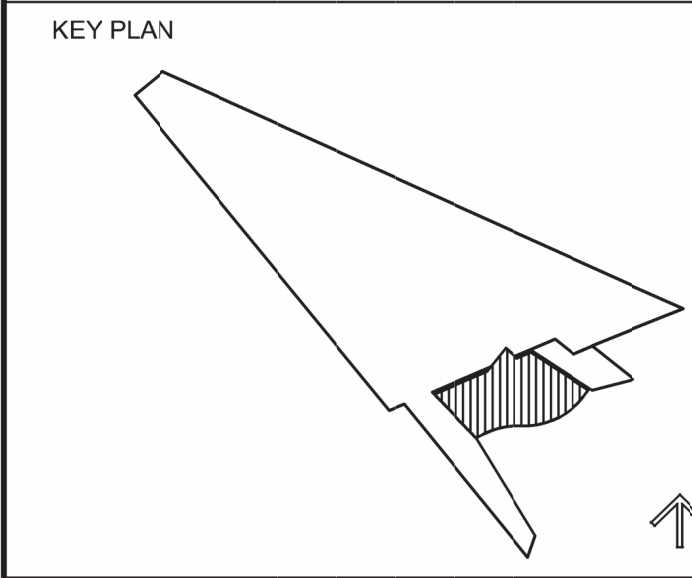
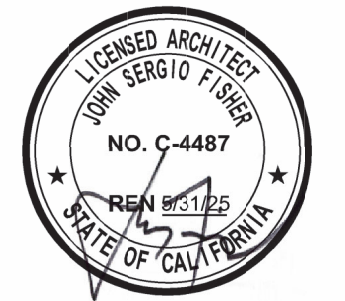
LEGEND
 - - - - - (E) ACCESSIBLE PATH OF TRAVEL PER 13016-101-26087
 [Symbol] EXISTING BUILDING
 [Symbol] NEW ADDITION

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1.24.2024

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John Sergio Fisher & Associates Inc. **jsfa**
 5567 Reseda Blvd #209
 Tarzana California 91356
 (818) 344-3045
 fax (818) 344-0338
 E-mail: mail@jsfarchs.com
 Architecture & Planning
 John Fisher AIA



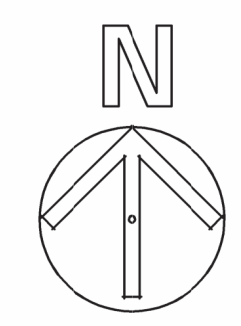
Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

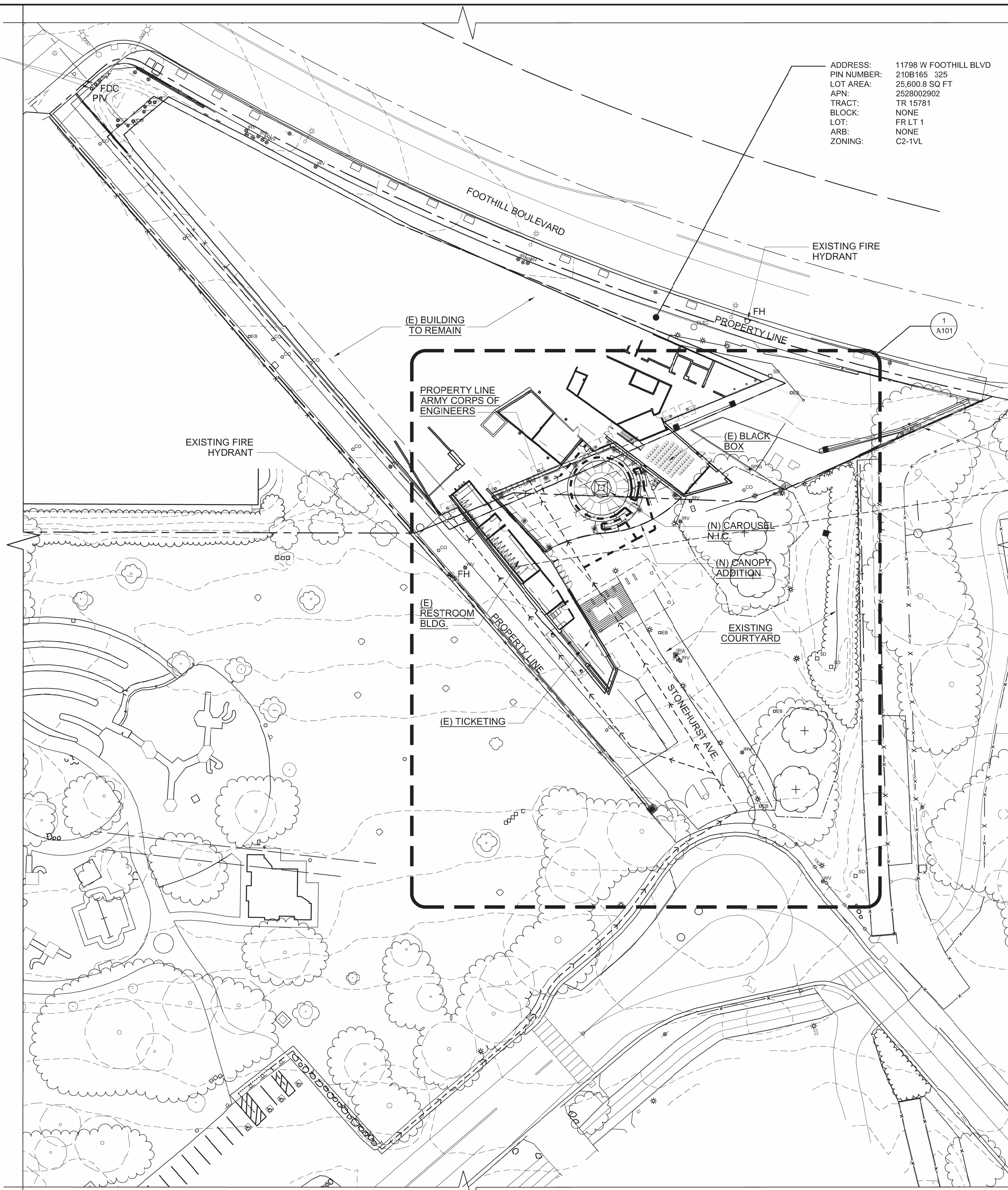
11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA 91040
 Drawing Title
SITE PLAN

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

PLANS APPROVED
 City of Los Angeles
 Department of City Planning
 DATE: 03/22/2024 PAGE NO. 2 of 6
 PDR NO.: 23010-20000-04364
 CASE NO.: ZA-2005-5816-ZV-SPR
 PLANNER: Ruben Vasquez
 NOTES:

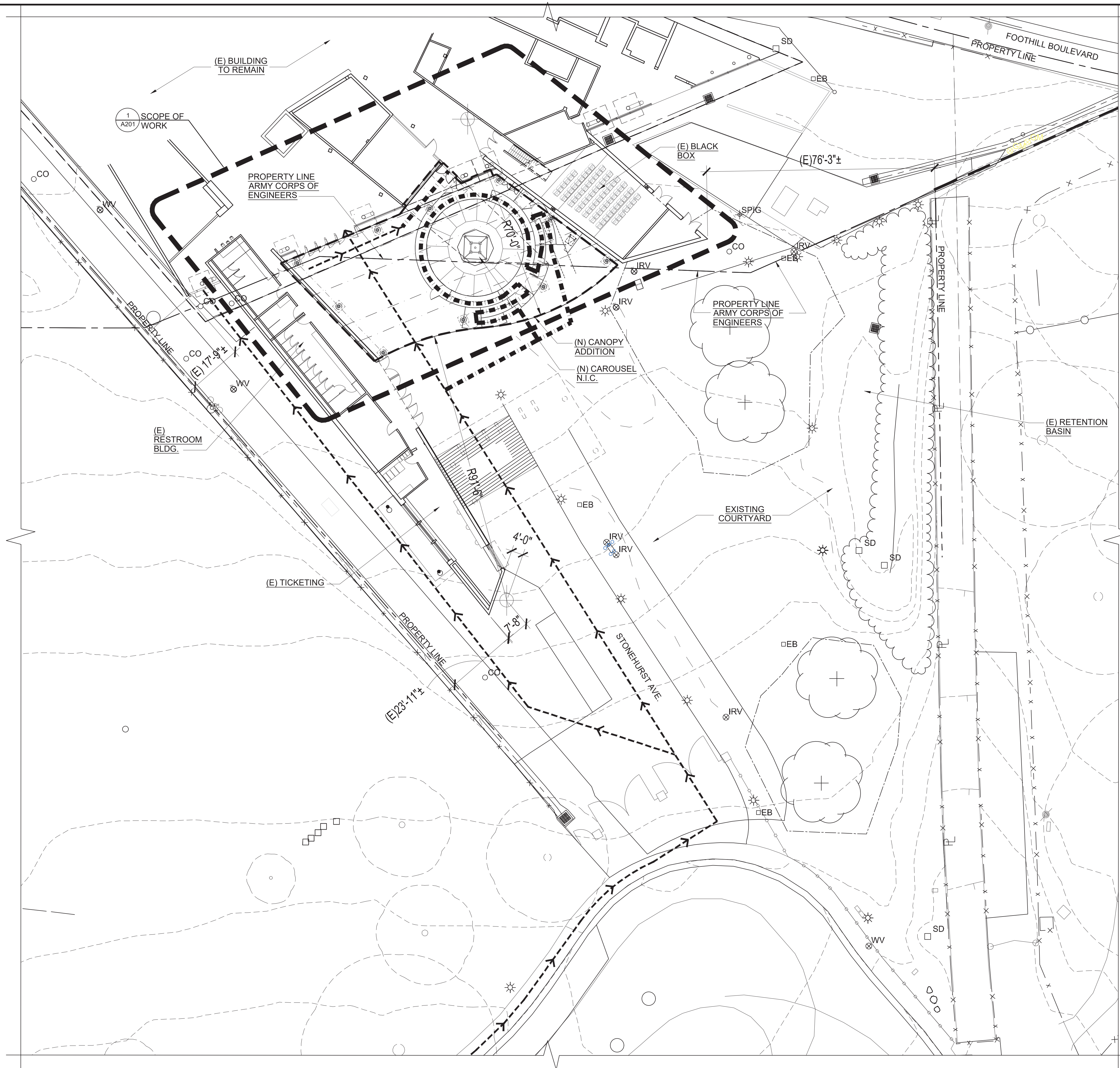


SITE PLAN
 SCALE: 1/32"=1'-0"



1

A100



PRIMARY PATH OF TRAVEL

I certify that the primary path of travel to the area of alteration from the public way and accessible parking space as indicated on the plans does not include steps or a slope exceeding 1:20 except where access is provided by ramp with 1:12 maximum slope or a disabled accessible elevator. I understand that if the primary path of travel is found not to be as indicated, significant delays may result.

Signature: *[Signature]* Position: Principle
 Print Name: John Sergio Fisher Date: _____

SANITARY FACILITIES, DRINKING FOUNTAINS, PUBLIC TELEPHONES & SIGNS

I certify that the sanitary facilities, drinking fountains, public telephones and signs serving the area of renovatio, structural repair, alteration or addition are in compliance with all provisions of Division I, New Building. I understand that significant delays may result if these accommodations are found not in compliance

Signature: *[Signature]* Position: Principle
 Print Name: John Sergio Fisher Date: _____

LEGEND

— (E) ACCESSIBLE PATH OF TRAVEL PER 13016-101-26087

▭ EXISTING BUILDING

▭ NEW ADDITION

REVISIONS

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/24

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/24

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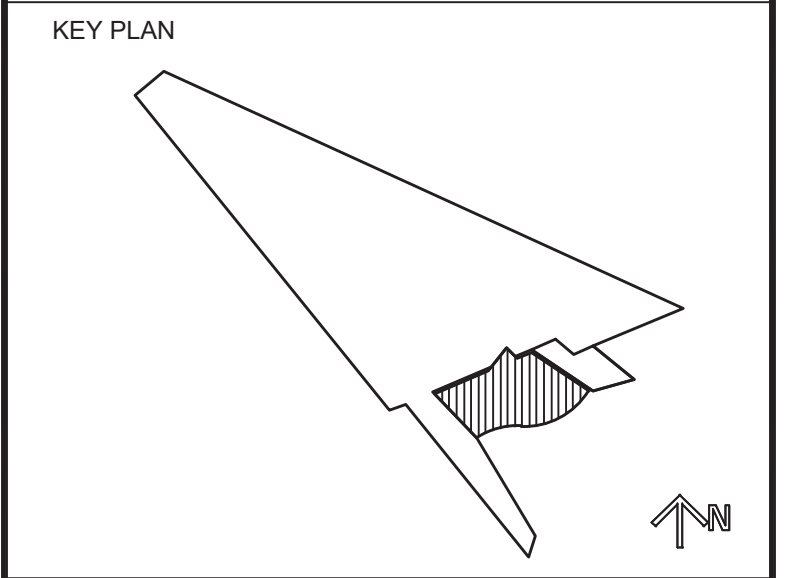
City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS

By: NORLITO MEDRANO, CASp Date: 01/29/2024

Certification No. 554 - EXP. 04/29/25

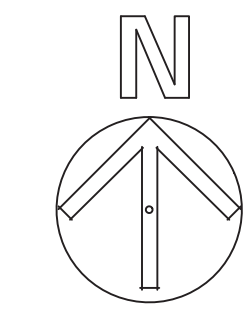
Application No./Permit No.: 23010-20000-04364

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PLANS APPROVED
 City of Los Angeles
 Department of City Planning

DATE: 03/22/2024 PAGE NO. 3 of 6
 PCSID NO: 23010-20000-04364
 CASE NO: 2A-2005-5816-ZV-SPR
 PLANNER: Ruben Vasquez
 NOTES: _____



ENLARGED SITE PLAN
 SCALE: 1/16"=1'-0"

1

Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
ENLARGED SITE PLAN

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

A101



- KEYNOTES**
1. REMOVE (E) DOOR, FRAME & HARDWARE
 2. REMOVE (E) FLOOR FINISH
 3. REMOVE WALLS AND ENTIRE ROOF
 4. (E) WALL TO REMAIN
 5. (E) COLUMN TO REMAIN
 6. REMOVE (E) CONCRETE SLAB
 7. (E) DOOR TO REMAIN, PROTECT IN PLACE
 8. PREPARE AREA TO RECEIVE (N) FOOTING
 9. (E) CURTAIN WINDOW TO REMAIN, PROTECT IN PLACE
 10. (E) CANOPY ABOVE TO REMAIN
 11. (E) FOUNDATION TO REMAIN
 12. STRIP FINISH TO ADD NEW
 13. REMOVE (E) LIGHT POLE
 14. REMOVE (E) PLANTING
 15. OUTLINE OF (E) ROOF ABOVE
 16. REMOVE (E) CONC TABLES AND BENCHES
 17. (E) LIGHT POLE TO BE PROTECTED IN PLACE
 18. (E) BLDG. TO REMAIN

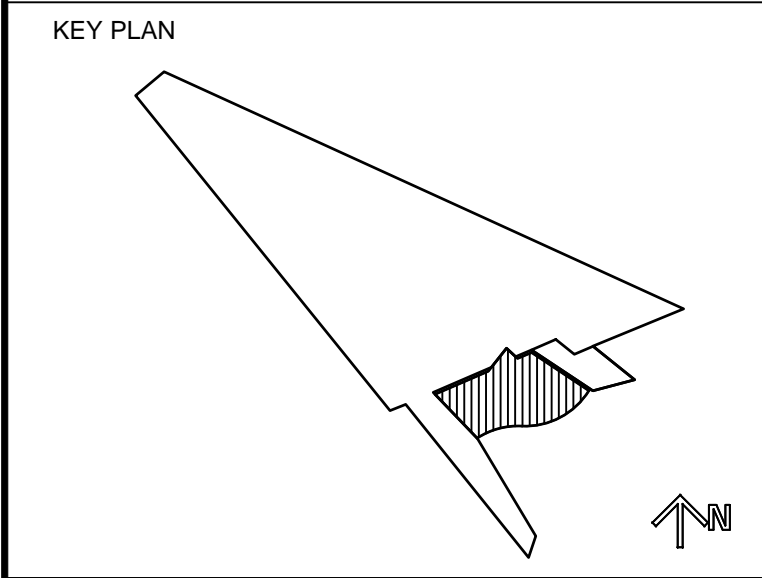
- LEGEND**
- EXISTING BUILDING
 - DEMOLITION AREA

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADRS RESUBMITTAL	1/24/2024
2	LADRS RESUBMITTAL	2/22/2024

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 Architecture & Planning
 John Fisher AIA



Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

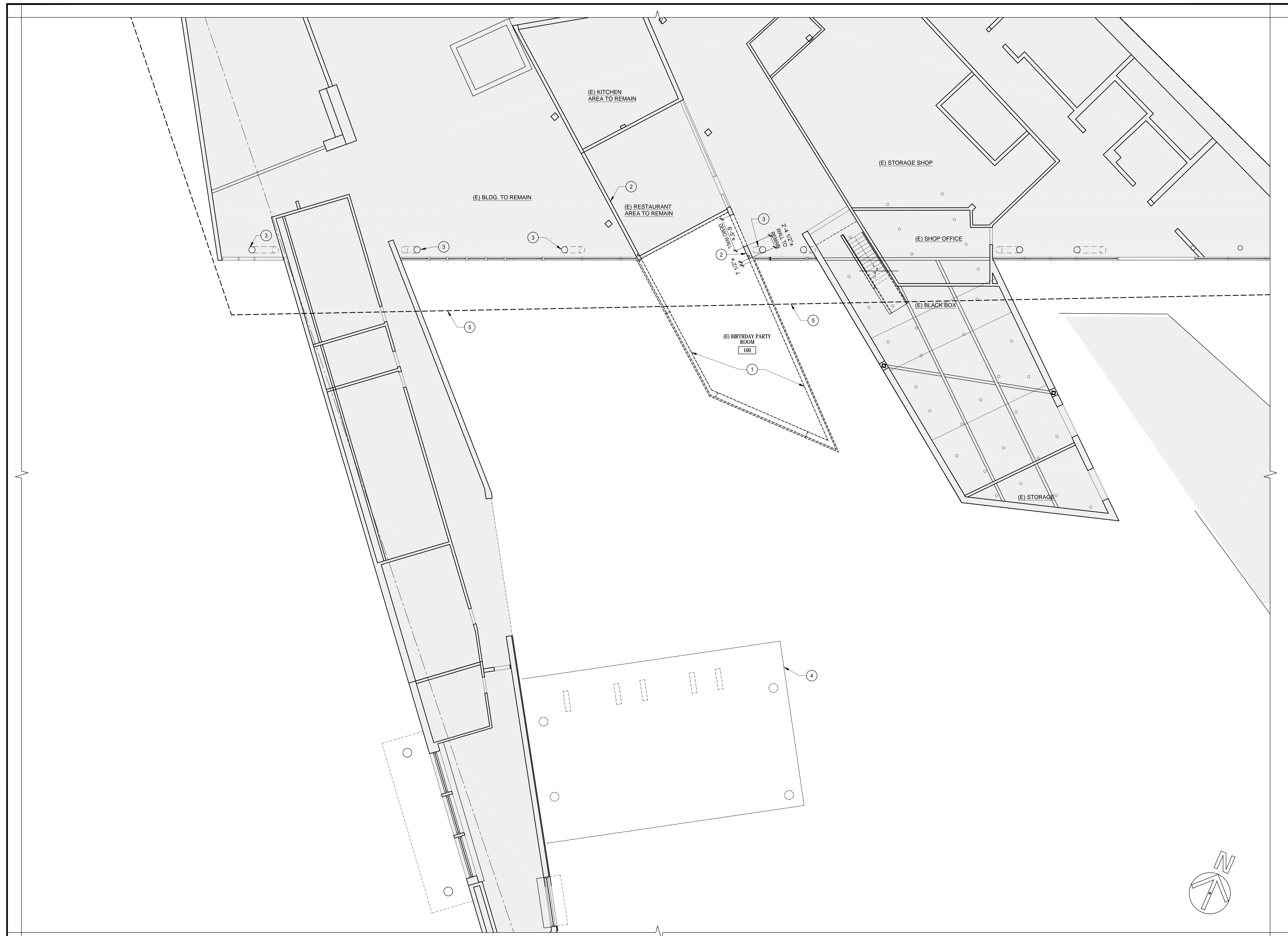
11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
DEMOLITION PLAN

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

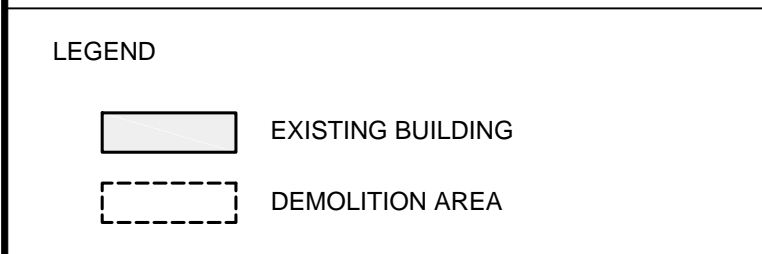
DEMOLITION PLAN
 SCALE: 1/8"=1'-0"

1

A120



- KEYNOTES**
1. REMOVE (E) WALLS, CEILING, & CEILING LIGHT FIXTURES
 2. (E) WALL TO REMAIN
 3. (E) COLUMN TO REMAIN
 4. (E) CANOPY TO REMAIN
 5. OUTLINE OF (E) ROOF ABOVE

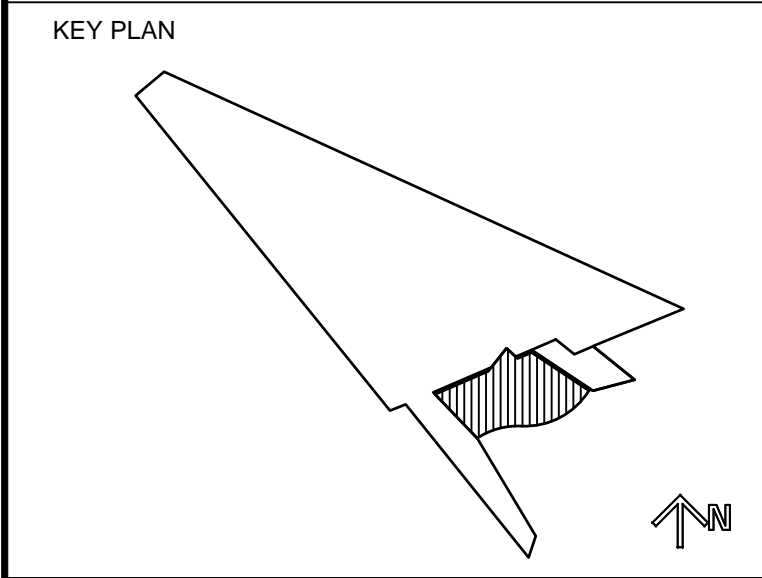
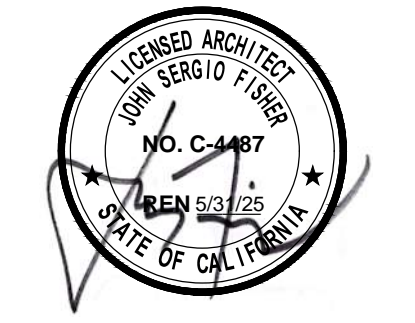


SUBMITTALS:

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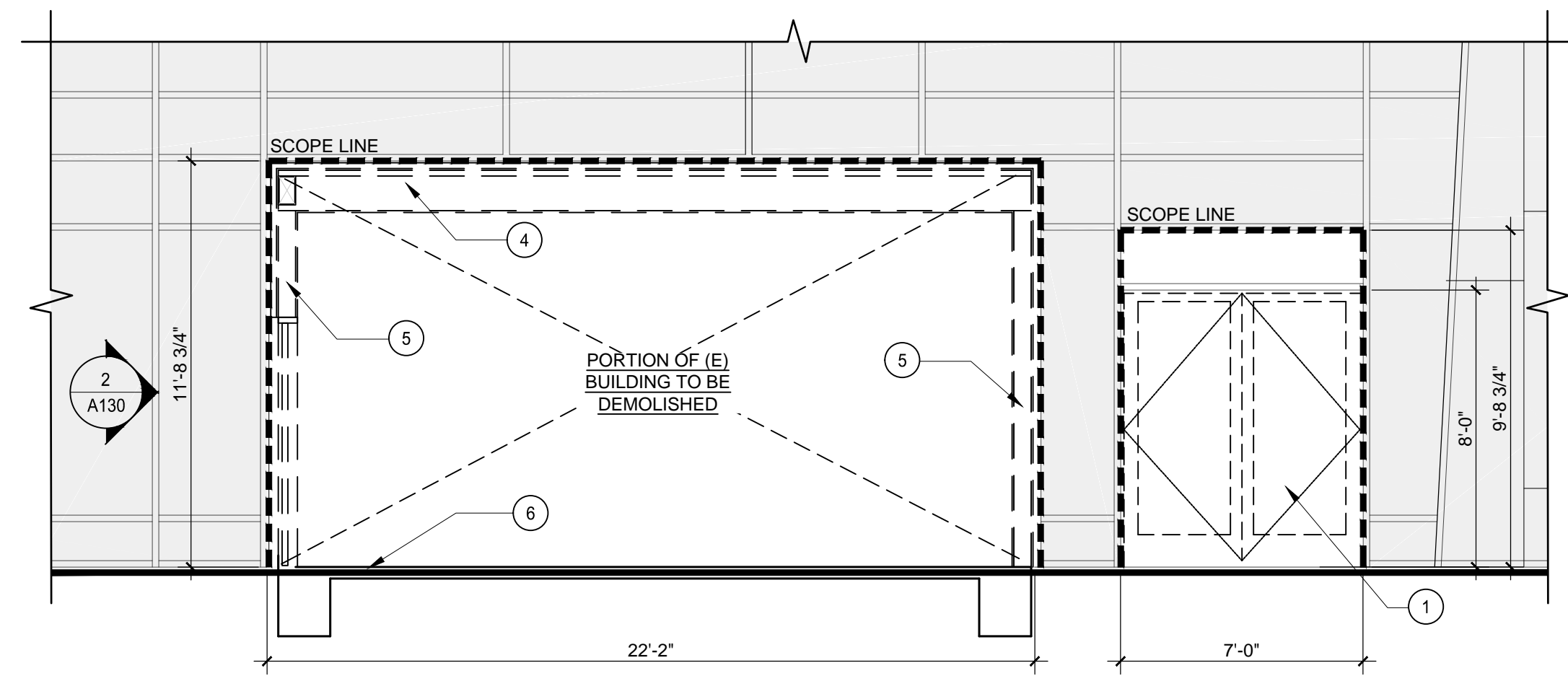


Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

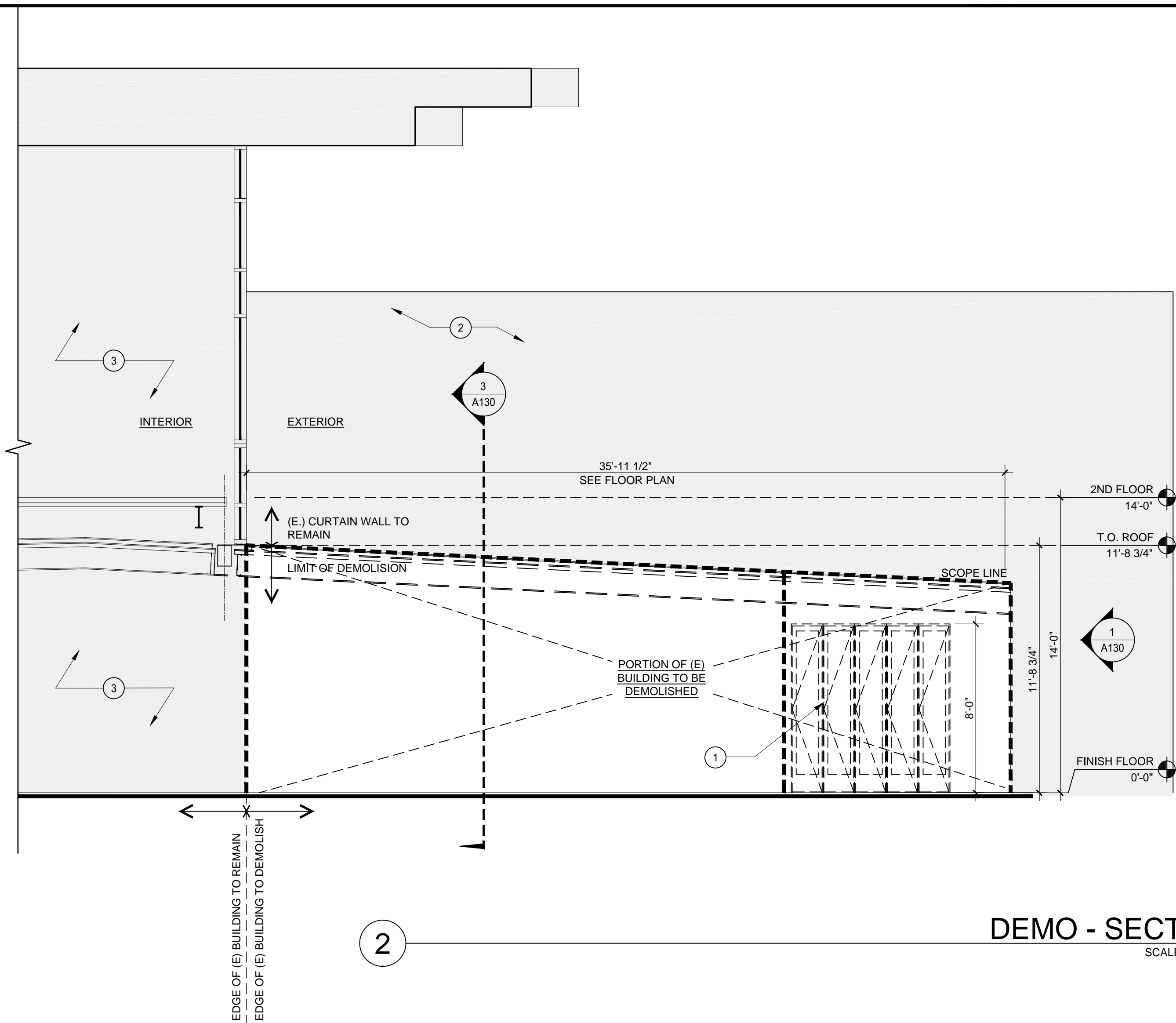
11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
DEMOLITION REFLECTED CEILING PLAN

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN



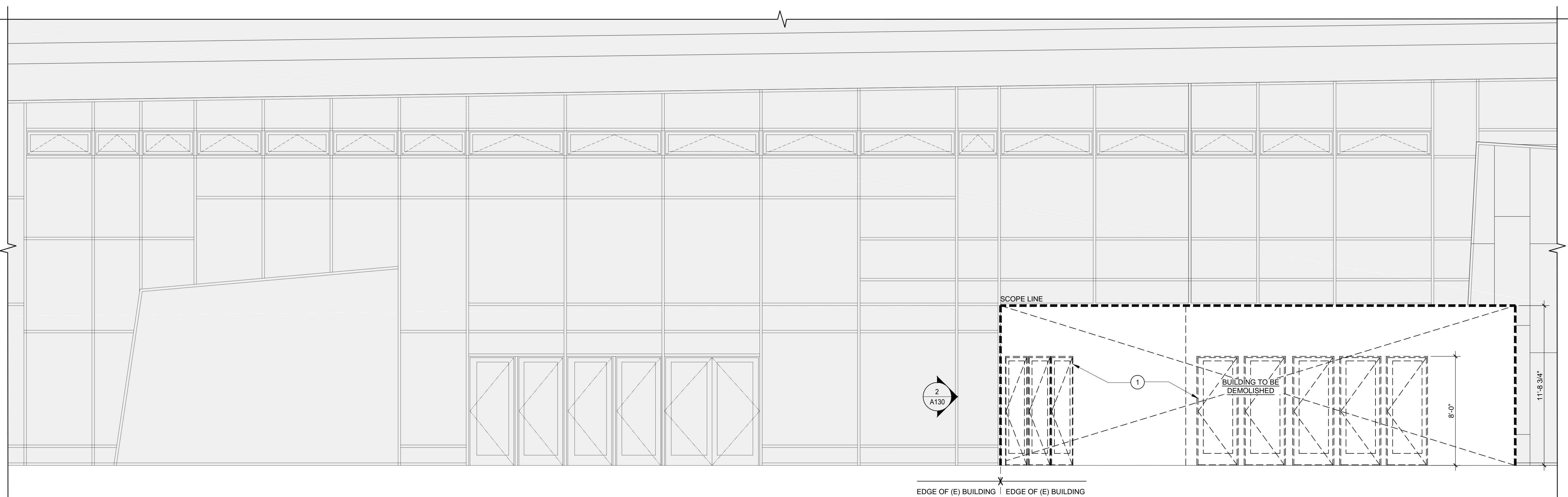
DEMO - CROSS SECTION

SCALE: 1/4"=1'-0"



DEMO - SECTION

SCALE: 1/4"=1'-0"



DEMO - FRONT ELEVATION

SCALE: 1/4"=1'-0"

- KEYNOTES**
1. REMOVE ALL (E) DOORS, DOOR FRAMES AND HARDWARE
 2. (E) BUILDING BEYOND
 3. (E) BUILDING
 4. ROOF ASSEMBLY TO BE DEMO AND REMOVED FROM SITE
 5. WALL ASSEMBLY TO BE DEMO AND REMOVED FROM SITE
 6. REMOVE FLOOR FINISH IF ANY KEEP AND PROTECT CONC. FLOOR SLAB

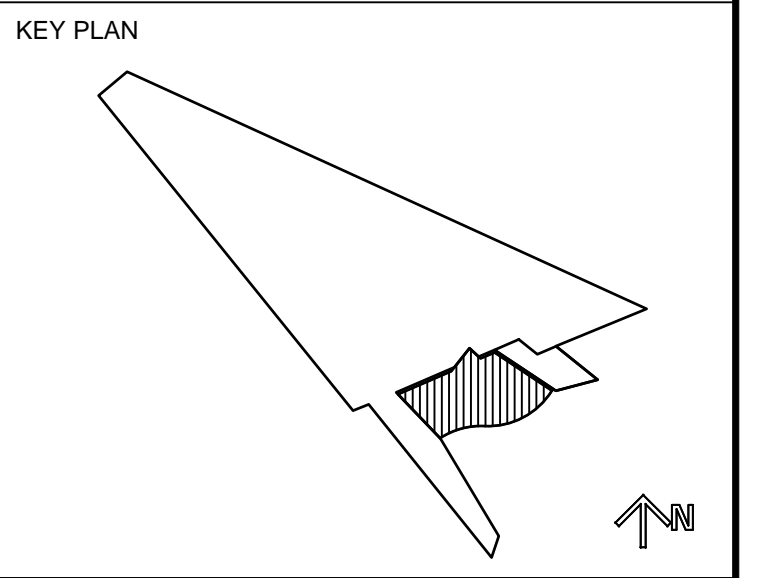
- LEGEND**
- EXISTING BUILDING
 - DEMOLITION AREA

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/2024
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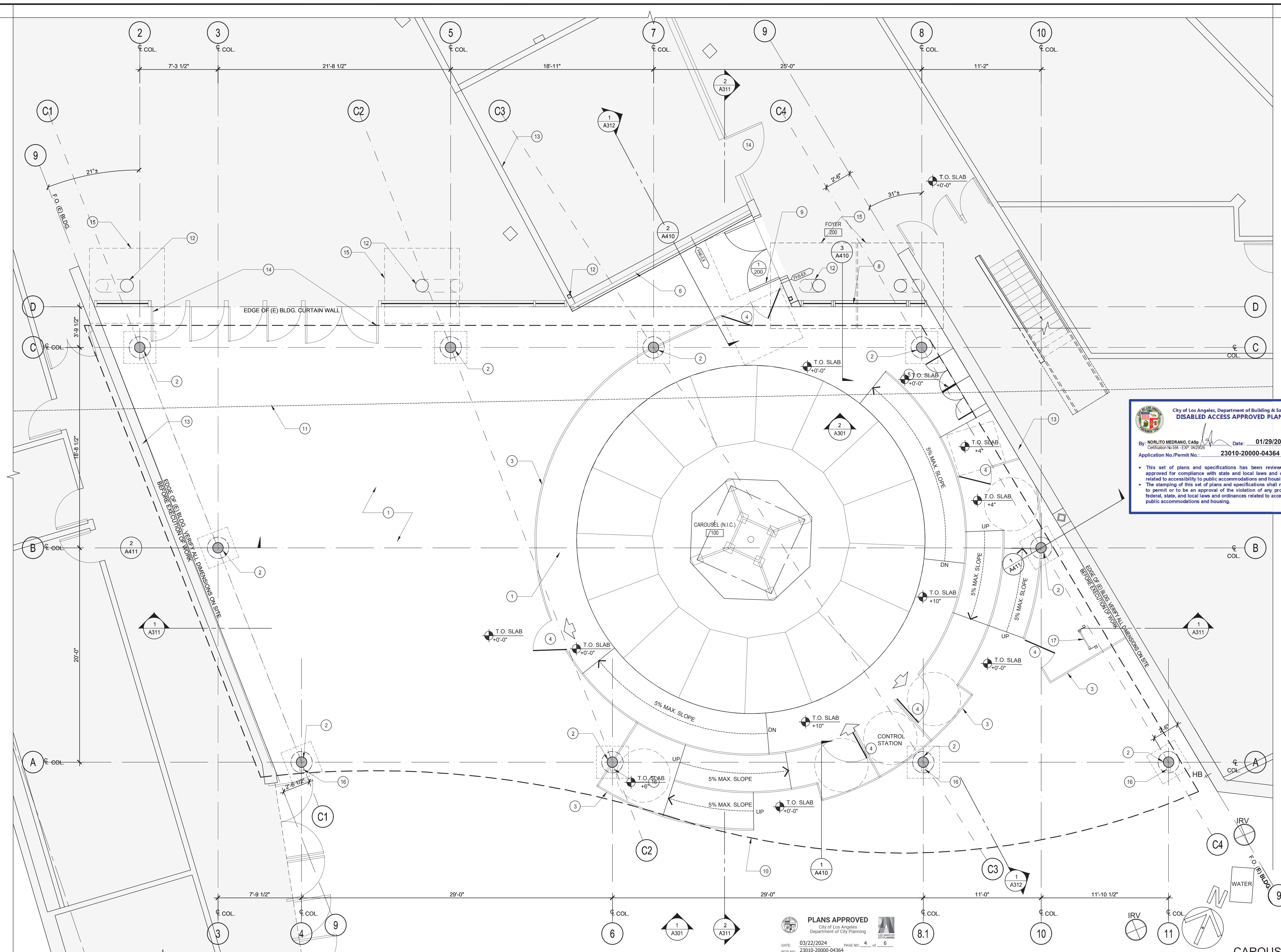


Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
DEMOLITION ELEVATIONS & SECTIONS

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN



- KEYNOTES**
- (N) CONCRETE PAVING
 - (N) 18" Ø COLUMN PER STRUCTURAL
 - (N) PIPE RAILING
 - (N) GATE
 - (N) MAINTENANCE CABINETS
 - (N) EXTERIOR CEMENT PLASTER PAINTED CUBE LOGO
 - (N) CONCRETE SLAB ON GRADE - FLOOR FINISH PER FINISH SCHEDULE
 - (N) STOREFRONT WINDOW
 - (N) STOREFRONT DOOR
 - OUTLINE OF (N) ROOF ABOVE
 - OUTLINE OF (E) ROOF ABOVE
 - (E) COLUMN TO REMAIN
 - (E) WALL TO REMAIN
 - (E) DOOR TO REMAIN
 - (E) FOUNDATION TO REMAIN
 - ROOF DRAIN DOWNSPOUT (TYP.) ON ALL 4 FRONT COLUMNS (TYP.) CONNECT TO STORM DRAIN PER CIVIL
 - ROOF ACCESS LADDER

LEGEND

	EXISTING BUILDING
	NEW ADDITION

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/24

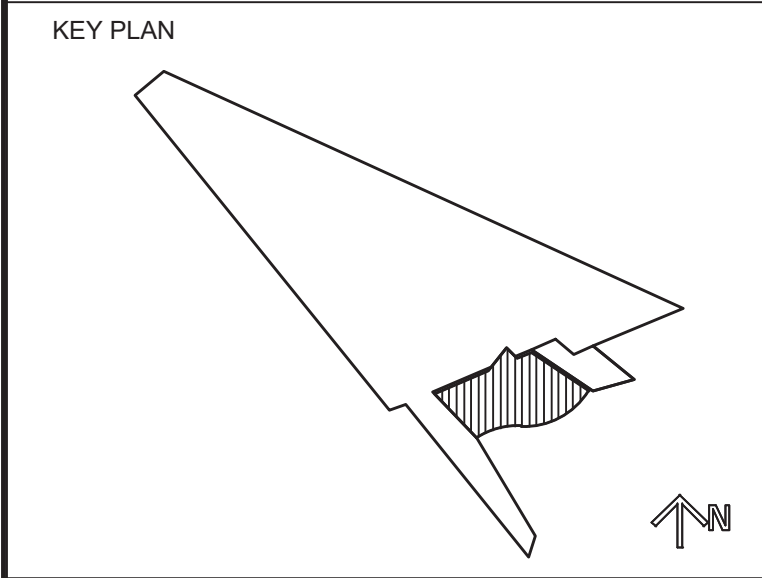
City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS

By: NORLITO MEDRANO, CASP Date: 01/29/2024
 Certification No. 564 - EXP. 04/29/24
 Application No./Permit No.: 23010-20000-04364

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Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

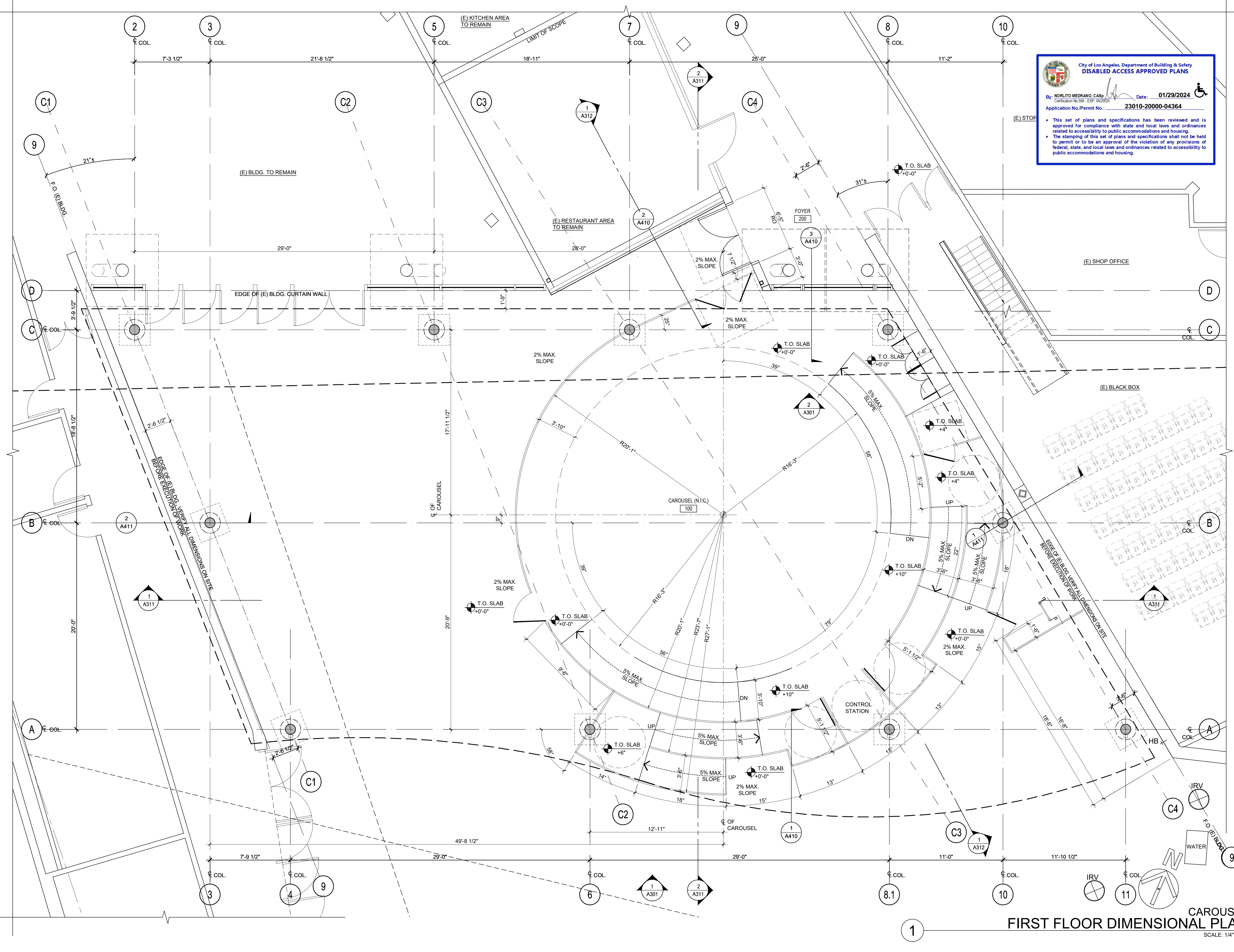
11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title: **PROPOSED FLOOR PLAN @ CAROUSEL**

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

PLANS APPROVED
 City of Los Angeles
 Department of City Planning

DATE: 03/22/2024 PAGE NO. 4 of 6
 PDS NO: 23010-20000-04364
 CASE NO: ZA-2005-5816-ZV-SPR
 PLANNER: Ruben Vasquez

CAROUSEL PROPOSED FLOOR PLAN
 SCALE: 1/4"=1'-0"



City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS

By: NORLITO MEDRANO, C.A.S. Date: 01/29/2024
 Certification No. 564 - EXP. 04/29/26
 Application No./Permit No.: 23010-20000-04364

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KEYNOTES



LEGEND

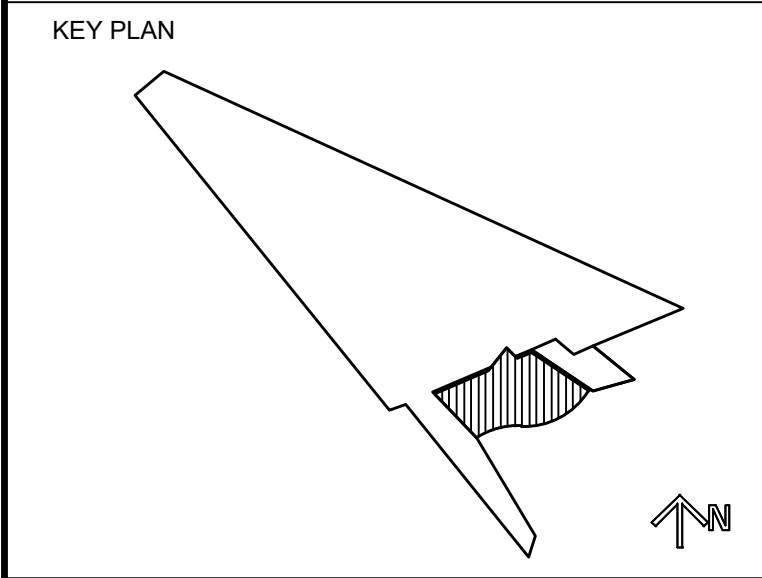
EXISTING BUILDING
 NEW ADDITION

SUBMITTALS:

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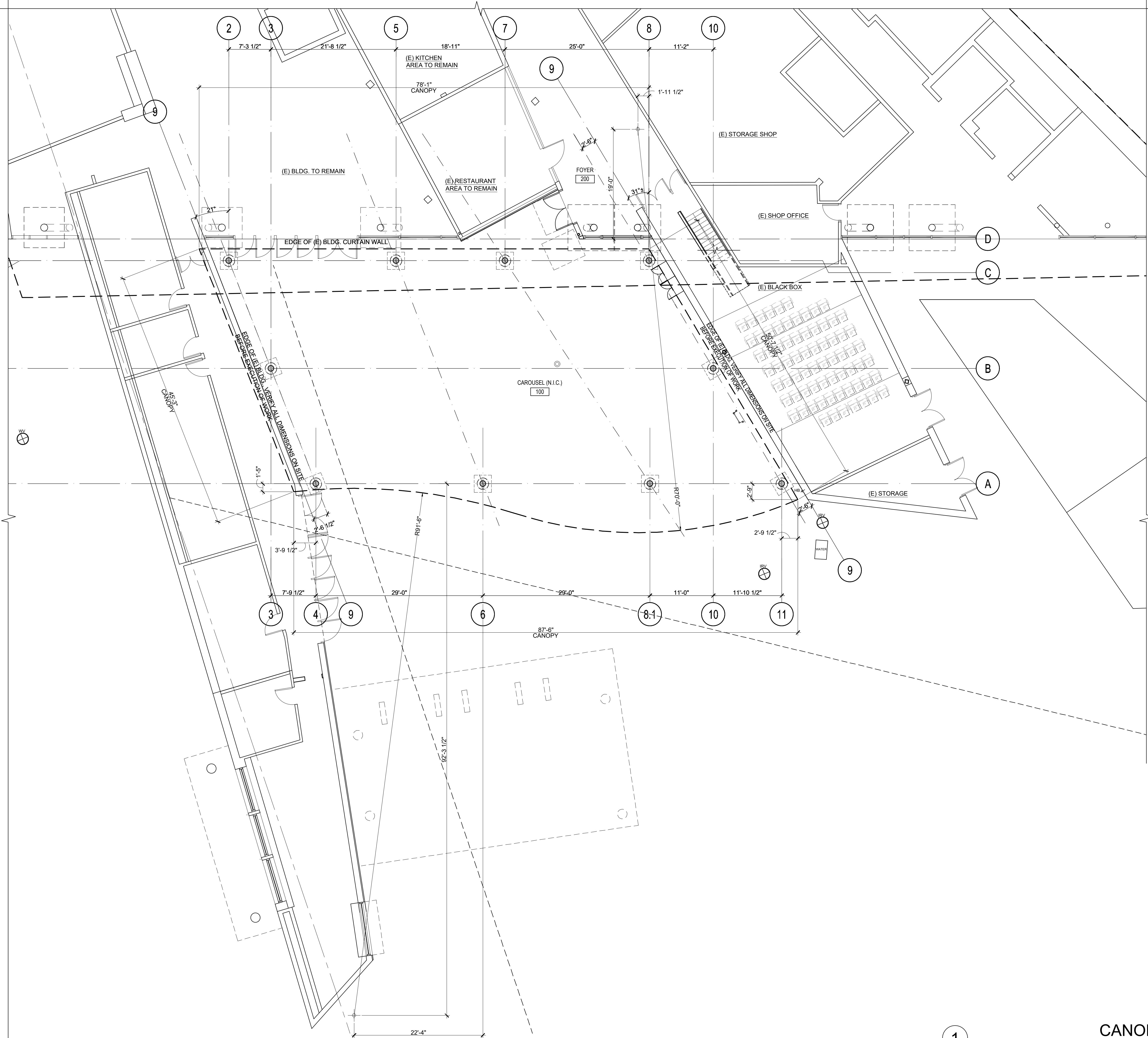
Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA 91040
 Drawing Title: **FIRST FLOOR DIMENSIONAL PLAN @CAROUSEL**

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

CAROUSEL FIRST FLOOR DIMENSIONAL PLAN
 SCALE: 1/4"=1'-0"



KEYNOTES

LEGEND

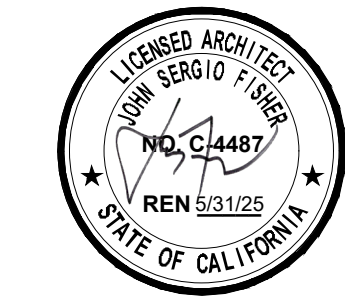
- EXISTING BUILDING
- NEW ADDITION

SUBMITTALS:

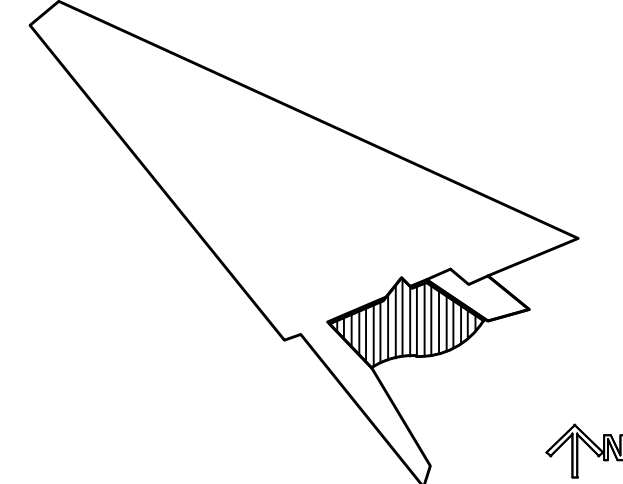
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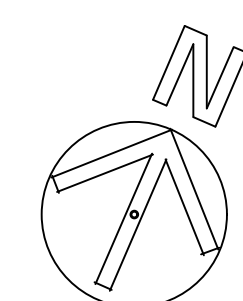
KEY PLAN



City of Los Angeles, Department of Building & Safety
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CANOPY DIMENSIONAL PLAN
 SCALE: 1/8"=1'-0"

1

Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
CANOPY DIMENSIONAL PLAN

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

A201-B



KEYNOTES

1. EXPOSED W14X26 BEAMS @ 80" O.C. - PAINTED
2. STEEL BEAM BY STRUCTURAL
3. 12" Ø COLUMN PER STRUCTURAL
4. (E) CURTAIN WALL
5. (E) COLUMN
6. LINE OF WALL BELOW
7. ROOF ACCESS LADDER

LEGEND

- EXISTING BUILDING
- NEW ADDITION

SUBMITTALS:

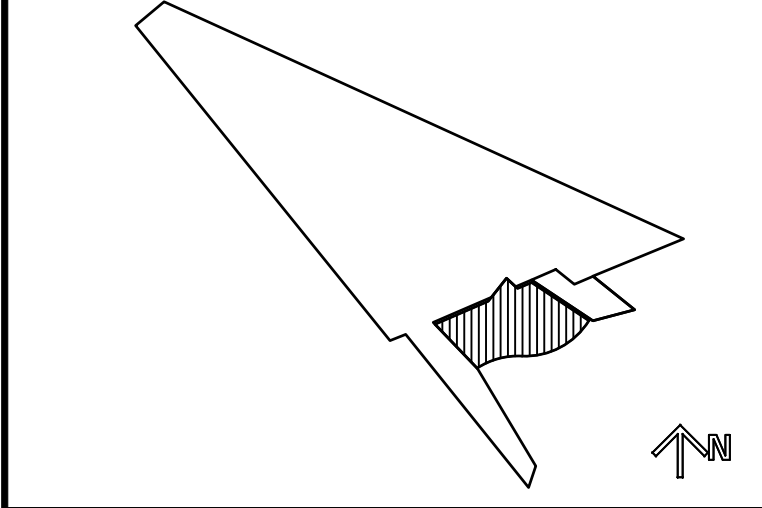
NO.	DESCRIPTION	DATE
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KEY PLAN



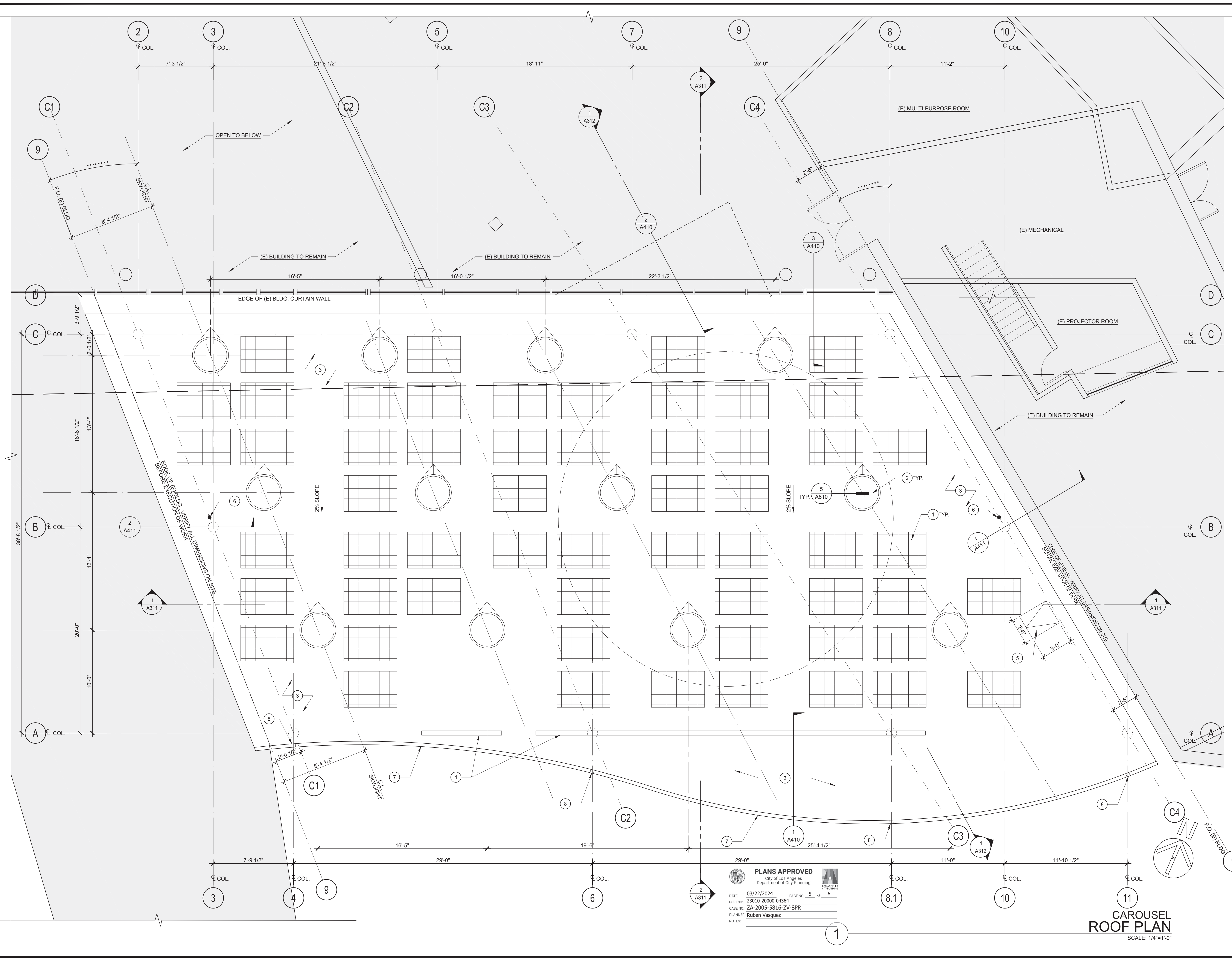
Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA 91040
 Drawing Title
BEAM PLAN
 @ CAROUSEL

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

CAROUSEL BEAM PLAN
 SCALE: 1/4"=1'-0"



- KEYNOTES**
1. PHOTOVOLTAIC PANEL (N.I.C)
 2. MEMBRANE ROOFING, ESR-1463, SEE 6/A811
 3. COMMERCIAL, MDL #CC2-036, ESR-4108, SEE 5/A811
 4. CUBE ENTRANCE SIGN
 5. ROOF ACCESS HATCH
 6. HOSE BIBS
 7. 4" METAL SHEET GUTTER
 8. ROOF DRAINAGE DOWNSPOUT TYP. ON ALL 4 FRONT COLUMNS

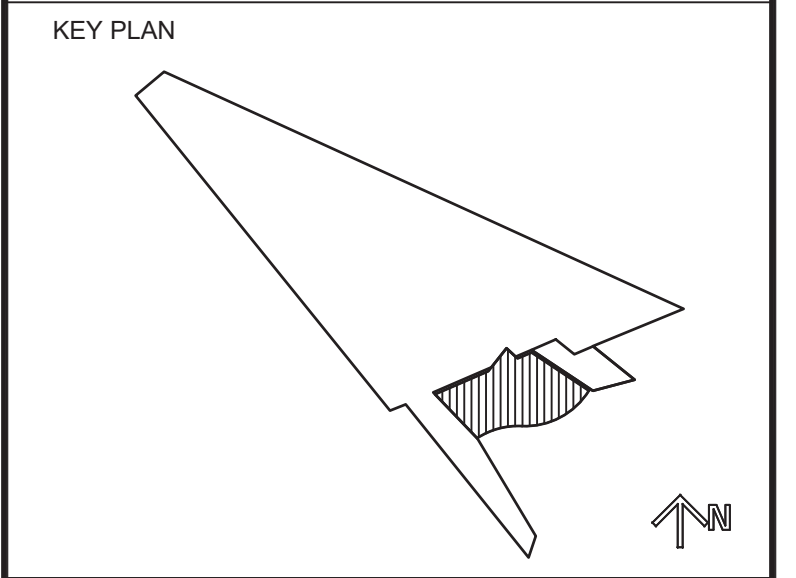
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Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
ROOF PLAN
@ CAROUSEL

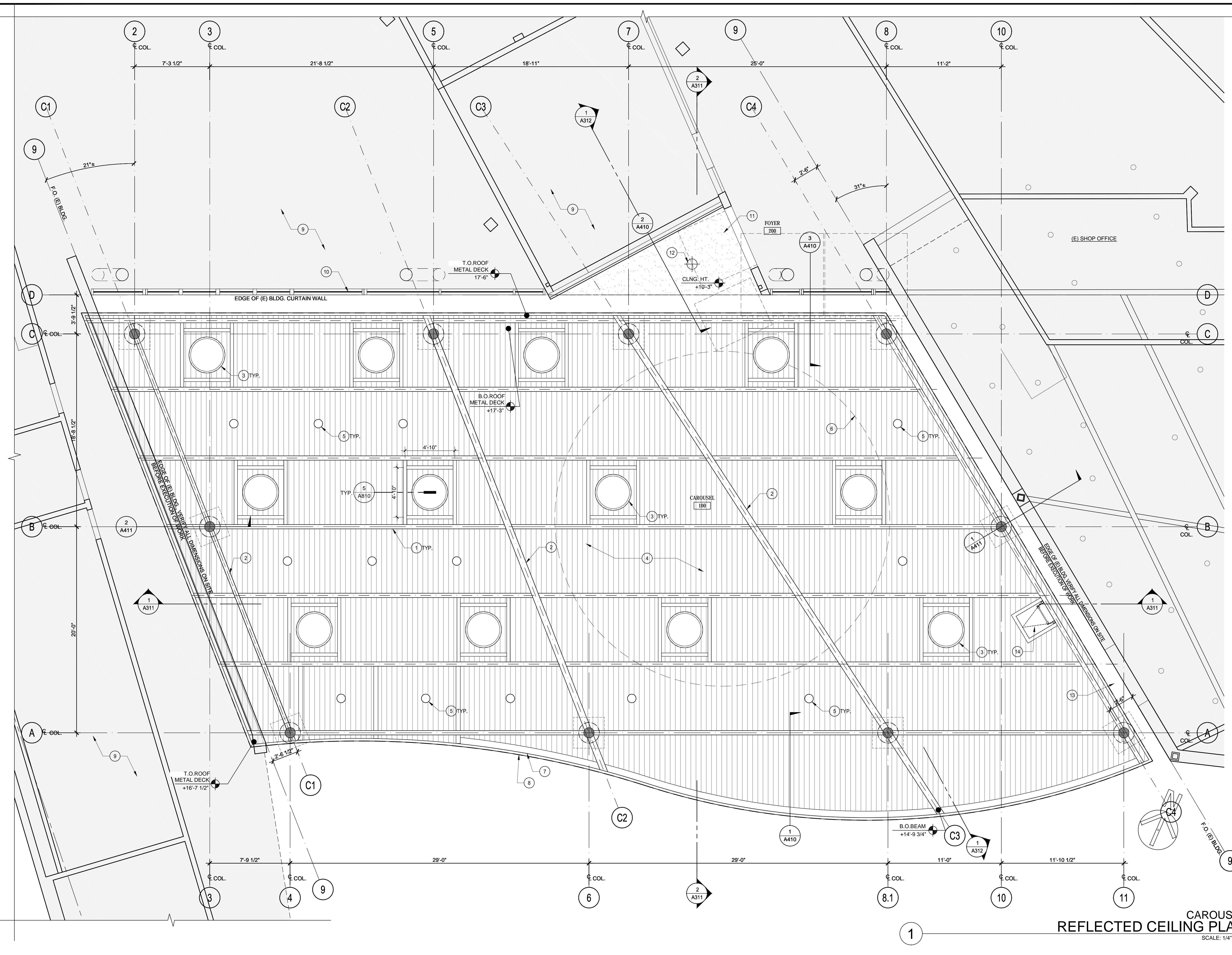
Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

PLANS APPROVED
 City of Los Angeles
 Department of City Planning

DATE: 03/22/2024
 PCSE NO: 23010-20000-04364
 CASE NO: ZA-2005-5816-ZV-SPR
 PLANNER: Ruben Vasquez

PAGE NO. 5 of 6

CAROUSEL ROOF PLAN
 SCALE: 1/4"=1'-0"



- KEYNOTES**
1. EXPOSED W14X26 BEAMS @ 80" O.C. - PAINTED
 2. STEEL BEAM BY STRUCTURAL
 3. 36" Ø SKYLIGHT
 4. EXPOSED STEEL DECK - PAINTED
 5. (N) SURFACE MOUNTED DOWN LIGHT FIXTURE
 6. OUTLINE OF CAROUSEL
 7. SHEET METAL GUTTER
 8. SHEET METAL FASCIA
 9. EXISTING TO REMAIN
 10. (E) CURTAIN WALL TO REMAIN
 11. (E) OEM PLASTER SOFFIT
 12. (N) RECESSED DOWN LIGHT FIXTURE
 13. (N) WALL SCOFFICE
 14. ROOF ACCESS HATCH

LEGEND

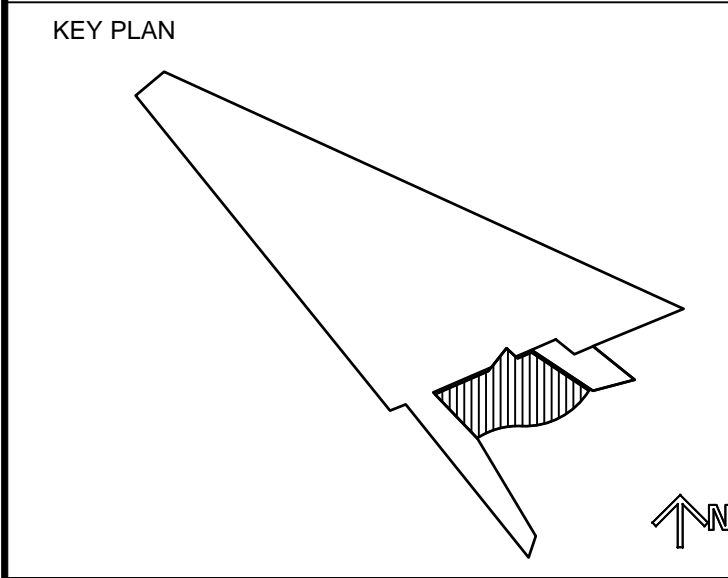
	EXISTING BUILDING
	NEW ADDITION

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADS RESUBMITTAL	1/24/2024
2	LADS RESUBMITTAL	2/22/2024

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 Tarzana California 91356
 (818) 344-3045
 fax (818) 344-0338
 E-mail: mail@jsfarchs.com
 Architecture & Planning
 John Fisher AIA



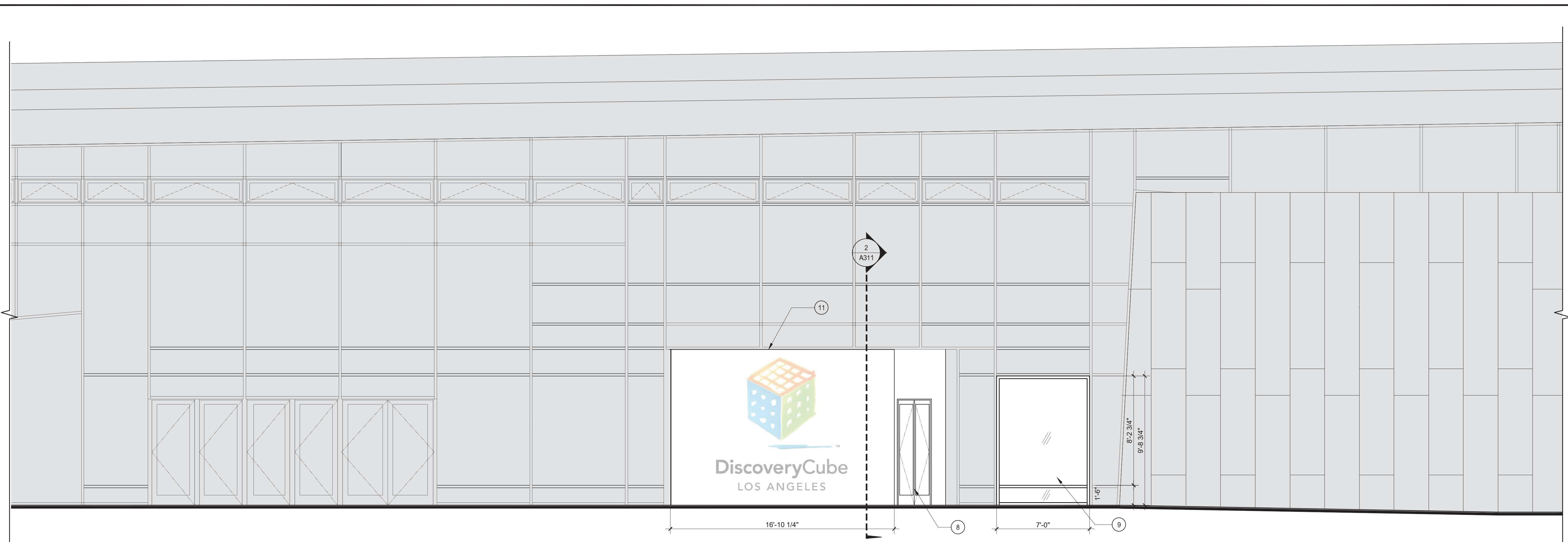
Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

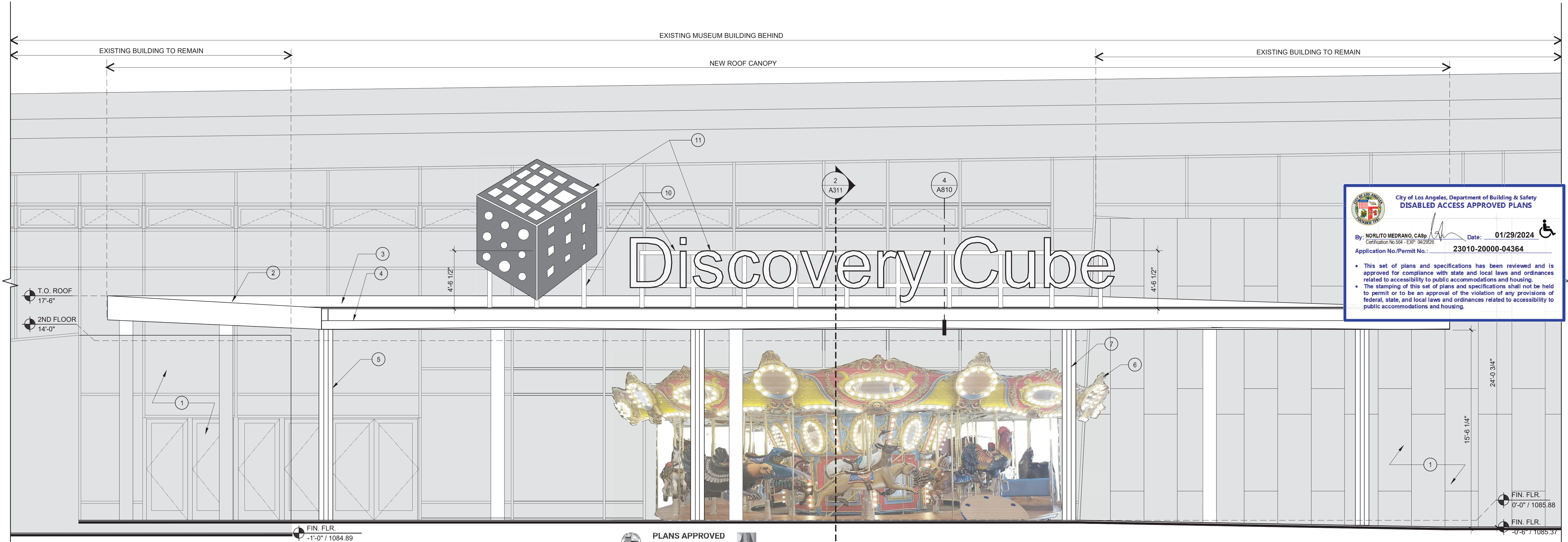
11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
**REFLECTED CEILING PLAN
 @ CAROUSEL**

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

**CAROUSEL
 REFLECTED CEILING PLAN**
 SCALE: 1/4"=1'-0"



2 NEW STOREFRONT EXTERIOR ELEVATION SCALE: 1/4"=1'-0"



1 CAROUSEL COURTYARD EXTERIOR ELEVATION SCALE: 1/4"=1'-0"

- KEYNOTES
- (E) BUILDING TO REMAIN
 - PHOTOVOLTAIC PANELS PER ROOF PLAN (N.I.C.)
 - ROOFING MEMBRANE OVER VERCOR METAL DECK
 - 4" WIDE RAIN GUTTER
 - (N) COLUMN PER STRUCTURAL (TYP.)
 - (N) CAROUSEL (N.I.C.)
 - ROOF DRAIN DOWNSPOUT (TYP.) ON ALL 4 FRONT COLUMNS (TYP.) CONNECT TO STORM DRAIN PER CIVIL
 - (E) EXIT DOOR
 - (N) STOREFRONT WINDOW
 - SIGN POST PER STRUCTURE
 - SIGNAGE UNDER SEPARATE PERMIT

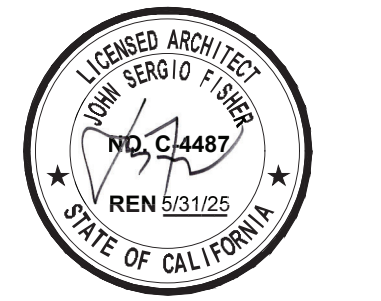
- LEGEND
- EXISTING BUILDING
 - NEW ADDITION

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/24

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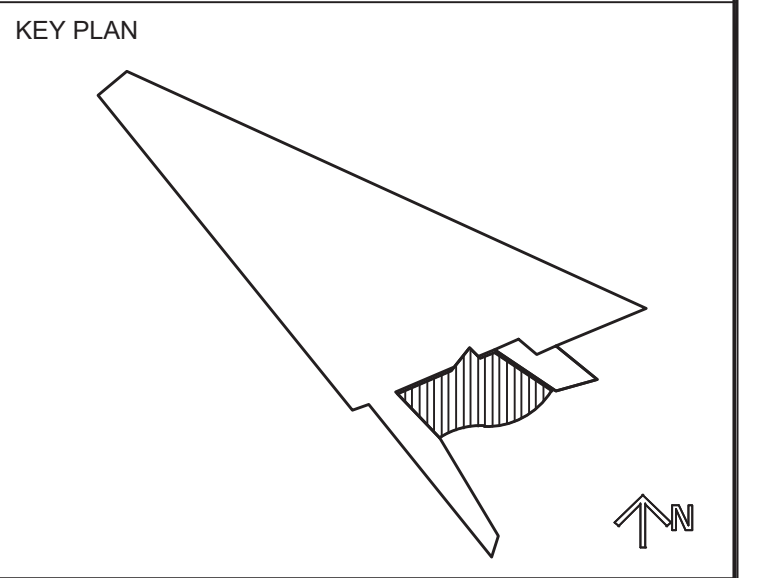
John Sergio Fisher & Associates Inc. **jsfa**
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 (818) 344-3045
 fax (818) 344-0338
 E-mail: mail@jsfarchs.com
 Architecture & Planning
 John Fisher AIA



City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS

By: NORLITO MEDRANO, CASp Date: 01/29/2024
 Certification No. 564 - EXP. 04/29/28
 Application No./Permit No.: 23010-20000-04364

- This set of plans and specifications has been reviewed and is approved for compliance with state and local laws and ordinances related to accessibility to public accommodations and housing.
- The stamping of this set of plans and specifications shall not be held to permit or to be an approval of the violation of any provisions of federal, state, and local laws and ordinances related to accessibility to public accommodations and housing.



Client: **DISCOVERY CUBE LOS ANGELES**

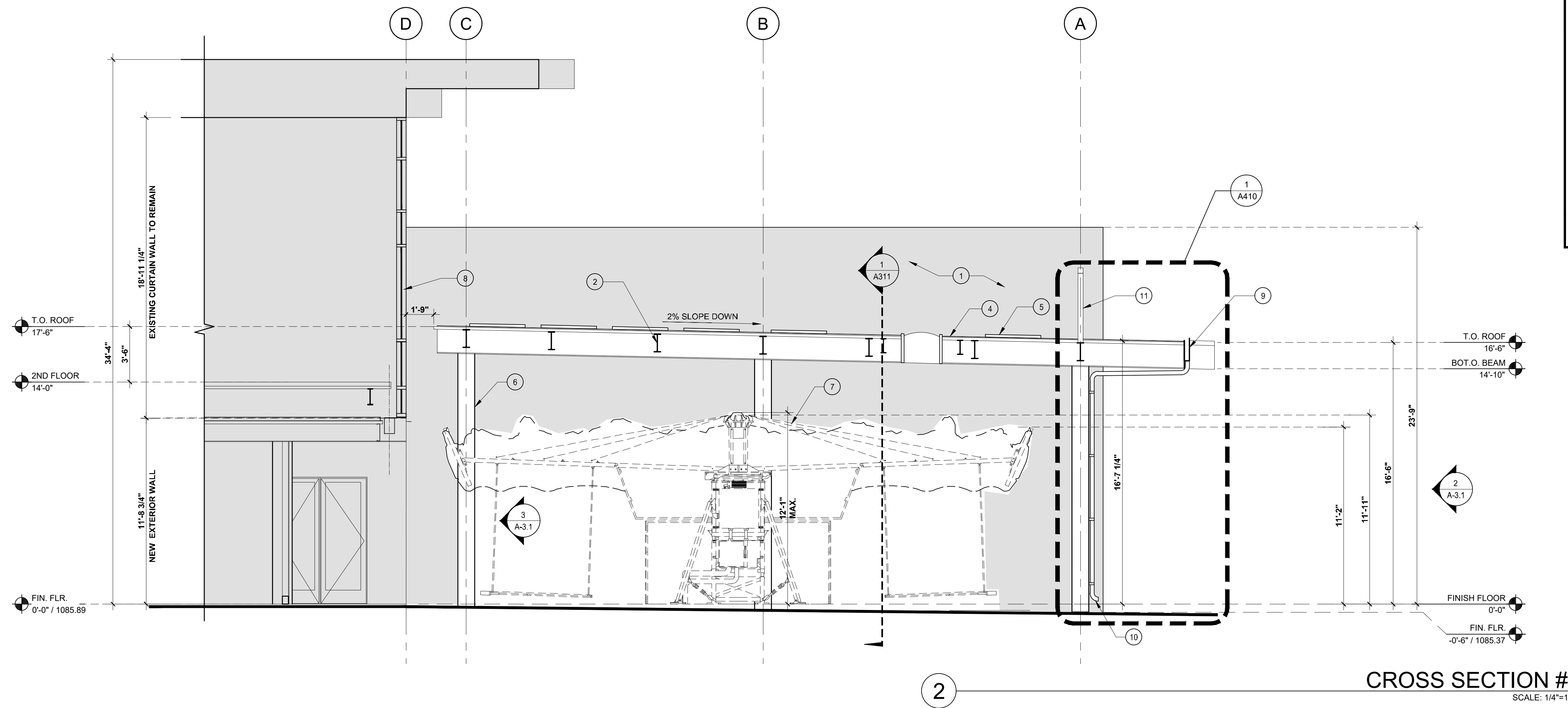
Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title: **EXTERIOR ELEVATIONS**

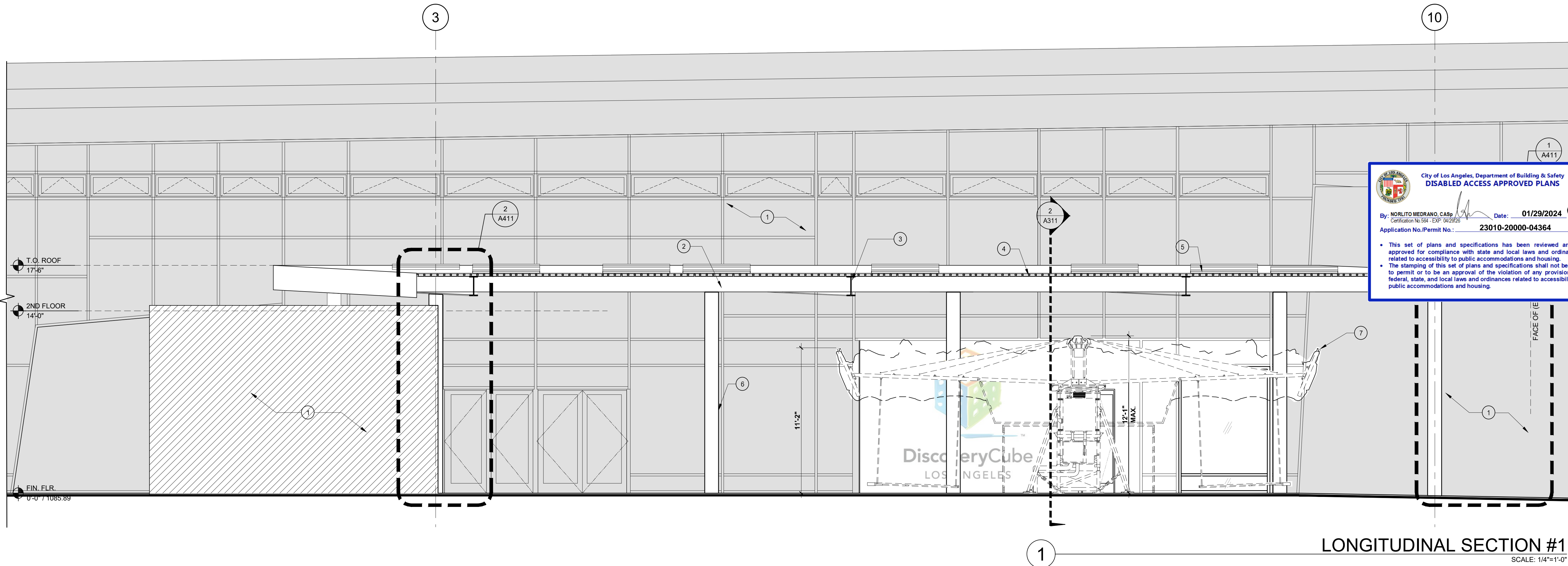
Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

PLANS APPROVED
 City of Los Angeles
 Department of City Planning

DATE: 03/22/2024 PAGE NO. 6 of 6
 PROJ. NO.: 23010-20000-04364
 CASE NO.: ZA-2005-5816-ZV-SPR
 PLANNER: Ruben Vasquez



CROSS SECTION #2
SCALE: 1/4"=1'-0"



LONGITUDINAL SECTION #1
SCALE: 1/4"=1'-0"

- KEYNOTES**
- (E) BUILDING TO REMAIN
 - ROOF JOISTS MEMBERS PER STRUCTURAL
 - BEAMS PER STRUCTURAL
 - ROOF MEMBRANE OVER 5/8" DENSGLASS OVER VERCO METAL ROOF DECK
 - PHOTOVOLTAIC PANELS PER ROOF PLAN (N.I.C)
 - (N) X SQ. STEEL COLUMN PER STRUCTURAL (TYP.)
 - (N) CAROUSEL (N.I.C)
 - (E) CURTAIN WALL TO REMAIN
 - 4" WIDE RAIN GUTTER
 - ROOF DRAIN DOWNSPOUT (TYP.) ON ALL 4 FRONT COLUMNS (TYP.) CONNECT TO STORM DRAIN PER CIVIL
 - SIGN POST PER STRUCTURAL

- LEGEND**
- EXISTING BUILDING
 - NEW ADDITION

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/24

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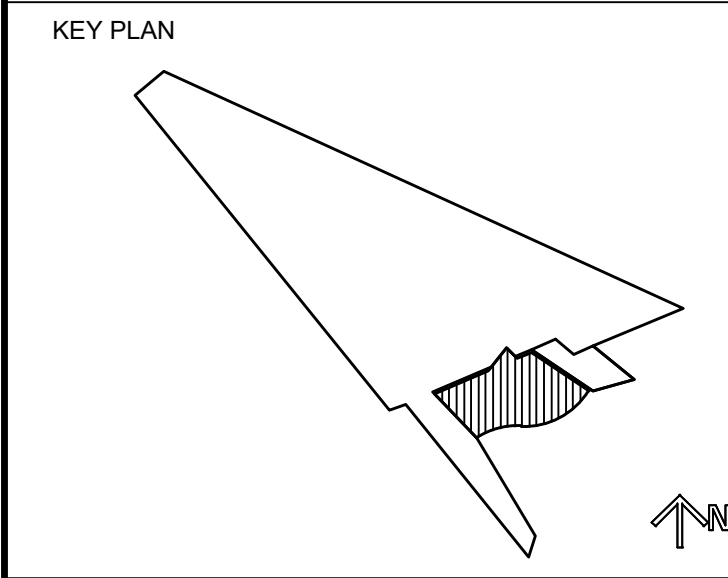
John Sergio Fisher & Associates Inc.
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E-mail: mail@jsfarchs.com
Architecture & Planning
John Fisher AIA



City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS

By: NORLITO MEDRANO, CASp Date: 01/29/2024
Certification No. 564 - EXP. 04/29/25
Application No./Permit No.: 23010-20000-04364

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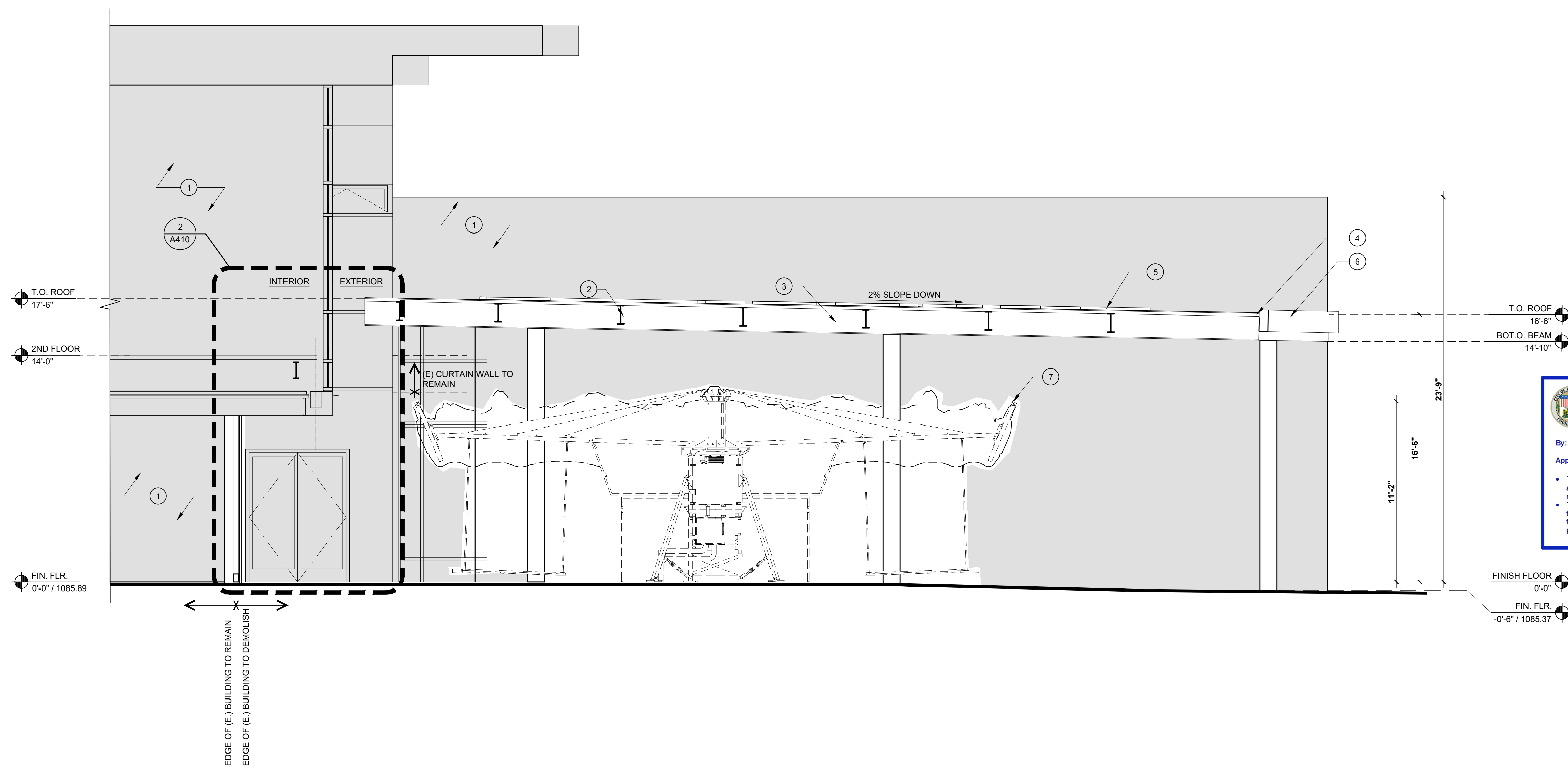
Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

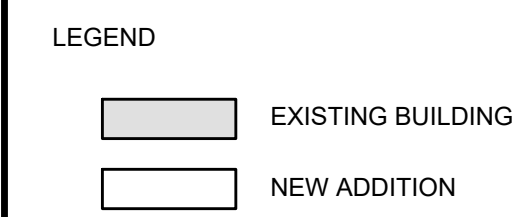
11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040
Drawing Title
**BUILDING SECTIONS
@ CAROUSEL**

Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN

A311



- KEYNOTES
- (E) BUILDING TO REMAIN
 - ROOF JOISTS MEMBERS PER STRUCTURAL
 - BEAMS PER STRUCTURAL
 - ROOF MEMBRANE OVER 5/8" DENSGLOSS OVER VERCO METAL ROOF DECK
 - PHOTOVOLTAIC PANELS PER ROOF PLAN (N.I.C)
 - 4" WIDE RAIN GUTTER
 - (N) CAROUSEL (N.I.C)



SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/24

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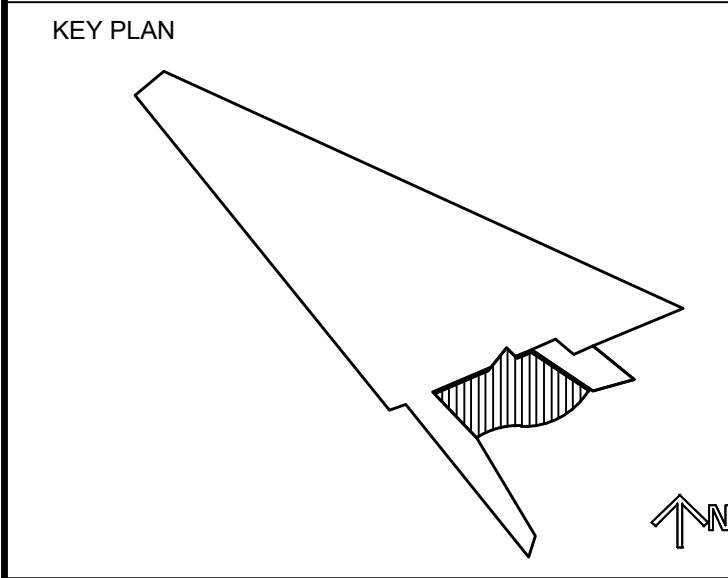
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DISABLED ACCESS APPROVED PLANS

By: NORLITO MEDRANO, CASp Date: 01/29/2024
 Certification No. 564 - EXP: 04/29/23
 Application No./Permit No.: 23010-20000-04364

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Client:
DISCOVERY CUBE LOS ANGELES

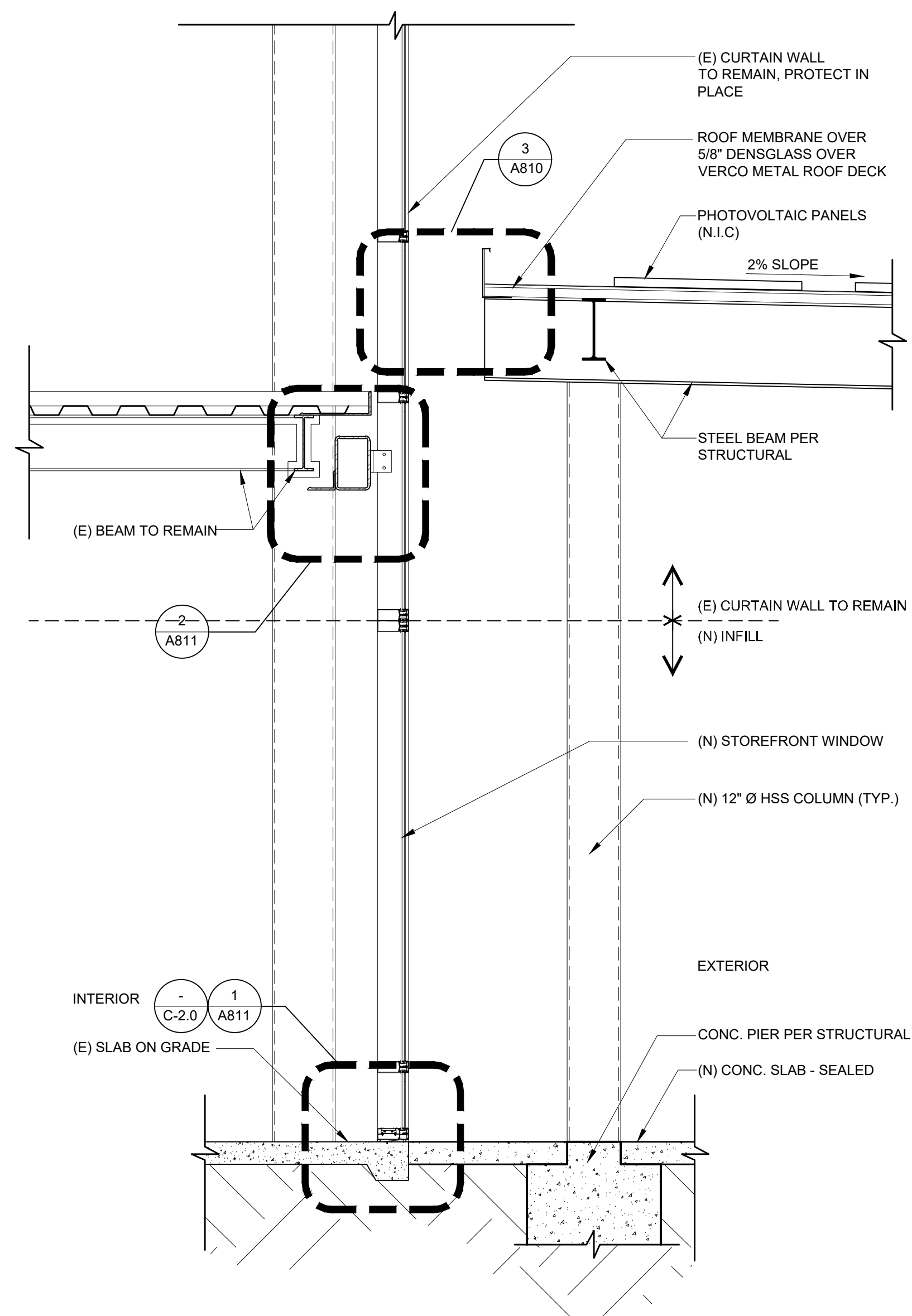
Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
**BUILDING SECTIONS
 @ CAROUSEL**

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

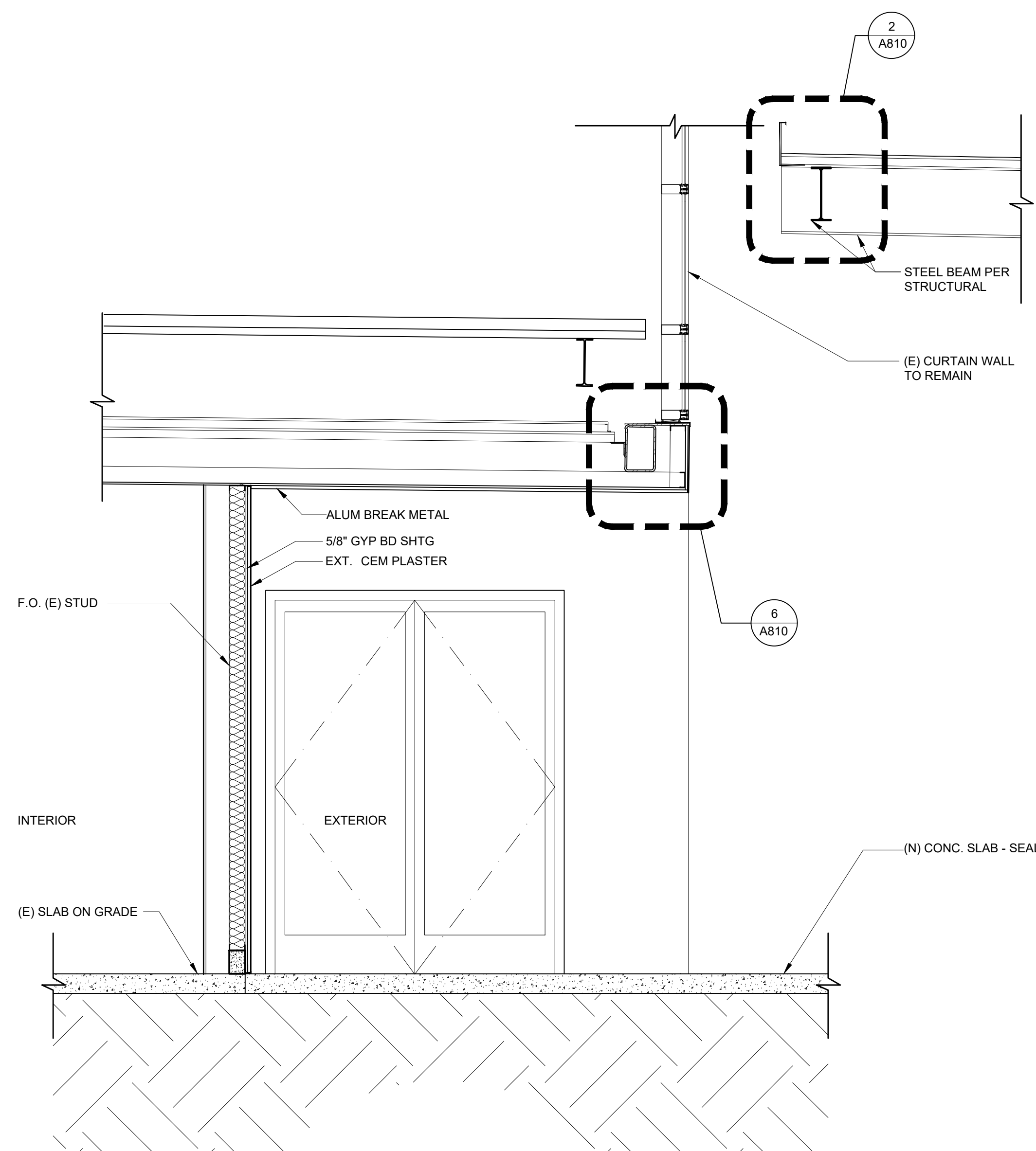
**CAROUSEL
 BUILDING SECTION**
 SCALE: 1/4"=1'-0"

1



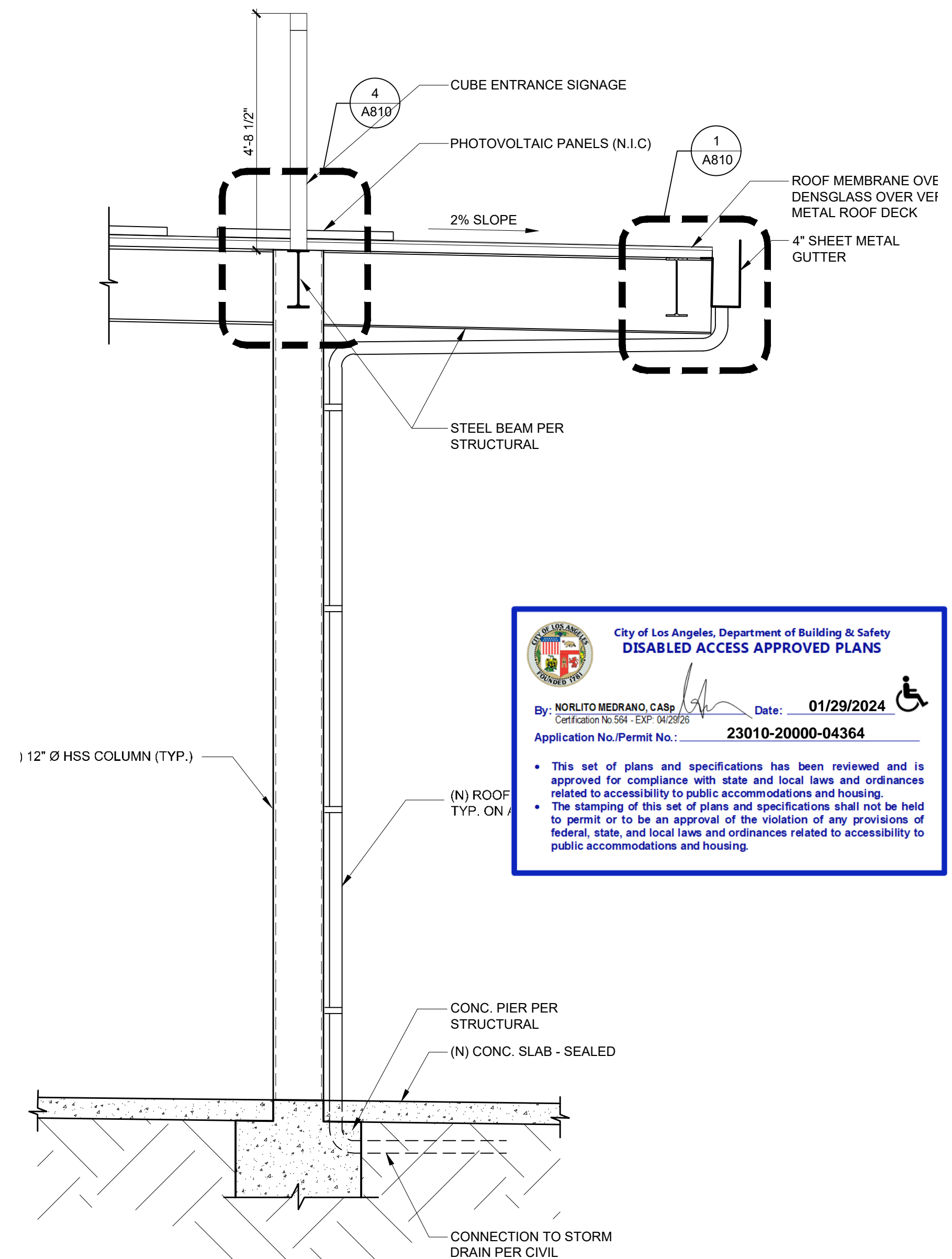
WALL SECTION
SCALE: 1/2"=1'-0"

3 REF: 1/A204



WALL SECTION
SCALE: 1/2"=1'-0"

2 REF: 2/A312



WALL SECTION
SCALE: 1/2"=1'-0"

1 REF: 2/A311



KEYNOTES

LEGEND

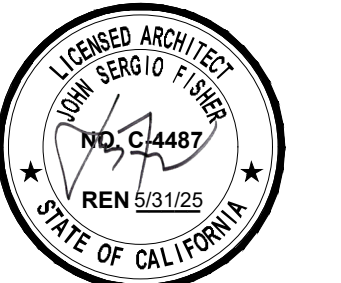
SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/24

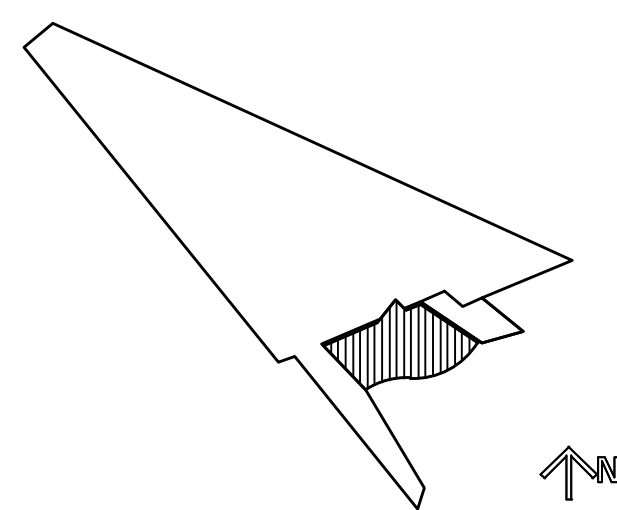
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KEY PLAN



Client:
DISCOVERY CUBE LOS ANGELES

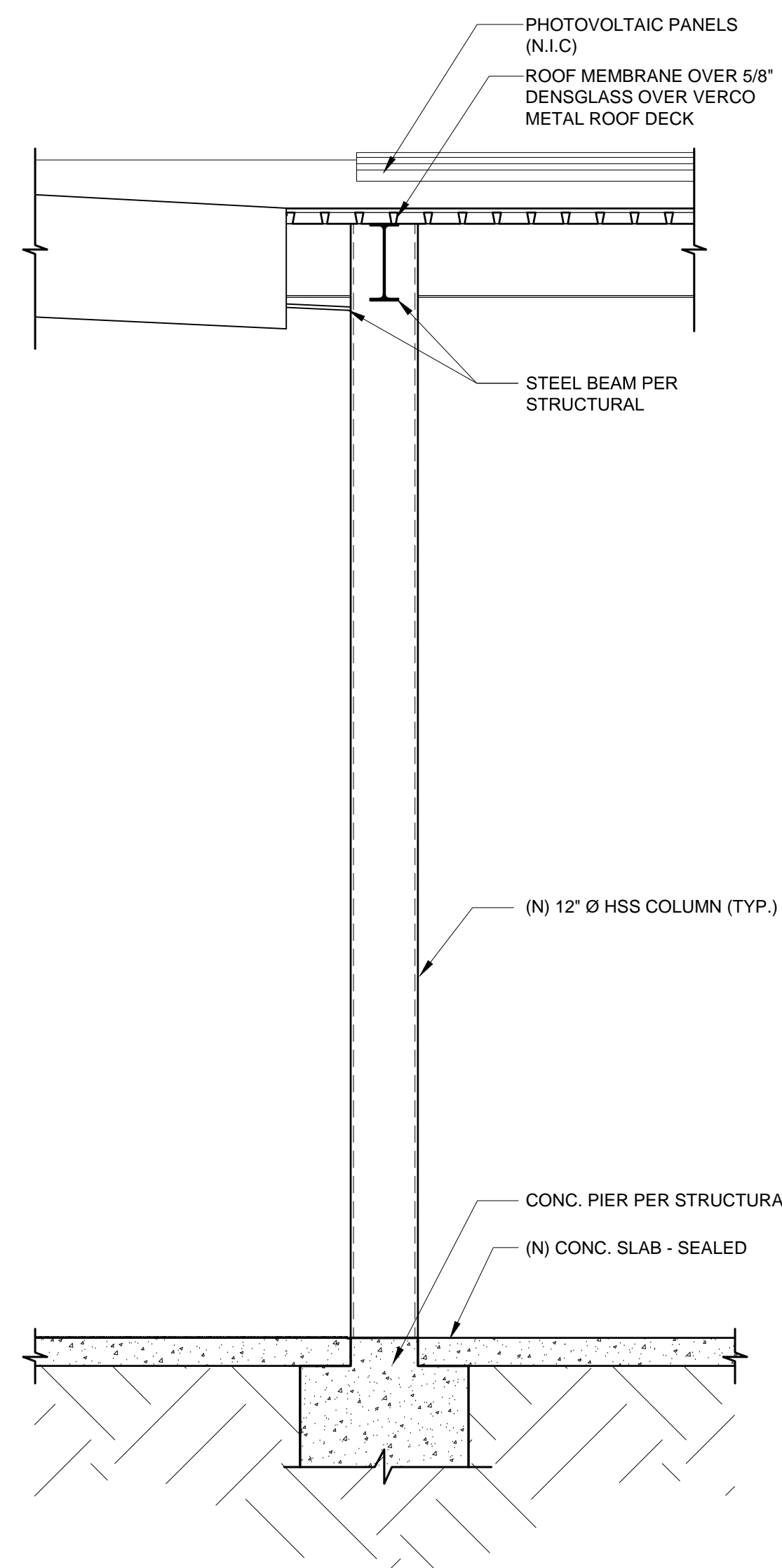
Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA 91040

Drawing Title
WALL SECTIONS

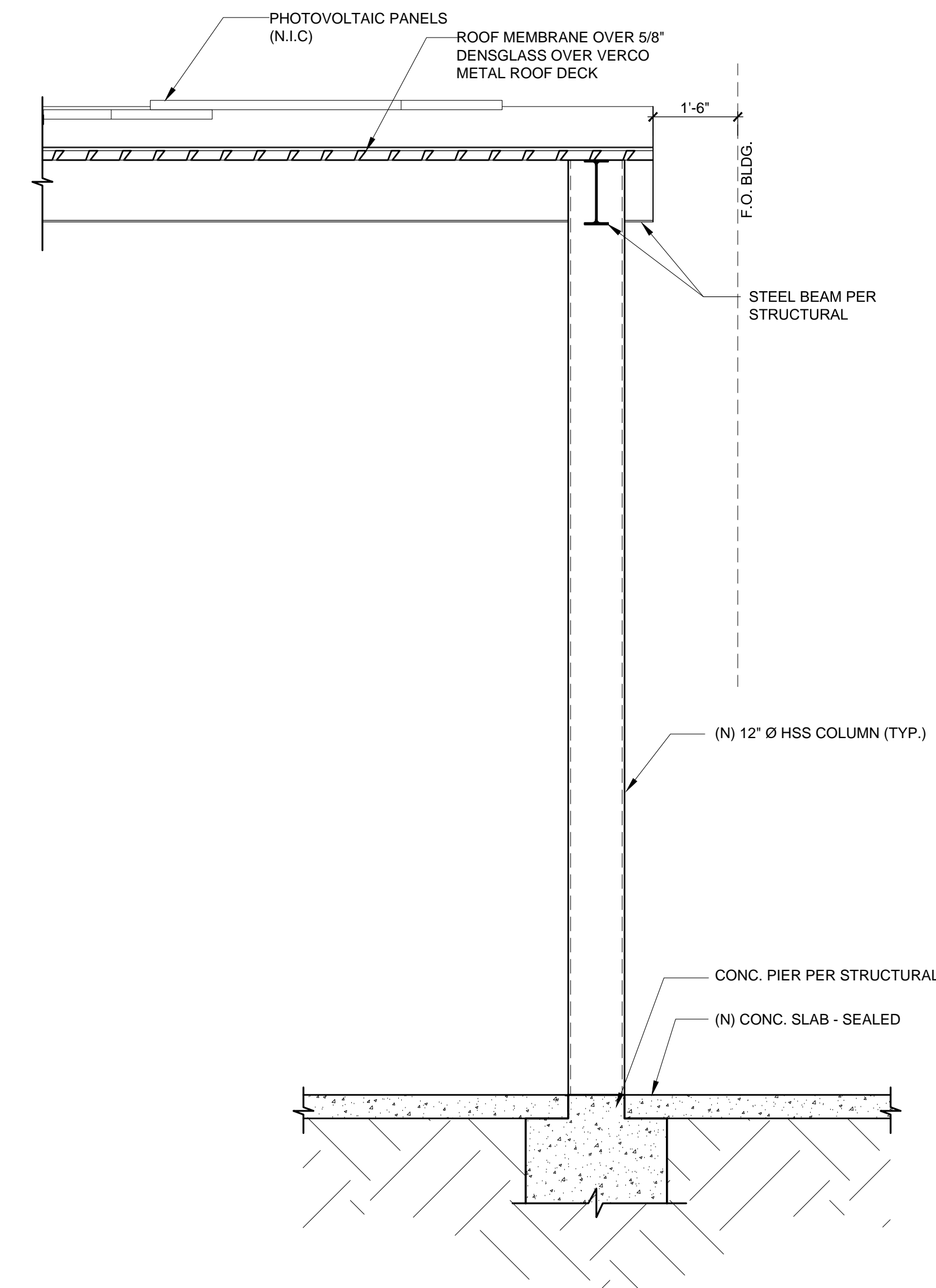
Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN

A410



2 REF: 1/A311

WALL SECTION
SCALE: 1/2"=1'-0"



1 REF: 1/A311

WALL SECTION
SCALE: 1/2"=1'-0"

KEYNOTES

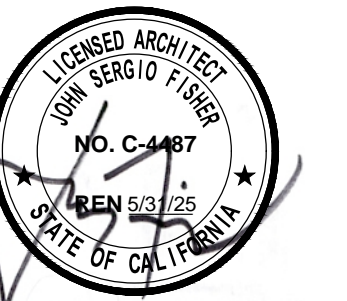
LEGEND

SUBMITTALS:

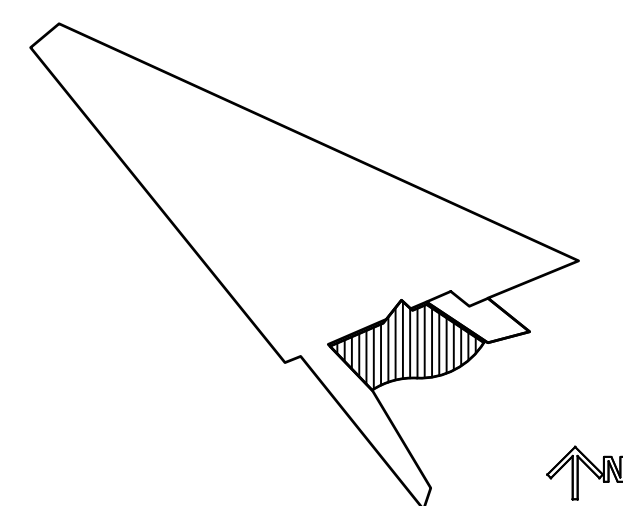
NO.	DESCRIPTION	DATE
1	LADRS RESUBMITTAL	1/24/2024
2	LADRS RESUBMITTAL	2/22/2024

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KEY PLAN



Client:
DISCOVERY CUBE LOS ANGELES

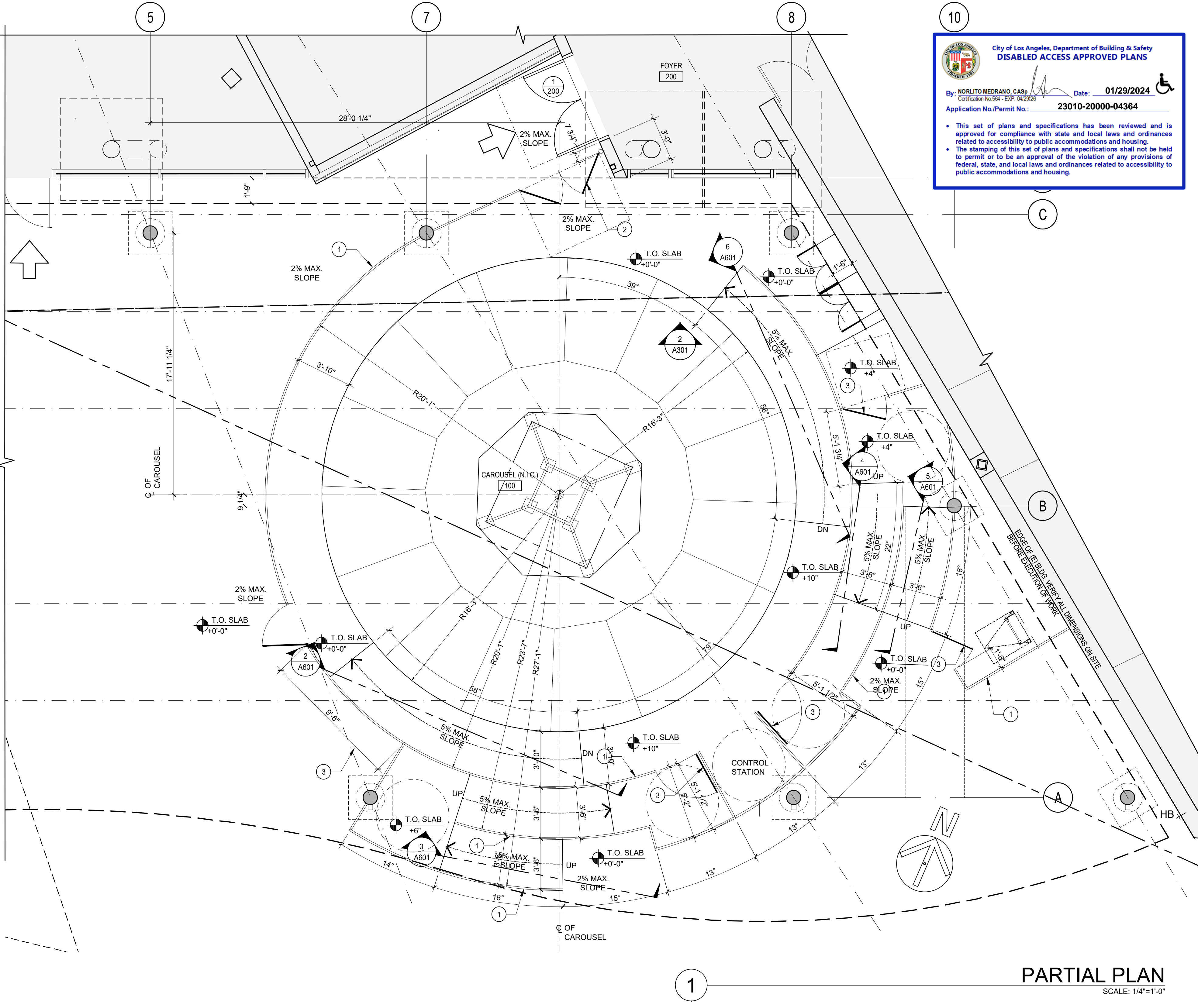
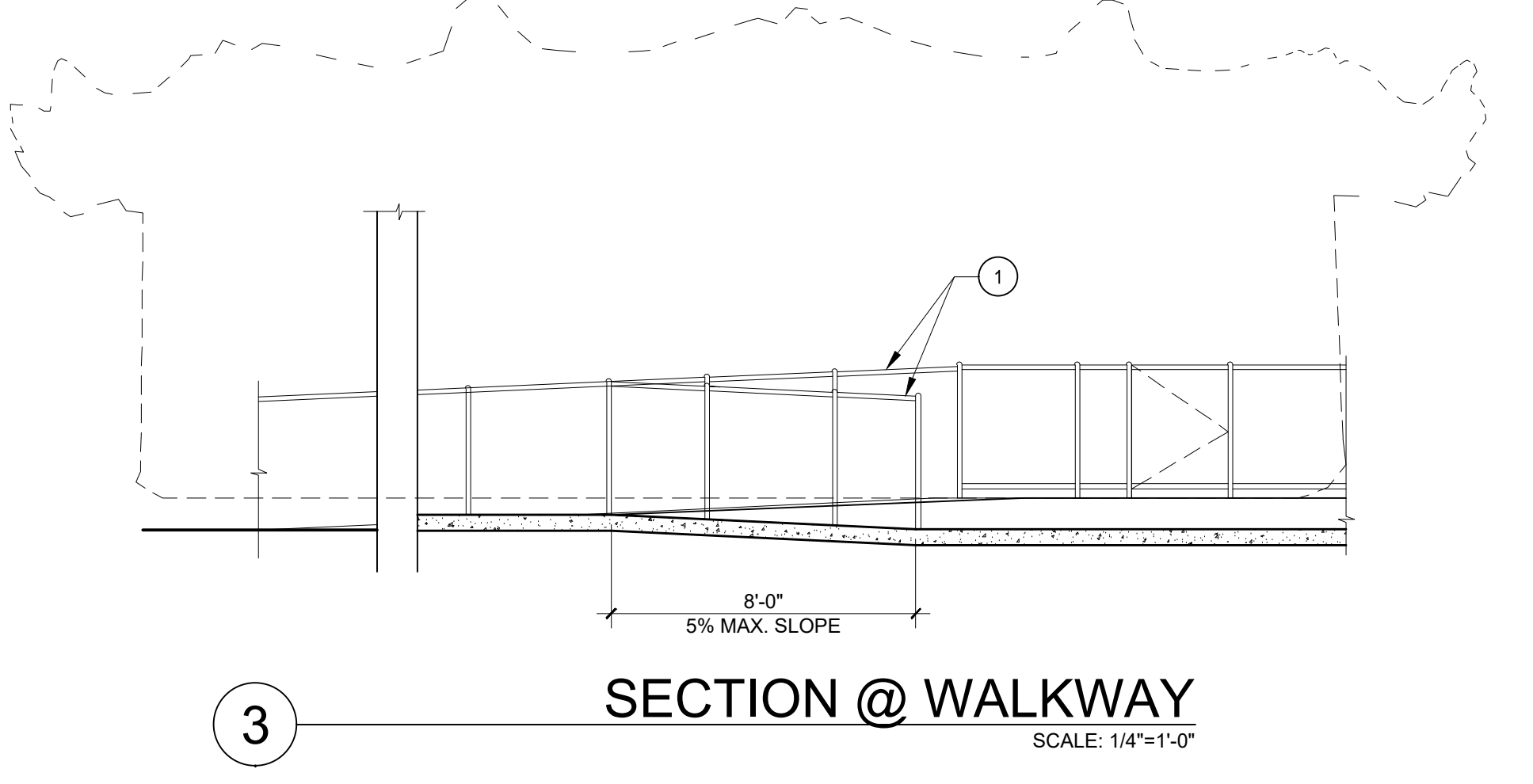
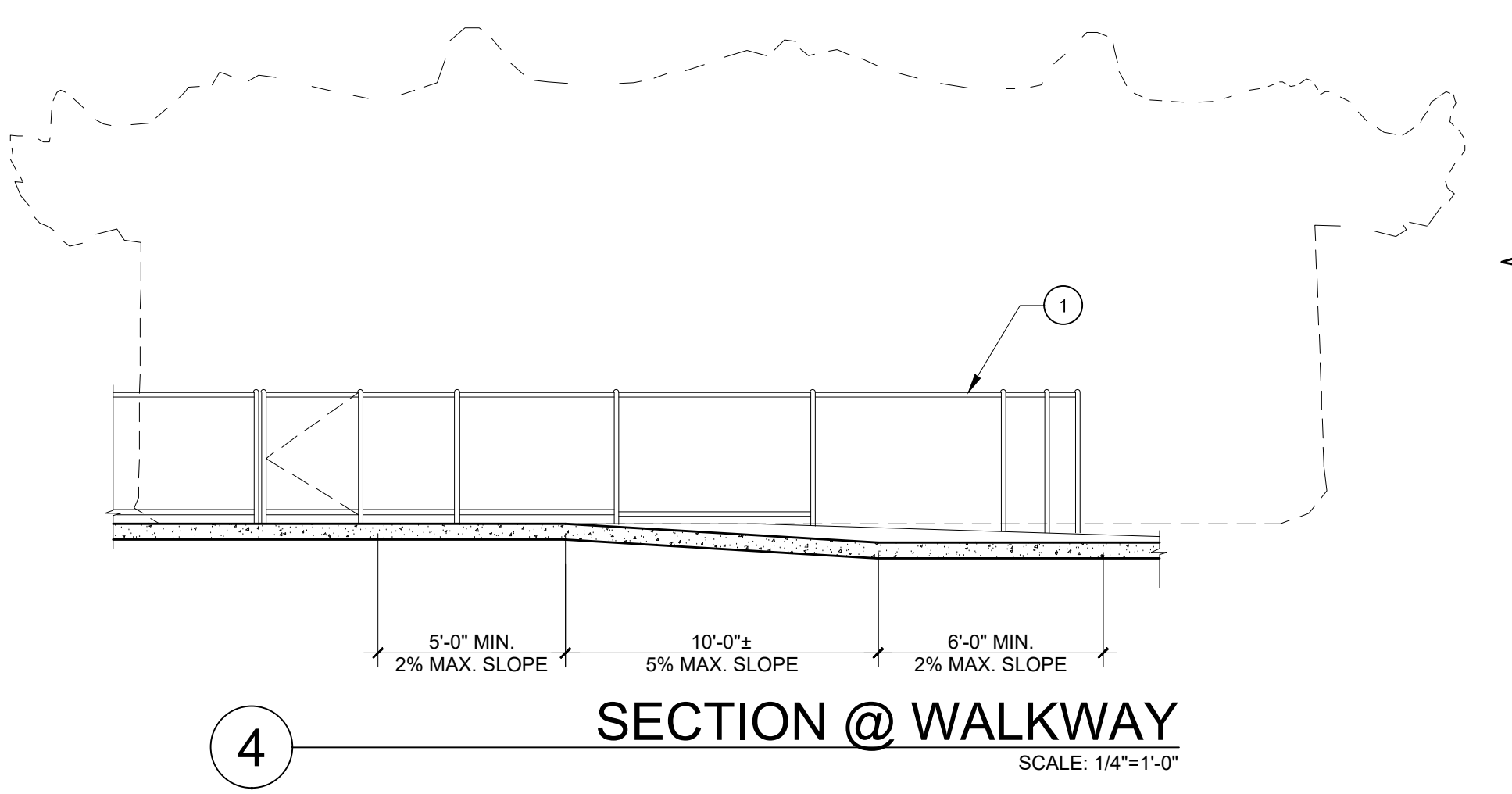
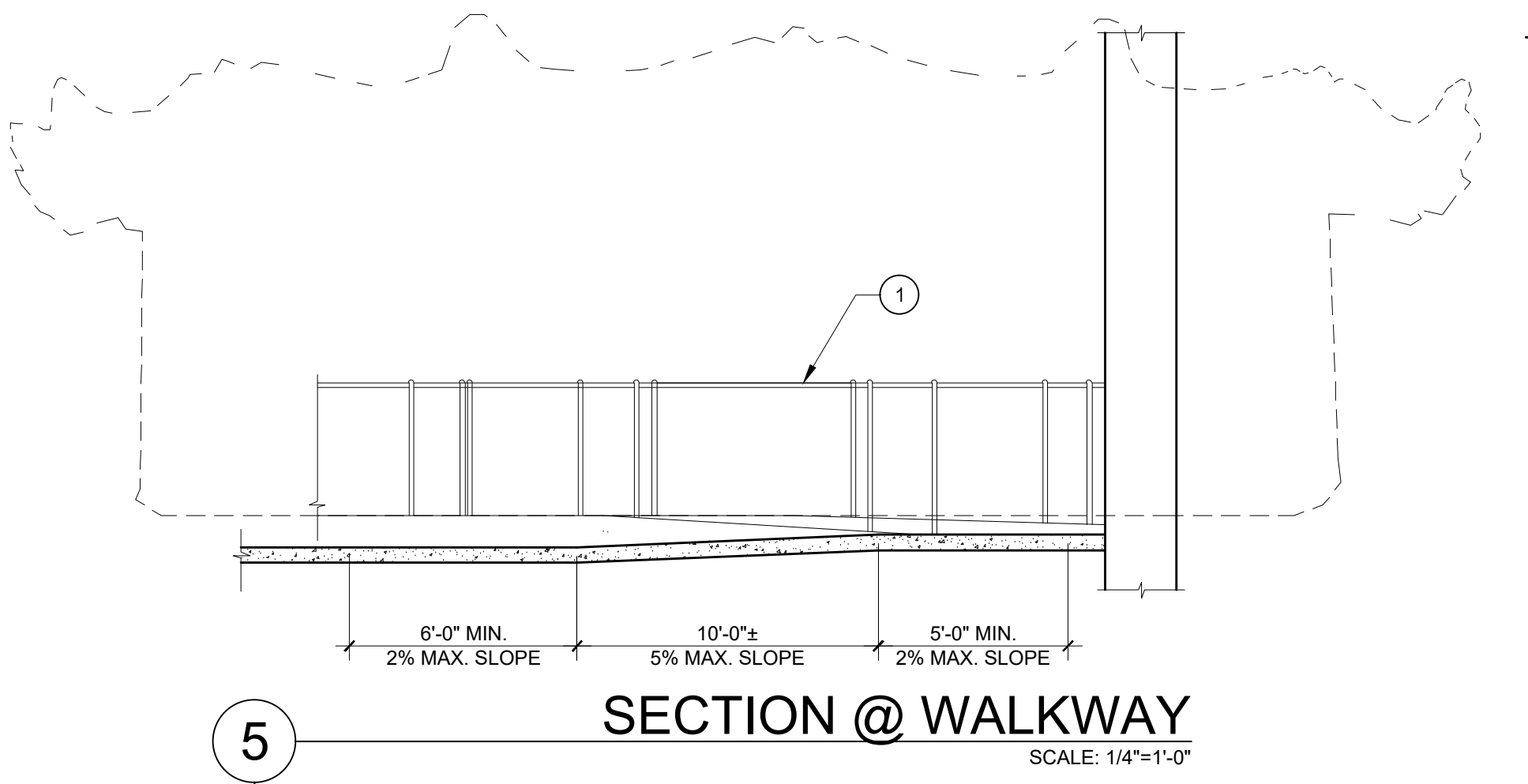
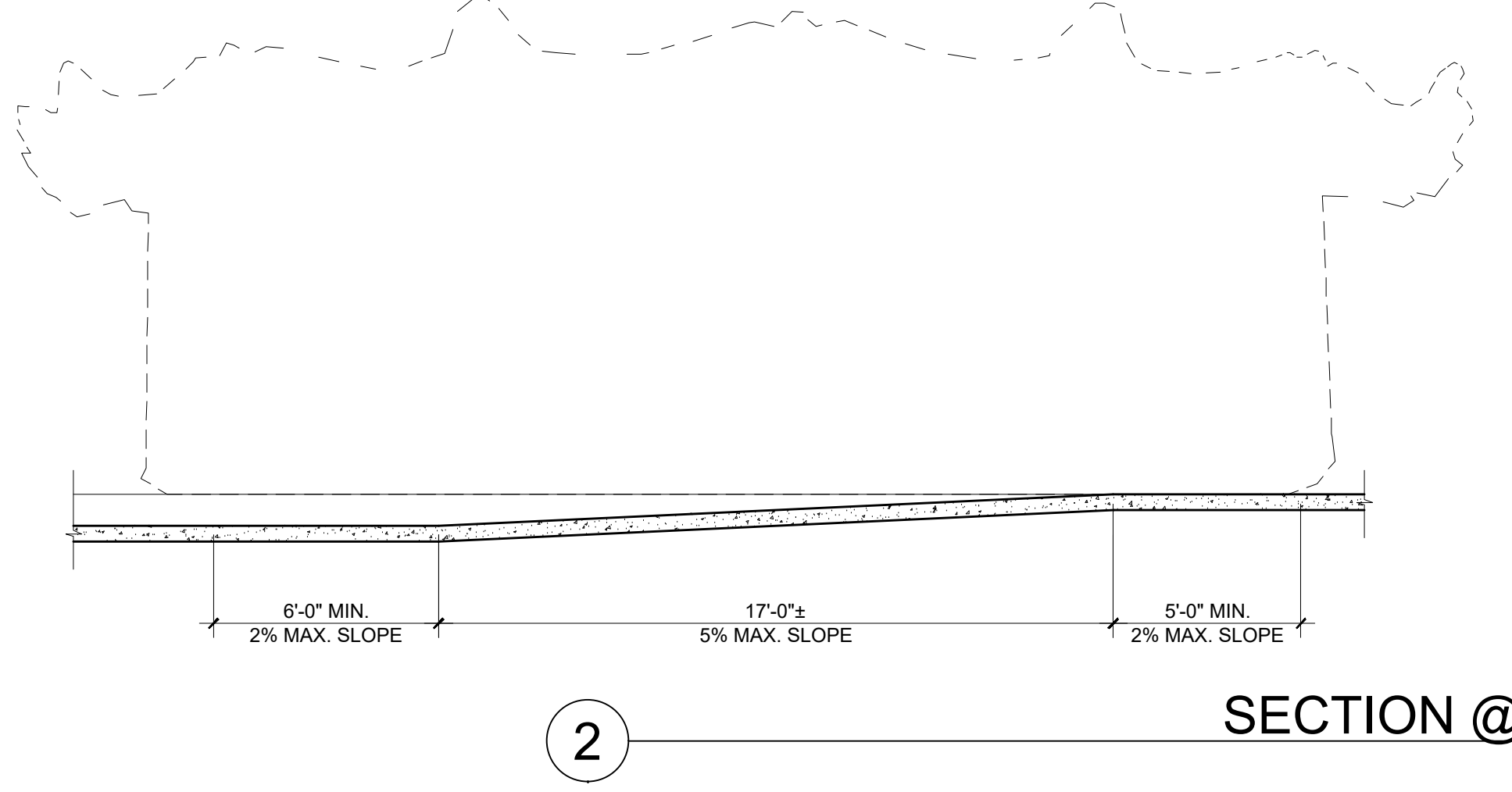
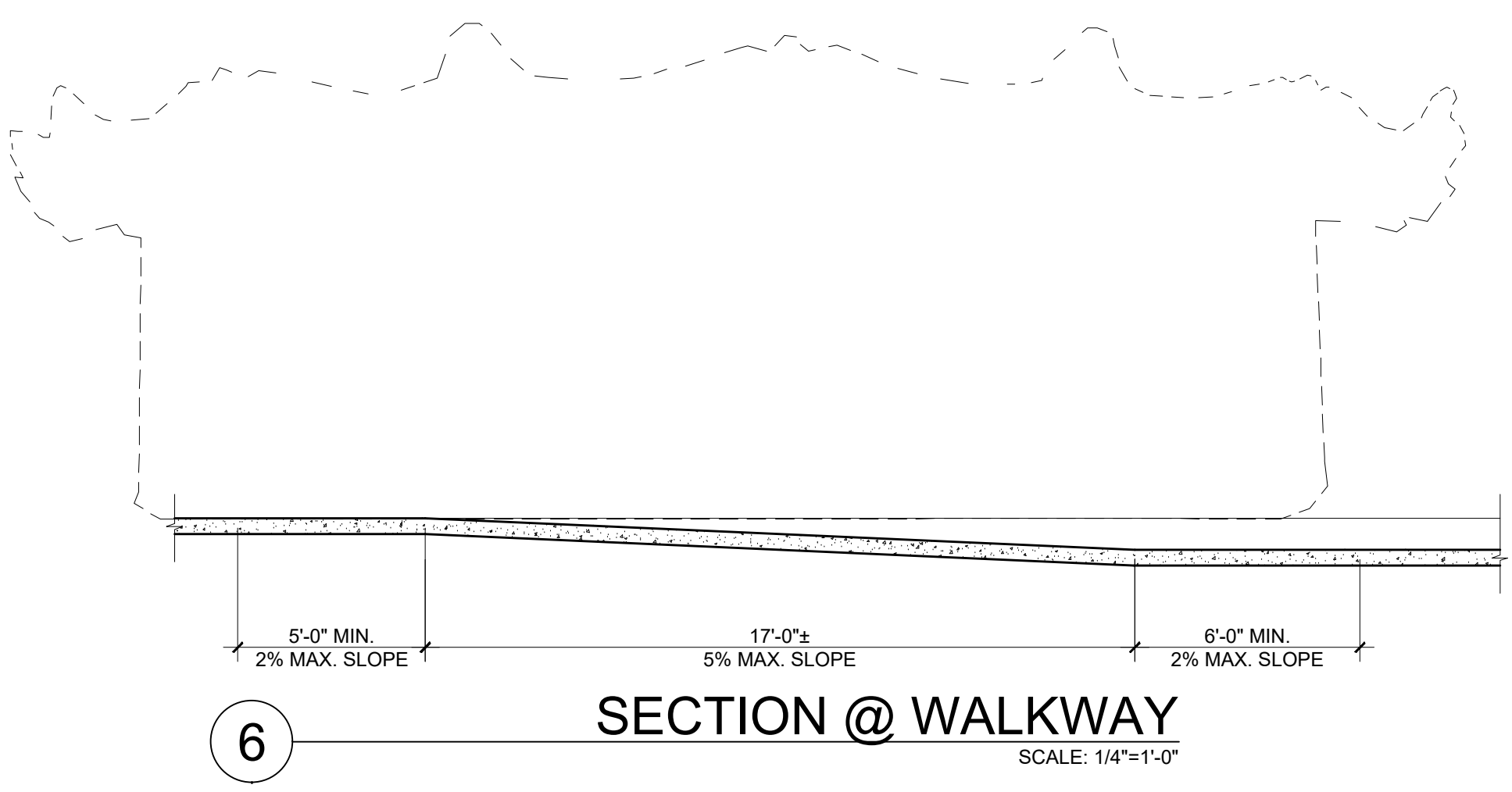
Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040

Drawing Title
WALL SECTIONS

Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN

A411



City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS

By: **NORLITO MEDRANO, C.A.S.** Date: **01/29/2024**

Certification No. 564 EXP. 04/29/26
Application No./Permit No.: **23010-20000-04364**

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- KEYNOTES**
- PIPE RAILING
 - 6'-0" GATE
 - 3'-0" GATE

LEGEND

[Hatched Box]	EXISTING BUILDING
[White Box]	NEW ADDITION

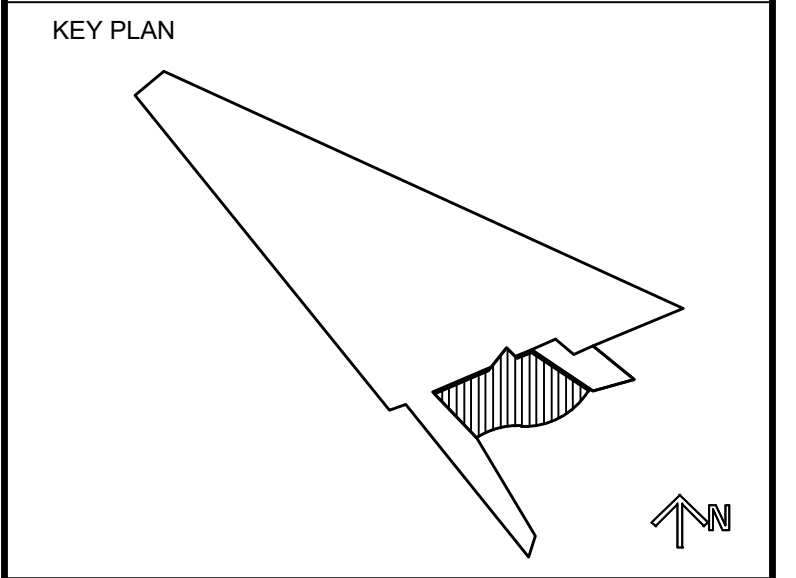
SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/24

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fax (818) 344-0338
E-mail: mail@sfarchs.com
Architecture & Planning
John Fisher AIA

jsfa



Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040
Drawing Title
WALKWAYS PLAN & SECTIONS @ CAROUSEL

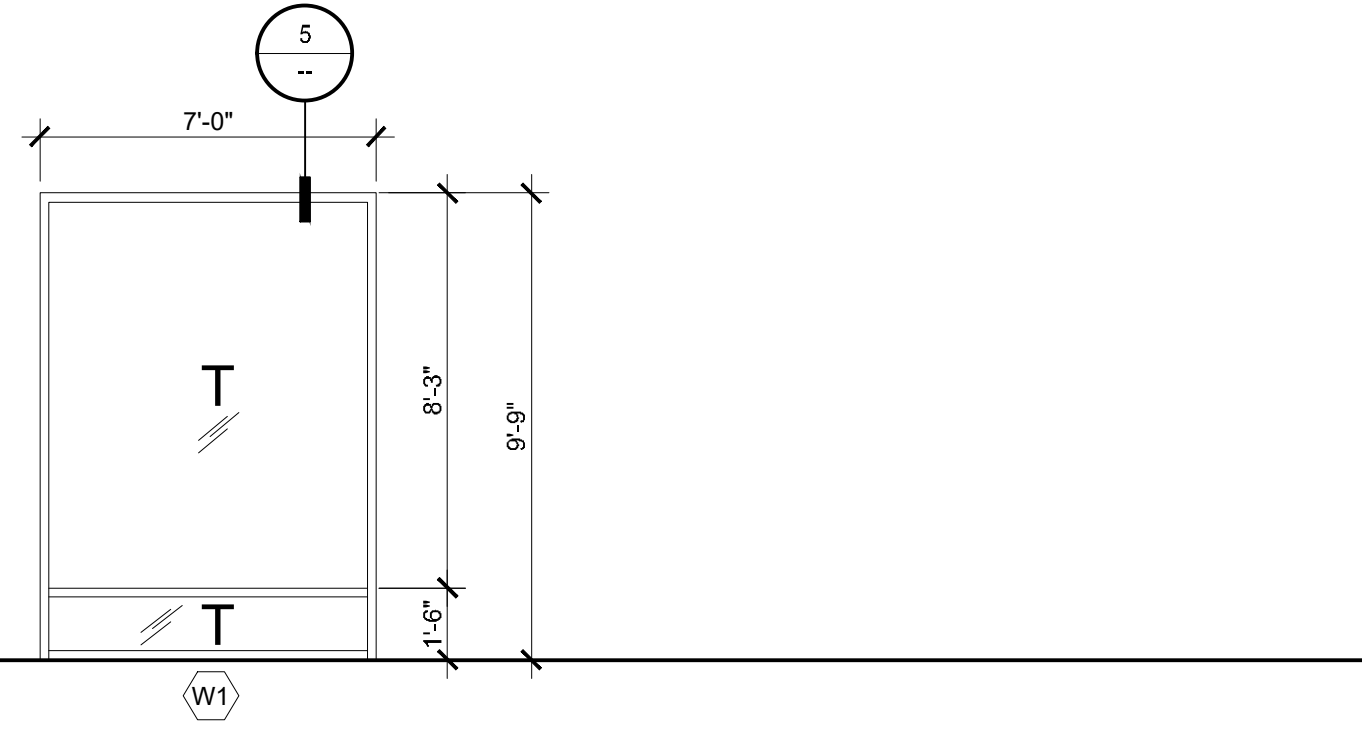
Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN

A601

WINDOW SCHEDULE

WINDOW TYPE	WIDTH	HEIGHT	SILL HEIGHT	FRAME MATERIAL	FUNCTION	FRAME TYPE	LABEL	GLAZING	DETAIL			REMARKS
									HEAD	JAMB	SILL	
W1	7'-0"	9'-9"	0'-0"	ALUM	FIXED	--	--	DBL-LOW E	5'-	5'-	4'-	

WINDOW & FRAME TYPES:



ABBREVIATIONS

NOTE	EXPLANATION
T	TEMPERED GLASS
HM	HOLLOW METAL
PNT	PAINT
GL	GLASS
SS	STAINLESS STEEL
FF	FACTORY FINISH
PH	PANIC HARDWARE
MTL	METAL
STL	STEEL
SW	SOLID WOOD
ALUM	ALUMINUM

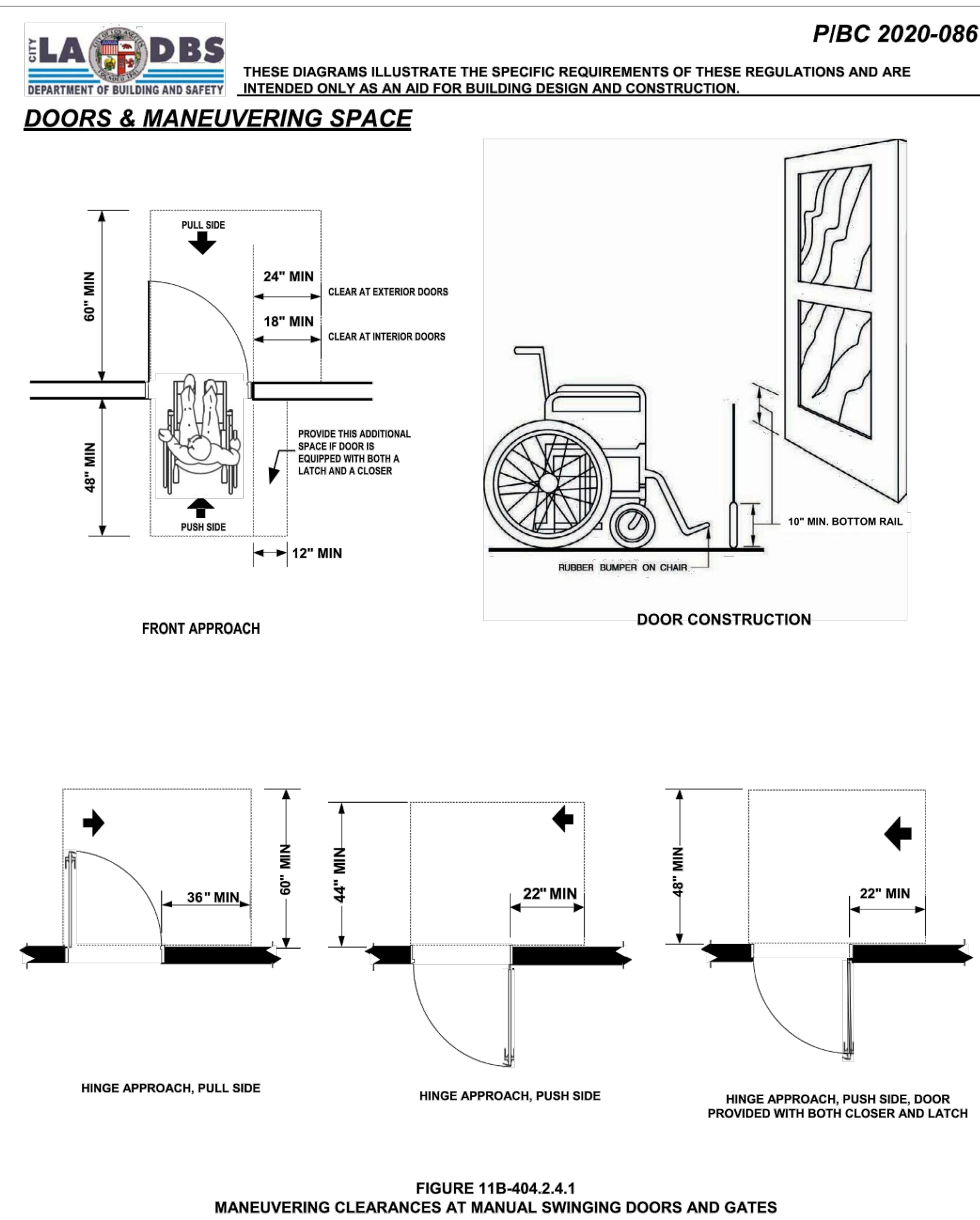
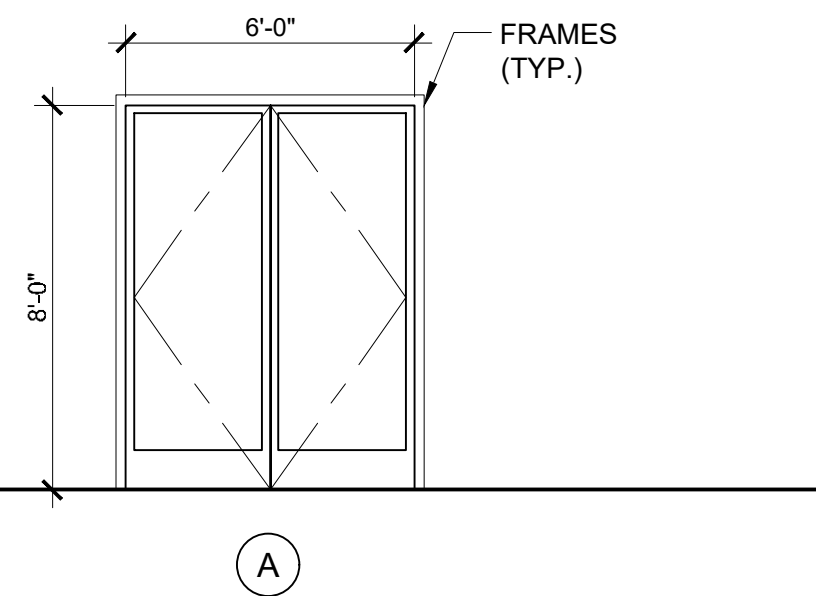
NOTES:

- REFER TO SPECIFICATION SECTION 087100 FOR LIST OF HARDWARE SETS.
- RE: EMERGENCY EXIT AND PANIC HARDWARE:
 - THE CROSS-BAR SHALL EXTEND ACROSS NOT LESS THAN ONE-HALF THE WIDTH OF THE DOOR/GATE.
 - THE ENDS OF THE CROSS-BAR SHALL BE CURVED, GUARDED OR OTHERWISE DESIGNED TO PREVENT CATCHING ON THE CLOTHING OF PERSONS DURING EGRESS.

DOOR SCHEDULE

DOOR NO.	ROOM NAME	DOOR										DOOR NO.							
		TYPE	WIDTH	HEIGHT	THICKNESS	MATERIAL	FINISH	DOOR & FRAME LABEL (RATING IN MINS)	MATL	FINISH	HARDWARE SET		HEAD	JAMB	SILL	SOUND DOOR STC RATING	PANIC HARDWARE	SECURITY HARDWARE	NOTES
1/200	RECEPTION	A	6'-0"	8'-0"	PER MFR.	GL	FF	--	ALUM	FF	#001	2/-	2/-	1B/-	--	PH	Y	EXTERIOR - ELECTRONIC HDWR FOR SINGLE POINT OF ENTRY	1/200

DOOR & FRAME TYPES:



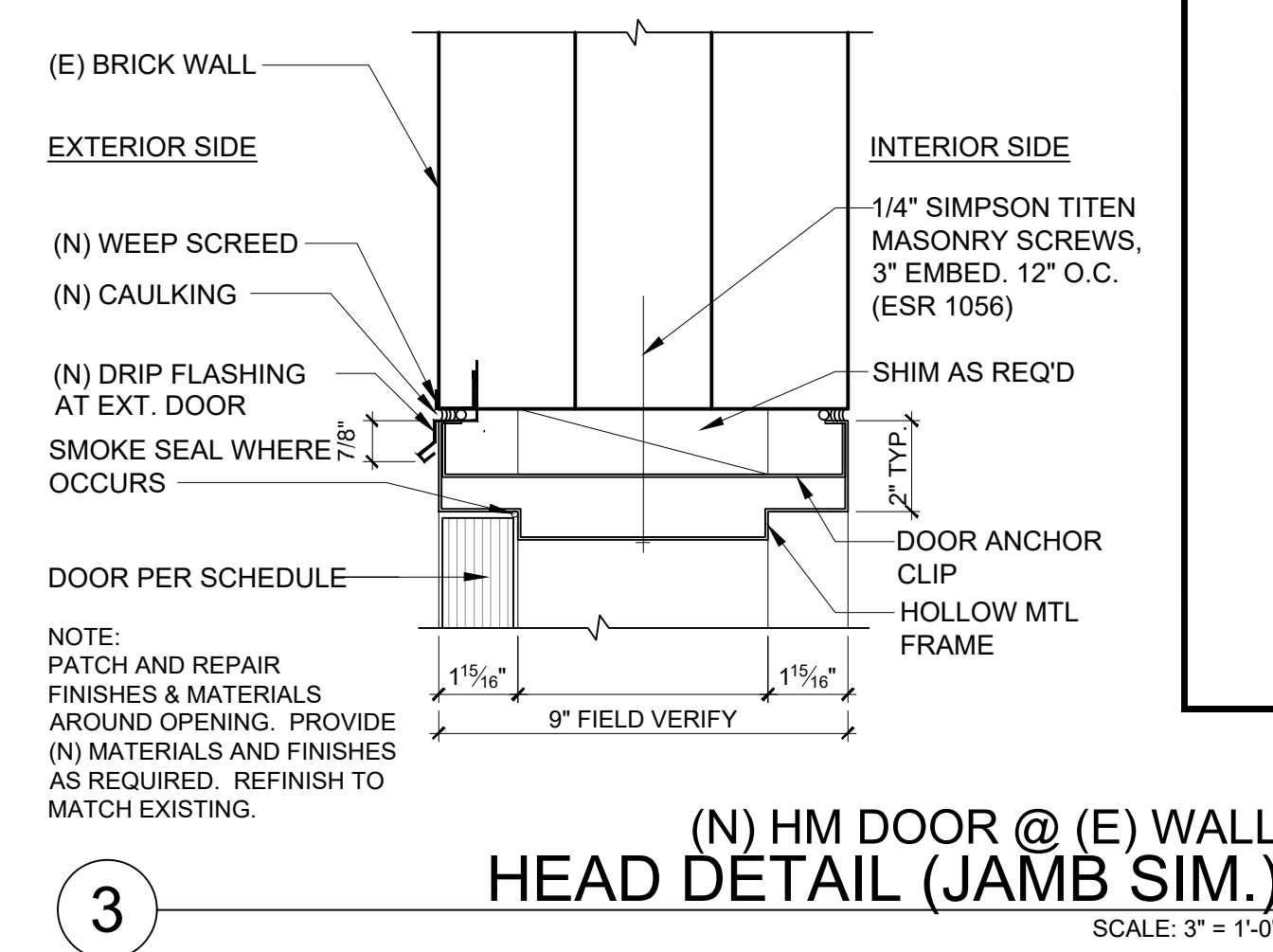
As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

City of Los Angeles, Department of Building & Safety
DISABLED ACCESS APPROVED PLANS

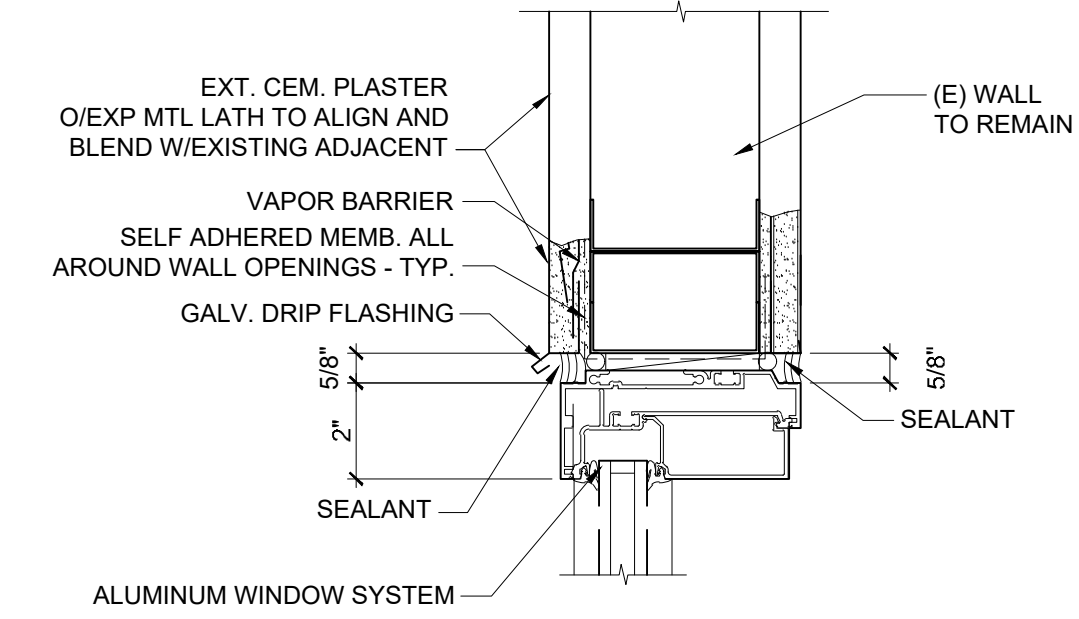
By: **NORLITO MEDRANO, CASp** Date: **01/29/2024**

Application No./Permit No.: **23010-20000-04364**

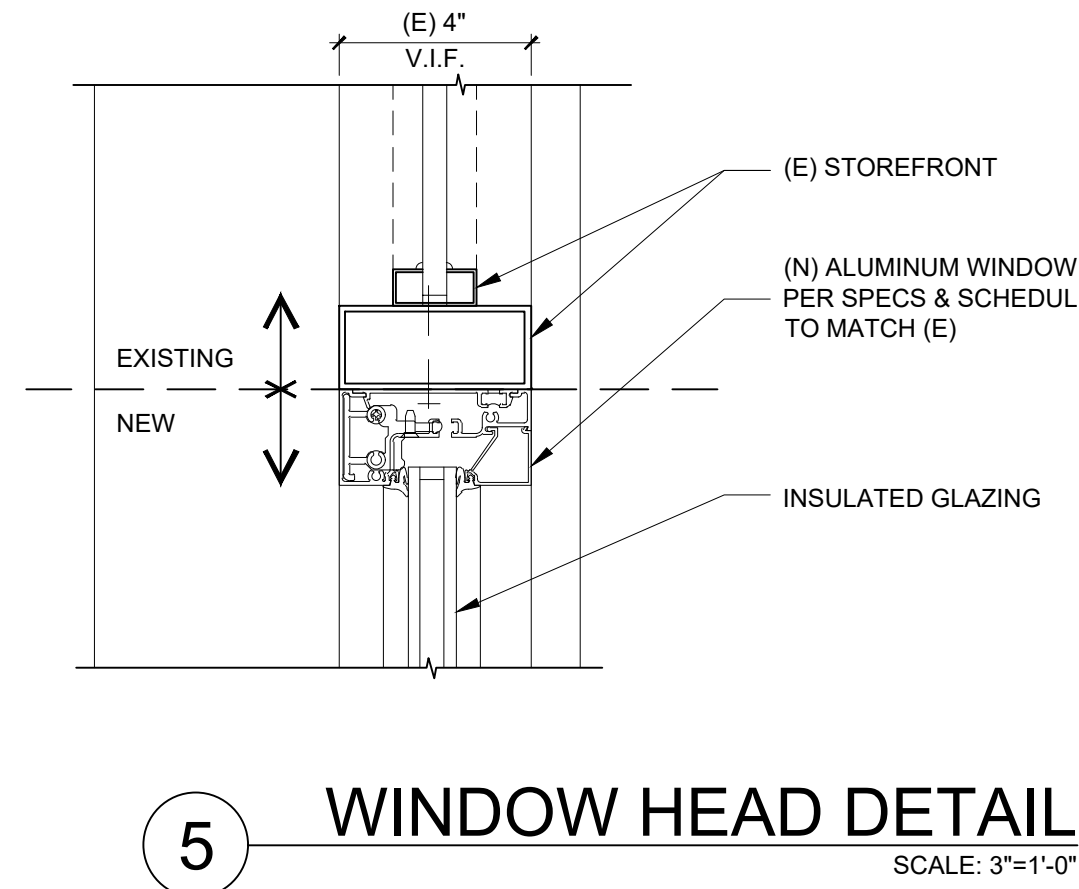
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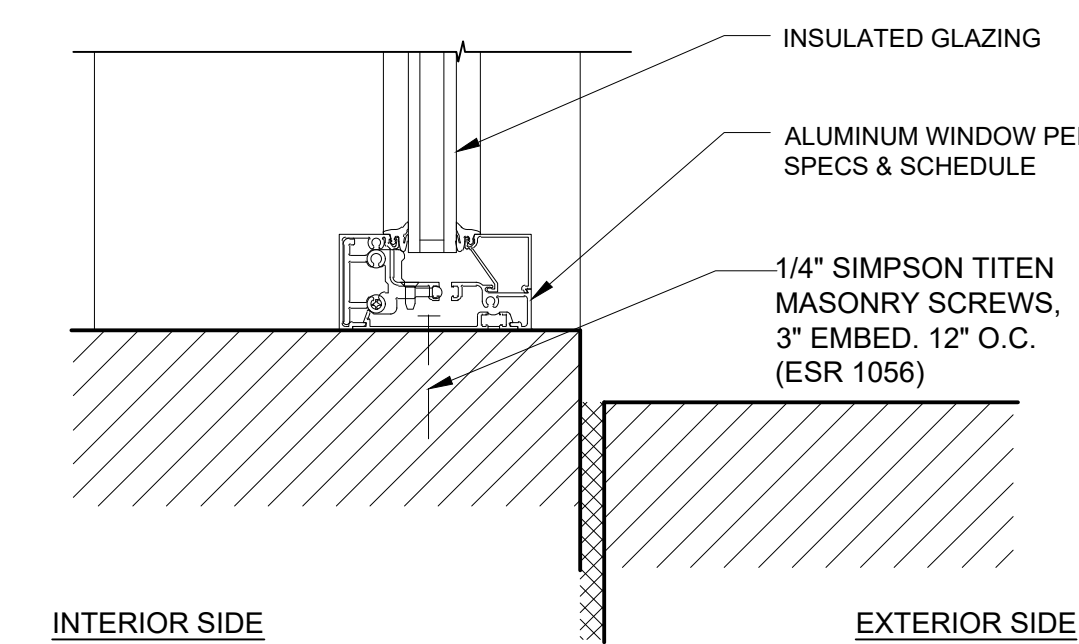
3 (N) HM DOOR @ (E) WALL HEAD DETAIL (JAMB SIM.)
SCALE: 3"=1'-0"



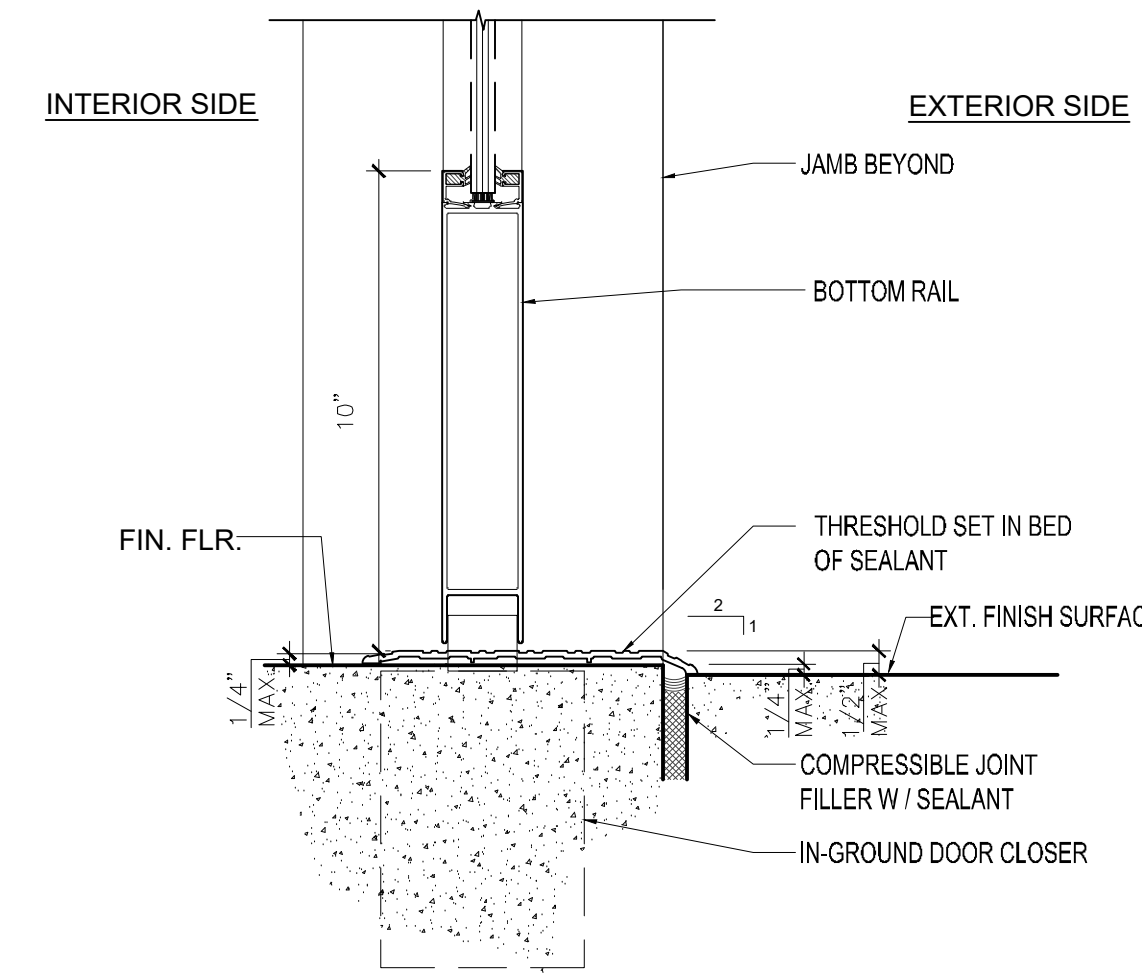
2 STOREFRONT DOOR HEAD/JAMB DETAIL
SCALE: 3"=1'-0"



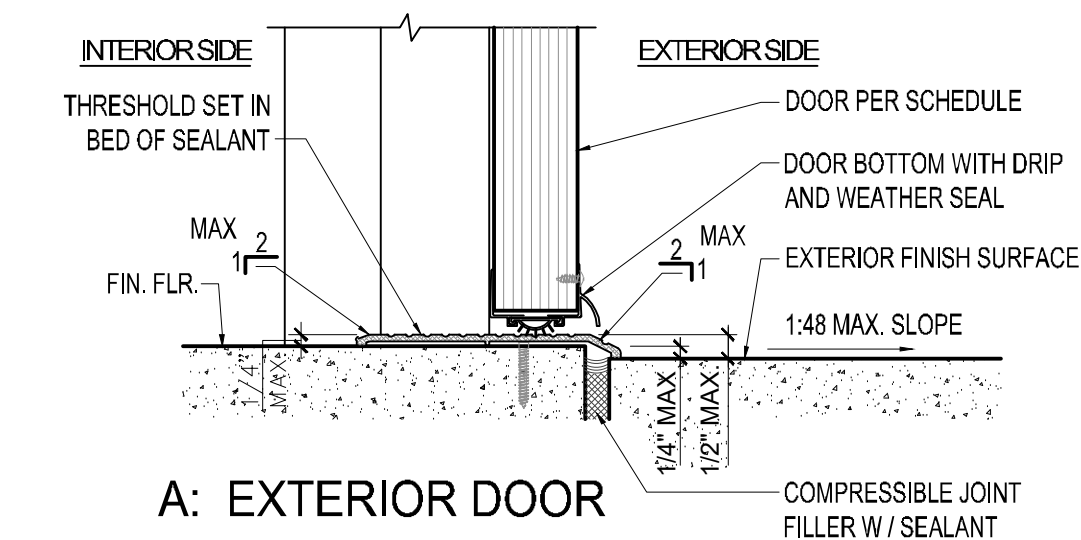
5 WINDOW HEAD DETAIL
SCALE: 3"=1'-0"



4 WINDOW SILL DETAIL
SCALE: 3"=1'-0"



B: EXTERIOR STOREFRONT DOOR



A: EXTERIOR DOOR

1 THRESHOLD DETAILS
SCALE: 3"=1'-0"

GENERAL NOTE:

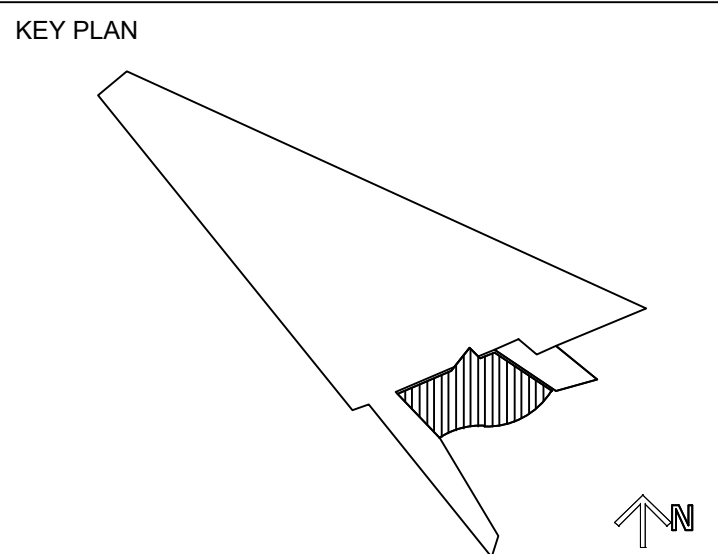
- FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OF WINDOW UNITS.
- FRAMES FOR TRANSOM PANELS SHALL BE INCORPORATED WITH FRAME FOR DOORS. COORDINATE WITH DOOR SCHEDULE.
- ALL GLAZING IS CLEAR.
- ALL EXTERIOR GLAZING IS CLEAR LOW E DOUBLE.
- OPERABLE PART OF WINDOW SHALL BE 48" MAX. AFF AND 44" MAX. AFF AT OBSTRUCTION.

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/26/24

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Architecture & Planning
John Fisher AIA



Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040

Drawing Title: **DOOR / WINDOW SCHEDULES & DETAILS**

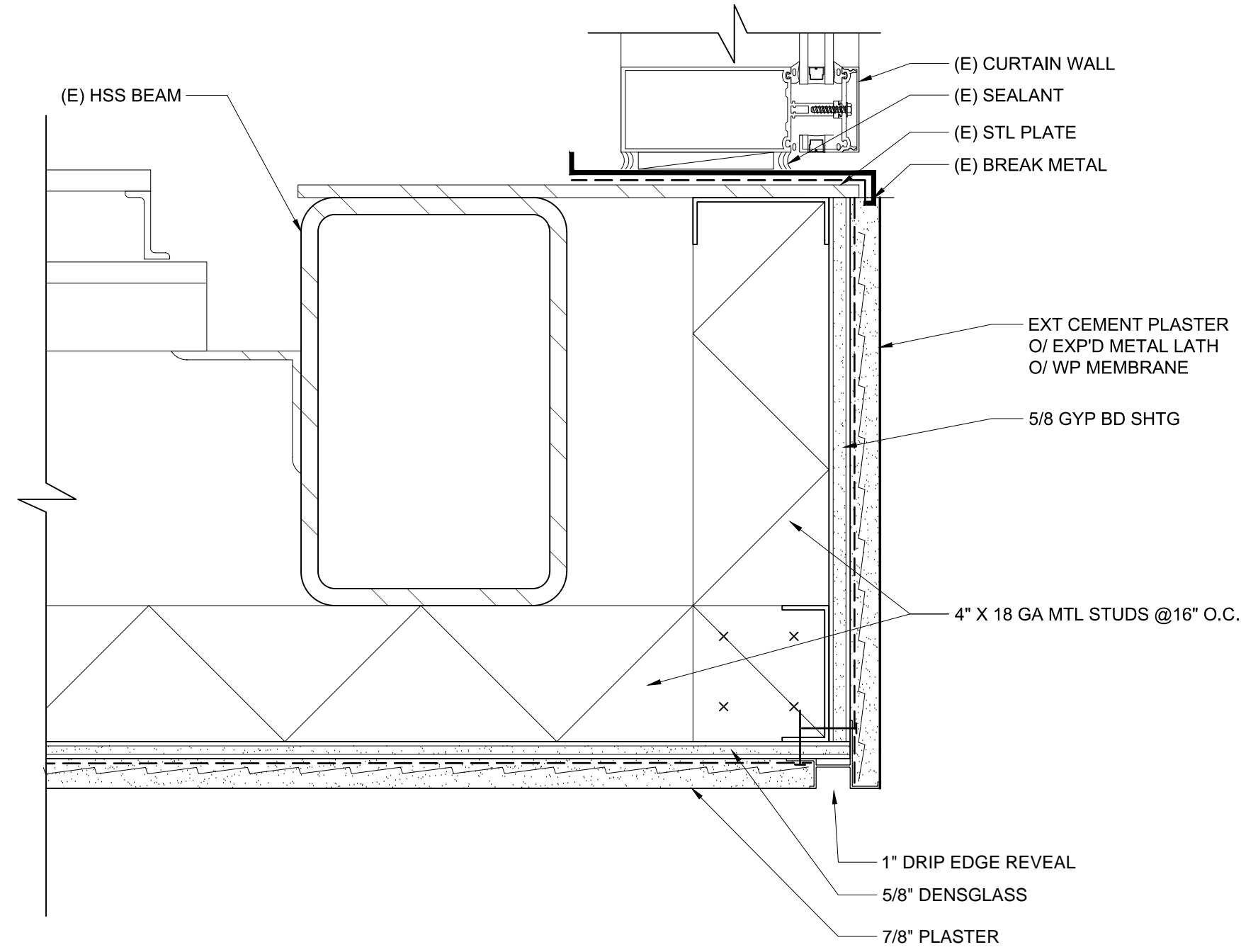
Project No.: 2209

Phase: CONSTRUCTION DOCUMENTS

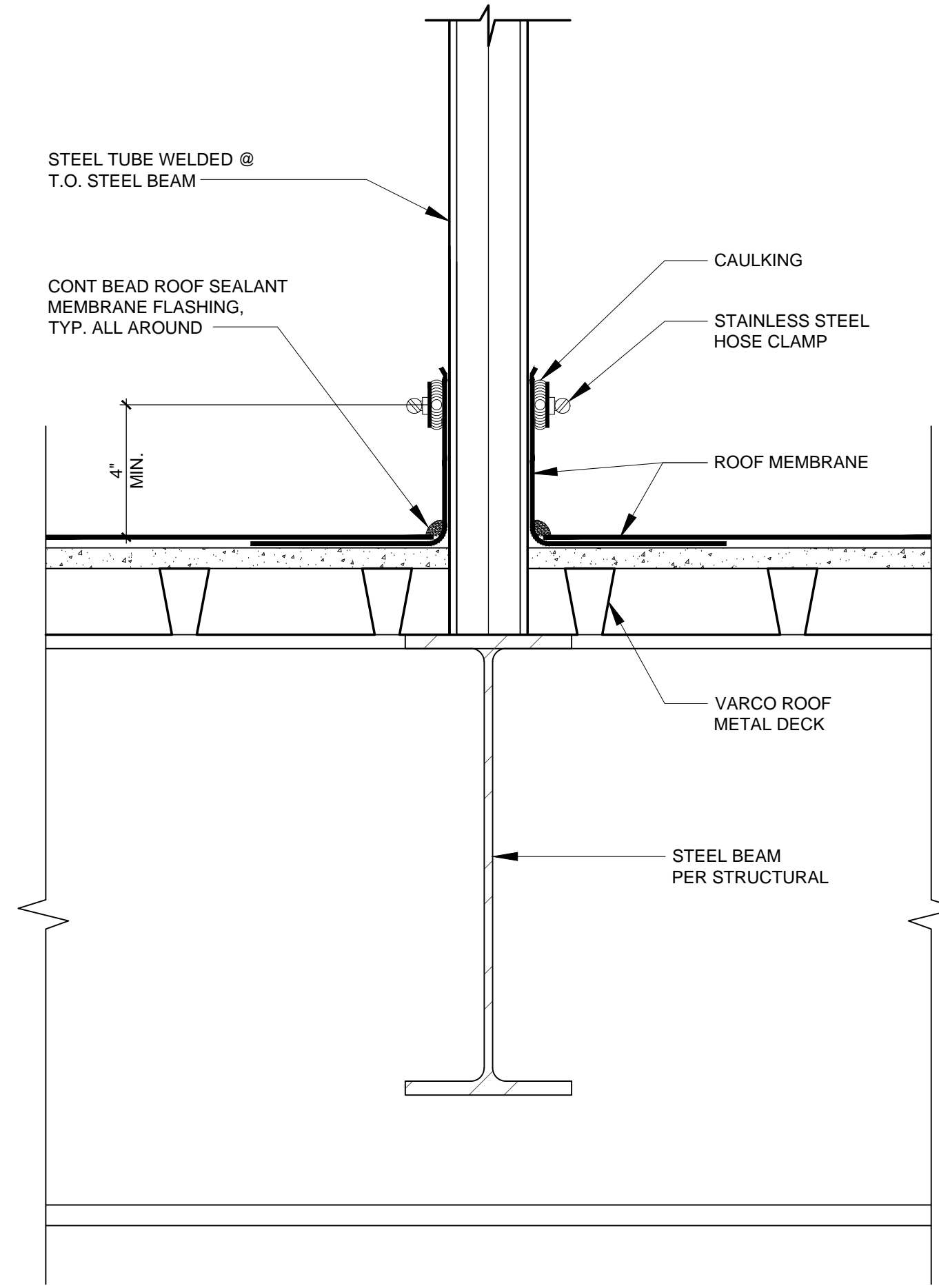
Date: SEPTEMBER 29, 2023

Scale: AS SHOWN

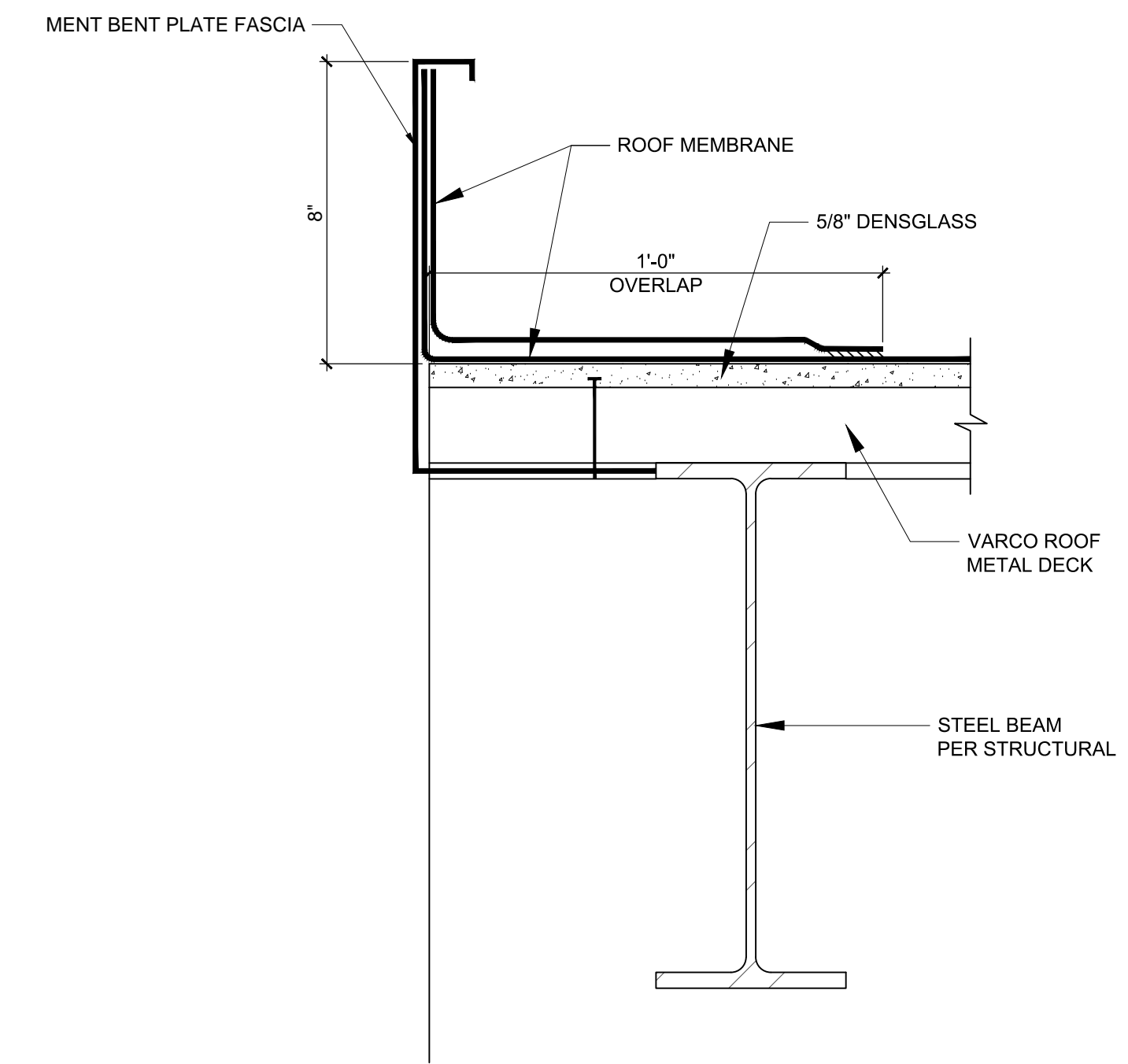
A701



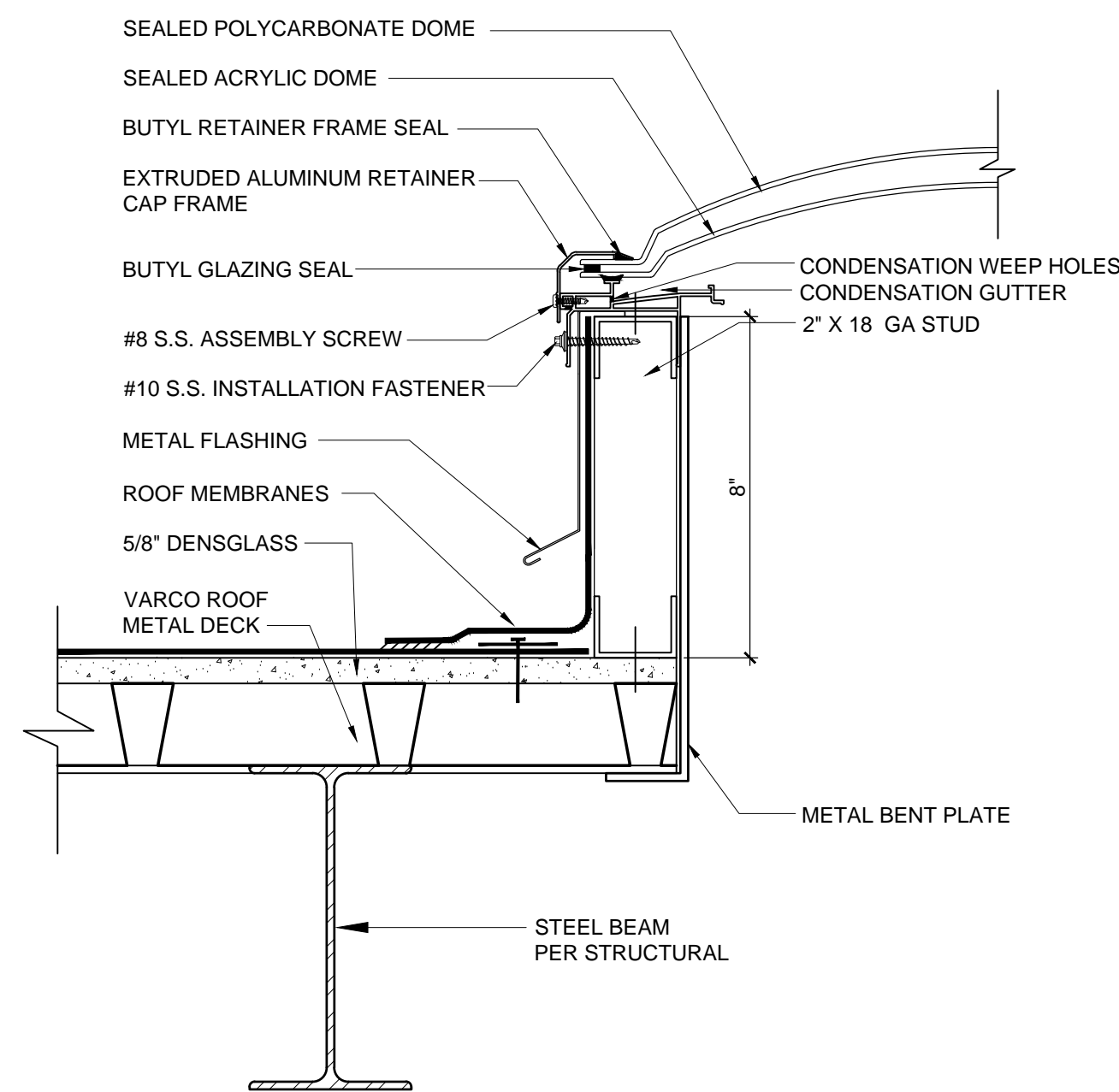
6 REF: 2/A410 **EXTERIOR SOFFIT DETAIL** SCALE: 3"=1'-0"



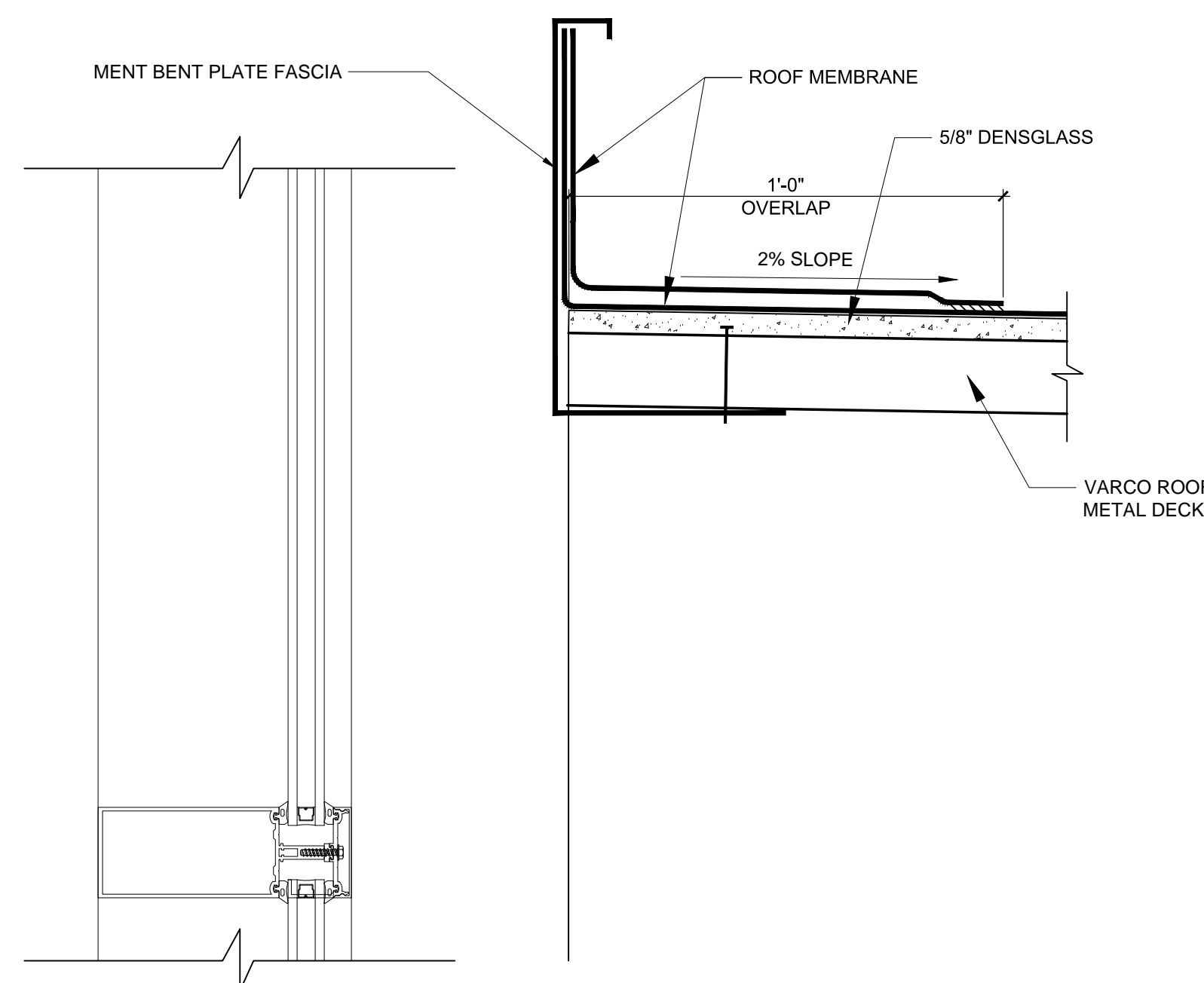
4 REF: 1/A410 **SIGNAGE DETAIL** SCALE: 3"=1'-0"



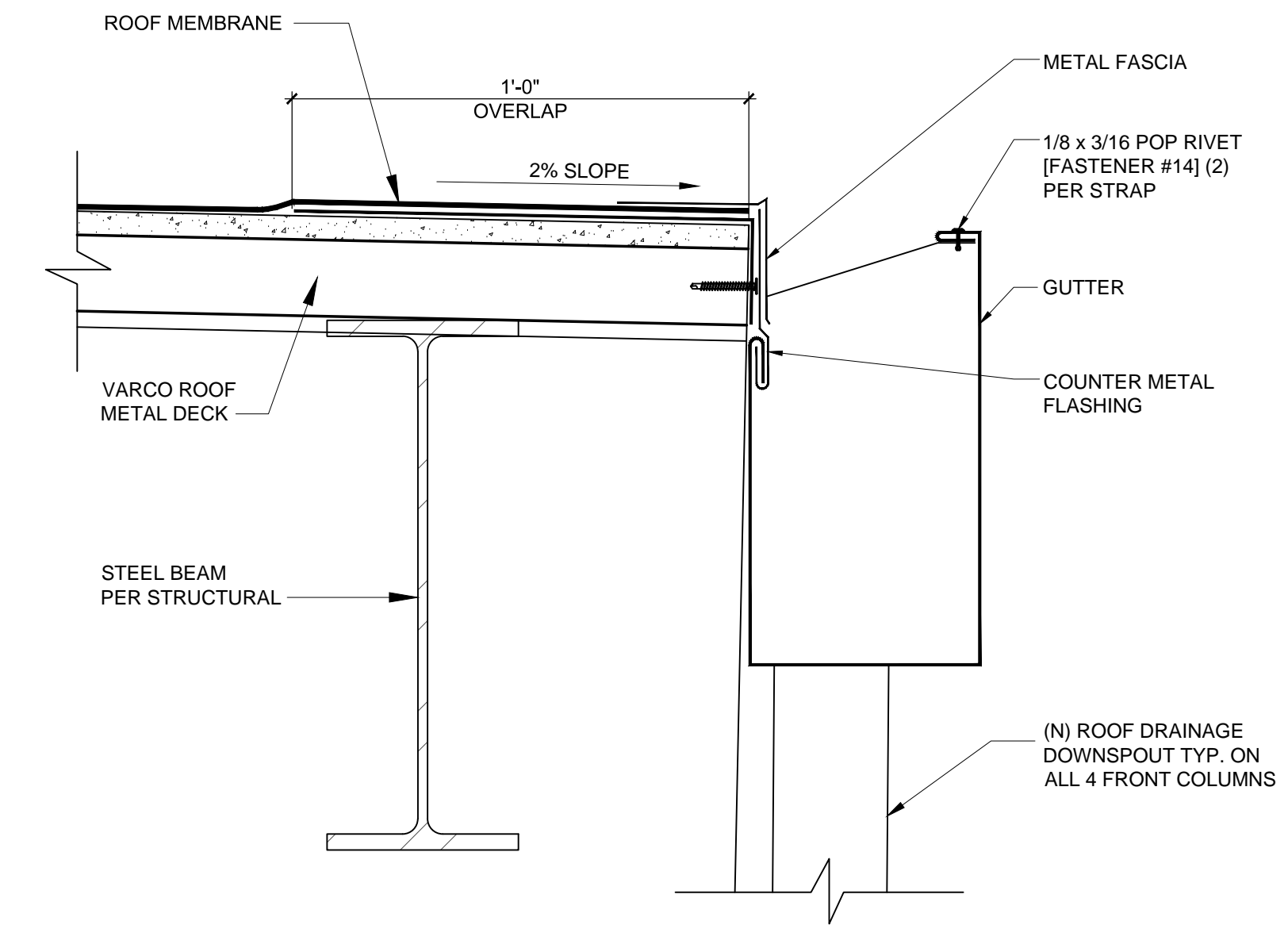
2 REF: 2/A410 **ROOF DETAIL** SCALE: 3"=1'-0"



5 REF: 1/A211-A **SKYLIGHT DETAIL** SCALE: 3"=1'-0"



3 REF: 2/A410 **ROOF DETAIL** SCALE: 3"=1'-0"



1 REF: 1/A410 **GUTTER DETAIL** SCALE: 3"=1'-0"

NOTES

SUBMITTALS:

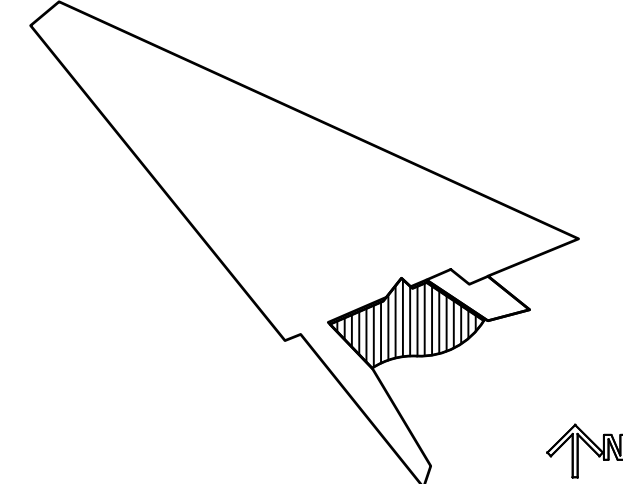
NO.	DESCRIPTION	DATE
1	LADRS RESUBMITTAL	1/24/2024
2	LADRS RESUBMITTAL	2/22/2024

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KEY PLAN



Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
DETAILS

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

ICC-ES Evaluation Report

ESR-1463


Revised October 2023
Revised January 18, 2024

This report also contains:
- CBC Supplement
- LABC Supplement

Subject to renewal October 2025

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<p>DIVISION: 07 00 00 — THERMAL MOISTURE AND PROTECTION</p> <p>Section: 07 53 23 — Ethylene-Propylene-Diene-Monomer Roofing</p> <p>Section: 07 54 19 — Polyvinyl-Chloride Roofing</p> <p>Section: 07 54 23 — Thermoplastic-Polyolefin Roofing</p>	<p>REPORT HOLDER: CARLISLE SYNTEC SYSTEMS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC</p> <p>ADDITIONAL LISTEE: MULE-HIDE PRODUCTS COMPANY, INC.</p> <p>VERSICO, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC</p> <p>WEATHERBOND, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC.</p> <p>ROOFING PRODUCTS INTERNATIONAL, INC.</p>	<p>EVALUATION SUBJECT: CARLISLE EPDM, PVC AND TPO SINGLE-PLY ROOFING MEMBRANES</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012 and 2009 *International Building Code® (IBC)*
- 2021, 2018, 2015, 2012 and 2009 *International Residential Code (IRC)*
- 2013 *Abu Dhabi International Building Code (ADIBC)*

*The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-1463 LABC and LARC Supplement.

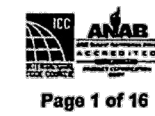
Properties evaluated:

- Weather resistance
- Roof covering fire classification
- Wind uplift resistance
- Impact resistance

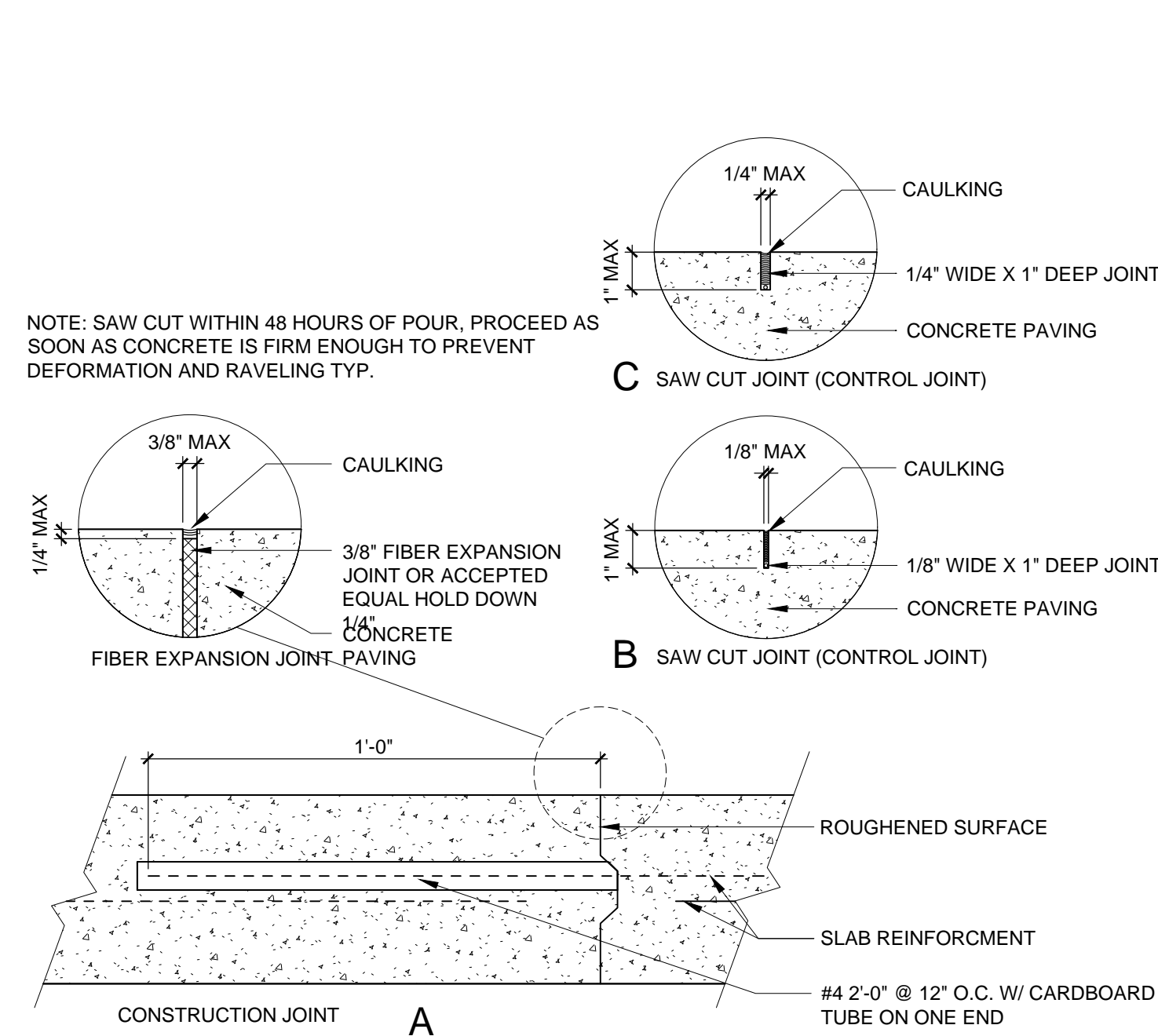
2.0 USES

Carlisle ethylene propylene diene monomer (EPDM), polyvinyl chloride (PVC) and thermoplastic polyolefin (TPO) single-ply roofing membranes are used as roof coverings in adhered and mechanically fastened membrane roofing systems.

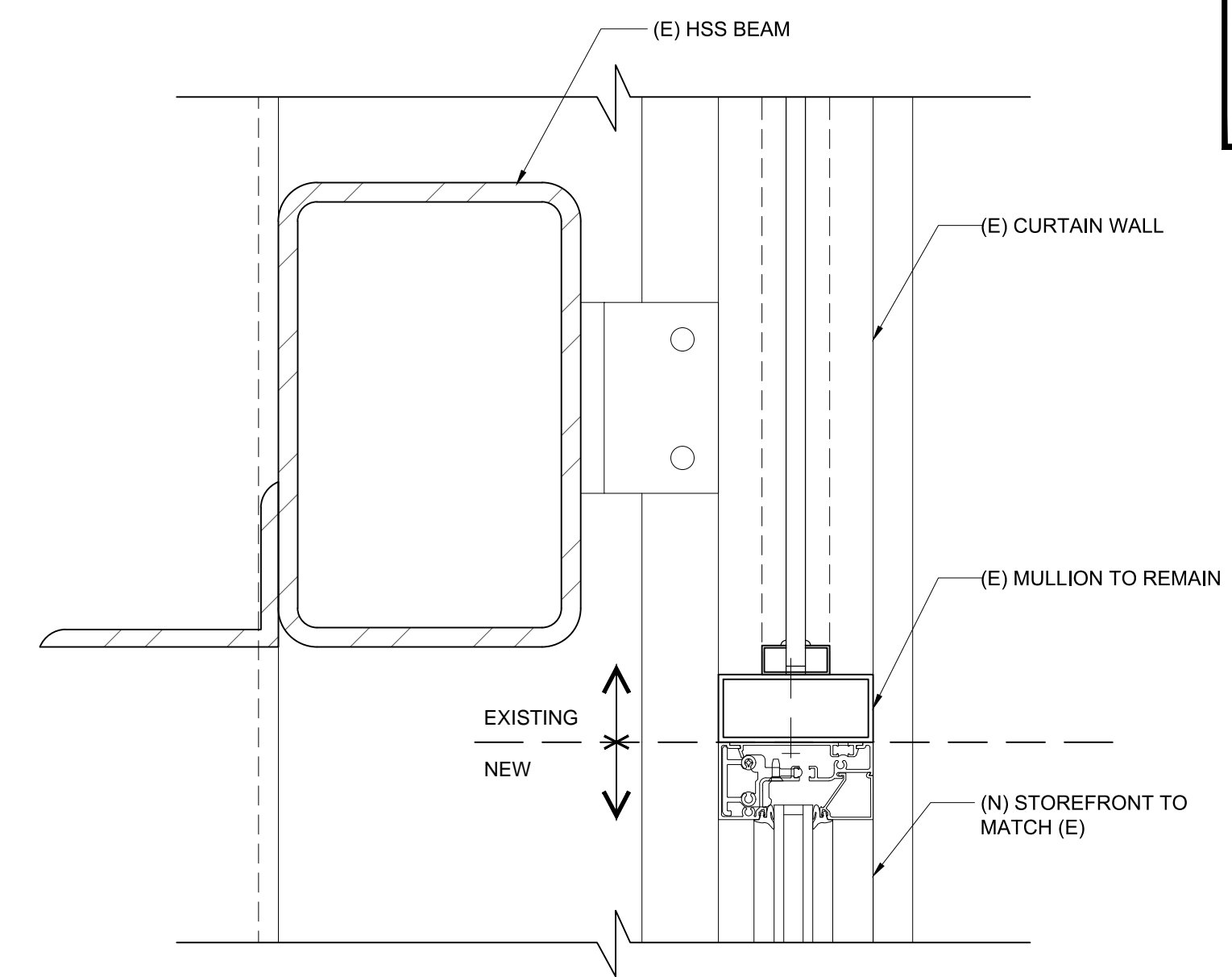
ROOF MEMBRANE ICC REPORT



Page 1 of 16



4 CONCRETE PAVING JOINT DETAIL SCALE: 3"=1'-0"



2 CURTAIN WALL DETAIL REF: 3/A410 SCALE: 3"=1'-0"

ICC-ES Evaluation Report

ESR-4108


Revised December 2023

This report also contains:
- CBC Supplement
- FBC Supplement

Subject to renewal December 2024

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<p>DIVISION: 08 00 00 — OPENINGS</p> <p>Section: 08 62 00 — Unit Skylights</p>	<p>REPORT HOLDER: VELUX AMERICA LLC</p>	<p>EVALUATION SUBJECT: VELUX® DYNAMIC DOME SKYLIGHTS</p>	
--	--	---	---

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2021, 2018, 2015 and 2012 *International Building Code® (IBC)*
- 2021, 2018, 2015 and 2012 *International Residential Code® (IRC)*

Properties evaluated:

- Structural
- Air infiltration
- Water penetration resistance
- Durability

1.2 Evaluation to the following green standard:

- 2020, 2015 and 2012 *ICC 700 National Green Building Standard™ (ICC700-2020, ICC 700-2015 and ICC 700-2012)*

Attributes verified:

- See Section 2.0.

2.0 USES

The VELUX Dynamic Dome Skylights are non-operable plastic-glazed unit skylights complying with IBC Sections 2405 and 2610 and IRC Section R308.6.

The attributes of the skylights have been verified as conforming to the requirements of (I) ICC700-2020 Section 701.4.3.4 and 11.701.4.3.4; ICC 700-2015 Section 701.4.3.3 and 11.701.4.3.4; and ICC 700-2012 Section 701.4.3.3 and 11.701.4.3.3 for fenestration air leakage. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.0 DESCRIPTION

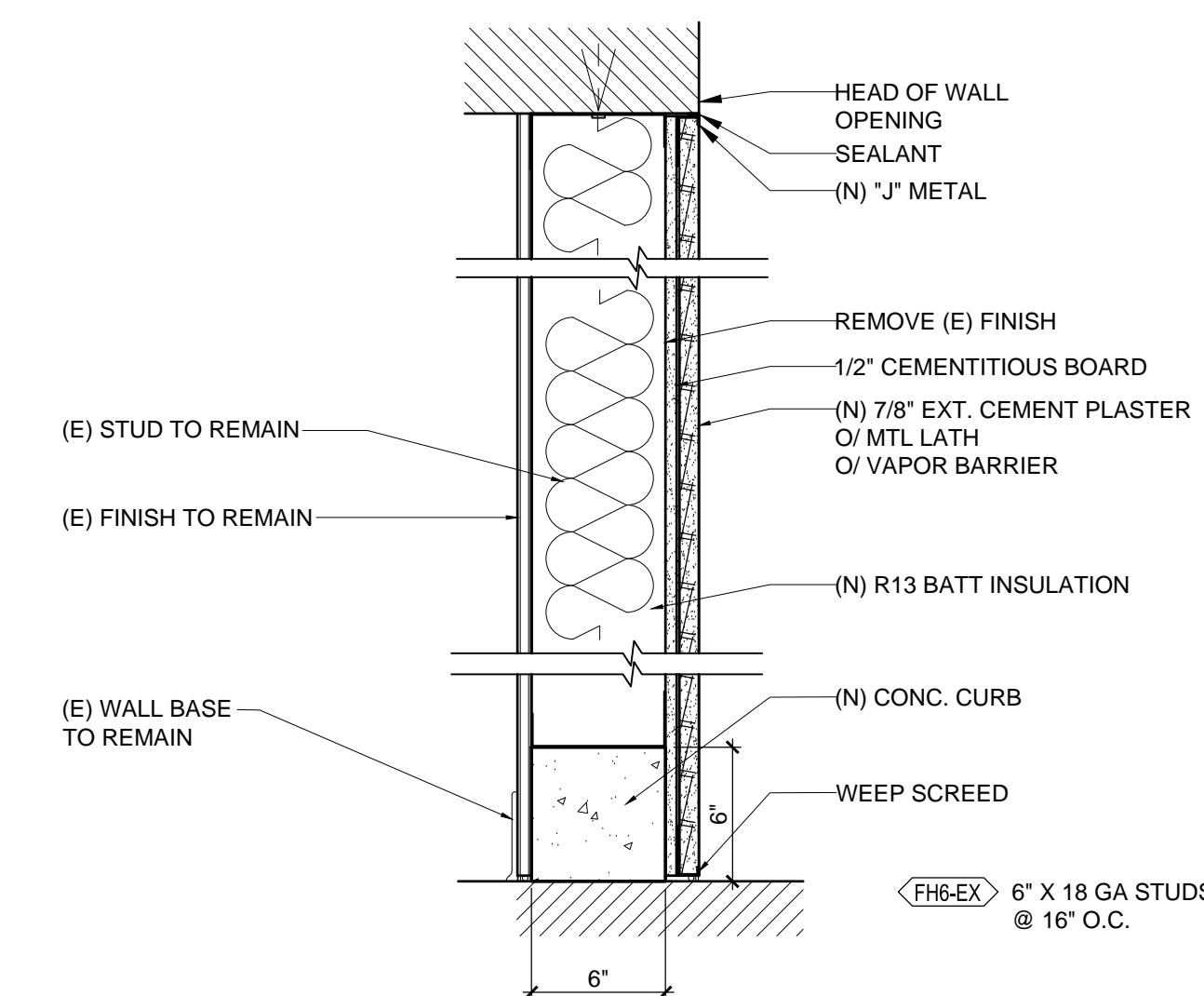
3.1 Single Dynamic Domes:

The VELUX CDS Single Dynamic Domes consist of a single geometric-shaped plastic dome factory-attached to an aluminum extruded frame with an aluminum extruded retainer cap.

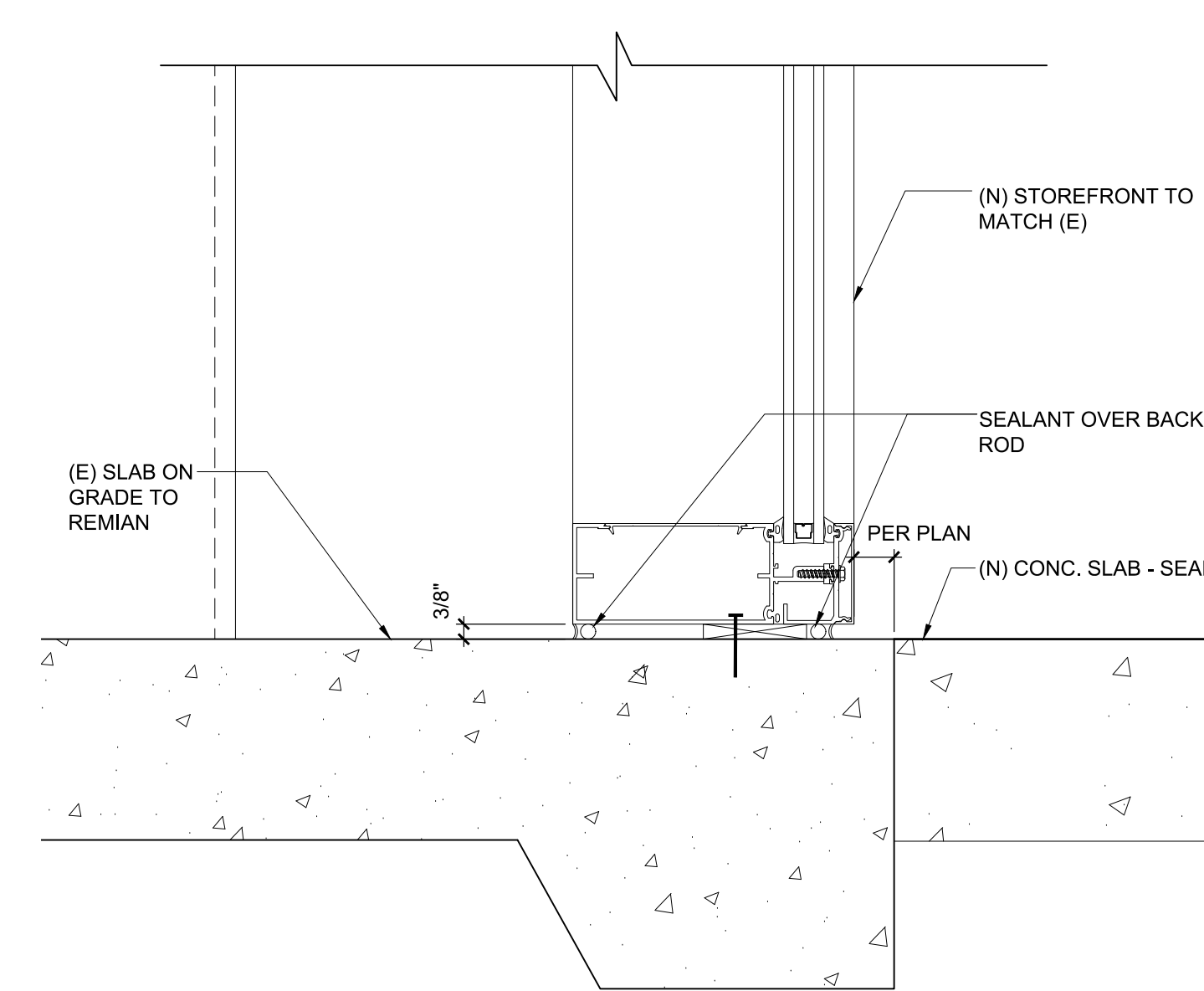
SKYLIGHT ICC REPORT



Page 1 of 8



3 DETAIL @ (E) WALL REF: 1/A201 SCALE: 1 1/2"=1'-0"



1 CURTAIN WALL DETAIL REF: 3/A410 SCALE: 3"=1'-0"

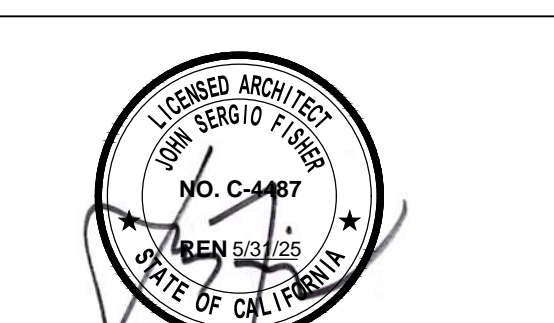
NOTES

SUBMITTALS:

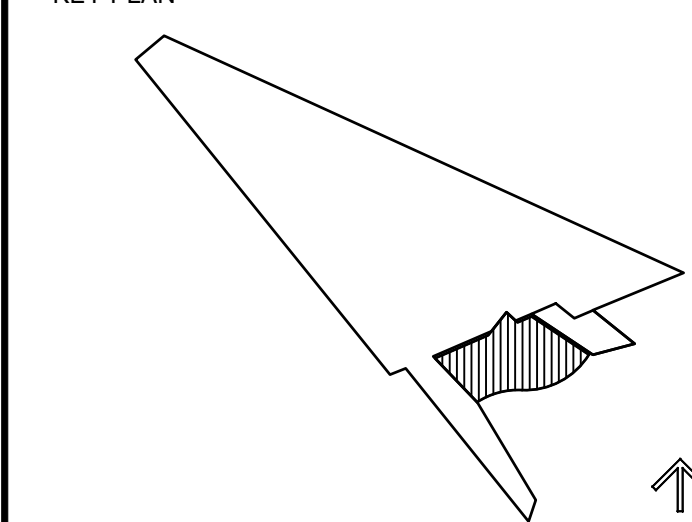
NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	1/24/2024
2	LADBS RESUBMITTAL	2/22/2024

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Architecture & Planning
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KEY PLAN



Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA 91040
Drawing Title
DETAILS & ICC REPORTS

Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN

A811

GENERAL NOTES

POST-INSTALLED ANCHORS AND DOWELS

1. Provide the following post-installed anchors and dowels including expansion anchors, epoxy anchors/dowels and screw anchors:
 - A. Expansion anchors in concrete shall be one of the following or approved equal. UNO:
HILTI KWIK BOLT T22 (ICC ESR-4266) LABC
SIMPSON STRONG-BOLT 2 (ICC ESR-3037) LABC
 - B. Epoxy anchors and dowels in concrete shall be the following or approved equal. UNO:
HILTI HIT-HY 200 A/R V3 (ICC ESR-4868) LABC
HILTI HIT-RE 500 V3 (ICC ESR-3814) LABC
SIMPSON SET-XP (ICC ESR-2508) LABC
SIMPSON SET-3G (ICC ESR-4057) LABC
 - C. Screw anchors in concrete shall be the following or approved equal. UNO:
HILTI KH-EZ (ICC ESR-3027) LABC
SIMPSON TITEN HD (ICC ESR-2713) LABC

FOUNDATIONS

1. Foundation design is based on recommendations in Geotechnical Report no. TET 21-220E prepared by Tetra Tech, dated November 19, 2021, and subsequent addenda letters dated September 27, 2023. Perform foundation work complying with report and addenda. Geotechnical Report and addenda are part of the contract documents and shall be kept on the job site at all times.
2. Pile foundation with 24"x 8'-0" min. length design is based on geotechnical engineer requirements.
3. Carousel spread footing foundation design is based on a bearing capacity of 2500 psf with a 33% increase for seismic or wind loading for miscellaneous continuous wall footings at least 18 inches wide but less than 4 ft wide.
4. Design lateral bearing pressure is 165 psf/ft with a 33% increase for seismic or wind loading and a 200% increase for isolated pole type footings.
5. Construct bottom of footings a minimum of 24 inches below adjacent grade or finish floor, whichever is lower.
6. Construct miscellaneous footings and slab-on-grade over compacted fill or undisturbed
7. Foundation excavations shall be observed by and acceptable to the Geotechnical Engineer prior to placement of fill, reinforcing steel, or concrete.
8. Perform filling, backfilling, compaction, etc., as indicated in Geotechnical Report and under the supervision of the Geotechnical Engineer.

DRILLED PILES

1. Perform drilling by persons or firms regularly engaged in such work.
2. Maximum variation of the center of any shaft from the required location shall be 2 inches and no caisson shall be out of plumb more than 2%.
3. Fill shaft excavations with concrete as soon after drilling as possible. Do not leave holes open overnight.
4. Inspector and Geotechnical Engineer shall be continuously present during drilling operations and placing of reinforcing and concrete.
5. Geotechnical Engineer shall submit a written certification to Governing Code Authority and Architect (Structural Engineer) that work observed complies with conditions of Geotechnical Report, drawings and Specifications.
6. See Cast-In-Place Concrete and Reinforcing Steel sections for remainder of concrete and reinforcing steel requirements.

CAST-IN-PLACE CONCRETE

1. All concrete work to conform to CBC Chapter 19.
2. Provide normal weight aggregates of natural sand and rock complying with ASTM C33 (aggregate size).
3. Provide Portland Cement conforming to ASTM C150, Type II.
4. Provide normal weight concrete (145 pcf), with proven shrinkage characteristics not exceeding 0.05% for foundations, 0.045% for conventionally reinforced slabs/beams, walls and columns, and 0.04% for post-tensioned slabs/beams, and attaining minimum compressive strengths at 28 days (f_c) as follows, unless noted otherwise:

Piles/pilecaps	5000 psi
Slabs on grade	3000 psi
Other concrete UNO	3000 psi
5. Provide lean concrete, where specifically indicated, containing 2 sacks of cement per cubic yard of concrete.
6. Submit concrete design mix data for each type and compressive strength of concrete specified signed by and bearing the seal of a registered Civil Engineer in state to Architect (Structural Engineer). Concrete design mix shall comply with ACI 318-14 Section 26.4.3.
7. Submit shop drawings to Architect (Structural Engineer) indicating locations of concrete construction joints for review prior to placing concrete. Locate joints at locations to minimize effects of shrinkage as well as being placed at points of low stress and shall comply with ACI 318, Section 26.5.6.
8. Slump shall not exceed 4 (+/- 1) inches. Slump shall not exceed 4" (+0", -1") inches for slab on grade, walls, slab on metal deck and suspended slab.
9. Do not use concrete or grout containing chlorides.
10. Provide keys in construction joints unless detailed otherwise. Thoroughly clean, remove laitance, and thoroughly wet and remove standing water in construction joints before placing new concrete. For horizontal construction joints that are not keyed, the surface shall be cleaned and roughened, exposing clean aggregate solidly embedded in the mortar matrix.
11. Roughen existing concrete surface to a full amplitude of 1/16 inch where existing concrete abuts new concrete.
12. Perform concrete work in compliance with ACI 301.
13. Maintain concrete above 50 degrees Fahrenheit and in a moist condition for a minimum of 7 days after placement unless otherwise accepted by Architect (Structural Engineer).
14. Slab on grade is not designed as a structural diaphragm.

GENERAL (Cont'd)

13. Modifications or substitutions may be considered provided a written request, subject to review, is submitted to Architect (Structural Engineer) prior to its use, installation in the field, or inclusion on any shop drawing. Costs associated with review, approval and installation shall be borne by Contractor.
14. Shop drawing submittals:
 - A. Contractor shall review for completeness and compliance with contract documents and stamp shop drawings documenting this review prior to submission.
 - B. Submit shop drawings to Architect (Structural Engineer) for review. Do not commence fabrication until review process is completed.
 - C. When an engineer is required to sign and stamp shop drawings and calculations, the seal shall indicate that the engineer is registered where project occurs.
 - D. Shop drawings are not a part of contract documents and all reviews are for general conformance with design intent only. Architect's (Structural Engineer's) review does not constitute an authorization to deviate from the contract documents or the building code.
 - E. Shop drawings will be rejected for incompleteness, lack of coordination with other portions of contract documents, lack of calculations (if required), or where modifications or substitutions are indicated without prior review.
 - F. Submit shop drawings and calculations to Governing Code Authority when specifically indicated or requested.
 - G. Maintain a copy of all shop drawings reviewed by Architect (Structural Engineer) at site during construction period.
 - H. Structural Engineer requires 10 working days after receipt of shop drawings
15. Install and anchor mechanical and electrical and plumbing equipment to structure complying with ASCE/SEI 7-16, Chapter 13. Isolators, fasteners and any other element providing stability for equipment shall be approved by LA City Research Report or equivalent testing procedure and be capable of transmitting code required lateral loads. Provide suspended equipment with approved lateral or sway bracing.
16. The DWG files and/or BIM (Building Information Model) are the property of the Structural Engineer and will not be released to the Contractor or subcontractor for their use.
17. Submit deferred submittal/design-build items to the Architect (Structural Engineer) for review. After review, submit deferred submittal/design-build items to the Governing Code Authority for approval prior to installation. The following is a list of deferred submittal/design-build items:
 - A. Equipment anchorage
18. All abbreviations of referenced standards are per CBC Chapter 35.
19. Contractors responsible for the construction of wind or seismic force resisting system/component listed in the "Statement of Special Inspection" shall submit a written statement of responsibility to the governing code authority and the Owner prior to the commencement of work on such system or component per CBC1704.4.

REINFORCING STEEL

1. Provide reinforcing steel complying with ASTM A615, Grade 60.
2. Splice reinforcing steel where indicated. If splice locations are not specifically shown or indicated, verify splice locations with Architect (Structural Engineer) prior to preparing reinforcing steel shop drawings.
3. Lap reinforcing steel at splices to lengths indicated.
4. Minimum clear distances between reinforcing steel, including spliced reinforcing steel, shall be 1" or 1 bar diameter, whichever is greater. For bundled bars, minimum clear distances between units of bundled bars shall be same as single bars except bar diameter is derived from equivalent total area of bundle.
5. Maintain the following minimum clear distances between reinforcing steel and face of concrete unless noted otherwise:

Slabs on grade	(center of slab)
Concrete below grade, formed	2"
Concrete below grade, unformed	3"
6. Reinforcing chairs shall be plastic or plastic coated when resting on exposed surfaces.
7. Provide dowels for walls matching vertical reinforcing size and spacing, unless noted otherwise.
8. Provide reinforcing steel and reinforcing steel to be welded complying with ASTM A706, Grade 60 steel or ASTM A706, Grade 80, as shown on drawings. Weld reinforcing steel in compliance with AWS D1.4. If welding of reinforcing steel other than A706 is desired, submit proposed welding procedure, indicating conformance to AWS@1.2 and Governing Code Authority requirements, to Architect (Structural Engineer) for acceptance and to Governing Code Authority for approval prior to execution. Welders shall be certified as required by Governing Code Authority.
9. Bend reinforcing steel cold unless otherwise accepted by Architect (Structural Engineer). Provide special inspection of all cold bent reinforcing.
10. Securely tie anchor bolts, reinforcing steel, inserts, etc., in place prior to pouring concrete or grout.
11. Submit reinforcing steel shop drawings indicating reinforcing placement, including splice locations and lengths, to Architect (Structural Engineer) for review and acceptance. Promptly notify Architect (Structural Engineer) prior to developing reinforcing steel shop drawings if insufficient clear distances between reinforcing steel or other congestion is encountered. Prepare shop drawings in compliance with ACI 315, Part B.

DISCOVERY CUBE LA SHEET LIST	
S001	GENERAL NOTES
S002	GENERAL NOTES
S003	GENERAL NOTES
S101	TYPICAL DETAILS
S102	TYPICAL DETAILS
S103	TYPICAL DETAILS
S201	FIRST FLOOR FOUNDATION/ FRAMING PLAN
S204	ROOF FRAMING PLAN
S301	SECTIONS AND DETAILS
Grand total: 9	

GENERAL

1. Perform construction and workmanship in compliance with contract documents and 2023 City of Los Angeles Building Code (LABC).
2. Governing Code Authority: Los Angeles Department of Building and Safety.
3. Design Criteria:

Roof Live Loads = 20 psf (Reducible)

Wind Design Data:
Basic Wind Speed (Vult) = 105 mph
Vasd = 85 mph
Risk Category: II
Wind Exposure = B
Internal Pressure Coefficient (GCpi) = +0.18

Design Velocity Pressure $q_h = 16.8 \text{ psf}$
per ASCE 7-16 Eq 26.10-1 assuming mean roof height $h = 17 \text{ ft}$

Note: Required adjustments to q_h for project specific conditions shall be made using the appropriate adjustment factors in the governing building code

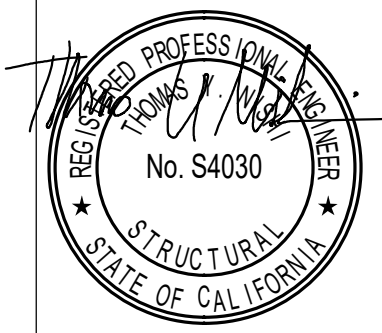
Earthquake Design Data:
Risk Category: II
Seismic Importance Factor (I_e) = 1.0
Mapped Spectral Response Acceleration Parameters
 $S_s = 2.412g$
 $S_1 = 1.421g$

Site Class: D
Design Spectral Response Parameters
 $S_{ds} = 1.608g$
 $S_{d1} = 0.948g$
Seismic Design Category: E
Superstructure
Basic Seismic Force Resisting System: Ordinary Steel Cantilever Columns
Design Base Shear = 123.3 kips
Seismic Response Coefficient (C_s) = 1.286g
Response Modification Coefficient (R) = 1.25
Analysis Procedure used: ELF
Maximum Inelastic story drift = 0.02h

Special Loads:

Photovoltaic Panel Systems Dead Load = 10 psf

5. Structural drawings, as part of contract documents, indicate information sufficient to convey design intent. If errors, inconsistencies or omissions are discovered, promptly notify Architect (Structural Engineer) before proceeding with work.
6. Existing structural drawings for the Children's Museum of Los Angeles project, prepared by AGPS Architecture, Inc. and Thornton Tomasetti Group dated June 20, 2005, including all addenda and revisions, are a part of these contract documents.
7. When performing work, including shop drawing development, consider requirements of contract documents in their entirety (e.g., size and location of openings, penetrations and embedment for ducts, piping, vents, conduits, etc.).
8. Details and schedules indicated as "typical" may not be specifically referenced on drawings. Determine where each typical detail or schedule applies before proceeding with work. If conditions are found which are not specifically detailed, and no typical detail or schedule applies, promptly notify Architect (Structural Engineer).
9. Conditions shown as existing are based on information provided to Structural Engineer when drawings were prepared. No warranty is implied as to accuracy of these existing conditions.
10. Verify field measurement and conditions with contract documents. If errors, inconsistencies or omissions are discovered, promptly notify Architect (Structural Engineer) before proceeding with work.
11. Contract documents represent the finished structure. Unless otherwise shown, they do not indicate method of construction. Construction means, methods, techniques, sequences and procedures are the responsibility of the Contractor, and not the Engineer. Provide adequate excavation procedures, shoring, bracing and erection procedures complying with national, state and local safety ordinances. No allowance has been made for construction equipment, cranes, hoists and similar items to be supported off or from the structure.
12. Observation visits to site by field representatives of Architect (Structural Engineer) do not include review of construction means and methods and are not special and continuous inspections. Observations are solely for the purpose of determining if Contractor understands design intent conveyed in contract documents. Observations do not guarantee Contractor's performance and are not to be construed as supervision or inspection of construction.



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SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	12/8/2023
2	LADBS RESUBMITTAL	2/22/2024

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jfsa



Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040

Drawing Title
GENERAL NOTES

Project No: 2209 ESE: B2304360

Phase: CONSTRUCTION DOCUMENTS

Date: DECEMBER 13, 2023

Scale: 12" = 1'-0"

S001

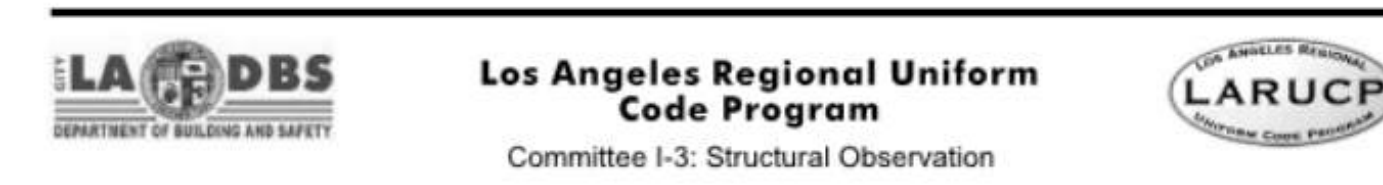
GENERAL NOTES

STRUCTURAL OBSERVATION (Cont'd)

- B. Call an additional preconstruction meeting, and
- C. Furnish the replacement Structural Observer with a copy of all previous observation reports.
- D. The new Structural Observer must be designated by the engineer or architect of record.

The replacement Structural Observer shall approve the correction of the original observed deficiencies unless otherwise approved by plan check supervision. The policy of the Department shall be to correct any properly noted deficiencies without consideration of their source.

- 10. The engineer or architect of record shall develop all changes relating to the structural systems. The building department shall review and approve all changes to the approved plans and specifications.



STRUCTURAL OBSERVATION PROGRAM AND DESIGNATION OF THE STRUCTURAL OBSERVER

11800 WEST FOOTHILL BLVD.

PROJECT ADDRESS: LOS ANGELES, CA 91040 PERMIT APPL NO.: B23VN15021

Description of Work: New steel entry canopy structure addition over new carousel

Owner: LA Discovery Cube Architect: John Sergio Fisher & Associates, Inc. Engineer: Englekirk Institutional

STRUCTURAL OBSERVATION (only checked items are required)			
Firm or Individual to be responsible for the Structural Observation:			
Name: Diana Nishi		Phone: (323) 733-6673	
		Calif. Registration: S3963	
FOUNDATION	WALL	FRAME	DIAPHRAGM
<input checked="" type="checkbox"/> Footing, Stem Walls, Piers	<input checked="" type="checkbox"/> Concrete	<input type="checkbox"/> Steel Moment Frame	<input type="checkbox"/> Concrete
<input type="checkbox"/> Mat Foundation	<input type="checkbox"/> Masonry	<input type="checkbox"/> Steel Braced Frame	<input checked="" type="checkbox"/> Steel Deck
<input checked="" type="checkbox"/> Caisson, Piles, Grade Beams	<input type="checkbox"/> Wood	<input type="checkbox"/> Concrete Moment Frame	<input type="checkbox"/> Wood
<input type="checkbox"/> Stepp'g/Retain'g Foundation, Hillside Special Anchors	<input type="checkbox"/> Others:	<input type="checkbox"/> Masonry Wall Frame	<input type="checkbox"/> Others:
<input type="checkbox"/> Others:		<input checked="" type="checkbox"/> Others: Cantilever Steel Columns	

DECLARATION BY OWNER

I, the Owner of the project, declare that the above listed firm or individual is hired by me to be the Structural Observer.

Signature: _____ Date: _____

DECLARATION BY ARCHITECT OR ENGINEER OF RECORD (required if the Structural Observer is different from the Architect or Engineer of Record)

I, the Architect or Engineer of record for the project, declare that the above listed firm or individual is designated by me to be responsible for the Structural Observation.

Signature: _____ License No.: _____ Date: _____

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability, and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

IN Form 08 (Part 2) (Rev. 03-11-2016)

STEEL DECKING

1. Provide steel decking by manufacturer(s) indicated on drawings.
2. Roof decking (no concrete fill):
 - A. Provide steel roof decking and closure angles complying with ASTM A653 SS, with a minimum yield of 40,000 psi and galvanized with G90 commercial coating complying with ASTM A525.
 - B. Roof decking is designed for unshored construction.
 - E. Do not suspend piping, ducts, work utilities or other from roof decking unless otherwise shown or approved. Submit methods of support from roof framing for loads other than acoustical ceilings to Architect (Structural Engineer).
3. Provide closure angles at openings for mechanical equipment, ducts, piping, vents, conduits, etc., including those not shown on structural drawings. Closure angles shall be 18 gauge and be welded to decking, unless detailed otherwise.
4. Bear decking at least 2 inches at supports. Lap decking at ends at least 2 inches and center laps over supports.
5. Weld steel decking in compliance with ANSI/AWS D1.3 using a minimum of E60XX electrodes. Welders shall be certified as required by the Governing Code Authority.
6. Submit complete steel decking shop drawings to Architect (Structural Engineer) for review.

STRUCTURAL OBSERVATION

1. Structural Observation is required for the structural system in accordance with LABC 2020. Structural Observation is the visual observation at the construction site of the elements and connections of the structural system at significant construction stages, and the complete structure for general conformance to the approved plans and specifications. Structural Observation does not waive the responsibility for the inspections required of the building inspector or the deputy inspector.
2. The owner shall employ a State of California registered civil or structural engineer or licensed architect to perform the Structural Observation. The Los Angeles Department of Building and Safety (LADBS) requires the use of the engineer or architect, or his/her designee responsible for the structural design who are independent of the contractor.
3. The Structural Observer shall provide evidence of employment by the owner or the owner's representative. A letter from the owner, the owner's representative, or a copy of the agreement for services shall be sent to the building inspector before the first site visit.
4. The owner or owner's representative shall coordinate and call for a meeting between the engineer or architect responsible for the structural design, Structural Observer, contractor, affected subcontractors and deputy inspectors. The purpose of the meeting shall be to identify the major structural elements and connections that affect the vertical and lateral load systems of the structure and to review scheduling of the required observations. A record of the meeting shall be included in the first observation report submitted to the building inspector.
5. The Structural Observer shall perform site visits at those steps in the progress of the work that allow for correction of deficiencies without substantial effort or uncovering of the work involved. At a minimum, the listed significant construction stages on either the "Structural Observation/Significant Construction Stages" form or the "Structural Observation Program and Designation of the Structural Observer" form IN/Form.08 (Part 2) require a site visit and an observation report from the Structural Observer.

CONSTRUCTION STAGES

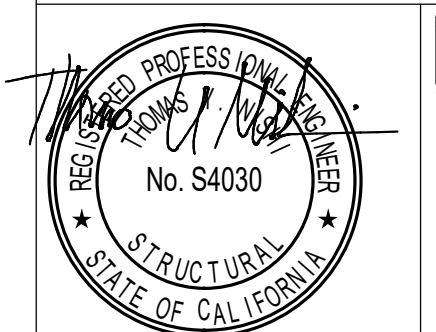
- A. Foundations: First drilled pile, foundations and slab on grade reinforcing.
- B. Structural Steel: Steel columns and beams
- C. Roof Decking: Deck welding and connections

ELEMENTS/CONNECTIONS TO BE OBSERVED

6. The Structural Observer shall prepare a report of the "Structural Observation Report Form" IN/Form.08 (Part 1) for each significant stage of construction observed. The original of the Structural Observation report shall be sent to the building inspector's office and shall be signed and sealed by the responsible Structural Observer. One copy of the observation report shall be attached to the approved plans. The copy attached to the plans shall be signed and sealed by the responsible Structural Observer or their designee. Copies of the report shall also be given to the owner, contractor, and deputy inspector. Any deficiency noted on the observation report will become the responsibility of the structural engineer or architect of record to verify its completion by the Structural Observer.
7. A final observation report must be submitted which shows that all observed deficiencies were resolved and structural system generally conforms with the approved plans and specifications. The Los Angeles Department of Building and Safety (LADBS) will not accept the structural work without the final observation report and the correction of specific deficiencies noted during normal building inspection.
8. The Structural Observer shall provide the original stamped and signed "Structural Observation Report Form" to the City of Los Angeles Department of Building and Safety Building Inspector.
9. When there is a need to replace the Structural Observer of record, the owner shall:
 - A. Notify the building inspector in writing before the next inspection by submitting completed "Structural Observation Program and Designation of the Structural Observer" form IN/Form.08 (Part 2).

STRUCTURAL STEEL

1. STRUCTURAL STEEL: Material, Fabrication, and Erection
 - A. Materials
 - 1. Provide structural steel complying with the following ASTM Standard Specifications, unless noted otherwise:
 - All structural steel: ASTM A992
 - Plates, channels, angles: ASTM A36
 - Pipes: ASTM A53, Grade B (35 ksi)
 - Hollow structural section: ASTM A500 Grade C (50 ksi)
 - Anchor rods: ASTM F1554, Grade 55 at SFRS
 - Reinforcing steel: See Reinforcing Steel Section.
 - B. High Strength Bolts
 - 1. Provide high strength bolts, nuts and washers complying with ASTM F3125 Grade A325 and F959, unless noted otherwise. All high strength bolts shall be bearing type with threads included in shear plane (A325-N), unless noted otherwise.
 - 2. Assemble high strength bolts in compliance with Specification for Structural Joints Using ASTM F3125 Grade A325 or ASTM F3125 Grade A490 Bolts.
 - 3. Tighten A325-N bolts to a snug tight condition. Tighten A325 pretensioned bolts (where specified) to at least the minimum tension specified in the referenced standard using one of the following tightening methods: turn-of-nut, calibrated wrench or direct tension indicator tightening.
 - C. Fabricate and erect structural steel in compliance with "Specification for Structural Steel Buildings," AISC 360-16 and LABC Chapter 22.
 - D. Building structural steel is designed for unshored construction unless noted otherwise.
 - E. Submit shop drawings to Architect (Structural Engineer) for review and, upon request, to Building Official.
 - F. Los Angeles City Building Department licensed fabricator is required for Structural Steel.
2. Welding
 - A. Basic Requirements
 - 1. Weld structural steel in compliance with ANSI/AWS D1.1, and AISC Specification, Chapter J. Welders shall be certified as required in the plans and by Governing Code Authority. Welding shall be done by electric arc process using low-hydrogen electrodes with specified tensile strength not less than 70 ksi unless noted otherwise. Welding may be performed using submerged arc process with automatic welding (SAW-1).
 - 2. Shop welds shall be performed in LA City Building Department licensed fabricator's shop.
 - 3. Field welding by welders must be certified by the LA City Building Department for structural steel. Continuous inspection by deputy inspector is required.
 - 4. Unless a larger size fillet weld is indicated, provide minimum size of weld per AISC Specification, Section J2 and Table J2.4.
 - 5. No attempt has been made to differentiate between shop and field welded connections.
 - B. Project Seismic Force Resisting System (SFRS) Welding Requirements
 - 1. Refer to Project Specifications and AISC 341-16, Chapters I and J.
 - 2. For Demand Critical welds as required by AISC 341 or as otherwise shown on the Drawings, provide additional CVN toughness of 40 ft-lbs at 70 degree Fahrenheit using test procedures described in AISC 341 Appendix W.
 - C. Inspections
 - 1. All inspection requirements shall follow the Quality Assurance section including inspection tables, AISC 360-16 Chapter N, AISC 341-10 Chapter J, and the project specifications.



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323.733.6673 F
323.733.6682 F
www.englekirk.com

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	12/8/2023
2	LADBS RESUBMITTAL	2/22/2024

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(818) 344-3045
fax (818) 344-0338
E-mail: mail@jsfarchs.com
Architecture & Planning
John Fisher AIA



Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY
11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040
Drawing Title
GENERAL NOTES

Project No: 2209 ESE: B2304360
Phase: CONSTRUCTION DOCUMENTS
Date: DECEMBER 13, 2023
Scale: 12" = 1'-0"

S002

GENERAL NOTES

Page 3
11800 N FOOTHILL BLVD

- 15. Footings supported shall be reinforced with a minimum of four (4), 1/2-inch diameter (#4) deformed reinforcing bars. Two (2) bars shall be placed near the bottom and two (2) bars placed near the top of the footing.
16. Pile caisson and/or isolated foundation ties are required by LAMC Sections 91.1809.13 and/or 91.1810.3.13. Exceptions and modification to this requirement are provided in Information Bulletin P/BC 2020-030.
17. When water is present in drilled pile holes, the concrete shall be tremied from the bottom up to ensure minimum segregation of the mix and negligible turbulence of the water (1808.8.3).
18. Existing uncertified fill shall not be used for lateral support of deep foundations (1810.2.1).
19. Slabs placed on approved compacted fill shall be at least 3/5 inches thick and shall be reinforced with 1/2-inch diameter (#4) reinforcing bars spaced a maximum of 16 inches on center each way.
20. The seismic design shall be based on a Site Class D, as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check.
21. The structure shall be connected to the public sewer system per P/BC 2020-027.
22. All roof, pad and deck drainage shall be conducted to the street in an acceptable manner in non-erosive devices or other approved location in a manner that is acceptable to the LADBS and the Department of Public Works (7013.10).
23. An on-site storm water infiltration system at the subject site shall not be implemented, as recommended.
24. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS (7013.10).
25. The soils engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading (7008, 1705.6 & 1705.8).
26. All friction pile or caisson drilling and excavations shall be performed under the inspection and approval of the geologist and soils engineer. The geologist shall indicate the distance that friction piles or caissons penetrate into competent [material] bedrock in a written field memorandum. (1803.5.5, 1705.1.2)
27. Prior to pouring concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the work inspected meets the conditions of the report. No concrete shall be poured until the LADBS Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)
28. Prior to excavation an initial inspection shall be called with the LADBS Inspector. During the initial inspection, the sequence of construction; [shoring; ABC slot cuts; underpinning;

Page 4
11800 N FOOTHILL BLVD

- pile installation;] protection fences; and, dust and traffic control will be scheduled (108.9.1).
29. Installation of shoring, underpinning, slot cutting and/or pile excavations shall be performed under the inspection and approval of the soils engineer and deputy grading inspector (1705.6, 1705.8).
30. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the soil inspected meets the conditions of the report. No fill shall be placed until the LADBS Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be included in the final compaction report filed with the Grading Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Division of the Department upon completion of the compaction. In addition, an Engineer's Certificate of Compliance with the legal description as indicated in the grading permit and the permit number shall be included (7011.3).
31. No footing/slab shall be poured until the compaction report is submitted and approved by the Grading Division of the Department.

YING LIU
Geotechnical Engineer II

Log No. 129227
213-482-0480

cc: Applicant
Tetra Tech, Project Consultant
VN District Office

BOARD OF BUILDING AND SAFETY COMMISSIONERS
JAVIER NUÑEZ PRESIDENT
JOSELYN GEAGA-ROSENTHAL VICE PRESIDENT
JACOB STEVENS
MOISES ROSALES
NANCY YAP

CITY OF LOS ANGELES CALIFORNIA



KAREN BASS
MAYOR

DEPARTMENT OF BUILDING AND SAFETY
OSAMA YOUNAN, P.E. GENERAL MANAGER
JOHN WRIGHT EXECUTIVE OFFICER

SOILS REPORT APPROVAL LETTER

January 30, 2024

LOG # 129227
SOILS/GEOLOGY FILE - 2

Discovery Cube
2500 N. Main Street
Santa Ana, CA 92705

TRACT: TR 15781
LOT(S): FR LTI
LOCATION: 11800 N FOOTHILL BLVD

Table with 4 columns: CURRENT REFERENCE REPORT LETTER(S), REPORT No., DATE OF DOCUMENT, PREPARED BY. Rows include Soils Report and Addendum Report.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed discovery cube exhibits and courtyard carousel canopy.

The earth materials at the subsurface exploration locations consist of up to 7.5 feet of uncertified fill underlain by silt to clayey sand.

The consultants recommend to support the proposed structure(s) on conventional, mat-type, and drilled-pile foundations bearing on compacted fill underlain by competent native undisturbed soils.

The referenced reports are acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis () refer to applicable sections of the 2023 City of LA Building Code. P/BC numbers refer to the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

- 1. The soils engineer shall review and approve the detailed plans prior to issuance of any permit. This approval shall be by signature on the plans that clearly indicates the soils engineer has reviewed the plans prepared by the design engineer; and, that the plans included the recommendations contained in their reports (7006.1).
2. All recommendations of the report(s) that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

Page 2
11800 N FOOTHILL BLVD

LADBS 6-5 (Rev. 05/30/2023) AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

Page 2
11800 N FOOTHILL BLVD

- 3. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans (7006.1). Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.
4. A grading permit shall be obtained for all structural fill and retaining wall backfill (106.1.2).
5. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.0075 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density. Placement of gravel in lieu of compacted fill is only allowed if complying with LAMC Section 91.7011.3.
6. If import soils are used, no footings shall be poured until the soils engineer has submitted a compaction report containing in-place shear test data and settlement data to the Grading Division of the Department; and, obtained approval (7008.2).
7. Compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the bottom of footings or a minimum of three feet whichever is greater (7011.3).
8. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill (1809.2, 7011.3).
9. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction (7013.12).
10. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the General Safety Orders of the California Department of Industrial Relations (3301.1).
11. Excavations shall not remove lateral support from a public way, adjacent property or an existing structure. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)
12. Prior to the issuance of any permit that authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation (3307.1).
13. Unsurcharged temporary excavations shall be trimmed back at a gradient not exceeding 1.5(H):1(V), as recommended.
14. All foundations shall derive entire support from compacted fill underlain by competent undisturbed soils, as recommended and shall be approved by the geologist and soils engineer by inspection.

QUALITY ASSURANCE (Con't)

Table with 4 columns: Description, Frequency, Periodic, and other. Rows include 'CONCRETE INSPECTIONS & VERIFICATION (TABLE 1705.3)', 'SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE', and 'CAST IN PLACE DEEP FOUNDATION ELEMENTS - TABLE 1705.8'.

Notation:
X Denotes either continuous or periodic inspections.
--- Denotes an activity that is either a one-time activity or one where the frequency is defined in some other manner

- Notes:
1. Additional detail regarding inspections and tests are provided in the project specifications and/or notes on the drawings.
2. Refer to design build drawings for design and project specific inspection requirements.
3. Special inspection is not required where design wind speed is less than 110 mph.
4. See Geotechnical Consultant for more information.

QUALITY ASSURANCE

- 1. Testing laboratory shall submit reports indicating results and observations of tests and inspections and stating compliance or noncompliance with contract documents to Architect (Structural Engineer) and to Governing Code Authority. Contractor shall reimburse Owner for costs related to tests and inspections of unidentifiable materials or materials furnished without certified laboratory test reports, materials found deficient after initial tests and inspections, or materials replacing deficient materials. See Specifications for additional test and inspection requirements.
2. Provide cement, aggregates, reinforcing steel, structural steel, high-strength bolts, etc., from identifiable tested stock. Submit certified laboratory test reports to Architect (Structural Engineer) and to Governing Code Authority. If materials cannot be identified or if certified laboratory test reports cannot be made available, testing laboratory will perform tests to determine conformance with contract documents as directed by Architect (Structural Engineer).
3. Testing laboratory shall provide special inspection, complying with LABC Section 1704 (unless otherwise noted), for the following:
A. Concrete and reinforcing steel where specified concrete compressive strength is greater than 2000 psi.
B. Shop and field welded reinforcing steel as stipulated in CBC Section 1705.3.1
C. Drilled Piles.
D. Bolts installed in concrete.
E. Field welding
F. High-strength bolts.
4. Testing laboratory shall review concrete mix design data and shall perform the following concrete tests at frequency indicated in as indicated in Required Inspections of Reinforced Concrete in Quality Assurance Section.
5. Prepare specimens taken from the in-place work or from test panels once every shift or not less than one for each 50 cubic yards of shotcrete placed in compliance with ACI 506.2, Section 1.6.2.1 and CBC 1908.10. Testing laboratory shall obtain three core samples per panel and test as indicated in Required Inspections of Reinforced Concrete in Quality Assurance Section.
6. Testing laboratory shall perform the following tests in structural steel as indicated in Required Inspections of Structural Steel in Quality Assurance Section.

Table with 4 columns: ITEM, TESTING, INSPECTION & VERIFICATION TASKS, FREQUENCY, PERIODIC. Rows include 'STRUCTURAL STEEL INSPECTIONS & VERIFICATION (TABLE 1705A.2.1)' and 'SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE'.



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SUBMITTALS:

Table with 3 columns: NO., DESCRIPTION, DATE. Rows include LADBS RESUBMITTAL 12/8/2023 and LADBS RESUBMITTAL 2/22/2024.

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Architecture & Planning
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Client: DISCOVERY CUBE LOS ANGELES

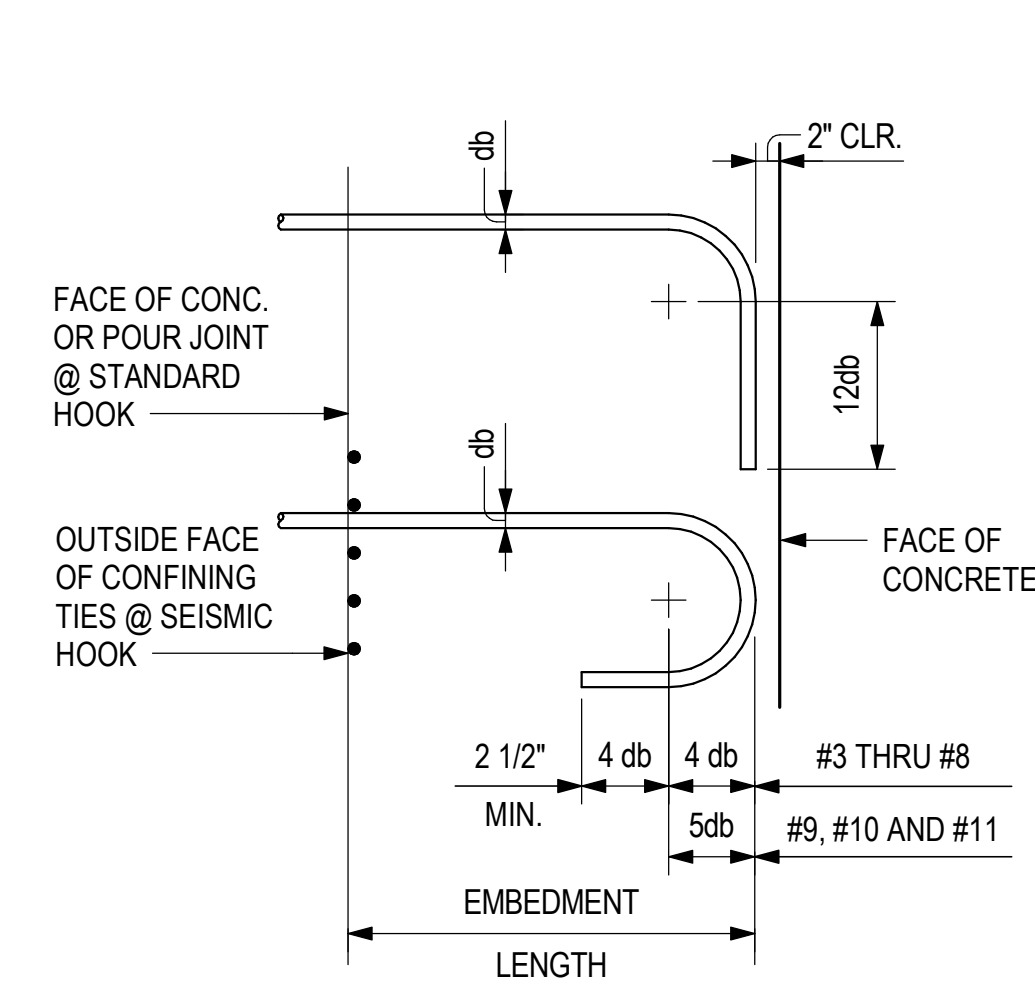
Job Name: COURTYARD CAROUSEL CANOPY

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040

Drawing Title: GENERAL NOTES

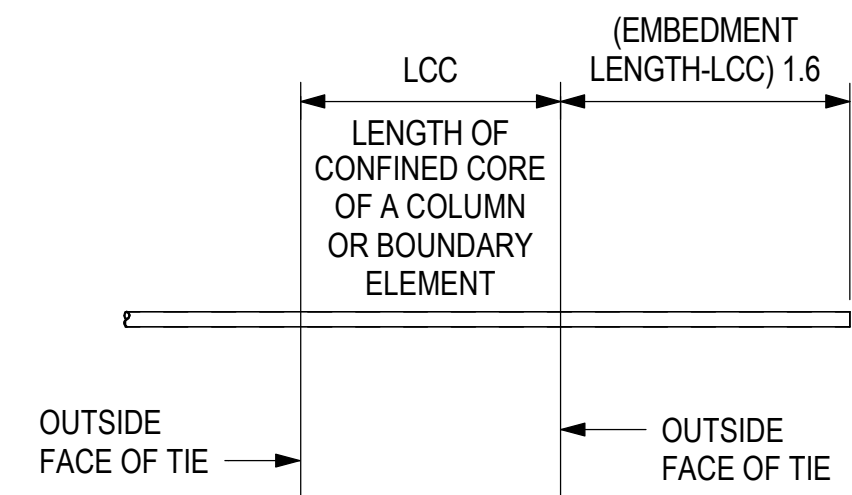
Project No: 2209 ESE: B2304360
Phase: CONSTRUCTION DOCUMENTS
Date: DECEMBER 13, 2023
Scale: 12" = 1'-0"

S003



- NOTES:**
- ALL HOOKED BARS SHALL EXTEND AS FAR AS POSSIBLE TO THE OPPOSITE FACE WITH A MINIMUM 2" END COVER AND EMBEDMENT NOT LESS THAN THE SCHEDULE.
 - MINIMUM SIDE COVER = 2 1/2"
 - FOR WALL FOOTING DOWEL EMBEDMENT LENGTHS SEE "TYPICAL CONCRETE WALL DOWEL EMBEDMENT AND LAP SCHEDULE"

STANDARD HOOK DETAILS



- NOTE:**
- STRAIGHT BARS TERMINATED AT A JOINT SHALL PASS THROUGH THE CONFINED CORE OF A COLUMN OR BOUNDARY ELEMENT. ANY PORTION OF THE STRAIGHT EMBEDMENT NOT WITHIN THE CONFINED CORE SHALL BE INCREASED BY A FACTOR OF 1.6.

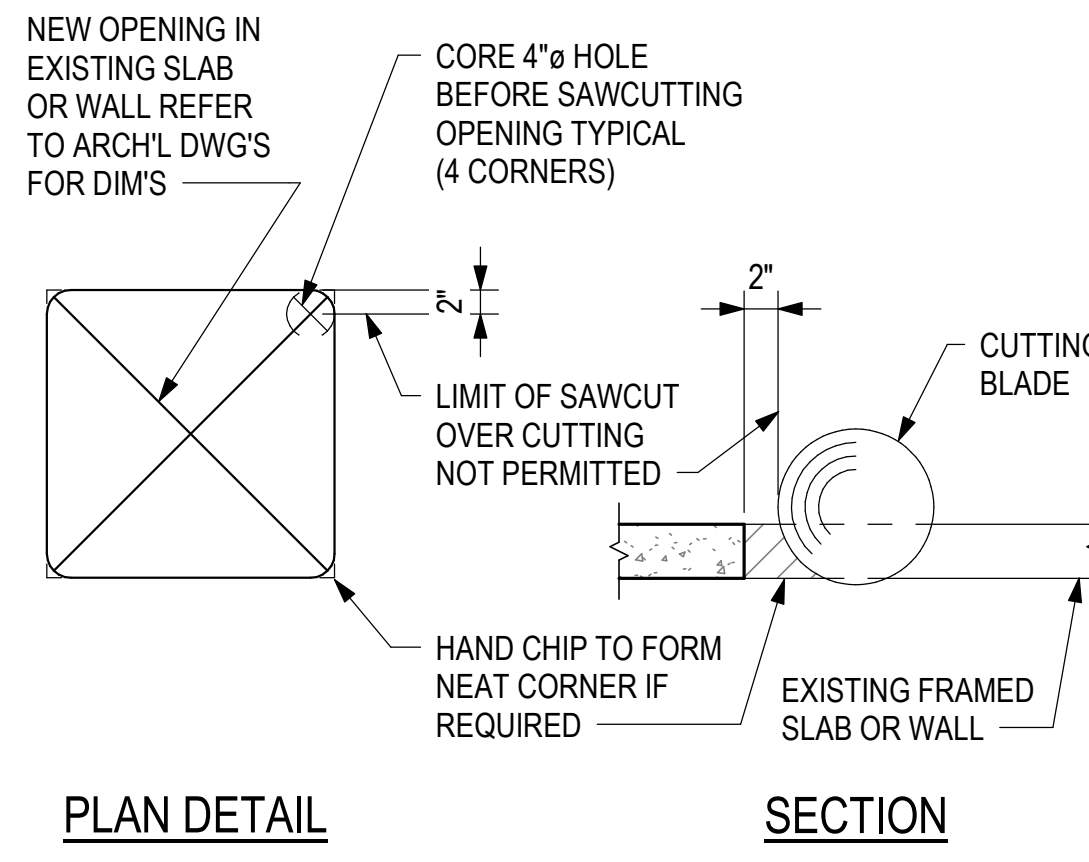
STRAIGHT BARS AT A JOINT (FOR MOMENT FRAME ONLY)

REINFORCING EMBEDMENT NOTES

- TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BARS.
- BOTTOM BARS ARE ALL VERTICAL BARS AND HORIZONTAL BARS WITH LESS THAN 12" OF CONCRETE CAST BELOW HORIZONTAL BARS.
- FOR LIGHTWEIGHT CONCRETE MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.3.
- FOR GRADE 75 REINFORCING MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.25.
- FOR GRADE 80 REINFORCING MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.53.
- FOR 3 BAR BUNDLE MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.20. FOR 4 BAR BUNDLE MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.33. SEE NOTE 5 FOR GRADE 80.
- FOR BUNDLED BARS, AN EFFECTIVE BAR DIAMETER SHALL BE USED FOR DETERMINING COVER AND SPACING LIMITATIONS.
 - A. FOR 2 BAR BUNDLE $d_{be} = 1.60 \sqrt{\text{BAR AREA}}$
 - B. FOR 3 BAR BUNDLE $d_{be} = 1.95 \sqrt{\text{BAR AREA}}$
 - C. FOR 4 BAR BUNDLE $d_{be} = 2.26 \sqrt{\text{BAR AREA}}$

DEVELOPMENT TYPE	CATEGORY	DESCRIPTION	BAR	AREA (sq.in.)	0.11		0.20		0.31		0.44		0.60		0.79		1.00		1.27		1.56			
					DIAMETER db		0.375		0.500		0.625		0.750		0.875		1.000		1.128		1.270		1.410	
DEVELOPMENT TYPE	CATEGORY	DESCRIPTION	NORMAL WEIGHT CONCRETE f_c PSI	#3	#4	#5	#6	#7	#8	#9	#10	#11	TOP		BOT.		TOP		BOT.		TOP		BOT.	
													TOP	BOT.	TOP	BOT.	TOP	BOT.	TOP	BOT.	TOP	BOT.	TOP	BOT.
STRAIGHT-TENSION EMBEDMENT (CLASS A)	1	COVER $\geq 2db$ AND CLEAR SPACING $\geq 4db$	3000	16	12	18	14	22	17	26	20	38	29	43	33	49	37	55	42	61	47	61	47	
			4000	16	12	16	12	19	15	23	18	33	25	37	29	42	33	47	37	53	41	53	41	
			5000	16	12	16	12	17	13	20	16	29	23	34	26	38	29	43	33	47	36	47	36	
			6000	16	12	16	12	16	12	19	14	27	21	31	24	34	27	39	30	43	33	43	33	
	2	ALL OTHERS	3000	22	17	29	22	36	28	43	33	63	48	72	55	81	62	91	70	101	78	101	78	
			4000	19	15	25	19	31	24	37	29	54	42	62	48	70	54	79	61	87	67	87	67	
			5000	17	13	23	17	28	22	34	26	49	38	56	43	63	48	71	54	78	60	78	60	
			6000	16	12	21	16	26	20	31	24	45	34	51	39	57	44	64	50	71	55	71	55	
	3	COVER $< db$ OR CLEAR SPACING $< 2db$	3000						54	42	65	50	94	72	107	83	121	93	136	105	151	116	116	
			4000						47	36	56	43	81	63	93	72	105	81	118	91	131	101	101	
			5000						42	32	50	39	73	56	83	64	94	72	106	81	117	90	90	
			6000						38	30	46	35	67	51	76	59	85	66	96	74	107	82	82	
HOOK EMBEDMENT	STANDARD	ALL OTHERS	3000	6	8	10	12	14	16	18	20	22	22	22	22	22	22	22	22	22	22	22	22	
			4000	6	7	9	10	12	14	16	17	17	17	17	17	17	17	17	17	17	17	17	17	
			5000	6	6	8	9	11	12	14	15	15	15	15	15	15	15	15	15	15	15	15	15	15
			6000	6	6	7	9	10	11	13	14	14	14	14	14	14	14	14	14	14	14	14	14	14
	SEISMIC	HOOK ANCHORED IN SEISMIC FRAME COLUMN	3000	7	9	11	13	15	17	19	22	24	24	24	24	24	24	24	24	24	24	24	24	24
			4000	6	8	10	11	13	15	17	19	21	21	21	21	21	21	21	21	21	21	21	21	21
			5000	6	7	9	10	12	14	15	17	19	20	20	20	20	20	20	20	20	20	20	20	20
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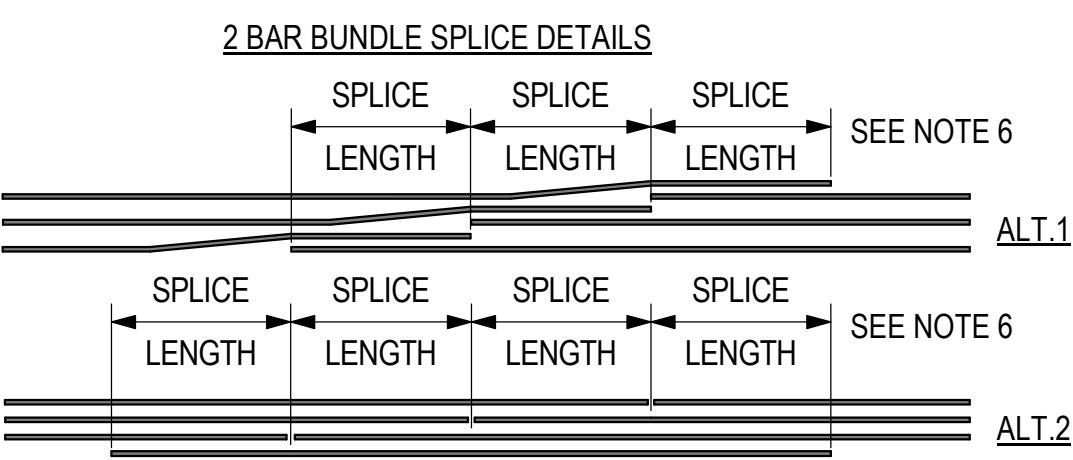
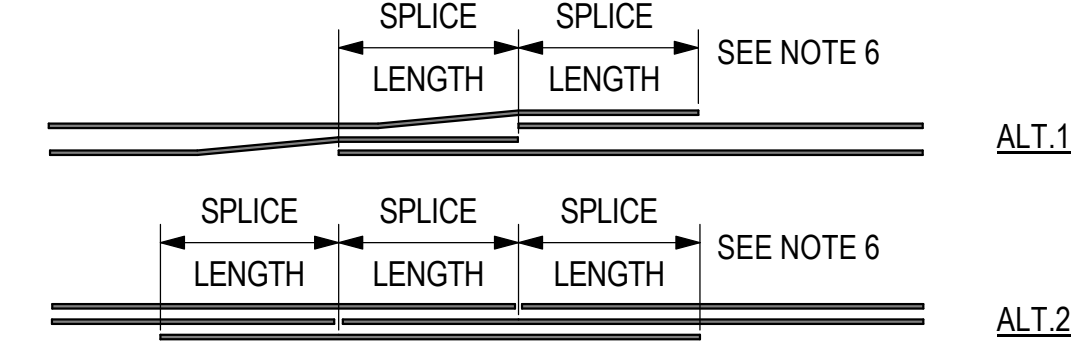
TYPICAL STRAIGHT AND HOOKED EMBEDMENT LENGTH SCHEDULE



TYPICAL SAWCUT DETAIL

REINFORCING SPLICE NOTES

- TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BARS.
- BOTTOM BARS ARE ALL VERTICAL BARS AND HORIZONTAL BARS WITH LESS THAN 12" OF CONCRETE CAST BELOW HORIZONTAL BARS.
- FOR LIGHTWEIGHT CONCRETE MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.3.
- FOR GRADE 75 REINFORCING MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.25.
- FOR GRADE 80 REINFORCING MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.33.
- FOR 2 BAR BUNDLE MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.20.
- FOR 3 BAR BUNDLE MULTIPLY THE LENGTHS IN THE SCHEDULE BY 1.33.
- FOR BUNDLED BARS, AN EFFECTIVE BAR DIAMETER SHALL BE USED FOR DETERMINING COVER AND SPACING LIMITATIONS.
- CLASS "A" SPLICE IS A CLASS "B" SPLICE MULTIPLIED BY 0.77.
- WHEN BARS OF DIFFERENT SIZE ARE LAP SPICED, SPLICE LENGTH SHALL BE THE GREATER OF DEVELOPMENT LENGTH OF THE LARGER BAR AND "CLASS B" OF THE SMALLER BAR.
 - A. FOR 2 BAR BUNDLE $d_{be} = 1.60 \sqrt{\text{BAR AREA}}$
 - B. FOR 3 BAR BUNDLE $d_{be} = 1.95 \sqrt{\text{BAR AREA}}$

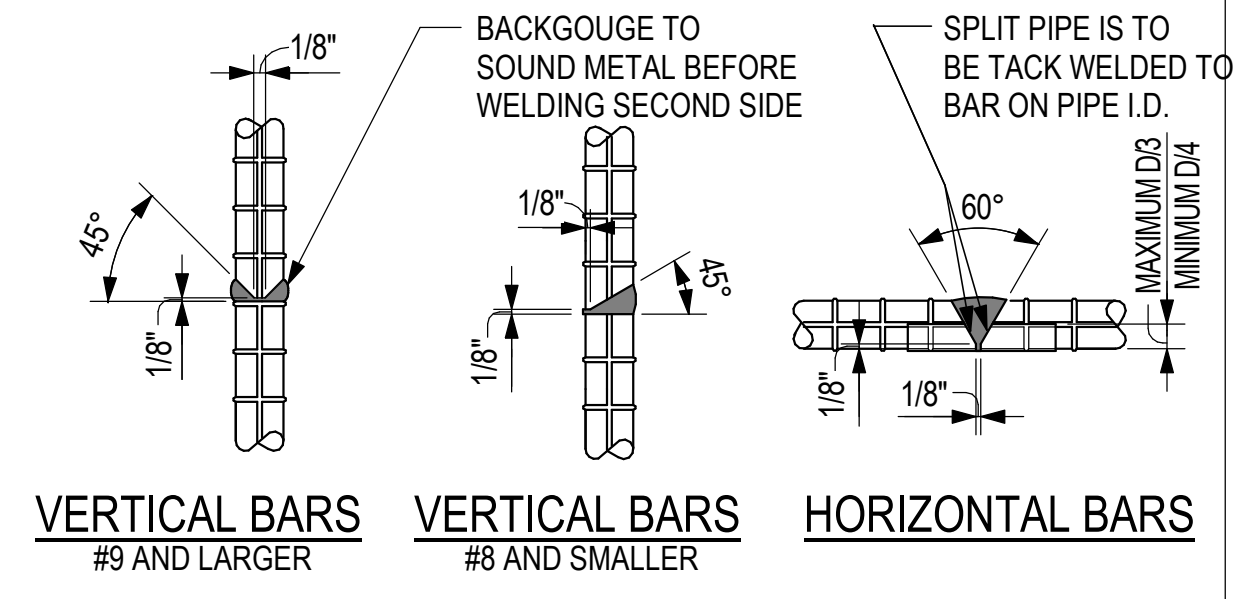


BUNDLE LAP SPLICES

NOTE: BARS SHALL BE BUNDLED WITH NO MORE THAN TWO BARS IN THE SAME PLANE.

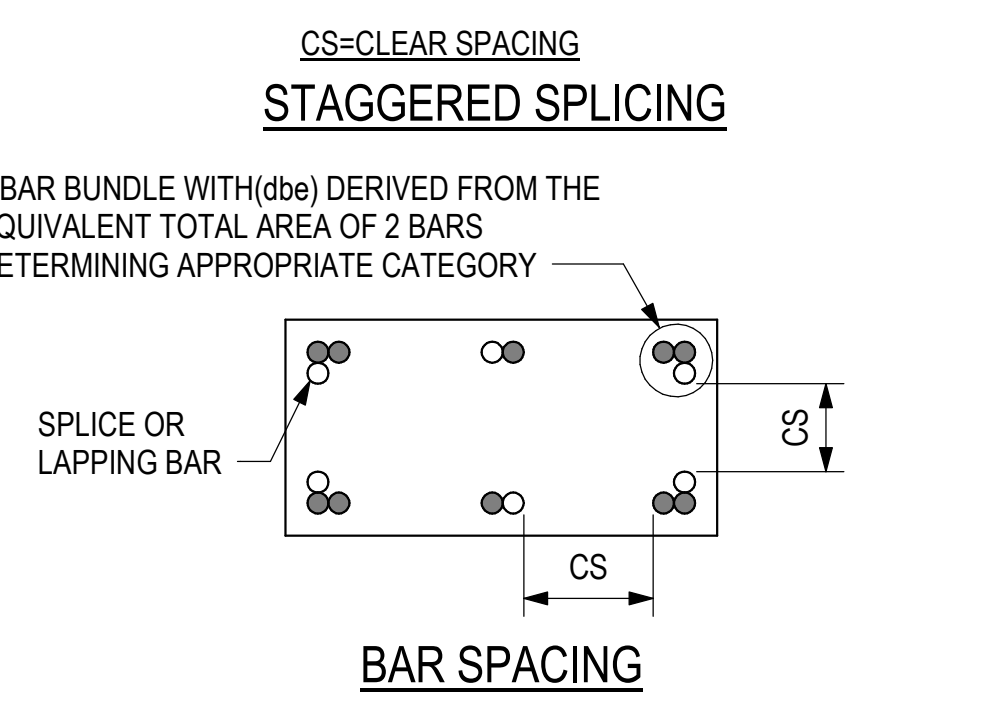
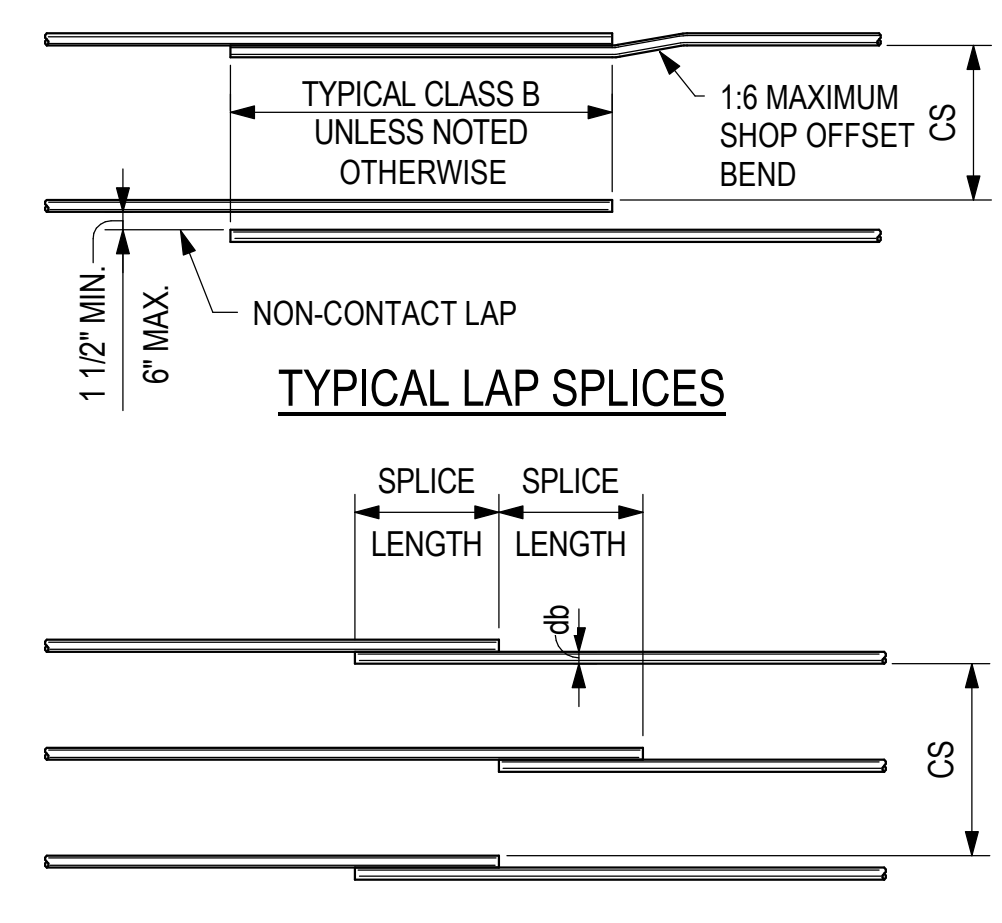
LAP CLASS	CATEGORY	DESCRIPTION	BAR	AREA (sq.in.)	0.11		0.20		0.31		0.44		0.60		0.79		1.00		1.27		1.56			
					DIAMETER db		0.375		0.500		0.625		0.750		0.875		1.000		1.128		1.270		1.410	
LAP CLASS	CATEGORY	DESCRIPTION	NORMAL WEIGHT CONCRETE f_c PSI	#3	#4	#5	#6	#7	#8	#9	#10	#11	TOP		BOT.		TOP		BOT.		TOP		BOT.	
													TOP	BOT.	TOP	BOT.	TOP	BOT.	TOP	BOT.	TOP	BOT.	TOP	BOT.
CLASS B	1	COVER $\geq 2db$ AND CLEAR SPACING $\geq 4db$	3000	21	16	23	18	28	22	34	26	49	38	56	43	63	49	71	55	79	61	61	47	
			4000	21	16	21	16	25	19	29	23	43	33	49	37	55	42	62	47	68	53	53	41	
			5000	21	16	21	16	22	17	26	20	38	29	44	34	49	38	55	43	61	47	47	36	
			6000	21	16	21	16	21	16	24	19	35	27	40	31	45	34	50	39	56	43	43	33	
	2	ALL OTHERS	3000	28	22	38	29	47	36	56	43	81	63	93	72	105	81	118	91	131	101	101	78	
			4000	25	19	33	25	41	31	49	37	71	54	81	62	91	70	102	79	114	87	87	67	
			5000	22	17	29	23	36	28	44	34	63	49	72	56	81	63	92	71	102	78	78	60	
			6000	21	16	27	21	33	26	40	31	58	45	66	51	74	57	84	64	93	71	71	55	
	3	COVER $< db$ OR CLEAR SPACING $< 2db$	3000						70	54	84	64	122	94	139	107	157	121	177	136	196	151	151	
			4000						61	47	73	56	106	81	121	93	136	105	153	118	170	131	131	
			5000						54	42	65	50	95	73	108	83	121	94	137	105	152	117	117	
			6000						50	38	59	46	86	67	99	76	111	85	125	96	139	107	107	

TYPICAL REINFORCING GRADE 60 SPLICE SCHEDULE



- NOTES:**
- BUTT WELD STAGGERED @ 24" o.c. MINIMUM MAY BE USED AS AN ALTERNATE TO INDICATED LAP SPLICES.
 - STAGGER BUTT WELDS 2'-0" AT ADJACENT BARS.
 - A PRE-QUALIFICATION TENSION TEST SHALL BE MADE BY AN APPROVED TESTING LAB ON SAMPLES OF EVERY SIZE BAR BEING WELDED UTILIZING MATERIALS, CONDITIONS & WELDING PROCEDURES TO CONFORM TO CBC & GOVERNING INSPECTION AGENCIES. ALL COSTS INCURRED FOR WELDING APPROVALS SHALL BE ASSUMED BY THE GENERAL CONTRACTOR.

TYPICAL WELDED BUTT SPLICE DETAIL



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jsfa

PROFESSIONAL ARCHITECT
 JOHN SERGIO FISHER
 No. C-4487
 ARCHITECT
 STATE OF CALIFORNIA

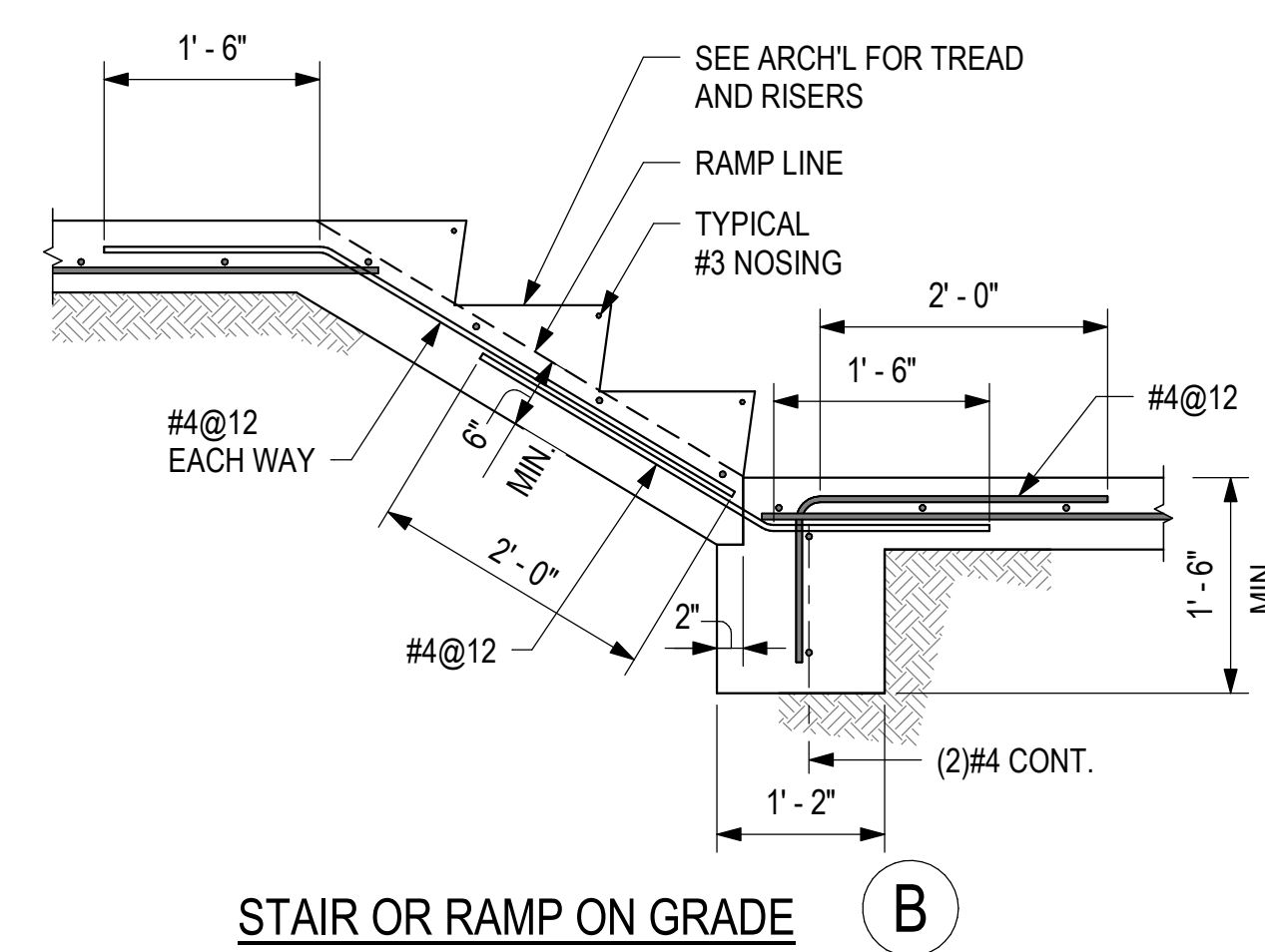
Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

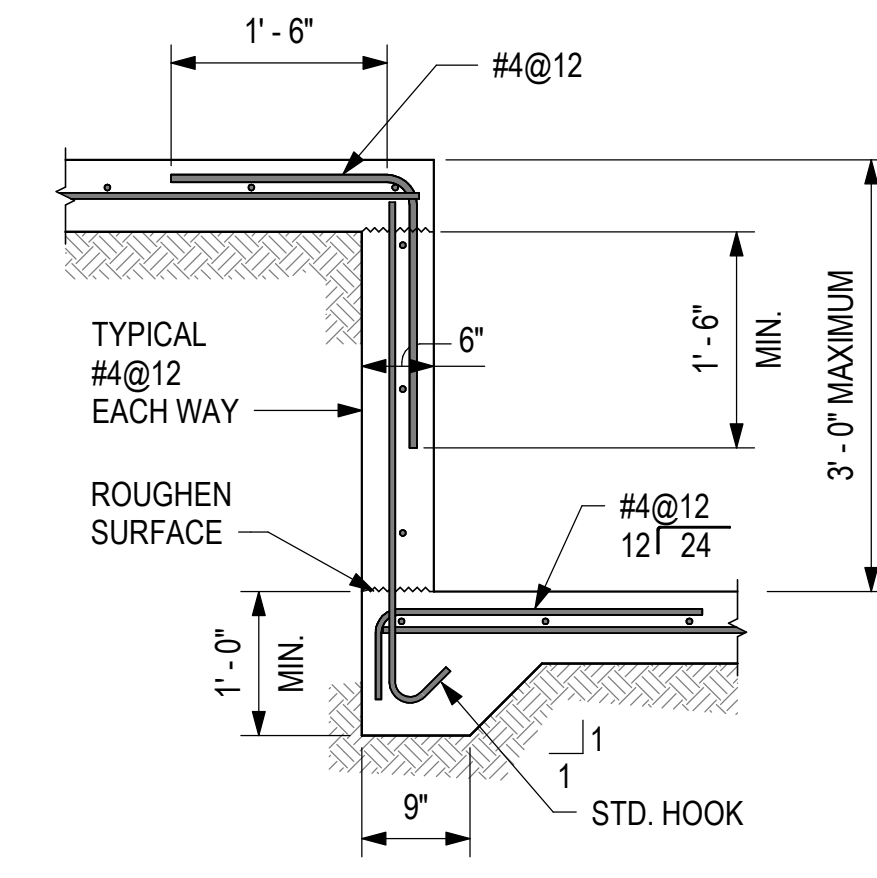
11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040

Drawing Title
TYPICAL DETAILS

Project No: 2209 ESE: B2304360
 Phase: CONSTRUCTION DOCUMENTS
 Date: DECEMBER 13, 2023
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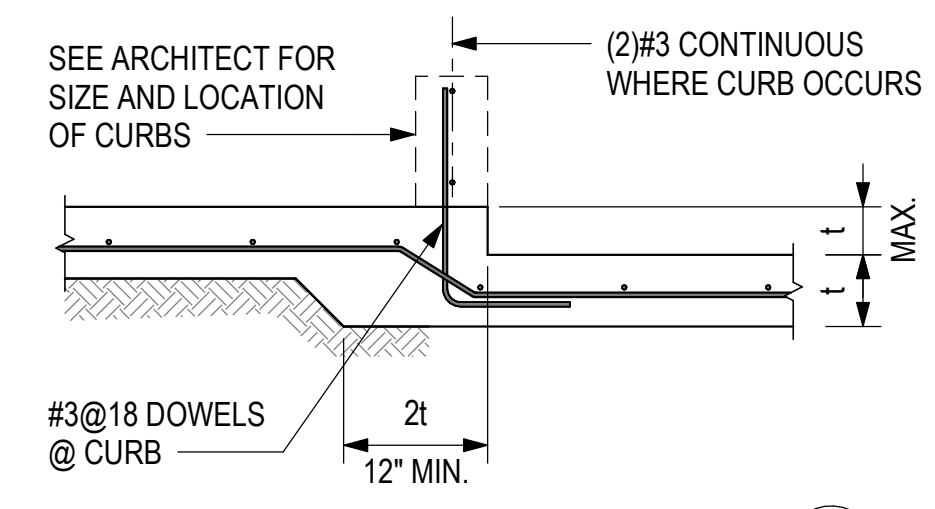
STAIR OR RAMP ON GRADE **B**



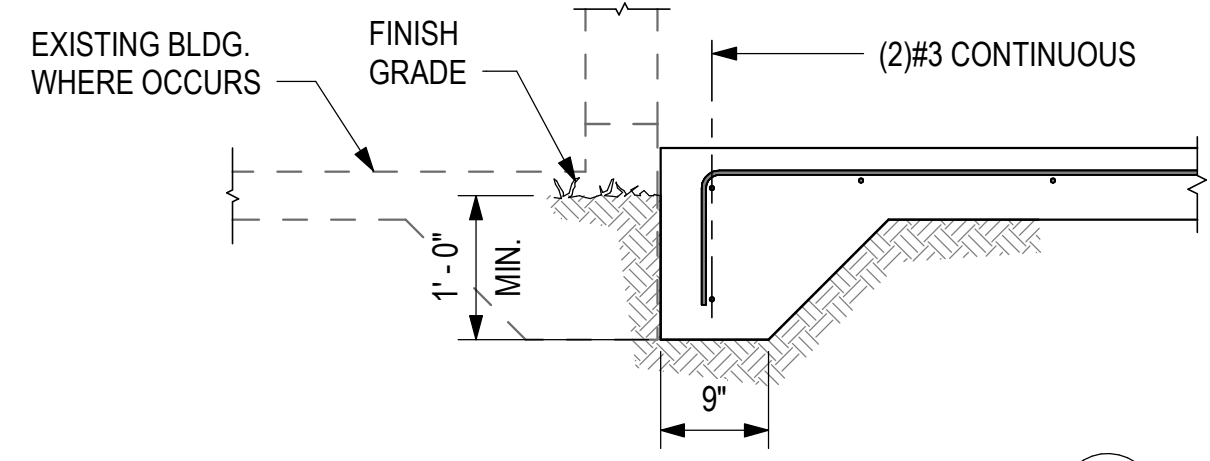
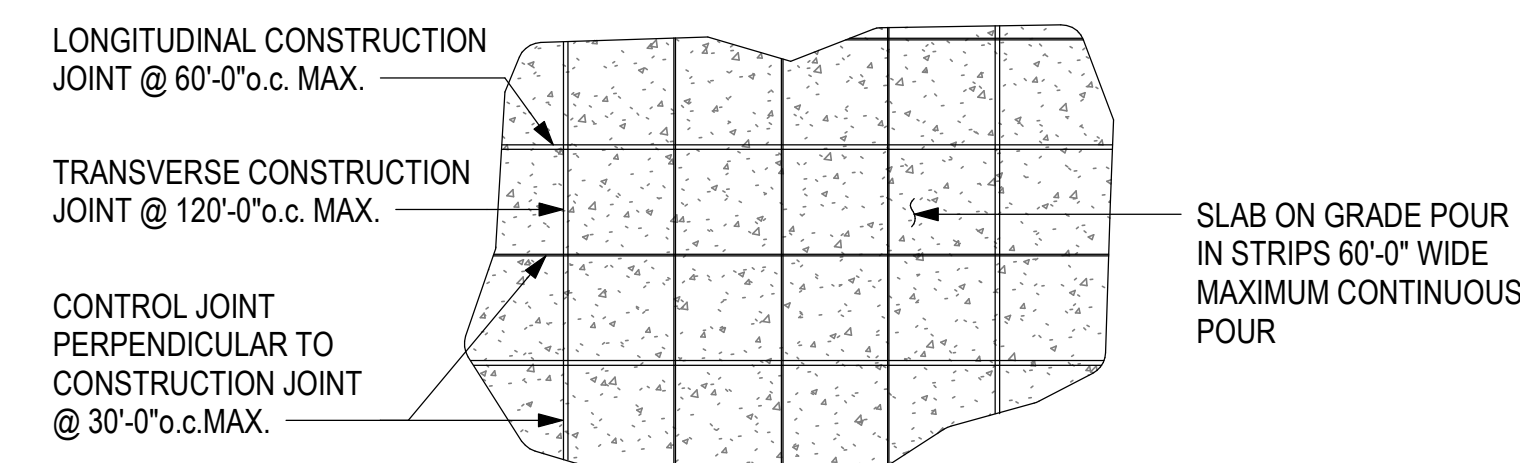
CONCRETE RETAINING WALL **A**

TYPICAL SLAB ON GRADE DETAILS **2**

TC302 2_16_MOD

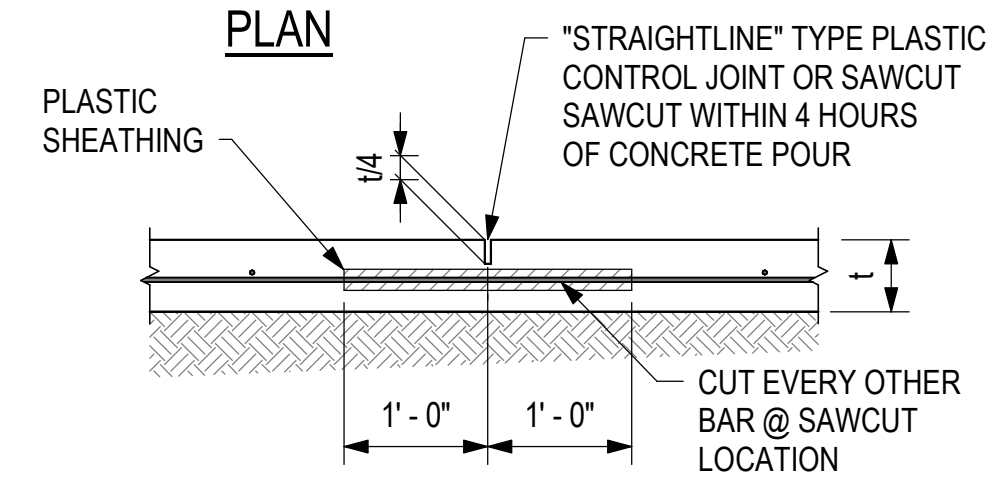


CURB AND SLAB DEPRESSION **E**

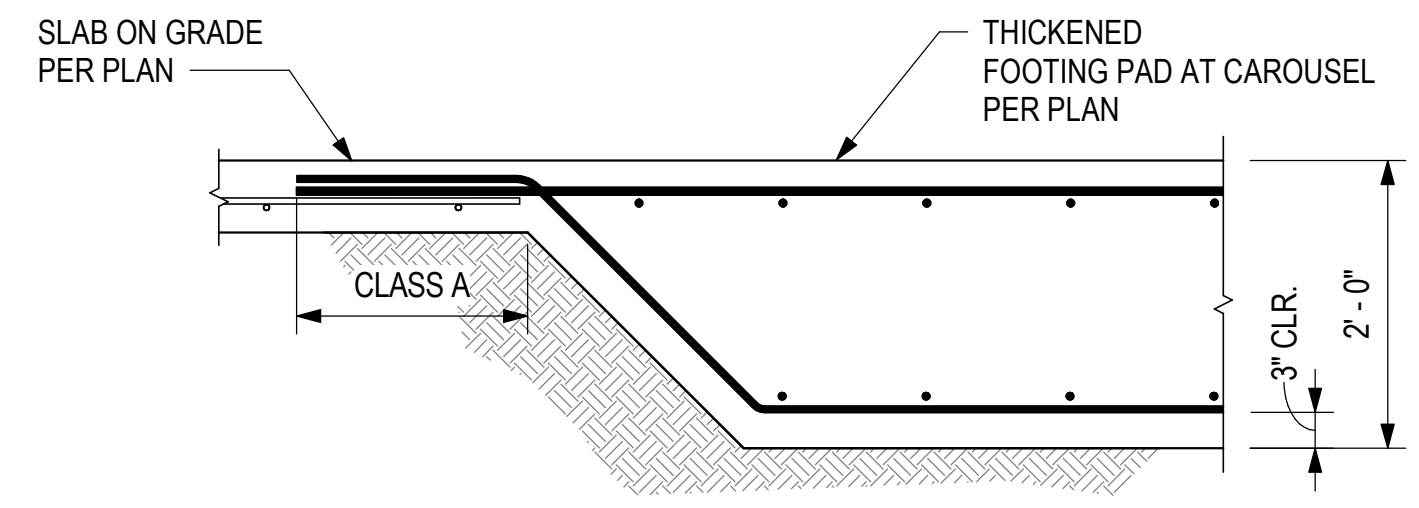


EDGE OF SLAB **D**

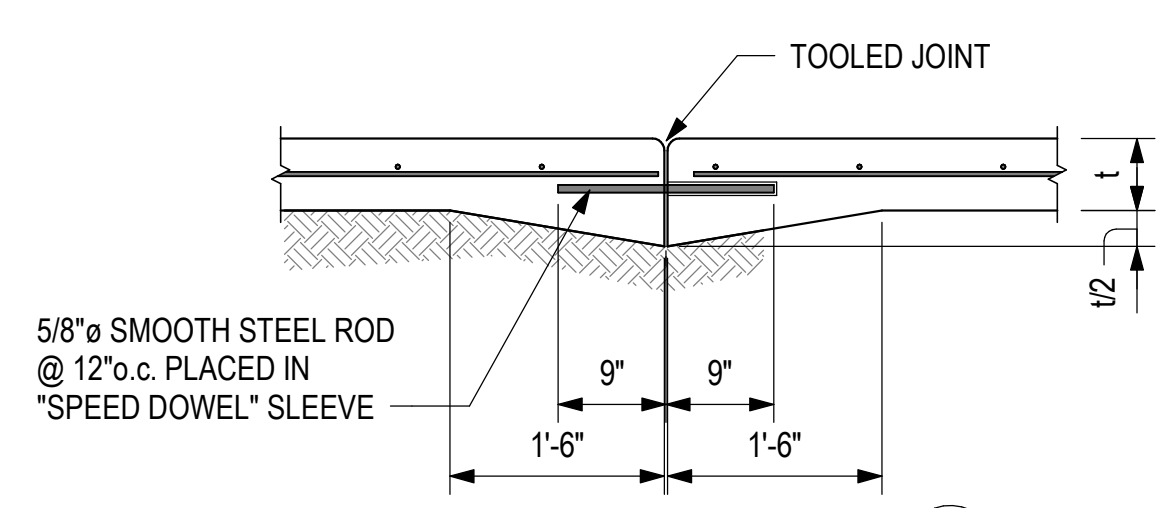
NOTES:
1. FOR SLAB ON GRADE THICKNESS, REINFORCING AND SUBGRADE PREPARATION SEE PLAN.



CONTROL JOINT **B**



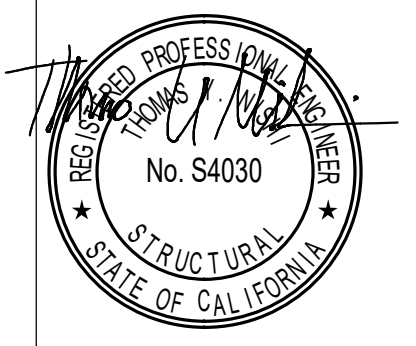
THICKENED FOOTING AT SLAB ON GRADE TRANSITION **C**



CONSTRUCTION JOINT **A**

TYPICAL SLAB ON GRADE DETAILS **1**

TC301_16_MOD



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2	LADBS RESUBMITTAL	2/22/2024

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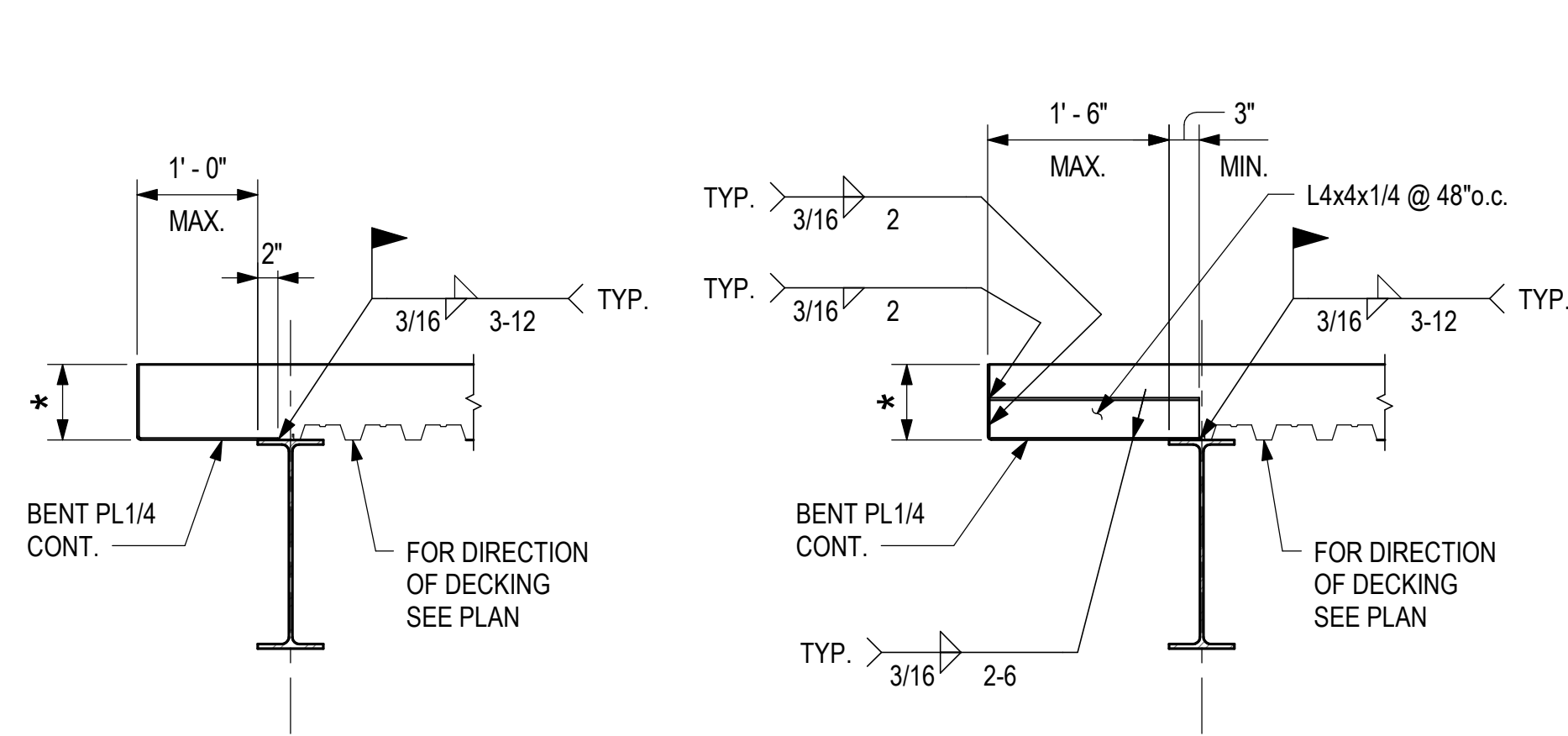
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E-mail: mail@jsfarchs.com
Architecture & Planning
John Fisher AIA



Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY
11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040
Drawing Title
TYPICAL DETAILS

Project No: 2209 ESE: B2304360
Phase: CONSTRUCTION DOCUMENTS
Date: DECEMBER 13, 2023
Scale: 3/4" = 1'-0"



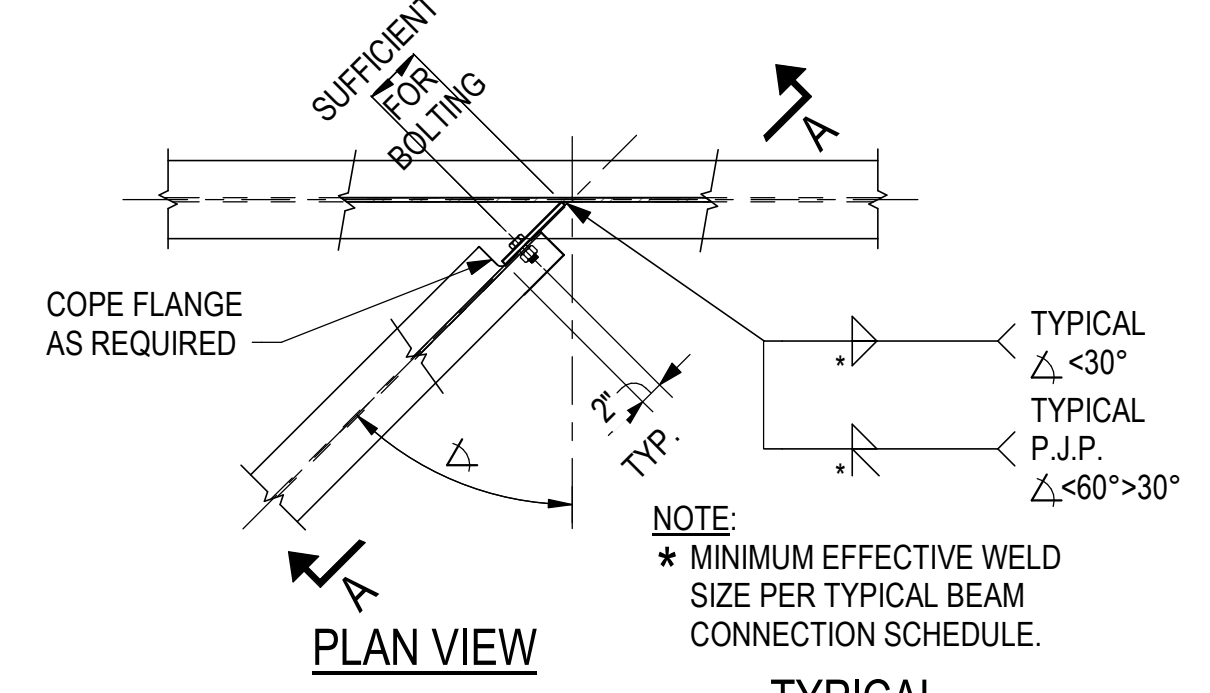
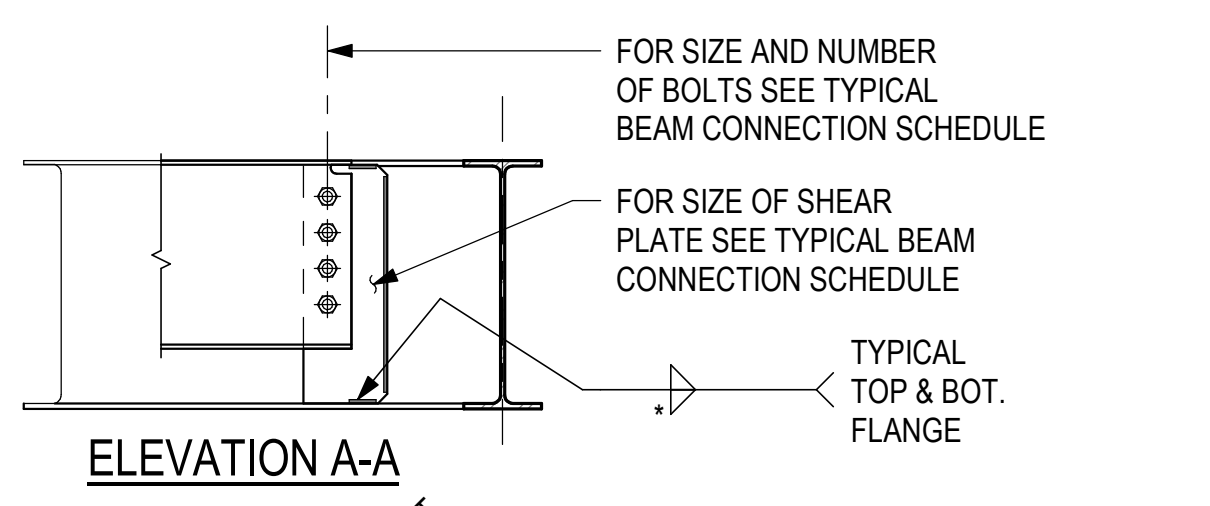
* VERIFY HEIGHT OF BENT PLATE w/ ARCHITECT.

- STEEL DECK NOTES:**
1. ALL STEEL DECKING SHALL CONFORM TO IAPMO REPORT #0217 AND LA RR 23789.
 2. DEPUTY INSPECTOR SHALL BE REQUIRED FOR LIGHT GAGE WELDING ON STEEL DECK.
 3. DEPUTY INSPECTOR SHALL BE REQUIRED FOR STUDS USED ON STEEL DECK.
 4. ALL STEEL DECKING SHALL BE 50 KSI. MINIMUM.
 5. SLABS EXPOSED TO WEATHER OR MOISTURE SENSITIVE COVERINGS SHALL BE PROVIDED WITH POSITIVE VENTED STEEL DECK.
 6. ALL SHOTPINS SHALL CONFORM TO ICC REPORT ESR-2197 (HILTI) OR ER-3829 (PNEUTEK) AND LA RR 25296.

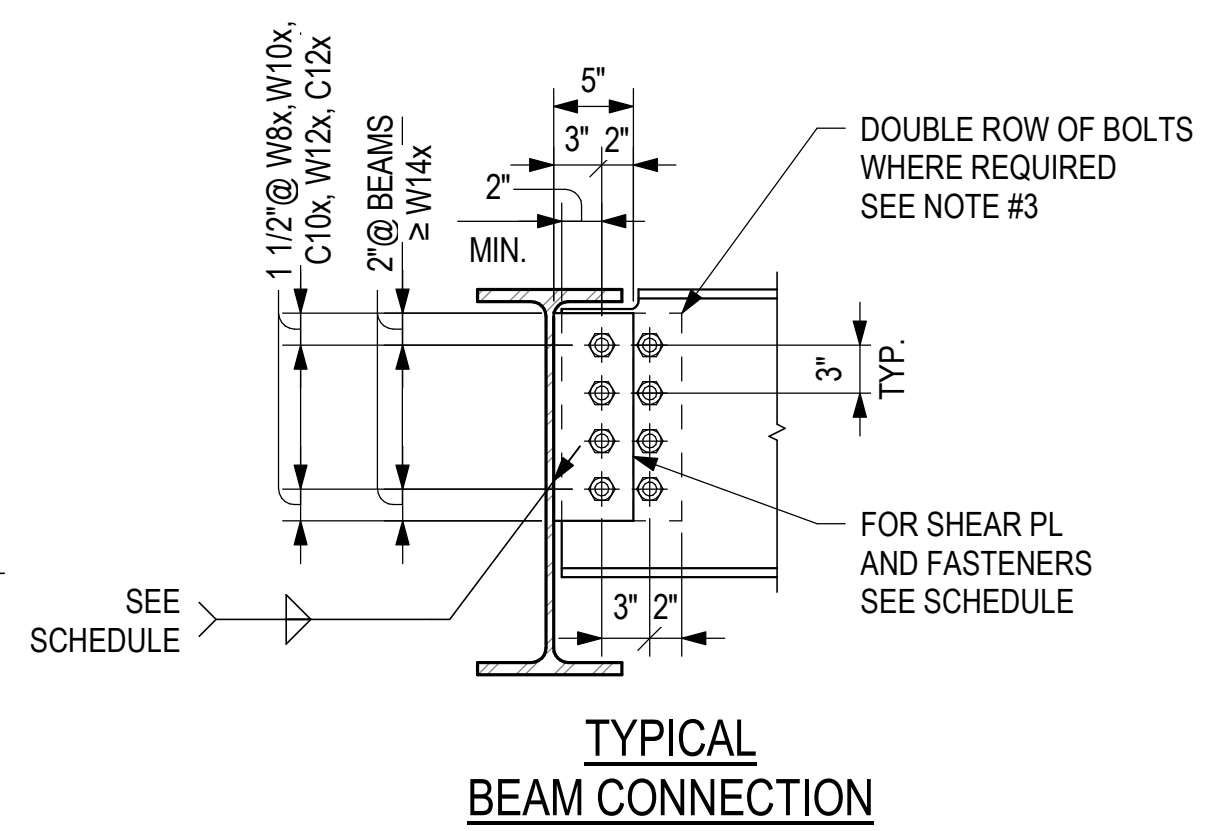
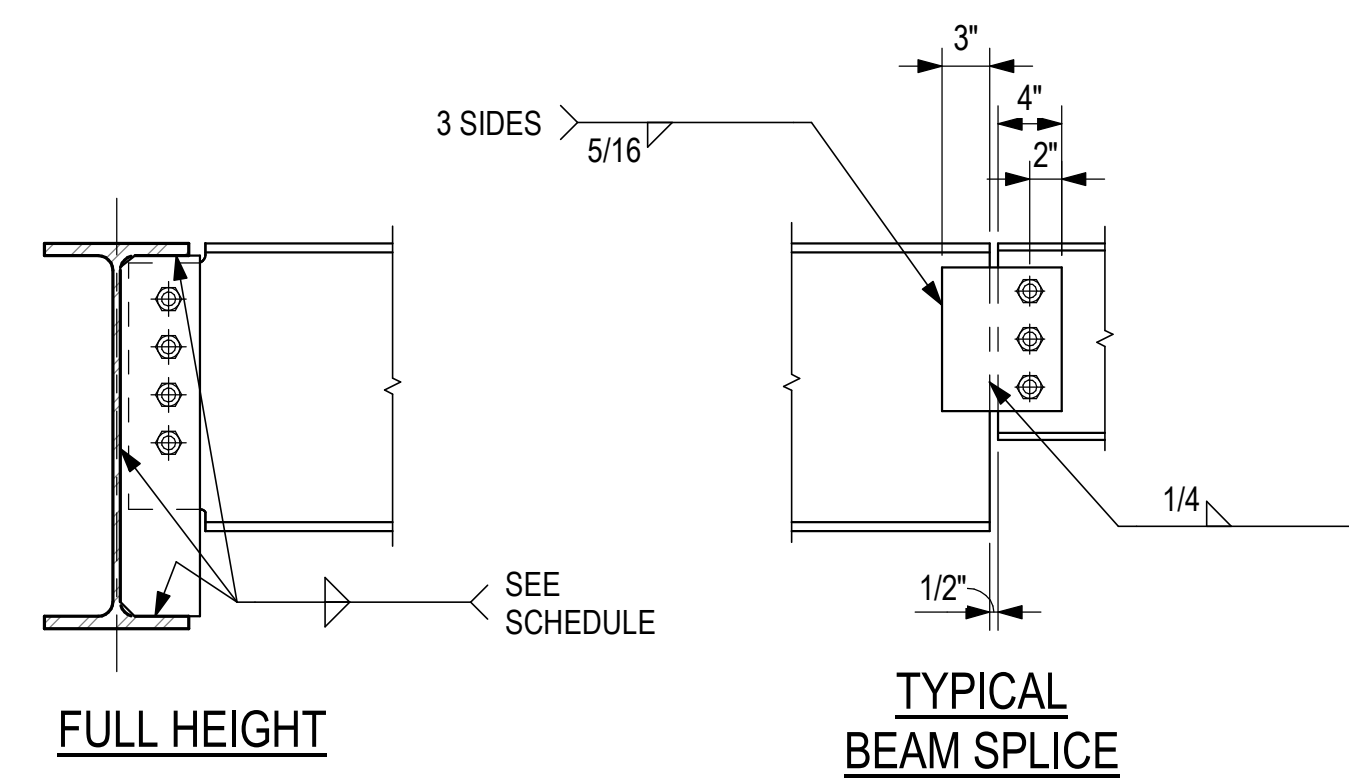
MARK	STEEL DECK TYPE	GAGE	TOTAL SLAB "t"	SLAB DESCRIPTION	STEEL DECK ATTACHMENT PATTERN			MAXIMUM UNSHORED SPAN			REMARKS	
					PERPENDICULAR TO SUPPORT		PARALLEL TO SUPPORT	SEAMS	SINGLE	DOUBLE		TRIPLE
					ENDS	INTERMEDIATE						
D1	VERCO 2.0D DOVETAIL	18	2"	2" THICK METAL DECK (NO CONCRETE FILL)	(4)HILTI X-ENP19 PAF CONN.	(4)HILTI X-ENP19 PAF CONN.	(4)HILTI X-ENP19 @ 12"o.c.	SIMPSON #10 XU34B1016 @ 12"o.c.	9'-6"	10'-6"	11'-6"	TYPICAL CANOPY ROOF

TYPICAL PERIMETER OF NON-CONCRETE ROOF EDGE **5**

TYPICAL SLAB AND STEEL DECK SCHEDULE **2**



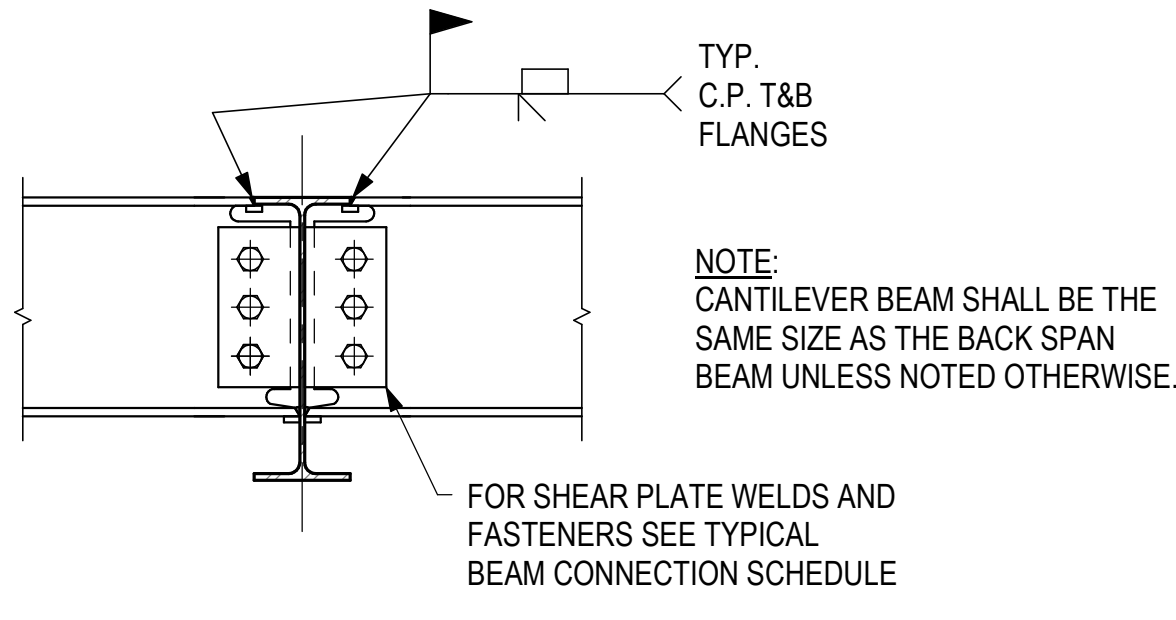
TYPICAL SKEWED BEAM CONNECTION DETAIL **4**



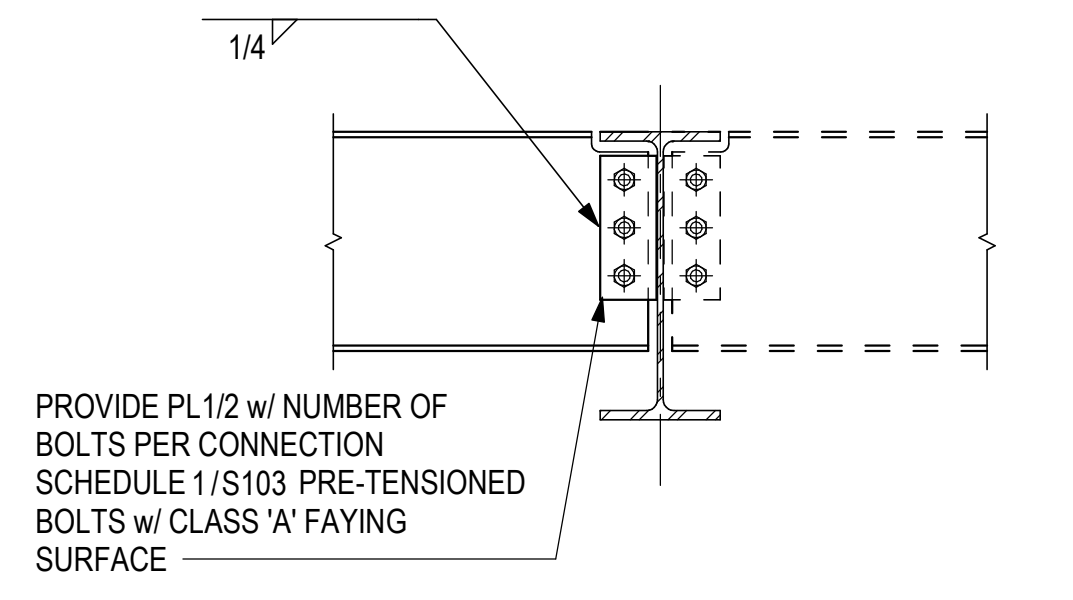
PROVIDE STIFFENER WHERE INDICATED ON PLAN THUS →

TYPICAL SHEAR PLATE BEAM STIFFENERS

- NOTES:**
1. ALL STIFFENERS SHALL EXTEND TO EDGE OF FLANGE MINIMUM. SEE CONNECTION SCHEDULE AND TYPICAL BEAM CONNECTION DETAIL ABOVE FOR REMAINDER OF INFORMATION.
 2. 7/8" Ø BOLTS MAY BE USED INSTEAD OF 3/4" Ø BOLTS.
 3. PROVIDE DOUBLE ROW OF BOLTS WHERE NUMBER OF BOLTS SPECIFIED CANNOT FIT IN SINGLE ROW.



TYPICAL MOMENT CONNECTION BEAM TO BEAM **6**



BEAM TO BEAM CONNECTION DETAIL

TYPICAL DRAG BEAM FLANGE CONNECTION DETAIL (SLRS) **3**

BEAM SIZE	A325-N	SHEAR PLATE "t"	WELD BOTH SIDES	ASD AVAILABLE STRENGTH	LFSD AVAILABLE STRENGTH
W8x, W10x	(2)3/4"Ø	3/8	5/16	8.8k	13.1k
W12x, W14x	(3)7/8"Ø	3/8	5/16	23.9k	35.8k
W16x, W18x	(4)7/8"Ø	3/8	5/16	45.5k	68.3k

TYPICAL BEAM CONNECTION SCHEDULE **1**

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 John Fisher AIA



Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040

Drawing Title: **TYPICAL DETAILS**

Project No: 2209 ESE: B2304360

Phase: CONSTRUCTION DOCUMENTS

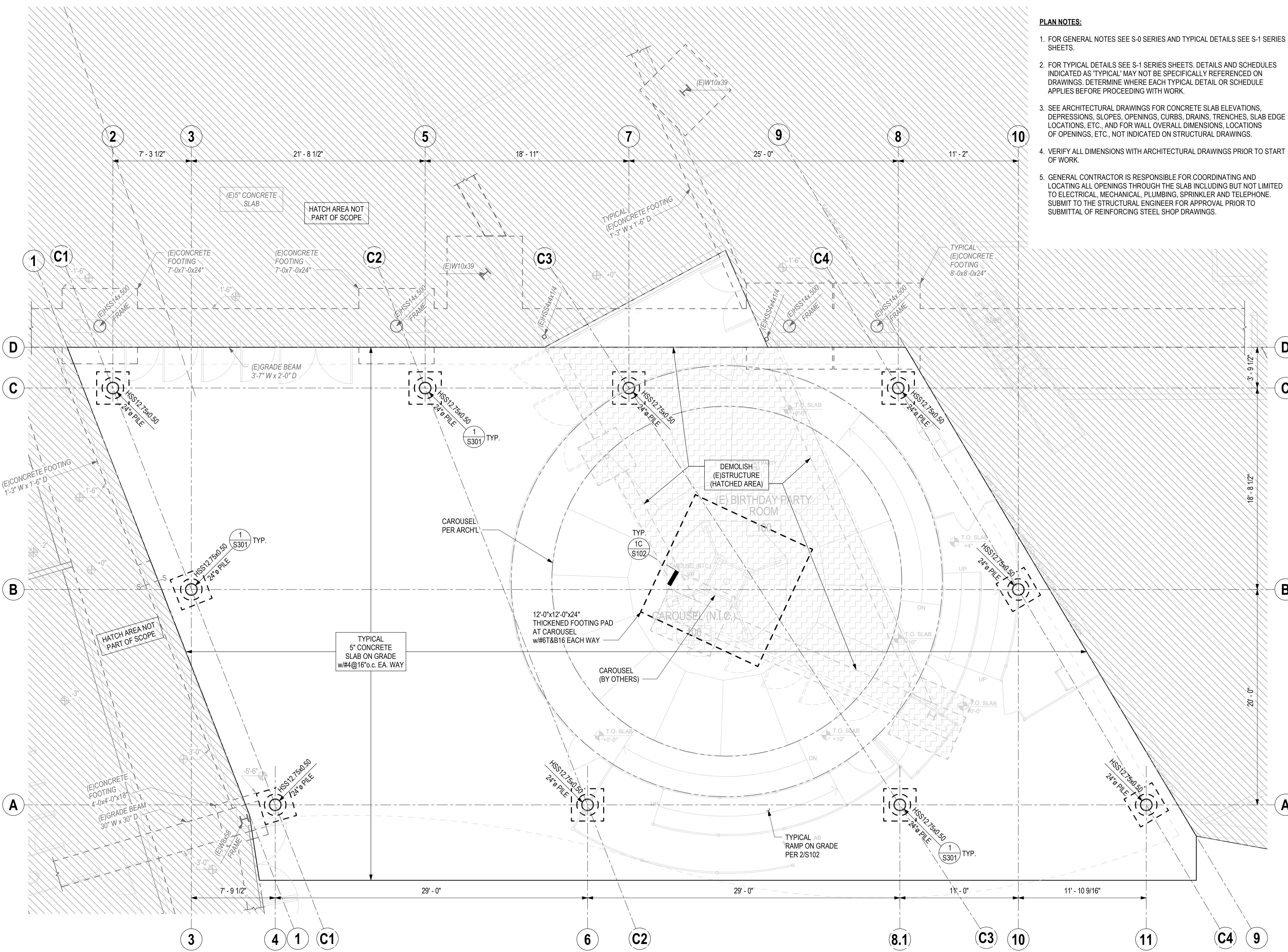
Date: DECEMBER 13, 2023

Scale: As indicated

S103

PLAN NOTES:

1. FOR GENERAL NOTES SEE S-0 SERIES AND TYPICAL DETAILS SEE S-1 SERIES SHEETS.
2. FOR TYPICAL DETAILS SEE S-1 SERIES SHEETS. DETAILS AND SCHEDULES INDICATED AS 'TYPICAL' MAY NOT BE SPECIFICALLY REFERENCED ON DRAWINGS. DETERMINE WHERE EACH TYPICAL DETAIL OR SCHEDULE APPLIES BEFORE PROCEEDING WITH WORK.
3. SEE ARCHITECTURAL DRAWINGS FOR CONCRETE SLAB ELEVATIONS, DEPRESSIONS, SLOPES, OPENINGS, CURBS, DRAINS, TRENCHES, SLAB EDGE LOCATIONS, ETC., AND FOR WALL OVERALL DIMENSIONS, LOCATIONS OF OPENINGS, ETC., NOT INDICATED ON STRUCTURAL DRAWINGS.
4. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF WORK.
5. GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND LOCATING ALL OPENINGS THROUGH THE SLAB INCLUDING BUT NOT LIMITED TO ELECTRICAL, MECHANICAL, PLUMBING, SPRINKLER AND TELEPHONE. SUBMIT TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO SUBMITTAL OF REINFORCING STEEL SHOP DRAWINGS.



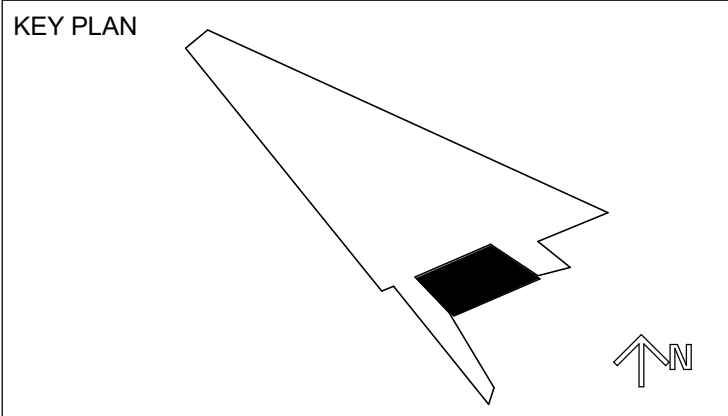
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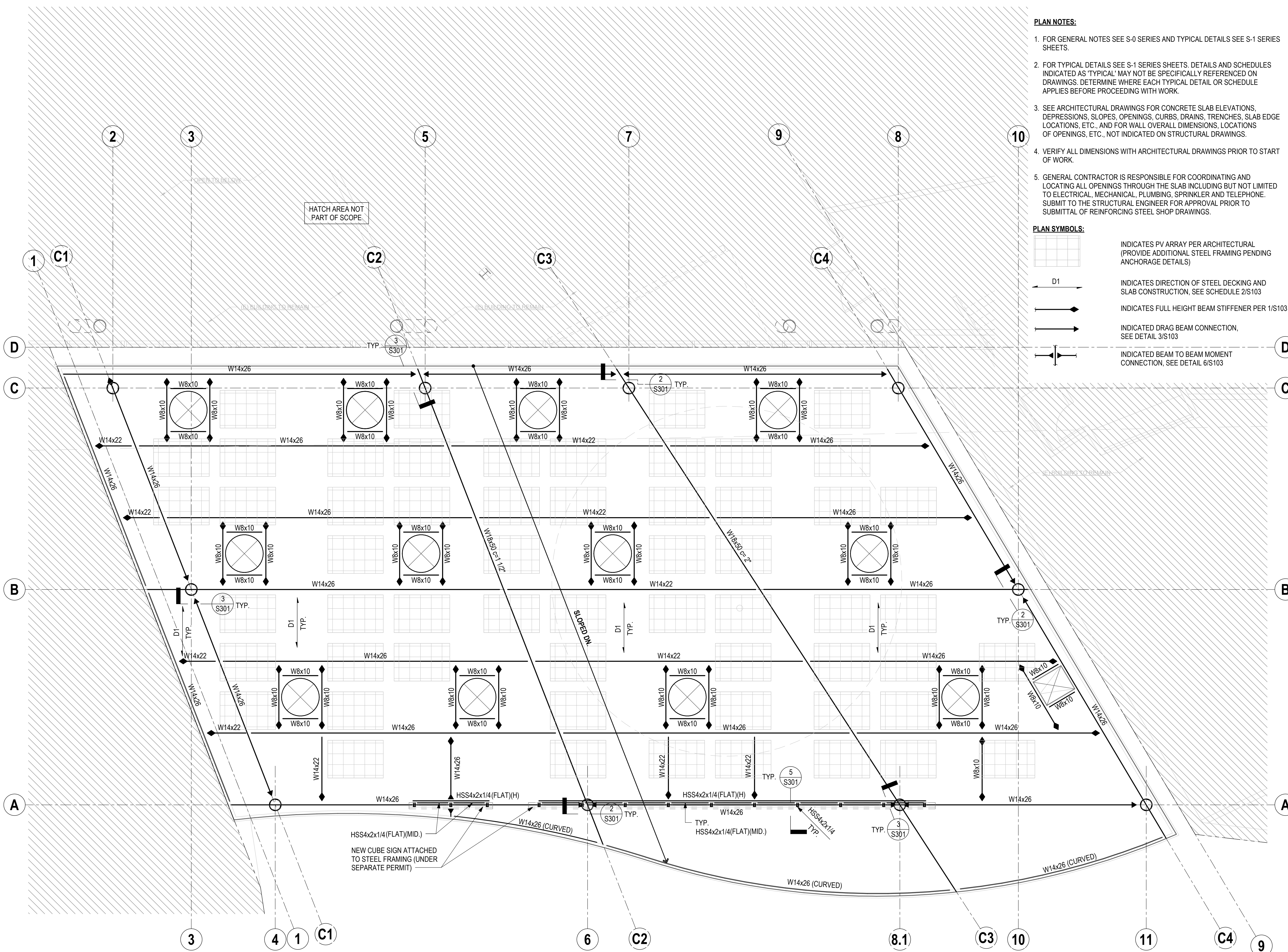


Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY
 11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
FIRST FLOOR FOUNDATION/ FRAMING PLAN

Project No: 2209 ESE: B2304360
 Phase: CONSTRUCTION DOCUMENTS
 Date: DECEMBER 13, 2023
 Scale: As indicated

FIRST FLOOR FOUNDATION/ FRAMING PLAN **A**
 1/4" = 1'-0"



- PLAN NOTES:**
- FOR GENERAL NOTES SEE S-0 SERIES AND TYPICAL DETAILS SEE S-1 SERIES SHEETS.
 - FOR TYPICAL DETAILS SEE S-1 SERIES SHEETS. DETAILS AND SCHEDULES INDICATED AS 'TYPICAL' MAY NOT BE SPECIFICALLY REFERENCED ON DRAWINGS. DETERMINE WHERE EACH TYPICAL DETAIL OR SCHEDULE APPLIES BEFORE PROCEEDING WITH WORK.
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 - VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF WORK.
 - GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND LOCATING ALL OPENINGS THROUGH THE SLAB INCLUDING BUT NOT LIMITED TO ELECTRICAL, MECHANICAL, PLUMBING, SPRINKLER AND TELEPHONE. SUBMIT TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO SUBMITTAL OF REINFORCING STEEL SHOP DRAWINGS.

- PLAN SYMBOLS:**
- INDICATES PV ARRAY PER ARCHITECTURAL (PROVIDE ADDITIONAL STEEL FRAMING PENDING ANCHORAGE DETAILS)
 - D1 INDICATES DIRECTION OF STEEL DECKING AND SLAB CONSTRUCTION, SEE SCHEDULE 2/S103
 - INDICATES FULL HEIGHT BEAM STIFFENER PER 1/S103
 - INDICATED DRAG BEAM CONNECTION, SEE DETAIL 3/S103
 - INDICATED BEAM TO BEAM MOMENT CONNECTION, SEE DETAIL 6/S103

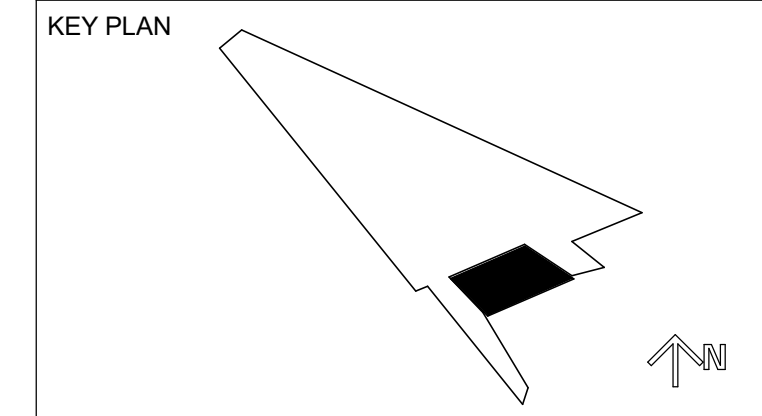
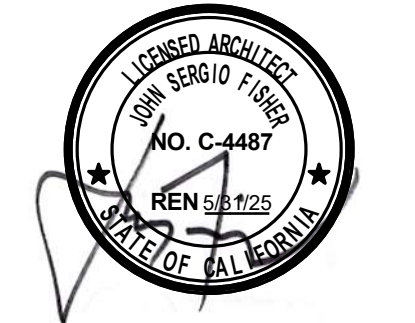
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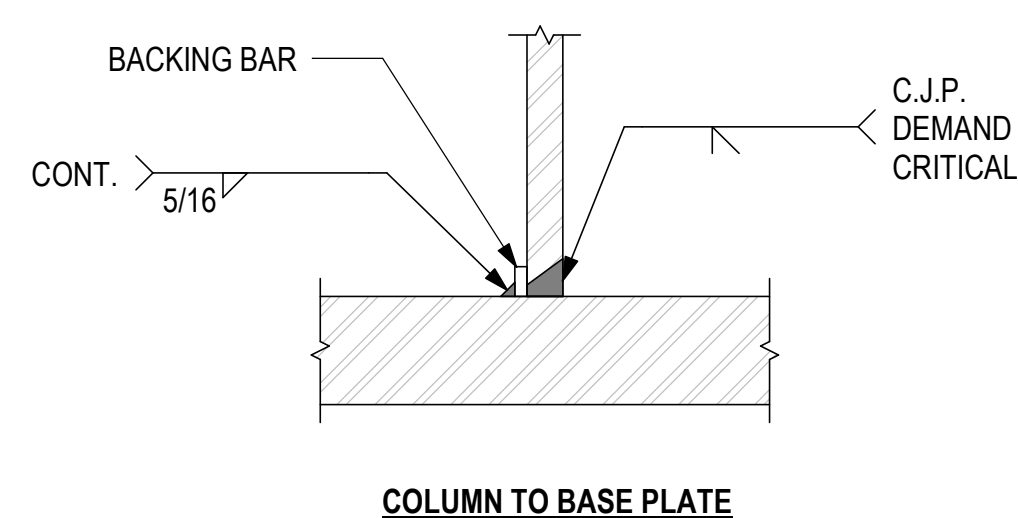
Client:
DISCOVERY CUBE LOS ANGELES

Job Name:
COURTYARD CAROUSEL CANOPY

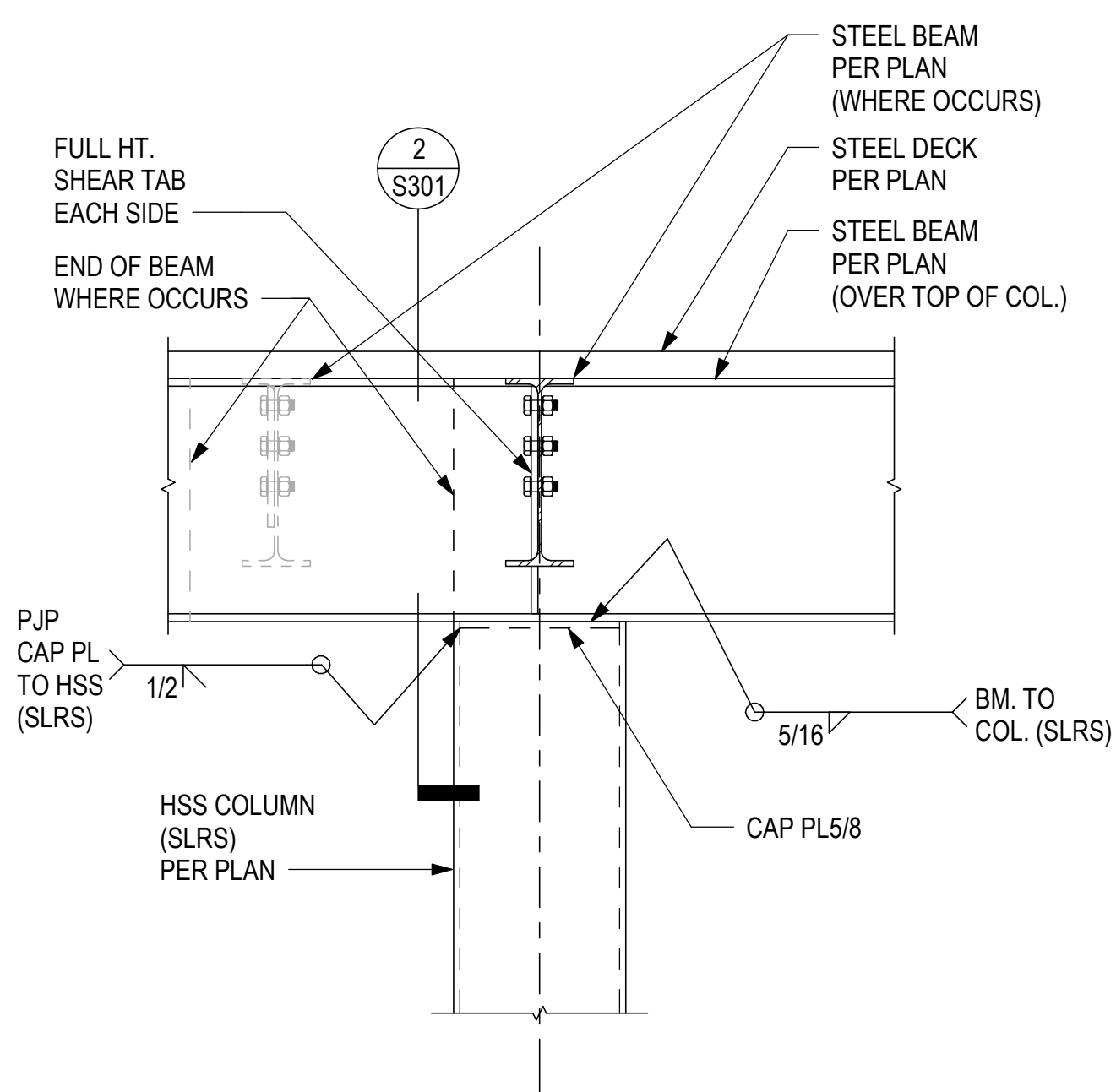
11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040

Drawing Title
ROOF FRAMING PLAN

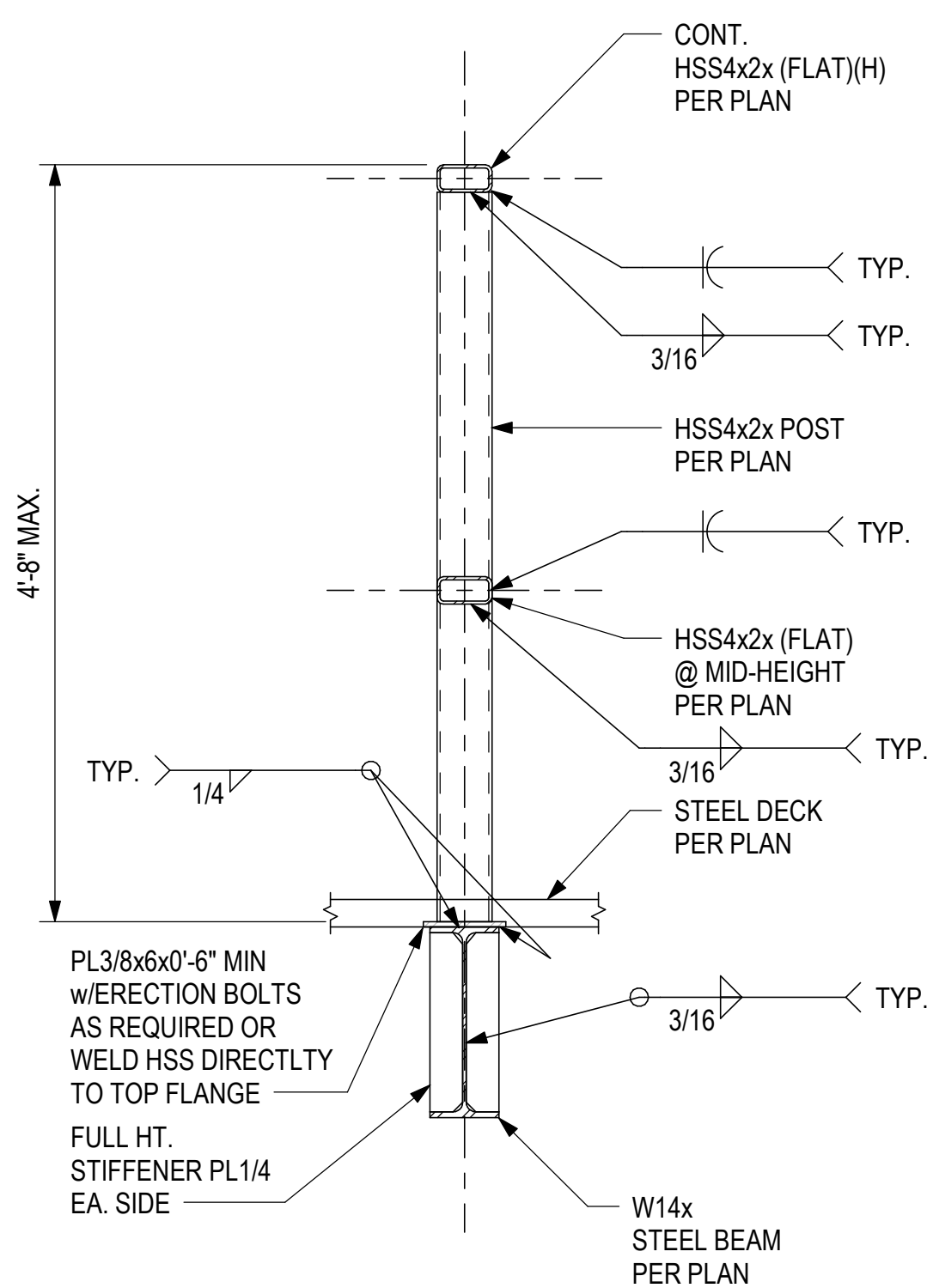
Project No: 2209 ESE: B2304360
 Phase: CONSTRUCTION DOCUMENTS
 Date: DECEMBER 13, 2023
 Scale: As indicated



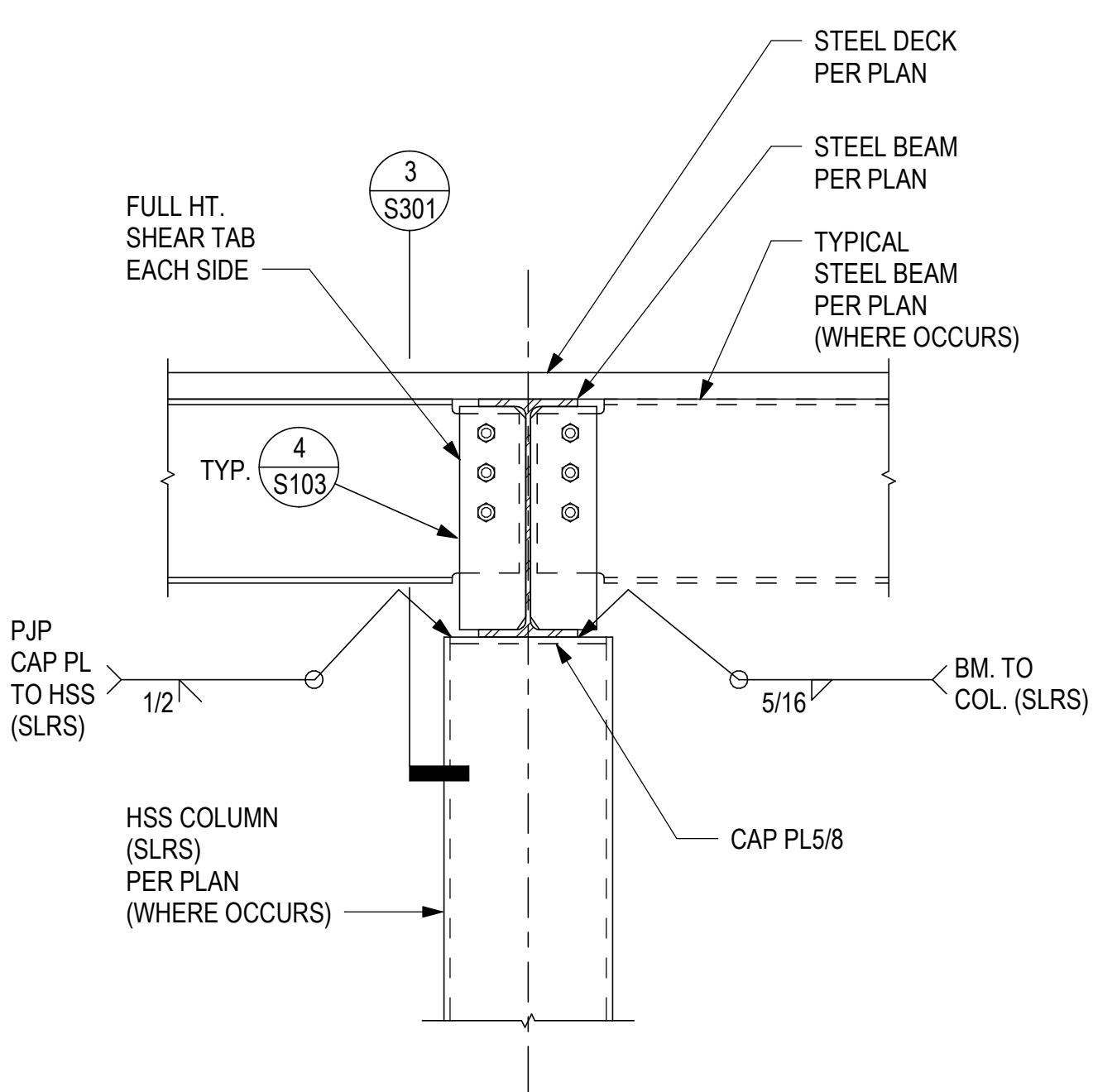
TYPICAL HSS COLUMN (SLRS) TO BASE PLATE DETAIL 4
3" = 1'-0"



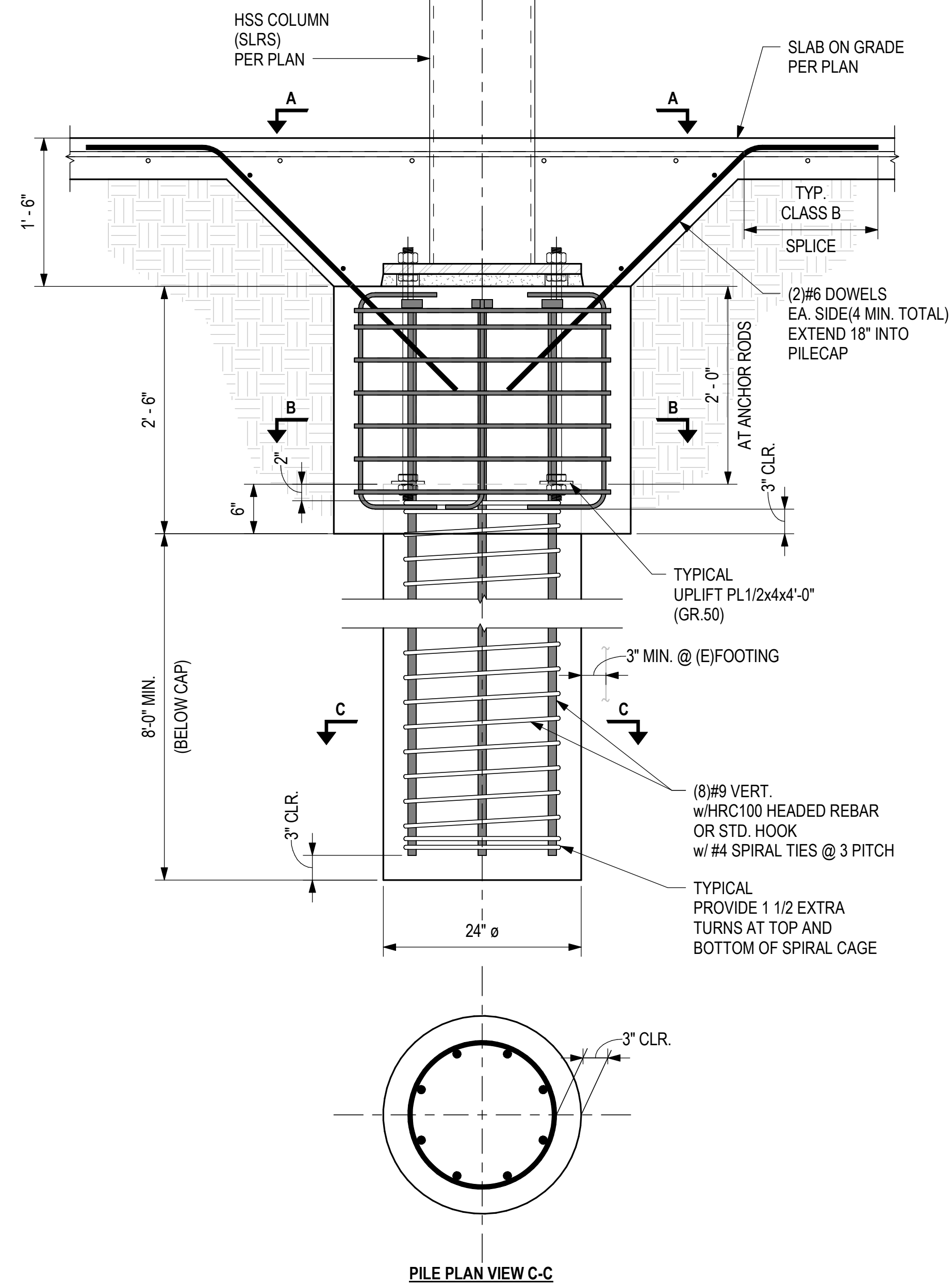
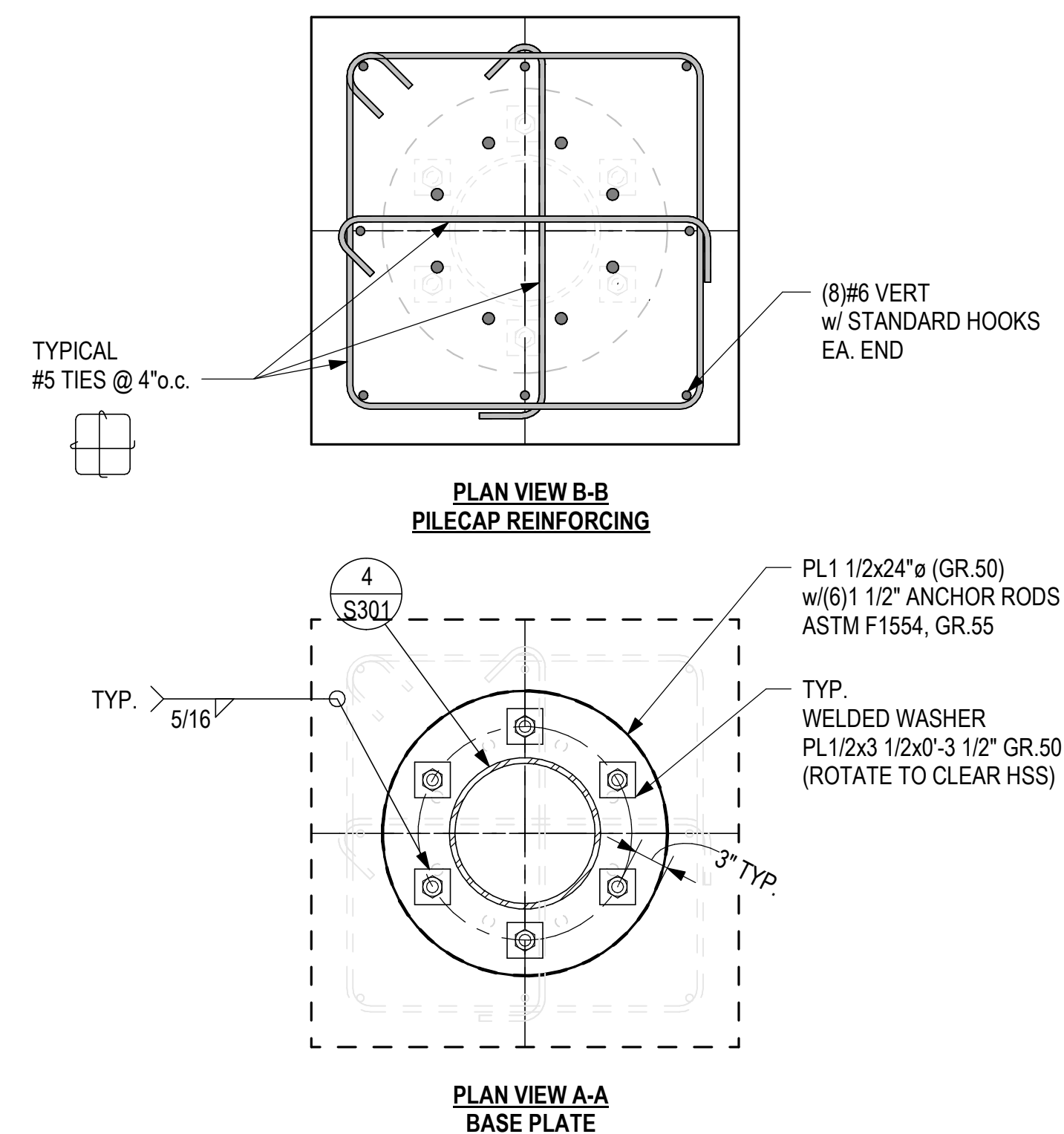
STEEL DETAIL 3
1" = 1'-0"



SIGN POST DETAIL 5
1" = 1'-0"



STEEL DETAIL 2
1" = 1'-0"



TYPICAL HSS COLUMN BASE PLATE / PILE DETAIL 1
1" = 1'-0"

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SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	12/8/2023
2	LADBS RESUBMITTAL	2/22/2024

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John Fisher AIA



Client: **DISCOVERY CUBE LOS ANGELES**
Job Name: **COURTYARD CAROUSEL CANOPY**
11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA. 91040
Drawing Title: **SECTIONS AND DETAILS**

Project No: 2209 ESE: B2304360
Phase: CONSTRUCTION DOCUMENTS
Date: DECEMBER 13, 2023
Scale: As indicated **S301**

LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	WATTS	MOUNTING	COLOR TEMPERATURE K*	CRI	LUMENS
1	LED CANOPY LIGHT WITH 12"SQ. x 8"D. DIE-FORMED ALUMINUM HOUSING, POLYCARBONATE DROPPED LENS, BRONZE FINISH, NON-DIMMED, UNIVERSAL VOLTAGE DRIVER, RATED FOR DAMP LOCATIONS.	40	SURFACE	4000	80	4350
	ECLIPSE LIGHTING #QE5 SERIES OR EQUAL					
1A	SAME AS TYPE 7 EXCEPT WITH INTERGAL 90-MINUTE EMERGENCY BATTERY BACK UP POWER SUPPLY					
2	LED DOWNLIGHT WITH 6-INCH APERTURE, REGRESSED DIFFUSED ACRYLIC LENS, RATED FOR WET LOCATIONS, 65-DEGREE LIGHT DISTRIBUTION, CLEAR SEMI-SPECULAR TRIM, NON-DIMMED.	37	RECESSED	3500	80	2800
	H.E. WILLIAMS #6DR SERIES OR EQUAL					

DISCOVERY CUBE				EXISTING PANELBOARD L13				PROJECT NO. 476.029			
VOLTS 120/208 PHASE 3PH, 4W MTG SURFACE				LOCATION FIRST FLOOR				MAIN M.D. BUS 225A			
←- LOAD (VA)		→-LOAD		←- LOAD (VA)		→-LOAD		←- LOAD (VA)		→-LOAD	
CKT	A B C	TYPE	BKR	QUAN	DESCRIPTION	CKT	A B C	TYPE	BKR	QUAN	DESCRIPTION
1	1272		G	30/3	EXISTING CIRCUIT	A 2	800		G	20/1	EXISTING CIRCUIT
3	360		G			B 4	1000		G	20/1	EXISTING CIRCUIT
5			G			C 6	360		R	20/1	EXISTING CIRCUIT
7	360		R	20/1	EXISTING CIRCUIT	A 8	800		G	20/1	EXISTING CIRCUIT
9	360		R	20/1	EXISTING CIRCUIT	B 10	800		G	20/1	EXISTING CIRCUIT
11	360		R	20/1	EXISTING CIRCUIT	C 12	500		G	20/1	EXISTING CIRCUIT
13	360		R	20/1	EXISTING CIRCUIT	A 14	800		G	20/1	EXISTING CIRCUIT
15	360		R	20/1	EXISTING CIRCUIT	B 16	540		R	20/1	SPARE
17	360		R	20/1	EXISTING CIRCUIT	C 18	540		L	20/1	SPARE
19	360		R	20/1	EXISTING CIRCUIT	A 20	900		R	20/1	EXISTING CIRCUIT
21	360		R	20/1	EXISTING CIRCUIT	B 22	900		R	20/1	EXISTING CIRCUIT
23	360		R	20/1	EXISTING CIRCUIT	C 24	900		R	20/1	EXISTING CIRCUIT
25	360		R	20/1	EXISTING CIRCUIT	A 26	1000		G	100/3	EXISTING CIRCUIT
27	360		R	20/1	EXISTING CIRCUIT	B 28	1000		G		
29	360		R	20/1	EXISTING CIRCUIT	C 30	1000		G		
31	640		L	20/1	NEW CANOPY LIGHTS	A 32				20/1	SPACE
33				20/1	SPACE	B 34				20/1	SPACE
35				20/1	SPACE	C 36				20/1	SPACE
37				20/1	SPACE	A 38				20/1	SPACE
39				20/1	SPACE	B 40				20/1	SPACE
41				20/1	SPACE	C 42				20/1	SPACE

CONNECTED VA AMPS RECEPT. () 10 KVA @ 5000 = 7920 LOAD TYPE:
 PHASE A = 7652 54 KITCHEN @ 65X = 9332 G - GENERAL (1000) M - MOTOR (1000)
 PHASE B = 6040 50 OTHER LOAD @ 100X = 9332 L - L.C.L. (1250) M1 - MOTOR (1250)
 PHASE C = 4740 40 TOTAL VA = 18727 R - RECEPTACLE (500) X - X-RAY (1000)
 TOTAL = 18432 51 TOTAL AMPS = 52 (10 KVA @ 1000) XI - X-RAY (500)
 K - KITCHEN (650)

PROVIDE NEW CIRCUIT BREAKER

APPLICABLE CODES

- 2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R.
- 2022 BUILDING ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.*
- 2022 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R.
(2020 NATIONAL ELECTRICAL CODE AND 2022 CALIFORNIA AMENDMENTS)
- 2022 CA ENERGY EFFICIENCY STANDARDS
- 2022 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24 C.C.R.
- 2023 LA ELECTRICAL CODE

ELECTRICAL SHEET INDEX

- E001 SYMBOL LIST/FIXTURE SCHEDULE
- E002 SINGLE LINE DIAGRAM
- E101 OVERALL SITE ELECTRICAL PLAN
- E120 ELECTRICAL DEMOLITION PLAN
- E201 CAROUSEL ELECTRICAL PLAN
- E211 CAROUSEL LIGHTING PLAN
- ET24-1 TITLE 24 DOCUMENTATION

SCOPE OF WORK


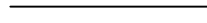
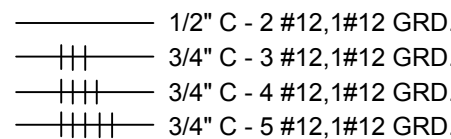

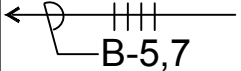
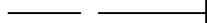
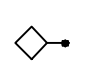


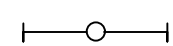
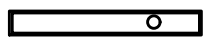
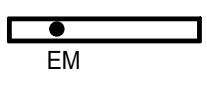
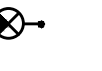

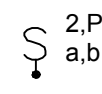


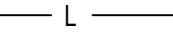






1. DISCONNECT AND REMOVE EXISTING LIGHTS, RECEPTACLES, OUTLET BOXES, CABLES, AND CONDUITS FROM BIRTHDAY PARTY ROOM BEING DEMOLISHED TO MAKE ROOM FOR NEW CAROUSEL.
2. PROVIDE ELECTRICAL CONNECTIONS TO NEW CAROUSEL.
3. PROVIDE NEW LIGHTS ON NEW CANOPY ABOVE CAROUSEL AND IN NEW EXTERIOR SOFFIT.

ABBREVIATIONS LIST

A.F.F.	ABOVE FINISH FLOOR
A.F.G.	ABOVE FINISH GRADE
AWG	AMERICAN WIRE GAUGE
AMP, A	AMPERE
A.I.C.	AMPERES INTERRUPTING CAPACITY (SYMMETRICAL)
AF/AT	AMP FRAME, AMP TRIP
AS/AF	AMP SWITCH, AMP FUSE
CIRC., CKT.	CIRCUIT
CB	CIRCUIT BREAKER
C	CONDUIT
C.O.	CONDUIT ONLY.
CONN	CONNECTED
DIA	DIAMETER
E-O-L	END-OF-LINE CIRCUIT TERMINATOR
EF	EXHAUST FAN
FT or '	FEET
FA	FIRE ALARM
GFI	GROUND FAULT INTERRUPTER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
H., W., D., L.	HEIGHT, WIDTH, DEPTH, LENGTH
HID	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
IN. or "	INCHES
IG	ISOLATED GROUND
J-BOX	JUNCTION BOX
KVA	KILOVOLT AMPERES
KW	KILOWATT
LCL	LONG CONTINUOUS LOAD
L.F.	LINEAR FEET
LTG, LTS	LIGHTING
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
MTD	MOUNTED
NEC	NATIONAL ELECTRICAL CODE
NO. or #	NUMBER
PH or φ	PHASE
PROVIDE	FURNISH, INSTALL AND CONNECT.
REC, RECEPT	RECEPTACLE
TP	TWISTED (NON SHIELDED) PAIR
U.N.O.	UNLESS NOTED OTHERWISE

SYMBOL LIST

(ALL SYMBOLS NOT NECESSARILY USED ON THESE DRAWINGS)
ALL SYMBOL DESCRIPTIONS ARE SUBJECT TO MODIFICATION AS NOTED ON THE DRAWINGS

	CIRCUIT BREAKER
	CONDUIT, INSTALLED CONCEALED IN WALL OR IN CEILING SPACE, UNLESS OTHERWISE NOTED
	1/2" C - 2 #12,1#12 GRD. 3/4" C - 6 #12,1#12 GRD. 3/4" C - 3 #12,1#12 GRD. 1" C - 7 #12,1#12 GRD. 3/4" C - 4 #12,1#12 GRD. 1" C - 8 #12,1#12 GRD. 3/4" C - 5 #12,1#12 GRD. 1 1/4" C - 9 #12,1#12 GRD.
	CONDUIT, INSTALLED CONCEALED IN OR UNDER FLOOR OR BELOW GRADE, 3/4" CONDUIT MINIMUM.
	HOMERUN TO PANEL "B" FOR CIRCUITS 5 AND 7 WITH SEPARATE NEUTRALS.
	UNDERGROUND CONDUIT SUBROUT, STUB 5'-0" FROM BUILDING OR WALKWAY, CAP, MARK AND RECORD.
	COMPUTER OUTLET WITH TWO (2) CATEGORY 6A COMPUTER CONNECTORS, WHITE IN COLOR, IN WEATHERPROOF OUTLET BOX. PROVIDE CATEGORY 6 CABLE FROM EACH CONNECTOR TO BUILDING MDF.
	INTRUSION DETECTION SYSTEM MOTION SENSOR ON VEILING OUTLET BOX.
	FIXTURE SCHEDULE DESIGNATION: "2" INDICATES FIXTURE TYPE, "100" INDICATES FIXTURE TOTAL WATTAGE.
	STRIP OR INDUSTRIAL LIGHTING FIXTURE, SURFACE, CHAIN OR PENDANT MOUNTED ON SURFACE MOUNTED OUTLET BOX.
	LIGHT FIXTURE SUSPENDED FROM CEILING.
	LIGHT FIXTURE CONNECTED TO EMERGENCY BATTERY/CENTRAL INVERTER "EM".
	EXIST SIGN CONNECTED TO REMOTE EMERGENCY.
	LOW VOLTAGE LIGHT SWITCHES IN FLUSH WALL OUTLET BOX AT +45". LETTERS INDICATE OUTLETS CONTROLLED.
	SINGLE POLE TOGGLE SWITCH, ON FLUSH WALL MOUNTED OUTLET BOX, +45". INSTALL MULTIPLE SWITCHES UNDER COMMON COVER PLATE. SUBSCRIPT OR SUPERSCRIPIT AT SWITCH SYMBOL INDICATES THE FOLLOWING: 2 - DOUBLE POLE 4 - FOUR WAY M - MANUAL MOTOR STARTERS 3 - THREE WAY P - PILOT LIGHT K - KEY OPERATED R - SPDT MOMENTARY CONTACT RELAY SWITCH V - VAPOR PROOF a,b,c,d, ETC. - MULTIPLE SWITCHES WITH IDENTIFICATION OF OUTLET CONTROLLED.
	LINE VOLTAGE OCCUPANCY SENSOR ON FLUSH CEILING OUTLET BOX FOR LIGHTING CONTROL.
	LOW VOLTAGE OCCUPANCY SENSOR ON FLUSH CEILING OUTLET BOX FOR LIGHTING CONTROL.
	3/4" C. WITH LOW VOLTAGE LIGHTING CONTROL WIRING.
	DUPLEX CONVENIENCE RECEPTACLE VERTICAL ON FLUSH WALL MOUNTED OUTLET BOX, +18". STEM INDICATES WALL MOUNTED OUTLET BOX, TYPICAL.
	DUPLEX CONVENIENCE RECEPTACLE WITH INTERNAL GROUND FAULT INTERRUPTER, VERTICAL ON FLUSH WALL MOUNTED OUTLET BOX +18".
	DUPLEX CONVENIENCE RECEPTACLE, WITH INTERNAL GROUND FAULT INTERRUPTER, ON FLUSH WALL MOUNTED OUTLET BOX WITH METALLIC WEATHERPROOF LOCKABLE "IN-USE" DOOR COVER, +18".
	JUNCTION BOX, FLUSH WALL MOUNTED, +18".
	INDICATES CONNECTION TO EQUIPMENT AS REQUIRED, TYPICAL.
	WALL MOUNTED PANELBOARD, ADJACENT LINE INDICATES PANEL FRONT. ADJACENT BALLOON INDICATES PANEL DESIGNATION "A", SEE DRAWING E-1 FOR PANEL SCHEDULE.

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	12/8/2023

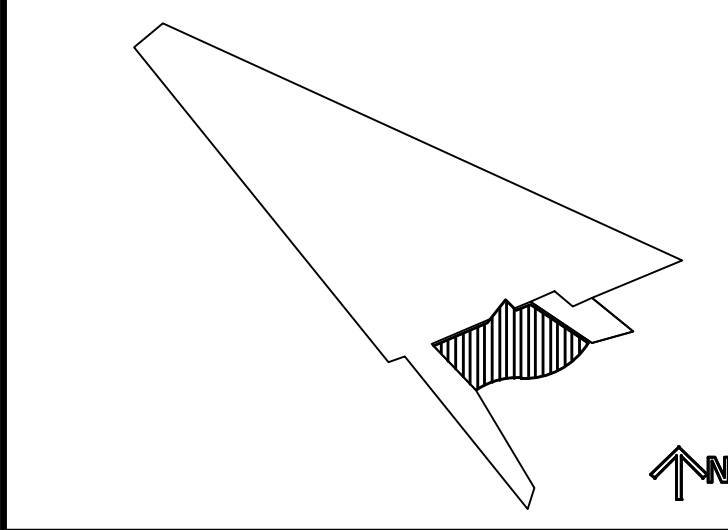
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REGISTERED PROFESSIONAL ENGINEER
No. E 10372
Exp. 09-30-24

KEY PLAN



Client: **DISCOVERY CUBE LOS ANGELES**

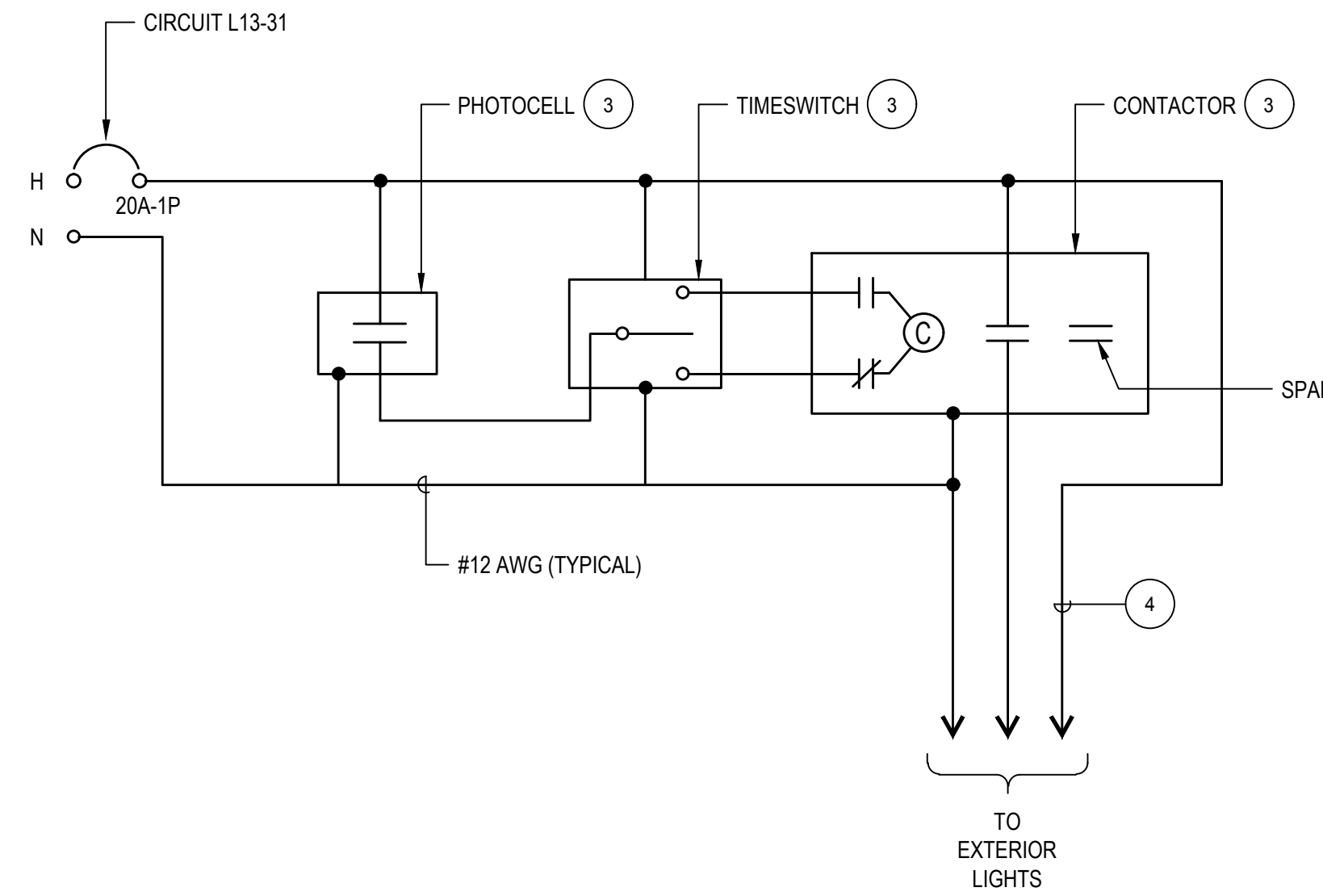
Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA 91040

Drawing Title
**SYMBOL LIST
FIXTURE SCHEDULE**

Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN

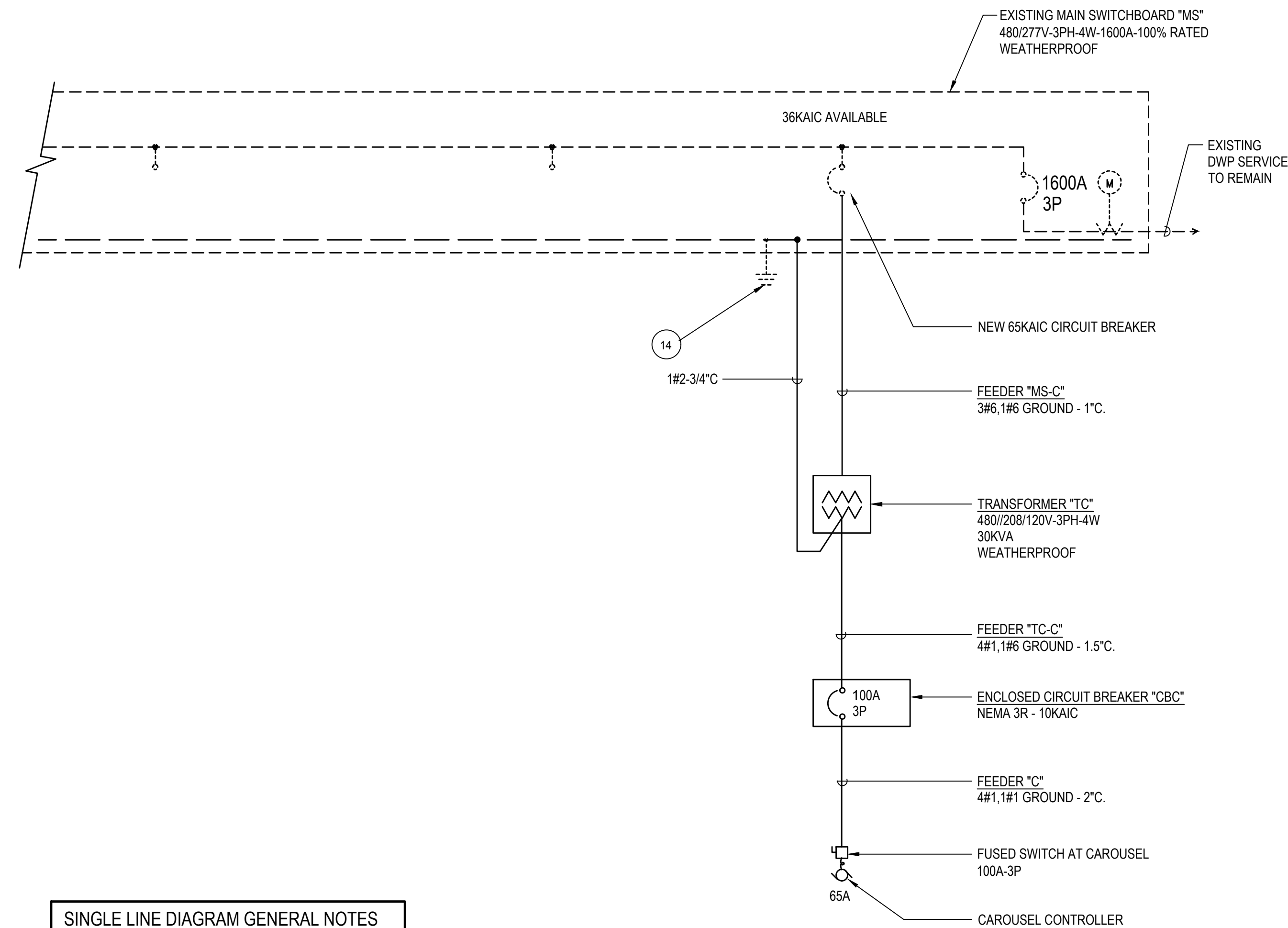
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LIGHTING CONTROL WIRING DIAGRAM

SCALE: N.T.S. 2

- REFERENCE NOTES
- 1 LOAD SHOWN IS NEW CONNECTED LIGHTING LOAD. EXISTING LIGHTING LOAD REMOVED IS 312 WATTS.
 - 2 LOAD SHOWN IS NEW CONNECTED LIGHTING LOAD. EXISTING LIGHTING LOAD REMOVED IS 192 WATTS.
 - 3 SEE SHEET E211-A FOR PART NUMBERS.
 - 4 UNSWITCHED CONDUCTOR TO CHARGE BATTERY IN TYPE 1A LIGHT FIXTURES.
 - 5 EXISTING TRANSFORMER RATED 480/208/120V-3PH-4W-300KVA TO REMAIN.
 - 6 EXISTING OUTDOOR DISTRIBUTION BOARD RATED 208/120V-3PH-W-W-1200AMPS TO REMAIN.
 - 7 NET LOAD CHANGE TO PANEL NY WORK SHOWN ON THESE DRAWINGS: +8 AMPS(960 WATTS). NEW CONNECTED LOAD: 127AMPS.
 - 8 EXISTING 10A-4P AUTOMATIC TRANSFER SWITCH FOR EMERGENCY POWER SYSTEM TO REMAIN.
 - 9 EXISTING 50KW-480/277V-3PH-4W STANDBY EMERGENCY GENERATOR TO REMAIN.
 - 10 EXISTING EMERGENCY DISTRIBUTION PANEL RATED 480/277V-3PH-4W-100A TO REMAIN.
 - 11 EXISTING TRANSFORMER RATED 480/2208-120V-3PH-4W-30KVA TO REMAIN.
 - 12 NET LOAD CHANGE TO PANEL BY WORK SHOWN ON THESE DRAWINGS: LESS THAN 1 APM (68 WATTS). NEW CONNECTED LOAD: 84AMPS.
 - 13 NET LOAD CHANGE TO PANEL BY WORK SHOWN ON THESE DRAWINGS: +6 AMPS(717 WATTS). NEW CONNECTED LOAD: 76AMPS.
 - 14 EXISTING GROUNDING SYSTEM INCLUDING UFER, COLD WATER, AND BUILDING STEEL TO REMAIN.



SINGLE LINE DIAGRAM GENERAL NOTES

1. ALL WIRE COPPER TYPE THHN/THWN 90C.
2. ITEMS SHOWN DASHED ARE EXISTING TO REMAIN. ITEMS SHOWN SOLID ARE NEW.

SINGLE LINE DIAGRAM

SCALE: N.T.S. 1

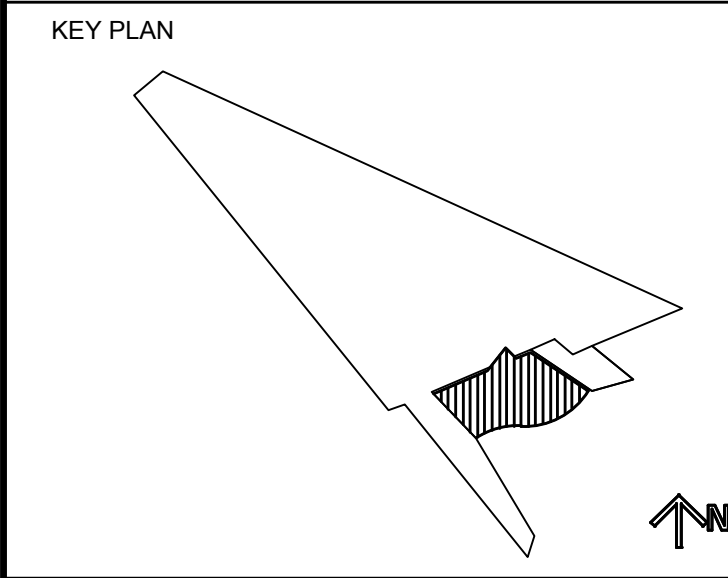
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 fbaengr.com
 FBA Job Number: 475.029



Client: **DISCOVERY CUBE LOS ANGELES**

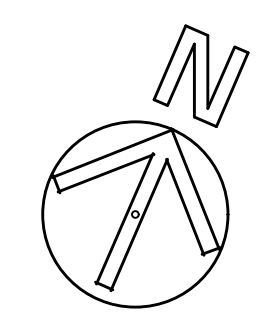
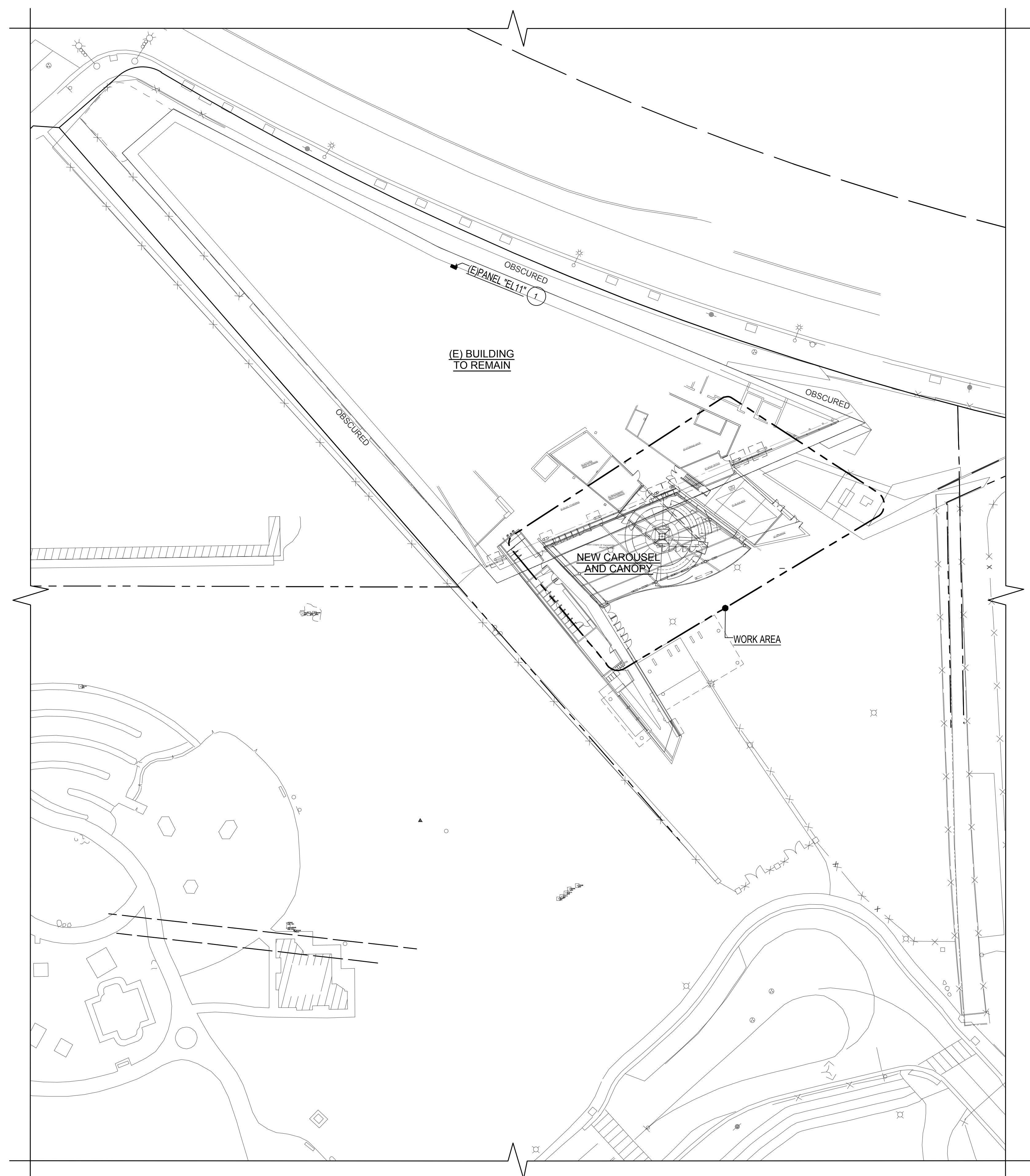
Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
SINGLE LINE DIAGRAM

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

E002

FBA Engineering / Plot Date: 2/1/2024 11:52 AM / Plotted by: Josue Saldaña / Drawing Location: I:\476\023\Carousel\E101_476029-OVERALL ELECTRICAL SITE PLAN.dwg



OVERALL SITE ELECTRICAL PLAN
SCALE: 1/32"=1'-0"

REFERENCE NOTES

- 1 EXISTING PANEL TO REMAIN. SEE SINGLE LINE DIAGRAM SHEET E002.

SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	12/8/2023

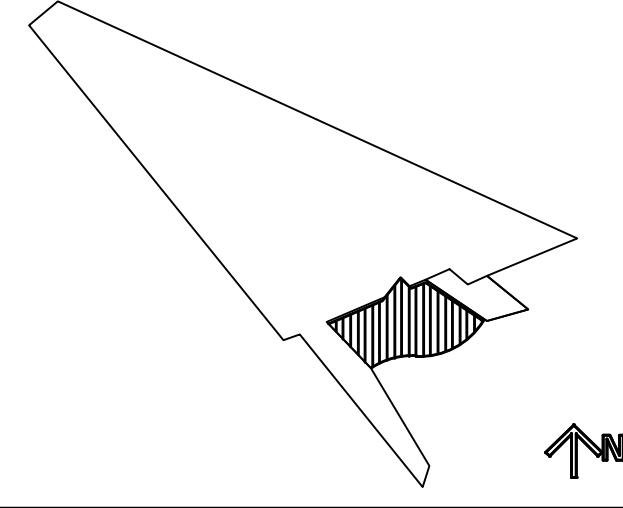
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 fbaeng.com
 FBA Job Number: 476.029



KEY PLAN



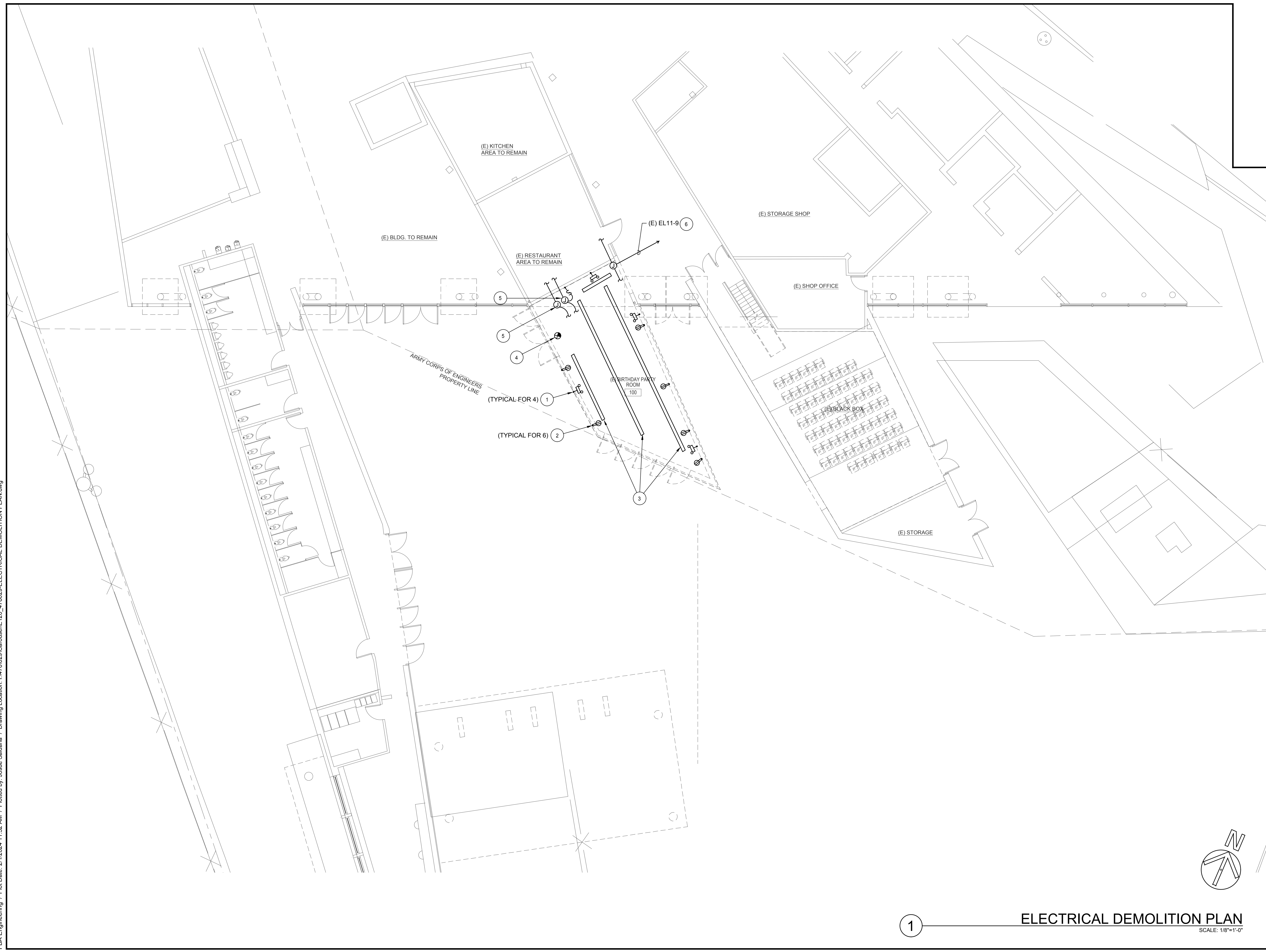
Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
OVERALL SITE ELECTRICAL PLAN

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

FBA Engineering / Plot Date: 2/1/2024 11:52 AM / Plotted by: Josue Saldana / Drawing Location: I:\476\029\CarouseiE120_776029-ELECTRICAL DEMOLITION PLAN.dwg



- REFERENCE NOTES**
- 1 DISCONNECT AND REMOVE EXISTING EMERGENCY LIGHT.
 - 2 DISCONNECT AND REMOVE EXISTING DUPLEX RECEPTACLE.
 - 3 REMOVE EXISTING TRACKLIGHTS, TRACK, AND RELATED CONDUITS, WIRES, AND CONTROLS.
 - 4 DISCONNECT AND REMOVE EXISTING EXIT SIGN.
 - 5 MOVE EXISTING BOXES INTO ADJACENT ROOM TO MAINTAIN POWER TO EXISTING LIGHTS CONNECTED TO SAME CIRCUIT AS LIGHTS BEING DEMOLISHED.
 - 6 EXISTING HOMERUN TO REMAIN.

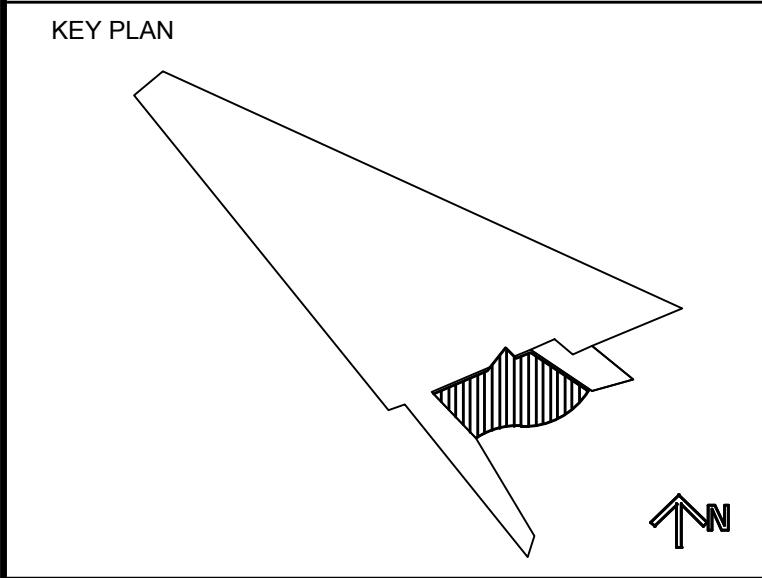
SUBMITTALS:

NO.	DESCRIPTION	DATE
1	LADBS RESUBMITTAL	12/8/2023

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 FBA Job Number: 476.029



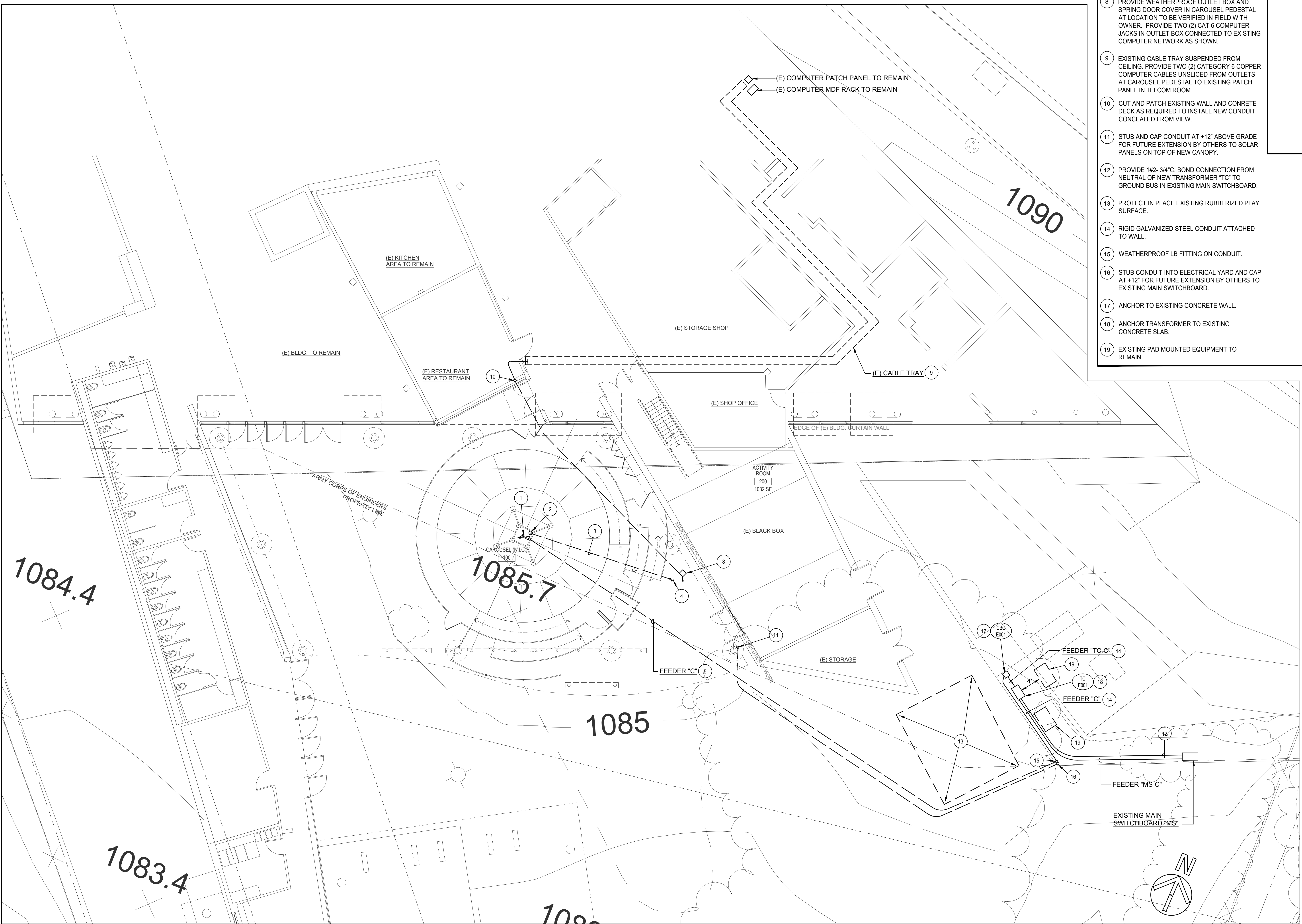
Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
ELECTRICAL DEMOLITION PLAN

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

FBA Engineering / Plot Date: 2/1/2024 11:52 AM / Plotted by: Josue Saldana / Drawing Location: I:\476\0230\Carousel\E201_476029-CAROUSEL ELECTRICAL PLAN.dwg



- REFERENCE NOTES**
- PROVIDE WEATHERPROOF DISCONNECT SWITCH AND CONNECT TO MAIN INPUT POWER TERMINALS ON CAROUSEL.
 - CONNECT TO CONTROL TERMINALS ON CAROUSEL.
 - 20#12-1.5"C. FOR CONTROLS
 - CONNECT TO CAROUSEL CONTROL PEDESTAL VERIFY EXACT LOCATION.
 - PVC SCHEDULE 40 CONDUIT RUN BELOW GRADE.
 - PROVIDE 3" PLUS 1" PVC SCHEDULE 40 CONDUIT BELOW GRADE FOR FUTURE SOLAR PANELS BY OTHERS ON TOP OF CANOPY.
 - PROVIDE TWO (2) CATEGORY 6 COPPER COMPUTER CABLES IN 1" PVC SCHEDULE 40 CONDUIT BELOW GRADE.
 - PROVIDE WEATHERPROOF OUTLET BOX AND SPRING DOOR COVER IN CAROUSEL PEDESTAL AT LOCATION TO BE VERIFIED IN FIELD WITH OWNER. PROVIDE TWO (2) CAT 6 COMPUTER JACKS IN OUTLET BOX CONNECTED TO EXISTING COMPUTER NETWORK AS SHOWN.
 - EXISTING CABLE TRAY SUSPENDED FROM CEILING. PROVIDE TWO (2) CATEGORY 6 COPPER COMPUTER CABLES UNSPLICED FROM OUTLETS AT CAROUSEL PEDESTAL TO EXISTING PATCH PANEL IN TELCOM ROOM.
 - CUT AND PATCH EXISTING WALL AND CONCRETE DECK AS REQUIRED TO INSTALL NEW CONDUIT CONCEALED FROM VIEW.
 - STUB AND CAP CONDUIT AT +12" ABOVE GRADE FOR FUTURE EXTENSION BY OTHERS TO SOLAR PANELS ON TOP OF NEW CANOPY.
 - PROVIDE 1#2- 3/4"C. BOND CONNECTION FROM NEUTRAL OF NEW TRANSFORMER "TC" TO GROUND BUS IN EXISTING MAIN SWITCHBOARD.
 - PROTECT IN PLACE EXISTING RUBBERIZED PLAY SURFACE.
 - RIGID GALVANIZED STEEL CONDUIT ATTACHED TO WALL.
 - WEATHERPROOF LB FITTING ON CONDUIT.
 - STUB CONDUIT INTO ELECTRICAL YARD AND CAP AT +12" FOR FUTURE EXTENSION BY OTHERS TO EXISTING MAIN SWITCHBOARD.
 - ANCHOR TO EXISTING CONCRETE WALL.
 - ANCHOR TRANSFORMER TO EXISTING CONCRETE SLAB.
 - EXISTING PAD MOUNTED EQUIPMENT TO REMAIN.

- REFERENCE NOTES**
- PROVIDE WEATHERPROOF DISCONNECT SWITCH AND CONNECT TO MAIN INPUT POWER TERMINALS ON CAROUSEL.
 - CONNECT TO CONTROL TERMINALS ON CAROUSEL.
 - 20#12-1.5"C. FOR CONTROLS
 - CONNECT TO CAROUSEL CONTROL PEDESTAL VERIFY EXACT LOCATION.
 - PVC SCHEDULE 40 CONDUIT RUN BELOW GRADE.
 - PROVIDE 3" PLUS 1" PVC SCHEDULE 40 CONDUIT BELOW GRADE FOR FUTURE SOLAR PANELS BY OTHERS ON TOP OF CANOPY.
 - PROVIDE TWO (2) CATEGORY 6 COPPER COMPUTER CABLES IN 1" PVC SCHEDULE 40 CONDUIT BELOW GRADE.

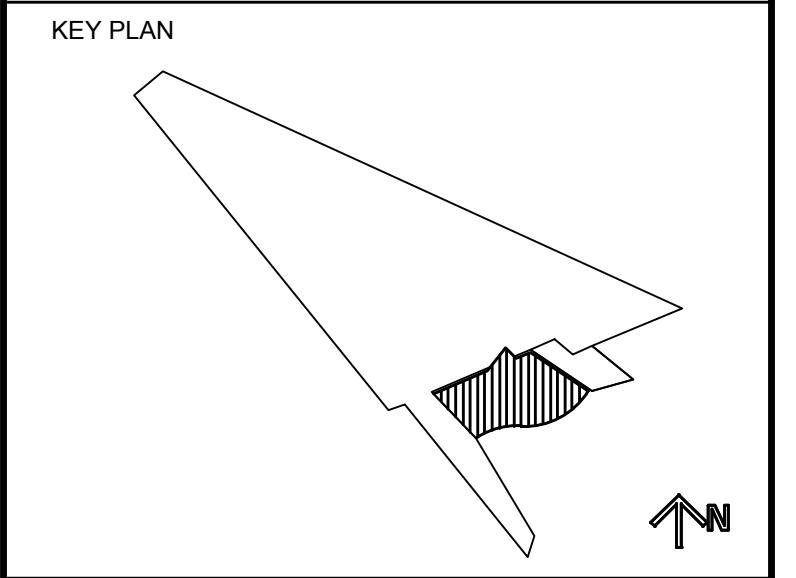
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NO.	DESCRIPTION	DATE
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 fbaengr.com
 FBA Job Number: 476.029



Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

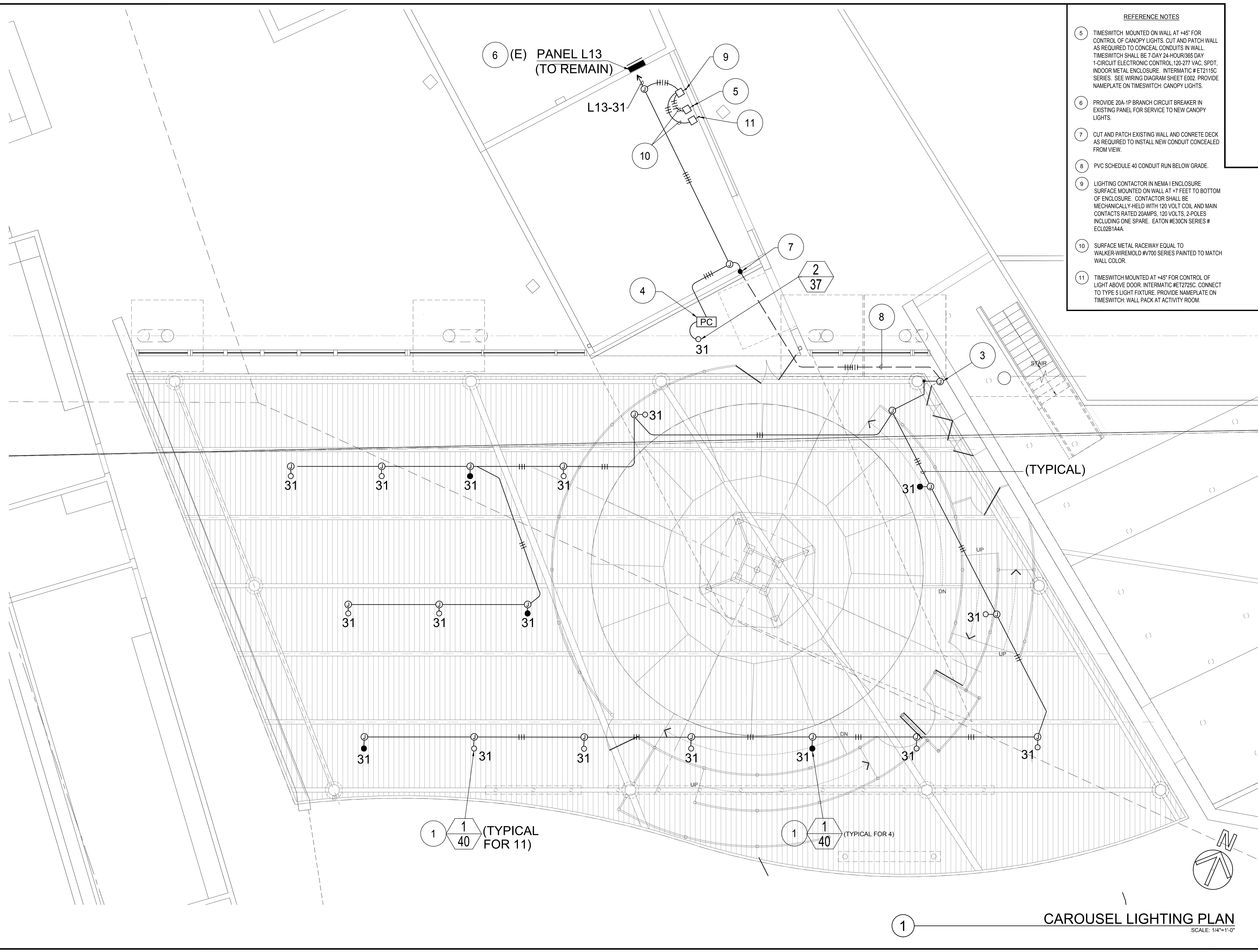
11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA 91040

Drawing Title: **CAROUSEL ELECTRICAL PLAN**

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

1 CAROUSEL ELECTRICAL PLAN
 SCALE: 1/8"=1'-0"

FBA Engineering / Plot Date: 2/1/2024 11:52 AM / Plotted by: Josue Saldana / Drawing Location: I:\476\0230\Carousel\LIGHTING PLAN.dwg



- REFERENCE NOTES**
- 5 TIMESWITCH MOUNTED ON WALL AT +45' FOR CONTROL OF CANOPY LIGHTS. CUT AND PATCH WALL AS REQUIRED TO CONCEAL CONDUITS IN WALL. TIMESWITCH SHALL BE 7-DAY 24-HOUR/365 DAY 1-CIRCUIT ELECTRONIC CONTROL, 120-277 VAC, SPDT, INDOOR METAL ENCLOSURE. INTERMATIC # ET2115C SERIES. SEE WIRING DIAGRAM SHEET E002, PROVIDE NAMEPLATE ON TIMESWITCH: CANOPY LIGHTS.
 - 6 PROVIDE 20A-1P BRANCH CIRCUIT BREAKER IN EXISTING PANEL FOR SERVICE TO NEW CANOPY LIGHTS.
 - 7 CUT AND PATCH EXISTING WALL AND CONCRETE DECK AS REQUIRED TO INSTALL NEW CONDUIT CONCEALED FROM VIEW.
 - 8 PVC SCHEDULE 40 CONDUIT RUN BELOW GRADE.
 - 9 LIGHTING CONTACTOR IN NEMA 1 ENCLOSURE SURFACE MOUNTED ON WALL AT +7 FEET TO BOTTOM OF ENCLOSURE. CONTACTOR SHALL BE MECHANICALLY HELD WITH 120 VOLT COIL AND MAIN CONTACTS RATED 20AMPS, 120 VOLTS, 2-POLES INCLUDING ONE SPARE. EATON #E30CN SERIES # ECL02B14AA.
 - 10 SURFACE METAL RACEWAY EQUAL TO WALKER-WIREMOLD #V700 SERIES PAINTED TO MATCH WALL COLOR.
 - 11 TIMESWITCH MOUNTED AT +45' FOR CONTROL OF LIGHT ABOVE DOOR. INTERMATIC #ET2725C. CONNECT TO TYPE 5 LIGHT FIXTURE. PROVIDE NAMEPLATE ON TIMESWITCH: WALL PACK AT ACTIVITY ROOM.

- REFERENCE NOTES**
- 1 SURFACE MOUNT FIXTURE TO UNDERSIDE OF CANOPY.
 - 2 EMT CONDUIT WITH WEATHERPROOF COMPRESSION FITTINGS RUN EXPOSED ON UNDERSIDE OF CANOPY AND PAINTED TO MATCH COLOR OF SURROUNDING SURFACES.
 - 3 WEATHERPROOF JUNCTION BOX AT +12' ABOVE GRADE WITH RIGID GALVANIZED STEEL CONDUIT RISER PAINTED TO MATCH COLOR OF SURROUNDING SURFACES.
 - 4 120 VOLT PHOTOCELL MOUNTED TO FLUSH OUTLET BOX ON UNDERSIDE OF CANOPY FOR CONTROL OF EXTERIOR LIGHTS. INTERMATIC #EK4336S SERIES.

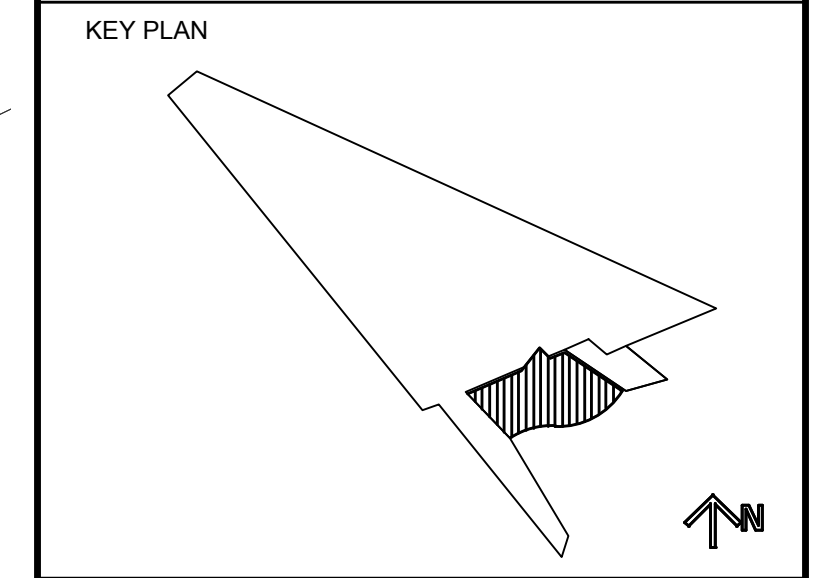
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 fbaengr.com
 FBA Job Number: 476.0230



Client: **DISCOVERY CUBE LOS ANGELES**

Job Name: **COURTYARD CAROUSEL CANOPY**

11800 WEST FOOTHILL BLVD.
 LOS ANGELES, CA. 91040
 Drawing Title
CAROUSEL LIGHTING PLAN

Project No.: 2209
 Phase: CONSTRUCTION DOCUMENTS
 Date: SEPTEMBER 29, 2023
 Scale: AS SHOWN

CAROUSEL LIGHTING PLAN
 SCALE: 1/4"=1'-0"

STATE OF CALIFORNIA CALIFORNIA ENERGY COMMISSION
Outdoor Lighting CERTIFICATE OF COMPLIANCE
Project Name: COURTYARD CAROUSEL CANOPY AND ACTIVITY ROOM
Report Page: (Page 1 of 7)
Date Prepared: 1/31/2024

A. GENERAL INFORMATION
Table with 4 columns: Item, Description, Value, and Unit. Includes Project Location (LOS ANGELES), Climate Zone (9), and Occupancy Types within Project.

B. PROJECT SCOPE
This table includes outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.7 / 170.2(e)6 or 141.0(b)(2) / 180.2(b)(4)Bv for alterations.
My Project Consists of:
New Lighting System
Altered Lighting System

Generated Date/Time: Documentation Software: EnergyPro
CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance
Report Version: 2022.0.000
Compliance ID: EnergyPro-7526-0124-0809
Report Generated: 2024-01-31 16:35:37

STATE OF CALIFORNIA CALIFORNIA ENERGY COMMISSION
Outdoor Lighting CERTIFICATE OF COMPLIANCE
Project Name: COURTYARD CAROUSEL CANOPY AND ACTIVITY ROOM
Report Page: (Page 4 of 7)
Date Prepared: 1/31/2024

H. OUTDOOR LIGHTING CONTROLS
This table demonstrates compliance with controls requirements for all new or altered luminaires installed as part of the permit application.
Mandatory Controls for Nonresidential Occupancies, Parking Garages & Common Areas in Multifamily Buildings

Table with 5 columns: Area Description, Shut-Off, Auto-Schedule, Motion Sensor, Field Inspector. Includes CANOPY and Astronomical Timer.

I. LIGHTING POWER ALLOWANCE (per 140.7 / 170.2(e))
This table includes areas using allowance calculations per 140.7 / 170.2(e). General Hardscape Allowance is per Table 140.7-A/170.2-F while "Use it or lose it" allowances are per Table 140.7-B/170.2-G.
General Hardscape Allowance
Per Application
Sales Frontage
Ornamental
Per Specific Area

J. LIGHTING ALLOWANCE: PER APPLICATION
This section does not apply to this project.

Generated Date/Time: Documentation Software: EnergyPro
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Report Version: 2022.0.000
Compliance ID: EnergyPro-7526-0124-0809
Report Generated: 2024-01-31 16:35:37

STATE OF CALIFORNIA CALIFORNIA ENERGY COMMISSION
Outdoor Lighting CERTIFICATE OF COMPLIANCE
Project Name: COURTYARD CAROUSEL CANOPY AND ACTIVITY ROOM
Report Page: (Page 7 of 7)
Date Prepared: 1/31/2024

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
I certify that this Certificate of Compliance documentation is accurate and complete.
Documentation Author Name: Stephen R. Zajicek P.E.
Signature Date: 2024-01-31

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:
The information provided on this Certificate of Compliance is true and correct.
I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).

Responsible Designer Name: STEPHEN R. ZAJICEK P.E.
Signature Date: 2024-01-31
Address: 150 PALLARINO AVE, SUITE A120
City/State/Zip: COSTA MESA CA 92626

Generated Date/Time: Documentation Software: EnergyPro
CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance
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STATE OF CALIFORNIA CALIFORNIA ENERGY COMMISSION
Outdoor Lighting CERTIFICATE OF COMPLIANCE
Project Name: COURTYARD CAROUSEL CANOPY AND ACTIVITY ROOM
Report Page: (Page 2 of 7)
Date Prepared: 1/31/2024

C. COMPLIANCE RESULTS
Calculations of Total Allowed Lighting Power (Watts) 140.7 / 170.2(e)6 or 141.0(b)(2) / 180.2(b)(4)Bv
Table with 10 columns: Item, Description, Value, Unit, Compliance Results. Includes General Hardscape Allowance, Per Application, Sales Frontage, Ornamental, Per Specific Area, Existing Power Allowance, Total Allowed, Total Actual, and Compliance Results.

D. EXCEPTIONAL CONDITIONS
This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS
This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

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Report Version: 2022.0.000
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Report Generated: 2024-01-31 16:35:37

STATE OF CALIFORNIA CALIFORNIA ENERGY COMMISSION
Outdoor Lighting CERTIFICATE OF COMPLIANCE
Project Name: COURTYARD CAROUSEL CANOPY AND ACTIVITY ROOM
Report Page: (Page 5 of 7)
Date Prepared: 1/31/2024

K. LIGHTING ALLOWANCE: SALES FRONTAGE
This section does not apply to this project.

L. LIGHTING ALLOWANCE: ORNAMENTAL
This section does not apply to this project.

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA
This table includes areas using the allowance per specific area from Table 140.7-B/170.2-G. More than one specific area allowance may be taken in a single project, if applicable. However, multiple specific area allowances may not be taken for the exact same area on the site.
Table with 10 columns: Area Description, Specific Area Type per Table 140.7-B, Specific Area (ft²), Allowed Density (W/ft²), Extra Allowance (Watts), Luminaire Name or Item Tag, Watts per Luminaire, # of Luminaires, Design Watts, Additional Allowance (Watts).

FOOTNOTES: See Table 140.7-B/170.2-G for rules for calculating the specific areas (ft²) for these additional lighting allowances.
For luminaires indicated in Table I as linear, wattage in column 07 is W/ft instead of Watts/luminaire. Total linear feet should be indicated in column 08 instead of number of luminaires.

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)
This section does not apply to this project.

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Compliance ID: EnergyPro-7526-0124-0809
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Outdoor Lighting CERTIFICATE OF COMPLIANCE
Project Name: COURTYARD CAROUSEL CANOPY AND ACTIVITY ROOM
Report Page: (Page 3 of 7)
Date Prepared: 1/31/2024

F. OUTDOOR LIGHTING FIXTURE SCHEDULE
For new or altered lighting systems demonstrating compliance with 140.7 / 170.2(e)6 all new luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application are included in the Table below.
Table with 10 columns: Item Tag, Complete Luminaire Description, Watts per luminaire, How is Wattage determined, Total Number Luminaires, Luminaire Status, Excluded per 140.7(a) / 170.2(e)6A, Design Watts, Cutoff Req. > 6,200 Initial lumen output 130.2(b) / 160.5(c)1, Field Inspector.

FOOTNOTES: Selections with a * require a note in the space below explaining how compliance is achieved.
Luminaire is lighting fixture. EXCEPTION 2 to 130.2(b)
FOOTNOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b)
For linear luminaires, wattage should be indicated as W/ft instead of Watts/luminaire. Total linear feet should be indicated in column 05 instead of number of luminaires.
Select "New" for new luminaires in a new outdoor lighting project, or for added luminaires in an alteration. Select "Altered" for replacement luminaires in an alteration. Select "Existing to Remain" for existing luminaires within the project scope that are not being altered and are remaining. Select "Existing Reinstalled" for existing luminaires which are being removed and reinstalled as part of the project scope.
Compliance with mandatory shielding requirements is required for luminaires with initial lumen output >= 6,200 unless exempt by 130.2(b) / 160.5(c)

G. SHIELDING REQUIREMENTS (BUG)
This section does not apply to this project.

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Report Generated: 2024-01-31 16:35:37

STATE OF CALIFORNIA CALIFORNIA ENERGY COMMISSION
Outdoor Lighting CERTIFICATE OF COMPLIANCE
Project Name: COURTYARD CAROUSEL CANOPY AND ACTIVITY ROOM
Report Page: (Page 6 of 7)
Date Prepared: 1/31/2024

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION
Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online.
Form/Title

Form/Title
Systems/Spaces To Be Field Verified

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE
Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html
Form/Title
Systems/Spaces To Be Field Verified

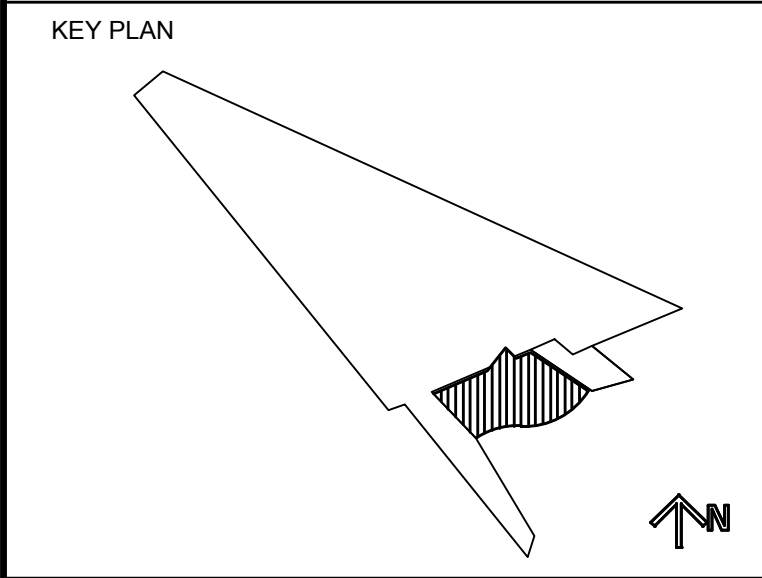
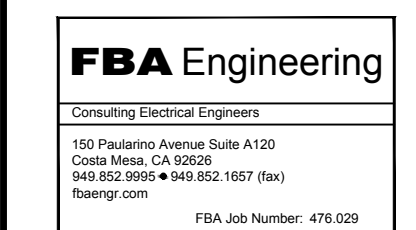
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Architecture & Planning
John Fisher AIA



Client: DISCOVERY CUBE LOS ANGELES

Job Name: COURTYARD CAROUSEL CANOPY
11800 WEST FOOTHILL BLVD.
LOS ANGELES, CA 91040
Drawing Title: TITLE 24 DOCUMENTATION

Project No.: 2209
Phase: CONSTRUCTION DOCUMENTS
Date: SEPTEMBER 29, 2023
Scale: AS SHOWN

ET24-1

DISCOVERY CUBE
LOS ANGELES

**COURTYARD CAROUSEL
CANOPY ADDITION**

11800 West Foothill Blvd.,
Los Angeles, CA 91040

***Issue For Bid
Specifications***

**Updated
March 25, 2024**

John Sergio Fisher & Associates, Inc.
5567 Reseda Blvd. Suite 209/ Tarzana, CA 91356
Tel: 818.344.3045

SECTION 01 00 00

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SECTION 01 01 00

SUMMARY OF WORK

PART 1 – GENERAL

1.01 SUMMARY

- A The Courtyard Carousel Canopy is a 4,000 square foot, fully sprinklered canopy structure. Standing nearly 18 feet tall adjacent to the main entrance of the Discovery Cube Los Angeles Facility. It is an exposed metal deck over wide flange steel beams with purlins set a-top 12” diameter steel columns with concrete pier footings. On the top side of the metal deck is a full array of solar panels that supply renewal energy into the existing facility’s solar power system. The purpose of the canopy is to provide shelter for the main entrance to the museum facility and the adjacent upcoming new installation of a 36 foot diameter carousel with 30 carousel-horses, one spinning tube and one ADA-compliant chariot.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. The work shall include all work shown and specified except for work indicated "N.I.C." or "Not in Contract"
- B. Unless provided otherwise in the Contract Documents, all risk of loss of Work covered by Contract Documents shall rest with Contractor until Final Completion and Acceptance of the Work.

1.03 PROJECT REQUIREMENTS:

- A. Comply with 2019 California Building Code and local codes.

END OF SECTION

SECTION 01 05 00

FIELD ENGINEERING & SURVEY CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Surveying requirements for the Work.

1.02 RELATED SECTIONS

- A. 31 100 – Site Clearing
- B. 31 20 00 – Earth Moving

1.03 SURVEY SERVICE

- A. Unless otherwise stated by the Architect or noted in the Special Provisions, the CONTRACTOR shall provide all surveying services.

1.04 PAYMENT FOR SURVEYING

- A. The payment for surveying shall be included in respective items of work and shall include, but not to be limited to, construction staking, location and/or relocation of conflicting utilities, locating survey monuments, setting of survey monuments and center line ties, preparing and filing centerline tie sheets and Corner Records, locating Bench Marks and notifying the Office of the County Surveyor of same, professional office services and field calculations, and furnishing all labor, materials, tools, equipment and incidentals for doing all work involved. No additional compensation shall be allowed unless a separate bid item is provided.

PART 2 – PRODUCTS (not applicable)

PART 3 – EXECUTION

3.1 SUBMITTALS

- A. CONTRACTOR shall submit the name and address of the State of California licensed surveyor to CM, ARCHITECT and OWNER including any changes as they may occur.
- B. CONTRACTOR shall submit to OWNER and/or CM, ARCHITECT copies of cut sheets, coordinate plots, data collector printouts, and other documentation as available to verify completeness and/or accuracy of field surveying work.
- C. Certificates: Submit a certificate signed by the land surveyor certifying that the location and elevations of the improvements comply with the Contract Documents.

3.2 LAYOUT OF THE WORK

- A. CONTRACTOR shall employ a State of California licensed surveyor to lay out the entire Work, set grades, lines, levels, control points, vertical and horizontal control, elevations, grids and positions. Before the commencement of Work, surveyor shall, in conjunction with OWNER and CM provided engineering survey of the Project site, locate all reference points and benchmarks, then lay out all lines, elevations, and measurements for the entire Work including but not limited to, buildings, grading, paving and utilities.
- B. All work under this contract shall be built in accordance with the lines and grades shown on the plans. Field survey for establishing these, and for the control of construction, shall be the responsibility of the Contractor. All such survey work including construction staking shall be done under the supervision of a California Licensed Land Surveyor or authorized Civil Engineer. Staking shall be done on all items ordinarily requiring grade and alignment, at intervals normally accepted by the agencies and trade involved.
- C. The CONTRACTOR shall be responsible for any errors in the finished work, and shall notify the Engineer, in writing, within 24 hours, of any discrepancies, or design errors during the construction staking.

3.3 SURVEY REQUIREMENTS

- A. Establish a minimum of two permanent horizontal and vertical control points on the Project site, remote from the building area, referenced to data established by the survey control points.
- B. Indicate the reference points on the project record drawings with the basis of elevation being the established benchmarks.
- C. Establish lines, grades, locations and dimensions by instrumentation. From time to time, verify the layout of all Work by the same methods.
- D. Provide grade stakes and elevations to construct over excavation and re-compaction, rough and final grades, paved areas, curbs, gutters, sidewalks, building pads, landscaped areas, and other areas as required.
- E. Calculate and layout proposed finished elevations and intermediate control as required to provide smooth transitions between the spot elevations indicated in the Contract Documents.
- F. Provide stakes and elevations for grading, fill, and topsoil placement
- G. Provide adequate horizontal and vertical control to locate utility lines, including but not limited to, storm, sewers, water mains, gas, electric and signal and provide vertical control in proportion to the slope of the line as required for accurate construction. Dry utilities will be based upon adequate horizontal and vertical control layout Prior to trench closure, survey and record invert and flow line elevations. Survey and record top of curb and flow line elevations on finished concrete or AC surfaces at key locations such as BC's, EC's, grade breaks, corners or angle points in sufficient number to demonstrate the Work complies with the intent of the Contract Documents.

- H. Provide horizontal and vertical control for batter boards for drainage, utility, and other on-site structures as required.
- I. Furnish building corner offsets as required to adequately locate building pads. Provide cut and fill stakes within the building pad perimeter adequate to control both over excavation and re-compaction and the final sub-grade elevation of the building pad.
- J. Submit a certification, signed by the surveyor, confirming the elevations and locations of improvements are in conformance with the Contract Documents. The statement shall include survey notes for the finish floor and building pad, showing the actual measured elevations on the completed sub-grade, recorded to the nearest 0.01'. Building pad tolerance will be +/- 0.10'.

3.4 ESTABLISHMENT OF GRADES IN HARDSCAPE AREAS

- A. All work shall conform to the lines, elevations, and grades shown. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.
- B. Areas having drainage gradients of 2 percent or more shall have elevation stakes, set with instrument, at grid intervals of 25 feet. Intermediate stakes may be set by using a tightly-drawn string line over the tops of adjacent stakes. Grade stakes must be set at all grade breaks, grade changes, etc.
- C. Areas having drainage gradients of less than 2 percent shall have elevation stakes, set with instrument, at 10 foot intervals. Grade stakes must be set at all grade breaks, grade changes, etc.
- D. Protect and maintain stakes in place until their removal is approved by the Owner. Grade or location stakes lost or disturbed by Contractor, shall be reset by the Surveyor at the expense of Contractor.

3.5 STORM DRAIN INSTALLATION

- A. All storm drain pipelines, trench drains, catch basins and drain inlets shall be staked by a licensed surveyor if slope of grade is less than 2% and a complete set of cut sheets shall be supplied to the Inspector. All construction staking shall be installed and verified for grade and alignment prior to the start of construction.

3.6 RECORD DRAWINGS

- A. Upon Substantial Completion, CONTRACTOR shall obtain and pay for reproducible transparencies of the as built survey drawings. Deliver to ARCHITECT, final "record" drawings of the original drawings and completed Work within specified tolerances.
- B. Record drawings shall indicate locations by coordinate of all utilities onsite with top of pipe elevations at major grade and alignment changes, rim grate or top-of-curb and flow line elevations of all drainage structures and manholes.

- C. Completed record drawing transparencies shall be signed and certified as correct and within specified tolerances by the licensed surveyor.
- D. Attention is called to other sections of the Contract Documents requiring verification or measurements of installed Work by survey. Surveyor shall perform and certify all such surveys or verifications are completed in accordance with the Contract Documents.

END OF SECTION

SECTION 01 09 00

ABBREVIATIONS

PART 1 - GENERAL

1.01 ABBREVIATIONS

A. The following abbreviations may be used in the Contract Documents.

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AAN	American Association of Nurserymen, Inc.
AASHTO	American Association of State Highway and Transportation Officials
ABPA	Acoustical and Board Products Association
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ACPA	American Concrete Pipe Association
ADC	Air Diffusion Council
AFBMA	Anti-Friction Bearing Manufacturers Association
AFI	Air Filter Institute
AGA	American Gas Association
AGC	Associated General Contractors of America
AI	The Asphalt Institute
AIA	American Institute of Architects
AIMA	Acoustical Insulating Material Association
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALSC	American Lumber Standards Committee
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
AOAC	Association of Official Analytical Chemists
APA	American Plywood Association
API	American Petroleum Institute
AQMD	Air Quality Management District
ARI	Air-Conditioning and Refrigeration Institute
ASA	American Standards Association
ASAHC	American Society of Architectural Hardware Consultants
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
ASME	American Society of Mechanical Engineers Association, Inc.
ASTM	American Society for Testing and Materials
AWCI	Association of Wall and Ceiling Industries
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWPB	American Wood Preservers Bureau
AWPI	American Wood Preservers Institute

AWS	American Welding Society, Inc.
AWWA	American Water Works Association, Inc.
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Institute of America
BOCA	Building Officials and Code Administrators
CAC	California Administrative Code
CAGBSC	California Green Building Standards Code
CARB	California Air Resources Board
CBM	Certified Ballast Manufacturers Association
CCR	California Code of Regulations
CDA	Copper Development Association, Inc.
CE	Corps of Engineers (U. S. Dept. of the Army)
CEC	California Energy Commission
CESO	California Elevator Safety Order
CGA	Compressed Gas Association
CPSC	Consumer Product Safety Commission
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards of NBS (U.S. Dept. of Commerce)
CTI	Cooling Tower Institute
DHI	Door & Hardware Institute
DISS	Diameter Index Safety System
EPA	Environmental Protection Agency
ETL	Electrical Testing Laboratories
FFDA	Federal Food and Drug Administration
FGMA	Flat Glass Marketing Association
FIA	Factory Insurance Association
FM	Factory Mutual Engineering Corp.
FS	Federal Specification
GA	Gypsum Association
GFI	Ground Fault Interrupter
HEPA	High Efficiency Particulate Air
HI	Hydronics Institute
HMI	Hoists Manufacturers Institute
HMMA	Hollow Metal Manufacturers Association
HPMA	Hardwood Plywood Manufacturers Association
IBEW	International Brotherhood of Electrical Workers
IBR	Institute of Boiler and Radiator Manufacturers
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineering Association
IEEE	Institute of Electrical and Electronic Engineers
IEC	International Electric Code
IES	Illuminating Engineers Society
IGCC	Insulation Glass Certification Council
ISA	Instrument Society of America
LIA	Lead Industries Association
MIA	Marble Institute of America
MIL	U.S. Government, Military Specification
MLSFA	Metal Lath/Steel Framing Association
MOC	Ministry of Communications General
MSHA	Mine Safety and Health Administration

MSS	Manufacturers Standardization Society of Valve and Fittings
NAAB	National Association of Air Balance
NAAMM	The National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NBFU	National Board of Fire Underwriters
NBGQA	National Building Granite Quarries Association, Inc.
NBHA	National Builders' Hardware Association
NBS	National Bureau of Standards (U. S. Dept. of Commerce)
NCMA	National Concrete Masonry Association
NCPWB	National Certified Pipe Welding Bureau
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code by NFPA
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NETA	National Electrical Testing Association
NFPA	National Fire Protection Association
NHLA	National Hardwood Lumber Association
NIOSH	National Institute of Occupational Safety and Health
NPA	National Particleboard Association
NRC	Noise Reduction Coefficient
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association, Inc.
NWWDA	National Wood Window and Door Association
OAR	Owner's Authorized Representative
OSHA	Office of Safety and Health Administration
OSHPD	Office of Statewide Health Planning and Development
PCA	Portland Cement Association
PCB	Polychlorinated Biphenyl
PCI	Prestressed Concrete Institute
PDI	Plumbing and Drainage Institute
PI	Perlite Institute
PS	Product Standard of NBS (U.S. Dept. of Commerce)
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service (Grading Rules)
SAE	Society of Automotive Engineers
SAS	Saudi Arabian Standard Organization
SBC	State Building Code
SCAQMD	South Coast Air Quality Management District
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal & Air Conditioning Contractors' National Association, Inc.
SSPC	Steel Structures Painting Council
STC	Sound Transmission Coefficient
SWI	Sealant and Waterproofers Institute
TCA	Tile Council of America, Inc.
UBC	Uniform Building Code
UFAS	Uniform Federal Accessibility Standards

UHMW	Ultra-High Molecular Weight
UL	Underwriters' Laboratories, Inc.
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USDA	United States Department of Agriculture
USGBC	US Green Building Council
USSG	United States Steel Gauge
WCLIB	West Coast Lumber Inspection Bureau (Grading Rules)
WH	Warnock Hersey
WIC	Woodwork Institute of California
WWPA	Western Wood Products Association (Grading Rules)

END OF SECTION

SECTION 01 21 00

CONTRACTOR'S USE OF THE PROJECT SITE

PART 1 - GENERAL

1.1 USE OF PUBLIC THOROUGHFARES AND ROADS

- A. Contractor shall make its own investigation of the condition of available public thoroughfares in and around the project site, and of the clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the Project site.
- B. Where materials are transported in the prosecution of the Work, do not load vehicles beyond the capacity recommended by manufacturer of the vehicles or prescribed by any applicable state or local law or regulation.
- C. Obtain City of Los Angeles Encroachment Permit.
- D. Provide protection against damage whenever it is necessary to cross existing sidewalks, curbs, and gutters in entering upon the project site. Repair and make good at the expense of Contractor all damages thereto, including damage to existing utilities and paving, arising from the operations under the Contract.

1.2 WATCHMAN'S SERVICES

- A. During all hours that Work is not being prosecuted, furnish such watchman's services as Contractor may consider necessary to safeguard materials and equipment in storage on the Project site, including Work in place or in process of fabrication, against theft, acts of malicious mischief, vandalism, and other losses or damages.
- B. Owner will not be liable for any loss or damage.

1.3 RUBBER-TIRED EQUIPMENT

- A. Where carts, hand trucks, wheelbarrows, and similar wheeled conveyances are used on or in any portions of any structure, equip with pneumatic tires.

1.4 STORAGE

- A. Contractor's use of the Project site for the Work and storage is restricted to the areas designated on the Drawings or as approved by Owner's Representative.

1.4 TEMPORARY HOISTS

- A. Provide temporary hoist as required by job conditions for the installation of materials and equipment. Install and operate in accordance with all safety regulations of authorities having jurisdiction.

1.5 TEMPORARY SHORING AND BRACING

- A. Provide temporary shoring and bracing as required for execution of the Work. All shoring and bracing shall comply with safety regulations of authorities having jurisdiction.

1.6 TEMPORARY BARRICADES

- A. Provide temporary barricades as necessary. Maintain barricades in a clean and neat condition until no longer required and removal is approved or requested.

1.7 REMOVAL AND RECONDITIONING

- A. Temporary facilities, barricades, utilities and other construction of temporary nature shall be removed from the Project site as soon as the progress of the work will permit in the opinion of Owner's Representative; and the portions of the Project site and building occupied by same shall be reconditioned and restored to original condition. For temporary utilities, refer to General Conditions.
- B. Legally dispose of all debris resulting from removal and reconditioning operations.

1.8 CONTROL OF CONSTRUCTION WATER

- A. Provide impermeable floor coverings and suitable dams to prevent damage by water used for the Work. Immediately clean up and remove all surplus water and water spilled in non-working areas. Do not allow water to overflow gutters or flood streets.

1.9 DUST CONTROL, AIR POLLUTION AND ODOR CONTROL

- A. The Contractor shall employ measures to prevent the creation of dust, air pollution and odors.
 - 1. Unpaved areas where vehicles are operated shall be periodically wetted down or given an equivalent form of treatment to eliminate dust formation.
 - 2. All volatile liquids including fuels or solvents shall be stored in closed containers.

3. No open burning of debris, lumber or other scrap will be permitted.
4. Equipment shall be maintained in a manner to reduce gaseous emissions.
5. Low sulfur fuel shall be used for construction equipment.
6. Stockpiles of excavated materials shall be covered with material approved by Owner's Representative.
7. Contractor shall provide street sweeping whenever silt from construction site is carried over to adjacent public thoroughfares.

1.10 NOISE CONTROL

- A. The following noise control procedures shall be employed:
 1. Maximum Noise: The Contractor shall use equipment and methods during the course of this work that are least disruptive to adjacent offices or residences. Noise levels for trenchers, graders, trucks and pile drivers shall not exceed 90 dBA at 50 feet as measured under the noisiest operating conditions. For all other equipment, noise levels shall not exceed 85 dBA at 50 feet.
 2. Equipment. Jack hammers shall be equipped with exhaust mufflers and steel muffling sleeves. All diesel equipment shall have exhaust muffled. Air compressors shall be of a quiet type such as a "whisperized" compressor.
 3. Operations: Machines shall not be left idling. Electric power shall be used in lieu of internal combustion engine power wherever possible. Equipment shall be maintained to reduce noise from vibration, faulty mufflers, or other sources.
 4. Scheduling: Noisy operations shall be scheduled so as to minimize their disturbance to occupied adjacent areas and duration at any given location.

1.11 BARRICADE FENCING

- A. Barricade chain link fencing shall be installed straight and plumb, using galvanized steel pipe and 9 gauge galvanized 2-inch diamond mesh wire fabric fastened to the posts and rails.
- B. Posts shall be 2.375 inch O.D.; securely set in the ground and spaced a maximum of 10'-0" O.C. and 8'-0" height with a continuous top pipe rail. Posts shall not be set in or on existing concrete paving or walls to

remain, but shall be located in soil, planter or brick paved areas.

- C. Maintain fencing in a straight, clean and neat condition throughout construction as approved by Owner's Representative.

1.12 TEMPORARY STRUCTURES

- A. Erect and maintain, for duration of operations and in locations as approved, suitable temporary office facilities as required for Contractor's, Owner's and Owner's Representative's administration of the work. Provide necessary sheds and facilities for the storage of tools, materials, and equipment employed in the performance of the work. Temporary buildings shall be weather tight with raised solid floors, solid sheathed and composition roofs, and adequately glazed and screened windows for light and ventilation. Provide for Owner and Owner's Representative a clean 12' x 40' (minimum) trailer in good condition inside and outside electricity, heating and lighting, complete with air conditioning and a 120-208 volt/100 amp electric service and hook up for Owner's Representative and Owner with a cylinder locked door and at least four (4) keys. The trailer shall have two (2) 12' long partitions with doors located as approved by Owner's Representative. Configuration shall be as approved by Owner's Representative. Temporary buildings shall be painted using colors as approved. Contractor shall furnish daily janitorial service in the trailer. Provide stairs and handicapped ramp per code.

1.13 TRAFFIC CONTROL

- A. Provide traffic control barriers and flagmen throughout the construction period.
 - 1. Provide flagmen at pedestrian crossings of construction equipment right-of-ways one hundred percent of the time such equipment is operating. When equipment is not operating, such equipment right-of-ways shall be closed to equipment by means of a chain link gate.
 - 2. Provide temporary traffic control barriers to ensure safety of all persons and property.
 - 3. Provide numbers of flagmen necessary for vehicular and pedestrian traffic control. Flagmen shall be on duty at all times when the Work is in progress.

END OF SECTION

SECTION 01 30 00

SUBMITTALS

PART 1 – GENERAL

1.01 SUMMARY

- A. This section describes general requirements for submittals for the Work:
 - 1. Procedures
 - 2. Schedule of Shop Drawing and Sample Submittals
 - 3. Safety Plan
 - 4. Progress Schedule
 - 5. Product Data
 - 6. Shop Drawings
 - 7. Samples
 - 8. Quality Control Submittals
 - a. Design Data
 - b. Test Reports
 - c. Certificates
 - 9. Manufacturers' Instructions
 - 10. Machine Inventory Sheets Operations and Maintenance Manuals Computer Programs
 - 11. Project Record Documents
- B. Related Sections
 - 1. Section 01 01 00: Summary of Work
 - 2. Section 01 41 00: Regulatory Requirements
 - 3. Section 01 63 00: Product Options and Substitutions

1.02 PROCEDURES

- A. Submit at contractor's cost in electronic format: Schedule of Shop Drawing and Sample Submittals, Safety Plans, Progress Schedule, Product Data, Shop Drawings, Samples, Quality Control Data, Machine Inventory Sheets, Operations and Maintenance Manuals, Computer Programs, and Project Record Documents required by the Contract Documents.
- B. Transmit each item with a standard letter of transmittal in form approved by Construction Manager.

- C. Identify project, Contractor, subcontractor, major supplier, pertinent drawing sheet and detail number, and specification section number as appropriate. Provide space for Contractor, Construction Manager and NE review stamps.
- D. Where manufacturer's standard drawings or data sheets are used, they shall be marked clearly to show those portions of the data, which are applicable to this project.
- E. Submit Shop Drawings, Samples and other submittals to Construction Manager for review and approval by Architect/Engineer in accordance with accepted schedule of Shop Drawings and Samples submittals.
- F. The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show Architect/Engineer the materials and equipment Contractor proposes to provide and to enable Architect/Engineer to review the information for the limited purposes specified below. Samples shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which it is intended and otherwise as Architect/Engineer may require enabling Architect/Engineer to review the submittal. The number of each Sample to be submitted will be as specified in the Specifications.
- G. At the time of each submission, Contractor shall give Construction Manager, Architect/Engineer, and Inspector specific written notice of all variations, if any; that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, and the reasons therefore. This written notice shall be in a written communication separate from the submittal. In addition, Contractor shall cause a specific notation to be made on each Shop Drawing and Sample submitted to Construction Manager for review and approval of each such variation by Architect/Engineer.
- H. If CM accepts deviation, CM shall issue appropriate Contract Modification.
- I. Submittal coordination and verification is responsibility of Contractor; this responsibility shall not be delegated in whole or in part to subcontractors or suppliers. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:
 - 1. All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto;
 - 2. All materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work; and
 - 3. All information relative to Contractor's sole responsibilities and of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.
- J. Contractor shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.
- K. Contractor's submission to Construction Manager of a Shop Drawing or Sample submittal will constitute Contractor's representation that it has satisfied its obligations

under the Contract Documents, and as set forth immediately above, with respect to Contractor's review and approval of that submittal.

- L. Designation of work "by others", if shown in submittals, shall mean that work will be responsibility of Contractor rather than subcontractor or supplier who has prepared submittals.
- M. After review by Architect/Engineer of each of Contractor's submittals, one of set of duplicates of material will be returned to Contractor with actions defined as follows:
 - 1. NO EXCEPTIONS TAKEN - Accepted subject to its compatibility with future submittals and additional partial submittals for portions of the work not covered in this submittal. Does not constitute approval or deletion of specified or required items not shown on the submittal.
 - 2. MAKE CORRECTIONS NOTED (NO RESUBMISSIONS REQUIRED) - Same as 1. above, except that minor corrections as noted shall be made by Contractor.
 - 3. REVISE AND RESUBMIT - Rejected because of major inconsistencies or errors which shall be resolved or corrected by Contractor prior to subsequent review by Architect/Engineer.
 - 4. EXCEPTIONS TAKEN (RESUBMIT) - Submitted material does not conform to Plans and Specifications in major respect, i.e.: wrong size, model, capacity, or material.
- N. It is considered reasonable that Contractor shall make a complete and acceptable submittal at least by second submission. CM reserves the right to deduct monies from payments due Contractor to cover additional costs of Architect's/Engineer's review beyond the second submission. Illegible submittals will be rejected and returned to Contractor for resubmission.
- O. Favorable review will not constitute acceptance by CM or Architect/Engineer of any responsibility for the accuracy, coordination and completeness of the submittals. Accuracy, coordination, and completeness of Submittals shall be sole responsibility of Contractor, including responsibility to back check comments, corrections, and modifications from CM's or Architect's/Engineer's review before fabrications. Submittals may be prepared by Contractor, subcontractors, or suppliers, but Contractor shall ascertain that submittals meet requirements of Contract Documents, while conforming to structural space and access conditions at point of installation. Architect/Engineer's review will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Favorable review of submittal, method of work, or information regarding materials and equipment Contractor proposes to furnish shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by Architect/Engineer or CM, or any officer or employee thereof, and Contractor shall have no claim under Contract on account of failure or partial failure or inefficiency or insufficiency of any plan or method of work or material and equipment so accepted. Favorable review shall be considered to mean merely that Architect/Engineer or CM has no objection to Contractor using, upon his own full responsibility, plan or method of work proposed, or furnishing materials and equipment proposed.

- P. Architect's/Engineer's review will not extend the means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
- Q. Submit complete initial submittal for those items where required by individual specification Sections. Complete submittal shall contain sufficient data to demonstrate that items comply with Specifications, shall meet minimum requirements for submissions cited in technical specifications, shall include motor data and seismic anchorage certifications, where required, and shall include necessary revisions required for equipment other than first named. If Contractor submits incomplete initial submittal, when complete submittal is required, submittal may be returned to Contractor without review.
- R. It shall be Contractor's responsibility to copy, conform and distribute reviewed submittals in sufficient numbers for Contractor's files, subcontractors and vendors.
- S. After Architect/Engineer review of submittal, revise and resubmit as required. Identify changes made since previous submittal.
 - 1. Begin no fabrication or work, which require submittals until return of submittals not requiring resubmittal.
 - 2. Normally, submittals will be processed and returned to Contractor within ten [10] working days of receipt, or less.
 - 3. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.03 SAFETY PLAN

- A. Submit one hard copy, one electronic copy and PDF format of the Safety Plan specific to this Contract to Construction Manager within fifteen (15) calendar days after Start Date of the Contract Times, electronic copy to be returned.
- B. One (1) copy of accepted Safety Plan will be returned to Contractor.
- C. No on-site work shall be started until Safety Plan has been reviewed and accepted by CM. Acceptance of Safety Plan shall not affect Contractor's responsibility for maintaining a safe working place and instituting safety programs in connection with project in full compliance with local, state and federal regulations.

1.04 PROGRESS SCHEDULE

- A. Submit one hard copy and electronic PDF version, electronic copy to be returned of each of the following items:
 - 1. Initial CPM Schedule at the Pre-construction Conference.
 - 2. Original CPM Schedule within thirty (30) days of Notice to Proceed (NTP).
 - 3. Adjustments to the CPM Schedule as required.
 - 4. CPM Schedule updates monthly, five (5) days prior to monthly progress meeting.
- B. Submit one hard copy and electronic copy to be returned of each of the following items:

Progress Schedules and Reports, with:

1. Initial CPM Schedule
 2. Original CPM Schedule
 3. Each monthly Schedule update
- C. Progress Schedules and Reports shall be submitted as one hard copy and electronic copy returned as or if required.

1.05 PRODUCT DATA.

- A. Within fifteen [15] calendar days after Start Date of the Contract Times submit two (2) copies of complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- C. Tabulate products by specification section number.
- D. Supplemental Data:
 1. Submit one hard copy and one electronic PDF, which will be returned by Construction Manager.
 2. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to Project.
- E. Provide copies for Project Record Documents described in Section 01700 Contract Closeout.

1.06 SHOP DRAWINGS

- A. Provide one hard copy and one electronic version.
- B. Original sheet or reproducible transparency will be marked with Architect's/Engineer's review comments and returned to Contractor.
- C. Each sheet/copy must include project name and project number and bid number on all sheets.
- D. Mark each copy to identify applicable Products, models, options, and other data; supplement manufacturers' standard data to provide information unique to Work.
- E. Include manufacturers' installation instructions when required by specification section.

1.07 SAMPLES

- A. Submit full range of manufacturers' standard colors, textures, and patterns for Construction Manager's selection.
- B. Submit samples to illustrate functional and aesthetic characteristics of Product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.
- C. Include identification on each sample, giving full information.

- D. Submit two (2) samples unless otherwise specified. One (1) will be retained.
- E. Sizes: Unless otherwise specified, provide the following:
 - 1. Paint Chips: Manufacturers' standard
 - 2. Flat or Sheet Products: Minimum 6 inches square, maximum 12 inches square
 - 3. Linear Products: Minimum 6 inches, maximum 12 inches long
 - 4. Bulk Products: Minimum 1 pint, maximum 1 gallon
- F. Full size samples may be used in Work upon approval.
- G. Mock-ups:
 - 1. Erect field samples and mock-ups in accordance with requirements of Specification sections.
 - 2. Modify or make additional field samples and mock-ups as required to provide appearance and finishes
 - 3. Mock ups be to be done in an area of construction, then reviewed and approved. If approved they can remain in place, if reject they are to be removed and redone. To be reviewed by Construction Manager, School and Architect.

1.08 QUALITY CONTROL SUBMITTALS

- A. Design Data: Not applicable.
- B. Test Reports: Three (3) copies. One (1) copy will be marked with Architect's/Engineer's review comments and returned to Contractor.
 - 1. Indicate that material or product conforms to or exceeds specified requirements.
 - 2. Reports may be from recent or previous tests on material or product, but must be acceptable to Construction Manager. Comply with requirements of each individual specification Section.
- C. Certificates: Three (3) copies. One (1) copy will be marked with Architect's/Engineer's review comments and returned to Contractor.
 - 1. Indicate that material or product conforms to or exceeds specified requirements.
 - 2. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 3. Certificates may be recent or from previous test results on material or product, but must be acceptable to Construction Manager.
- D. Manufacturers' Instructions: one hard copy and (1) electronic PDF to be submitted. (1) electronic PDF to be returned. One copy will be marked with Architect's/Engineer's review comments and returned to Contractor.
 - 1. Include manufacturer's printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing.
 - 2. Identify conflicts between manufacturer's instructions and Contract Documents.

1. 09 MACHINE INVENTORY SHEETS – Not Applicable

1.10 OPERATIONS AND MAINTENANCE MANUALS

- A. Submit one hard copy and one electronic copy of manufacturers' operations and maintenance manuals. If necessary, one will be marked with Architect's/Engineer's review comments and returned to Contractor for correction until satisfactory information is provided. CM will retain satisfactorily corrected manuals for its own use. Once approved one hard copy and CD to be transmitted back for use by owner and their staff.
- B. Operations and maintenance manuals shall include the following as appropriate:
 - 1. Operating instructions
 - 2. Preventive maintenance instructions
 - 3. Cleaning instructions
 - 4. Safety precautions
 - 5. Trouble shooting procedures
 - 6. Theory of operation to discrete component level
 - 7. Schematic diagrams, flow diagrams, wiring diagrams, logic diagrams, etc. to discrete component level
 - 8. Parts lists showing all discrete components with part number, current prices and availability
 - 9. List of replaceable supplies; paper, ink, ribbon, etc. with part numbers, current prices and availability
 - 10. Recommended levels of spare parts and supplies to keep on hand
 - 11. Manufacturers' service and maintenance technical manuals
 - 12. Names, addresses and telephone numbers of service and repair firms for the equipment
- C. Manuals shall be the same as are used by manufacturers' authorized technicians to completely service and repair the equipment.

1.11 COMPUTER PROGRAMS

When any equipment requires operation by computer programs, submit copy of program on appropriate diskette plus all user manuals and guides for operating the programs and making changes in the programs for upgrading and expanding the databases. Provide required licenses to CM at no additional cost.

1.12 PROJECT RECORD DOCUMENTS

Submit one copy of each of the Project Record Documents listed in Section 017000 Project Closeout.

END OF SECTION

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Perform all Work in compliance with requirements of:
1. State of California Code of Regulations (CCR):
 - a. Title 8, Industrial Relations
 - b. Title 19, Public Safety
 - c. Title 24, Building Standards, Parts 1-7 and Part 9
 2. Occupational Safety and Health Act (OSHA)
 3. National Electrical Code (NEC)
 4. National Fire Protection Association Codes and Standards (NFPA).
 5. All other applicable health and life-safety requirements, including City of Los Angeles codes and regulations.
- B. Unless otherwise specified, specific references to codes, regulations, standards, manufacturers' instructions, or requirements of regulatory agencies, when used to specify requirements for materials or design elements, shall mean the latest edition of each in effect at the date of submission of bids, or the date of the Change Order or Field Order, as applicable.

1.02 CONFLICTS

- A. If a conflict exists between referenced regulatory requirements or between referenced regulatory requirements and the Contract Documents, Contractor shall notify Owner's Representative and request that the conflict be resolved. The fact that the Contract Documents may establish higher or more costly requirements than the minimum Code or other regulatory requirements referenced above shall not constitute a "conflict".

END OF SECTION

SECTION 01 41 20

QUALITY CONTROL

PART 1 - GENERAL

- 1.1 DESCRIPTION: All other Sections of Division 1 apply to this Section. The Contractor is responsible for implementing a Quality Control program that will ensure the timely and cost effective completion of this project.
- 1.2 RESPONSIBILITIES OF CONTRACTOR
- A. Coordinate work of all subcontractors and of separate contracts, if any, assigned to this Contract.
 - 1. Coordinate activities included in various Sections to assure efficient and orderly installation of each component. Coordinate operations included under different Sections that are dependent on each other for proper installation and operation.
 - a. Interior finishes: Schedule construction operations with consideration for indoor air quality.
 - b. Commissioning: The project will have selected building systems commissioned as specified in Section Commissioning. Coordinate pre-functional tests and start-up testing with commissioning.
 - B. Cooperate with other contractors, if any, performing work on the site under separate contracts.
 - C. Cooperate with the owner in accommodating Owner-furnished material, furnishings, equipment and their installation.
 - D. Establish on-site lines of authority and communication.
 - 1. Schedule and conduct progress meetings with Owner's representatives and the Architect.
 - 2. Utilize sequentially numbered and dated forms to document requests for information and clarification.
 - E. Provide and maintain a competent staff of experienced construction, administrative and supervisory personnel in sufficient numbers to meet the contract completion date.
 - F. Furnish detailed time schedule of operations for all work on the project. Monitor schedule as work progresses, and revise schedule at appropriate intervals to reflect actual progress.
 - G. Furnish detailed breakdown of total contract amount organized by construction activity or Table of Contents shown in the specifications.

- H. Verify that applications for permits, inspections, temporary facilities and permanent utilities are processed in a timely manner.
 - I. Unless otherwise indicated or specified, perform the following items of work:
 - 1. Locate, identify, protect and maintain existing water, gas, sewer, irrigation and storm drain lines; lighting, power and telephone conduits and wires; and all other existing surface or subsurface structures.
 - 2. Do not disturb, disconnect or damage utilities during the progress of the work.
 - 3. Maintain all existing plants and trees which are to remain.
 - 4. Repair or replace to satisfaction of Architect, all damage to existing improvements and to adjacent public or private property and rights-of-way, resulting directly or indirectly from operations under the contract.
 - J. Coordinate furnishing and placing of embedded items, sleeves and blockouts with formwork and reinforcing steel.
 - K. Resolve conflicts that may develop among subcontractors and vendors over access to, and utilization of, the restricted spaces available for construction activities, materials and equipment.
- 1.3 VERIFICATION OF CONDITIONS: Prior to installing any portion of the work, inspect the work in place to receive the work to be installed and arrange for correction of defects in the existing workmanship, material, or conditions that may adversely affect work to be installed. Such inspections shall include test applications of the materials to be installed as required to establish the correct condition of surfaces involved. Installation of materials on work in place constitutes acceptance of such work in place as being in proper condition to receive the materials to be applied and waiver of claim that the work in place is defective as pertains to warranty requirements, excluding unascertainable or concealed conditions. Where the specifications require a material to be installed under the supervision or inspection of the material manufacturer or his representative, the manufacturer or his representative also shall inspect the work in place and issue a letter of approval to Architect.
- 1.4 TOLERANCES NOMENCLATURE:
- A. Tolerances of Numbers: Unless other tolerances are indicated or specified elsewhere, specified numbers such as gauges, weights, temperatures, and similar references, but specifically not including dimensions and time, will be acceptable if within formally established, written and recognized commercial tolerances established for the affected trade. In the absence of formally written and recognized commercial tolerances, plus or minus 1 percent will be acceptable. If a specified number cannot be obtained, the number shall be interpreted as the next larger, provided it meets other requirements of the contract documents including sufficient space being available as indicated on the drawings.
 - B. Tolerances of Specified Words: Unless otherwise specified, the following words shall have the following meanings. Construction executed within these tolerances will be considered acceptable.

1. "Straight": Allowed deviations from an absolutely straight line of sight shall be plus or minus 1/16" in one foot, plus or minus 1/8" in 10 feet, and plus or minus 1/4" for the entire length of a particular construction. These deviations shall be non-accumulative. Straight lines or planes on drawings shall conform to these tolerances.
2. "Flat": Allowed deviations from an absolutely flat plane shall be plus or minus 1/1000 inch in one square inch, within plus or minus 1/16 inch in one square foot, within plus or minus 1/8 inch in an area ten feet by ten feet, and within plus or minus 1/4 inch for the entire area of a particular construction item. Flat planes on drawings shall conform to these tolerances.
3. "Level": Allowed deviation from an absolutely horizontal plane shall be 1/2 degree of angle. Horizontal lines or planes on drawings shall conform to this tolerance.
4. "Plumb": Allowed deviation from an absolutely vertical plane of plus or minus 1/2 degree of angle. Vertical lines or planes on drawings shall conform to this tolerance.
5. "Angle": Allowed deviation from an absolutely vertical plant of plus or minus 1/2 degree of specified degree of angle. Angled lines or planes on drawings shall conform to this tolerance.

PART 2 - PRODUCTS Not applicable to this Section.

PART 3 - EXECUTION Not applicable to this Section.

END OF SECTION

SECTION 01 63 00

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 – GENERAL

1.01 SUMMARY

- A. Procedures are described for selecting products and requesting substitutions of unlisted materials in lieu of materials named in the specifications or approved for use in addenda.
- B. Related Sections
 - 1. Section 01 30 00: Submittals

1.02 CONTRACTOR'S OPTIONS

- A. For products specified only by reference standard: Select any product meeting that standard.
- B. For products specified by naming one or more products or manufacturers:
 - 1. Select products of any named manufacturer meeting specifications.
 - 2. For any product or manufacturer, which is not specifically named, submit Request for Substitution (RFS) prior to bid. The only grounds for requesting a substitution after bid is a result of the product becoming discontinued.

1.03 SUBSTITUTIONS

- A. Prior to Bid the Construction Manager and Architect/Engineer will consider RFS from Contractor. After that period, requests will be considered only when product becomes unavailable due to no fault of Contractor. Requests for review of proposed substitute items will not be accepted from anyone other than Contractor. The RFS will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice Contractor's achievement of substantial completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents.
- B. Submit separate RFS for each product and support each request with:
 - Product identification
 - Manufacturer's literature
 - Samples, as applicable
 - Name and address of similar projects on which product has been used, and date of installation
 - Name, address and telephone number of manufacturer's representative or sales engineer
- C. Where required, itemize a comparison of the proposed substitution with product specified and list significant variations. If variation from product specified is not pointed

out in submittal, variation will be rejected even though submittal was favorably reviewed.

- D. Should a substitution be granted any cost incurred to change construction or any other piece of equipment shall be borne exclusively by the trade contractor granted the substitution.
- E. All variations of the proposed substitute from that specified will be identified in the RFS and available maintenance, repair and replacement service will be indicated.
- F. Include accurate cost data comparing proposed substitution with product and amount of net change in Contract price, including but not limited to, an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors effected by the resulting change, all of which will be considered by Construction Manager and Architect/Engineer in evaluating the proposed substitute. Construction Manager and Architect/Engineer may require Contractor to furnish additional data about the proposed substitute.
- G. Substitutions will not be considered for acceptance when:
 - 1. They will result in delay meeting construction milestones or completion dates.
 - 2. They are indicated or implied on submittals without formal request from Contractor.
 - 3. They are requested directly by subcontractor or supplier.
 - 4. Acceptance will require substantial revision of Contract Documents.
 - 5. They disrupt Contractor's job rhythm or ability to perform efficiently.
- H. Substitute products shall not be ordered without written acceptance of Construction Manager and Architect/Engineer.
- I. Construction Manager and Architect/Engineer will determine acceptability of proposed substitutions and reserve right to reject proposals due to insufficient information.

1.04 CONTRACTOR'S REPRESENTATION AND WARRANTY

- A. Requests constitute a representation and warranty that Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product
 - 2. Will provide the same warranty for substitution as for specified product
 - 3. Will coordinate installation and make other changes, which may be required for Work to be complete in all respects
 - 4. Waives claims for additional costs, which may subsequently become apparent
 - 5. Will compensate the Owner for additional redesign costs associated with substitution
 - 6. Will be responsible for Construction Schedule slippage due to substitution
 - 7. Will be responsible for Construction Schedule delay due to late ordering of available specified products caused by requests for substitution, which is subsequently rejected by Construction Manager

8. Will compensate the Owner for all costs; including extra costs of Contract, extra cost to other contractors, and any claims brought against the Owner, caused by late requests for substitutions or late ordering of products.

1.05 CONSTRUCTION MANAGER'S AND ARCHITECT/ENGINEER'S DUTIES

- A. Review Contractor's RFS with reasonable promptness.
- B. Notify Contractor in writing of decision to accept or reject requested substitution.

1.06 COST OF REVIEW

- A. Construction Manager and Engineer will record time required in evaluating substitutes proposed or submitted by Contractor. Whether or not Construction Manager or Architect/Engineer accepts the substitute item so proposed or submitted by Contractor, Contractor shall reimburse the Owner for the charges of Architect/Engineer and Construction Manager for evaluating each such proposed substitute item.
- B. The Owner reserves the right to waive the requirement of paragraph A above.

PART 2—PRODUCTS

Not used.

PART 3—EXECUTION

Not used.

END OF SECTION

SECTION 01 70 00

PROJECT CLOSEOUT

PART 1 – GENERAL

1.01 SUMMARY

This section describes contract closeout procedures including:

1. Removal of temporary construction facilities
2. Substantial completion
3. Final completion
4. Final cleaning
5. Project record documents
6. Material, equipment and finish data
7. Project guarantee
8. Warranties
9. Turn-in
10. Release of claims
11. Guaranty and Maintenance Bonds

1.02 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion Inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore permanent facilities used during construction to specified condition.

1.03 SUBSTANTIAL COMPLETION

- A. When Contractor considers Work or designated portion thereof as substantially complete, submit written notice, with list of items to be completed or corrected to Construction Manager.
- B. Within reasonable time, Construction Manager and Architect/Engineer will inspect to determine status of completion.
- C. Should Construction Manager or Architect/Engineer determine that Work is not substantially complete; Construction Manager will promptly notify Contractor in writing, listing all defects and omissions.
- D. Remedy deficiencies and send a second written notice of substantial completion. Architect/Engineer will re-inspect the Work. If deficiencies previously noted are not corrected on re-inspection, then Contractor shall pay the cost of the reinspection.
- E. When Architect/Engineer determines that Work is substantially complete, Construction Manager will issue a Certificate of Substantial Completion.

- F. Manufactured units, equipment and systems, which require startup, must have been started up and run for periods prescribed by Construction Manager, Architect/Engineer, or Owner before a Certificate of Substantial Completion will be issued.

1.04 FINAL COMPLETION

- A. When Contractor considers Work is complete, submit written certification that:
 - 1. Contractor has inspected Work for compliance with Contract Documents.
 - 2. Work, except for Contractor maintenance after Final Acceptance, has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected.
 - 3. Work is complete and ready for final inspection.
 - 4. Contractor has achieved all requirements for Final Acceptance as that term is defined in Section 014100 – Regulatory Requirements.
- B. In addition to submittals required by conditions of Contract, provide submittals required by governing authorities and submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
- C. When Architect/Engineer finds Work is acceptable and final submittal is complete, Construction Manager will issue final change order reflecting approved adjustments to Contract Sum not previously made by Change Order.

1.05 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
 - 1. Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment operated during construction, clean ducts, blowers and coils of units operated without filters during construction.
 - 2. Employ skilled workers for final cleaning.
 - 3. Vacuum cleaners are required to have HEPA (high efficiency particulate arrester) filters.
 - 4. Implement and follow the School's policy for environmentally benign cleaning materials.
- C. Clean Site; mechanically sweep-paved areas.
- D. Remove waste and surplus materials, rubbish, and construction facilities from Site.

1.06 PROJECT RECORD DOCUMENTS

- A. General
 - 1. Project Record Documents required include:
 - a. one set of the Bid Set plan and specification book on #20 bond approved by building department

- b. Record Set: (1) hard copy and electronic copy of CD.As-Built plan sets and specifications
 - c. One set of red-marked record set project documents
 - d. Marked-up copies of Specifications, Addenda and Change Orders
 - e. Marked-up Project Data submittals and Record Samples
 - f. Three sets Operation and Maintenance manuals, warranties and other related project close out documents.
 - g. Provide PDF files of all approved drawings
 - h. Provide PDF files of all approved specifications
 - i. Provide digital files of all Record Set As-Built drawings, including Addenda and change orders
2. Specific Project Record Documents requirements that expand requirements of this Section are included in the individual Sections of Divisions 2 through 32 per issued specification.
 3. Maintenance of Documents and Samples:
 - a. Store Project Record Documents and samples in the field office apart from Contract Documents used for construction.
 - b. Do not permit Project Record Documents to be used for construction purposes.
 - c. Maintain Project Record Documents in good order, and in a clean, dry, legible condition.
 - d. Make documents and samples available at all times for inspection by Architect/Engineer.
 4. The School will provide a PDF set of the construction drawings and project manuals for the Contractor's use for copying during construction.
- B. Project Record Drawings
1. Mark-up Procedure: During the construction period, maintain a set of prints of the Contract Drawings and Shop Drawings for Project Record Document purposes.
 2. Mark these Drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to information on concealed elements, which would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to:
 - a. Dimensional changes
 - b. Drawings Revisions to details shown
 - c. Drawings Depths of foundations below the first floor

- d. Locations and depths of underground utilities
 - e. Revisions to routing of piping and conduits
 - f. Revisions to electrical circuitry
 - g. Actual equipment locations
 - h. Duct size and routing
 - i. Locations of concealed internal utilities
 - j. Changes made by Change Order
 - k. Details not on original Contract Drawings
3. Mark completely and accurately Project Record Drawing prints of Contract Drawings or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
 4. Mark Project Record Drawing sets with red erasable colored pencil; use other colors to distinguish between changes for different categories of the Work at the same location.
 5. Mark important additional information, which was either shown schematically or omitted from original Drawings.
 6. Note construction change directive numbers; alternate numbers; Change Order numbers and similar identification.
 7. Responsibility for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing data, whether the individual or entity is the installer, subcontractor, or similar entity, is required to prepare the mark-up on Project Record Drawings.
 - a. Accurately record information in an understandable and legible drawing technique.
 - b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.
 8. At time of Substantial Completion, submit Project Record Drawings to Construction Manager for The School's records. Organize into sets, bind and label sets for The School's continued use.

D. PROJECT RECORD SPECIFICATIONS

During the construction period, maintain one copy of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.

1. Mark the Project Record Specifications to indicate the actual installation where the installation varies substantially from that indicated in Specifications and Modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options,

and information on concealed installation that would be difficult to identify or measure and record later.

- a. In each Specification Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
 - b. Record the name of the manufacturer, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with Project Record Product Data submittals and maintenance manuals.
 - c. Note related Project Record Product Data, where applicable, for each principal product specified, indicate whether Project Record Product Data has been submitted in maintenance manual instead of submitted as Project Record Product Data.
2. Upon completion of mark-up, submit Project Record Specifications to the Construction Manager for the School's records.
- F. PROJECT RECORD PRODUCT DATA. During the construction period, maintain one copy of each Project Record Product Data submittal for Project Record Document purposes.
1. Mark Project Record Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Project Record Product Data submitted. Include significant changes in the product delivered to the site, and changes in manufacturer's instructions and recommendations for installation.
 2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 3. Note related Change Orders and mark-up of Project Record Drawings, where applicable.
 4. Upon completion of mark-up, submit a complete set of Project Record Product Data to the Construction Manager for The School's records.
 5. Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.
 6. Each prime Contractor is responsible for mark-up and submittal of record Project Record Product Data for its own Work.
- G. MATERIAL, EQUIPMENT AND FINISH DATA.
1. Provide data for primary materials, equipment and finishes as required under each specification section.
 2. Submit two (2) sets prior to final inspection, bound in 8-1/2 inches by 11 inches three-ring binders with durable plastic covers; provide typewritten table of contents for each volume.
 3. Arrange by Specification division and give names, addresses, and telephone numbers of subcontractors and suppliers. List:

- a. Trade names
- b. Model or type numbers
- c. Assembly diagrams
- d. Operating instructions
- e. Cleaning instructions
- f. Maintenance instructions
- g. Recommended spare parts
- h. Product data

1.08 MISCELLANEOUS PROJECT RECORD SUBMITTALS

Refer to other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Construction Manager for the School's records.

Categories of requirements resulting in miscellaneous records include, but are not limited to the following:

- a. Field records on excavations and foundations
- b. Field records on underground construction and similar work
- c. Survey showing locations and elevations of underground lines
- d. Invert elevations of drainage piping
- e. Surveys establishing building lines and levels
- f. Authorized measurements utilizing unit prices or allowances
- g. Records of plant treatment
- h. Ambient and substrate condition tests
- i. Certifications received in lieu of labels on bulk products
- j. Batch mixing and bulk delivery records
- k. Testing and qualification of tradespersons
- l. Documented qualification of installation firms
- m. load and performance testing
- n. Inspections and certifications by governing authorities leakage and water-penetration tests
- o. Fire resistance and flame spread test results
- p. Final inspection and correction procedures

1.09 PROJECT GUARANTEE

- A. Neither recordation of final acceptance nor final certificate for neither payment nor provision of the Contract nor partial or entire use or occupancy of the Site by the The School shall constitute acceptance of Work not done in accordance with Contract Documents nor relieve Contractor of liability in respect to express warranties or responsibility for faulty materials or workmanship.
- B. Requirements for Contractor's guarantee of completed Work are included in Document 00700 General Conditions, Article 1.09. Contractor shall guarantee Work done under Contract against failures, leaks or breaks or other unsatisfactory conditions due to defective equipment, materials or workmanship, and perform repair work or replacement required, at Contractor's sole expense, for period of 2 years from date of Final Acceptance, as required by paragraph 13.2 of Document 00700 General Conditions.
- C. The School may make repairs to defective Work as set forth in paragraph 12.6 of Document 00700 General Conditions, if, within 5 working days after mailing of written notice of defective work to Contractor or authorized agent, Contractor shall neglect to make or undertake with due diligence repairs; provided, however, that in case of leak or emergency where, in opinion of the School, delay would cause hazard to health or serious loss or damage, repairs may be made without notice being sent to Contractor, and Contractor shall pay cost thereof.
- D. If, after installation, operation or use of materials or equipment to be furnished under Contract proves to be unsatisfactory to Construction Manager, the School shall have right to operate and use materials or equipment until it can, without damage to the School, be taken out of service for correction or replacement. Period of use of defective materials or equipment pending correction or replacement shall in no way decrease guarantee period required for acceptable corrected or replaced items of materials or equipment.
- E. Nothing in this Section shall be construed to limit, relieve or release Contractor's, subcontractors' and equipment suppliers' liability to the School for damages sustained as result of latent defects in equipment caused by negligence of suppliers' agents, employees or subcontractors. Stated in another manner, warranty contained in the Contract Documents shall not amount to, nor shall it be deemed to be, waiver by the School of any rights or remedies (or time limits in which to enforce such rights or remedies) it may have for defective workmanship or defective materials under laws of this State pertaining to acts of negligence.

1.10 WARRANTIES AND BONDS

- A. Execute Contractor's submittals and assemble documents executed by subcontractors, suppliers, and manufacturers.
 - 1. Provide table of contents and assemble in 8-1/2 inches by 11 inches three-ring binder with durable plastic cover.
 - 2. Assemble in Specification Section order.
- B. Submit material prior to final application for payment.

1. For equipment put into use with the School's permission during construction, submit within ten (10) working days after first operation.
 2. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten (10) working days after acceptance, listing date of acceptance as start of warranty period.
- C. Warranties are intended to protect the School against failure of work and against deficient, defective and faulty materials and workmanship, regardless of sources.
- D. Limitations: Warranties are not intended to cover failures, which result from the following:
1. Unusual or abnormal phenomena of the elements
 2. Vandalism after substantial completion
 3. Insurrection or acts of aggression including war
- E. Related Damages and Losses: Remove and replace Work which is damaged as result of defective Work, or which must be removed and replaced to provide access for correction of warranted Work.
- F. Warranty Reinstatement: After correction of warranted Work, reinstate warranty for corrected Work to date of original warranty expiration or to a date not less than 365 days after corrected Work was done, whichever is later.
- G. Replacement Cost: Replace or restore failing warranted items without regard to anticipated useful service lives.
- H. Warranty Forms: Submit drafts to Construction Manager for approval prior to execution. Forms shall not detract from or confuse requirements or interpretations of Contract Documents.
1. Warranty shall be countersigned by manufacturers.
 2. Where specified, warranty shall be countersigned by subcontractors and installers.
- I. Rejection of Warranties: the School reserves right to reject unsolicited and coincidental product warranties, which detract from or confuse requirements or interpretations of Contract Documents.
- J. Term of Warranties: For materials, equipment, systems and workmanship warranty period shall be two (2) years minimum from date of substantial completion of entire Work except where:
1. Detailed specifications for certain materials, equipment or systems require longer warranty periods.
 2. Materials, equipment or systems are put into beneficial use of the School prior to Substantial Completion as agreed to in writing by Construction Manager.
- K. Warranty of Title: No material, supplies, or equipment for Work under Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all work to deliver the

Site, together with improvements and appurtenances constructed or placed thereon by Contractor, to the School free from any claim, liens, security interest, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any materials or labor for any Work covered by Contract shall have right to lien upon the Site or improvement or appurtenances thereon. Nothing contained in this Paragraph, however, shall defeat or impair right of persons furnishing materials or labor under bond given by Contractor for their protection or any rights under law permitting persons to look to funds due Contractor in hands of the School.

1.11 TURN-IN

Contract will not be closed out and final payment will not be made until all personnel Identification Media, vehicle permits and keys issued to Contractor during prosecution of Work are turned in to the School.

1.12 RELEASE OF CLAIMS

Contract will not be closed out and final payment will not be made until Document 00530 Agreement and Release of Any and All Claims, is completed and executed by Contractor and the School.

1.13 FIRE INSPECTION COORDINATION

Contractor shall coordinate fire inspection and secure sufficient notice to the School to permit convenient scheduling.

PART 2 – PRODUCTS

Not applicable to this section.

PART 3 – EXECUTION

Not applicable to this section.

END OF SECTION

SECTION 01 75 00

PROTECTION OF EXISTING STRUCTURES AND UTILITIES

PART 1 - GENERAL

1.01 SUBMITTALS

- A. When conditions encountered differ from that shown, submit proposed remedial methods, shoring shop drawings for approval.
- B. Cross-reference to Contract Documents includes shop drawings, samples and product data as appropriate.

PART 2 - PRODUCTS

2.01 MATERIALS

Materials, Manufacturers and Fabrication: Comply with the requirements established by the Contract Documents.

PART 3 - EXECUTION

3.01 PROCEDURES

- A. The Drawings show, if applicable, existing above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, hot water, and other utilities which are known to Owner.
- B. Locate all known existing utility installations before proceeding with construction operations which may cause damage to such installations. The existing installations shall be kept in service where shown and damage shall be repaired at no increase in Contract Sum.
- C. If any other structures or utilities are encountered, request Owner's Representative to provide direction on how to proceed with the Work.
- D. If any structure or utility is damaged, take immediate action to ensure the safety of persons and property.
- E. Shoring:
 - 1. General Protection. Pursuant to Labor Code Sections 6705 and 6707, Contractor shall include in its base bid all costs incident to the provision of adequate sheeting, shoring, bracing or equivalent method for the protection of

life and limb which shall conform to the applicable Federal and State Safety Orders.

2. Before beginning excavation five feet or more in depth, Contractor shall submit to Owner's Representative a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazards of caving ground during the excavation. The proposed plan shall comply with the State of California Construction Safety Orders and Title 24 of the California Code of Regulations (CCR). If the detailed plan varies from such shoring system standards, it shall be prepared by a registered civil or structural engineer whose name and registration number shall be indicated on the Drawing. If a dispute arises as to whether the plan must be prepared by a registered civil or structural engineer, Owner's Representative's determination of the matter shall be final and conclusive on Contractor. The cost of required engineering services shall be borne by Contractor and shall be deemed to have been included in the amount bid for the Work as stated in the Agreement.
3. Neither the review nor approval of any plan showing the design of shoring, bracing, sloping, or other provisions for worker protection, shall relieve Contractor from its obligation to comply with Construction Safety Orders Standards and Title 24 CCR for the design and construction of such protective Work, and Contractor shall indemnify Owner and Owner's Representative from any and all claims, liability, costs, action and causes of action arising out of or related to the failure of such protective systems. Contractor shall defend Owner, its officers, employees, and agents and Owner's Representative in any litigation of proceeding brought with respect to the failure of such protective systems.
4. Comply with State of California Construction Safety Orders, Article 6 - Excavations, Trenches, Earthwork - whether or not the excavation, trench, or earthwork is five feet or more in depth.

END OF SECTION

SECTION 01 76 00

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 DESCRIPTION

Contractor shall be responsible for all cutting, fitting and patching required to complete the work and to:

- A. Make its several parts fit together properly.
- B. Uncover portions of the work to provide for installation of ill-timed work.
- C. Remove and replace work not conforming to requirements of Contract Documents.
- D. Provide routine penetrations of nonstructural surfaces for installation of electrical conduit, plumbing and ductwork.

1.02 SUBMITTALS

- A. Submit a written request to Owner's Representative well in advance of executing any cutting or alteration which affects:
 - 1. The work of the Owner or any separate contractor.
 - 2. The structural value or integrity of any element of the existing building.
 - 3. The integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
 - 4. The efficiency, operational life, maintenance or safety of operational elements.
 - 5. The visual qualities of sight-exposed elements.
- B. The request shall include:
 - 1. Identification of the project.
 - 2. Description of the affected work.
 - 3. The necessity for cutting alteration.
 - 4. The effect of the work on the Owner or any separate Contractor and on the structural or weatherproof integrity of the existing building.

5. Description of the proposed work:
 - a. The scope of cutting, patching or alteration,
 - b. The trades who will execute the work,
 - c. Products proposed to be used,
 - d. The extent of refinishing to be done.
 6. Alternatives to cutting and patching.
 7. Cost proposal, when applicable.
 8. Written permission of any separate contractor whose work will be affected.
- C. Should conditions of the work or the schedule indicate a change of products, submit a request for substitution.
- D. Submit a written notice to Owner's Representative designating the date and the time the work will be uncovered.

PART 2 - PRODUCTS

2.01 MATERIALS

Comply with Contract Documents for each specific product involved.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect existing conditions of the project, including elements subject to damage or to movement during cutting and patching.
- B. After uncovering work, inspect the conditions affecting the installation of products or performance of the work.
- C. Report unsatisfactory or questionable conditions to the Owner's Representative in writing; do not proceed with the work until the Owner's Representative has provided further instructions.

3.02 PREPARATION

- A. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the work.

- B. Provide devices and methods to protect other portions of the project from damage.
- C. Provide protection from the elements for that portion of the project which may be exposed by cutting and patching work.

3.03 PERFORMANCE

- A. Execute cutting and demolition by methods which will prevent damage to other work and will provide proper surfaces to receive installation of reports.
- B. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- C. Restore work which has been cut or removed; install new products to provide completed work in accordance with requirements of Contract Documents.
- D. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- E. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes.
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish the entire unit.

END OF SECTION

SECTION 02 21 00
CLEARING, GRUBBING AND STRIPPING

PART ONE – GENERAL

1.1 DESCRIPTION

- A. All site clearing and grubbing on the job-site indicated on the Contract Drawings and in the Project Manual.
- B. Site clearing shall consist of removing all vegetable growth such as trees, roots, stumps, shrubs, brush, limbs; and stone, boulders, clods, wood and other vegetative growth from the growth surface. Clearing shall also include the removal and disposal of trash piles, rubbish, etc.
- C. Grubbing shall consist of the removal and disposal of wood roots, stumps, shrubs, brush, stone, boulders, clods, vegetable growth, etc. below the ground or subgrade surface.
- D. CONTRACTOR shall furnish all tools, equipment materials and supplies and shall perform all labor to complete the work associated with removal of all natural and artificial objectionable material from the designated areas of work as indicated in the Contract Documents.
- E. This work shall also include the protection from injury and preservation of existing improvements, adjacent property, utility vegetation and existing objects designated to remain.
- F. Prior to commencing the work, obtain acceptance from the ENGINEER regarding methods to be used and disposal of removed materials.
- G. Related Sections:
 - 1. Documents affecting work of this Section included, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, DIVISION 1 - GENERAL REQUIREMENTS and other Sections of the Project Manual.
 - 2. Site Demolition in Section 02 22 00.
 - 3. Earthwork in Section 02 31 00.
 - 4. Concrete work in Section 03 30 00.

1.2 QUALITY ASSURANCE

- A. Labor: Use adequate numbers of skilled laborers thoroughly trained in site-clearing operations and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for the proper performance of the work of this Section.
- B. Codes and Regulations: Perform all work of this Section in strict accordance with applicable Government Codes and Regulations especially meeting all safety standards and requirements of CAL/OSHA, County and 1999 Los Angeles City Building Code and applicable Amendments. Conform to all storm water pollution control measures as required

and provided in Section 02 31 00 - EARTHWORK of the Project Manual. Provide additional measures, added materials and devices as may be needed as directed by the City Engineer or the Consultant at no added cost to the City.

C. Miscellaneous Requirements:

1. Erection and maintenance of protections
2. Dust Control
3. Repair of Damages
4. Cleaning and Removal of Rubbish

D. Permits and Licenses: Procure all City, County and State Permits and Licenses, including Municipal Business License and pay all charges and fees for the same.

E. Contractor Submittals - Submit schedule of clearing, grubbing, and erosion control measures to be put in place for all work scheduled during the rainy season (October - April).

PART TWO - PRODUCTS

2.1 MATERIALS

- A. Soil Sterilant: As specified in Section 02 31 00 - EARTHWORK.
- B. Provide Materials not specifically described but required for completion of the work of this Section as selected by the Contractor subject to the approval of the City Engineer or the Consultant.

PART THREE - EXECUTION

3.1 SITE CONDITIONS

Examine the job-site and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper site-clearing operations, as directed by the City Engineer or the Consultant. Do not proceed until such detrimental conditions have been corrected.

3.2 PROTECTION

- A. Protect Existing Structures and Site Improvements indicated to remain from damage by approved methods and/or as authorized by the City Engineer. Removal of all protections shall be when work of this Section is completed or when so authorized by the City Engineer or the Consultant. Apply protections to adjacent properties as required and directed by the City Engineer.
- B. Protect Existing Utilities Indicated or made known to remain traversing the job-site and serving existing adjacent facilities.

- C. Protect Existing Trees and Shrubs Indicated to remain by providing temporary surrounding fencing so located a sufficient distance away so that trees and shrubs will not be damaged by site-clearing operations.
- D. Protection of Persons and Property (existing structures and site improvements).
 - 1. Provide barricades, warning signs at open depressions and holes on adjacent property and public accesses.
 - 2. Provide operating warning lights during hours from dusk to dawn each day or as otherwise required.
 - 3. Protect existing remaining structures, utilities, sidewalks, pavements other facilities from damage as caused by settlement, undermining, washout or other hazards created by site-clearing operations of this Section.
 - 4. Provide and maintain pedestrian and vehicular access in accordance with Work Area Traffic Control Handbook (WATCH), latest edition.
- E. Use means necessary to prevent air pollution or dust from becoming a nuisance to the public, to neighbors and to others performing work on or near the job-site. Comply with governing regulations.
- F. Maintain access to the job-site, other neighboring property, street and alley at all times.
- G. The project site shall be maintained in conformance with Section 7-8 - PROJECT SITE MAINTENANCE of the Standard Specifications for Public Works Construction (SSPWC) and the requirements of this Project Manual.

3.3 SITE CLEARING AND GRUBBING

- A. General:
 - 1. For drawing clarity, not all trees, shrubs, brush, grass, weeds, or exact amount of trash or debris are shown on the drawings. Contractor shall carefully study the Contract Drawings, the Soil Investigation Report and the Survey, visit the job site and verify the extent of the work to be done prior to the Bid.
 - 2. Prior to starting job-site clearing operations in the company of the City Engineer or Consultant Architect, Soil Engineer and Inspector; visit the job site and verify the extent of the work.
 - 3. Site clearing and grubbing shall conform to Section 300-1 - CLEARING AND GRUBBING of SSPWC and applicable requirements of the Project Manual.
 - 4. Site clearing and grubbing shall be done in the presence of the Soil Engineer. Contractor shall notify the City Engineer 72 hours prior to clearing operation.
- B. Site Clearing and Grubbing Operations
 - 1. To a depth of at least 12" below existing ground surfaces or new graded surfaces whichever is lower, or to a depth where settlement will not occur as caused by decomposition of roots. Clean out all vegetable growth, roots, stumps, clods and other objective materials.

2. Treat roots remaining in the soil with a weed killer approved and as directed by the City Engineer or the Consultant.
3. Remove all concrete and masonry debris. Remove stones, boulders, clods which are one (1) inch or larger. Remove stones, boulders, clods which are one (1) inch or larger from all utility trenches.
4. Remove all existing rubbish and debris or those resulting from work operations of this Section as soon as possible, do not allow to pile up. Do not burn rubbish and debris on the job-site.
5. Remove all growths including trees and shrubs on the job-site within property lines including trees in tree wells and elsewhere as noted on the Contract Drawings.
6. Where active utility lines need to be capped or plugged, perform such work in accordance with requirements of the Utility Company or government agency having jurisdiction and conform to provisions of Section 01 14 00 - CONTRACTOR'S USE OF THE PREMISES, and Subsection 3.2B of this Section.
7. Existing Services to remaining structures are to be maintained at all times.

3.4 STRIPPING

- A. Stripping shall include the removal and disposal of all organic sod, topsoil, grass and grass roots, and other objectionable material remaining after clearing and grubbing from the areas designated to be stripped. The depth of stripping shall be as shown on the Drawings and specified herein.
- B. Topsoil from the strippings shall be stockpiled and used for the finished site grading. Excess topsoil will be placed in the waste disposal areas designated by the ENGINEER.
- C. Prior to beginning any excavation or fill, strip the topsoil to a depth sufficient to remove all organic material and stockpile for future use. In general, topsoil shall be removed where structures are to be built, trenches dug, and roads, parking lots, walks, and similar improvements constructed within the areas presently covered with topsoil. Topsoil shall be stored clear of the construction area. Take reasonable care to prevent the topsoil from becoming mixed with subsoil.

3.5 TOPSOIL

- A. Strip and remove existing sod, and stock pile existing sod if specified for reuse in the Contract Works.
- B. After proposed planting area(s) has been cleared of vegetation and grubbed, strip the existing topsoil to a depth specified and to provide at least a [6-inch depth of topsoil] [in areas shown on the Contract Drawings] to be turfed or planted and to fill planters without contamination with subsoils.
- C. If on site topsoil is specified for reuse, stock pile topsoil in an area clear of new construction or where directed by the City Engineer or the Consultant.

- [D. Maintain topsoil stockpiles in a manner which will not obstruct the natural flow of drainage.
1. Maintain the stockpiled topsoil free from debris and trash.
 2. Keep the stockpiled topsoil damp to prevent drying out and creating a dust source.
 3. Soil samples shall be obtained and analyzed for agricultural suitability and fertility.
 4. Place and compact backfill in the planting area. Add soil amendments to topsoil in accordance with the recommendation and cultivate.
 5. Provide Soil Sterilization in accordance with Section 02 31 00 – EARTHWORK of the Project Manual.

3.6 REMOVAL AND DISPOSAL OF CLEARING AND GRUBBING DEBRIS

- A. General: All materials removed shall be disposed of outside of the right-of-way. No accumulation of flammable material shall remain on or adjacent to the right-of-way. The roadway and adjacent areas shall be left with a neat and finished appearance.
- B. Bituminous Pavement: Bituminous pavement removal shall be in conformance with SSPWC Section 300-1.3.2.
- C. Concrete Pavement: Concrete pavement removal shall be in conformance with SSPWC Section 300-1.3.2.
- D. Concrete Curb, Walk, Gutters, Cross Gutters, Driveways, and Alley Intersections: Concrete removal shall be in conformance with SSPWC Section 300-1.3.2.

3.7 STORAGE OF MATERIALS AT THE JOB-SITE

Storage not permitted beyond brief accumulation awaiting pick up by removal trucks. Delays in the removal of site-clearing materials from the job-site shall be subject to the approval of the City Engineer or the Consultant.

END OF SECTION

SECTION 02 31 00
EARTHWORK

PART ONE - GENERAL

1.1 SUMMARY

- A. Provided and execute earthwork as indicated on the Contract Drawings or in the Project Manual including but not limited to the following:
1. General excavating and trenching for various trades.
 2. General exterior grading and cutting.
 3. General excavating for site improvements.
 4. Select base materials for under concrete slab and under paving.
 5. Filling and Backfilling.
 6. Treatment for termite control.
 7. Structure excavation, unclassified fill and borrow excavation defined in Section 300 – EARTHWORK of the "Standard Specifications for Public Works Construction (SSPWC)".

B. RELATED WORK SPECIFIED ELSEWHERE

1. Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, DIVISION 1 - GENERAL REQUIREMENTS and other applicable Sections of the Project Manual.
2. Clearing, Grubbing and Stripping in Section 02 21 00.
3. Concrete Work in Division 3.

1.2 QUALITY ASSURANCE

- A. Labor: Use adequate numbers of skilled laborers to are thoroughly trained and experienced in the necessary crafts and who are completely familiar with specified requirements and the methods needed for proper performance of the Work of this Section.
- B. Equipment: Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.
- C. Codes and Standards: Perform excavation work in compliance with applicable ordinance of governing authorities having jurisdiction including, but not limited to, the 1999 L. A. City Building Code and applicable Amendments; Division 1-

DEPARTMENT OF INDUSTRIAL RELATIONS of Title 8 of the California Code of Regulations; Section 300 - EARTHWORK of SSPWC, as amended by Brownbook.

1. In addition to complying with Codes and Standards having jurisdiction, comply with directions of the Soil Engineer.
- D. The Contractor shall provide necessary measures for storm water pollution control and water quality protection. The Contractor shall meet the standards of good housekeeping at all time.
- E. Testing and Inspection Services: The City will engage a qualified soil testing and inspection service for quality control testing during earthwork operations. Testing shall be performed in accordance with the soil investigation reports and testing standards, the instructions of the Soil Engineer and the applicable Sections of General Conditions.
- F. Soil Engineer: The City will retain the services of a Soil Engineer for the purpose of soil investigations and testing, all the necessary inspections and observations, and certifications.
- G. Survey: The Contractor shall employ the services of a California licensed surveyor for the purposes of survey control, layout, grade and cross-sections required to control work. Survey work shall conform to Section 01 72 20-SURVEYING.

1.3 SUBMITTALS

Conform to provisions of Section 01330 of DIVISION 1 - GENERAL REQUIREMENTS.

- A. Sources of imported materials.
- B. Method of Back-Filling and Compaction.
- C. Dewatering Plans.
- D. California General Construction Activity Stormwater Permit, Waste Discharge Identification Number, Wet Weather Erosion Control Plan or Stormwater Pollution Prevention Plan.
- E. Test Reports-Excavating: Contractor shall submit the following reports directly to the Los Angeles City Department of Building & Safety, prepared by the Soil Engineer and the testing service, with a copy to the Engineer.
 1. Test reports on borrow material.
 2. Verification of each footing subgrade.
 3. Field density test reports.

4. One optimum moisture-maximum density curve for each type of soil encountered.
5. Other test reports as required by the Soil Engineer and the local cognizant agency.

1.4 PERMITS

- A. Required: In addition to the requirements specified herein, and in applicable Section 01112 – DESCRIPTION OF WORK of DIVISION 1 - GENERAL REQUIREMENTS of the Project Manual.
- B. The Contractor shall perform all work in accordance with the permit requirements of the Los Angeles City Department of Building and Safety, including obtaining the grading permit, hauling permit and bond, and making the notification to the adjacent property owners; no additional compensation will be allowed therefore.
- C. Contractor shall furnish Engineer with a duplicate copy of OSHA excavation permit, and all other required permits prior to the start of the excavation work.
- D. The Contractor shall obtain and pay for the California State Regional Water Quality Control Board (LARWQCB) Construction Water Discharge Permit.
- E. The Contractor shall obtain and pay for Calif General Construction Activity Stormwater Permit. The Contractor shall obtain Waste Discharge Identification Number after submitting stormwater Pollution Prevention Plan (SWPPP) pursuant to Section 91.106 of L.A.M.C. to the Los Angeles City Dept. Building and Safety for reviews.
- F. The Contractor shall make all necessary notifications, obtain and pay for required permits and file manifests with the South Coast Air Quality Management District (S.C.A.Q.M.D.).

1.5 JOB CONDITIONS

- A. Required Work Coordination: The Contractor shall fully coordinate the work operations of this Section with that of other trades involved and with the Engineer to assure proper sequence of work, limitations, methods and time of work so as to minimize or avoid interference with the existing utilities as well as performance of work by the other Contractors. Contractor shall include minimum two weeks in its Construction Schedule to allow the Soil Engineer to prepare final Soil Report to be submitted to the Los Angeles City Department of Building and Safety Grading Division for final approval if the Soil Engineer is obtained by the City. The Contractor shall coordinate and arrange for all the inspections with the local authorized agencies and the Bureau of Contract Administration.
- B. Trench Safety: Attention is directed to the provisions of Section 6705 of the Labor Code concerning trench excavation safety plans.
- C. Air Pollution Control: The Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes which apply to work performed

pursuant to the Contract, including any air pollution control rules, regulations, ordinances and statutes, specified in Section 1107 of the Government Code.

- D. Use of Pesticides: The Contractor shall comply with all rules and regulations of the Department of Food and Agriculture, the Department of Health, the Department of Industrial Relations and all other agencies which govern the use of pesticides required in the performance of the Work on the Contract.

1. Pesticides shall include, but shall not be limited to herbicides, insecticides, fungicides, rodenticides, germicides, menatocides, bactericides, inhibitors, fumigants, defoliant, soil sterilants, and repellents.

2. Any substance or mixture of substances intended for preventing, repelling, mitigating or destroying weeds, insects, diseases, rodents, or nematodes and any substance of mixture for substances intended for use as a plant regulator, defoliant shall be considered as a pesticide.

- E. Sound Control Requirements: The Contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the Contract.

Each combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

- F. Use of Explosives: The use of explosives is not permitted.

1.6 PROTECTIONS

- A. General: Comply with provisions of Section 00 30 90 - PROTECTION OF PERSONS AND PROPERTY AND RESTORATION OF EXISTING IMPROVEMENTS in GENERAL CONDITIONS. Protect and guard all excavations against damage to life, limb and property as prescribed by Los Angeles City Department of Building and Safety.

- B. Protections of Persons and Property: Provide and install signs, lights and barricades at danger points on and off the job-site to guard against accidents, etc.

1. Barricade open excavations occurring as part of this work and post with warning lights.

2. Operate and maintain warning lights as recommended by authorities having jurisdiction.

3. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

4. Perform excavation within drip-line of large trees to remain by hand, and protect the root system from drainage or dry out to the greatest extent possible. Maintain

moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

- C. Existing Improvements (including trees and shrubs Indicated to Remain): Protect against damage resulting from Contractor's operations. Repair or replace damaged items to the full satisfactions of the City at no added cost to the City.
- D. Shoring, Cribbing and Lagging: Required of excavations and earthbanks as necessary to prevent caving in, erosion or gulying of sides. Conform to applicable provisions in Section 02 24 00 – SHORING of the Project Manual.
1. Design and calculations of shoring, etc. shall be in accordance with requirements of with the latest Los Angeles City Building Code, Section 2811 and Safety Orders of State of California, Division of Industrial Safety, Title 8, Subchapter 4, Article 6, Sections 1540 and 1541.
 2. Upon completion of project or when no longer needed or otherwise directed by the authority having jurisdiction, remove all such shoring from the job-site.
- E. Water: Divert or pump out of all excavations until concrete and other items are placed therein, forms removed and backfilling is completed. The Contractor shall provide a means for solids removal before discharging the water.
- F. Existing Utilities: Utilities shown on the drawings are shown pursuant to a search of available records and are shown as a matter of information and not as a matter of fact. Conforming with Section 01 11 20 - SUMMARY OF THE WORK, Section 01 14 00 – CONTRACTOR'S USE OF THE PREMISES and other Sections of the Project Manual, the Contractor shall locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult City immediately for directions. Cooperate with City and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility Company.
 2. Do not interrupt existing utilities serving facilities occupied and used by City and others, during occupied hours, except when permitted in writing by the Engineer and then only after acceptable temporary utility services have been provided.
 3. Provide a minimum of 48-hour notice to the Engineer, and receive written notice to proceed before interrupting any utility. Obtain clearance and notify all utility companies in the area and call Underground Service Alert by calling (800) 422-4133. Deliver utility clearance ticket number to the Engineer prior to the start of any work.
 4. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of service if lines are active.

1.7 INSPECTION

- A. Required: All excavations and trenches shall be inspected by the Los Angeles City Building and Safety Inspector, and the Soil Engineer before filling, backfilling and/or other subsequent work is placed therein.

1. Earthwork backfill for structures shall comply with requirements of Section 300-3.5 - STRUCTURAL BACKFILL of SSPWC and/or requirements in the Project Manual.

1.8 SOILS INFORMATION

Soils Report as part of the Project Manual. Contractor shall comply with all Soils Report recommendations specified and other instruction directed by the Engineer. In case of conflicts between other part of the Project Manual and Soils Report the most restrictive condition shall govern unless otherwise approved by the Soil Engineer.

1.9 MATERIAL HANDLING

- A. Delivery: All materials, tools, equipment, etc. to be delivered to the job-site, in such a manner coordinated with progress of work of this Section.

- B. Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or dispose of in accordance with Section 300-2.6 - SURPLUS MATERIALS of SSPWC. Place, grade and shape stockpiles for proper drainage.

1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
2. Dispose of excess soil material and waste materials as herein specified.

PART TWO – PRODUCTS

2.1 SOIL MATERIALS

- A. Suitable Excavated Material: Suitable materials from excavations for use in fill and embankments shall be free from shale, sod, large clods or hard lumps of earth, roots, trash or other debris; that has a liquid limit of less than 30 and a plasticity index of less than 9; and is readily compatible to specified density. No rock, cobbles or broken concrete exceeding 2 inches in maximum dimension shall be placed in compacted fill without the specified approval of the Engineer. No rock, cobbles or broken concrete exceeding 1 inch in maximum dimension shall be placed in compacted fill of the utility trench.

- B. Fill Material: Furnish imported earth material as necessary; if specified in the contract requirements or if the amount of suitable earth materials obtained from the job-site excavations is not sufficient to properly construct the required fill, subject to the approval of the Engineer or the Soil Engineer prior to use.

1. Submit imported fill material samples and testing results for the Engineer's approval prior to importing to the job site in accordance with Section 300-5 BORROW EXCAVATION of SSPWC.
 2. Imported fill material shall be free of foreign materials, vegetable growths, sod, rocks, expansive soils and all debris.
 3. Lime for Treatment of Imported Fill Material: As here after specified in accordance with Section 301-5 - LIME-TREATED SOIL of SSPWC.
 4. Where fill material exhibits a wide variation in consistency, the Engineer may require blending to stabilize and upgrade the material as directed by the Engineer.
 5. In landscape (planting area), fill shall not be saline or contain anything that would prevent normal plant growth: See LANDSCAPING, Section 02900 of the Project Manual for verification of required or approved fill material.
- C. Base Material: "Crushed Aggregate Base", 3/4-inch maximum size aggregate, as specified in Section 200-2 - UNTREATED BASE MATERIALS of SSPWC.
- D. Pipe Bedding and Trench Backfill Material:
1. Use clean earth materials previously removed from job-site excavations, or use imported fill materials as above specified free from clay, rock or gravel larger than 1-inches for utility trenches, and clay, rock or gravel larger than 2" inches in an area other than utility trench subject to the Soil Engineer's approval prior to use.
 2. For sanitary sewer pipe, use Case I bedding material and extend 12-inch above said pipe, the balance of backfill to be approved clean earth materials.
 3. For storm drain pipe, use approved washed sand and extend 4 inches above said pipe, the balance of backfill to be approved clean earth materials. For storm drain pipe section located beneath the sidewalk paving and connected to concrete curb outlet, sand bedding and backfill are not applicable.
 4. For water pipe or pipe rise, use approved washed sand and extend 12-inches above said pipe, the balance of backfill to be approved clean earth materials.
 5. For electrical conduits, use approved washed sand and extend 4 inches above said conduits, the balance of backfill to be approved clean earth materials. For utility service connection, provide bedding and backfill material in accordance with utility company's instructions.
 6. For the landscape irrigation piping, use approved washed sand and extend 4-inches above said pipe, the balance of backfill to be an approved clean earth materials.
 7. Conforming to applicable Sections of the Project Manual for the pipe bedding widths and depths.
- E. Structural Backfill: The structural backfill shall have a sand equivalent of not less than 20 in accordance with Section 300-3.5 - STRUCTURAL BACKFILL and Section 300-4.5 -

PLACING MATERIALS FOR FILLS of SSPWC, and placed and compacted to 90% of relative compaction.

- F. Slurry Backfill: Slurry backfill shall be 60 E 0.7 (Class 100-E-100) and placed in accordance with Section 306-1.3.1 - BACKFILL AND DENSIFICATIONS of SSPWC.]
- G. Drainage Fill Material: Crushed Rock conforming to ASTM C131 – TEST METHOD FOR RESISTANCE TO DEGRADATION OF SMALL SIZE COARSE AGGREGATE BY ABRASION AND IMPACT IN THE LOS ANGELES MACHINE and Section 200-1.2 - CRUSHED ROCK AND ROCK DUST of SSPWC.

2.2 WEED KILLER/SOIL STERILANT

Not used

2.3 TOPSOIL

- A. Where required by and shown on the Landscape Drawings or otherwise required, provide topsoil consisting of friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and reasonably free from subsoil, roots, heavy or stiff clay, stones larger than [2 inches] in greatest dimension, noxious weeds, sticks, brush, litter, and other deleterious matter.
- B. Obtain topsoil from sources within the project limits, provide imported topsoil from approved sources outside the project limits, or from both sources.

2.4 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

2.5 TERMITE CONTROL MATERIAL

Not used

PART THREE - EXECUTION

3.1 SURFACE CONDITIONS

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until detrimental conditions are corrected.

3.2 WATER QUALITY PROTECTION

- A. Eroded sediments and other pollutants must be retained on site and may not be transported from the site via sheetflow, swales, area drains, natural drainage, or wind.

- B. Stockpiles of earth and other construction-related materials must be protected from being transported from the site by wind or water.
- C. Fuels, oils, solvents, and other toxic materials must be stored in accordance with their listing and are not to contaminate the soil nor the surface waters. All approved toxic storage containers are to be protected from the weather. Spills must be cleaned up immediately and disposed of in a proper manner. Spills may not be washed into the drainage system.
- D. Excess or waste concrete may not be washed into the public way or any drainage system. Provisions shall be made to retain concrete wastes on-site until they can be appropriately disposed of or recycled.
- E. Trash and construction-related solid wastes must be deposited into a covered receptacle to prevent contamination of rainwater and dispersal by wind.
- F. Sediments and other materials may not be tracked from the site by vehicle traffic. The construction entrance roadways must be stabilized so as to inhibit sediments from being deposited into the public ways. Accidental depositions must be swept up immediately and may not be washed down by rain or by any other means.

3.3 CONTAMINATED SOIL

- A. *The following requirements apply to handling and disposing of contaminated soils or debris encountered during site excavations.*
 - 1. *The Contractor shall be licensed for hazardous materials handling and hauling or have a qualified licensed subcontractor on call to provide a site-specific Health & Safety Plan and supervise sampling and chemical analysis of potentially-contaminated soils or debris. The Plan should specify particular action levels for each contaminant found during exploratory drilling and suspected to occur along the project alignment or within the site and provide guidelines for personal safety and public protection, including monitoring and appropriate personal protective equipment needed on the jobsite during all phases of excavation of the project.*
 - 2. *The workers exposed to or handling contaminated soils shall have sufficient health and safety training, consistent with OSHA Hazardous Waste Operation Standards (29 CFR 1910.120), and Cal-OSHA "Hazardous Waste Operations & Emergency Response" (8 CCR 5192). The contractor, qualified subcontractor or an industrial hygienist shall prepare a site-specific health and safety plan. The plan shall appoint a site safety officer and establish responses to contaminants, including methane gas, known to exist in the area based on site knowledge and/or a Phase II Site Assessment Report.*
 - 3. *Soils which have visible staining or an odor shall be tested in the field by the contractor or qualified environmental subcontractor with an organic vapor analyzer (OVA) for volatile components, which require additional considerations in their handling and disposal. Soil with OVA readings exceeding 50 ppm volatile organic compounds (probe held 3 inches from the excavated soil face), or which is visibly stained or has a detectable petrochemical odor shall be stockpiled by the Contractor separately from non-contaminated soils. If volatile compounds*

are present at concentrations exceeding 50 ppm, an SCAQMD Rule 1166 permit will be required, which most likely will require control of vapor, such as covering the stockpiles with plastic sheeting or wetting with water or a soap solution. The Contractor shall obtain all permits.

4. *The stockpiles shall be barricaded near the excavation area, away from drainage areas or catch basins, on an impermeable plastic liner (6 mil nominal thickness and tested at 100 psi strength). Caution must be taken to separate any contaminated soil from the remainder of the excavated material. If only a small amount of contaminated soil is encountered, it may be drummed in 55-gallon steel drums with sealing lids. Sealed soil bins may be required on larger projects and/or those in residential areas.*
5. *The stockpiled soil shall be sampled in a random and representative manner. To establish waste classification, samples shall be analyzed for Total Recoverable Petroleum Hydrocarbons (TRPH), volatile organics (VOC), TPH as gasoline or diesel if these fuels are found in the area, Title 22 heavy metals, reactivity (pH), corrosivity and toxicity. The number of samples will depend upon the volume of material removed, one sample for approximately every ton of soil. Storage space available at the site and site occupant sensitivity will determine the amount of soil that can be stockpiled. Suspected contaminated soil samples can be taken to a State-certified environmental laboratory or tested in the field with a mobile lab. Materials with elevated levels of TRPH, metals or other regulated contaminants will require handling by workers who have been adequately trained for health and safety aspects of hazardous material handling.*
6. *In older areas of the City, unanticipated types of hazardous waste are sometimes encountered, even if not discovered in the site assessment investigations. Should potential biohazards (such as medical waste material or syringes), lead-based paint, mercury-containing lamps or thermostats, PCB-containing transformer ballast, or asbestos-containing materials as "Transite" pipe be suspected, appropriate chemical tests shall be taken to verify the presence and concentrations of these contaminants before they are disturbed. All appropriate U.S. EPA and Cal-OSHA regulations must be followed; generally specialty licensed hazmat remediation and/or air monitoring firms with certified personnel must be employed.*

B. Removal and Classification of Excavated Soil

1. *Any contaminated material (soil, asphalt, concrete, railroad ballast, trash fill or debris) that is to be hauled off the site is considered a "waste product" and must be classified as hazardous or nonhazardous waste under all criteria by both State and Federal Codes prior to disposal. If the waste soil or other material is determined hazardous, a hazardous waste manifest will be prepared by the Contractor or its qualified representative and the material transported to an appropriate class of facility for recycling or landfill disposal by a registered hazardous material transporter. If the soil is nonhazardous but still exceeds levels that can be returned to the excavation or is not needed on the site, a less costly nonhazardous transporter and soil recycling facility shall be used if no hazardous constituents are present above their respective action levels.*
2. *Soil with levels of 100 ppm TRPH (crude oil, waste oil and diesel), 10 ppm gasoline, and 1/50/50/50/ ppm benzene, toluene, ethylbenzene and xylenes needs to be moved offsite. Soil contaminated with hydrocarbons at values less*

than these values may be backfilled, used for fill or paved over. All excavated material moved offsite must be manifested, transported by a registered hauler, and disposed of in the proper class landfill or recycler.

3. *The Contractor shall notify Inspector of all contaminated material removals, and provide copies of signed manifests.*

C. Contaminated Groundwater

1. *Water quality may vary over the project excavation. Contamination with fuel hydrocarbons, heavy metals and high mineral content is possible. Should any dewatering be needed for excavation bottoms, the extent shall be minimized, sufficient to remove interior or nuisance water from structures. Dewatering minimization is required to avoid moving potential contamination plumes nearby and to avoid settlement of nearby structures. Cut-off methods such as using interlocking sheetpiles or slurry/grout walls may be used. Dewatering plans shall be prepared by the Contractor or qualified Geologist and reviewed and approved by the Engineer before dewatering operations begin. Sampling ports should be provided in the dewatering system.*
2. *The produced water shall be temporarily stored in large Baker-type tanks and analyzed by a State-certified environmental laboratory selected by the contractor. If the groundwater quality falls within guidelines established by the Bureau of Sanitation, Department of Public Works, a permit may be obtained to discharge the water into a nearby sewer. A NPDES permit from the Los Angeles Regional Water Quality Control Board will be required for any discharge into the storm drain system. If hydrocarbon or other water contamination precludes this, the water will have to be treated onsite (such as in an oil-water separator) or hauled off-site in vacuum trucks to a local water treatment facility.*

3.4 SITE PREPARATION

- A. Remove the existing soil including fill material, debris, roots and foreign materials to natural soil at the proposed building site. Removal shall be continued to at least 5 feet beyond the exterior faces of the exterior foundation. Removal shall be done in accordance with Section 02210 - SITE CLEARING and Grubbing of the Project Manual.
- B. Remove the upper 12 inches of existing soil including debris, roots and foreign materials under new yard paving areas, concrete walk, concrete curb and gutter prior to recompaction (to 95% relative compaction).
- C. Subgrades: Scarify for recompaction to a depth of 6-inches, bring to optimum moisture content and then recompact to at least 95% maximum density for subgrade as per ASTM D1557 - TESTED METHOD FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING MODIFIED EFFORT (56,000 FT - LBF/FT³). Prepare subgrade in accordance with Section 301-1 - SUBGRADE PREPARATION of SSPWC.
- D. Holes and trenches existing on the job-site or resulting from Contractor's operations shall be filled with clean existing or imported earth materials (free of large clods and stone).

Unless indicated otherwise, construct fill in accordance with Section 300-4.5 - PLACING MATERIALS FOR FILLS of SSPWC in 8-inch layers and each layer compacted to 95% relative compaction and finished to elevations necessary to require cutting by fine grading. Inspection by Los Angeles City Building and Safety Inspector and the Soil Engineer are required prior to filling. Obtain minimum one compaction test for each layer or volume specified by Code.

- E. Grading: To elevations of existing adjoining street surfaces, private property and surfaces immediately adjacent to the job-site limits indicated on the Contract Drawings; make all grades in a straight line from any point to any other perimeter point.
- F. Dewatering:
 - 1. Remove all water, including rain water, encountered during trench and sub-structure work to an approved location by pumps, drains, and other approved methods.
 - 2. Keep excavations and site construction area free from water.
- G. Dust Control: Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the job-site.
- H. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material. Apply water in manner to prevent free water appearing on surface during or subsequent to compaction operations.
 - 1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
 - 2. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.
- I. Rework: Any previously compacted or tested subgrade and fill material, which are affected or disturbed, in the opinion of the Soil Engineer, by the inclemency of the weather such as rains, floods, earthquake or others shall be reworked, retested and re-inspected at no additional cost to the City.
- J. Approval of Subgrade: By the Soil Engineer and the Los Angeles City Building and Safety Inspector prior to placing any fill.

3.5 GRUBBING AND GRADING

- A. Remove entire roots under the footings and elsewhere two feet below the subgrade of each surface.
- B. Rough: Leave cut and fill sufficiently high to require cutting by fine grading.
- C. Fine: To elevations required to ensure proper drainage or finished elevations

indicated on drawings.

- D. Subgrade Preparation: Required for all areas, other than filled or backfill areas, over which moisture barrier material, slabs, walks or pavement will be placed; in accordance with provision specified herein and Section 301-1 - SUBGRADE PREPARATION of SSPWC.
- E. Inspection Required: Prior to placing base material, concrete or other materials.
- F. Grading for Demolition Jobs: To specified elevations or elevations of existing sidewalks, adjacent property lines or surfaces immediately adjacent to the sites. Make all grades straight-line from any point to any other perimeter point.
- G. Grading for New Asphalt Concrete Paving:
 - 1. Rough: Cut and fill to be left sufficiently high to require cutting by fine grading and preparation of the surface for placement of the required select base material to thickness noted on the Contract Drawings or matching that of adjacent existing select base materials.
 - 2. Fine: To exact elevations necessary for required new paving and paving repairs.
 - 3. Testing and Inspection Required: Prior to placing of select base and asphalt paving materials.

3.6 EXCAVATING

- A. General:
 - 1. Excavation consists of the removal and disposal of materials necessary to establish required grade elevations and certified compacted fill for new construction pursuant to Section 300-2 UNCLASSIFIED EXCAVATION of SSPWC.
 - 2. Excavated materials suitable for use as fill and/or backfill to be stockpiled where directed by the Engineer.
 - 3. Non-approved and excess excavated materials to be legally removed and disposed of from the job-site.
 - 4. Shoring, Bracing and Bulkheading of Trenches: All to be provided, installed and maintained where required to support trenches, See Subsection 1.6 of this Section. Conform to the requirements prescribed by the Los Angeles City Department of Building and Safety, CAL/OSHA, Section 02240 - SHORING and other Sections of the Project Manual.
 - 5. Access to Trenches: Conform to Section 306-1.1.4 - ACCESS TO TRENCHES of SSPWC. Provide safe and suitable ladders, which project 2 feet above the top of the trench. It shall be provided for all trenches over 4 feet in depth. Minimum one ladder shall be provided for each 50 feet of open trench or fraction thereof, and be so located that the workers

in the trench need not move more than 25 feet to a ladder.

6. Encountered Existing Underground Piping or Conduits: Immediately stop the trench operations at the point of encounter, notify the Engineer of such condition and submit support drawings to the Engineer for approval. The support drawings shall be in conformance with the Los Angeles City Bureau of Engineering Standard Plans S-253, SUPPORTS FOR STORM DRAIN AND SEWER PIPES ACROSS TRENCHES, latest edition; CAL/OSHA and the utility company's requirements.

B. For Substructure Concrete:

1. When Earth Banks are Stable: To net sizes of concrete, except as otherwise specified or indicated on the Contract Drawings.
2. When Earth Banks are not Stable: Sufficiently wider than concrete to allow for forms and inspection thereof.
3. Where Rock Occurs: Surface to be leveled to a clean, even hard surface.
4. Depth: As indicated on Contract Drawings.
5. Excessive Width and Depth: Where excavation is made wider and deeper than required, fill with concrete specified in Section 03300 of the Project Manual, at Contractor's expense.
6. Inspection Required: After excavation and before placing concrete and before backfilling, the exposed soil or subgrade will be carefully inspected by the City of Los Angeles Building and Safety Inspector and the Soil Engineer to verify removal of additional unsuitable soil.
7. Protections and Shorings: See Subsection 1.6 of this Section.
8. Excavation for Grade Beams: Omit forms when sides will stand to a cut face, make such excavation 1-inch wider on each side.
9. When excavating adjacent to existing remaining structures, do so in a sequence as required and approved by the Engineer to avoid displacement or damage to the existing adjacent structure.

C. For Site Improvements:

1. Masonry Yard Walls: As necessary for required footing and setting of forms for concrete work, to depth indicated.
2. For Planter Curbs: To exact curb limit, without excessive removal of adjacent paving or subgrade for new paving.
3. For Concrete and Asphaltic Site Improvements such as concrete and/or asphalt pavements, concrete walkways, driveways aprons, concrete curb and gutter: Excavate to exact limits of such work without excessive removal of existing subgrade. Scarify and compact top 6 inches of

subgrade and compact at 95% relative density.

- D. For Walls (including wall footings): Width not less than 18-in. from face of wall and sufficient for necessary forms, cribbing, bracing, inspection, and application for watering on walls, where required.
- E. Conduit and Piping: Conforming to the requirements as specified on the drawings, Los Angeles City Plumbing Code, SSPWC and other sections of the Project Manual. Any piping with 8 feet or less cover or backfill, Case 1 Bedding Installations of Los Angeles City Bureau of Engineering Standard Plan S-251, latest edition, shall be used for all piping laying unless otherwise specified on the drawings or noted.
1. Depth and Width of Trench For Storm Drainage Piping: To depth necessary for installation of piping and construction of catch basin in accordance with requirements of Section 02545 - STORM DRAIN SYSTEM, PLUMBING Section in Division 15 of the Project Manual and as noted on the Contract Drawings. Provide minimum 12 inches side clearance from side of the piping. Make the sides vertical and the bottoms smooth, firm, level or uniformly sloped as required, slope to not exceed a downward slope of two horizontal to one vertical in a manner to prevent formation of water pockets in the pipe. For backfill or earth cover exceeded 8 feet, refer to Los Angeles City Bureau of Engineering Standard Plan S-251, latest edition, for maximum allowable trench width and bedding material. Unless specified otherwise, provide minimum 2 inches washed sand bedding below the pipe barrel.
 2. Depth and Width of Trench for Plumbing Piping: As necessary for complete installations of the piping, fixtures and controls; provide minimum 12 inches side clearance from side of the piping; make the sides vertical and bottoms smooth, firm, level or slopes, as required by the code for proper drainage. Final elevations shown on Contract Drawings shall mean the invented pipe elevations. Pipe thickness and bedding thickness shall be used in determining trench depths. Conform to the requirements as specified in the Los Angeles City Plumbing Code and in Division 15 of the Project Manual. For backfill or earth cover exceeded 8 feet, refer to Los Angeles City Bureau of Engineering Standard Plan S-251, latest edition, for maximum allowable trench width and bedding material. Unless specified otherwise, provide minimum 4 inches washed sand bedding below the pipe barrel.
- If final elevation is not shown on contract drawings, place all piping to a depth no less than 24 inches.
3. Depth and Width of Trench for Electrical Conduit and Pull Box: As necessary for complete installation of the electrical conduits and pull box, unless specified otherwise, provide minimum 7 1/2 inches side clearance from the side of the conduit and pull box and 2 inches sand bedding in accordance with the Contract Drawings and requirements of the Utility Company.

Conduit shall be placed to a depth of not less than 24 inches and 36 inches under the driveway.

4. Depth and Width of Trench for Landscape Irrigation Piping: As necessary for complete installations of the piping fixtures and controls; provide a minimum of 7 1/2 inches side clearance from the side of the piping and 4 inches washed sand bedding. Depth of piping shall be conformance with Section 02810 – IRRIGATION SYSTEMS of the Project Manual. All trenches for electrical conduit and wiring shall be in accordance with requirements listed hereinbefore.

- F. Corrections: Required of all unauthorized excavations made below indicated depths, as recommended by the Soil Engineer at no added cost to the City.

3.7 FILLING

- A. General: Construct in accordance with Section 300-4- UNCLASSIFIED FILL of SSPWC and place in layers not exceeding 8-inches thickness, compacted to a relative compaction of not less than 95% when tested in accordance with Section 211-2 - COMPACTION TESTS of SSPWC, except that fill in planting areas may be compacted to 90% relative compaction. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density. Placement of gravel in lieu of compacted fill is only allowed if complying with LAMC Section 91.7011.3.
- B. In Planting Areas and Tree Wells: If flooding method is specified for fill material, place saturated fill (exclusive of topsoil fill) prior to construction of adjacent improvements to minimize settlement as follows:
 1. Planting Areas and Holes: Cultivate and soak the specified backfill mix for a minimum of two days using a common lawn soaker.
 2. Tree Wells: Excavate a sump approximately 3-feet square by 3-feet deep and flood each sump for about 3 days.
- C. Fill all holes on the existing job-site or resulting from site-clearing or demolition operations.
- D. Topsoil Fill: Specified in Section 02900 - LANDSCAPING of the Project Manual.
- E. Inspection Required: Prior to placement of fill materials. See Subsection 1.7A of this Section.
- F. Concrete and Asphalt Site Improvements Walkways: Compact top 6 inches of existing subgrade and each 8" layer of backfill or fill material at 95% relative

density.

3.8 BACKFILLING

- A. Prior to Backfilling: Remove debris, trash and form materials from excavations.
- B. Inspection Required: Prior to backfilling operations.
- C. Placement of Backfill: In layers not exceeding 8-inches thickness, moisten to optimum moisture content and tamp until required 95% relative compaction is secured and finish to suitable elevations to provide for anticipated settlement and shrinkage.
- D. Pipe Bedding And Backfill Over Underground Piping And Conduit: Place bedding and backfill material in conformance with provisions specified Subsection 2.1 (D) herein and in Section 333400 - STORM DRAIN SYSTEM, Division 15 - PLUMBING and Division 16 – ELECTRICAL of the Project Manual. Do not place backfill materials until the Inspector has inspected and approved the pipe installation. The bedding shall be compacted and shaped to form a firm base for the pipe and conduit. The initial backfill shall be placed in two lifts. The first lift shall be to the spring line of the pipe or conduit. The initial backfill shall be lightly compacted by light tamping. The balance of backfill shall be placed in accordance with Subsection 3.8 (C) herein.
- F. For Parking Lot or Demolition Jobs: Use clean material previously removed from excavations or use imported materials as hereinbefore specified subject to approval by the Inspector or Engineer.
- G. For Backfill Against Basement Walls: Do not place until such walls have gained sufficient strength to resist backfill loads and backside of such walls have been properly waterproofed without prior approval of the Inspector. Bring backfill up to finish grade or to subgrade for paving as indicated on the drawings.
- H. In Planting Areas Holes and Tree Wells: After planting, cultivate and soak the specified backfill mix for a minimum of two days using a common lawn soaker if specified.
- I. For Voids Left by the Removal of Sheet piling, Piles and Similar Shoring Supports: Immediately backfill with structural backfill of clean sand which shall be jetted into place to ensure a dense and complete filling of the voids.
- J. Slurry Backfill: In areas where specified and/or around the utilities, vaults or other structures where the Soil Engineer determines that it is not practical to attain the required compaction by the mechanical methods or water densification, provide a trench slurry backfill 60-E0.7 (Class 100-E-100).

3.9 SELECT BASE

- A. Place in accordance with Section 301-2 - UNTREATED BASE of SSPWC and "Soil Report" recommendations.

- B. Locations: Place select base beneath concrete and asphalt concrete yard paving, beneath concrete driveway aprons and concrete gutters in yard areas, building floor slab on grade and elsewhere to thickness noted on the Contract Drawings.
- C. Thickness: At least 4 inches under yard concrete paving, at least 4-inches under yard asphalt concrete paving, and at least 4-inches under all building slabs on grade with 2 inches of sand and vapor barrier or as otherwise indicated on the Contract Drawings.

NOTE: Place to thickness matching that of original thickness of select base under existing removed concrete or asphalt concrete paving and make ready to receive paving repair materials. Aggregate base shall be compacted to 95% relative density in accordance with Section 301-2 - UNTREATED BASE of SSPWC.

3.10 SOIL TREATMENT FOR TERMITE CONTROL
Not used

3.11 SOIL STERILIZATION

Apply specified soil sterilization material to areas to receive select base materials and all exterior area including concrete and asphalt paving, concrete walkway, concrete curb and gutter, by methods recommended by the manufacturer. Certify in writing that the material has been applied.

3.12 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Removal from City's Property: Remove waste materials, including unacceptable excavated material, trash and debris, and dispose of it off City's property in a legal manner and to conform with the requirements shown in Section 01572 – CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT of Division 1 - General Requirements.
- B. Provide written consent of the owner of the property upon which the surplus material is to be deposited, pursuant to Section 01 57 20 – CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT specified above and Section 300-26 - SURPLUS MATERIAL of SSPWC.

3.13 PAYMENT FOR CONTAMINATED SOIL REMOVAL AND BACKFILLING

Contractor shall submit contract bid price for the removal and disposal of contaminated soil with estimated quantity specified in SCHEDULE OF WORK AND PRICES. The area of removal shall be determined by Soil Engineer or Engineer in the field. Contractor shall include in the contract bid price all incidental costs for complete removal and disposal of contaminated soil including labors and materials for excavation; backfill and compaction; shoring; temporary storage, soil sampling; imported backfill soil; barricade; all necessary permits, notification, manifest and inspections; delays; additional

mobilization; field office salary and expenses, profit and overhead cost for all Subcontractors and General Contractor. The total quantity of work shall be determined by the amount of contaminated soil removed and disposed from the job site. An adjustment in payment shall be made based upon the increase or decrease in quantity and the contract bid price submitted, with no additional overhead and profit mark-up; or overhead and profit allowance.

END OF SECTION

02 41 00
SITE DEMOLITION

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. This Section covers all wrecking and demolition, together with the removal and disposal of items.
- B. Related Work Specified Elsewhere:
 - 1. Refer to Division 0, GENERAL CONDITIONS and Division 1, GENERAL REQUIREMENTS.
 - 2. Clearing and grubbing is specified in Section 02 21 00, CLEARING AND GRUBBING.
 - 3. Excavating and filling for the site is specified in Section 02 31 00, EARTHWORK, except as herein specified.

1.02 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Traffic:
 - a. Obstruction. Do not close, obstruct, or store material or equipment in streets, sidewalks, alleys or passageways without a permit in accordance with all local ordinances, regulations and codes.

1.03 JOB CONDITIONS

- A. Salvage and/or remove equipment, material, or items called for on the plans, and store as directed, the items to remain the property of the Owner. These items are assumed to be in good operating condition at the time the Contract is signed. Properly protect them and remove them complete, including all appurtenances, and deliver in good order to the Owner as directed.
 - 1. Other items. Certain items removed by the mechanical and electrical Contractors and itemized on the mechanical and electrical Contract Drawings. Cooperate with all Contractors as required to facilitate the removal of these items and examine the mechanical and electrical drawings and specifications to determine the extent of Work involved.
- B. Environmental Requirements:
 - 1. Ground and Surface Water. After the existing buildings or structures have been removed, protect the resulting building excavation or open area from surface or ground water. Promptly remove any water which accumulates in the excavation or opening. The method of dewatering and the disposal of the water is subject to review by the Geotechnical Engineer.
- C. Protection:
 - 1. General Requirements. Protect persons and property in accordance with the GENERAL CONDITIONS. Remove all temporary construction upon completion of the Project.

- a. Temporary Barricade Fence. On all sides of the property except where existing buildings are on the property line or where a sidewalk shed is specified, erect an 8 foot (2.44 m) high fence built solid for its entire length and height, except for such openings as doors, necessary for the proper prosecution of the Work.
 - b. Temporary protective fence. Before beginning any excavation or construction Work at the site, erect a temporary protective fence around the excavation and immediately adjacent to the building. Erect a 4 foot (1.22 m) high fluorescent orange temporary protective fence secured to posts not more than 8 feet (2.44 m) o.c.
 - c. Temporary Sidewalk Shed. Erect a temporary sidewalk shed of adequate strength and stability on all sides where there is an existing sidewalk adjacent to the street.
 - d. Temporary weathertight partitions. Provide weathertight, insulated partitions between the demolished and the remaining structure, and where exterior walls or windows are removed prior to enclosing the new addition, which are sound and secure. Equip any access through these partitions with padlock and key. Paint the partition on the interior side. Provide any temporary construction required in order to eliminate unnecessary heat loss and for safety measures.
 - e. Temporary dustproof partition. Provide dust-tight partitions and closures to isolate the Work from the remaining parts of the existing building or certain parts of the new construction when needed for access. Partitions shall consist of 2 x 4 (50 x 100 mm) wood studs spaced 16 inches (400 mm) o.c. with 1/4 inch (6.4 mm) hardboard facing with taped joints. Take every precaution to prevent the invasion of dust through these partitions. Equip any access with padlock and key. Paint the partitions on the occupied side.
 - f. Temporary emergency fire exit. Construct a temporary wood stairway for use as an emergency fire exit. Access shall be through a window to a platform. Build stairs of standard dimension lumber with open risers not exceeding 7-1/2 inches (191 mm) in height and a minimum of 3 feet (1.0 m) in width. Provide a handrail on open side of stair. Coordinate exact location with the temporary sidewalk shed and barricade fence construction and as directed by the Owner. The Contractor may salvage existing doors, frames and hardware. Install all doors complete and insure that they are accessible only from the remaining portion of the building and can be locked. Keep the area around the stair and egress from the stair clear of equipment and materials at all times.
2. Existing structures and property. Take precautions to guard against movement or settlement of adjacent buildings or structures. Provide and place bracing or shoring as necessary or proper in connection therewith. Be responsible for safety and support of such buildings and structures. Be liable for any movement or settlement, any damage or injury caused thereby or resulting therefrom. If at any time safety of any adjacent buildings or structures appears to be endangered, cease operation, take precautions to support such buildings or structures and notify the Architect. Resume operations only after permission has been granted. If the Architect considers additional bracing or shoring necessary to safeguard, or prevent movement or settlement, install such bracing or shoring upon Architect's order. If the Contractor fails to comply promptly with such order, such bracing and shoring may be placed by the Owner at the Contractor's expense.

PART 2 (NOT USED)

PART 3 EXECUTION

3.01 INSPECTION

A. Condition of Premises:

1. Accept the premises as found and clear the site as specified. The Owner assumes no responsibility for condition of buildings on site at time of proposal or continuation of conditions thereafter. Assume risk regarding damage or loss, whether by reason of fire, theft, or other casualty or happening to specified buildings.

3.02 PREPARATION

A. Utilities:

1. Prior to disconnecting, removing, plugging or abandoning existing utilities serving the buildings being removed, notify all utility corporations, companies, individuals or local authorities concerned with the Work.

3.03 INSTALLATION/APPLICATION/PERFORMANCE/ERECTION

A. Performance:

1. Wrecking and Demolition.

- a. Buildings and Other Items. Wreck, demolish, dismantle and completely remove all buildings, items, and obstructions as shown on the drawings or called out in these specifications. Remove any existing rubbish, trash and junk and leave the site clear of such materials. Remove all foundations completely. Remove all basement and cellar floors and other concrete slabs.
 - (1) Dust Retention. In demolishing masonry walls, etc., keep work wet down thoroughly to prevent dust and dirt from rising. Provide necessary water, waterlines and connections for this purpose.
 - (2) Pneumatic Tools. Work with pneumatic or vibratory tools will generally be permitted, however on certain areas the Architect may direct that only hand tools be used.
- b. Party Walls. Existing party walls shall remain in place as indicated on the drawings.
 - (1) Openings. Brick up all windows and other openings in the party wall on the exposed side and match the existing construction inside, including plaster and paint. Retain fire protection hourly rating.
 - (2) Repair. Remove all projections. Point and patch masonry which is in poor condition evident at time of bidding. Repair any disturbed roofing or flashing. Where existing walls intersect the standing party wall, cut neatly at the juncture face and parge all cuts.
 - (3) Provide temporary weathertight partition over all openings in the party wall for protection against the elements and for protection during demolition operations.
- c. Walks and Drives. Where indicated on the drawings, remove pavement, curbs and sidewalks to full depth, take care to avoid damage to adjacent

- remaining pavement or sidewalks. Make cuts in such a manner that a clean vertical joint remains.
- d. Utilities. Disconnect electrical service and/or cut off and cap gas, water and sewer services at the mains on the property or in the street as required by the responsible utility company, or local authority or relocate as shown on the drawings. Remove and cut off and plug or cap all utilities within the existing building areas, except those designated to remain. The Contractor shall coordinate the removal Work with the relocation and/or new Work being performed by all contractors.
 - e. Removal. Unless otherwise noted or specified to be relocated or stored, all materials removed become the property of the Contractor and are to be removed completely away from the site by him. Do not store or permit debris to accumulate on the Site. If the Contractor fails to remove excess debris promptly, the Owner reserves the right to cause same to be removed at Contractor's expense.

3.04 FIELD QUALITY CONTROL

- A. Workmanship:
 - 1. Demolition Work. Execute in an orderly and careful manner with due consideration for neighbors and the public. Execute the Work to insure adjacent properties and the public against damages incurred by falling debris or other causes.
 - 2. Masonry. Demolish in small sections and brace and shore where necessary to avoid collapse of the structure.
 - 3. Burning of Materials. Burn no materials or debris on the premises.
 - 4. Dust control. Constantly sprinkle all rubbish and debris to lay down the dust.
- B. Traffic:
 - 1. Interference. Conduct operations with minimum interference with roads, streets, driveways, alleys, sidewalks and other facilities.

3.05 ADJUSTMENT AND CLEANING

- A. Temporary Structures. Remove all temporary structures when they are no longer required.
- B. Repair:
 - 1. Clean up, repair, or replace at no cost to the Owner, all property damaged by reason of required Work, including restoring all disturbed areas, surfaced and unsurfaced, to their original condition on completion of the Work. All patchwork shall match existing and be performed in a neat and workmanlike manner by craftsmen skilled in the trade involved. Painted surfaces shall be painted to match the adjacent areas. In newly graded areas take every precaution and temporary measures necessary, such as temporary seeding, to prevent damage from erosion of freshly graded areas. Where any settlement or washing may occur prior to acceptance of the work, repair and re-establish grades to the required elevations and slopes at no additional cost to the Owner. This applies to damage to the newly graded areas within the construction limits and damage to adjacent properties by eroded material.

3.06 SCHEDULES

- A. Schedule of Demolition:
 - 1. Contractor to coordinate building demolition with Owner and Architect. If demolition is to be conducted during business hours, measures should be taken and approved by the owner and architect to protect the public from construction activities.

END OF SECTION

SECTION 03 10 00

CONCRETE FORMWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Forms for cast-in-place concrete.
2. Shoring, bracing, accessories and form coating.

B. Work installed but furnished in other Sections:

1. Inserts, bolts, anchors and other items furnished by other trades for installation in formed concrete.

C. Related work:

1. Division 3 for concrete.

D. References

1. ACI 117, specifications for tolerances for construction and concrete materials.
2. ACI 347, Guide to Formwork for Concrete.
3. APA Design/Construction Guide, Concrete Forming.

1.2 SYSTEM DESCRIPTION

A. Design requirements:

1. Engineer, fabricate, assemble and install concrete formwork to meet or exceed the criteria indicated and specified, to conform to the profiles indicated and to other requirements of the Contract Documents, to satisfy the requirements of the authorities having jurisdiction, and to provide a watertight, structurally sound, self-draining assembly.
2. If required by the authorities having jurisdiction, prepare and submit shop drawings, specifications, calculations and any other supporting data required for review and approval, and pay fees incurred, prior to beginning installation.
3. Engineering calculations for these assemblies shall bear the signature and seal of a California-licensed professional engineer.

1.3 SUBMITTALS

- A. Submit manufacturer's product data, specifications, typical installation details and other data as necessary to demonstrate compliance with the specified requirements for form facing materials, including coatings, release agents, ties, joint sealant or tape, and accessories.
- B. Shop drawings: For concrete permanently exposed to view, submit large scale, dimensioned drawings showing materials, profiles, joints, finishes, methods of fabrication and anchorage details.
 - 1. Provide elevation drawings of each concrete plane to be remain exposed.
 - a. Show tie placement, panel layout, construction joint and other pertinent details.
 - b. Show locations of openings and control joints.
 - 2. Coordinate shop drawings with the work of other trades that are part of, or will be incorporated into, the work of this section. Indicate work to be performed by other trades, including adjacent and abutting materials to which this work is to be secured, and provide drawings showing all slab penetrations per level on a single plan per level prior to erecting form work.
 - 3. Submit drawings showing all hangers and seismic braces per level on a single plan per level prior to erecting form work. Indicate magnitude of applied gravity and seismic loads at each location.
 - 4. Drawings shall be complete for each specific area of Project when submitted.
 - 5. Shoring and re-shoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and re-shoring installation and removal.
- C. Samples: Submit full-size samples of proposed ties and plugs for concrete permanently exposed to view.
- D. Records: Keep an accurate record of the dates of all form removal and furnish copies to the architect.

1.4 QUALITY ASSURANCE

- A. Grading: Provide lumber and plywood grade-marked by a grading agency acceptable to the authorities having jurisdiction.
- B. Qualifications:
 - 1. Professional Engineer qualifications: California licensed professional engineer and experienced in providing engineering services of the kind required.
 - 2. Installer's qualifications: Firm and individuals with a minimum of 3 consecutive years experience in the fabrication and erection of concrete formwork on projects similar in material, design, complexity and extent to this Project, and whose work has resulted in applications with a record of successful in-service performance.

1.5 HANDLING

- A. Store materials outdoors, off the ground on pallets, protected with breathing type covers.
- B. Handling: Handle form facing materials to prevent damages that could be transferred to finished concrete work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Forms for exposed concrete surfaces – general: Plywood, metal, metal-framed/plywood-faced, or FRP which will provide continuous, flat or curved as applicable, smooth exposed concrete surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on Drawings, where indicated.
 - 1. Type:
 - a. For smooth concrete to remain exposed without further treatment: Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1) Plywood, metal, or other approved panel materials.
 - 2) Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - 3) High-density overlay, Class 1 or better.
 - 4) Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - 5) Structural 1, B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
 - b. For concrete surfaces to be sacked and rubbed: DOC PS-1 “B-B (Concrete Form) Plyform,” Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
 - c. Elsewhere where concrete will remain exposed, with or without a mechanical finish: Overlaid plywood complying with DOC PS-1 “A-C or B-B High Density Overlaid Concrete Form,” Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
- B. Forms for concealed concrete surfaces: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Form ties and spreaders:

1. Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties with plastic cones to provide a minimum 1 in. breakback, designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 2. Furnish units that will leave no corrodible metal closer than 1 in. to the plane of exposed concrete surface.
 3. Furnish ties that, when removed, will leave holes no larger than 1 in. in diameter in concrete surface.
 4. Furnish ties with integral water-barrier plates to walls indicated to receiving damp-proofing or waterproofing.
 5. For concrete to remain exposed to view use "A-3 Standard Snap Tie" with A-2 Plastic Cones by Dayton Superior, "ST-1" Series Snap Ties by Meadow Burke, or equal.
 6. Do not use wire ties, wood spreaders, or embedded types in which embedded portion is less than 1-1/2-inch from exterior face of concrete.
- D. Foam filler: ASTM C 578, Type IV, 1.8-lb/cu. feet density.
- E. Chamfer strips: Extruded PVC, with a 3/4-inch diagonal faces unless otherwise indicated, by Greensteak Group, Inc., Barker Steel LLC, or equal, or oiled softwood shapes with the same profile.
- F. Form coatings: Commercial formulation form-coating compounds that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces. One of the following, or equal; do not use form oil.
1. Formshield WB by the Euclid Chemical Co.
 2. Clean Strip J-1-A by Dayton Superior Construction Chemicals.
 3. J-3 Light by Dayton Superior Construction Chemicals.
 4. Magic Kote VOC by Dayton Superior Construction Chemicals.
 5. Durogard Plus by WR Meadows.
 6. Debond by L & M Construction Chemicals Inc.
- G. Prefabricated construction joint keyways: Key-Loc by Form-A-Key Products Div. of Cardinal Manufacturing Co., BoMetals Inc., or equal, complete with all accessories.
- H. Form voids: One of the following types.
1. Corrugated fiberboard by SureVoid Products, Inc., or Deslauriers, Inc. or equal.
 2. Expanded polystyrene foam blocks complying with ASTM D 6817, with a minimum compressive strength of 15 psi, Thermal Star X-Grade by Atlas EPS, Geofam by AMF Corp. or equal.

- a. Provide in accordance with the manufacturer's standard specifications with related and required manufacturer's hardware and adhesives.

2.2 FORMWORK REQUIREMENTS

A. General:

1. The design and construction of forms and shoring are the contractor's responsibility, but shall comply with specified requirements.
2. Form contact surfaces shall be clean, free from dents, holes and other imperfections.
3. Establish and maintain benchmarks, lines and controls necessary to achieve specified tolerances.
4. Take an accurate survey of the form location just prior to concrete pour.

B. Earth bank:

1. Except for exterior face of wall footings and grade beams that must be formed, earth banks may be used to form footings and grade beams if the soil is firm, neatly trimmed, and will retain concrete in the required size and shape.
2. Increase the concrete coverage as required by the authorities having jurisdiction when concrete is cast against earth.

C. Wood forms:

1. Construct with plywood panels as large as practicable where, because of their height, walls and columns have a horizontal form joint, the horizontal joint shall align throughout the floor, or area unless accepted otherwise by Architect.
2. For concrete permanently exposed to view, fill voids and imperfections in form contact surfaces with body putty sanded flush and smooth and seal joints between panels with compound paste specifically designed to seal forms, or other approved material, to prevent concrete leakage.
3. Provide sharp, clean corners at form intersecting planes, without visible edges and offsets. Back joints with additional studs or girts.
4. Form recesses and projections with smooth finish materials, and install in forms with sealed joints to prevent displacement.
5. Drill holes accurately in forms to fit ties used. Prevent leakage of concrete around tie holes. Do not drive ties through undersized or improperly prepared holes.
6. Kerf backside of wood inserts used for forming keyways, reglets, recesses and similar treatments, to allow wood to swell without spalling concrete, and to assure easy removal.

D. Metal forms:

1. Provide sections of metal forms that fasten tightly and interlock securely.
 2. Cut or drill forms for attaching sleeves or other items to be embedded in concrete.
 3. Provide precisely cut openings required by trades.
- E. Re-use of forms:
1. Form materials may be re-used if they produce finished surfaces equal to finished surfaces where new form materials are used.
 2. Before reuse, thoroughly clean, recondition in every respect, suitable for their re-use purpose.
- F. Tolerances: To obtain cast-in-place concrete not exceeding the tolerances specified in Section 03 3000, except support form facing material to limit deflection to L/360 between supports for concrete exposed to view, and L/270 for all other concrete.
- G. High density insulation filler:
1. Use boards of maximum thickness to achieve insulation depth.
 2. Where required, apply adhesive to layers of insulation to prevent movement during concrete placement.
 3. After boards are installed, protect until concrete topping is prepared and placed.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions and measurements affecting the work of this Section at site.
- B. Correct detrimental conditions to the proper and timely completion of this work before proceeding with installation.

3.2 FORMWORK INSTALLATION

- A. Construction:
1. Comply with the applicable provisions of ACI 347, Guide to Formwork for Concrete, and APA Design/Construction Guide "Concrete Forming."
 2. Rigidly support and construct forms to the lines, surfaces and profiles necessary to produce concrete to the design indicated.
 3. Construct forms to be removable without prying against concrete.
 4. Make forms tight, without cracks or holes, to prevent leakage of mortar or loss of fine particles from concrete.

5. Cover or fill holes that are not used, and cracks that have opened up, flush with adjacent surfaces.
- B. Wales and studs: Provide wales and studs of adequate size and spacing to prevent form failure and to obtain concrete within the tolerances specified.
- C. Ties and spreaders: Place ties as indicated on approved shop drawings, spaced and aligned as indicated, in plumb columns and level rows. Do not permit wood, other than built-in treated bucks or nailing blocks, to permanently remain in forms.
- D. Form contact surfaces: As specified above, except that the plywood form facing material specified must be used for concrete permanently exposed to view. Forms for all other concrete may be constructed of plywood, fiberglass, plastic, or steel.
 1. To eliminate joint offsets, block plywood edges that do not occur at bearing points.
 2. Do not expose plywood edges to concrete.
- E. Special features:
 1. Corners: Form exposed corners between beams and columns to produce a square, smooth, solid joint without paste leakage.
 - a. Except where chamfers are indicated, miter or cope corners accurately and attach securely to the form facing material with adhesive or nails driven flush with the item being fastened. Avoid hammer marks. Provide sharp, clean corners, without visible edges or offsets at intersecting planes. Back joints with extra studs or girts to maintain square intersections.
 - b. Install chamfer strips in corners of all other forms, unless otherwise indicated. Miter chamfer strip at changes in direction.
 - c. Corners that will be concealed in the Work may be formed either square or chamfered.
 2. Concrete details: Form offsets, keys, reglets, seats, pockets, anchorages, moldings, chamfers, blocking, screeds, drips, bulkheads and other required features as indicated or as necessary to receive or engage the work of other trades.
 3. Openings, chases and recesses: Form as indicated or necessary to receive, pass and clear other work.
 - a. Verify sizes and locations with other trades before forming. Closely coordinate the location of boxes, cans and sleeves furnished by other trades.
 - b. Seal edges of cutouts and holes in plywood.
- F. Form release agent: Thoroughly clean forms and coat with release agent prior to initial use (except when mill-oiled) and before each reuse.
 1. Apply form coating before reinforcement and embeds are placed.

2. Apply form coating in accordance with its manufacturer's instructions and coverage rates. Do not over-apply.
 3. Provide a coating of uniform thickness. Do not allow excess form coating material to accumulate in forms or to come into contact with in-place concrete against which fresh concrete will be placed.
 4. Coat steel forms with a non-staining rust preventive material. Rust-stained steel formwork is not acceptable.
- G. Tolerances: Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows.
1. Class A, 1/8-inch
 2. Class B, 1/4-inch
 3. Class C, 1/2-inch
 4. Class D, 1-inch

3.3 FORMWORK REMOVAL

- A. Remove forms after concrete has developed sufficient strength to not be damaged by form removal operation and to safely sustain its own weight and superimposed loads, as determined by testing field-cured concrete cylinders, but not sooner than specified in ACI 347, Paragraph 3.7.2.3.
- B. Take care when removing forms that concrete surfaces are not marred or gouged, that corners are true, sharp and unbroken. Do not pry against concrete when removing forms.
- C. Cut off nails flush on concealed surfaces. Cutback tie wires and nails in exposed concrete surfaces at least 1-1/2-inches. Remove rod and cone ties and separators or similar devices and pull inward away from finished surfaces.
- D. Where used, remove rod and cone ties and separators or similar devices and pull.

3.4 REUSING FORMS

- A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- B. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Reinforcing steel for cast-in-place concrete.
2. Supplementary parts and components, such as clips, fasteners, chairs, tie wires, and other miscellaneous accessories required for a complete installation.

B. References

1. ACI 117, Standard Tolerances for Concrete Construction and Materials.
2. ACI 315, Details and Detailing of Concrete Reinforcement.
3. CRSI, Manual of Standard Practice.
4. AWS D1.4, Structural Welding Code – Reinforcing Steel.
5. ACI SP-66, ACI Detailing Manual.

1.2 SUBMITTALS

A. Shop drawings:

1. Submit shop drawings prepared by a California-registered professional engineer showing fabrication, bending, and placement of concrete reinforcing.
2. Submit bar drawings and schedules with the corresponding placing diagrams.
 - a. Comply with ACI SP-66.
 - b. Indicate bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcing.
 - c. Include special reinforcing required for openings through concrete structures.
3. Drawings shall be complete for any specific area of Project when submitted.

B. Certificates: Submit copies of mill reports and test data for reinforcing steel sampled prior to starting this work.

1. Mill reports shall contain the steel source, description, heat number, yield point,

ultimate tensile strength, elongation percentage, bend test and chemical analysis.

- a. If the reports show material is satisfactory no tests will be required.
 - b. For foreign steel, perform testing as specified below by a testing laboratory acceptable to the authorities having jurisdiction.
 - c. Certification from any other sources is not acceptable.
2. Ensure material delivered for use is that represented by mill reports.
 3. Obtain copies of mill reports, examine them, certify whether the material represented complies with Specifications requirements, and make distribution of reports as required. Report chemical composition of each heat, as determined by ladle analysis.
- C. LEED Submittals:
1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
- D. Test reports: Submit test data for reinforcing steel sampled and tested prior to starting this work.
1. Where materials proposed for use cannot be identified, pay for an approved testing laboratory to make one series of tests (tensile and bend) from each 2.5 tons, or fraction thereof, of each size and kind of reinforcing steel.
 2. Include minimum 2 samples of sufficient length to allow tests to be made on the as-rolled bar.
- E. Welding qualifications: Qualify procedures and personnel according to AWS D1.4, Structural Welding Code – Reinforcing Steel.

1.3 HANDLING

- A. Delivery:
1. Deliver reinforcing to the site bundled, tagged and marked; handle to prevent damage to material.
 2. Use metal tags indicating size, length and other markings shown on placement drawings. Maintain tags after bundles are broken.
- B. Storage:
1. Electrode storage: Comply with the combined recommendations of AWS and the electrode manufacturer for storage of electrodes. Do not use electrodes that

have been wetted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Reinforcing steel: ASTM A 615 Grade 60 or A706 Grade 80 indicated on Drawings, and for reinforcing to be welded use bars complying with ASTM A 706, Grade 60 or Grade 80.
- B. Welded wire mesh: ASTM A 185. Provide in flat sheets, not rolls.
- C. Welding electrodes: AWS A5.1 E70XX Series, low hydrogen, having a minimum yield point of 60,000 psi.
- D. Tie wire:
 - 1. ASTM A 82, 16-gage (minimum) annealed steel wire.
- E. Supports for reinforcing: Provide bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire mesh in place. Use wire-bar-type supports complying with Concrete Reinforcing Steel Institute (CRSI) specifications.
 - 1. Slabs-on-grade: Provide supports with sand plates or horizontal runners where base material will not support chair legs, or precast concrete block chairs with embedded wire ties.
 - 2. Exposed concrete surfaces: Where legs of supports are in contact with forms, provide supports with legs that are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).
 - 3. Over waterproof membranes and vapor retarder: Provide precast concrete chairs to prevent puncturing of membrane.
- F. Splice sleeves:
 - 1. Acceptable manufacturers:
 - a. Erico, Inc.: Lenton Coupler
 - b. Splice Sleeve North America; NMB Splice Sleeve
 - c. Dayton Superior: Bar-Lock (MBT) Coupler System
 - d. Headed Reinforcement Corp.; HRC Mechanical Coupler System
 - 2. Description: Steel sleeves conforming to requirements of ACI 318. Identify each splice sleeve by the size and type imprinted on the sleeve.

2.2 FABRICATION

- A. General: Except as modified by the Contract Documents, comply with Chapter 7 of CRSI Manual of Standard Practice for fabrication of reinforcing.
- B. Bending and forming:
 - 1. Fabricate steel bars, wire and welded wire mesh to sizes, lengths and gages indicated.
 - 2. Accurately form to shapes by methods that will not damage the materials.
 - 3. Heating of reinforcing for bending is not permitted.
- C. Tolerances: Comply with ACI 117.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions and measurements affecting the work of this Section at site.
- B. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.2 PREPARATION

- A. Clean reinforcing of loose mill scale, excessive rust, oil, and other coating that might destroy or reduce its bond before placing it.

3.3 PLACING

- A. Place reinforcing under the continuous inspection of the Owner's Testing Agency.
- B. Placing: Comply with the listed reference standards as applicable. Do not install bars with unscheduled kinks or bends.
- C. Spacing of reinforcing: Space reinforcing to maintain proper distance and clearance between parallel bars and between bars and forms.
- D. Floor system reinforcing: Do not place until concrete in walls and columns has been placed and forms and projecting steel have been thoroughly cleaned.
- E. Splices:
 - 1. Do not splice reinforcing bars except where indicated.
 - 2. At lapped splices, bars shall be in contact, unless noted otherwise on the Drawings, and shall be firmly wired together before placing concrete.

3. Extend stubs and dowels required to receive and engage subsequent work a sufficient length to develop the strength of the bar.
4. Place dowel and stub bars in the forms and secure against displacement during placing of concrete.

F. Welded wire mesh reinforcing:

1. Straighten and cut to required size where required and lay flat in place.
 - a. Lap welded wire mesh one full mesh plus 2 inches.
 - b. Securely wire together and to other reinforcing at approximately 24 inches o.c.

G. Clearance: Maintain clear distances between reinforced steel and face of concrete indicated on the Drawings.

H. Sleeved splices: install spliced sleeves only where indicated in accordance with manufacturer's instructions.

3.4 WELDING

A. Welding:

1. Use only ASTM 706 steel where welding is proposed. Perform welding, where shown or approved, by the direct electric arc process in accordance with AWS D1.4 using specified low-hydrogen electrodes.
2. Preheat 6 in. each side of joint. Protect joints from drafts during the cooling process; accelerated cooling is prohibited.
3. Do not tack weld bars.
4. Clean metal surfaces to be welded of all scale and foreign material. Clean welds each time electrode is changed and chip burned edges before placing welds. When wire brushed, the completed welds must exhibit uniform section, smooth welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion and penetration into the base metal.
5. Cut out welds or parts of welds found defective with chisel and replace with proper welding.
6. Prequalification of welds shall be in accordance with Code.

B. Welded splices: Use full penetration butt welds made by the electric-arc method unless indicated otherwise.

1. Use only welders who have passed the AWS standard qualification tests within the previous year.

2. Weld splices shall develop 125 percent of the specified yield strength of the reinforcing bars, or of the smaller bar in transition splices.
 3. Clean bars of oil, grease, dirt and other foreign substances, and flame-dry before welding.
 4. Prepare ends of bars in compliance with AWS D1.4.
 5. Preheat bars before welding.
- C. Welding Inspection. Where welding is done in excess of the maximum permitted by ASTM A 775, clean the damaged area and touchup with repair material complying with ASTM A 775.

END OF SECTION

SECTION 03 25 00
CONCRETE ACCESSORIES

PART 1 -- GENERAL

1.1 THE REQUIREMENT

- A. The CONTRACTOR shall furnish all tools, equipment, materials, and supplies to install all concrete accessories to complete the Work including cast-in-place anchor bolts (also known as anchor rods), epoxy grouted anchor bolts or dowels and, expansion or adhesive anchors, in accordance with the requirements of the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 03 30 00 Cast-in-Place Concrete.
- B. Section 03 62 00 Grout.

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Comply with the reference standards and Standard Specifications of the GENERAL REQUIREMENTS.
- B. Comply with the current provisions of the following Codes and Standards, as applicable.

1. Commercial Standards:

AISC Code of Standard Practice for Steel Buildings and Bridges

AISC Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings

ASTM A 36 Specifications for Carbon Structural Steel

ASTM A 153 Specifications for Zinc Coating (Hot Dip) on Iron and Steel Hardware

ASTM A 193 Specifications for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service

ASTM A 194 Specifications for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service

ASTM A 307 Specifications for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength

ASTM A 449	Specifications for Quenched and Tempered Steel Bolts and Studs
ASTM A 615	Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM B 633	Specifications for Electrodeposited Coatings of Zinc on Iron and Steel
ASTM B 695	Specifications for Coatings of Zinc Mechanically Deposited on Iron and Steel
ASTM F 436	Specifications for Hardened Steel Washers
ASTM F 1554	Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength

1.4 CONTRACTOR SUBMITTALS

- A. Submittals shall be made in accordance with the GENERAL REQUIREMENTS.
- B. The following submittals and specific information shall be provided.
 - 1. High Strength Anchor Bolts: The CONTRACTOR shall provide mill certificates and certified compliance with ASTM F 1554; A 449 with F 436.
 - 2. The CONTRACTOR shall submit shop drawings for all welded or fabricated items for use as anchors.
 - 3. The CONTRACTOR shall submit catalog cuts and manufacturer's recommendations, with applicable City of Los Angeles Research Reports, for all expansion and adhesive anchors, and anti-seize thread lubricants.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. Anchor Size: Anchor size shall be as specified or shown on plans.
- B. Anchor Material:
 - 1. Water-containment or sanitary structures, immersion service, or exposed exterior locations: Stainless steel.

2. Other locations: Galvanized steel as permitted by the corresponding ASTM except as listed in the contract drawings.

- C. Anchor Length: Sufficient to extend through the nut(s) and not more than 1/4 inch beyond the nut when exposed while meeting the required embedment as indicated on the contract drawings or as required by the associated Los Angeles Department of Building and Safety's Research Report.

2.2 ANCHOR GRADES

A. Anchor Bolts and Nuts:

1. High Strength: ASTM F 1554 Grade 105; A 449, galvanized. Provide with corresponding galvanized hardened washers.
2. Stainless steel: ASTM A 193 and A 194, Type 316N, Grade 8MN.
3. Unspecified: ASTM F 1554 Grade 36; A 36 or A 307, galvanized.
4. Galvanizing: Hot dipped as required per ASTM F 1554; 1.25 ounces per square foot per ASTM A 153 or B 633; When protected from the atmosphere, moisture and sewage gases, ASTM B 695 is also acceptable.
5. Other Coatings: None; As specified in the contract drawings.

- B. Flat Washers: Same material and finish as nut and bolt. For high strength bolts, use ASTM [F 1554; F 436].

C. Anti-Seize Thread Lubricant for use with stainless steel anchors:

1. Jet-Lube "Nikal"
2. Never-Seez "Pure Nickel Special"
3. Permatex "Nickel Anti-Seize"
4. Or an approved equal.

- D. Reinforcing Steel Dowels: ASTM A 615, Grade 60. Same diameter as spliced rebar, or #4 minimum.

E. Expansion and Adhesive Anchors: Use only anchor types and styles with Research Report approval by the Los Angeles Department of Building and Safety.

1. Simpson Strong-tie "Wedge All"
2. Hilti "Kwik-Bolt II"
3. Phillips "Red Head"
4. Or an approved equal.

PART 3 -- EXECUTION

3.1 PROJECT CONDITIONS

- A. Examine the areas and conditions under which the work will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until detrimental conditions are corrected.

3.2 CAST-IN-PLACE ANCHOR BOLTS

- A. Provide templates or other means to ensure accurate placement. Provide sufficient threads to allow for a nut to be placed on the concrete side of the template.
- B. Anchor bolts shall be clean and free of all coatings which may impair bonding with concrete.
- C. Provide two nuts and a washer with each anchor bolt. Provide an additional locknut when indicated on the Drawings.
- D. High Strength Bolts: Install such that ASTM Grade markings are visible after casting into concrete.

3.3 EPOXY-GROUTED ANCHOR BOLTS OR DOWELS

- A. Provide templates or other means to ensure accurate placement.
- B. Anchor bolts or dowels shall be clean and free of all coatings which may impair bonding with epoxy.
- C. Provide two nuts and a washer with each anchor bolt. Provide an additional locknut when indicated on the Drawings.
- D. High Strength Bolts: Install such that ASTM Grade markings are visible after casting into concrete.
- E. Do not disturb bolt or dowel until epoxy grout has cured and reached full strength.

- 3.4 EXPANSION AND ADHESIVE ANCHORS: Install per Los Angeles Department of Building and Safety Approved Research Report and manufacturer's recommendations, whichever is more restrictive. Provide nuts and washers of same material and finish as anchor body.

- 3.5 STAINLESS STEEL ANCHORS. After installation of stainless steel anchor bolts or expansion anchors, lubricate threads before fastening.

End of Section

SECTION 03 29 00
JOINTS IN CONCRETE

PART 1 -- GENERAL

1.1 THE REQUIREMENT

- A. The CONTRACTOR shall construct all joints and bearing pads in concrete at the locations shown. Joints required in concrete structures are of various types and will be permitted only where shown, unless specifically accepted by the ENGINEER.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 03 10 00 Concrete Formwork.
B. Section 03 20 00 Concrete Reinforcement.
C. Section 03 30 00 Cast-in-Place Concrete.

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Comply with the reference standards of the GENERAL REQUIREMENTS.
B. Comply with the current provisions of the following Codes and Standards, as applicable:

1. Federal Specifications:

TT-S-0227E(3) Sealing Compound, elastomeric type, Multi-component for Caulking, Sealing, and Glazing Buildings and Other Structures).

2. U.S. Army Corps of Engineers Specifications:

CRD-C572

3. Other Government Standards:

CSS Caltrans Standard Specifications.

4. Commercial Standards:

ASTM C 920 Specification for Elastomeric Joint Sealants.

ASTM D 624 Test Method for Rubber Property -- Tear Resistance.

ASTM D 638 Test Method for Tensile Properties of Plastics.

ASTM D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.

ASTM D 747 Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam.

ASTM D 1751	Premolded Joint Filler
ASTM D 1752	Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
ASTM D 2240	Test Method for Rubber Property -- Durometer Hardness.

1.4 TYPES OF JOINTS

- A. Construction Joints: When fresh concrete is placed against a hardened concrete surface, the joint between the two pours is called a construction joint. Unless otherwise specified, all joints in water bearing members shall be provided with a waterstop and sealant groove of the shape specified and as shown on the plans.
- B. Contraction Joints: Contraction joints are similar to construction joints except that the fresh concrete shall not bond to the hardened surface of the first pour, which shall be coated with a bond breaker. The slab reinforcement shall be stopped 4-1/2 inches from the joint, unless noted otherwise; which is provided with a sleeve-type dowel, to allow shrinkage of the concrete of the second pour. Waterstop and sealant groove shall also be provided.
- C. Expansion Joints: To allow the concrete to expand freely, a space is provided between the two pours, the joint shall be formed as shown on the plans. This space is obtained by placing a filler joint material against the first pour, which acts as a form for the second pour. Unless otherwise specified, all expansion joints in water bearing members shall be provided with an approved type waterstop.

Premolded expansion joint material shall be installed with the edge at the indicated distance below or back from finished concrete surface, and shall have a slightly tapered, dressed, and oiled wood strip secured to or placed at the edge thereof during concrete placement, which shall later be removed to form space for sealing material. The space so formed shall be filled with a joint sealant material as specified in the Paragraph in Part 2 entitled "Joint Sealant." In order to keep the two elements in line the joint shall be provided with a sleeve-type dowel as shown.

- D. Control Joints (Weakened Plane): The function of the control joint is to provide a weaker plane in the concrete, where shrinkage cracks will probably occur. A groove, of the shape and dimensions as shown on the plans, is formed or saw-cut in the concrete and shall be filled with a joint sealant material as specified in the Paragraph in Part 2 entitled "Joint Sealant."
- E. All other Joints, bearing devices, and elastomeric bearing pads for bridge structures shall comply with CSS Section 51.

1.4 CONTRACTOR SUBMITTALS

- A. Submittals shall be made in accordance with GENERAL REQUIREMENTS.
- B. The following submittals and specific information shall be provided.
 - 1. Waterstops: Prior to use of the material required under this contract, qualification samples shall be submitted. Such samples shall consist of extruded or molded sections of each size or shape to be used. The material sample shall be representative of the material to be furnished under this contract. The balance of the material to be used under this contract shall not be produced until after the ENGINEER has reviewed and approved the qualification samples.

2. Joint Sealant: Prior to ordering the sealant material, the CONTRACTOR shall submit to the ENGINEER for review and approval, data to show compliance with the requirements of the Contract Documents. Certified test reports from the sealant manufacturer on the actual batch of material being supplied indicating compliance with the above requirements shall be furnished the ENGINEER before the sealant is used on the job.
3. Shipping Certification: The CONTRACTOR shall provide written certification from the manufacturer as an integral part of the shipping form, to show that all of the material shipped to this project meets or exceeds the physical property requirements of the Contract Documents. Supplier certificates are not acceptable.
4. The CONTRACTOR shall submit placement shop drawings showing the location and type of all joints for each structure.

1.5 QUALITY ASSURANCE

- A. Waterstop manufacturer shall demonstrate five years (minimum) continuous, successful experience in production of waterstops.
- B. Waterstop Inspection: It is required that all waterstop field joints shall be subject to inspection, and no such work shall be scheduled or started without having made prior arrangements with the INSPECTOR to provide for the required inspections. Not less than 24 hours notice shall be provided to the INSPECTOR for scheduling such inspections.
- C. All field joints in waterstops shall be free of misalignment, bubbles, inadequate bond, porosity, cracks, offsets, and other defects which would reduce the potential resistance of the material to water pressure at any point. All defective joints shall be replaced with material which shall pass said inspection, and all faulty material shall be removed from the site and disposed of by the CONTRACTOR at its own expense.
- D. The following waterstop defects represent a partial list of defects which shall be grounds for rejection:
 1. Offsets at joints greater than 1/16-inch or 15 percent of material thickness, at any point, whichever is less.
 2. Exterior crack at joint, due to incomplete bond, which is deeper than 1/16-inch or 15 percent of material thickness, at any point, whichever is less.
 3. Any combination of offset or exterior crack which will result in a net reduction in the cross section of the waterstop in excess of 1/16-inch or 15 percent of material thickness at any point, whichever is less.
 4. Misalignment of joint which result in misalignment of the waterstop in excess of 1/2-inch in 10 feet.
 5. Porosity in the welded joint as evidenced by visual inspection.
 6. Bubbles or inadequate bonding.
- E. Waterstop Samples: Prior to use of the waterstop material in the field, a sample of a fabricated metered cross and a tee constructed of each size or shape of material to be used shall be submitted to the ENGINEER for approval. These samples shall be fabricated so that the material and workmanship represent in all respects the fittings to be furnished under this contract. Field samples of fabricated fittings (crosses, tees, etc.) will be selected at random by the INSPECTOR for testing. When tested, they shall have a tensile strength across the joints equal to at least 600 psi.

- F. Construction Joint Sealant: The CONTRACTOR shall prepare adhesion and cohesion test specimens as specified herein, at intervals of 5 working days while sealants are being installed.
- G. The sealant material shall show no signs of adhesive or cohesive failure when tested in accordance with the following procedure in laboratory and field tests:
 - 1. Sealant specimen shall be prepared between 2 concrete blocks (1-inch by 2-inch by 3-inch). Spacing between the blocks shall be 1/2-inch. Coated spacers (2-inch by 1-1/2-inch by 1/2-inch) shall be used to insure sealant cross-sections of 1/2-inch by 2 inches with a width of 1/2-inch.
 - 2. Sealant shall be cast and cured according to manufacturer's recommendations except that curing period shall not exceed 24 hours.
 - 3. Following curing period, the gap between blocks shall be widened to one inch. Spacers shall be used to maintain this gap for 24 hours prior to inspection for failure.
- H. Store waterstops under tarps to protect from oil, dirt, and sunlight.

1.6 GUARANTEE

- A. The CONTRACTOR shall provide a 5-year written guarantee of the entire sealant installation against faulty and/or incompatible materials and workmanship, together with a statement that it agrees to repair or replace, to the satisfaction of the CITY, at no additional cost to the CITY, any such defective areas which become evident within said 5-year guarantee period.

PART 2 -- PRODUCTS

2.1 PVC WATERSTOPS

- A. General: Waterstops shall be extruded from an elastomeric polyvinyl chloride compound containing the plasticizers, resins, stabilizers, and other materials necessary to meet the requirements of these Specifications. No reclaimed or scrap material shall be used. The CONTRACTOR shall obtain from the waterstop manufacturer and shall furnish to the ENGINEER for review, current test reports and a written certification of the manufacturer that the material to be shipped to the job meets the physical requirements as outlined in the U.S. Army Corps of Engineers Specification CRD-C572 and those listed herein.
- B. Flatstrip and Center-Bulb Waterstops: Flatstrip and center-bulb waterstops shall be as detailed and as manufactured by: [Kirkhill Rubber Co., Brea, California; Greenstreak, St. Louis, MO, Water Seals, Inc., Chicago, Illinois; Progress Unlimited, Inc., New York, New York]; or an approved equal; provided, that at no place shall the thickness of flat strip waterstops, including the center bulb type, be less than 3/8-inch.
- C. Multi-Rib Waterstops: Multi-rib waterstops, where required, shall be as detailed and as manufactured by [Water Seals, Inc., Chicago, Illinois; Progress Unlimited, Inc., New York, New York; Greenstreak, St. Louis, MO], or an approved equal. Prefabricated joint fittings shall be used at all intersections of the ribbed-type waterstops.
- D. Other Types of Waterstops: When other types of waterstops, not listed above are required and shown, they shall be subjected to the same requirements as those listed herein.

- E. Waterstop Testing Requirements: When tested in accordance with the specified test standards, the waterstop material shall meet or exceed the following requirements:

<u>Physical Property, Sheet Material</u>	<u>Value</u>	<u>ASTM Std.</u>
Tensile Strength-min (psi)	1750	D 638, Type IV
Ultimate Elongation-min (percent)	350	D 638, Type IV
Low Temp Brittleness-max (degrees F)	-35	D 746
Stiffness in Flexure-min (psi)	400	D 747
Accelerated Extraction (CRD-C572)		
Tensile Strength-min (psi)	1500	D 638, Type IV
Ultimate Elongation-min (percent)	300	D 638, Type IV
Effect of Alkalies (CRD-C572)		
Change in Weight (percent)	+0.25/-0.10	-----
Change in Durometer, Shore A	+5	D 2240
Finish Waterstop		
Tensile Strength-min (psi)	1400	D 638, Type IV
Ultimate Elongation-min (percent)	280	D 638, Type IV

F. Accessories

1. Provide factory made waterstop fabrications for all changes of direction, intersections, and transitions leaving only straight butt joint splices for the field.
2. Provide hog rings or grommets spaced at 12 inches on center along length of waterstop.
3. Provide Teflon coated thermostatically controlled waterstop splicing irons for field butt splices.

2.2 RUBBER WATERSTOPS

For bridge structures, neoprene waterstop requirements shall conform to CSS Section 51-1.

2.3 JOINT SEALANT

- A. Joint sealant shall be polyurethane polymer designed for bonding to concrete which is continuously submerged in water.
- B. Joint sealant material shall meet the following requirements:

Work Life	45 - 90 minutes
Time to Reach 20 Shore "A" Hardness (at 77 degrees F, 200 gr quantity)	24 hours, maximum
Ultimate Hardness	30 - 40 Shore "A"

Tensile Strength	250 psi, minimum
Ultimate Elongation	400 percent, minimum
Tear Resistance (Die C ASTM D 624)	75 pounds per inch of thickness, minimum
Color	Light Gray

For bridge structures, additional requirements of CSS Section 51 shall also apply.

- C. All polyurethane sealants for waterstop joints in concrete shall conform to the following requirements:
1. Sealant shall be 2-part polyurethane with the physical properties of the cured sealant conforming to or exceeding the requirements of ASTM C 920 or Federal Specification TT-S-00227 E(3) for 2-part material, as applicable.
 2. For vertical joints and overhead horizontal joints, only "non-sag" compounds shall be used; all such compounds shall conform to the requirements of ASTM C 920 Class B, or Federal Specification TT-S-0027 E(3), Type II.
 3. For plane horizontal joints, the self-leveling compounds which meet the requirements of ASTM C 920 Class A, or Federal Specification TT-S-0027 E(3), Type I shall be used. For joints subject to either pedestrian or vehicular traffic, a compound providing non-tracking characteristics, and having a Shore "A" hardness range of 25 to 35, shall be used.
 4. Primer materials, if recommended by the sealant manufacturer, shall conform to the printed recommendations of the sealant manufacturer.
- D. All sealants, wherever shown, or required hereunder shall be [Rubbercalk 2101-I or 270 as manufactured by Products Research Company; GS 102 or GS 1102 as manufactured by General Sealants Corp]; or an approved equal. For sanitary structures mastic/sealant material shall be [Ram Nek Sealant by Henry Co.; Sika Flex 1A, Sikadur 51 NS by Sika Corp].
- E. Sealants for non-waterstop joints in concrete shall conform to the requirements of Section [07900], "Joint Sealants". Mastic joint sealer shall be a material that does not contain evaporating solvents; that will tenaciously adhere to concrete surfaces; that will remain permanently resilient and pliable; that will not be affected by continuous presence of water and will not in any way contaminate potable water; and that will effectively seal the joints against moisture infiltration even when the joints are subject to movement due to expansion and contraction. The sealer shall be composed of special asphalts or similar materials blended with lubricating and plasticizing agents to form a tough, durable mastic substance containing no volatile oils or lubricants and shall be capable of meeting the test requirements set forth hereinafter, if testing is required by the ENGINEER.

2.4 PREFORMED JOINT FILLER

- A. Preformed joint filler material shall be of the preformed non-extruding type joint filler constructed of cellular neoprene sponge rubber or polyurethane of firm texture. Bituminous fiber type will not be permitted. All non-extruding and resilient-type preformed expansion joint fillers shall conform to the requirements and tests set forth in ASTM D 1752 for Type I, except as otherwise specified herein.
- B. Unless otherwise noted, preformed joint filler shall be a non-extruding, resilient, bituminous type conforming to the requirements of ASTM D 1751.

2.5 BACKING ROD

- A. Backing rod shall be an extruded closed-cell, polyethylene foam rod. The material shall be compatible with the joint sealant material used and shall have a tensile strength of not less than 40 psi and a compression deflection of approximately 25 percent at 8 psi. The rod shall be 1/8-inch larger in diameter than the joint width except that a one-inch diameter rod shall be used for a 3/4-inch wide joint.

2.6 BOND BREAKER

- A. Bond breaker shall be [Super Bond Breaker as manufactured by Burke Company, San Mateo, California; Hunt Process 225-TU as manufactured by Hunt Process Co., Santa Fe Springs, California; Select Cure CRB as manufactured by Select Products Co., Upland, California]; or an approved equal. It shall contain a fugitive dye so that areas of application will be readily distinguishable.

0.7 BEARING DEVICES AND ELASTOMERIC BEARING PADS

Bearing devices and elastomeric bearing pads shall comply with CSS Section 51.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Unless otherwise shown, waterstops of the type specified herein shall be embedded in the concrete across joints as shown. All waterstops shall be fully continuous for the extent of the joint. Splices necessary to provide such continuity shall be accomplished in conformance to printed instructions of manufacturer of the waterstops. The CONTRACTOR shall take suitable precautions and means to support and protect the waterstops during the progress of the work and shall repair or replace at its own expense any waterstops damaged during the progress of the work. All waterstops shall be stored so as to permit free circulation of air around the waterstop material.
- B. When any waterstop is installed in the concrete on one side of a joint, while the other half or portion of the waterstop remains exposed to the atmosphere for more than 2 days, suitable precautions shall be taken to shade and protect the exposed waterstop from direct rays of the sun during the entire exposure and until the exposed portion of the waterstop is embedded in concrete.

3.2 SPLICES IN WATERSTOPS

- A. Splices in waterstops shall be performed by heat sealing the adjacent waterstop sections in accordance with the manufacturer's printed recommendations and the following requirements:
 - 1. The material not be damaged by heat sealing.
 - 2. The splices have a tensile strength of not less than 60 percent of the unspliced materials tensile strength.
 - 3. The continuity of the waterstop ribs and of its tubular center axis be maintained.

- B. Butt joints of the ends of two identical waterstop sections may be made while the material is in the forms.
- C. All joints with waterstops involving more than 2 ends to be jointed together, and all joints which involve an angle cut, alignment change, or the joining of 2 dissimilar waterstop sections shall be prefabricated by the CONTRACTOR prior to placement in the forms, allowing not less than 24-inch long strips of waterstop material beyond the joint. Upon being inspected and approved, such prefabricated waterstop joint assemblies shall be installed in the forms and the ends of the 24-inch strips shall be butt welded to the straight run portions of waterstop in place in the forms.

3.3 JOINT CONSTRUCTION

A. Setting Waterstops:

1. In order to eliminate faulty installation that may result in joint leakage, particular care shall be taken of the correct positioning of the waterstops during installation. Adequate provisions must be made to support the waterstops during the progress of the WORK and to insure the proper embedment in the concrete. The symmetrical halves of the waterstops shall be equally divided between the concrete pours at the joints. The center axis of the waterstops shall be coincident with the joint openings. Maximum density and imperviousness of the concrete shall be insured by thoroughly working it in the vicinity of all joints
2. In placing flat-strip waterstops in the forms, means shall be provided to prevent them from being folded over by the concrete as it is placed. Unless otherwise shown, all waterstops shall be held in place with light wire ties on 12-inch centers which shall be passed through the edge of the waterstop and tied to the curtain of reinforcing steel. Horizontal waterstops, with their flat face in a vertical plane, shall be held in place with continuous supports to which the top edge of the waterstop shall be tacked. In placing concrete around horizontal waterstops, with their flat face in a horizontal plane, concrete shall be worked under the waterstops by hand so as to avoid the formation of air and rock pockets.
3. Adequate means shall be provided for anchoring the waterstop in concrete. Waterstops shall be positioned so that they are equally embedded in the concrete on each side of the joint.
4. For bridge structures, waterstops shall conform to CSS Section 51-1.

B. Joint Location:

Construction joints, and other types of joints, shall be provided where shown. When not shown, construction joints shall be provided at [25-foot] maximum spacing for all concrete construction, subject to the approval of the ENGINEER, unless noted otherwise. Where joints are shown spaced greater than 25 feet apart, additional joints shall be provided to maintain the [25-foot] maximum spacing. The location of all joints, of any type, shall be submitted for acceptance by the ENGINEER.

C. Joint Preparation:

Special care shall be used in preparing concrete surfaces at joints where bonding between two sections of concrete is required. Unless otherwise shown, such bonding will be required at all horizontal joints in walls. Surfaces shall be prepared in accordance with the requirements of Section [03300] [03310], "Cast-in-Place Concrete." Except on horizontal wall construction joints, wall to slab joints or where otherwise shown or specified, at all joints where waterstops

are required, the joint face of the first pour shall be coated with a bond breaker as specified herein.

D. Construction Joint Sealant:

1. Construction joints in water-bearing floor slabs, and elsewhere as shown, shall be provided with tapered grooves which will be filled with construction joint sealant. The material used for forming the tapered grooves shall be left in the grooves until just before the grooves are cleaned and filled with joint sealant. After removing the forms from the grooves, all laitance and fins shall be removed, and the grooves shall be sand-blasted. The grooves shall be allowed to become thoroughly dry, after which they shall be blown out; immediately thereafter, they shall be primed and filled with the construction joint sealant. The primer used shall be supplied by the same manufacturer supplying the sealant. No sealant will be permitted to be used without a primer. Care shall be used to completely fill the sealant grooves. Areas designated to receive a sealant filler shall be thoroughly cleaned, as outlined for the tapered grooves, prior to application of the sealant.
2. Sealant application shall be in accordance with the manufacturer's printed instructions. The surfaces of the groove for the sealant shall not be coated. Concrete next to waterstops shall be placed in accordance with the requirements of Section 03 30 00, Cast-in-Place Concrete.
3. The primer and sealant shall be placed strictly in accordance with the printed recommendations of the manufacturer, taking special care to properly mix the sealant prior to application. All sealant shall cure at least 7 days before the structure is filled with water.
4. All sealant shall be installed by a competent waterproofing specialty contractor who has a successful record of performance in similar installations. Before work is commenced, the crew doing the WORK shall be instructed as to the proper method of application by a representative of the sealant manufacturer.
5. Thorough, uniform mixing of 2-part, catalyst-cured materials is essential; special care shall be taken to properly mix the sealer before its application. Before any sealer is placed, the CONTRACTOR shall arrange to have the crew doing the WORK carefully instructed as to the proper method of mixing and application by a representative of the sealant manufacturer.
5. Any joint sealant which after the manufacturer's recommended curing time for the job conditions of the WORK hereunder, fails to fully and properly cure shall be completely removed; the groove shall be thoroughly sandblasted to remove all traces of the uncured or partially cured sealant and primer, and shall be re-sealed with the specified joint sealant. All costs of such removal, joint treatment, re-sealing, and appurtenant work shall be at the expense of the CONTRACTOR.

3.4 BEARING DEVICES AND ELASTOMERIC BEARING PADS

Bearing devices and elastomeric bearing pads shall comply with CSS Section 51.

End of Section

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Cast-in-place concrete (CIPC).

B. Related work:

1. Division 2 for site concrete work.
2. Division 3 for concrete forms and concrete reinforcing.

C. References

1. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. ACI 301 - Specifications for Structural Concrete for Buildings.
4. ACI 305 - Recommended Practice for Hot Weather Concreting.

1.2 SUBMITTALS

A. Data:

1. Product data: Submit manufacturer's product data, specifications, typical installation details and other data as necessary to demonstrate compliance with the specified requirements for all manufactured products.
2. Design data:
 - a. Submit pit source and characteristics of each type of aggregate to Architect prior to designing mixes.
 - b. Submit mix designs prepared for review by a testing laboratory acceptable to the authorities having jurisdiction.
 - c. Submit mix designs on the Mix Design Submittal Form included at the end of this specification.

B. Certificates: Submit cement certificates, admixture certificates (including chloride ion content) and batch plant tickets and non-shrink grout test data.

1.3 QUALITY ASSURANCE

- A. Uniformity: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
- B. Installer's qualifications: Firm and individuals with a minimum of 3 consecutive years of experience in the installation of cast in place concrete on projects similar in material, design, complexity and extent to this Project, and whose work has resulted in applications with a record of successful in-service performance.
- C. Manufacturer's qualifications:
 - 1. Firm experienced in manufacturing ready-mixed concrete products and complying with the requirements of ASTM C 94 for production facilities and equipment.
 - 2. Firm certified according to the NRMCA Certification of Ready Mixed Concrete Production Facilities.
- D. Testing agency qualifications:
 - 1. Independent testing agency acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
 - 2. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- E. Pre-Concrete Meeting:
 - 1. At least 40 days prior to ordering specified materials or the start of concrete work, arrange a pre-installation meeting between the Contractor, Architect, Structural Engineer, Project superintendent, concrete supplier, and concrete contractor and his finisher foreman to review the proposed mix designs, test placements and all methods and procedures to achieve the specified hardened concrete properties, use of admixtures, application of curing compounds and coordination with other trades.
 - 2. The Contractor shall record minutes of the meeting, decisions made, and corrective measures to be taken before installation/application starts. Send copy of the minutes to the Architect no later than 3 days following the meeting.

1.4 PROJECT CONDITIONS

- A. Do not place concrete when the temperatures of the materials in contact with the concrete, the concrete temperature, and the ambient temperature exceed the ranges recommended in ACI 305 and 306, or if it is likely to exceed these temperatures before the concrete has taken its initial set, unless special precautions recommended by ACI 305 and 306 are provided.

1.5 SCHEDULING

- A. Allow sufficient time in the construction schedule for appropriate slab drying, in accordance with the finish manufacturer's recommendations, for slabs to receive a moisture-sensitive deferred finish.
- B. Quick setting concrete with a maximum w/cm of 0.40 may be required to avoid schedule delays.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Portland cement: ASTM C150, Type I or II low alkali. Do not change brand or type of cement without Architect's written approval.
- B. Aggregates and Supplementary Cementitious Materials:
 - 1. Where sulfate conditions are present and Portland Limestone Cement is proposed to be used, the cement shall be Type IL MS/HS conforming to ASTM Specifications C595 unless noted otherwise.
 - 2. Fly Ash: ASTM C618, Type F may be used up to a maximum of 25% of the total cementitious content.
 - 3. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120 may be used up to a maximum of 40% of the total cementitious content.
 - 4. Natural Pozzolans: ASTM C618, Class N.
 - 5. The exact percentages of supplementary cementitious materials used shall be based on a successful test placement on-site.
 - 6. Hard rock aggregates: ASTM C33, graded so that coarse aggregate nominal size is not larger than 1/5 of the narrowest dimension between form faces, nor 3/4 of the minimum clear spacing between individual reinforcing bars or bundles of bars, whichever is less, but never greater than 3/4-inch in any dimension for slabs 4 inches thick or less; 1-1/2 inches maximum at all other locations.
 - 7. Combined aggregate gradation for slabs and other designated concrete shall be 8% - 18% for large top size aggregates (1-1/2 in.) or 8% - 22% for smaller top size aggregates (1 in. or 3/4 in.) retained on each sieve below the top size and above the No. 100.
 - 8. Lightweight aggregates: Expanded shale, clay or slate produced via the rotary kiln method and complying with the requirements of ASTM C330, from sources approved by the authorities having jurisdiction.
- C. Admixtures:

Note: Silica fume admix will result in a different color concrete than non-silica fume concrete. Integral waterproofing admixtures include Vandex, AM-10 by the Euclid Chemical Company or Darapel by WR Grace and Ipanex.

1. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures. Provide one of the following:
 - a. "AEA-92 and Air 40" by The Euclid Chemical Co.
 - b. "Sika Aer" by Sika Corp.
 - c. "MB-VR or MB-AE" by BASF
2. Water-Reducing Admixture: ASTM C494, Type A, and containing not more than 0.05 percent chloride ions. Provide one of the following:
 - a. "Eucon X15 or Eucon WR 91" by the Euclid Chemical Co.
 - b. "Pozzolith 322N" by BASF.
 - c. "Plastocrete 160" by Sika Chemical Corp.
 - d. Or approved Equal.
3. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C494, Type F or Type G and containing not more than 0.05 percent chloride ions. Provide one of the following:
 - a. Plastol Series, Euclid Chemical Co.
 - b. ADVA Flow, W.R. Grace & Co.
 - c. Glenium Series, BASF, Inc.
4. High-Range, Water-Reducing, and Retarding (Superplasticizer): ASTM C 494, Type G.
 - a. Eucon 537 by The Euclid Chemical Company
 - b. Daracem 100 by W.R. Grace & Co.
 - c. Rheobuild 916 by BASF
5. Non-Chloride, Non-Corrosive Accelerating Admixture: The admixture shall conform to ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. The admixture manufacturer must have long-term non-corrosive test data from an independent testing laboratory (of at least a year's duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures. Provide the following:
 - a. "Accelguard 80, 90 or NCA" by The Euclid Chemical Co.

6. Water-Reducing, Retarding Admixture: ASTM C494, Type D, and contain no more than 0.05 percent chloride ions. Provide one of the following:
 - a. "Eucon NR or Eucon Retarder 75" by The Euclid Chemical Co.
 - b. "Pozzolith Retarder" by BASF
 - c. "Plastiment" by Sika Chemical Co.
 7. Hydration Control Admixture:
 - a. Eucon Stasis by The Euclid Chemical Co.
 8. MasterSet Delvo by BASF
 - a. SikaRard 440 by Sika Chemical Co.
 9. Certification: Written conformance to the above-mentioned requirements and the chloride ion content of admixtures will be required from the admixture manufacturer prior to mix design review by the Engineer.
 10. Prohibited Admixtures: Calcium chloride thiocyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.
 11. Single Source: All admixtures shall be from the same manufacturer to assure single source responsibility.
- D. Water: Fresh, clean, and free of oil and other materials injurious to concrete.

2.2 ADHESIVES

- A. Structural Epoxy Adhesive: ASTM C 881, two (2) component, 100% solids, 100% reactive compound suitable for use on dry or damp surfaces. Provide one of the following:
 1. "Duralcrete Series" by The Euclid Chemical Company
 2. "SpecProxy Series" by SpecChem.
 3. "Sikadur Hi-Mod Series" by Sika Chemical Corp.
 4. "Rezi-Weld 1000" by WR Meadows
- B. Non-structural adhesive: Basis of design is for "Weldcrete" by Larsen Products Corp. Other acceptable materials/manufacturers include the following:
 1. The compound shall be a polyvinyl acetate type. Rewettable: "Weldcrete" by The Larsen Co. or "SpecWeld" by SpecChem. Use only in areas not subject to moisture.
 2. In these areas use a non-rewettable; polymer modified, bonding admixture,

"Flex-Con" or SBR Latex by The Euclid Chemical Company or "Strong Bond" by SpecChem in an approved bonding grout.

2.3 RELATED MATERIALS

- A. Underlayment Compound: Free flowing, self-leveling, pumpable, cementitious base compound. Products: Subject to compliance with requirements, provide the following:
1. "Flo Top, Super Flo-Top or Tamms SLU" by The Euclid Chemical Co.
 2. "Ardex" by Ardex Co.
 3. "SpecFlow" by SpecChem
 4. "Underlayment 110" by BASF
- B. Repair topping: Self-leveling, polymer modified high strength topping. Product shall be "Thin-Top Supreme" by The Euclid Chemical Co. or "DuoPatch" by SpecChem. The topping shall exhibit the following properties:
1. Chaplin Abrasion Test - 0.02 mm (0.0079") maximum @ 28 days (British Standard 8204)

2.4 CURING COMPOUNDS

- A. General: Curing, hardening, and sealing agents to be applied sequentially shall be products of a single manufacturer. Where products of different manufacturers are used including proprietary topping and surfacing materials, confirm their compatibility with respective manufacturers.
1. Compound shall produce a uniform, continuous, adherent film that does not check, crack, or peel and is free from pinholes or other imperfections.
 2. Curing compound used on exposed concrete surfaces shall be non-discoloring, fast drying and shall be conclusively demonstrated not to darken or yellow with age.
 3. Curing and sealing compound for use on concrete floors to receive adhered covering shall be specially formulated for such use and shall be certified by the manufacturer not to inhibit the bonding qualities of flooring adhesives. Refer to the Finish Schedule on the Drawings for specific finish materials and areas of application.
 4. Strippable Curing Compound will be used on floors receiving a penetrating sealer or adhesive applied finishes.
- B. Compatibility: Use compound guaranteed not to affect the appearance of the concrete surfaces, and the bond, adhesion, or effectiveness of finishes or surface treatment specified herein to be applied to concrete.
- C. Type I, Strippable Curing Compound: The compound shall conform to ASTM C309

(Voc Compliant, 350 g/l). For use on slabs receiving subsequent applied finishes and where noted on the drawings. Install in strict accordance with the manufacturer's recommendation and supervision.

1. "Atlas Quantum-Cure" by Atlas Tech Products Company.
2. "E-Cure" by The SpecChem Company
3. "Kurez W VOX" by the Euclid Chemical Company.

D. Type III, cure, and seal: Apply one coat for curing and second coat for sealing. Clear Curing and Sealing Compound (VOC Compliant, 350 g/l): Liquid type membrane forming curing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class A, 25% solids content minimum. Moisture loss shall be not more than 0.40 Kg/m² when applied at 300 sq. ft./gal. Manufacturer's certification is required. Subject to project requirements provide one of the following products:

1. Super Diamond Clear VOX by The Euclid Chemical Company
2. "Cure & Seal WB 25" by SpecChem
3. Super Aquacure VOX by The Euclid Chemical Company
4. Lusterseal WB 300 by The Euclid Chemical Company
5. Masterkure 30W by BASF Construction Products mas
6. Or equal.

E. Type IV, Moisture Retaining Cover Conforming to ASTM C171: A naturally colored, non woven polypropylene fabric with a 4 mil non perforated reflective (white) polyethylene coating containing stabilizers to resist degradation from ultraviolet light. Fabric shall exhibit low permeability and high moisture retention.

1. Hydracure S-16 by PNA Construction Technologies, Inc.
2. Matthews, NC (Website: www.pna-inc.com) (800.542.0214)
3. Transguard 4000 by Reef Industries (Armorlon Division), Incorporated, Houston TX (Website: www.reefindustries.com, Voice: 800.231.6074).
4. Or equal.

2.5 LIQUID SEALER DENSIFIER

A. Liquid Sealer/Densifier: High performance, deeply penetrating concrete densifier; odorless, colorless, VOC - compliant, non-yellowing silicate based solution designed to harden, dustproof, and protect concrete floors subjected to heavy vehicular traffic and to resist black rubber tire marks on concrete surfaces. The compound must contain a minimum solids content of 20% of which 50% is silicate. Liquid Sealer Densifier shall be applied in strict accordance with the directions of the manufacturer

and the project specifications. Provide one of the following:

1. Diamond Hard by The Euclid Chemical Company
2. "SpecHard" by SpecChem
3. SealHard by L&M Construction Chemicals

2.6 MISCELLANEOUS MATERIALS

- A. Evaporation retarder: Eucobar by The Euclid Chemical Company, "SpecFilm Concentrate" by SpecChem, Sealtight Evapre by WR Meadows, E-Con by L&M Construction Chemicals, Inc., or equal.
- B. Non-Shrink, Non-Metallic Grout:
 1. The non-shrink grout shall be a factory pre-mixed grout and shall conform to ASTM C1107, "Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink)." In addition, the grout manufacturer shall furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95% bearing under a 4' x 4' base plate. Provide:
 - a. "NS Grout or NC Grout" by The Euclid Chemical Co.
 - b. "SC MultiPurpose Grout" by SpecChem
 - c. "Five Star Grout" by U.S. Grout Corp.
 - d. "Masterflow 713" by BASF
 2. Where high fluidity and/or increased placing time is required, use the specified high flow grout. This grout shall be used for all base plates larger than 10 square feet. Provide:
 - a. "Hi-flow Grout", by The Euclid Chemical Co.
 - b. "SC Precision Grout" by SpecChem
 - c. "TammsgROUT Supreme", by Tamms Industries
 - d. "Masterflow 928" by BASF

2.7 SOURCE QUALITY CONTROL

- A. Employ a testing laboratory, acceptable to the Owner and Architect, to test the materials for conformance with these Specifications before concrete mixes are established, and when source is changed, unless recent test results of materials to be used on the Project, performed by an acceptable testing laboratory, are accepted by the Architect.
- B. Testing coarse aggregates:

1. Test aggregates before and after concrete mix is established and whenever the character source of material is changed, but not less than one test for each 500 cu. yards.
2. Perform a sieve analysis to determine conformity with limits of gradation. Perform sampling and testing according to ASTM C33, and as follows:
 - a. Sampling of aggregates: ASTM D75. Take samples of aggregates at source of supply, or if source of supply has been approved, from storage bunkers at ready-mixed concrete plant.
 - b. Testing of aggregates shall include:
 - 1) Sieve analysis: ASTM C136.
 - 2) Organic impurities: ASTM C40. Fine aggregate shall develop a color not darker than the referenced standard color.
 - 3) Soundness: ASTM C88. Loss after 5 cycles not over 8 percent for coarse aggregate, nor 10 percent for fine aggregate.
 - 4) Abrasion: ASTM C131. Weight loss not over 10-1/2 percent after 100 revolutions, nor 42 percent after 500 revolutions.
 - 5) Deleterious materials: ASTM C33.
 - 6) Materials passing No. 200 sieve: ASTM C 117, not over 1 percent for gravel, 1.5 percent for crushed aggregate per ASTM C 33.
 - 7) Reactive materials: ASTM C289 and ASTM C1260. Aggregates shall indicate no potential deleterious reactivity.
 - 8) Definitions: ASTM C125.
 - c. Test lightweight structural aggregates in compliance with ASTM C 330. Report unit weight, tests for deleterious substances, unburned or under-burned lumps, loss of ignition, soundness, and staining materials.
3. Cement test:
 - a. The cement mill laboratory will be acceptable as testing laboratory for this purpose when approved by the Building Department. Submit evidence to show that the cement mill laboratory is qualified to perform tests. The laboratory shall make tests for every 500 barrels or fraction thereof of cement used, in compliance with ASTM C150.
 - b. Make tensile strength test at 7 days. Tag the cement for identification at the location of sampling. A representative of the Testing Agency shall certify that materials being used are taken from the lots sampled and tested for this report.

2.8 MIXES

A. Mix design:

1. Employ a testing laboratory, acceptable to the Owner and Architect, to design structural concrete mixes required for the Project to provide:
 - a. Concrete of the compressive strength indicated on the Drawings.
 - b. Adequate workability and proper consistency to permit concrete to be worked readily into the forms and around reinforcement without segregation and excessive bleeding.
 - c. Admixture Usage: All concrete must contain the specified water-reducing admixture or the specified high-range water-reducing admixture (superplasticizer). All thin concrete slabs, less than 8" in thickness placed at air temperatures below 50°F shall contain the specified non-corrosive, non-chloride accelerator. All concrete required to be air entrained shall contain an approved air entraining admixture. All pumped concrete with a slump higher than 6", concrete for industrial slabs, synthetic fiber concrete, architectural concrete, self-consolidating concrete, concrete required to be watertight or concrete with a water/cementitious ratio below 0.50 shall contain the specified high-range water-reducing admixture (superplasticizer) as required by the mix design. All concrete slabs placed at air temperatures above 90°F may require the use of a water reducing retarding admixture. All architectural concrete and heavily reinforced members as required on the drawings shall use Self-Consolidating Concrete. Self-Consolidating Concrete shall contain the specified high-range water-reducing admixture and viscosity-modifying admixture where required. Minimum spread of 20" – 30" or as required by the successful test placement. The workability, pumpability, finishability, and setting time of the proposed mix design shall be verified with a successful test placement onsite.
 - d. Other requirements noted on the Drawings and specified herein.
2. Determine proper proportions for design mixes in compliance with ACI 301.
3. Determine proper water-cement ratio by preliminary test made in compliance with ASTM C 192.
4. Slump: All concrete containing the high-range water-reducing admixture (superplasticizer) shall have a maximum slump of 9" unless otherwise approved by the Engineer of Record. The concrete shall be at a slump of 2" to 3", (3" to 4" for concrete receiving a "shake-on" hardener or lightweight concrete), be verified before the high-range water-reducing admixture is added to increase the slump to the approved level. All Self-Consolidating Concrete shall have a spread of 20 – 30 inches.

All other concrete, slump not to exceed 4 (+/- 1) inches. For slab on grade, walls, slab on metal deck and suspended slabs, slump not to exceed 4 (+0, -1) inches.

5. Compressive Tests shall be conducted in compliance with ASTM C 39.
- B. Submit reports showing results of sieve analysis, mix design, results of compression and modulus of elasticity (MOE) tests, including stress-strain diagrams.
1. Make minimum 4 test specimens of each design mix for strength less than or equal to 5,000psi and a minimum of 8 test specimens of each design mix for strength higher than 5,000psi. One cylinder shall be tested at 7 days for information. Two 6 x 12 in. or three 4 x 8 in. cylinders at 28 days shall be tested for acceptance. Extra Cylinders shall be held in reserve. Make minimum one extra test specimen for post-tensioned concrete, and a specimen shall be tested prior to stressing.
 2. If trial batches are used the average critical strength f'_{cr} shall be $f'c + 1200$ psi. For strengths higher than 5,000 psi at 28 days the f'_{cr} shall equal $1.10 f'c + 700$ psi.
 3. Do not start concrete production until mixes have been reviewed and are acceptable to the Architect and Engineer of Record.
- C. For each batch, weigh the fine and coarse aggregate separately, measure cement and water separately and introduce separately into the mix so that proportions can be accurately controlled and easily checked.
- D. Do not change proportions established by the accepted mix design without the Architect's written approval.
1. Mixing and delivery shall comply with ASTM C 94, these Specifications, and Building Code requirements.
 2. Owner's Testing Agency will perform check sieve analysis of the aggregates being used, check compliance with mix design and the cement being used against mix design; check that water has been removed from the drum before adding mix ingredients for the following load and shall witness the loading of mixing trucks. The Owner's Testing Agency will send a written report of each inspection to Architect indicating compliance with these Specifications.
 3. In addition to the requirements of ASTM C 94 Section 16.1, provide the following information on delivery tickets signed by an authorized representative of the batching plant with each mixer truck of concrete delivered to the site.
 - a. Type and brand of cement.
 - b. Cement content per cubic yard of concrete.
 - c. Maximum size of aggregate.
 - d. Total water content and water/cementitious material ratio.
 - e. Time batched.
 4. Deliver batch tickets to Inspector at the site when concrete is delivered.

5. Maintain equipment in proper operating condition, with drums cleaned before charging each batch. Schedule rates of delivery in order to prevent delay of placing the concrete after mixing, or holding dry-mixed materials too long in the mixer before the addition of water and admixtures.
6. Remove all materials, including water remaining in the ready-mix truck drum, completely before ingredients for the following loads are introduced in the drum.
7. Do not use concrete that has not been placed 30 minutes after leaving the mixer, or concrete that is not placed within 60 minutes after water is introduced into the mix. Placement time shall not be extended more than 4 hours when hydration control admixtures are used.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions and measurements affecting the work of this Section at site.
- B. As applicable for each placing operation, verify accuracy of lines, levels, elevations and dimensions for excavations, subgrade, vapor retarder and formwork.
- C. Verify reinforcing and accessories for proper position, sizes, clearances, fastenings, laps, and splices.
- D. Verify that no vapor retarder damage has occurred since the pre-installation conference inspection.
 1. Repair damage to achieve complete and continuous vapor barrier membrane.
- E. Verify that steel deck joints are sealed and that there are no openings or voids that will permit concrete leakage.
- F. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.2 PREPARATION

- A. Place items to be embedded in concrete, including but not limited to, conduits, sleeves, nailers, anchors, and rough hardware, built into concrete as indicated or required.
 1. Do not embed piping and conduits, other than steel electrical conduits, in structural concrete. Locate conduits so as to reduce strength of the structure the least amount, as approved by the Architect, and as indicated on the Drawings.
 2. Embed bolts, inserts and other items in the concrete. Secure accurately so that they are not displaced during concrete placing, compacting, and finishing operations. Wire tie, nail or bolt embeds securely to forms.
 3. Set embedded bolts for materials and equipment attached to concrete to

template, layouts, and shop drawings. Verify size, length, and location of electrical conduits with respect to equipment supports.

4. Fill voids in sleeves, inserts and anchor slots temporarily with readily removable material to prevent entry of concrete in the voids.
 5. Install expansion joint fillers where indicated, and as required to isolate concrete slabs-on-grade from other building elements such as walls and equipment pads. Cover filler with plastic joint cap and leave in place until ready to receive sealant.
- B. Moisten, do not saturate, earth subgrade and bearing surfaces. Do not place concrete on muddy subgrade.
- C. Wet wood forms thoroughly when they are not treated with form release agent. Wet other materials sufficiently to reduce suction and maintain concrete workability.
- D. Mask areas to receive sealants, caulking compounds or / waterproofing / coatings before application of curing or sealing agents.
- E. Do not proceed with placement of concrete until conditions are satisfactory.

3.3 CONVEYING

- A. Rapid handling: Transport concrete from the mixer to location of placing as rapidly as practical to avoid separation or loss of ingredients.
- B. Transporting methods: Use pipes, cranes, carts, buggies, or other approved means to deliver concrete to final locations. Do not use delivery systems (pipe, chutes, etc.) formed of aluminum for transporting concrete.
- C. Free fall:
1. As dictated by job conditions at each location, but not more than 4 ft. where concrete will be exposed in the Work and 6 ft. at all other locations. Self-Consolidating Concrete may be dropped up to 15 feet as approved by the Architect.
 2. Avoid large concentration of concrete in one location that would produce unacceptable deflection in supporting formwork or steel decking.
- D. Concrete flow:
1. Keep surface of concrete level during placing with a minimum of concrete allowed to flow from one position to another. Self-Consolidating Concrete may be allowed to flow up to 50 feet.
 2. Carry concrete up uniformly for the length of walls being placed to reduce lateral flow of concrete to 5 ft. maximum. Flowing concrete, 9 inch slump + 1 inch, may be used to place concrete in walls with a uniform elevation, with a maximum lateral flow of 10 feet. Self-Consolidating Concrete may be placed at fewer locations and allowed to flow up to 50 feet.

- E. Runways: Construct substantial runways and scaffolding to avoid movement and vibration in the forms and reinforcing steel as a result of transporting and placing concrete.

3.4 PLACING

- A. General: Comply with ACI 304. Do not place concrete in or under water.
- B. Comply with ACI 207.1R and ACI 301 for mass concrete placement and temperature control. Mass placement is defined as placement with at least a dimension greater or equal to 4 ft. For mass concrete placements, develop and obtain approval for a plan to ensure the following, during the first 72 hours of heat dissipation period:
 - 1. The temperature differential between the center core of the placement and the exposed concrete surface does not exceed 35°F.
 - 2. The temperature at the center core of the placement does not exceed 158°F.
- C. Do not place slab-on-grade until the vapor retarder or vapor barrier are inspected for damages, proper joint, and penetrations seals.
- D. Consolidation: Thoroughly consolidate concrete and work it around reinforcement and embedded items and into corners and angles of forms, by spading, rodding, and tamping to exclude rock pockets, air bubbles and "honeycombs" and to obtain required density and strength.
- E. Internal vibration:
 - 1. Use mechanical vibrators to consolidate each layer with that previously placed, to completely embed reinforcement and fixtures, and to bring fine materials to the faces and top surfaces to produce the proper finish.
 - 2. Assign at least one workman at each location where concrete is being placed to vibrate and consolidate the concrete in forms. Do not "over-vibrate" to prevent separation of ingredients.
 - 3. Keep extra standby vibrator at the site.
 - 4. Do not use vibrator to move concrete.
- F. Record: Keep records showing location, date and time of placement and quantity of concrete placed on the Project.
- G. Floor slabs: Shape slabs to the levels, slopes and elevations indicated and accurately pitch or grade to drainage fittings and fixtures installed in them. Where indicated, depress slabs to receive other finishes.
- H. Construction joints:
 - 1. Location: Locate joints to least impair the strength and appearance of the structure. Obtain the Architect's approval of construction joint locations before

casting concrete. In general construction joints shall be located as follows, unless otherwise indicated on the Drawings.

- a. In walls locate at the underside of floors or slabs, and at the top of footings or floor slabs.
 - b. In slabs-on-grade locate joints where shown on the Drawings; offset not less than 5 ft., with a maximum of 2 offsets.
 - c. In all cases make construction joints perpendicular to the main reinforcement. Continue reinforcement across joints, unless otherwise indicated.
2. Provide keyways at least 1-1/2-inch deep in construction joints in slabs, and between walls and footings; use prefabricated bulkheads specified for slabs in Section 03100. Butt joints with diamond dowels may be used at construction joints in slabs-on-grade subjected to vehicular traffic.
 3. Keep exposed face of construction joints continuously moist from time of initial set until subsequent placing of concrete against them, but not to exceed the curing period. When not damp, wet (do not saturate) the contact surface of joints for a minimum of 24 hours before placing adjoining concrete.
 - a. Before placing adjoining concrete, clean contact surfaces to remove laitance, loosened particles of aggregate or damaged concrete, and expose sound, coarse aggregates solidly embedded in the matrix.
 - b. To achieve the above, the contact surface may be washed with clean water under pressure (jet blast), may be sandblasted, or in areas which will be concealed from view when the building is completed an approved structural adhesive may be used on clean, structurally sound concrete. Remove wash water entirely from surface.
 - c. If a contact surface becomes coated with foreign materials of any nature after being cleaned, clean again to suitable condition.

3.5 FINISHING

- A. As specified in Section 03350.

3.6 CURING

- A. Formed concrete:

1. Wet the tops and exposed portions of formed concrete and keep moist until forms are removed.
2. If forms are removed before 14 days after concrete is cast, coat concrete with curing compound as specified for flatwork below.

- B. Concrete flatwork:

1. For interior slabs scheduled to remain exposed and not receive a penetrating sealer: Curing and Sealing compound Type III.
 - a. After finishing and as soon as it can be done without marring the finish, spray curing and sealing compound uniformly in compliance with its manufacturer instructions submitted to the Architect, as specified above.
 - b. When the manufacturer recommends a coverage range, use the heavier application unless otherwise permitted by the Architect.
 - c. Examine at regular intervals that the compound film is intact. If damaged, moisten the concrete and apply additional compound.
 2. For all other concrete flatwork: Curing compound Types I for interior slabs, and III clear, non-yellowing for exterior slabs.
 - a. Promptly after finishing, apply curing compound uniformly by spray at the rate at which the compound conforms to ASTM C 309 requirements.
 - b. Examine at regular intervals that the compound film is intact. If damaged, moisten the concrete and apply additional compound.
- C. Protection: Unless otherwise recommended by the curing compound manufacturer, restrict traffic on treated slabs for a minimum of 8 hours under normal conditions.

3.7 MISCELLANEOUS CONCRETE WORK

- A. Provide all other concrete work indicated or required to complete the Work, even though not specifically specified, including the following.
- B. Equipment bases and foundations:
 1. Provide machine, and equipment bases and foundations where indicated on Drawings.
 2. Set anchor bolts for machines and equipment to template at correct elevations, complying with diagrams or templates of the manufacturer furnishing the machines and equipment.
 3. Use the specified non-shrink grout, non-metallic grout under all base plates and other locations noted on the drawings. Use High Flow Grout for base plates larger than 6 square feet.
- C. Construct stairs, pits, trenches, curbs, integrally cast equipment pads and other miscellaneous concrete work to the profiles and dimensions indicated.
- D. Waterproof membranes:
 1. Perform work over waterproof membranes to prevent damage to the membranes.
 2. Schedule this work to reduce to a practical minimum the period when the

installed membrane is left without protection.

3. Prior to placing concrete, inspect the membrane and repair damage that may have occurred.

3.8 FIELD QUALITY CONTROL

A. Site tests: The following will be performed by the Owner's Testing Agency.

1. Samples will be taken during progress of the work to determine slump or slump/flow, water content, compressive strength, aggregate gradation, and grout-mix tests, with assistance furnished by the Contractor. For lightweight concrete, fresh density shall be used for acceptance of the concrete, based on the correlation of fresh density to equilibrium density for the approved mix design.
2. Minimum four 6x12 cylinders (five for 4x8 cylinders) will be made for each day's pour or for each 150 cu. yards, or 5,000 sq. ft. of surface area, whichever is less, for each type of concrete being cast with a concrete strength of 5,000psi or less. For concrete strength higher than 5,000 psi, minimum eight 6x12 cylinders (eleven for 4x8 cylinders) will be made. For post-tensioned concrete, minimum one extra cylinder will be made for a 3-day test before stressing.
3. For concrete strength of 5,000psi or less, one cylinder will be tested at 7 days for information. Two 6 in. x 12 in. or three 4 in. x 8 in. cylinders at 28 days shall be tested for acceptance. The remaining cylinder will be kept in reserve in case tests are unsatisfactory. For high strength concrete, 6,000 psi or higher requires two additional cylinders (three for 4x8 cylinders) tested at 90 days and 180 days separately.
4. Samples will be made in compliance with ASTM C172.
5. Specimens will be made and cured in compliance with ASTM C31.
6. The 28-day, 90-day and 180-day values will be the criteria for acceptance of concrete regarding strength only.
 - a. 7-day tests may be regarded as indicative of compliance or non-compliance with the 28-day, 90-day and 180-day strength requirements, and the Contractor should be guided accordingly in matter of adjusting proportions, if necessary, and notify the Architect.
 - b. 7-day tests shall also be a guide to the Contractor regarding time for form removal.
 - c. See general notes of structural drawings for concrete strength that 10,000 psi or higher strengths are required at 56 or 90 days.
7. Verification and control of water content shall be done by slump testing, review of truck delivery tickets from the batch plant and monitoring the water content by use of the microwave test AASHTO T318, "Standard Method of Test for Water Content of Freshly Mixed Concrete Using the Microwave Oven." Slump tests will

be made for each set of tests cylinders in compliance with ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

B. Test Evaluation:

1. Concrete cylinder test will be evaluated in compliance with ACI 214 and 318.
2. If 28-day, 90-day and 180-day test results indicate that concrete strength is not as specified, core concrete as directed by the Architect in compliance with ASTM C42.
 - a. Plug core hole solid with specified non-shrink grout or other material as approved by the Architect.
 - b. The cost of cores, tests and patching shall be borne by the Contractor.
3. In the event that additional core tests do not show strength required, or as determined by load tests made in compliance with ACI 318, the defective concrete shall be removed and replaced, or shall be reinforced as directed by the Architect, at the Contractor's expense.
4. If core tests results fall below design strength specified, adjust the concrete mix or lower the water cementitious material ratio for future batches, at no additional cost to the Owner.
5. The testing agency shall provide a statistical analysis of all mix designs 8000 psi or higher strength. The average strength, standard deviation, w/cm and slump or slump flow shall be reported to the Architect, Structural Engineer, Owner, General Contractor, and others on the test distribution list each month.

C. Defective concrete:

1. Concrete which does not meet the requirements of the Contract Documents will be deemed defective.
2. Remove defective concrete as directed by Architect and replace with concrete meeting the requirements of the Contract Documents, at no additional cost to the Owner.

3.9 PROTECTING / CLEANING

- A. Take suitable precautions in compliance with applicable ACI requirements to secure satisfactory concrete in either hot or cold weather.
- B. Restrict construction vehicular traffic on slabs-on-grade to prevent damage and staining.
- C. Protect concrete to prevent damage and staining.

- D. Protect work of other trades from damage by work of this Section with heavy Kraft paper securely taped in place.
 - 1. Maintain protection in effective condition for as long as need for protection exists.
 - 2. Control use of water within the building so that no damage to previously installed work or existing structure and finish will occur.
- E. Upon completion, wash and clean exposed concrete and leave free of oil, paint, plaster, and foreign substances, ready to receive applied finishes or to be left exposed.

END OF SECTION

SECTION 03 62 00

NON-SHRINK GROUTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Grout under column base plates, and elsewhere as shown on the Drawings and required by job conditions.

1.2 SUBMITTALS

- A. Data: Submit manufacturer's product data, specifications, and other data as necessary to demonstrate compliance with the specified requirements for each type of grout proposed for use.

1.3 HANDLING

- A. Delivery:
 - 1. Deliver materials to project site in original unopened packages, clearly labeled with manufacturer's identification labels intact and legible, indicating manufacturer's name, brand, type, source of product, date of manufacture, UL classification, expiration date and grade.
 - 2. Protect materials from excessive moisture in shipment, storage, and handling.
- B. Storage: Store materials indoors, off the ground on pallets, protected with breathing type covers.

1.4 PROJECT CONDITIONS

- A. Do not install grout under adverse weather conditions, or when temperature, humidity or other environmental requirements are beyond manufacturer's recommended limits.

1.5 SEQUENCING

- A. Obtain setting templates from affected trades where the spacing and alignment of anchors, bolts, and similar items is critical.
- B. Embed anchors, bolts, inserts and other items in grout as the Work progresses.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of design is for “Crystex” high flow, non-shrink grout by L & M Construction Chemicals, Inc. Other acceptable materials/manufacturers include the following:
 - 1. “Masterflow 713” by Master Builders.
 - 2. “Five Star Grout” by US Grout Corp.
 - 3. Or equal.

2.2 MATERIALS

- A. Grout: Pre-packaged, non-metallic, non-gaseous, non-shrinking when tested in accordance with ASTM C 1107 Grade B or C at a fluid consistency (flow cone) of 20 to 30 seconds.
 - 1. 30-minute old grout shall flow through flow cone after slight agitation, in temperatures of 40 to 0 deg. F and bleed free.
- B. Grout strength:
 - 1. Under base plates for steel columns: Minimum 7,500 psi 28-day strength.
 - 2. At non-structural locations: Minimum 4,000 psi 28-day strength.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and surfaces to receive materials, and conditions under which materials will be applied.
- B. Verify surfaces to receive grout are free from dust, construction debris, oil, grease, waxy films, curing compounds, release agents and other deleterious materials that would negatively affect the quality of installation, durability and material performance.
- C. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.2 PREPARATION

- A. Concrete surfaces:
 - 1. Clean concrete that will be in contact with grout of dust, construction debris, form oil, curing compound and other contaminants.
 - 2. Roughen concrete surfaces by chipping or sandblasting to expose coarse aggregate.
 - 3. Presoak concrete and masonry surfaces thoroughly for not less than 24 hours

prior to grouting to reduce their suction.

- B. Steel: Remove loose rust and scale, oil, dirt, and other contaminants.
- C. Correct conditions detrimental to the proper and timely completion of this work before proceeding with installation.

3.3 COORDINATION

- A. Obtain setting templates from affected trades where the spacing and alignment of anchors, bolts, and similar items is critical.
- B. Embed anchors, bolts, inserts and other items in grout as the work progresses.

3.4 GROUTING

- A. Mix grout with recommended amount of water in a mixer, all in compliance with its manufacturer's instructions. Do not place grout when ambient temperature is not within the range recommended by its manufacturer.
- B. Construct watertight forms around base plates to provide an approximately one-inch clearance on 3 sides, and additional clearance on the fourth side as necessary to accommodate the flow box into which the grout will be placed and funneled under the base plates.
- C. Grouting under base plates:
 - 1. Place grout under base plates to the thickness indicated on the Drawings, but in no case less than one inch.
 - 2. Wherever possible place grout from one side only to minimize cold joints and air entrapment. Use rods and straps to move grout to its final location. To prevent bleeding and segregation, avoid the use of vibrators.
 - 3. Place grout at least 1/4-inch above the bottom of the base plate to insure complete filling of the grout space.
 - 4. Cut grout shoulders back at a 45 degrees angle from the base of the plate to the concrete foundation just before the grout hardens.
- D. Railing posts, anchor bolts, frames, sills, and similar items:
 - 1. Roughen inside surfaces of grout pocket before proceeding.
 - 2. Brace items plumb and level and leave bracing in place until grout reaches its full strength. Finish grout flush with adjacent surfaces.
- E. Curing: Cure grout in compliance with its manufacturer's printed instructions to prevent rapid evaporation of water and shrinkage cracks.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Extent of structural steel work shown on Drawings including schedules, notes and details for size and location of members, and type of steel required or as required to complete the work.
2. Structural steel is that work defined in American Institute of Steel Construction (AISC) "Code of Standard Practice", as required to provide support for exterior cladding shading devices, skylights, interior construction and as otherwise shown on drawings.
3. Members and Connections: Details shown are typical; similar details apply to similar conditions unless otherwise indicated. Verify dimensions at site without causing delay in work. Where connections to existing steel are required, promptly expose the existing steel and verify dimensions and conditions at site without causing delay in work.
4. Promptly notify Owner's Representative whenever design of members and connections for any portion of structure are not clearly indicated.

B. Related work:

1. Division 3 for non-shrink grout.
2. Division 5 for metal deck, metal fabrications, etc.

1.2 REFERENCES

A. Codes and Standards: Comply with provisions of following, based on the latest edition, except as otherwise indicated:

1. 2022 California Building Code (CBC).
2. American Institute of Steel Construction (AISC) Manual of Steel Construction (LRFD), Fourteenth Edition, including Specification for Structural Steel Buildings.
3. AISC Code of Standard Practice for Steel Buildings and Bridges except that Section 4, Paragraph 4.4.1(b) is deleted. Substitute the following: "Connections submitted in accordance with Section 3.1.2 shall be designed by a California Registered Professional Engineer (civil) employed by the Contractor, unless such connections are specifically designed in the Contract Documents. Submit all connection calculations for review." Omit reference to Owner responsibility in

AISC Code "Commentary" paragraph 4.4.1, relative to responsibility for connections.

4. American Welding Society (AWS) Structural Welding Code (AWS D1.1)
5. AWS D1.8 Structural Welding Code – Seismic Supplement
6. Welding Zinc-Coated Steel (AWS D19.0)
7. Research Council on Structural Connections (RCSC) Specification for Structural Joints Using A325 or A490 Bolts.
8. American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and other Structures (ASCE 7-22)
9. American Society of Testing Materials (ASTM) General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use (ASTM A6).
10. Steel Structures Painting Council (SSPC) "Steel Structures Painting Manual"
11. American Concrete Institute (ACI) Building Code and Commentary (ACI 318-19)
12. AISC "Specifications for Architecturally Exposed Structural Steel," (latest edition)

1.3 SUBMITTALS

- A. Product Data: Submit for information producer or manufacturer's specifications and installation instructions for the following products. Include laboratory tests reports and other data to show compliance with specifications (including specified standards).
 1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
 2. High-strength bolts (each type), including nuts and washers.
 3. Structural steel primer paint.
 4. Shrinkage-resistant grout.
- B. LEED Submittals:
 1. Product Data for Credit MR 4: Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating cost for each product having recycled content.
 2. Product Data for Credit MR 5: Product data for regional materials indicating location and distance from Project site of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is

considered regional.

- C. Shop Drawings: Submit for action detailed, coordinated, and checked shop drawings for all structural steel components prior to the start of fabrication and/or erection. Shop drawings shall show:
1. Items as required by AISC 360, AISC 341 and Code of Standard Practice.
 2. Shop drawings for structural members requiring penetrations shall contain a statement confirming that the Contractor has coordinated the location and size of all the openings.
 3. Shop drawings stamped and signed by California licensed civil or structural engineer for all back up support steel framing (HSS sections, angles, plates, etc.) as required for exterior cladding systems to be designed and detailed as specified in related sections.
- D. Erection Drawings: Submit for action detailed, coordinated, and checked erection drawings for all structural steel for review prior to the start of fabrication and/or erection. Erection drawings shall show:
1. Items as required by AISC 360, AISC 341 and Code of Standard Practice.
- E. Test Reports: Submit for information copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) conducted and test results and state whether compliance or non-compliance with specifications.
- F. Welding Procedure Specifications
1. Submit for action Welding Procedure Specifications (WPS) for each weld to be used on the Project. Referenced WPS on the shop and erection drawings where they are to be used. Submittals consisting of additional WPS's not specifically referenced on the shop or erection drawings will be rejected. The Contractor shall also submit the manufacturer's product data sheets for all welding material to be used and shall use the more stringent of AWS and manufacturer tolerances in developing WPS. The data sheets shall describe the product, limitations of use, recommended welding parameters, and storage and exposure requirements, including baking and rebaking, if applicable.
 2. Welding Procedure Specifications (WPS's) shall specify the items, tolerances and variables required by AWS D1.1 and D1.8.
 3. Submit for action Welding Procedure Qualifications when proposed welds are not defined as prequalified by AWS D1.1.
- G. Welder Performance Qualification Records (PQR): The Contractor shall submit written PQR for all welding personnel under the Contractor's supervision who will be performing on the Project. The PQR shall document the successful completion of the appropriate welding personnel qualification tests. All welder qualification testing shall be performed in accordance with the current or a previous version of AWS D1.1. The Contractor shall also submit additional documentation that the welder has passed all

designated supplemental welder qualification testing required for the types of welding to be performed, including Supplemental Welder Qualification for Restricted Access Welding in Annex C of AWS D1.8.

- H. Contractor's Statement of Responsibility: Each Contractor responsible for the work shall submit a written Statement of Responsibility prior to commencement of the work. The statement shall contain the following:
1. Acknowledgement of awareness of the special requirements contained in the Quality Assurance, Quality Control, and the Submittals Sections of this Specification, special requirements contained in all reinforced codes and standards, and an acknowledgement of the special requirements contained in the statement of special inspection.
 2. Acknowledgement that control will be exercised to obtain conformance with the construction documents.
 3. Procedures for exercising control within the Contractor's organization, the method and frequency of reporting, and the distribution of reports.
 4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site at such intervals to ensure uninterrupted progress of work.
- B. Deliver anchor bolts, templates, and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay work.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- D. Store weathering steel and galvanized steel above ground, under cover, separated from one another with strip spacers, in a dry, well ventilated conditions to avoid wet storage stains.
- E. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as approved.

1.5 QUALITY ASSURANCE AND QUALITY CONTROL

- A. Source Quality Control: Materials and fabrication procedures are subject to inspection and test in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.
 1. Promptly remove and replace materials or fabricated components that do not comply.

- B. Regional Materials: Verify manufacturer's certificate demonstrate that steel products were extracted, harvested, or recovered, as well as manufactured within 500 miles of the Project site.

- C. Qualification of Welding: Qualify welding processes and welding operators in accordance with American Welding Society "Structural Welding Code," AWS D1.1 and ASW A4.3 "Standard Qualification Procedure."
 - 1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
 - 2. Welding personnel shall be qualified in accordance with AWS D1.1, Section 4, Parts A and C. Welders who have not used the given welding process for a period of six or more months shall be re-qualified. Welders whose work routinely exhibits poor workmanship in the opinion of the Owner's Representative shall be re-qualified without additional cost to the Owner before performing further welding.
 - 3. PQR testing performed more than six months prior to the start of the welding by the welder is acceptable, provided written documentation is submitted showing that the welder has continued to use the applicable welding process on an ongoing basis since the test was conducted, with no lapse in service exceeding six months.

- D. VOC Limits: Use steel accessories that comply with National VOC rule of the United States Environmental Protection Agency as defined in "40 CFR Part 59, National Volatile Organic Compound Emission Standards for Architectural Coatings."

- E. Inspection and Testing Agency
 - 1. Owner will select an independent testing and inspection agency to perform the inspections and tests listed in Division-1, Quality Control, as required by AISC 360, AISC 341 or as shown on the Drawings, to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports.
 - 2. Testing Agency: Conduct and interpret tests and state in written reports whether test specimens comply with requirements and specifically state any deviations there from.
 - 3. Contractor shall provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
 - 4. Testing agency may inspect structural steel at plant before shipment; however, Owner's Representative reserves the right, at any time before final acceptance, to reject material not complying with specified requirements.
 - 5. Contractor shall correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests at Contractor's expense, as may be

necessary to reconfirm any non-compliance of original work, and as may be necessary to show compliance of corrected work.

6. Testing Agency shall inspect and test as specified.
 - a. Inspector qualifications shall be per AISC 341 Chapter J and AISC 360 Chapter N.
 - b. Shop & Field Bolted Connections: Inspect in accordance with the Drawings, AISC 341 Chapter J and AISC 360 Chapter N.
 - c. Shop & Field Welding: Inspect and test during fabrication and during field erection of structural steel assemblies per AISC 341 Chapter J and AISC 360 Chapter N.
 - 1) Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work and report rejectable weld defect rates greater than three percent for any given welder to the Owner's Representative. Record work required and performed to correct deficiencies.
 - 2) Perform visual inspection of each and all welds during the welding work and confirm use of proper WPS. Welds executed not in conformance with WPS shall be considered rejectable.

1.6 PRE-FABRICATION / PRE-ERECTION CONFERENCES

- A. Prior to performing any fabrication or erection work, the Owner's Representative, Quality Assurance Personnel, Inspectors, and Contractor personnel supervising shop, field, and Quality Control work shall hold a Pre-Fabrication and Pre-Erection Conference to review welding procedures and inspection requirements for all welding and bolting operations.

1.7 SEISMIC LOAD (FORCE) RESISTING SYSTEM

- A. The Seismic Load (Force) Resisting System (SLRS or SFRS) is defined as the assembly of structural elements that resist seismic loads, including struts, collectors, chords, diaphragms and trusses. Included in the SLRS (or SFRS) are the columns, beams, girders and braces, and the connections between these elements, specifically designed to resist seismic forces, as designated on the contract documents. The SLRS (or SFRS) does not include members that provide out-of-plane bracing to components of the SLRS (or SFRS), nor does it include other structural members designed to resist only gravity loads.
- B. All details referenced as applying to members of the SLRS (or SFRS) shall be considered part of the SLRS (or SFRS).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: For fabrications of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding and repair as specified in AWS D1.1, prior to cleaning, treating and application of surface finishes.
- B. Structural Steel Shapes, Plates and Bars: as indicated on the Drawings.
 - 1. Finish: Shop primed except where indicated to be galvanized or to be left unpainted.
- C. Cold-Formed Steel Tubing: ASTM A500, Grade C.
 - 1. Finish: Shop primed except where indicated to be galvanized or to be left unpainted.
- D. Steel Pipe: ASTM A53, Type E or S, Grade B.
 - 1. Finish: Shop primed except where indicated to be galvanized or to be left unpainted.
- E. Shear Stud-Type Connectors: ASTM A108, Grade 1015 or 1020, cold finished carbon steel; with dimensions complying with AISC Specifications and Type B per AWS D1.1, Sections 7.2 and 7.3. (Nelson Shear Connector Studs) or equal; sized as indicated.
- F. Provide hexagonal nuts for all connections.
- G. Unfinished Threaded Fasteners: ASTM A307, Grade A, regular low-carbon steel bolts and nuts, only where indicated.
 - 1. Provide hexagonal heads and nuts for all connections.
- H. High Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers as follows:
 - 1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A325, unless noted otherwise.
 - 2. Quenched and tempered steel bolts, nuts and washers, complying with ASTM A490.
 - 3. Direct tension indicator washer-type bolts per ASTM F959, or twist-off-type tension control bolts per ASTM F1852 shall be used at all pre-tensioned bolts.
- I. Electrodes for Welding: Welding material shall comply with AWS A5.1, A5.5, A5.17, A5.18, A5.20, A5.23, A5.25, A5.26, A5.28, A5.29, and A5.33.
 - 1. The filler metals shall be classified as low hydrogen under the provisions of AWS D1.1.

2. For welded joints on members comprising the Seismic Load (Force) Resisting Systems, welding filler metals shall be classified for nominal 70 ksi tensile strength, referred to as E70 electrodes, regardless of welding process, and shall provide the following minimum mechanical property requirements:
 - a. CVN toughness of 20 ft-lbs at 0 degree Fahrenheit using AWS A5 classification test method.
 - b. For Demand Critical welds as required by AISC 341 or as otherwise shown on the Drawings, provide additional CVN toughness of 40 ft-lbs. at 70 degrees Fahrenheit using test procedures prescribed in AISC 341 Appendix W.
 - c. Yield strength: 58 ksi minimum using both AWS A5 classification test for E70 classification tests and the test procedures prescribed in AISC 341.
 - d. Tensile strength: 70 ksi minimum using both AWS A5 classification test for E70 classification tests and the test procedures prescribed in AISC 341.
 - e. Elongation: 22 percent using both AWS A5 classification test and the test procedures prescribed in AISC 341.
- J. Structural Steel Primer Paint: Fabricator's standard rust-inhibiting primer. Rust-inhibiting, long oil alkyd, Tnemec, or equal and shall be formulated for exterior exposure for extended periods up to 1 year. Rust-inhibiting, long oil alkyd, Tnemec 90-97 Gray, and Tnemec Uni-Bond 115, or equal, for interior exposures.
- K. Recycled Content of Steel Products: Postconsumer recycled content shall be based on steel produced from electric arc furnaces (EAF). The recycled content value is based on the post-consumer percentage (56.6%) plus one-half of poste-industrial percentage (32.6%) for total recycled content not less than 74.9%.

PART 3 - EXECUTION

3.1 FABRICATION

- A. Fabricate structural steel in accordance with the AISC Specifications with the modifications and additional requirements specified herein and as indicated on the Drawings.
- B. Shop Connections: Weld or bolt as indicated on the drawings or as otherwise required.
- C. Bolt field connections except where welded connections are indicated. Use high-strength threaded fasteners for all bolted connections, except where unfinished bolts are indicated.
- D. Install high strength threaded fasteners in accordance with RCSC Specification for Structural Joints.
- E. Welded Construction

1. Each welder working on the Project shall be assigned an identification symbol or mark. Each welder shall mark or stamp his or her identification symbol at each weldment completed. Stamps, if used, shall be the low-stress type.
 2. WPSs shall be available to welders and inspectors prior to and during the welding process. Prior to welding, joint fit-up shall be verified by the welder for conformance with the WPS and AWS D1.1.
 3. Welding shall be performed in accordance with the appropriate WPS for the joint.
 4. Groove welds shall be complete joint penetration groove welds, unless specifically designated otherwise on the Drawings. Groove preparation details are at the Contractor's selection, subject to qualification, if required, in accordance with AWS D1.1.
 5. Weld tabs shall be in accordance with AWS D1.1 Section 5.31 as modified herein. End dams shall not be used.
 6. Backing shall be in accordance with AWS D1.1 Section 5.10, AISC 341 or as shown on the Drawings.
 7. Faces of fillet and groove welds exposed to view shall have as-welded surfaces that are reasonably smooth and uniform. Unless indicated on the Drawings as required by AISC 341 or AISC 358, or as required for Architecturally Exposed Structural Steel, no finishing or grinding shall be required, except where clearances or fit of other items may so necessitate.
 8. For all CJP and PJP groove welds subjected to ultrasonic testing (UT), a visible mark shall be placed as required by AISC 341.
- F. Bolted Construction: Store fasteners in a protected place. Except for ASTM F1852 "twist-off" type assemblies, clean and relubricate bolts, nuts and washers that become dry or rusty before use. F1852 fastener components may be relubricated following the manufacturer's written instructions, and must be retested after relubrication and prior to use to verify suitability for installation.
1. Do not use flame cutting to align bolt holes except as permitted by RCSC specification.
 2. Ream holes that must be enlarged to admit bolts. Do not enlarge holes by more than 1/32 inch. Should additional reaming beyond 1/32 inch be necessary, drill or ream to the next larger hole size and use the next larger size bolt, with Owner's Representative approval.
 3. Bolt holes may be made by punching or drilling. Bolt holes may also be made by thermal cutting to a smaller diameter, followed by reaming to the required diameter.
- 3.2 COLUMN BASES, BEARING PLATES & ANCHOR RODS
- A. Provide column base plates, anchor rods, templates and leveling plates as noted in the

Drawings.

- B. Provide bearing plates under beams resting on footings, piers or walls.
- C. Mill or press level column bases, bearing plates, and leveling plates as required. Provide loose plates for setting, as specified in Division-3, Cast-in-Place Concrete.

3.3 MISCELLANEOUS STEEL SUPPORT FRAMING

- A. Select members that are true and straight for fabrication of steel wall framing. Straighten as required to provide uniform, square and true members in completed wall framing.

3.4 HOLES FOR OTHER WORK

- A. Provide holes where indicated or as required for securing other work to steel framing, and for the passage of such work through steel framing members, as shown on approved shop drawings.
- B. Provide threaded nuts welded to framing and other specialty items as indicated to receive other work.
- C. Cut, drill or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

3.5 SHOP PAINTING

- A. General: Shop paint structural steel, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel, which is partially exposed on exposed portions and initial 2" of embedded areas only.
 - 1. Do not paint surfaces that are to be welded or high-strength bolted with friction-type connections.
 - 2. Do not paint surfaces that are scheduled to receive sprayed-on fireproofing.
 - 3. Apply 2 coats of paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.
 - 4. Interior items: Shop prime with shop primer indicated.
 - 5. Exterior items: Shop prime with shop primer indicated.
- B. Surface Preparation: After inspection and before shipping, clean steelwork to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Clean steel in accordance with SSPC as follows:
 - 1. SP-1 "Solvent Cleaning."
 - 2. SP-2 "Hand Tool Cleaning"

3. SP-6 "Commercial Blast Cleaning" when extended field exposure is expected.

- C. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and at a rate to provide dry film thickness of not less than 1.5 mils. Use painting methods that result in full coverage of joints, corners, edges and exposed surfaces. Apply two coats of paint to surfaces that are inaccessible after assembly or erection.

3.6 INSTALLATION

- A. Erect structural steel in accordance with the AISC Specifications, AISC 358 and AISC Code of Standard Practice, with the modifications and additional requirements specified herein.
- B. Provide suitable and safe erecting equipment for workman. Maintain equipment in a safe and stable condition until the steel structure is fully self-supporting. Conform to the requirements governing safety and health regulations for construction equipment and construction safety.

3.7 ANCHOR RODS

- A. Provide anchor rods, leveling plates, and other connections between the structural steel and foundations for setting as specified in Division-3, Concrete. Provide templates with the anchor rods as may be required to locate the anchor rods and other connections accurately and correctly. Check and verify vertical and horizontal alignment of anchor rods before setting of structural steel. If any errors are noted, make corrections.

3.8 FIELD ASSEMBLY

- A. Accurately assemble structural steel framing to the lines and elevations indicated. Align and adjust the various members forming parts of a completed frame or structure before permanently fastening. Fasten splices of compression members after the abutting surfaces have been brought completely into contact. Clean all bearing surfaces that will be in permanent contact before the members are assembled.
- B. Temporarily connect all members with sufficient bolts to ensure the safety of the structure until permanent connections are made. Provide all temporary guys, braces, etc., necessary to protect the framing against wind and construction loadings and maintain the structure plumb and in proper alignment until such time as the work of other trades is in place and the structure is complete.
- C. Level and plumb individual members of structure and the structure as a whole per AISC tolerances or as otherwise detailed on the Drawings, whichever is more stringent. Coordinate tolerances requirements prior to fabricating and erecting steel.
- D. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

- E. If members do not fit properly in the field, drill necessary new holes as approved by the Owner's Representative. When required by the Owner's Representative and without additional cost to the Owner, provide structural calculations stamped and signed by a California Registered Professional Engineer (civil) demonstrating that the revised connection satisfies the design intent shown on the Drawings.
- F. Members that are warped or bent may be rejected if, in the opinion of the Owner's Representative, they are unserviceable. Otherwise, correct bent or warped members to the satisfaction of Owner's Representative before being erected.
- G. Splices will be permitted only where indicated. All erection bolts used in welded construction may be tightened securely and left in place; if erection bolts are removed, fill holes with plug welds.
- H. The bracing and adequacy of temporary connections, and the removal of paint on surfaces adjacent to field welds shall be as specified in the AISC Specifications.
- I. Erect columns and attached base plates (using non-shrink grout installed under Division 3; verify grout pad levels and construction before proceeding with the work.) Securely brace and guy columns and hold them plumb in line until bolting has been completed.
- J. Tighten anchor rods after supported members have been positioned and plumbed.

3.9 CONNECTIONS

- A. All shop and field connection to be welded or high-strength bolted unless otherwise indicated.
- B. Completely fabricate all items of structural steel that are to be built into or anchored into masonry or concrete, complete with bolts, anchors, clips, stud anchors, etc., to engage with the adjacent construction.
- C. Only light drifting will be permitted to draw parts together. Drifting to match unfair holes will not be permitted. Any enlargement of holes necessary to make connections shall be done by reaming and twist drills with the use of proper size bolts.
- D. Correct any error in shop or field work which prevents the proper assembling and fitting of parts by the moderate use of drift pins or a moderate amount of reaming and slight clipping or cutting at the expense of the Contractor.

3.10 SURFACE FINISH

- A. Flush Surfaces: Welds in butt joints required to be flush shall be finished so as to not reduce the thicknesses of the thinner base metal or weld metal by more than 1/32 inch or 5% of the material thickness, whichever is less. Remaining reinforcement shall not exceed 1/32 inch in height. However, all reinforcement shall be removed where the weld forms part of a faying or contact surface. All reinforcement shall blend smoothly into the plate surfaces with the transition areas free from undercut.
- B. Finish Methods and Values: Chipping and gouging may be used, provided these

methods are followed by grinding. Where surface finishing is required, surface roughness values shall not exceed 250 micrometers, unless otherwise noted or specified in this Specification. Regardless of the surface finish required, the direction of grinding marks may be in any direction.

- C. Measurement of surface finish values by visual appearance or tactile comparison is acceptable.

3.11 WELD ACCEPTANCE CRITERIA

- A. Owner's Representative's Authority: Welds or portions of welds that fail to meet the acceptance criteria of AWS D1.1 shall be repaired or replaced. The Contractor may request acceptance by the Owner's Representative of a weld discontinuity without repair or replacement when the Contractor can prove that the effect of the discontinuity will not be detrimental to the performance of the structure. The Owner's Representative is the final authority for acceptance of such welds.
- B. Regions of welds that cannot be inspected shall be identified and recorded and the Owner's Representative shall be notified in writing.
- C. Ultrasonic Testing – Flaw Detection: When ultrasonic testing is required, the joint shall be scanned for flaw detection purposes following the procedures prescribed in AWS D.1.1, Annex S, with exceptions as noted below. Joints that fail the acceptance criteria described below may be inspected using the Ultrasonic Testing – Flaw Sizing methods as prescribed in this Specification or, at the Contractor's option, may be excavated for further investigation and repaired, then reinspected using these Flaw Detection procedures.
- D. PJP groove welds joints shall not be rejected on the basis of indication ratings (db values) from the root area of the weld. Notches within the weld, located a distance more than 1.8 inch from the as-welded root, shall be scanned for acceptance using the criteria above.

3.12 GAS CUTTING

- A. The use of a gas cutting torch in the field for correction fabrication errors will not be permitted on any member in the structural framing unless approval of the Owner's Representative has been obtained.

3.13 CORRECTIVE WORK

- A. There shall be no field cutting or alteration of structural steel members or connections without prior review by the Owner's Representative.
- B. Structural elements having errors or which do not satisfy tolerance limits shall be repaired. Repairs to structural steel, fasteners and welds shall be as required by AISC Specifications, AISC 358, AWS D1.1 and AWS D1.8.
- C. Submit drawings showing reasons for and detail of proposed corrective work for approval by the Owner's Representative prior to performing corrective work.

Corrective work shall be performed in accordance with the requirements of the Contract Documents accompanied by a repair procedure and substantiating calculations prepared by a California Registered Professional Engineer (civil).

3.14 TOUCH-UP

- A. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.
- B. Apply by brush or spray to provide minimum dry film thickness of 1.5 mils.
- C. Cleaning and touch-up painting of field weld, bolted connections, and abraded areas of shop paint on structural steel is included in Division 9 under painting work.
- D. For touching-up of galvanized steel, comply with AHDGA "Recommended Practice for Touchup of Damaged Galvanized Coatings", and ASTM A780.

3.15 TEMPORARY PLANKING

- A. Provide temporary planking for the safety of workmen and for the working platforms as required. Such temporary planking to remain in place until approved to be removed from the Project site.

END OF SECTION

SECTION 05 31 00

STEEL DECKING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Steel decking.
2. Filler pieces and metal closure pieces.
3. Supplementary parts and components, such as clips, fasteners, supplementary framing, and other miscellaneous accessories required for a complete installation.

1.2 SYSTEM DESCRIPTION

- A. Unless noted otherwise on the Drawings, steel deck does not require shoring.
- B. When the weight of wet concrete fill is expected to exceed the deck manufacturer's published data for safe capacity and allowable deflection, design, engineer, fabricate, assemble and install temporary shoring and its connection to adjacent construction to conform to the profiles indicated and to other requirements of the Contract Documents, to satisfy applicable governing codes and regulations, and to provide structurally sound assemblies until concrete fill has attained its 28-day strength.

1.3 SUBMITTALS

A. Data:

1. Submit steel deck manufacturer's product data, specifications, typical installation details and other data as necessary to demonstrate compliance with the Drawings, specified requirements and the requirements of the authorities having jurisdiction.
2. Submit the steel deck manufacturer's recommendations for welding rods.

B. Shop drawings:

1. Submit large scale, dimensioned shop drawings showing section profiles, trim, sizes, and material thickness/gage.
2. Include plan layout drawings showing openings, sump pans, supports, connections, welds and erection instructions.
 - a. Identify welds by AWS welding symbols.

- b. Indicate temporary shoring of decking where required.
- 3. Coordinate shop drawings with the work of other trades that are part of, or will be incorporated into, the work of this section. Indicate the work to be performed by other trades, including adjacent and abutting materials to which this work is to be secure, and provide drawings showing all slab penetrations per level on a single plan per level.
- 4. Submit drawings showing all hangers and seismic braces per level on a single plan per level. Indicate magnitude of applied gravity and seismic loads at each location.
- C. Certificates: Submit welder's certificates demonstrating welders to be employed in this work are current in their certification.
- D. Installation instructions: Submit steel deck manufacturer-prepared instructions concerning the proper installation sequence of steel deck.

1.4 QUALITY ASSURANCE

- A. Welder's qualifications: Qualify welding operators and welding procedures in compliance with AWS "Qualification" requirements of AWS D1.1 for steel and AWS D1.3 for sheet steel.
 - 1. Verify welders to be employed in this work have satisfactorily passed AWS qualification tests and are current in their certification.
 - 2. If re-certification is required, retesting will be Contractor's responsibility.
- B. Regulatory requirements:
 - 1. Comply with fire resistance ratings indicated and required by the authorities having jurisdiction.
 - 2. Provide materials, accessories and application procedures listed by UL or tested in for the fire resistive construction ratings shown or required.

1.5 HANDLING

- A. Delivery: Deliver materials to project site in original protective wrappings, clearly labeled with manufacturer's identification labels intact and legible, indicating manufacturer's name, type, source of product, UL classification, testing and inspection.
- B. Storage:
 - 1. Store materials above ground and under cover.
 - 2. Store galvanized steel assemblies, separated with strip spacers, in dry, well-ventilated conditions to avoid wet storage stains.
- C. Handling:

1. Handle steel decking that will remain exposed in the Work to prevent damaged during shipping and handling.
2. Work showing dents, creases, burrs in cells, deformations, weathering or other defects affecting its use will not be accepted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Galvanized steel sheet: Structural quality: ASTM A 653 SS or A1063, Grade 50 minimum galvanized coating designation G60.
- B. Miscellaneous steel shapes: ASTM A 36.

2.2 ACCESSORIES

- A. Welding rods: Select welding rods in accordance with steel deck manufacturer's recommendations and AWS specifications for the metal alloy to be welded.
- B. Galvanizing repair paint: Basis of design is for "90-97Tneme-Zinc" by Tnemec Co. Other acceptable manufacturers, when approved by the Architect, include the following:
 1. "MZ-4" by Valspar Corp.
 2. "Catha-Coat 303H" by Devoe Coatings.
 3. "Amercoat 68HS" by Ameron Protective Coating Division.

2.3 FABRICATION

- A. Decking:
 1. Types and profiles indicated on the Drawings, formed in lengths to span 3 or more supports, unless otherwise indicated, with flush, telescoping, or nested ends, end laps and nesting side laps.
 - a. Composite decking shall have either mechanically fixed shear devices such as embossments, holes or welded buttons, or inverted triangular shaped ribs.
 - b. Fabricate decking supporting waterproofing membrane, roofing and elastomeric coating with vent tabs protruding and staggered in the low flutes, 12-inch maximum o.c., or other joint deformation, to provide a minimum 1.5-percent openings (uniformly distributed) of the total deck area for relief of vapor pressure; do not use vent tabs to support mechanical equipment.

- B. Fabricate metal closure strips, column flashing, access hole covers and cover plates from sheet steel of the same quality as deck units.
- C. Hangers for suspended ceilings: Fabricate lip tabs and integral tabs from minimum 16-gage galvanized steel, sized and shaped to safely support 100 lbs. pull through hole in tab.
 - 1. Tabs shall project at least 2-inch below fireproofing.
 - 2. Slots or holes punched in decking for installation of pigtail wires are not permitted, except for decking supporting insulating concrete.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions and measurements affecting the work of this Section at site.
- B. Correct detrimental conditions before proceeding with installation.

3.2 INSTALLATION

- A. Install decking and accessories in compliance with their manufacturer's recommendations and the approved shop drawings.
- B. Coordinate and cooperate with other trades in locating decking bundles to prevent overloading of structural framework.
- C. Place decking on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting steel supports not less than 2-inches and masonry and concrete supports not less than 4-inches before fastening permanently.
 - 1. Do not stretch or contract side lap interlocks. Place decking in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting deck units.
 - 2. Cut and fit decking and accessories around other work projecting through or adjacent to the decking as shown on the Drawings. Provide neat, square and trim cuts.
- D. Do not use decking for storage or working platforms until permanently secured.
 - 1. Coordinate protection and bracing of metal decking used as runway for transporting concrete.
 - 2. Verify that decking manufacturer's directions for protection are followed.

3.3 FASTENING

- A. Welding: Weld decking permanently to steel supporting members. Comply with the Drawings and AWS D1.1, Structural Welding Code - Steel, and AWS D1.3, Structural Welding Code - Sheet Steel.
- B. Side joints: Fasten interlocking side closures as noted on the Drawings.

3.4 OPENINGS

- A. Reinforce openings as indicated on the Drawings.
 - 1. Provide additional steel reinforcing and closure pieces as required for strength, continuity of decking and support of other work as shown.
 - 2. Provide openings required for work of other trades that are not indicated on Drawings only after approval from the Architect of proposed size, location and reinforcing. Cost of such openings and their reinforcing shall be borne by the Contractor.
- B. Form metal closure plates to configuration required to provide tight-fitting closures at open ends of cells of flutes and sides of decking.
 - 1. Adjusting plates: Provide in locations too narrow to accommodate full-size deck units and install as recommended by the deck manufacturer and as indicated on the approved shop drawings.
 - 2. End closures: Provide metal cover plates or joint tape at joints between decking sheets to be filled with concrete to prevent concrete leakage.
 - 3. Column flashing: Provide between floor decking and columns that penetrate the deck. Field cut flashing to fit and tack weld to decking and columns.
 - 4. Access hole covers: Provide to seal holes cut in decking to facilitate welding of decking to structural supports.

3.5 ATTACHMENTS

- A. Coordinate location, spacing and type of connections required to attach wood nailers, suspended ceilings and similar items to decking.
- B. Drill decking as shown and as required by approved shop drawings.

3.6 CLEANING AND TOUCHING-UP

- A. Remove slag from welds, clean to bright metal and touchup with zinc-rich paint; also clean and touchup with zinc-rich paint raw edges of deck cut for openings.
- B. Welds to be covered with concrete need not be slagged and painted.

3.7 FIELD QUALITY CONTROL

- A. Site tests: The Owner will employ a testing agency to verify compliance with specified requirements.
 - 1. Testing Agency will furnish qualified inspectors.
 - 2. Tests and inspections shall comply with Code requirements, as amended by the regulations of the authorities having jurisdiction.

- B. Site tests and inspection:
 - 1. Testing Agency will inspect welds visually while welders are making welds at commencement of this work and again after the work is completed for penetration of weld metal, fusion, and general ability of operator. Defective welds shall be corrected in compliance with applicable provisions of AWS D1.1.
 - 2. Testing Agency will be required to confirm welder's qualifications and to certify in writing upon completion of this work that the welding has been performed in compliance with Drawings and Specification requirements, including the use of AWS qualified procedures, the manufacturer's recommended use of automatic equipment, and the use of preheat, if required, and with all applicable requirements of regulatory agencies having jurisdiction.
 - 3. The Testing Agency will report on the results of the inspection.

- C. Survey: In addition to the survey required of the structural steel frame in Section 05120, the Contractor's surveyor shall also provide a survey of the steel decking to verify dimensions, elevations and tolerances. Deck edge closure strips shall be within 1/4-inch of the theoretical location shown on the Drawings.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Section includes requirements for provision of Metal fabrications not necessarily limited to the following:
 - 1. Railing assemblies: guardrails, handrails, handrail brackets and intermediary rails.
 - 2. Pipe sleeves, metal connectors, embeds, bolts, plates, and hangers.

1.2 SUBMITTALS

- A. Provide shop drawings for all layouts of railings and gates, showing details, connections and components.

1.3 REGULATIONS

- A. All railings and gates shall comply with CBC 2022.
 - 1. Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides.

PART 2 – PRODUCTS

2.1 GENERAL: Provide and install items complete in respect to function as intended.

2.2 MATERIALS

- A. Structural Steel Shapes Plates Bars And Rods: ASTM A36.
 - 1. Steel Plates
 - a. Low and Intermediate Tensile Strength: ASTM A283.
 - b. Normalized High-Strength Low-Alloy Structural Steel: ASTM A633.
 - c. Steel Sheets and Strip: ASTM A569 and A570.
 - 2. Steel Sheet
 - a. Commercial Quality: ASTM A366.
 - b. Structural Quality: ASTM A611.
- B. Structural Tube Steel: ASTM A500 and A501.
- C. Structural Steel Pipe: ASTM A53, Grade B.
- D. Bolts, Nuts and Washers: A307 or A36.
- E. Other Metals: Specialty items.
- F. Welding Materials: Applicable AWS D1.1, type required for materials being welded. Use E70 welding electrodes for all structural steel welding.

2.3 PAINTING

- A. Shop Prime
 - 1. Coatings For Protection of Dissimilar Materials: Bituminous type paint.
 - 2. Primer For Ferrous Metal: Modified alkyd rust inhibitive primer. Tnemec Co Inc.'s "Series 10, P10-99 Red color.
 - 3. Finish color to be black.

2.4 STANDARD CATALOG PRODUCTS

- A. Non-Shrink Grout
 - 1. Combination of metallic aggregates and Portland cement preformulated for job site mixing.
 - 2. Manufacturer: Sullivan Co., "Sulco"; Conrad B. Sovig Co., "Consov Iron Waterproofing"; Master Builders, "Embeco"; Grace Construction Materials, "Vibro-Foil"; or equal.

2.5 FABRICATION

- A. Shop Fabrication and Finish Schedule:
 - 1. Painting
 - a. General
 - 1) Apply prime paint materials in accordance with manufacturer's instructions and recommendations.
 - 2) Permit thorough drying before shipment.
 - 3) Spot paint abrasions and field connections after assembly.
 - b. Galvanizing Repair Paint: Apply paint having minimum dry film thickness of 2 mils.
 - c. Prime Paint: Apply paint having minimum dry film thickness of 1.5 mils minimum.
 - d. Bituminous Coating for Protection of Dissimilar Materials: Apply at least two coats, minimum 5 mils total thickness.
 - e. Finish Painting: As specified in Section 09 90 00.
 - 2. Galvanizing
 - a. Hot-dip galvanize products after fabrication in accordance with the following, as applicable:
 - 1) ASTM A123.
 - 2) ASTM A153.
 - 3) ASTM A385.
 - b. Mark galvanized products with the name of the galvanizer, the applicable ASTM designation, and the weight of the zinc coating.
 - c. Galvanize fabricated items complete, or in the largest practicable sections.
 - d. Galvanizing shall be at the rate of 2.0 ounces per square foot, minimum.
 - e. Galvanized items that are to be painted shall be wash-primed within six hours of galvanizing.
 - f. Touch-up galvanized items with zinc-rich paint as required by the University's Representative..
 - 3. Finish Schedule.
 - a. Ferrous Metal, Exterior Items

- 1) Concealed: Clean and hot-dip galvanize in accordance with galvanizing standards.
- 2) Exposed
 - a) Typical: Clean, then hot-dip galvanize in accordance with galvanizing standards, chemically etch and shop-apply one prime-coat.
 - b) Intermediary rails to be welded as noted.
 - c) Hardware Including Fasteners (Bolts, Nuts, Washers and Similar Type Items): Finish to match item fastened.

2.6 SOURCE QUALITY CONTROL

- A. Inspections: The Owner's Testing Agency will continuously inspect welding in field of fabricated items in accordance with applicable requirements of CBSC CBC Chapter 17A.

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Inspections: The Owner's Testing Agency will continuously inspect welding in field of fabricated items in accordance with applicable requirements of CBSC CBC Chapter 17A.

END OF SECTION

SECTION 05 51 15

METAL LADDERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum access ladders.

1.2 RELATED SECTIONS

- A. Section 05 50 00 – Metal Fabrications: Fasteners and installation requirements used to attach ladders to structure.

1.3 REFERENCES

- A. AA – Aluminum Association.
- B. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- D. OSHA 1910.27 – Fixed Ladders.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product.
- C. Shop Drawings:
 - 1. Detail fabrication and erection of each ladder indicated. Include plans, elevations, sections, and details of metal fabrications and their connections.
 - 2. Provide templates for anchors and bolts specified for installation under other Sections.

3. Provide reaction loads for each hanger and bracket.

D. Qualification Data:

1. Refer to Quality Assurance provisions for submittal requirements evidencing experience, certifications and resources.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in producing aluminum metal ladders similar to those indicated for this Project.

1. Record of successful in-service performance.
2. Sufficient production capacity to produce required units.
3. Professional engineering competent in design and structural analysis to fabricate ladders in compliance with industry standards and local codes.

- B. Installer Qualifications: Competent and experienced firm capable of selecting fasteners and installing ladders to attain designed operational and structural performance.

- C. Product Qualification: Product design shall comply with OSHA 1910.27 minimum standards for ladders.

- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Install ladder in area designated by Architect.
2. Do not proceed with remaining work until workmanship and installation are approved by Architect.
3. Rework mock-up as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurement before fabrication.

1. Established Dimensions: Where field measurements cannot be made without

delaying the Work, indicate established dimensions on shop drawing submittal and proceed with fabrication.

1.8 WARRANTY

- A. A. Manufacturer has responsibility for an extended Corrective Period for work of this Section for a period of 5 years commencing on the shipment date of the product against all the conditions indicated below, and when notified in writing from Owner, manufacturer shall promptly and without inconvenience and cost to Owner correct said deficiencies.
1. Defects in materials and workmanship.
 2. Deterioration of material and surface performance below minimum OSHA standards as certified by independent third party testing laboratory. Ordinary wear and tear, unusual abuse or neglect excepted.
 3. Within the warranty period, the manufacturer shall, at its option, repair, replace, or refund the purchase price of defective ladder.
- B. Manufacturer shall be notified immediately of defective products, and be given a reasonable opportunity to inspect the goods prior to return. Manufacturer will not assume responsibility, or compensation, for unauthorized repairs or labor. Manufacturer makes no other warranty, expressed or implied, to the merchantability, fitness for a particular purpose, design, sale, installation, or use, of the ladder; and shall not be liable for incidental or consequential damages, losses of or expenses, resulting from the use of ladder products.

1.9 EXTRA MATERIALS

- A. Furnish touchup kit for each type and color of paint finish provided.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: O'Keeffe's, Inc.; 100 N Hill Drive, Suite 12, Brisbane, CA 94005. Toll Free Tel: (888) 653-3333. Tel: (415) 824-4900. Fax: (415) 824-5900. Email: info@okeeffes.com. Web: <http://www.okeeffes.com>.
- B. Substitutions: Not permitted.

- C. Requests for substitutions will be considered in accordance with provisions of Section 01 63 00 – Product Options and Substitutions.

2.2 APPLICATIONS/SCOPE

- A. Fixed Access Ladder:

- 1. Standard Duty Channel Rail.

- a. Model 500 as manufactured by O’Keeffe’s Inc.

2.3 FINISHES

- A. Mill finish. As extruded.

- B. Clear Anodic Finish: AA-M10C22A41 Mechanical finish as fabricated. Architectural Class I, clear coating 0.018 mm or thicker.

- C. Paint. Urethane over chemically pretreated substrate.

- 1. Provide manufacturer's color chart for selection by Architect.

2.4 MATERIALS

- A. Aluminum Sheet: Alloy 5005-H34 to comply with ASTM B209.

- B. Aluminum Extrusions: Alloy 6063-T6 to comply with ASTM B221.

2.5 FABRICATION

- A. Rungs: Not less than 1-1/4 inches (32 mm) in section and 18–3/8 inches (467mm) long, formed from tubular aluminum extrusions. Squared and deeply serrated on all sides.

- 1. Rungs shall withstand a 1,500 pound (454 kg) load without deformation or failure.

- B. Channel Side Rails: Not less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Coordinate anchorages. Furnish setting drawings, templates, and anchorage structural loads for fastener resistance.
- B. Do not begin installation until supporting structure is complete and ladder installation will not interfere with supporting structure work.
- C. If supporting structure is the responsibility of another installer, notify Architect of unsatisfactory supporting work before proceeding.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction.

3.3 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 11 00

FLEXIBLE FLASHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Provide flexible rubberized asphalt, self-sealing through-wall flashing and wall flashing accessories, as shown on details at roof parapet locations.
- B. Related Sections
 - 1. Section 07 60 00 - Flashing and Sheet Metal
 - 2. Section 07 90 00 - Joint Sealants

1.2 REFERENCES

- A. ASTM - American Society for Testing and Materials
 - 1. D412 - Standard Test Methods for Rubber Properties in Tension
 - 2. D570 – Standard Test Method for Water Absorption of Plastics.
 - 3. D1004 – Test Method for Initial Tear Resistance of Plastic Film and Sheeting
 - 4. D1876 – Test Method for Peel Resistance of Adhesives
 - 5. D1938 - Test Method for Tear Propagation Resistance of Plastic Film and Thin Sheeting by a Single-Tear Method
 - 6. D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
 - 7. E 96 -Test Methods for Water Vapor Transmission of Materials
 - 8. E154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide system that complies with following requirements:
 - 1. Provide materials for system type specified which are products of single manufacturer.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data completely describing products.
- B. Manufacturer's Instructions: Manufacturers installation instructions.

1.5 QUALITY ASSURANCE

- A. Applicator's Qualifications: Contractor is have Work of this Section performed by applicator who has at least 5 years experience in the application of the specified system and shall be able to show successful completion of such installations.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store materials in accordance with manufacturer's instructions.

1.7 PROJECT CONDITIONS

- A. Proceed with Work of this Section only when existing and predicted weather conditions will permit Work to be performed in accordance with manufacturer's installation instructions.
- B. Environmental Requirements: Install flashing to dry surfaces at air and surface temperatures of 25 degrees F and above in accordance with manufacturer's recommendations at locations indicated.

1.8 WARRANTY

- A. Manufacturer is to supply, with supervised application, 5 year written warranty against water penetration through treated areas.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Flexible Membrane Wall Flashing
 - 1. Description
 - a. Membrane: 32 mils of self-adhesive rubberized asphalt integrally bonded to 8 mils of cross laminated, high-density polyethylene film to provide minimum 40 mil thick membrane.
 - b. Membrane is to be interleaved with disposable silicone-coated release paper until installed.
 - 2. Performance Requirements
 - a. Water Vapor Transmission: ASTM E96, Method B: 0.05 perms maximum.
 - b. Water Absorption: ASTM D570: Maximum 0.1 percent by weight.
 - c. Puncture Resistance: ASTM E154: 80 pounds minimum..
 - d. Tear Resistance
 - 1) Initiation: ASTM D1004: Minimum 13.0 pounds M.D.
 - 2) Propagation: ASTM D1938: Minimum 9.0 pounds M.D.

- e. Lap Adhesion At 25 degrees F: ASTM D1876: 5.0 pounds per inch of width
 - f. Low Temperature Flexibility ASTM D1970: Unaffected to minus 45 degrees F.
 - g. Tensile Strength: ASTM D 412, Die C Modified: Minimum 800 pounds per square inch.
 - h. Elongation, Ultimate Failure of Rubberized Asphalt: ASTM D412, Die C: Minimum 200 percent.
3. Manufacturer And Product: Grace Construction Products Model Perm-A-Barrier Wall Flashing, or equal.

2.2 ACCESSORIES

A. Surface Conditioner

1. Description: Water-based latex liquid for substrate preparation.
2. Physical Characteristics
 - a. Flash Point: No flash to boiling point.
 - b. Solvent Type: Water.
 - c. VOC Content: Not to exceed 125 g/L
 - d. Application Temperature: 25 degrees F and above.
 - e. Freeze And Thaw Stability: 5 cycles minimum.
 - f. Freezing point (as packaged): 14 degrees F.
3. Manufacturer And Product: Grace Construction Products Model Perm-A-Barrier Surface Conditioner, or equal.

B. Termination Mastic

1. Description: Rubberized asphalt-based mastic with 200 g/L max. VOC Content.
2. Manufacturer And Product: Grace Construction Products Model Perm-A-Barrier Model Bituthene Mastic, or equal.

PART 3 EXECUTION

3.1 INSPECTION

- #### A. Examine surfaces designated to receive flexible flashing:
1. Verify curing methods used for cementitious materials are compatible with membrane system.
 2. Verify curing methods used for sealant materials are compatible with membrane system.
 3. Ensure items which pass through surfaces to receive waterproofing materials are properly and rigidly installed.
 4. Ensure surfaces are free of cracks, waves, depressions and projections or sharp objects which may be detrimental to proper installation and performance of waterproofing membrane.
 5. Ensure that backing materials are in place and properly installed.
 6. Ensure adjoining materials are in proper condition to receive and maintain the waterproofing material installations.

- B. Do not proceed with application until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Surface Preparation: Prepare surfaces to receive waterproofing in accordance with manufacturer's installation instructions.
- B. Cleaning
 1. Clean surfaces of dust, dirt, and curing and parting compounds if required to be removed by waterproofing materials manufacturer.
 2. Curing and parting compounds are to be thoroughly removed by chemical or mechanical means.
- C. Seal items projecting through membrane, such as pipes, conduits, and the like, in accordance with manufacturer's installation instructions.
- D. Condition of surfaces, prior to application of waterproofing membrane, is to meet manufacturer's requirements.
- E. Do not apply waterproofing membrane to damp, frozen, dirty, dusty or otherwise unsuitable surfaces.
- F. Applications shall not commence when the temperature is below 40 degrees Fahrenheit or when precipitation is imminent.
- G. Take adequate precautions if inclement weather is anticipated during Work, to ensure those materials, already applied materials and the interior are protected from moisture.
- H. Provide primer at substrate where recommended by manufacturer.

3.3 INSTALLATION

- A. Apply waterproofing membranes in accordance with manufacturer's installation instructions and as indicated on the Drawings.
- B. Application of Flexible Membrane Wall Flashing
 1. Precut pieces of flashing to easily handled lengths for each location.
 2. Remove silicone coated release paper and position flashing carefully before placing it against surface.
 3. When properly positioned, place against surface by pressing firmly into place by hand roller.
 4. Fully adhere flashing to substrate to prevent water from migrating under flashing.
 5. Overlap adjacent pieces 2 inches and roll seams with hand roller.
 6. Trim bottom edge 1/2 inch back from exposed face of wall.
 7. Flashing is not to be permanently exposed to sunlight.

8. At heads, sills and flashing terminations, turn up ends minimum of 2 inches and make careful folds to form end dam, with seams sealed.
9. Do not allow rubberized asphalt surface of flashing membrane to come in contact with polysulfide sealants, creosote, uncured coal tar products or EPDM.
10. Do not expose flashing membrane to sunlight for more than thirty days prior to enclosure.

3.4 ACCESSORIES

- A. Surface Conditioner
 1. When required by dirty or dusty site conditions or by surfaces having irregular or rough texture, apply surface conditioner by spray, brush, or roller at the rate recommended by manufacturer, prior to flashing installation.
 2. Allow surface conditioner to dry completely before flashing application.
- B. Termination Mastic
 1. Apply bead or trowel coat of mastic along flashing top edge, seams, cuts, and penetrations.

3.5 ADJUSTING AND CLEANING

- A. Remove masking materials after installation. Clean stains on materials which will be exposed in the completed Work.
- B. Clean stains from adjacent surfaces with appropriate cleaning agents.
- C. Remove masking protection, equipment, material and debris from surface and storage area.

3.6 PROTECTION

- A. Protect Work in this Section both during and after installation, from damage of any kind and from any source, until the Work has been covered.

END OF SECTION

SECTION 07 21 00

BUILDING INSULATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Formaldehyde-free thermal insulation.
- B. Related Sections:
 - 1. Section 07 90 00: Joint Sealants.
 - 2. Section 09 24 23: Cement Stucco..

1.02 REFERENCES

- A. ASTM International:
 - 1. ASTM C165 Standard Test Method for Measuring Compressive Properties of Thermal Insulations.
 - 2. ASTM C356 Standard Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heat.
 - 3. ASTM C411 Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.

1.03 SYSTEM DESCRIPTION

- A. Design Requirements: Provide products that have been manufactured, fabricated and installed to the following criteria:
 - 1. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test methods indicated below or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - a. Surface Burning Characteristics (ASTM E84)
 - b. Assembly Fire Resistance Rating (ASTM E119)
 - c. Combustion Characteristics (ASTM E136)
 - 2. Thermal Performance (ASTM C518): R-19 at exterior walls and below.
- B. Performance Requirements: Provide products that have been manufactured, fabricated and installed to the following criteria:
 - 1. Surface Burning Characteristics, Unfaced (ASTM E84): Flamespread index 25, smoke developed 50.
 - 2. Recycled Glass Content: 25%.
 - 3. Combustibility (ASTM E136): Noncombustible.
 - 4. Formaldehyde Content: Free of formaldehyde.

1.04 SUBMITTALS

- A. General: Submit listed submittals in accordance with provisions of Section 01 30 00 Submittals.
- B. Product Data: Submit manufacturer's product data and installation instructions
- C. Samples: Submit manufacturer's standard selection and verification samples.
- D. Quality Assurance/Control Submittals: Submit the following:
 - 1. Test Reports: Upon request, submit thermal test reports from recognized test laboratories.
 - 2. Certificates: Submit manufacturer's certificate that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

- A. Obtain each type of building insulation through a single source.
- B. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.

1.06 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirement Section.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

PART 2 – PRODUCTS

2.01 FORMALDEHYDE-FREE BUILDING INSULATION

- A. Manufacturer: Johns Manville, or an approved equal.
- B. Proprietary Products/Systems: Building insulation, including the following:
 - 1. JM Formaldehyde-free™ Unfaced Batts, or equal.
 - a. Thermal Resistance (R-Value) (ASTM C518): R-values:
 - 1) R-13 – wall spaces
 - b. Combustion Characteristics (ASTM E136): Pass.
 - c. Critical Radiant Flux (ASTM E970): Greater than 0.11 Btu/ft² × s (0.12 W/cm²).
 - d. Water Vapor Sorption (ASTM C1104): 5% or less.
 - e. Odor Emission (ASTM C1304): Pass.
 - f. Corrosiveness (ASTM C665): Pass.

- g. Fungi Resistance (ASTM C1338): Pass.
 - h. Recycled Content: Certified by Scientific Certification Systems to contain minimum of 20% post-consumer and 5% pre-consumer recycled glass product, on average of manufacturer's products.
 - i. Prove through documentation that product complies with CIWMB Section 01350 for indoor air quality.
 - j. Thickness: min 4"
 - k. Flamespread (ASTM E84): 25, maximum.
 - l. Smoke Developed (ASTM E84): 50, maximum.
 - m. Material Standard: ASTM C665, Type I.
 - n. Smoke Developed (ASTM E84/ CBC Section 720.2)
 - 1) Foil-faced Batts: 450, maximum.
 - 2) Kraft-faced Batts: Unrated.
 - o. Material Standard:
 - 1) Foil-faced Batts: ASTM C665, Type III, Class B, Category 1.
 - 2) Kraft-faced Batts: ASTM C665, Type II, Class C, Category 1.
 - p. Recycled Content: Certified by Scientific Certification Systems to contain minimum of 20% post-consumer and 5% pre-consumer recycled glass product, on average of manufacturer's products.
 - q. Prove through documentation that product complies with CIWMB Section 01350 for indoor air quality.
 - 1) MR-faced Batts: ASTM C665, Type II, Class C, Category 1.
- C. JM Formaldehyde-free™ Kraft and Foil-faced Batts, or equal
- 1. Thermal Resistance (R-Value) (ASTM C518): R-values:
 - 2. R-13 – walls

2.02 ACCESSORIES

- A. Tape: Self-adhesive vapor retarder tape with flame-spread index of 25 or less, smoke developed index of 50 or less.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Comply with the instructions and recommendations of the building insulation manufacturer.

3.02 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Verify that site conditions are acceptable for installation of building insulation.
 - 2. Do not proceed with installation of building insulation until unacceptable conditions are corrected.

3.03 PREPARATION

- A. Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

3.04 INSTALLATION

- A. General: Comply with insulation manufacturer's written instructions applicable to products and application indicated.
 - 1. Install insulation that is undamaged, dry and unsoiled and that has not been left exposed at any time to ice and snow.
 - 2. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation.
 - 3. Water Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
 - 4. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.
- B. Installation of General Building Insulation:
 - 1. Seal joints between closed-cell (non-breathing) insulation units by applying adhesive, mastic or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic or sealant as recommended by insulation manufacturer.
 - 2. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
 - a. Tape ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
 - 3. Install glass-fiber blankets in cavities formed by framing members according to the following requirements:

- b. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - c. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - d. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.
4. Loose-Fill Insulation: Place loose-fill insulation into spaces and onto surfaces as shown, by machine blowing to comply with ASTM C1015. Level horizontal applications to uniform thickness as indicated. Hold insulation back from air vents, flues and heat-generating appliances.
- C. Installation of Vapor Retarders:
1. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
 2. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor retarder manufacturer.
 3. Seal joints caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with vapor retarder tape to create an airtight seal between penetrating objects and vapor retarder.
 4. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor retarder tape or another layer of vapor retarder.

3.05 PROTECTION

- A. Protect installed work from damage due to subsequent construction activity on the site. Repair damage to installed products prior to installation of finish materials.

END OF SECTION

SECTION 07 54 19

PVC ROOF MEMBRANE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Mechanically fastened PVC roof membrane system.
 - 2. Base sheet.
 - 3. Sheathing paper.
 - 4. Substrate board.
- B. Related Sections include the following:
 - 1. Section 07 60 00 - Flashing and Sheet Metal.
 - 2. Section 07 90 00 - Joint Sealants.

1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 "Terminology Relating to Roofing and Waterproofing"; glossary of NRCA's "The NRCA Roofing and Waterproofing Manual"; and the Roof Consultants Institute "Glossary of Roofing Terms" for definition of terms related to roofing work in this Section.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and Flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

- C. Jobsite Safety: Execute all operations and provide a safe work environment in accordance to OSHA standards and regulations. This requirement applies to all contractor personnel, associated subcontractors, workers in other trades, and jobsite visitors.
- D. Roofing System Design: Provide a PVC membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.
 - 1. Corner Uplift Pressure: 28.8 lbf/sq. ft.
 - 2. Perimeter Uplift Pressure: 28.8 lbf/sq. ft.
 - 3. Field-of-Roof Uplift Pressure: 24.7 lbf/sq. ft.
 - 4. Fire/Windstorm Classification: Class 1A-90 MPH

1.5 SUBMITTALS

- A. Product Data: For product indicated including color material options.
- B. Shop Drawings: For roofing system include plans.
 - 1. Flashings and membrane terminations.
 - 2. Sheet layout with perimeter and corner defined.
- C. Samples for Verification: For the following products:
 - 1. Manufacturer's standard sample size of sheet roofing, of color specified, including T-shaped side and end lap seam.
 - 2. Manufacturer's standard sample size of walkway pads or rolls.
 - 3. Manufacturer's standard sample size of base sheet.
 - 4. Manufacturer's standard sample size of substrate board.
 - 5. Six roof cover fasteners of each type, length, and finish.
 - 6. Six fasteners of each type, length and finish used for complete roofing installation.
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- E. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
- F. Qualification Data: For Installer and manufacturer.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
- H. Research/Evaluation Reports: For components of membrane roofing system.

- I. Maintenance Data: For roofing system to include in maintenance manuals.
- J. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
- B. Manufacturer Qualifications: A qualified manufacturer that has UL listing for membrane roofing system identical to that used for this Project.
- C. Source Limitations: Obtain all components from single source roofing manufacturer.
- D. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
 - 2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.
 - 3. Review governing regulations and requirements for insurance and certificates if applicable.
 - 4. Review temporary protection requirements for roofing system during and after installation.
 - 5. Review roof observation and repair procedures after roofing installation.
 - 6. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
- E. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site. Comply with requirements for preinstallation conferences in Division 01 Section "Project Management and Coordination." Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing.
 6. Require that all complimentary trades be present at conference. Including, but not limited to; electrical, plumbing, HVAC, and framing contractors.
 7. Review Flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 8. Review governing regulations and requirements for insurance and certificates if applicable.
 9. Review temporary protection requirements for roofing system during and after installation.
 10. Review roof observation and repair procedures after roofing installation.
- F. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:
1. Meet with Owner, Architect and Owner's rep, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing.
 6. Review Flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 7. Review governing regulations and requirements for insurance and certificates if applicable.
 8. Review temporary protection requirements for roofing system during and after installation.
 9. Review roof observation and repair procedures after roofing installation.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.9 GUARANTEE

- A. Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.
 - 1. Single-Source special warranty includes roofing membrane, Flashings, roofing membrane accessories, roof insulation, fasteners, substrate board, walkway products, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
 - 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Carlisle Syntec Systems - Sure Flex PVC Roofing Systems
- B. The Sure-Flex Mechanically Fastened Roofing System incorporates 60-mil Polyester Reinforced Sure-Flex Polyvinyl Chloride (PVC) membrane.

- C. Color options: white, gray, light gray, slate gray and tan. Provide
- D. Width: membrane is available in 10' wide field sheets and 5' perimeter sheets.
- E. Length: Sure-Flex sheets are available in rolls in 75' or 100' rolls.
- F. All sheets to be mechanically fastened over an approved insulation/underlayment to an acceptable roof deck with the appropriate Carlisle Fasteners and Fastening Plates.
- G. Adjoining sheets of Sure-Flex membrane are overlapped and joined together with a minimum 1-1/2" wide heat weld.
- H. Membrane fastening requirements are per manufacturer's recommendations/

2.2 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
- B. Sheet Flashing: Manufacturer's sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane.
- C. Sheet Flashing: Manufacturer's unreinforced sheet flashing of same material as sheet membrane.
- D. Bonding Adhesive: Manufacturer's standard water-based bonding adhesive for membrane, and solvent based bonding adhesive for Flashing.
- E. Fasteners required for all applications. Retain fasteners appropriate for application and change of plane terminations.
- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer. Product: High Load Fasteners and Plates
- G. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a patented bifurcation process. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee.
- H. Coping System: Manufacturer's factory fabricated coping consisting of a base piece and a snap-on cap. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee.

- I. Fascia System: Manufacturer's factory fabricated fascia consisting of a base piece and a snap-on cover. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee.

2.3 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer.

2.4 BASE-SHEET MATERIALS

- A. Base Sheet: ASTM D 4601, Type II, UL Class G2 rated, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides.
- B. Base Sheet: ASTM D 4897, Type II, venting, nonperforated, heavyweight, asphalt-impregnated and -coated, glass-fiber base sheet with coarse granular surfacing or embossed venting channels on bottom surface.

2.5 SHEATHING PAPER

- A. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft.

2.6 SUBSTRATE BOARD

- A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 5/8 inch thick. Product: Securock or Densglas.
- B. Substrate Board: ASTM C 728, perlite board, 3/4 inch thick, seal coated. Product: Fesco Board.
- C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening substrate panel to roof deck. Product: UltraFast Fasteners and Plates

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 SUBSTRATE BOARD INSTALLATION

- A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
 - 1. Fasten substrate board to top flanges of steel deck according to recommendations in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
 - 2. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to roofing system manufacturer's written instructions.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 SHEATHING PAPER INSTALLATION

- A. Loosely lay sheathing paper in a single layer over all wood deck areas, side and end lapping each sheet a minimum of 2 inches and 6 inches, respectively.
 - 1. Seal side and end laps with tape or adhesive.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.5 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
- B. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.

3.6 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07 60 00

FLASHING AND SHEET METAL

PART 1 GENERAL

1.1 SUMMARY

- A. Related Sections
 - 1. Section 07 90 00 - Joint Sealants: Joint sealant systems.
 - 2. Section 09 90 00 - Painting: Field finishing painting of sheet metal flashing and trim.

1.2 REFERENCES

- A. ASTM - American Society for Testing and Materials
 - 1. A653 Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated by the Hot-Dip Process.
 - 2. A666 Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - 3. B32 Standard Specification for Solder Metal.
 - 4. B749 Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
- B. CBSC - California Building Standards Commission
 - 1. CBC California Building Code, 2019 Edition
- C. AWS – American Welding Society
 - 1. D1.1 Structural Welding Code - Steel
 - 2. D2.0 Welding Symbols.
- D. SMACNA - Sheet Metal and Air Conditioning Contractors National Association, Inc.
 - 1. Architectural Sheet Metal Manual.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements
 - 1. Work of this Section is to physically protect items from damage that would permit water leakage to building interior.
 - 2. Material Gauge
 - a. Minimum 24 gauge, except as specified otherwise in this Section.
 - b. Provide thicker gauges if recommended by SMACNA Manual or material fabricator.
 - c. Provide special flashing transitions and soldered closure pieces wherever necessary to achieve the intent of the specifications.

1.4 SUBMITTALS

- A. Product Data: Submit manufacture's literature completely describing products.
- B. Shop Drawings Submit drawings indicating material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
 - 1. For items that are to be welded
 - a. Indicate welds, both shop and field, by symbols conforming to AWS D2.0.
 - b. Where welded connectors, concrete or masonry inserts are required to receive Work, indicate size and locations.
 - 2. Demonstrate relationship of flashings to adjacent materials.
 - 3. Include isometrics of corners and intersections and terminations and other items required by Work of this Section.
 - 4. Provide plans that indicate locations of each type of flashing and counter flashing and other items required by Work of this Section.

1.5 QUALITY ASSURANCE

- A. Qualifications
 - 1. Welders: Submit welders' certificates, certifying welders employed on the Work are qualified in accordance with AWS D1.1 within the previous 12 months.
- B. Regulatory Requirements
 - 1. Wind Loading: Design and size exterior items to withstand dead loads and live loads caused by pressure and suction of wind for design pressure in pounds per square foot in accordance with CBC Chapter 16 Division III Wind Design Sections 1615 thru 1620 and Section 1622 and Section 1625 in accordance with following:
 - a. Exposure: C
 - b. Wind Speed In Miles Per Hour: 70.
 - 2. Seismic Requirements: Design anchorage systems to comply with CBC Chapter 16 Division IV, Section 1632 as applicable for Seismic Zone 4 and requirements of Table 16-0, Elements Of Structures And Nonstructural Components And Equipment, Exterior And Interior Appendages 2.A.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Storage and Protection
 - 1. Deliver, store and handle packaged materials in original containers with seals unbroken and labels intact until time of use.
 - 2. Discharge materials carefully and store on clean concrete surface or raised platform in safe dry area. Do not dump onto ground.

3. Stack preformed material to prevent twisting, bending or abrasion and to provide ventilation.
4. Slope metal sheets to ensure drainage.
5. Store materials to provide ventilation and prevent bending, abrasion or twisting.
6. Prevent contact with materials which may cause discoloration, staining or damage.
7. Do not store panels or flashings with strippable film in areas exposed to sunlight.

1.7 PROJECT CONDITIONS

- A. Field Measurements
 1. Prior To Fabrication: Verify measurements in field and coordinate with related Work as required for proper and adequate fabrication and installation.
- B. Exercise care when working on or about roof surfaces to avoid damaging or puncturing membrane or flexible flashings.
- C. Place plywood, insulation boards or other suitable protection when working areas of newly installed membranes. Keep in place until completion of Work.
- D. Immediately advise the built-up roofing installer of any damage to the new membrane.

1.8 SEQUENCING AND SCHEDULING

- A. Ensure timely delivery of items to be embedded in Work of other Sections and furnish setting drawings or templates as specified in Article titled Submittals, sub-Article titled Setting Drawings or Templates in this Section.

1.9 WARRANTY

- A. Provide 2 year labor and material warranty for correcting failure of metal flashing systems to resist penetration of water.
- B. Provide 2 year extended warranty. Cover costs to replace and repair damage to building and contents due to failure of flashings and sheet metal Work to prevent water infiltration.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Sheet Materials, Typical
 - 1. Sheet Metal: Galvanized Steel Sheet Materials: ASTM A653, lock forming quality, minimum 20 gauge, with minimum 1.25 ounce per square foot zinc coating.
- B. Special Flashing Transitions: 4 pound lead.
- C. Solder and Flux: ASTM B32 types as recommended by manufacturer of sheet metal to be soldered. Re-melted or reworked solder will not be permitted.
- D. Flashing Compound: Polyisobutylene type, non-shrinking, nondrying sealant or tape as required by installation conditions, 1 inch width by 1/16 inch minimum thickness.

2.2 ACCESSORIES

- A. Fasteners (Nails, screws, rivets, bolts and nuts)
 - 1. General: Same material as item being fastened, except fasteners in contact with aluminum are to be compatible stainless steel fasteners.
 - 2. Washers And Spacers: Neoprene.
 - 3. Strainers At Tops Of Downspouts: Stainless steel.
 - 4. Fasteners
 - a. Metal to wood (unexposed) - 11gauge ring shank sufficient to penetrate 1 inch into wood, galvanized.
 - b. Metal to wood (exposed) Stainless steel, neoprene washered hex head screw #10, with length sufficient to penetrate wood 1 inch.
 - c. Metal to metal (exposed) - Stainless steel, neoprene washered hex head screw #10, with length sufficient to penetrate base metal 1/2 inch.
 - d. Rivets: ASTM B315, alloy 110, 5052, 5056, or 6061; appropriate temper, unless temper is specified.
 - e. Rivets, screws, bolts, nuts and wire: ASTM B211, alloy 1100, 5052 to 6061; appropriate temper.

2.3 FABRICATION

- A. Shop Assembly
 - 1. General
 - a. Design and fabricate Work in accordance: SMACNA Manual and with following requirements.
 - b. As far as practicable, form and fabricate sheet metal in shop. Where Project site fabrication is required, provide Work equal to shop quality. Additionally, identify bulk materials from which items are field fabricated by manufacturer's trademark printed or embossed at frequent intervals.
 - c. Reproduce accurately profiles and bends indicated.

- d. Provide profiles with interactions that are sharp, even and true; with plane surfaces free from buckles and waves; and seams that follow direction of water flow.
 - e. Reinforce correctly for strength and appearance.
 - f. Cut, fit, and drill sheet metal as required to accommodate related, adjacent or adjoining Work.
 - g. Exposed Edges of Sheet Metal: Fold, bend or return exposed edges of sheet metal. Raw edges will not be permitted.
 - h. Form pieces in longest practical lengths.
 - i. Sheet Metal Joints
 - 1) Flashing joints to have minimum 4 inch overlap with weld or solder or mechanical fastening with sealant.
 - 2) Join joints and miters as recommended by manufacturer.
 - 3) Where positive joining is required and where indicated on the Drawings, weld in accordance with applicable AWS D1.1 standards as applicable.
 - 4) Turn lock joints on exposed surfaces in direction of flow.
2. Soldering
- a. Neatly solder exposed surfaces.
 - b. Pre-tin edges minimum 1 1/2 inches both sides prior to soldering.
 - c. Use heavy soldering coppers of blunt design.
 - d. Immediately after applying flux, solder with well-heated coppers, thoroughly heating seams and completely sweating solder through full-width with at least 1 inch width along seams.
 - e. Solder in manner to seal metal joints and, where practical, inside surface not exposed to view.
 - f. After soldering, remove flux. Wipe and wash solder joints clean.
3. Expansion and Contraction of Sheet Metal Runs
- a. General
 - 1) Typical: Provide loose locking slip joint of maximum 8 feet from external and internal corners, maximum 24 feet length of straight runs, unless manufacturer recommends more frequent interval, and 1 at center of runs less than 20 feet, but more than 8 feet, unless specified otherwise following herein.
 - 2) Form expansion joints of intermeshing hooked flanges not less than 1 inch deep filled with mastic concealed within joints.
 - 3) Where movable non-expansion type joints are required for proper performance of Work, form metal to provide for proper installation of elastomeric sealant in compliance with SMACNA standards.
 - 4) Seams: Are to be located as indicated on Drawings or located in accordance with industry standard.
4. Provide following items of materials and minimum gauges as indicated on the Drawings.

- a. Cleats: Formed of same metal as that being anchored, with size, shape, and quantity as required to secure flashing and sheet metal in place

2.4 FINISHES

A. Factory Finishing

1. Galvanized Sheet Metal

- a. Finish: ASTM A653, G90 zinc coating.
- b. After Fabrication: Touch-up abraded surfaces in accordance with Section 09910.
- c.

2.5 Parapet Scuppers: Manufactured with closure flange trim to exterior, 6-inch wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify following:

1. Roof openings, pipes, sleeves, ducts or vents through roof are solidly set, and nailing strips are located.
2. Underlayment membrane termination and base flashings are in place, sealed and secure.

B. Do not start Work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation

1. Coordinate Work of this Section with installation of adjoining Work.
2. Install sheet metal Work related to roofing systems under supervision of Contractor's roofing installers.
3. Back paint flashings with materials for permanent protection of dissimilar materials or provide inorganic membrane separation where flashings are expected to be in contact with cementitious materials or dissimilar metals.
4. Use compatible metals for pipe clamps.
5. Ensure membrane and flashings are installed watertight prior to sheet metal installations.

3.3 INSTALLATION

- A. Conform to procedures and methods of installation and applicable details indicated in SMACNA Manual.
- B. Where installation requires fabrication at the Project site, conform to applicable requirements of Article titled Fabrication in this Section.
- C. Install Work watertight; ensure that items are installed in true and accurate alignment with other items and related Work, that joints are accurately fitted, that corners are reinforced and that exposed surfaces are free of dents.
- D. Install standard catalog products in accordance with manufacturer's instructions, unless otherwise indicated on the Drawings.
- E. Apply flashing compound at slip joints or wherever metal-to-metal contact occurs and movement may be anticipated to occur.
- F. Fastening
 1. Fasten in accordance with SMACNA Manual.
 2. Fasten sheet metal runs to under laying material by nailing through slotted holes in flange at 3 inches on center, unless otherwise indicated on the Drawings or required by manufacturer.
 3. Provide waterproof washers wherever fasteners penetrate flashings.
 4. Where sheet metal occurs over other sheet metal, use nails with minimum 1 inch metal disks.
 5. Secure flashings in place using standard concealed type fasteners, using specified type fasteners.
 6. When exposed fasteners are required, they are to be of same finish as flashings.
 7. Use exposed fasteners in locations only as indicated on the Drawings.
- G. Counter flash mechanical and electrical items projecting through roofing.
- H. Perform field welding only where indicated on reviewed Shop Drawings, in accordance with AWS D1.1.

3.4 ADJUSTING AND CLEANING

- A. Adjusting: Replace damaged material with new.
- B. Cleaning
 - 1. Upon completion of roofing installations, clear gutters and roof drains installed under this Section of debris and obstructions.
 - 2. Leave Work areas clean, free from grease, finger marks and stains.
 - 3. Remove scrap and debris from surrounding areas and grounds at end of each Work day and at completion of the Work of this Section.

3.5 PROTECTION

- A. Protect exposed finishes as required against construction damage; remove temporary protection prior to final completion.

END OF SECTION

SECTION 07 72 33

ROOF HATCH

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for roof hatches.
- B. Related Sections
 - 1. Section 05 50 00 Metal Fabrications
 - 2. Section 07 60 00 Flashing and Sheet Metal

1.2 REFERENCES

- A. CBSC - California Building Standards Commission
 - 1. CBC California Building Code, 2022 Edition

1.3 SUBMITTALS

- A. Product Data: Submit data completely describing products.
- B. Shop Drawings and Structural Calculations
 - 1. Submit Shop Drawings and structural calculations signed by Structural Engineer registered in the State of California.
 - 2. Include general construction, configurations, jointing methods and locations when applicable, and fastening methods.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements
 - 1. Wind Loading: Design and size exterior items to withstand dead loads and live loads caused by pressure and suction of wind for design pressure in pounds per square foot in accordance with CBC Chapter 16 Division III Wind Design Sections 1615 thru 1620 and Section 1622 and Section 1625 in accordance with following:
 - a. Exposure: C
 - b. Wind Speed In Miles Per Hour: 70.
 - 2. Seismic Requirements: Design anchorage systems to comply with CBC Chapter 16 Division IV, Section 1632A as applicable for Seismic Zone 4 and requirements of Table 16A-0, Elements Of Structures And Nonstructural Components And Equipment, Exterior And Interior Appendages 2.A.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping

1. Deliver materials and products in original containers with seals unbroken and labels intact until time of use. Label shall identify accessory, catalog number and finish.

B. Storage and Protection

1. Store delivered products in clean, safe, dry area.

1.6 SEQUENCING AND SCHEDULING

- ### A. Roof Hatch: Coordinate with installation of roofing system and related flashings and nailers.

PART 2 PRODUCTS

2.1 FABRICATED UNITS

A. Roof Hatch Basis of Design

1. Bilco Model Type S 36 x 30
2. Curb: 11 gauge aluminum; integral cap flashing to receive roof flashing system; extended flange for mounting.
3. Cover: 11 gauge aluminum, mill finish with 22 gauge aluminum inner liner; continuous plastic rubber gasket to provide weatherproof seal; designed to support specified roof live load.

2.2 FABRICATION

A. Shop Finishing

1. Prefabricated Hatch
 1. Aluminum: Manufacturer's standard mill finish.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas designated to receive roof accessories and verify following as applicable.
 - 1. Metal framing and blocking is correct for proper installation.
 - 2. Roof accessory items to receive another roof accessory item are correctly installed and ready to receive such item.
 - 3. Areas located to receive roof vents have been properly prepared.
- B. Do not install roof accessory items until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protection: Protect dissimilar materials from each other in accordance with requirements specified for such protection as specified in Section 05500.

3.3 INSTALLATION

- A. General: Install as indicated on the Drawings and in accordance with reviewed Shop Drawings.
- B. Roof hatches: Provide weather tight installations.

3.4 ADJUSTING

- A. Determine hatch operation is functioning properly to allow for door panels to open as required.
- B. Determine if fire alarm connection and winch cable operations are in working order.
- C. Adjust as required for proper operation.

3.5 CLEANING

- A. Prior to final completion
 - 1. Clean surfaces in accordance with reviewed manufacturer's instructions.

3.6 PROTECTION

- A. Protect installations from damage until final completion.

END OF SECTION

SECTION 07 90 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for provision of backing and sealants required to weather-proof, moisture proof or caulk joints.
- B. Related Sections
 - 1. Section 07 60 00 - Flashing and Sheet Metal: For sealants used with sheet metal Work.

1.2 REFERENCES

- A. ASTM - American Society for Testing and Materials
 - 1. C920 Standard Specification for Elastomeric Joint Sealants.

1.3 DEFINITION

- A. Where the word caulk or mastic occurs on Drawings or in the Specifications, they are to be defined as the sealant system required for each specific condition.

1.4 SYSTEM DESCRIPTION

- A. Performance Requirements
 - 1. Primer and sealant are to be from single manufacturer, who is also to approve backer rod. Prime all joints unless manufacturer recommends against priming surfaces.
 - 2. Provide elastomeric sealants, back-up and related materials capable of sealing buildings or structures against water, wind and dirt and at horizontal surfaces subject to vehicular traffic, resistant to petroleum derivatives.
 - 3. Review performance requirements of conditions to be sealed, including performance of back-up materials, and inform Owner's Representative of any obvious or assumed inappropriate materials or conditions, prior to installations.
 - 4. Review Drawings for joint sealant requirements. Inform Owner's Representative of any locations not clearly indicated on the Drawings or otherwise in question. Intent is for all joints requiring waterproofing to be properly sealed.

1.5 SUBMITTALS

- A. Product Data: Submit data completely describing products, including sealant chemical characteristics; performance criteria, limitations and color availability. Include accessory items necessary for successful completion of Work and recommendations for primer.
- B. Samples: Submit color samples for Owner's Representative color selection where material will be visually exposed.
- C. Certificate of Compliance: Upon completion of the Work, submit certificate signed by the Contractor, stating that sealant and caulking application complies with contract requirements and manufacturer's recommendations, and is proper and adequate for conditions requiring sealants and caulking
- D. Manufacturer's Instructions: Include manufacturer's requirements for surface preparation, temperature and humidity, application equipment and procedures for sealants and primers.
- E. WARRANTY: Furnish a written warranty against all defects in caulking and sealant materials for 5 years and defects in workmanship for 2 years, covering the following specific conditions, without limitation:
 - 1. Water leakage through sealed joints.
 - 2. Adhesive or cohesive failure of sealant.
 - 3. Staining of adjacent surfaces caused by migration of sealant or primer.
 - 4. Sealant hardened beyond Shore A hardness indicated in approved submittals.
 - 5. Chalking or visible color changes of cured sealants.
- F. CA Green Building Code:
Comply with requirements set forth in CA Green Building Code, Section 5.504.4.1 for Adhesives, Sealants and Caulks.

1.6 QUALITY ASSURANCE

- A. Qualifications: Contractor shall engage installer with a minimum of 3 similar installations, within 3 successive years, with each required sealant condition for this Project, and such installer is to act as supervising mechanic.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original labeled and sealed containers displaying manufacturer's name, brand name, type of sealant, color designation, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.
- B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other potential detrimental causes.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

1.9 SEQUENCING AND SCHEDULING

- A. Schedule application only after concrete and mortar has cured and the temperature is such that joints are most likely to be normal size.
- B. Coordinate the Work of this Section with other Work..
- C. Do not paint exposed polyurethane based sealants until they have completely completed off gazing.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General
 - 1. Provide joint sealer systems compatible with contacting membranes, liquid waterproofing systems and pre-molded joint filler materials.
 - 2. Provide joint sealer systems designed not to stain exposed surfaces.
 - 3. Manufacturer's standard color range shall permit matching of joint sealer materials to color of contacting surfaces.
 - 4. Sealants and Caulks
 - a. Type 1: Two-component solvent free, moisture insensitive, flexible epoxy resin sealer, self-leveling.
 - 1) Color: Standard color, matching adjacent surface.
 - 2) Use: Exterior or interior, horizontal traffic joints.
 - 3) Manufacturers: Sika Model 51 SL, or equal
 - b. Type 2: FF TT-S-00227E, Type II, class A, gun-grade, with primer as required, multi-component low modulus epoxidized polyurethane sealant, with movement capability up to 50 percent in extension and compression.
 - 1) Color: Manufacturer's standard, to be selected by Owner's Representative from full range of colors.
 - 2) Use: General exterior building sealing, cement plaster and similar conditions.
 - 3) Manufacturers: Tremco Model Dymeric Plus, Sika, Sonneborn or equal.
 - c. Type 3: FF-TT-S-0023C, Type II, Class A, single component, gun grade nonsag, silicone sealant, with movement capability plus or minus 50 percent.
 - 1) Color: As selected by Owner's Representative.

- 2) Use: Exterior and interior building sealing, nonporous materials.
- 3) Manufacturer: Dow Corning Model 795 Building Sealant, Tremco, Sika, Pecora, Sonneborn or equal
- d. Type 4: Single component, gun-grade, paintable, acrylic-latex, water-based sealant.
 - 1) Color: As selected by Owner's Representative.
 - 2) Use: Interior building sealant.
 - 3) Manufacturer: Tremco Model Acrylic Latex 834, Sonneborn, Pecora or equal..
- e. Type 5: FF-TT-S-001543A, Single component, gun grade, silicone rubber sealant, mold and mildew resistant, with movement capability plus or minus 25 percent.
 - 1) Color: White or to match adjacent surfaces.
 - 2) Use: Sanitary sealant.
 - 3) Manufacturers: Sonneborn Model Sonolastic Omniplus, Dow Corning, General Electric, Pecora or equal.
- f. Type 6: FF-TT-S-001657, Type I, butyl sealant, movement capability plus or minus 5 percent.
 - 1) Color: Manufacturer's standard.
 - 2) Use: For bedding thresholds and in concealed or non-working surfaces.
 - 3) Manufacturers: Tremco, Pecora or equal

2.2 ACCESSORIES

- A. Primers, Sealers, Surface Conditioners and Solvents: Non-staining and non-injurious to exposed surfaces; solvents are to be residue-free, of types recommended by joint sealer manufacturer to suit application.
- B. Typical Back-Up Material, Fillers and Joint Backing
 1. Non-staining, closed cell flexible neoprene or polyethylene, compatible with sealant material, of sizes and shapes recommended by sealant manufacturer for particular joint condition.
 2. Incompressible materials or acrylic, asphalt, oil or solvent containing materials will not be permitted.
 3. Bond Breaker: Pressure sensitive tape as recommended by joint sealer manufacturer to suit application.
- C. Cleaning Materials: Non-staining and not otherwise injurious to exposed surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces designated to receive sealants and caulks.

1. Verify that surfaces are free from bituminous materials, form release agents, bond breakers, curing compounds, water repellents or other special surface treatments.
2. Verify that joints and spaces requiring sealing are at correct or normal width.
3. Verify that concrete or plaster surfaces have properly cured.
4. Verify that aluminum surfaces are free of protective coating.

B. Do not install sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protection: Protect elements surrounding the Work of this Section from damage or disfiguration. Use masking tape where required to prevent contact of sealant with adjoining surfaces.

B. Surface Preparation

1. Prepare and size joints in accordance with manufacturer's instructions.
2. Clean out joints immediately before installing sealants, removing any loose materials and other foreign matter which might impair adhesion of sealant.
3. Prime joint surfaces where recommended by joint sealant manufacturers. Apply primer to comply with joint sealant manufacturer's recommendations.
4. Verify that joint backing and release tapes are compatible with sealant.
5. Install packing where required to obtain manufacturer's recommended joint depths.

3.3 INSTALLATION

A. Comply with the joint sealant manufacturer's printed installation instructions for specific materials, except where more stringent requirements apply. Comply with ASTM C962 for use of joint sealants.

B. Backer Rod and Bond Breaker

1. Measure joint dimensions and size materials to achieve required width and depth ratios.
2. Install backer rod and bond breaker into joints so that proper depth-to-width ratio is maintained for the sealant. Do not allow voids between segments.

C. Installation of Joint Sealants

1. Mix components according to directions on the container label.
2. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature ranges.
3. Apply sealants so as to directly contact and fully wet joint substrates.
4. Completely fill recesses provided for each joint configuration.

5. Provide uniform, cross-sectional shapes and depths relative to joint widths, which allow optimum sealant movement capability.
6. Immediately after sealant application and prior to the time skinning or curing begins, tool sealant joints to concave form smooth, uniform beads so as to eliminate air pockets, remove foreign embedded matter, ridges and sags.
7. Do not use tooling agents which discolor sealants or adjacent surfaces or which are not approved by the sealant manufacturer.
8. Remove masking tape immediately after tooling joints without disturbing joint seal.

3.4 ADJUSTING AND CLEANING

A. Adjusting

1. If damage or deterioration occurs, cut out and remove damaged or deteriorated sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from the original Work.
2. Repair or replace defaced or disfigured finishes caused by Work of this Section.

B. Cleaning

1. Clean off excess sealants or sealant smears adjacent to joints as Work progresses by methods and with cleaning materials approved by the manufacturer.
2. Clean adjacent soiled surfaces.

3.5 PROTECTION

- #### A.
- Protect joint sealants during and after curing period from contact with contaminating-substances or from damage resulting from construction operations of other causes so that they are without deterioration or damage at time of final completion.

END OF SECTION

SECTION 08 41 33

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 Related Documents

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 Summary

- A. This Section includes Aluminum Entrances, glass and glazing, and door hardware and components.
- B. Related Sections:
 - 1. 07 90 00 Joint Sealants
 - 2. 08 71 00 Door Hardware
 - 3. 08 80 00 Glass and Glazing

1.3 Definitions

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

1.4 Performance Requirements

- A. General Performance: Aluminum-framed entrance system shall withstand the effects of the following performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Aluminum Framed Entrance Performance Requirements:
 - 1. Wind loads: Provide entrance system; include anchorage, capable of withstanding wind load design pressures per local building department and CBC 2013 requirements.
 - 2. Air Infiltration: For single acting offset pivot or butt hung entrances in the closed and locked position, the test specimen shall be tested in accordance with ASTM E 283 at a pressure differential of 1.57 psf (75 PA) for single and pairs of doors. A single 3'0" x 7'0" (915 mm x 2134 mm) entrance door and frame shall not exceed 1.0 cfm/ft². A pair of 6'0" x 7'0" (1830 mm x 2134 mm) entrance doors and frame shall not exceed 1.0 cfm/ft².
 - 3. Structural Performance: Corner strength shall be tested per the Kawneer dual moment load test procedure and certified by an independent testing laboratory to ensure weld compliance and corner integrity.

1.5 Submittals

- A. Product Data: Include construction details, material descriptions, and fabrication methods, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum-framed entrance door indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum-framed entrance door and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum-framed entrance doors.
- F. Fabrication Sample: Corner sample consisting of a door stile and rail, of full-size components and showing details of the following:
 - 1. Joinery, including welds.
 - 2. Glazing.
- G. Other Action Submittals:
 - 1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

1.6 Quality Assurance

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum-framed entrance doors and storefronts that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. Source Limitations: Obtain aluminum-framed entrance door through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum-framed entrance doors and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements". Do not modify size and dimensional requirements.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockup for type(s) of swing entrance door(s) indicated, in location(s) shown on Drawings.
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.7 Project Conditions

- A. Field Measurements: Verify actual dimensions of aluminum-framed entrance door openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.8 Warranty

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
 - 1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

2.1 Manufacturers

A. Basis-of-Design Product:

1. Kawneer Company Inc., or approved equal.
2. The door stile and rail face dimensions of the 350 entrance door.
3. Major portions of the door members to be 0.125" (3.2) nominal in thickness and glazing molding to be 0.05" (1.3) thick.
4. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.
5. Provide adjustable glass jacks to help center the glass in the door opening.

2.2 Materials

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum-framed entrance door manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.090" (2.3 mm) wall thickness at any location for the main frame and door leaf members.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum-framed entrance door members, trim hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
 1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.

2.3 Storefront Framing System

A. Storefront Entrance Framing:

1. Trifab™ VG 450/451/451T or Trifab™ 451UT.
2. Thermally Broken entrance Framing - Kawneer IsoLock™ Thermal Break with a 1/4" (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
 - a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.

- B. Non-Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- E. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- F. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

2.4 Glazing

- A. Glazing: As specified in Division 08 Section "Glazing".
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

2.5 Hardware

- A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum-framed entrance doors.
- B. Standard Hardware:
 - 1. Weather-stripping:
 - a. Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with polymeric fin.
 - b. The door weathering on a single acting offset pivot or butt hung door and frame (single or pairs) shall be comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.
 - 2. Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners (Necessary to meet specified performance tests).
 - 3. Threshold: Extruded aluminum, one piece per door opening, with ribbed surface.
 - 4. See Door Hardware section 087000.

C. Access Control Entrance Hardware:

1. See Security devices in Section 285200 Intrusion Detection System

2.6 Fabrication

A. Fabricate aluminum-framed entrance doors in sizes indicated. Include a complete system for assembling components and anchoring doors.

B. Fabricate aluminum-framed glass doors that are reglazable without dismantling perimeter framing.

1. Door corner construction shall consist of mechanical clip fastening, SIGMA deep penetration plug welds and 1-1/8" (29 mm) long fillet welds inside and outside of all four corners. Glazing stops shall be hook-in type with EPDM glazing gaskets reinforced with non-stretchable cord.
2. Accurately fit and secure joints and corners. Make joints hairline in appearance.
3. Prepare components with internal reinforcement for door hardware.
4. Arrange fasteners and attachments to conceal from view.

C. Weather-stripping: Provide weather-stripping locked into extruded grooves in door panels or frames as indicated on manufacturer's drawings and details.

2.7 Aluminum Finishes

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Factory Finishing:

1. Kawneer Permanodic™ AA-M10C21A31, AAMA 611, Architectural Class II Clear Anodic Coating (Color #17 Clear) (Standard).

PART 3 - EXECUTION

3.1 Examination

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated installation.

1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76.2 mm) of opening.
3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Installation

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum-framed entrance doors, hardware, accessories, and other components.
- B. Install aluminum-framed entrance doors level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill threshold in bed of sealant, as indicated, for weather tight construction.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 Field Quality Control

- A. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 Adjusting, Cleaning, and Protection

- A. Clean aluminum surfaces immediately after installing aluminum-framed entrance doors. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION

SECTION 08 62 00

CURB MOUNT PLASTIC GLAZED CIRCULAR UNIT SKYLIGHTS

PART 1-GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Circular Curb-mounted plastic glazed unit skylights.
 - a. CC2 model circular double dome.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Section 07 54 00 PVC Roof Membrane
 - 2. Section 07 60 00 Flashing and Sheet Metal for metal flashing for skylights.
 - 3. Section 09 10 00 Metal Support Systems for curbs.
- C. Refer to roofing system sections for roofing accessories to be built into the roofing system to accommodate work of this section.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide unit skylights capable of withstanding loads as defined by the local codes having jurisdiction where units are to be installed without failure.
- B. Units shall be tested to compliance with AAMA\WDMA\CSA\101\I.S.2\A440 as required by the CBC.

1.3 SUBMITTALS

- A. Product Data Sheet: For each type of skylight specified, include details of construction and installation relative to applicable roofing materials.
- B. Samples for Selection: Manufacturer's color charts showing a full range of colors available for each type of skylight glazing and aluminum finish.

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide Thermoformed domes fabricated from sheets identical to those tested for the following fire-test-response characteristics, per ASTM test method indicated below, by UL or other testing and inspecting agencies acceptable to authorities having jurisdiction. Identify plastic sheets with appropriate markings of applicable testing and inspecting organization.
 - 1. Self-Ignition Temperature: 651 deg F (343 deg C) or greater when tested per ASTM D 1929 on plastic sheets in the thickness intended for use.

2. Smoke density of 75 or less when tested per ASTM D 2843 on plastic sheets in the thickness intended for use.
3. Relative- Burning Characteristics: As follows, when tested per ASTM D 635:
 - a. Class CC2 Burning rate of 2.5 inches (64 mm) per minute or less when tested on plastic glazing indicated above with a nominal thickness of 0.060 inch (1.5 mm) or the thickness intended for use.

1.5 WARRANTY

- A. General: Warranties specified in this section shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
- B. Skylight Warranty: Provide written warranty signed by manufacturer, agreeing to repair or replace work that exhibits defects in materials or workmanship and guaranteeing weather-tight and leak-free performance. "Defects" is defined as uncontrolled leakage of water and abnormal aging or deterioration.
 1. Warranty Period: 5 years from date of Substantial Completion.
- C. Plastic Warranty: Provide written warranty signed by manufacturer agreeing to repair or replace work that has or develops defects in the plastic. "Defects" is defined as abnormal aging or deterioration.
 1. Warranty Period for Acrylic: 5 years from date of Substantial Completion against yellowing.
- D. Finish Warranty: Provide written warranty signed by manufacturer agreeing to repair or replace work with finish defects. "Defects" is defined as peeling, chipping, chalking, fading, abnormal aging or deterioration, and failure to perform as required.
 1. Warranty Period for Anodized Finish: 5 year from date of shipment from the manufacturer.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by Wasco Skylights, part of the VELUX Group, Wells, ME (800-388-0293).
- B. Substitutions: Manufactures shall not be considered without prior approval in writing no later than ten (10) calendar days prior to bid. Substitute manufacturers must have been in the custom skylight business for not less than a period of 15 years and must submit to the Architect the following:
 1. List of similar projects successfully completed within the last five years.
 2. Proof of financial capability.
 3. Complete details of proposed skylight.
 4. Complete specifications for Architect's review.

2.2 MATERIALS

- A. Curb Frame: Bright white high-performance PVC with Bronze cap stock and minimum effective external wall thickness of 0.060 inch (1.5mm). Provide integral condensation gutter system with corners fully welded for waterproof quality.
- B. Retainer Frame: Extruded aluminum alloy 6063-T5 (min). ASTM B 221 (ASTM B 221 M) with minimum effective thickness of 0.060 inch (1.5 mm).
 - 1. Curbs: Minimum 1 ½" wide field built or pre-fabricated curb.
- C. Plastic Sheets: Monolithic, formable, transparent (colorless, tinted or translucent white) sheets with good weather and impact resistant.
 - 1. Acrylic: Thermoformable, acrylic (methacrylate), Category C-2 or CC-2 Type UVA (formulated with ultraviolet absorber), with Finish 1 (smooth or polished), unless otherwise indicated.
- D. Thermal Break: Fabricate skylight units with thermal chambered PVC frame.
- E. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other non-corrosive metal as recommended by manufacturer.

2.3 PLASTIC SKYLIGHT UNITS

- A. General: Factory-assembled, curb-mounted unit consisting of plastic glazing, gasketing, inner frame designed to mount on separate curb, and self-contained flashing.
 - 1. Products: Provide Model CC2 meeting the requirements of this section.
- B. Curb: Minimum 1 ½" wide field built or pre-fabricated.
- C. Condensation Control: Fabricate skylight units with integral internal gutters to collect condensation.
- D. Thermal Break: Fabricate skylight units with thermal chambered PVC.
- E. Shape and Size: As indicated by model number.
- F. Outer Glazing: Dome thermoformed:
 - a. Acrylic Clear
- G. Inner Glazing: Dome thermoformed:
 - a. Acrylic Clear

2.4 FABRICATION

- A. Framing Components: As follows:
 - 1. Factory fit and assemble components.
 - 2. Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
 - 3. Fabricate components to drain water passing joints and condensation to the exterior.
 - 4. Fabricate components to accommodate expansion, contraction, and field adjustment, and to provide for minimum clearance and shimming at skylight perimeter.
 - 5. Fabricate components to ensure that glazing is thermally and physically isolated from framing members.
 - 6. Fit and secure PVC frame joints by thermal welding.
 - 7. Fit and secure aluminum retainer joints by heliarc welding.

2.5 ALUMINUM FINISHES

- A. General: Comply with NAAMM "Metal Finishes Manual" recommendations for application and designations of finishes.
- B. Finish designations prefixed by AA conform to the system for designations of aluminum finishes established by the Aluminum Association.
 - 1. Anodized: Clear-Anodized Finish, Class I: AA-C22A41 complying with AAMA 611.

PART 3- EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting skylight performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions for protecting, handling, and installing skylight components.
- B. Coordinate with installation of roof deck and other substrates to receive skylight units.
- C. Coordinate with installation of vapor barriers, roof insulation, roofing, and flashing as required to assure that each element of the work performs properly and that combined elements are waterproof and weather tight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.
- D. Counter Flashing: Where counter flashing is required as component of the skylight, install to provide an adequate waterproof overlap with roofing or roof flashing (as counter flashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.

3.3 CLEANING AND PROTECTION

- A. Clean exposed metal and plastic surfaces according to manufacturer's instructions. Touch up damaged metal coatings.
- B. Final cleaning by others.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Mechanical and electrified door hardware for:
 - a. Swinging doors.
 - b. Sliding doors.
 - 2. Electronic access control system components, including:
 - a. Biometric access control reader.
 - b. Electronic access control devices.
- B. Exclusions
- C. Related Sections:
 - 1. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.

1.3 REFERENCES

- A. UL - Underwriters Laboratories
 - 1. UL 10B - Fire Test of Door Assemblies
 - 2. UL 10C - Positive Pressure Test of Fire Door Assemblies
 - 3. UL 1784 - Air Leakage Tests of Door Assemblies
 - 4. UL 305 - Panic Hardware
- B. ANSI - American National Standards Institute
 - 1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
- C. California Code of Regulations
 - 1. Title 24: California Building Standards Code

Use date of standard in effect as of Bid date.

BHMA – Builders Hardware Manufacturers Association
2019 California Building Code

Chapter 11B – Accessibility To Public Buildings, Public Accommodations,
Commercial Buildings and Public Housing

NFPA – National Fire Protection Association

NFPA 80 – Standard for Fire Doors and Other Opening Protectives.

NFPA 105 – Smoke and Draft Control Door Assemblies

NFPA 252 – Fire Tests of Door Assemblies

UL – Underwriters Laboratories

UL10C – Positive Pressure Fire Tests of Door Assemblies.

UL 305 – Panic Hardware

1.4 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.

B. Action Submittals:

1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

- a. Door Index; include door number, heading number, and Architects hardware set number.
 - b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
 - c. Type, style, function, size, and finish of each hardware item.
 - d. Name and manufacturer of each item.
 - e. Fastenings and other pertinent information.
 - f. Location of each hardware set cross-referenced to indications on Drawings.
 - g. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - h. Mounting locations for hardware.
 - i. Door and frame sizes and materials.
 - j. Name and phone number for local manufacturer's representative for each product.
 - k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.
 - 1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.
5. Key Schedule:
- a. Initiate and conduct meeting(s) with Owner representatives and hardware supplier to determine system keyway(s), keybow styles, structure, stamping, degree of physical security and degree of geographic exclusivity. Furnish Owner's written approval of the system; do not order keys or cylinders without written confirmation of actual requirements from the Owner.
 - b. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
 - c. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - d. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - e. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - f. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
 - 1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier and Installer.
2. Product Certificates for electrified door hardware, signed by manufacturer:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
3. Certificates of Compliance:
 - a. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in "QUALITY ASSURANCE" article, herein.
4. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data : Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Final approved hardware schedule, edited to reflect conditions as-installed.
 - e. Final keying schedule
 - f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
 - g. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.5 QUALITY ASSURANCE

- A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.
1. Where specific manufacturer's product is named and accompanied by "Owner Preference", including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)
 - a. Where no additional products or manufacturers are listed in product category, requirements for "Owner Preference" govern product selection.
 2. Where products indicate "acceptable manufacturers" or "acceptable manufacturers and products", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.

- B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project.
 - 1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 - 2. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
 - 3. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
 - a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.
- C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.
- D. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
 - 1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
- E. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
- F. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 - 1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
- G. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
- H. Means of Egress Doors: Latches do not require more than 5 lbs (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.
- I. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in "REFERENCES" article, herein.
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbs (22.2 N).
 - 2. Maximum opening-force requirements:

- a. Interior, Non-Fire-Rated Hinged Doors: 5 lbs (22.2 N) applied perpendicular to door.
 - b. Sliding or Folding Doors: 5 lbs (22.2 N) applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
 4. Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches (75 mm) from latch, measured to leading edge of door.
- J. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01.
1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 2. Inspect and discuss preparatory work performed by other trades.
 3. Inspect and discuss electrical roughing-in for electrified door hardware.
 4. Review sequence of operation for each type of electrified door hardware.
 5. Review required testing, inspecting, and certifying procedures.
- K. Coordination Conferences:
1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
 - a. Attendees: Door hardware supplier, door hardware installer, Contractor.
 - b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.
 2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.
 - a. Attendees: electrified door hardware supplier, doors and frames supplier, electrified door hardware installer, electrical subcontractor, Owner, Owner's security consultant, Architect and Contractor.
 - b. After meeting, provide letter of compliance to Architect, indicating when coordination conference was held and who was in attendance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
 1. Deliver each article of hardware in manufacturer's original packaging.

C. Project Conditions:

1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:

1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

E. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.7 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Existing Openings:
 1. Prior to submittal, carefully inspect existing conditions to verify finish hardware required to complete Work, including sizes, quantities, existing hardware scheduled for re-use, and sill condition material. If conflict between the specified/scheduled hardware and existing conditions, submit request for direction from Architect. Include date of jobsite visit in the submittal.
 2. Submittals prepared without thorough jobsite visit by qualified hardware expert will be rejected as non-compliant.
- F. Direct shipments not permitted, unless approved by Contractor.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
 - a. Closers:
 - 1) Mechanical: 30 years.
 - 2) Electrified: 2 years.
 - b. Automatic Operators: 2 years.
 - c. Exit Devices:
 - 1) Mechanical: 3 years.
 - 2) Electrified: 1 year.
 - d. Locksets:
 - 1) Mechanical: 10 years.
 - 2) Electrified: 1 year.
 - e. Continuous Hinges: Lifetime warranty
 - f. Key Blanks: Lifetime
2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
 - A. REGULATORY REQUIREMENTS: LOCATE LATCHING HARDWARE BETWEEN 34 INCHES TO 44 INCHES ABOVE THE FINISHED FLOOR, PER 2019 CALIFORNIA BUILDING CODE, SECTION 11B-404.2.7.
 1. Panic hardware: locate between 36 inches to 44 inches above the finished floor.
 - B. Handles, pull, latches, locks, other operable parts:
 1. Readily openable from egress side with one hand and without tight grasping, tight pinching, or twisting of the wrist to operate. 2019 California Building Code Section 11B-309.4.
 2. Force required to activate the operable parts: 5.0 pounds maximum, per 2019 California Building Code Section 11B-309.4.
 - C. Adjust doors to open with not more than 5.0-pounds pressure to open at exterior doors and 5.0-pounds at interior doors. As allowed per 2019 California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15-pounds.
 1. Exception: exterior doors' pressure-to-open may be increased to 8.5-pounds if: at a single location, and one of a bank of eight leafs or fraction of eight, and one leaf of this bank is fitted with a low- or high-energy operator.
 - D. Low-energy powered doors: comply with ANSI/BHMA A156.19. Reference: 2019 California Building Code Section 11B-404.2.9, Exception 2.
 1. Where powered door serves an occupancy of 150 or more, provide back-up battery power or stand-by generator power, capable of supporting a minimum of 100 cycles.

2. Actuators, vertical bar type: minimum 2-inches wide, 30-inches high, bottom located minimum 5-inches above floor or ground, top located minimum 35-inches above floor or ground. Displays International Symbol of Accessibility, per 2019 California Building Code Section 11B-703.7.
 3. Actuators, plate type: use two at each side of the opening. Minimum 4-inches diameter or 4-inches square. Displays International Symbol of Accessibility, per 2019 California Building Code Section 11B-703.7. Locate centerline of lower plate between 7- and 8-inches above floor or ground, and upper plate between 30- and 44-inches above floor or ground.
 4. Actuator location: conspicuously located, clear and level floor/ground space for forward or parallel approach.
- E. Adjust door closer sweep periods so that from an open position of 90 degrees, the door will take at least 5 seconds to move to a point 12 degrees from the latch, measured to the landing side of the door, per 2019 California Building Code Section 11B-404.2.8.
1. Spring hinges: adjust for 1.5 seconds minimum for 70 degrees to fully-closed.
- F. Smooth surfaces at bottom 10 inches of push sides of doors, facilitating push-open with wheelchair footrests, per 2019 California Building Code Section 11B-404.2.10.
1. Applied kickplates and armor plates: bevel the left and right edges; free of sharp or abrasive edges.
 2. Tempered glass doors without stiles: bottom rail may be less than 10 inches if top leading edge is tapered 60 degrees minimum.
- G. Door opening clear width no less than 32 inches, measured from face of frame stop, or edge of inactive leaf of pair of doors, to door face with door opened to 90 degrees. Hardware projection not a factor in clear width if located above 30 inches and below 80 inches, and the hardware projects no more than 4 inches. 2019 California Building Code Section 11B-404.2.3.
1. Exception: In alterations, a projection of 5/8 inch (15.9 mm) maximum into the required clear width shall be permitted for the latch side stop.
 2. Door closers and overhead stops: not less than 78 inches above the finished floor or ground, per 2019 California Building Code 11B-307.4.
- H. Thresholds: floor or landing no more than 0.50 inches below the top of the threshold of the doorway, per 2019 California Building Code Section 11B-404.2.5. Vertical rise no more than 0.25 inches, change in level between 0.25 inches and 0.50 inches: beveled to slope no greater than 1:2 (50 percent slope). 2019 California Building Code Section 11B-303.2 & ~.3.
- I. Floor stops: Do not locate in path of travel. Locate no more than 4 inches from walls, per BUILDING DEPT. Policy #99-08 (Access).

- J. Pairs of doors with independently-activated hardware both leaves: limit swing of right-hand or right-hand-reverse leaf to 90 degrees to protect persons reading wall-mounted tactile signage, per 2019 California Building Code Section 11B-703.4.2.
- K. Door and door hardware encroachment: when door is swung fully-open into means-of-egress path, the door may not encroach/project more than 7 inches into the required exit width, with the exception of door release hardware such as lockset levers or panic hardware. These hardware items must be located no less than 34-inches and no more than 48-inches above the floor/ground. 2019 California Building Code, Section 1005.7.1.
- L. In I-2 occupancies, latch release hardware is not permitted to project in the required exit width, regardless of its mounting height, per 2019 California Building Code, Section 1005.7.1 at Exception 1.

PART 2 -

2.1 MANUFACTURERS

- A. Where "Owner Preference" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturer" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- E. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

- A. Fasteners
 - 1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
 - 2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 - 3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on

opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.

4. Install hardware with fasteners provided by hardware manufacturer.
- B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.
1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
 2. Use materials which match materials of adjacent modified areas.
 3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.
- C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.3 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 3CB series "Owners Preference"

B. Requirements:

1. Provide three-knuckle ball bearing hinges conforming to ANSI/BHMA A156.1.
2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
 - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
 - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
4. 2 inches or thicker doors:
 - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
5. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
6. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
7. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

- a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
8. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.
 9. Doors 36 inches (914 mm) wide or less furnish hinges 4-1/2 inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.
 10. Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component.
 11. Provide mortar guard for each electrified hinge specified.
 12. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Where on-site modification of doors and frames is required:
 1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
 2. Field modify and prepare existing door and frame for new hardware being installed.
 3. When modifications are exposed to view, use concealed fasteners, when possible.
 4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:

- a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- b. Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
- c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 2. Custom Steel Doors and Frames: HMMA 831.
 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- H. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 1. Replace construction cores with permanent cores as indicated in keying section.
- I. Wiring: Coordinate with Division 26, ELECTRICAL sections for:
 1. Conduit, junction boxes and wire pulls.
 2. Connections to and from power supplies to electrified hardware.
 3. Connections to fire/smoke alarm system and smoke evacuation system.
 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 5. Testing and labeling wires with Architect's opening number.
- J. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

- K. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
- L. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- M. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
 - 1. Coordination: Coordinate provision with the security systems provider to mitigate excessive or redundant purchase.
 - 2. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.
- N. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- O. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- P. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- Q. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- R. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- S. Field-verify existing conditions and measurements prior to ordering hardware. Fill existing hardware cut outs not being used by the new hardware.
- T. Remove existing hardware not being reused. Tag and bag removed hardware, turn over to Owner.
- U. Where existing wall conditions will not allow door to swing using the scheduled hinges, provide wide-throw hinges and if needed, extended arms on closers.
- V. Provide manufacturer's recommended brackets to accommodate the mounting of closers on doors with flush transoms.

3.4 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.

3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.5 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DEMONSTRATION

- A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.7 DOOR HARDWARE SCHEDULE

- A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.
- B. Do not order material until submittal has been reviewed, stamped, and signed by Architect's door hardware consultant.
- C. Hardware Sets: TBD

End of Section

SECTION 08 80 00

GLASS AND GLAZING

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this section. Provide glass and glazing, complete.

A. Work Specified In This Section:

1. Glass and glazing, shop glazed and field glazed.
2. Tempered glass
3. Glass Canopy

B. Related Work Not In This Section:

1. Curtainwall framing.
2. Windows, storefront, and framed entrance doors.
3. Hollow metal frames.
4. Frameless Glass Doors

1.02 QUALITY ASSURANCE

A. Quality Standards: In addition to code, glass installations shall comply with ANSI Z97.1, as applicable, and Federal Safety Standard 16 CFR 1201.

B. Applicator's Qualifications: Applicator for the work of this section shall have not less than 10 years satisfactory experience in glazing projects of equivalent size and difficulty to this project.

1.03 SUBMITTALS:

A. Submit shop drawings showing details of each type glazing system indicating sizes, shapes, material and quantity. Show details indicating sealant thickness and profile, bite on glass, glass edge clearance, depth of rabbet and thickness of glass. Identify gasket materials, side spacer blocks, and setting blocks. Show weepage system in glass pockets. Details shall be full size.

B. Product Data: Submit manufacturer's technical data on the following:

1. Glass except clear float.
2. Glazing channels.
3. Glazing beads and compounds.
4. Glazing tape.

C. Samples: Submit the following:

1. Glass, each type, not smaller than 2" by 12" with smooth edges. Submittals shall identify thickness and type of glass. For exterior glass, indicate on the label the maximum design wind load it can accommodate based upon the maximum sizes required for that glass type. At least one sample of glass shall bear required markings, such as tempered glass indicators, manufacturer's name, and code required marks.
 2. Glazing channels, gaskets, spacers, setting blocks, each type.
 3. Sealants: Two 4" long beads, 1/4" to 3/8" diameter. Provide each type and color required in the project. Identify areas of use.
 4. Glazing tape: Two 12" long pieces.
- D. Certificates:
1. Submit from manufacturer stating the quality, thickness, and type of unlabeled glass delivered to the site for field cutting.
 2. Provide certification that the glazing used conforms to the referenced standards.
 3. Provide certification of applicator's qualifications.
- E. Regulatory Approval: Submit copies of research reports or equivalent documentation demonstrating approval for fire-rated glass.
- 1.04 DELIVERY, STORAGE, AND HANDLING: Deliver products to the site in unopened containers, labeled plainly with manufacturers' names and brands. Store glass and setting materials in safe, dry locations and do not unpack until needed for installation. Handle and install materials in a manner that will protect them from damage.
- 1.05 JOB CONDITIONS: Protect glazing until completion and final acceptance. Repair or replace damaged or defective glazing to the original specified condition, at no additional contract cost. Damaged or defective glazing includes glass that cannot be properly cleaned.
- 1.06 WARRANTY: Furnish written warranties covering products and workmanship under this section as follows:
- A. Exterior glazing: Against loosening, air or water leakage, glass pop-outs, and other defects for 5 years.
 - B. Glazing gaskets and channels: Against defective material or deterioration including without limitation, shrinkage, loss of seal, exposure to ozone, elements, smog and other air pollution, and commercial glass cleaners for 5 years.
 - C. Low E-coated glass: Coating against peeling or deterioration for 10 years.
 - D. Insulated glass: against development of material obstruction to vision (such as dust or film formation on the inner glass surfaces) caused by failure of the hermetic seal, other than through glass breakage, for 10 years.

- E. Laminated glass: against delamination or degradation of appearance by bubbling or other defect for a period of 10 years.

PART 2 - PRODUCTS

2.01 GENERAL: Glass furnished for the project shall match approved samples, be uniform in appearance, free from irregularities and differences in appearance when viewed from exterior as approved. Glass not complying with this requirement to be replaced with conforming glass without additional contract cost.

2.02 ACCEPTABLE MANUFACTURERS AND FABRICATORS: To maximum extent possible provide domestically manufactured and fabricated glass, and provide glass from one manufacturer. Specific types of glass specified or indicated shall be of manufacturers noted.

A. Primary Glass Manufacturers:

Oldcastle Glass Inc./ 9550 W. Higgins Road, Suite 390, Rosemont, IL60018
(800) 653-2278

Pilkington LOF/ 2800 28th Street, Suite 133, Santa Monica, CA 90405
(800) 522-9430.

PPG Glass Technology One PPG Place, 31N Pittsburgh, PA 15272
(800)434-2858

B. Glass Fabricators:

Viracon/ 800 Park Drive, Owatonna, MN 55060
(800) 533-2080

Southwest Technologies 1029 Corporation/ Way Palo Alto, CA 94303
(800) 365-8974

ACI Distribution/ 10234 4th Street, Rancho Cucamonga, CA 91730
(800) 303-4224

- C. Glass Canopy per Kalwall's DeaMor Company – Narrow line system, or equal
1. Finish aluminum with an anodized coating
 2. Glass is sloped and engineered to prevent water ponding and create a straight leading edge

2.03 GLASS

A. MATERIALS:

1. Domestic manufacture, conforming to ASTM C1036 and ASTM C1048, except as otherwise noted, and except total distortion tolerances in this section shall govern, Conform to ANSI Z97.1. Label factory cut panes and do not remove labels until

directed. Do not cut unlabeled glass delivered to site as material for field cutting until approval of material is obtained.

2. Furnish glass with straight smooth-finished edges where edges remain exposed.
- B. Float Glass: Type I, (transparent glass flat), Class 1 (clear), Quality q3, (glazing select), unless otherwise shown or specified, use 1/4 inch thick glass.
 - C. Tinted Float Glass: Type I, Class 2 (tinted heat absorbing and light reducing), quality q3, manufactured by PPG or LOF, color as selected, 6 mm (1/4 inch) thick unless otherwise indicated or specified.
 - D. Tempered Glass: Condition A, Type I or II, Class 1, Quality q3, Kind FT, match color of clear or tinted glass as applicable; fully thermal tempered, heat strengthening is not acceptable. Perform tempering by horizontal oscillating roller hearth or high speed roller hearth process. Do not use processes making gripper or tong marks. Handle and size glass according to manufacturer's instructions. Tempered glass is an important part of the artistic effect of the building design. Lights showing excessive distortion will not be permitted. Glass shall conform to the standard or quality established by the approved full-size sample installations.
 - E. Clear laminated glass: Conform to ASTM C 1172, glass assembly as shown, of clear float glass with 0.060" thick high strength polyvinyl butyral laminating sheet. Edges of laminated glass shall be treated with Ardis "500", or equal, edge protection to prevent contact of laminating sheet with sealants.
 - F. Insulating Glass: One inch thick, consisting of one light of clear float glass and one light of tinted float glass, one or both lights fully tempered where required, and 1/2 inch air space. Glass assembly shall consist of a non ferrous spacer, dual seals and an dehydrated evacuated space. Spacer shall be roll-formed of aluminum or stainless steel with bent or tightly welded joints. Primary seal shall be polyisobutylene or polyurethane and outer seal shall be silicone. Interstitial space shall be evacuated, dehydrated and provided with permanent dessicant. Sizes shall be within tolerances specified in SIGMA A 1202. Units shall conform to ASTM E 774, Class A.
 - G. Low Emissivity Glass (Low E Glass): Conform to ASTM C 1376 as applicable. Fabricate as specified above for insulating glass. Insulating glass units except provide magnetic sputter vacuum deposited metallic high-transmittance coating applied to the number 2 surface of the unit. The U-value for the IGU shall be no greater than 0.34, unless otherwise indicated.
 - H. Wire Glass: Type II (patterned and wired glass, flat). Class 1 (translucent), Quality q8 (glazing), Form 1 (wired, polished both sides), mesh m2 (square). Wire glass for fire rated openings shall bear an identifying UL label or the label of a recognized testing agency, and shall be rated for fire resistance indicated.

2.05 SETTING AND SEALING MATERIALS:

- A. Provide as specified in the GANA GM, SIGMA TM-3000, SIGMA TB-3001, and manufacturer's recommendations, unless specified otherwise herein. Do not use metal sash putty, nonskinning compounds, nonresilient preformed sealers, or impregnated preformed gaskets. Materials exposed to view and unpainted shall be gray or neutral color.
- B. Elastomeric Sealant: ASTM C920, Type S or M, Grade NS, Class 12.5, Use G. Use for channel or stop glazing wood and metal sash. Sealant shall be chemically compatible with setting blocks, edge blocks, and sealing tapes, with sealants used in manufacture of insulating glass units and with plastic sheet. Color of sealant shall match frames.
- C. Preformed Channels: Neoprene, vinyl, or rubber, as recommended by the glass manufacturer for the particular condition.
- D. Sealing Tapes: Preformed, semisolid, polymeric-based material of proper size and compressibility for the particular condition. Use only where glazing rabbet is designed for tape and tape is recommended by the glass or sealant manufacturer. Provide spacer shims for use with compressible tapes. Tapes shall be chemically compatible with the product being set.
- E. Setting Blocks and Edge Blocks: Neoprene of 70 to 90 Shore "A" durometer hardness, chemically compatible with sealants used, and of sizes recommended by IGMA and the glass manufacturer. Setting blocks for insulated glass shall conform to AAMA 101.
- F. Accessories: Provide as required for a complete installation, including glazing points, clips, shims, angles, beads, and spacer strips. Provide noncorroding metal accessories. Provide primer-sealers and cleaners as recommended by the glass and sealant manufacturers.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Clean joints, gutters and glass pockets, to remove foreign matter such as dirt, oil, grease, fireproofing, surface dust and debris.
- B. Remove loose particles present or resulting from cleaning. Remove protective coatings and fabrication oils and residue on metallic surfaces with solvents that leave no residue. Do not allow solvent to air dry without wiping. Use only clean lint free towels for wiping of surfaces.
- C. Do not glaze when the ambient temperature and weather conditions cause frost or moisture or condensation on framing, or during damp weather unless approved measures to eliminate these conditions are used.

D. Cut glass accurately to sizes required to the openings and in such a way that edges are smooth and straight. Clean glass free from dust, oil, etc., and wipe clean immediately before installation.

E. Set, remove and later reset glazing stops so as to avoid marking or defacing any portion of the frames, stops, settings, etc. Prime surfaces of openings properly where recommended by the sealant manufacturer.

F. Glazed openings shall be checked prior to glazing to ensure that openings are square, plumb, and secure in order that uniform face and edge clearances can be maintained. Inspect framing joint intersections to ensure that the offset in the jointery will not inflect undue edge pressure on the glass.

G. Maintain minimum face distances on both sides of glass as per GANA guidelines.

3.02 GLASS SETTING:

A. Shop glaze or field glaze items to be glazed using glass of the quality and thickness specified or indicated. Glazing, unless otherwise specified or approved, shall conform to applicable recommendations in the GANA GM, GANA SM, SIGMA TB-3001, SIGMA TM-3000, and manufacturer's recommendations.

B. Aluminum windows, curtainwall and storefront may be glazed in conformance with glazing method described in the standards under which they are produced, except that face puttying with no bedding will not be permitted. Handle and install glazing materials in accordance with manufacturer's instructions. Use beads or stops which are furnished with items to be glazed to secure the glass in place. Use tape glazing or elastomeric wet glazing method as recommended by sash manufacturer.

C. Insulating Glass Units:

1. Do not grind, nip, or cut edges or corners of units after the units have left the factory. Springing, forcing, or twisting of units during setting will not be permitted. Handle units so as not to strike frames or other objects. Installation shall conform to applicable recommendations of SIGMA TB-3001 and SIGMA TM-3000.

2. Glaze using tape and wet seal method. Apply a heel bead of tape around the stationary leg of the sash. Set the glass unit on setting blocks at the quarter points. Press the unit firmly against the tape, then place tap on the stops. Apply the stops to the sash and the unit, using a toe bead of glazing compound. When the stops are in place apply wet seal to the saash, beveling it away from the glass.

D. Wire Glass: Install glass for fire doors in accordance with installation requirements of NFPA 80.

E Laminated Glass: Sashes which are to receive laminated glass shall be weeped to the outside to allow water drainage into the channel.

F. Set glass with glass markings, such as manufacturer's name, tempered glass designations, or code required indicators, right side up, level and straight. Locate markings in accordance with approved submittals, or in lower left-hand corner as directed.

3.03 PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.

D. Remove and replace glass which is broken, chipped, cracked abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

E. Wash glass on both faces not more than 4 days prior to date scheduled for final acceptance of project. Wash glass by method recommended by glass manufacturer. Do not use any harsh cleaning agents, caustics, abrasives, or acids for cleaning. Polish glass both sides and leave free of soiling, streaks, and labels.

END OF SECTION

SECTION 09 10 00

METAL SUPPORT SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Section includes requirements for provision of
 1. Metal studs for exterior and interior wall framing, furring, and suspension systems for support of gypsum wallboard walls, ceilings and soffits.
 2. Backing for items adjoining or fastening to these systems unless otherwise noted.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements
 1. Provide fire-rated gypsum board systems conforming to minimum fire ratings as indicated on the drawings.
 2. Performance Requirements: Install metal support systems complying with following requirements:
 - a. That are plumb, true, straight, and rigid framing for support of collateral materials, and that accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
 - b. That accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
 - c. Provide gypsum board surfaces that have no variations which exceed 1/8 inch in 10 feet when a straight edge is laid on the surface in any direction, and that have no measurable variation in any two foot direction. Provide corners that are square, straight and plumb.
 - d. Surfaces not meeting these performance requirements shall be deemed uneven and defective and shall be replaced or repaired to the Architect's satisfaction at no increase in cost to the Contract.
- B. Regulatory Requirements
 1. Fire-Resistive Requirements: Provide fire-rated materials and systems complying with requirements of authorities having jurisdiction.
 2. Metal Framing Systems
 - a. Framing: Provide framing that is plumb, true, straight, and rigid framing for support of collateral materials and comply with requirements of CBSC CBC Chapter 25A, Sections as follows:
 - b. Vertical Assemblies: 2503A.1 and 2503A.2.

- c. Horizontal Assemblies: 2504A.1, 2504A.2, 2504A.3 and 2504A.4.
3. Seismic Requirements: Design anchorage systems to comply with CBC Chapter 16A Section 1632A as applicable for Seismic Zone 4 and requirements of
 - a. Table 16A-B- Special Loads
 - 1) Category: Partitions And Interior Walls: 5
 - b. Table 16A-0, Elements Of Structures And Nonstructural Components And Equipment
 - 1) Elements Of Structures
 - a) Interior Bearing And Non-Bearing Walls: 1.A.(3).
 - 2) Nonstructural Components
 - a) Exterior And Interior Ornamentations And Appendages: 2.A.
 - b) Partitions: 2I.
4. . Section 1632A, Seismic Zone 4, and requirements of Table 16A-O Nonstructural Component Item 1 as applicable.

PART 2 PRODUCTS

2.1 MATERIALS FOR METAL SUPPORT SYSTEMS

- A. Runner Tracks
 1. Typical: Provide tracks of same gauge, thickness and finish as studs, unless indicated otherwise or specified otherwise in this Section
- B. Stud Types
 1. Type A1, Typical: 16 gauge studs, with 14 gauge top and bottom tracks, C-shaped sections, having yield strength of 50,000 psi, galvanized finish conforming to ASTM A525 for exterior framing, Unimast Inc.'s "ST Stud"; or equal.
 2. Type A, Typical: 25 gauge, C-shaped sections, ASTM C625, having yield strength of 33,000 psi, galvanized finish conforming to ASTM A525. Unimast Inc.'s "ST Stud"; or equal.
 3. Type B, Typical, Non-Load Bearing; C-shaped sections, with punched webs and plain steel flanges to receive screws; fabricated from 20 gauge steel conforming to ASTM A568, and having hot-dip galvanized coating conforming to ASTM A525, manufacturer's standard.
 4. Type C, Typical At Door Framing, Load Bearing Studs; C-shaped sections, cold-formed with punched webs and plain flanges to receive screws; fabricated from 16 gauge galvanized steel conforming to ASTM A446, Grade D, having minimum yield point of 50,000 psi.
- C. Channels, Typical for Framing, Furring and Carrying Channels: Cold-rolled steel coated with rust-inhibitive material, with following minimum weights per 1000 lineal feet, subject to standard mill weight tolerances:

Size Inches	Gauge	Pounds
3/4	16	300
1-1/2	16	475
2	16	590

- D. Adjustable Wall Furring Channels: Formed from 20 gauge galvanized steel with either plain or perforated flanges to receive screws.
- E. Resilient Channel System
1. Resilient Channels: Galvanized steel channels, minimum 25 gauge. Uni-Mast "RC-1"; Cemco "RC-1", Dale/Incor "RFC-1"; or equal.
 2. Fasteners: U.S. Gypsum Co.'s following; or equal.
 - a. Typical: Use one-inch type S Bugle head dry wall screws.
 - b. For Fire Resistive Ceilings: Use 1-1/4-inch screws.
- F. Bracing Members, Stiffeners or Bridging, And Metal Backing:
1. Bracing Members: Of same material and finish as studs, thickness to suit purpose.
 2. Partition Stiffeners or Bridging: Cold-rolled channel or manufacturer's standard bridging for approved stud.
 3. Metal Backing Plate Systems:
 - a. Type A
 - 1) Use: For surface-mounted mirrors, waste receptacles, towel dispensers and similar type items having maximum weight of 50 pounds.
 - 2) Provide double Type A studs at sides of opening as indicated.
 - 3) Provide backing plate consisting of 16 gauge track notched as indicated.
 - 4) Secure track to studs with screws type and size as indicated.
 - 5) Secure items to backing plate with screws as indicated.
 - b. Type B
 - 1) Use: Backing for upper wall-hung cabinets (up to 2 shelves), base cabinets, full-height cabinets, handrails, guardrails, grab bars and wall- hung equipment and similar-type items having maximum weight of 100 pounds per foot.
 - 2) Provide double Type B studs of size and at sides of opening as indicated.
 - 3) Provide backing plate as indicated consisting of 16 gauge track notched to studs as indicated.
 - 4) Secure track to studs by welding as indicated.
 - 5) Secure items to backing plate with screws as indicated.
 - c. Type C

- 1) Use backing for upper wall-hung cabinets (over 2 shelves), and wall-mounted equipment up to 200 pounds per foot.
 - 2) Provide double Type B studs of size and at opening as indicated.
 - 3) Provide continuous backing plate of size as indicated consisting of 14 gauge steel plate.
 - 4) Secure backing plate to studs with screws as indicated.
 - 5) Provide track channel stiffeners size and shape as indicated welded to continuous backing plate as indicated.
 - 6) Secure items to backing plate with screws as indicated.
- G. Galvanized Finish Touch-Up Coating: Liquid zinc compound that bonds electrochemically to iron, steel and aluminum. As manufactured by ZRC Chemical Products, "ZRC Cold Galvanizing Compound"; or equal.
- H. Rust Inhibitive Touch-Up Coating: As manufactured by ICI Dulux "Dveflex 4020 DTM Flat Interior/Exterior Waterborne Primer & Finish (85xx)"; or equal.

2.2 FASTENERS AND ATTACHMENTS

- A. For Metal Support Framing Systems:
1. Welding Electrodes: AWS low hydrogen, rod number and diameter as recommended by the manufacturer.
 2. Powder-Driven Fasteners: Tempered steel pins with special corrosive-resistant plating or coating. Pins shall have guide washers to accurately control penetration, maximum 3/4-inch. Fastening shall be accomplished by low-velocity piston-driven power-actuated tool. Pins and tool shall be as manufactured by Hilti Fastening Systems; Impex Tool Corp., or equal. When installing in concrete, use care and caution to avoid cutting or damaging the existing reinforcing bars. Do not use on curb or edge of slab.
 3. Metal Screws: ASTM C1002, specifically designed for attachment of metal to metal, with self-tapping point and manufacturer's standard rust-inhibiting coating.
 4. Concrete Screws: Heat-treated screws with unique Hi-Lo thread design that cuts threads in pre-drilled holes in concrete. As manufactured by Buildex, "Tapcon Anchors", or equal.
 5. Wedge Anchors: FS-FF-S-325, Group II, Type 4, size as indicated. As manufactured by Hilti Fastening Systems "Kwik-Bolt" and "HDI Anchor"; Ramset Fastening Systems "Trubolts", or equal. Allowable capacity shall not exceed 80 percent of the allowable load listed in the ICBO Research Committee recommendation for the specific anchor. When installing in concrete use care and caution to avoid cutting or damaging the existing reinforcing bars.
 6. Machine Bolts, Nuts and Washers: Low carbon steel standard fasteners, externally and internally threaded, ASTM A307; malleable washers.

7. Hanger, Bracing and Tie Wire: Galvanized soft carbon steel. ASTM A641, Class I, coating, soft temper, of following minimum gauges, unless otherwise specified:
 - a. Single-Strand Tie Wire: 16.
 - b. Double-Strand Tie Wire: 18.

2.3 FINISHES

- A. Galvanized Surfaces: Where galvanizing is removed by welding or other assembly procedures, clean area of any foreign matter by wire-brushing and/or metal conditioner recommended by galvanized finish touch-up manufacturer. Apply galvanized touch-up coating by brush or spray with a minimum coverage of 1.4 mils, dry-film.
- B. Rust-Inhibitive Coated Surfaces: Where coating is removed by welding or other assembly procedures, clean area of any foreign matter and apply rust-inhibitive touch-up coating.

PART 3 EXECUTION

3.1 INSTALLATION

- A. General Requirements for Metal Support Systems
 1. Install studs and furring in accordance with following unless otherwise indicated:
 - a. Studs and Furring: Install in accordance with MLA Specifications and Bulletins.
 2. Securely fasten framing members together and to walls, floors and other structural supports.
 3. Wire-Tying:
 - a. For Members Perpendicular To Each Other: Saddle Tie.
 - 1) For Horizontal Stiffener Channels Placed At Intersecting Legs of Channel Brackets: Figure-eight tie unless otherwise indicated.
 - 2) For Splices: Double-wrap tie.
 4. Welding:
 - a. Perform welding by welder previously qualified for horizontal, vertical and overhead positions in accordance with AWS D1.1.
 - b. Use one inch seam welds unless specifically noted otherwise.
 5. Cutting:
 - a. General: Cut framing components squarely or on an angle as may be required to fit tightly with proper bearing against abutting members. Maintain members firmly in position until permanently fastened.

- b. Cutting of Studs: If stud web is cut more than 50 percent or stud flange is cut to any degree restore stud to original strength to the Architect's satisfaction by wire-tying, screwing or welding on steel reinforcement.
- 6. Deflection Allowance at Non-Loadbearing Conditions
 - a. Where partitions abut underside of rigid construction, cut studs short and install additional continuous track size as indicated.
 - b. Where partitions abut steel, concrete, or masonry vertical surfaces, set end stud free of abutting surface and secure ends of horizontal stiffeners in partition to abutting surface.
- 7. Installation Tolerances of Metal Support Systems Comply with requirements of Article titled "System Description, subArticle titled "Performance Requirements in this Section.
 - a. Maximum Variation From True Position: 1/8-inch.
 - b. Maximum Variation of any Member from Plane: 1/8-inch.
- 8. Stud Partitions Typical
 - a. Coordinate installation of bucks, anchors, and blocking with electrical and mechanical work to be placed in or behind stud framing.
 - b. Refer to Drawings for indication of partitions extending to ceiling only and for partitions extending through ceiling to structure above.
 - c. Coordinate placement of insulation in multiple stud spaces made inaccessible after stud framing erection.
 - d. Runner Track
 - 1) Use same runner track type and stud type for partitions unless otherwise noted
 - 2) Install runner track running continuous at top and bottom of wall framing unless otherwise indicated; and accurately align floor and ceiling runner track and securely attach at maximum 24 inches on center and at each end.
 - 3) Do not miter runner track at corners.
 - e. Studs
 - 1) Use single-length studs for each run with no splices.
 - 2) Space studs maximum 16-inches on center unless otherwise noted.
 - 3) Securely attach studs to runner track by welding as indicated.
 - 4) Locate studs maximum 2-inches from opening jambs abutting partitions or other construction.
 - 5) At partition corners, position stud to form outside corner and locate another stud within 2-inches from inside corner along each partition.
 - f. Partition Stiffeners, Horizontal
 - 1) Stiffen partitions with 3/4-inch horizontally placed channels at vertical mid-point.

- 2) Wire-tie stiffeners to inside of studs, or secure as recommended by stud manufacturer.
- g. Framing of Openings
- 1) General: Completely frame openings. Provide vertical-cut studs over openings as indicated.
 - 2) Vertical Framing Of Door Openings: Typical unless otherwise indicated.
 - 3) Secure 2 Type C studs together to form box and seam weld minimum 1 inch at 24 inches on center and install at each jamb continuous from floor to structure above as indicated. Where ductwork or other obstruction interferes with straight studs, head the studs and either offset frame or brace to structure above.
 - 4) Weld, bolt or screw jamb frame anchors to Type C studs. Secure 1 Type A typical stud to box formed by Type C studs for attachment of collateral material.
 - 5) Continuous typical partition framing each side of opening.
- h. Framing Over Openings:
- 1) Secure 2 Type C, studs together as indicated to form box and seam weld minimum 1-inch at 24-inches on center and install continuous from jamb to jamb. Weld, bolt or screw header box to jamb frame box.
 - 2) Provide horizontal Type B stud above box formed by Type C studs as indicated and weld bolt or screw to jamb frame box studs.
 - 3) Install cut to length jack studs between horizontal stud of opening and ceiling channel.
 - 4) At Doors Wider Than 36 Inches: Reinforce jack studs with 3/4 inch furring channel installed maximum 6 inches above opening. Extend channel minimum 2 stud spaces each side of opening. Wire-tie channel to inside of all studs and supports.
- i. Backing in Stud Partitions or Furring:
- 1) Typical: Securely screw typical metal backing to at least 3 stud supports, leaving flat surface of metal backing to receive attachment of object to be secured.
 - 2) Attachment: Verify that any pre-drilling of backing and attachment of spacers to prevent crushing of collateral material is done prior to application of collateral material.
 - 3) If it is determined by the Architect that backing was not provided for any items as required, the Contractor shall remove the finish material and install backing. The Contractor shall patch and refinish surface to match adjacent area and surface.
 - 4) Typical Backing System: Use metal backing track or plate and secure with screws as indicated.
 - 5) For Grab Bars: As specified in Section 10800

- j. Vertical and Horizontal Contact Furring:
 - 1) Install furring channels vertically at 16 inch centers, unless otherwise indicated.
 - 2) Install intermediate bracing at spaces sufficient to provide substantial foundation for collateral materials or other supported items.
 - 3) Completely frame openings with channels.

- 9. Resilient Channel Construction
 - a. Attaching Resilient Channels
 - 1) Attach channels at 24-inch center-to-center spacing perpendicular to joists, assuming joists are 16 inches apart.
 - 2) If joists are 24-inches apart, install channels at spacing of 16-inches on center,
 - 3) Use 1-inch S-Bugle Head dry wall (or similar screws.
 - 4) Drive screws through holes in channel mounting flange.
 - 5) Attach channels with mounting flanges facing in only one direction
 - 6) Hold back ends of channels 1/2 inch from intersecting surfaces.
 - 7) Splice channels only at joist and overlap butt ends no more than 1-1/2-inch. Drive screws through both flanges.
 - 8) Add additional framing if necessary so that channels are cantilevered no more than 6-inches.

END OF SECTION

SECTION 09 24 23

EXTERIOR CEMENT PLASTER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior Portland cement plasterwork on metal lath.
- B. Related Sections:
 - 1. Section 05 12 00 – Structural Steel Framing
 - 2. Section 07 21 00 – Building Insulation.
 - 3. Section 09 10 00 - Metal Support Systems.

1.3 SUBMITTALS

- A. Product Data:
 - 1. Product Data for each type of product indicated.
- B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.

1.4 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where indicated, provide portland cement plaster assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by, and displaying a classification label from, a qualified independent testing agency acceptable to the authority having jurisdiction. Identify products with appropriate markings of applicable testing agency.
 - 1. Construct fire-resistance rated partitions in compliance with tested assembly requirements [indicated on drawings].
 - 2. Rated assemblies to be substantiated from applicable testing using proposed products, by Contractor.
 - 3. Both metal framing and wallboard manufacturers must submit written confirmation that they accept the other manufacturer's product as a suitable component in the assembly. Acceptance is as follows:

- a. If installation of both products is proper, no adverse effect will result in the performance of one manufacturer's product by the other's product.
 - b. Combining products can be substantiated by required assembly tests.
4. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- B. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI's "Code of Standard Practice".

1.6 PROJECT CONDITIONS

- A. Comply with ASTM C 926 requirements.
- B. Exterior Plasterwork:
 1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
 2. Apply plaster when ambient temperature is greater than 40 deg F.
 3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

PART 2 - PRODUCTS

2.1 METAL LATH

- A. Expanded-Metal Lath: ASTM C 847, cold-rolled carbon-steel sheet, ASTM A 653/A 653M, G60.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide products by or comparable product by one of the following:
 - a. Alabama Metal Industries Corp.
 - b. CEMCO.
 - c. MarinoWARE.
 - d. Phillips Manufacturing Co.
 - e. ClarkDietrich Building Systems
 - f. or equal
 2. Recycled Content: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 20 percent.

3. Diamond-Mesh Lath: Flat 2.5 lb/sq. yd.
 4. Flat Rib Lath: Rib depth of not more than 1/8 inch
 5. Rib Lath, 3/8-Inch
- B. Wire Lath: ASTM C 933, Class 1 Galvanized Coating complying with ASTM A 641.
1. Basis-of-Design Product: Subject to compliance with requirements, provide named Structa Wire Corp. products by ClarkDietrich Building Systems or comparable product by one of the following:
 2. Structa Welded Wire Lath, ASTM C933:
 3. Structa Mega Lath:
 - a. Weight: 1.95 lb/sq. yd
 - b. Finish: Class 1 Galvanized Coating complying with ASTM A 641.
 - c. Alternate lath to 3.4 lb/sq. yd diamond mesh metal lath specified in ASTM C 847.
 - d. As per ICC ESR-2017.
 4. V Truss Corners - Exterior Corner Reinforcements:
 - a. Profile: Straight
 - b. Finish: Class 1 Galvanized Coating complying with ASTM A 641.
 - c. As per ICC ESR-2017.
- C. Wire-Fabric Lath:
1. Manufacturers: Subject to compliance with requirements, [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. Davis Wire Corporation; a Heico Wire Group company.
 - b. Jaenson Wire Company.
 - c. Keystone Steel & Wire Co.
 - d. K-Lath; a division of Georgetown Wire.
 2. Welded-Wire Lath: ASTM C 933; self-furring
 3. Woven-Wire Lath: ASTM C 1032; self-furring, with stiffener wire backing.
- D. Paper Backing: FS UU-B-790, Type I, Grade B, Style 1a vapor-retardant paper
1. Provide paper-backed lath at exterior locations.

2.2 ACCESSORIES

- A. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories:

1. Basis-of-Design Product: Subject to compliance with requirements, provide products by or comparable product by one of the following:
 - a. Alabama Metal Industries Corp.
 - b. CEMCO.
 - c. MarinoWARE.
 - d. Phillips Manufacturing Co.
 - e. ClarkDietrich Building Systems
 - f. Or equal
2. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 zinc coating.
3. Cornerite: Fabricated from expanded metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.
4. Strip Lath: Fabricated from expanded-metal lath with ASTM A653/A 653M, G60, hot-dip galvanized zinc coating.
5. External-Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.
6. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
7. Expansion Joints: Fabricated from zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
8. Two-Piece Expansion Joints: Fabricated from zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch wide; with perforated flanges.
9. Verify that manufacturers above offer products with characteristics that correspond to characteristics of plastic trim retained below. Consider deleting list of manufacturers; descriptions and reference to ASTM C 1063 often adequately specify commodity products.
10. Control Joints: One-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
11. Expansion Joints: Two-piece type, formed to produce slip-joint and square-edged 1/2-inch wide reveal; with perforated concealed flanges.
12. Soffit Reveals: PVC reveals conforming to ASTM C 1047.
 - a. Vinyl Corp. "No. DC58-50SE".
13. Soffit Vents: Vinyl soffit vent.
 - a. Vinyl Corp. "No. CSJ50-200V".

2.3 MISCELLANEOUS MATERIALS

- A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in portland cement plaster.
- C. Bonding Compound: ASTM C 932.

- D. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.
- E. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.
- F. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter, unless otherwise indicated.

2.4 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150, Type 2.
 - 1. Color for Finish Coats: As selected by Architect from manufacturer's full range.
- B. Plastic Cement: ASTM C 1328.
- C. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.
- D. Sand Aggregate: ASTM C 897.
 - 1. Color for Job-Mixed Finish Coats: White
- E. Perlite Aggregate: ASTM C 35.
- F. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
 - 1. Products: Subject to compliance with requirements:
 - a. Bonsal American, an Oldcastle Company; Marblesil Stucco Mix.
 - b. California Stucco Products Corp.; Conventional Portland Cement Stucco.
 - c. El Rey Stucco Company, Inc., a brand of ParexLaHabra, Inc.; Premium Stucco Finish.
 - d. Florida Stucco; Florida Stucco.
 - e. LaHabra, a brand of ParexLaHabra, Inc.; Exterior Stucco Color Coat.
 - f. Omega Products International, Inc.; ColorTek Exterior Stucco.
 - g. QUIKCRETE; QUIKCRETE Finish Coat Stucco, No. 1201.
 - h. Shamrock Stucco LLC; Exterior Stucco.
 - i. SonoWall, BASF Wall Systems, Inc.; Thoro Stucco.
 - j. USG Corporation; Oriental Exterior Finish Stucco.
 - 2. Color: As selected by Architect from manufacturer's full range.

2.5 PLASTER MIXES

- A. General: Comply with ASTM C 926 for applications indicated.

1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. cementitious materials.
- B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:
1. Portland Cement Mixes:
 - a. Scratch Coat: For cementitious material, mix 1 part portland cement and 0 to 3/4 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - b. Brown Coat: For cementitious material, mix 1 part portland cement and 0 to 3/4 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
 2. Masonry Cement Mixes:
 - a. Scratch Coat: 1 part masonry cement and 2-1/2 to 4 parts aggregate.
 - b. Brown Coat: 1 part masonry cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.
 3. Portland and Masonry Cement Mixes:
 - a. Scratch Coat: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - b. Brown Coat: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
 4. Plastic Cement Mixes:
 - a. Scratch Coat: 1 part plastic cement and 2-1/2 to 4 parts aggregate.
 - b. Brown Coat: 1 part plastic cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.
 5. Portland and Plastic Cement Mixes:
 - a. Scratch Coat: For cementitious material, mix 1 part plastic cement and 1 part portland cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - b. Brown Coat: For cementitious material, mix 1 part plastic cement and 1 part portland cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
- C. Base-Coat Mixes: Single base coats for two-coat plasterwork as follows:
1. Portland Cement Mix: For cementitious material, mix 1 part portland cement and 0 to 3/4 part lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

2. Portland and Masonry Cement Mix: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 3. Plastic Cement Mix: Use 1 part plastic cement and 2-1/2 to 4 parts aggregate.
- D. Base-Coat Mixes: Single base coats for two-coat plasterwork as follows:
1. Portland Cement Mix: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 2. Masonry Cement Mix: Use 1 part masonry cement and 2-1/2 to 4 parts aggregate.
 3. Plastic Cement Mix: Use 1 part plastic cement and 2-1/2 to 4 parts aggregate.
- E. Job-Mixed Finish-Coat Mixes:
1. Portland Cement Mix: For cementitious materials, mix 1 part portland cement and [3/4 to 1-1/2] [1-1/2 to 2] parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
 2. Masonry Cement Mix: 1 part masonry cement and 1-1/2 to 3 parts aggregate.
 3. Portland and Masonry Cement Mix: For cementitious materials, mix 1 part portland cement and 1 part masonry cement. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
 4. Plastic Cement Mix: 1 part plastic cement and 1-1/2 to 3 parts aggregate.
- F. Factory-Prepared Finish-Coat Mixes: For acrylic-based finish coatings], comply with manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare solid substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.3 INSTALLATION, GENERAL

- A. Sound Attenuation Blankets: Where required, install blankets before installing lath unless blankets are readily installed after lath has been installed on one side.
- B. Acoustical Sealant: Where required, seal joints between edges of plasterwork and abutting construction with acoustical sealant.

3.4 INSTALLING METAL LATH

- A. Expanded-Metal Lath: Install according to ASTM C 1063.
 - 1. Curved-Ceiling Framing: Install flat diamond-mesh lath.
 - 2. On Solid Surfaces, Not Otherwise Furred: Install self-furring, diamond-mesh lath.

3.5 INSTALLING ACCESSORIES

- A. Install according to ASTM C 1063 and at locations indicated on Drawings.
- B. Reinforcement for External Corners:
 - 1. Install lath-type, external-corner reinforcement at exterior locations.
- C. Control Joints: Install control joints at locations indicated on Drawings in specific locations approved by Architect for visual effect as follows:
 - 1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
 - a. Vertical Surfaces: 144 sq. ft.
 - b. Horizontal and other Nonvertical Surfaces: 100 sq. ft.
 - 2. At distances between control joints of not greater than 18 feet (5.5 m) o.c.
 - 3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
 - 4. Where control joints occur in surface of construction directly behind plaster.
 - 5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.6 PLASTER APPLICATION

- A. General: Comply with ASTM C 926.
 - 1. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.
 - 2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
 - 3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

- B. Walls; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork.
 - 1. Portland cement mixes.
 - 2. Plastic cement mixes.
 - 3. Portland and plastic cement mixes.

3.7 PLASTER REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.8 PROTECTION

- A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION

SECTION 09 90 00

PAINTS AND COATINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for the provision of:
 - 1. Surface preparation, painting and finishing of exposed items and surfaces.

1.2 REFERENCES

- A. ASTM - American Society for Testing and Materials:
 - 1. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
- B. SCAQMD
 - 1. Architectural coatings, Rule 1113

1.3 DEFINITIONS

- A. "Paint": As used herein, means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate or finish coats.

1.4 SYSTEM DESCRIPTION

- A. Performance Requirements
 - 1. Paint exposed surfaces whether or not colors are designated in the schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
 - 2. Painting is not required on pre-finished items, finished metal surfaces, concealed surfaces, operating parts and labels.
 - 3. Do not paint over UL, FM or other code required labels or equipment name, identification, performance rating or nomenclature plates.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each paint system specified, including primers.
 - 1. Provide manufacturer's technical information including label analysis and instructions for handling, storage and application of each material proposed for use.
 - 2. List each material and cross reference the specific coating, finish system and application. Identify each material by the manufacturer's catalog number and general classification.

- B. Samples
 - 1. Following the selection of colors and glosses by the Owner, submit samples for the Owner's review.
 - a. Provide 3 samples of each color and each gloss for each material on which the finish is specified to be applied.
 - b. Make samples approximately 8 inches by 10 inches in size, except as otherwise directed by the Owner.
 - c. If so directed by the Owner, provide field mock-ups during progress of the Work in the form of actual application of the materials on actual surfaces to be painted for approval by the Owner. Areas shall be 10 feet by 10 feet.
 - 2. Revise and resubmit each sample or field mock-up as requested until the required gloss, color and texture are achieved. Such samples or field mock-ups, when approved, will become standards of color and finish for accepting or rejecting the work of this Section.
 - 3. Do not commence finish painting until approved samples are on file at the job site.

- E. Quality Control Submittals
 - 1. Certificates: Provide certification by the manufacturer that products supplied do not contain or use volatile organic compounds (VOCs).

- F. Finish Schedule and Color Boards: Submit for review by the Owner each color scheme and coordinate with other finish materials.

- G. Comply with requirements set forth in the CA Green Building Code, Section 5.504.4.3 for Paints and Coatings.

1.6 QUALITY ASSURANCE

- A. Qualifications
 - 1. Applicator: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a minimum of 5 years of experience and a record of successful in-service performance.

- B. Provide primers and undercoat paint produced by the same manufacturer as finish coats.
 - 1. Review other Sections of these Specifications as required, verifying the prime coats to be used and assuring compatibility of the total coating system for the various substrates.
 - 2. Upon request, furnish information on the characteristics of the specific finish materials to assure that compatible prime coats are used.
 - 3. Provide barrier coats over non-compatible primers, or remove the primer and re-prime as required.
 - 4. Notify the Owner in writing of anticipated problems in using the specified coating systems over prime coatings supplied under other Sections.

1.7 SEQUENCING AND SCHEDULING

- A. Painting to be completed at least 7 days before carpeting or setting of acoustical panels.
- B. After painting, fully ventilate building with maximum outside air before installing carpet and acoustical panels. Maintain required temperature and humidity within the building.

1.8 MAINTENANCE

- A. Upon completion of the work of this Section, deliver to the Owner an extra stock equaling 4 gallons (1 box) or one 5 gallon pail of each color, type and gloss of paint used in the Work; tightly sealing each container, and clearly labeling the Project name and contents and location where used and with color swatch painted on top of the container.
 - 1. supply extra paints from same production lots or color runs as used in the work, in factory sealed and labeled containers and which are properly resealed after adding colorants and mixing.
 - 2. Deliver material to the Owner's on-site designated storage place, unload and position in place in accordance with Architect's instructions.
 - 3. Provide the Owner with a signed receipt indicating materials and quantities upon delivery.
 - 4. Provide maintenance manufacturers cleaning instructions for painted surfaces.
 - 5. Provide a final paint schedule listing, for each type of paint material used, the manufacturer, product name and/or number color name and/or number and locations installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Sherman Williams, Vista, Dunn-Edwards, PPG, or equal, preferable from local distributors.

2.2 PAINT MATERIALS

- A. Paint Materials, General: Provide primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer, based on testing and field experience.
- B. Material Quality: Provide manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
- C. Colors: To be selected from manufacturer's custom colors.
 - 1. per Owner's standards for exterior: semi-gloss for all surfaces in three color schemes
 - 2. per Owner's standards for interior: semi-gloss for all surfaces in three color schemes
 - 3. per Owner's request option for one ore more color schemes.

2.3 APPLICATION EQUIPMENT

- A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and as approved by the Owner.
- B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with the material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
 - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

3.2 PREPARATION

- A. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
- B. At existing areas: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
 - 2. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.
 - 3. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Cementitious Materials: Prepare concrete, concrete masonry block and cement plaster surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - 1. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
 - 2. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.
- D. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth. Touch-up minor defects with spackle and sand smooth and flush. Before painting, confirm that the gypsum board surface is prepared as prescribed in Section 09250. Paint finished gypsum board surface egg shell finish.
- E. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

1. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - a. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
 - b. When transparent finish is required, backprime with spar varnish.
 - c. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
 - d. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

- F. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.
 1. Blast steel surfaces clean as recommended by paint system manufacturer and according to requirements of SSPC SP-10.
 - a. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - b. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.

- G. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

- H. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 3. Use only thinners approved by paint manufacturer and only within recommended limits.

- I. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 PAINT APPLICATION

- A. General
 - 1. Touch-up shop-applied prime coats which have been damaged, and touch-up bare areas prior to start of finish coats application.
 - 2. Slightly vary the color of succeeding coats.
 - a. Do not apply additional coats until the completed coat has been inspected and approved.
 - b. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.
 - 3. Sand and dust between coats to remove defects visible to the unaided eye from a distance of 5 feet.
 - 4. On removable panels and hinged panels, paint the back sides to match the exposed sides.
- B. Drying
 - 1. Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suite adverse weather conditions.
 - 2. Consider oil base and oleo-resinous solvent-type paint as dry for re-coating when the paint feels firm; does not deform or feel sticky under moderate pressure of the thumb, and when the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- C. Brush Applications
 - 1. Brush out and work the brush coats onto the surface in an even film.
 - 2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness and other surface imperfections will not be acceptable.
- D. Spray Application
 - 1. Except as specifically otherwise approved by the Architect, confine spray application to metal framework and similar surfaces where hand brush work would be inferior.
 - 2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
 - 3. Do not double back with spray equipment to build up film thickness of 2 coats in 1 pass.
- E. For completed work, match the approved samples as to texture, color and coverage. Remove, refinish or repaint work not in compliance with the specified requirements.
- F. Miscellaneous Surfaces and Procedures
 - 1. Exposed mechanical items:
 - a. Finish electric panels, access doors, conduits, pipes, ducts, grilles, registers, vents and items of similar nature to match the adjacent wall and ceiling surfaces, or as directed.

- b. Paint visible duct surfaces behind vents, registers, and grilles flat black.
 - c. Wash metal with solvent, prime and apply 2 coats of alkyd enamel.
 2. Exposed pipe and duct insulation:
 - a. Apply 1 coat of latex paint on insulation which has been sized or primed under other Sections; apply 2 coats on such surfaces when unprepared.
 - b. Match color of adjacent surfaces.
 - c. Remove band before painting, and replace after painting.
 3. Hardware:
 - a. Paint prime coated hardware to match adjacent surfaces;
 - b. Paint metal portions of head seals, jamb seals, and astragal seals to match the color of the door frame unless otherwise directed by the Owner.
 4. Wet areas:
 - a. For oil base paints, use 1 percent phencimercuric or 4 percent tetrachlorophenol.
 - b. For water emulsion and glue size surfaces, use 4 percent sodium tetrachlorophenate.
 5. Exposed Vents: Apply 2 coats of heat resistant paint approved by the Owner.

3.4 INTERIOR PAINT SCHEDULE

- A. Wood Designated to Receive Opaque Finish
 1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a wood undercoater.
 - a. Undercoat
 - 1) Alkyd- or acrylic-latex-based, interior wood undercoater, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.
 - 2) Product: ICI Dulux - 1120 Ultra-Hide, or equal.
 - b. First and Second Coats
 - 1) Semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils.
 - 2) Product: ICI Dulux - 1407 Dulux Ultra, or equal.
- C. Ferrous Metal
 1. Semigloss, Acrylic Enamel Finish: 1 finish coat over an enamel undercoat and a primer. Primer is not required on shop-primed items.
 - a. Primer

- 1) Quick drying, rust-inhibitive alkyd based or epoxy metal primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.5 mils.
 - 2) Product: ICI Dulux - 4160 Ultra-Hide, Benjamin Moore & Co., or equal.
 - b. Undercoat
 - 1) Alkyd, interior enamel undercoat or semigloss, acrylic latex, interior enamel, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils.
 - 2) Product: ICI Dulux - 1120 Ultra-Hide, Benjamin Moore & Co., or equal.
 - c. Finish Coat
 - 1) Semigloss, acrylic latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils.
 - 2) Product: ICI Dulux - 1407 Dulux Ultra, Benjamin Moore & Co., or equal.
- E. Galvanized Metal
1. Semigloss, Acrylic Enamel Finish: 2 finish coats over a primer.
 - a. Primer
 - 1) Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.
 - 2) Product: ICI Dulux - 4020 Devflex, Benjamin Moore & Co., or equal.
 - b. First and Second Coats
 - 1) Semigloss, acrylic latex interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils.
 - 2) Product: ICI Dulux - 1407 Dulux Ultra, Benjamin Moore & Co., or equal.
- F. Gypsum Wall Board
1. Eggshell Acrylic finish, 2 finish coats over a primer.
 - a. Primer
 - 1) applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.
 - 2) Product: ICI Dulux, Benjamin Moore & Co., or equal.

3.5 EXTERIOR PAINT SCHEDULE

A. Graffiti Coating

1. Manufacturer: PROSOCO, Inc. or approved equal.

2. Product Description: Weather Seal GP is an economical, ready-to-use, water-based silane/siloxane water repellent for concrete, stucco, and most masonry surfaces. Apply weather Seal GP masonry resist cracking, spalling, staining and other damage related to water intrusion. Low odor and alkaline stable, Weather Seal GP is a low VOC treatment that is ideal for many field applications.

3. Technical Data

FORM: White milky liquid

SPECIFIC GRAVITY: 0.996

ACTIVE CONTENT: 2%

pH: 4-5

WT./GAL.: 8.29 lbs.

FLASH POINT: > 212 degrees F (>100 degrees C) ASTM D 3278

FREEZE POINT: 32 degrees F (0 degrees C)

VOC CONTENT: Complies with all known national, state and Owner AIM VOC regulations.

4. Vertical Application Instructions

a. Spray:

1. For best results, apply Weather Seal GP "wet-on-wet" to a visibly dry and absorbent surface.
2. Saturate from the bottom up, creating a 4" to 8" (15 to 20 cm) rundown below the spray contact point. Let the first application penetrate for 5-10 minutes.
3. Resaturate while surface still appears moist. Less will be needed for the second application.

b. Brush or roller: Saturate uniformly. Let protective treatment penetrate for 5 to 10 minutes. Brush out heavy runs and drips that don't penetrate.

c. Dense Surfaces Application Instructions

Saturate in a single application with no rundown. Back roll any runs or drips to ensure uniform appearance. One application is usually enough.

5. Horizontal Application Instructions

- a. Saturate in a single application. Use enough to keep the surface wet for 2 to 3 minutes before penetration.
- b. Broom out puddles until they soak in.

B. Exterior Paint: Sherwin Williams products or approved equal

1. concrete masonry units: Sherwin Williams Elastomeric System

- a. 1st Coat: S-W Loxon BlockSurfacer, A24W200 (50-100 sq ft/gal).
- b. 2nd Coat: S-W ConFlex XL Elastomeric High Build Coating, A5-400 Series.
- c. 3rd Coat: S-W ConFlex XL Elastomeric High Build Coating, A5-400 Series (16 mils wet, 7.5 mils dry per coat).

2. Metals: Sherwin Williams Latex System

- a. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5.0 mils wet, 2.0 mils dry).
- b. 2nd Coat: S-W A-100 Exterior Latex Gloss, A8 Series.
- c. 3rd Coat: S-W A-100 Exterior Latex Gloss, A8 Series (4 mils wet, 1.3 mils dry per coat).

C. All colors to be determined at time of submittal review by architect and owner's rep.

END OF SECTION

SECTION 09 96 00

ANTI-GRAFFITI COATING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Industrial coatings.
- B. Preparation of new surfaces for coating.
- C. Preparation of existing surfaces for re-coating.

1.2 RELATED SECTIONS

- A. Section 09 90 00 - Paints and Coatings: Field painting not specified elsewhere.

1.3 REFERENCES

- A. SSPC-SP 1 - Solvent Cleaning; Society for Protective Coatings; 1982.
- B. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1995.
- C. SSPC-SP 3 - Power Tool Cleaning; Society for Protective Coatings; 1995.
- D. SSPC-SP 10- Near White Blast Cleaning; Society for Protective Coatings; 1995.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Manufacturer's data sheets on each coating product to be used, including:
 - 1. Product characteristics.
 - 2. Preparation instructions and recommendations.
 - 3. Primer requirements and recommendations.
 - 4. Storage and handling requirements and recommendations.
- C. Application methods.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and sheens.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and sheen.

1.5 MOCK-UP

- A. Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: DuPont Industrial Coatings, or equal.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01035.

2.2 APPLICATIONS/SCOPE

- A. Mild Exposure Applications: Coordinate with Section 09900 and Contract Drawings for all Mild Exposure areas of the project.
- B. Exterior Building Surfaces To Be Painted:
 - 1. Concrete walls, beams, columns, and soffits.
 - 2. Concrete curbs, walks, floors, steps.
 - 3. Concrete masonry walls.
 - 4. Plaster/Stucco walls and soffits.
 - 5. Bare metal, primed metal, and galvanized metal - corrosion-resistant finish.
 - 6. Pipes, ducts, conduits, hangers and supports, equipment, and equipment enclosures exposed to weather or view - corrosion-resistant finish.
 - a. Colors: To be selected by Architect from manufacturer's full range of available colors.
 - 7. Preparation as specified by manufacturer.
 - a. Carbon Steel: SSPC SP-6 preparation recommended. Other lesser degrees of surface preparation may be used in some cases with some sacrifice in performance.

2.3 MATERIALS - GENERAL REQUIREMENTS

- A. Coatings - General:
 - 1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
 - 2. Supply each coating material in quantity required to complete entire project's work from a single production run.

- B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- C. Coating Application Accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to coating application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Seal surfaces that might cause bleed-through or staining of top coat.

3.3 INSTALLATION

- A. Stir coatings before and during application as recommended by manufacturer.
- B. Do not apply to wet or damp surfaces.
 - 1. Wait at least 30 days before applying to new concrete masonry.
 - 2. Test new concrete for moisture content.
 - 3. Wait until wood is fully dry after rain or morning fog or dew.
- C. Apply coatings using methods recommended by manufacturer.
- D. Apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.
- E. Apply coatings at spreading rate required to achieve the manufacturer's suggested film thickness.

3.4 PROTECTION

- A. Protect finished coatings until completion of project.
- B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

SECTION 09 97 00

CONCRETE FLOOR SEALER

PART 1 - GENERAL

1.01 DESCRIPTION: Division 1 applies to this Section. Provide concrete floor sealer on exposed interior concrete floors which are not designated to receive another finish, complete, as shown and specified.

1.02 QUALITY ASSURANCE:

A. Qualification of Applicator: The applicator shall be qualified and certified by the sealer manufacturer.

1.03 SUBMITTALS:

A. Samples and Data: Submit samples of sealer accompanied by manufacturer's technical data, application instructions and recommended coverage rates for types of surfaces to be treated.

B. Certificate and Summary Statement: Prior to completion of Work, submit a certificate stating that sealers applied conform to approved submittals and all requirements specified; in the certificate include a summary statement giving following information:

1. Number of square feet of each surface treated with sealer, classified as to the kind of material treated, and open pore or closed pore type.
2. The quantity of sealer, per coat, actually applied to the surface.

1.04 COMPLIANCE WITH REGULATIONS:

1. All materials shall comply with the current rules and regulations of the local air quality management Owner, with the rules regarding volatile organic compounds, and with FDA rules and regulations for dangerous materials in sealers.

2. Comply with requirements set forth in CA Green Building Code, Section 5.504.4.3 for Paints and Coatings.

1.05 PRODUCT DELIVERY: Deliver all sealer materials to the site in containers bearing name and batch number of manufacturer, with seals intact.

1.06 SUBMITTAL

A. Product Data: Submit manufacturer's product data

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

ProSoCo
3741 Greenway Circle
Kansas City, KS 66046
(800) 225-4255 FAX
(785) 830-9797

Thoro
889 Valley Park Drive
Shakopee MN 55379
(800)433-9517

2. COATING TYPES:

A. General: Sealer shall be water based, SCAQMD approved, clear modified alkyl alkoxy silane coating, ProSoCo "SLX Water and Oil Repellent" or equivalent by Thoro, designed for use on interior and exterior traffic surfaces. Sealer shall be designed to penetrate the pore surface of the concrete and inhibit moisture migration.

2.03 SHEEN: Completed sealer shall have semi-gloss sheen, as defined in Section 09900.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Coordinate work of Division 3 to provide water curing only for slabs to receive floor sealer.

B. Prepare surfaces in accordance with the coating manufacturer's printed instructions. Remove contaminants including loose mortar, rust and other products of corrosion, disintegrated concrete, and other substances that could interfere with adhesion of the coating system to the substrate.

3.04 APPLICATION: By experienced mechanics using methods and spray or roller equipment recommended by coating manufacturer, after surfaces to be treated are dry.

A. Apply floor sealer in accordance with manufacturer's recommendations. Apply evenly over the surface in 2 coats at approximately 400 square feet per gallon per coat. Apply the second coat immediately after the first coat has penetrated.

B. Keep traffic from treated surfaces until the material is thoroughly dry.

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

- 1.01 DESCRIPTION: Division 1 applies to this section. Provide complete signage.
- A. Work Specified in this Section:
 - 1. Accessible facilities signs per drawing sheets G103 and G104.
 - B. Related Work Specified Elsewhere:
 - 1. Division 01 – General Requirements
 - 2. Section 09 10 00 - Metal Support Systems
- 1.02 SUBMITTALS:
- A. Manufacturer's Literature. Provide brochures showing signs, including general specifications, materials and construction.
 - B. Shop and Layout Drawings: Provide complete drawings showing details of fabrication and erection; color type and style of letters, background; and setting details.
 - C. Maintenance Instructions: Provide manufacturer's recommended procedures for care of finished surfaces.
 - D. Certificates. Manufacturer's certification that materials meet Specification requirements.
- 1.03 QUALITY CONTROL
- A. Qualifications of Manufacturer: Signs shall be products of a manufacturer having not less than 2 years' experience in the manufacture of signage comparable to that required herein.
- 1.04 EXTENT OF SIGNAGE:
- A. If signs are not indicated on drawings, obtain from Owner an exact list and lettering of signs required.
- 1.05 DELIVERY AND STORAGE:
- A. Materials shall be wrapped for shipment and storage, delivered to the jobsite in manufacturer's original packaging, and stored in a clean, dry area in accordance with manufacturer's instructions.

1.06 REGULATORY REQUIREMENTS:

- A. Raised characters shall comply with CBC Section 11B-703.2:
1. Depth: It shall be 1/32 inch (0.8 mm) minimum above their background and shall be sans serif uppercase and be duplicated in Braille.
 2. Height: It shall be 5/8 inch (15.9 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "I". CBC Section 11B-703.2.5
 3. Finish and contrast: Characters and their background shall have a non-glare finish. Character shall contrast with their background with either light characters on a dark background or dark characters on a light background. CBC Section 11B-703.5.1
 4. Proportions: It shall be selected from fonts where the width of the uppercase letter "O" is 60 % minimum and 110 % maximum of the height of the uppercase letter "I". Stroke thickness of the uppercase letter "I" shall be 15 % maximum of the height of the character. CBC Sections 11B-703.4 and 11B-703.6
 5. Character Spacing: Spacing between individual tactile characters shall comply with CBC Section 11B-703.2.7 and 11B-703.2.8
 6. Braille: It shall be contracted (Grade 2) and shall comply with CBC Sections 11B-703.3 and 11B-703.4. Braille dots shall have a domed and rounded shape and shall comply with CBC Table and Figure 11B-703.3.1.
 7. Mounting height: A tactile sign shall be located 48" minimum to the baseline of the lowest Braille cells and 60" maximum to the baseline of the highest line of raised characters above the finish floor or ground surface.
 8. Mounting location: A tactile sign shall be located on the approach side, as one enters or exits rooms or space, and be reached within 0" of the required clear floor space per CBC Section and Figure 11B -703.4.2 as follows:
 - a. a clear floor space of 18' x 18" minimum, centered on the tactile characters, shall be provided beyond the arc of any door swings between the closed position and 45 degree open position.
 - b. on the wall at the latch side of a single door.
 - c. on the inactive leaf of a double door with one active leaf
 - d. on the wall at the right side of a double door with two active leaves.
 - e. on the nearest adjacent wall where there is no wall space at the latch side of a single door or no space at the right side of a double door with two active leaves.
 9. Visual characters shall comply with CBC Section 11B-703.5 and shall be 40" minimum above finish floor or ground.
 10. Pictograms shall comply with CBC Section 11B-703.6.
 11. Symbol of accessibility shall comply with CBC Section 11B-703.7.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Sign manufacturer shall have local fabrication or distribution system, so that additional signs may be ordered as the need arises. Acceptable manufacturers include the following:
1. Karman Ltd., Architectural Signs.
 2. Vomar Products Inc.
 3. ASI-Modulex, Inc.
 4. Mohawk Sign Systems, Inc.
 5. Accent Signage Systems.
 6. Or approved equal

2.02 BASIC MATERIALS:

A. Interior Sign Materials:

1. Substrate Panel: 1/8 inch minimum thick, integrally colored or clear, back foiled and back painted acrylic plastic, or laminated acrylic. Conforming to ASTM D4802; non-glare (matte), UV stable, suitable for interior and exterior use.
2. Corners shall be radius.
3. Edges shall be square and eased.
4. Colors as selected by Architect from manufacturer's custom color range.
5. Aluminum Extrusions: In conformance to ASTM B221.
6. Fasteners:
 - a. Stainless steel tamper-proof screws and plastic anchors.
 - b. Signs mounted on fire-rated doors shall be secured with adhesive.

B. Exterior Sign Materials:

1. Sign: ASTM B209 aluminum sheet, 0.080 inch thick with rounded corners of at least 1/8 inch radius and eased edges. White figure on a blue background; non-glare, high contrast signs. The blue shall be equal to color number 15090 in Federal Standard 595B.
2. Post: 2 by 2 inch galvanized steel tubing, weighing minimum of 4.31 pounds per foot and conforming to ASTM A500, Grade B, 3/16 inch thick wall thickness.
3. Concrete Post Footings: Refer to Section 32 1313, Site Concrete Work.

4. Fasteners: Stainless steel carriage bolts with tamper resistant nuts.

C. Characters and Symbols:

1. Computer cut raised characters and graphics shall be cut from 1/16 inch integrally colored acrylic.
2. Raised characters and graphics shall be inlaid 1/32 inch minimum into first surface of sign background, secured with adhesive so it cannot be removed without the use of tools.
3. Raised characters and graphics shall have beveled, eased or rounded edges.
4. Non-tactile text and graphics shall be applied to the second surface, and background color shall be applied to the second surface and protected with film or an additional backplate.
5. Pictograms and other symbols including the International Symbol of Accessibility, which are included on signs with raised characters and Braille, are not required to be raised.

2.03 COMMUNICATION ELEMENTS AND FEATURES

A. Raised Characters Raised characters shall comply with CBC 11B-703.2.

1. Character Type: Characters on signs shall be raised 1/32 inch minimum above their background and shall be sans serif uppercase characters duplicated in Braille. Characters and Braille shall be in a horizontal format.
2. Character Height: Character height measured vertically from the baseline of the character shall be 5/8 inch minimum and 2 inch maximum based on the height of the uppercase letter "I".
3. Character Proportions: Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the letter "I".
4. Stroke Thickness: Stroke thickness of the uppercase letter "I" shall be 15 percent maximum of the height of the character.
5. Character and Line Spacing shall be in conformance to CBC 11B-703.2.7 and 11B-703.2.8.
6. Character Placement: Braille shall be placed a minimum of 3/8 inch and a maximum of 1/2 inch directly below the tactile characters: flush left or centered, and 3/8 inch minimum from raised borders and decorative elements. If the tactile text is multiline, Braille shall be placed below the entire text.

- B. Visual Characters: Visual characters shall comply with CBC Section 11B-703.5. Characters shall be conventional in form, and shall be uppercase or lowercase or a combination of both, as indicated on the drawings. Characters shall not be italic, oblique, highly decorative, or unusual forms.
1. Finish and Contrast: Characters and their backgrounds shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or a dark characters on a light background.
 2. Character Proportions: Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase of the letter "I".
 3. Character Height: Minimum character height shall comply with CBC Table 11B-703.5.5.
 4. Height from Finish Floor or Ground: Visual characters shall be a 40 inches minimum above the finish floor or ground
 5. Stroke Thickness: Uppercase letter "I" shall be 10 percent minimum and 20 percent maximum of the height of the character.
 6. Character and Line Spacing: Shall be in accordance to CBC 11B-703.5.8 and 11B-703.5.9.
- C. Braille: Contracted Grade 2 Braille, conforming to CBC 11B-703.3. Braille characters shall be inlaid optically correct acrylic Raster beads into computer drilled holes in the panel surface.
1. Dimensions and Capitalization: Braille dots shall have a domed or rounded shape and shall comply with CBC Table 11B-703.3.1. The indication of an uppercase letter or letters shall only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms.
 2. Position: Braille shall be positioned below the corresponding text in a horizontal format, flush left or centered. If text is multi-lined, Braille shall be placed below the entire line of text. Braille shall be separated 3/8 inch minimum and 1/2 maximum from any other tactile characters and 3/8 inch minimum from raised borders and decorative elements.
- D. Pictograms: In conformance to CBC 11B-703.6. Pictograms shall have a field height of 6 inches minimum. Characters and Braille shall not be located in the pictogram field.
1. Finish and Contrast: Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.
 2. Text Descriptors: Pictograms shall have text descriptors located directly below the pictogram field, and shall comply with CBC 11B-703.2, 11B-

703.3 and 11B-703.4.

- E. International Symbol of Accessibility (ISA): Shall comply with CBC 11B-703.7 and CBC Figure 11B-703.7.2.1. The ISA shall consist of a white figure on a blue background. The blue shall be equal to Color No. 15090 in Federal Standard 595B.
- F. Mounting Locations and Height: Shall be as indicated on the drawings and in conformance to CBC 11B-703.4.
 - 1. Identification signs for rooms and spaces shall be located on the wall adjacent to the latch side of the door, as one enters the room or space. Signs that identify exits shall be located on the approach side of the door as one exits the room or space. Signs containing tactile characters shall be located so that a clear floor space 18 inches minimum by 18 inches minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.
 - a. Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side.
 - b. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located at the inactive leaf.
 - c. Where a tactile sign is provided at double doors with two active leaves, the sign shall be located to the right of the right hand door.
 - d. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall.
 - 2. Mounting height above finish floor or ground: Tactile characters on signs shall be located 48 inches minimum above finish floor or ground surface, measured from the baseline of the lowest Braille cells and 60 inches maximum above the finish floor or ground surface, measured from the baseline of the highest line of raised characters.

2.06 DIRECTIONAL EXIT SIGNAGE

- A. At exits and elevators serving a required accessible space but not providing an approved accessible means of egress, provide signage indicating the location of accessible means of egress.
 - 1. Finish and Contrast: Refer to paragraph 2.03.B.
 - 2. Character Height and Proportions: Refer to paragraph 2.03.B.
 - 3. Symbol of Accessibility: Refer to paragraph 2.03.E.

2.09 ACCESSIBILITY ENTRANCE SIGNS AND PATH OF TRAVEL DIRECTIONAL SIGNS

- A. Entrance Sign: Provide at each building entrance an International Symbol of Accessibility sign. Signs shall be visible to persons along approaching pedestrian ways.
 - B. Directional Signs: Provide where indicated on the drawings with arrow indicators and International Symbol of Accessibility.
 - C. Signs shall be mounted on wall with lower edge between 48 inches and 60 inches above ground surface or finish floor. Pole mounted, overhead and projecting signs shall have the lower edge at least 80 inches from the ground surface or finish floor.
 - D. Sign shall comply with the following requirements.
 - 1. Directional signs shall comply with paragraph 2.03.B.
 - 2. Symbol of Accessibility: Refer to paragraph 2.03.E.
- 2.10 OCCUPANT LOAD SIGNS
- A. Provide maximum occupancy load signs. Post in a conspicuous place near the main exit or exit access doorway from the room or space of rooms and areas indicated in the drawings.
 - B. Minimum size: 4 inches high by 8 inches wide, 7/8 inch high letters, 1 inch high numerals.
 - C. Sign to read: "MAXIMUM OCCUPANCY LOAD XXX". Obtain occupant load information from Architect.
 - 1. Color: Subsurface white text, red background.
 - 2. Character Height: One inch high.
 - 3. Text: "EMERGENCY GAS SHUT-OFF VALVE."
- 2.13 FIRE SPRINKLER RISER ROOM SIGN
- A. Locate one sign at each fire sprinkler riser room door as indicated in drawings.
 - B. Text: Sign to read "Fire Sprinkler Riser Inside", white characters, 1 inch high on red background.
 - C. Sign Requirements:
 - 1. Raised Characters and Proportions: Refer to paragraph 2.03.B.
 - 2. Braille: Refer to paragraph 2.03.C.
 - 3. Mounting Location and Height: Mounted on the door, refer to paragraph 2.03.F.
- 2.14 ELEVATOR LIFT SIGNS
- A. Elevator hoistways shall be identified on both jambs by a 2-inch high raised character identifying level of floor, accompanied by Grade 2 Braille in compliance with CBC. 11B-703.3. A raised, 5-pointed star placed to the left of the floor designation shall be provided on both jambs at the main entry level. The outside diameter of the star shall be two inches and all points

shall be of equal length. Raised characters including the star, shall be white on a black background. The Braille translation for the star shall be "MAIN". Applied plate shall be permanently fixed to the jambs.

- B. Machine Room: A sign shall be permanently displayed in the elevator machine room, elevator machinery space, elevator control space, or elevator control room in a conspicuous location with a minimum 1-1/2 inch letters on a contrasting background, stating:

NO COMBUSTIBLE STORAGE
PERMITTED IN THIS ROOM
By Order of the Fire Marshal

2.15 EVACUATION PLANS

- A. 1/8 inch thick acrylic sign consisting of a floor plan depicting the building layout. The words "EVACUATION PLAN" shall be included at the top of the plan in minimum 3/4 inch high characters. Interior spaces shall be indicated by shading and corridor shall be prominent and displayed in white. Sign shall provide emergency procedures information and instructions to be followed in the event of an emergency, and shall be printed with a minimum of 3/16-inch high non-decorative lettering providing a sharp contrast to the background. Emergency procedures information shall include, but not be limited to the following:
1. Viewer location symbol, "YOU ARE HERE" in the plan. Plan shall be oriented in each sign as required to correspond with the users view.
 2. Location of exits with arrows leading to them.
 3. Location of fire extinguishers.
 4. Fire department emergency telephone number 911.
- B. Mount signs so that bottom edge is no more than 48 inches from the finish floor, and within close proximity to the building, stair or elevator entrance. The reader must be able to approach the sign without encountering any obstacle.
- C. Evacuation Plans Requirements:
1. Finish and Contrast: Refer to paragraph 2.03.B.
 2. Character Height and Proportions: Refer to paragraph 2.03.B.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Beginning of installation means installer accepts condition of existing surfaces.

3.02 METHODS OF INSTALLATION

- A. Interior Identification Signs and Interior Directional Signs:
1. Fasten to wall with four tamper-proof round-head screws, one at each corner of sign. Furnish plastic anchors.
 2. When concealed installation is specified, install backplate to wall as above. Fasten sign to backplate with very high-bond double-faced tape.
 3. For installation on glass, fasten sign to glass with very high bond double faced tape. On opposite side of glass, anchor matching backplate to glass with very high-bond double-faced tape.
- B. Geometric Signs: Geometric toilet room signs shall be fastened to doors with three tamper-proof oval-head counter-sunk screws.
- C. Exterior Post Mounted Directional Signs: Size of required footing shall be as indicated on the drawings. Fasten sign with tamperproof stainless steel bolts.
- D. Exterior Wall Mounted Identification Signs and Directional Signs:
1. Acrylic signs: Install backplate to wall as above. Fasten sign to backplate with very high-bond double-faced tape and silicone.
- E. Exterior Building Sign:
1. Each letter shall be furnished with a minimum of three cast mounting lugs on backside, drilled and tapped to receive installation bolts.
 2. Letters shall be installed according to manufacturer's method PMC-1. Letters shall be installed $\frac{3}{4}$ inch away from wall surface, by an aluminum sleeve spacer.

3.03 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

3.04 PROTECTION

- A. Protect Work of this section until Substantial Completion.

END OF SECTION

SECTION 26 05 00

ELECTRICAL GENERAL PROVISIONS

PART 1 GENERAL

1.01 SCOPE

- A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete, as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to, the following:
 - 1. Examine all other Sections for work related to those other Sections and required to be included as work under this Section.
- B. Organization of the Specifications into Divisions, Sections and Articles, and Arrangement of Drawings shall not control the Contractor in dividing the Contract Work among Subcontractors or in establishing the extent of work to be performed by any trade.

1.02 GENERAL SUMMARY OF ELECTRICAL WORK

- A. The Specifications and Drawings are intended to cover a complete installation of systems. The omission of expressed reference to any item of labor or material for the proper execution of the work in accordance with present practice of the trade shall not relieve the Contractor from providing such additional labor and materials.
- B. Refer to the Drawings and Shop Drawings of other trades and the carousel for additional details, which affect the proper installation of this work. Diagrams and symbols showing electrical connections are diagrammatic only. Wiring diagrams do not necessarily show the exact physical arrangement of the equipment.
- C. Before submitting a bid, the Contractor shall become familiar with all features of the existing building which may affect the execution of the work. No extra payment will be allowed for failure to obtain this information.
- D. If there are Omissions or Conflicts between the Drawings and Specifications, clarify these points with the Owner's Representative before submitting bid and before commencing work.
- E. Provide Work and Material in Conformance with the Manufacturer's published recommendations for respective equipment and systems.

1.03 LOCATIONS OF EQUIPMENT

- A. The Drawings indicate diagrammatically the desired locations or arrangements of conduit runs, outlets, equipment, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the work to secure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structure conditions encountered.

- B. Where Outlets are placed on a Wall, locate symmetrically with respect to each other, furniture, cabinets, and other features or finishes on the wall.
- C. In the event Changes in the indicated locations or arrangements are necessary, due to developed conditions in the building construction or rearrangement of furnishings or equipment, such changes shall be made without cost to the Contract, providing the change is ordered before the conduit runs, etc., and work directly connected to same is installed and no extra materials are required.
- D. Coordinate and cooperate in every way with other trades to avoid interference and assure a satisfactory job.
- E. The Location of the Existing Utilities, Building, Equipment and Conduit shown on the Drawings is approximate.
- F. The locations of existing equipment, where shown on Drawings, are shown diagrammatically. The Owner, the Owner's Representative, and the Owner's Architect/Engineer are not responsible for the location of underground utilities or structures, whether or not shown or detailed and installed under this or any other Contracts. The Contractor shall identify each existing utility line prior to excavation and mark the locations on the ground of each existing utility line.

1.04 PERMITS

Arrange for and schedule all required inspections and examinations without additional cost to the Owner.

1.05 QUALITY ASSURANCE

- A. Work and Materials shall be in full accordance with the latest Rules and Regulations. The publications shall be included in the Contract Documents Requirements. If a conflict occurs between the following publications and any other part of the Contract Documents, the Requirements describing the more restrictive provisions shall become the applicable Contract definition:
 - 1. California Code of Regulations Title 24.
 - 2. California Part 3 "California Electrical Code" CEC, Title 24 and Title 8 "Division of Industrial Safety".
 - 3. California Building Code - CBC.
 - 4. California Fire Code – CFC
 - 5. The National Electrical Code – NEC/NFPA 70.
 - 6. The Life Safety Code – NFPA 101.
 - 7. The Uniform Building Code - UBC.
 - 8. International Building Code – IBC.
 - 9. National Fire Protection Agency-NFPA.
 - 10. National Fire Alarm Code – NFAC/NFPA 72.
 - 11. Underwriter's Laboratory-UL.
 - 12. Other applicable State and Local Government Agencies Laws and Regulations.
 - 13. Electrical Installation Standards National Electrical Contractors Association (NECA) and National Electrical Installation Standards (NEIS):
 - a. NECA/NEIS-1: Standard of Practices for Good Workman-ship in Electrical Contracting

- b. NECA/NEIS-101: Standard for Installing Steel Conduit (Rigid, IMC, etc.)
 - c. NECA/NEIS-111: Recommended Practice Installing Nonmetallic Raceways
 - d. NECA/NEIS-230: Recommended Practice for Installing Motors
 - e. NECA/NEIS-331: Standards for Installing Building and Service Entrance Grounding
 - f. NECA/NEIS-409: Recommended Practice for Installing and Maintaining Dry-Type Transformers
 - g. NEIS/NECA & IESNA-500: Recommended Practice for installing Indoor Commercial Lighting Systems
 - h. NEIS/NECA and IESNA-501: Recommended Practice for installing Exterior Lighting Systems
 - i. NEIS and IESNA-502: Recommended Practice for Installing Industrial Lighting Systems
 - j. NECA/BICSI-568: Standards for Installing Commercial Building Telecommunications System
- B. All Material and Equipment shall be new and shall be delivered to the site in unbroken packages. All material and equipment shall be listed and labeled by Underwriters Laboratories or other recognized Testing Laboratories, where such listings are available. Comply with all installation Requirements and restrictions pertaining to such listings.
- C. Work and Material shown on the Drawings and in the Specifications are new and included in the Contract unless specifically indicated as existing or N.I.C. (not in Contract).
- D. Keep a copy of all Applicable Codes and Standards available at the Job Site at all times for reference while performing work under this Contract. Nothing in Plans or Specifications shall be construed to permit work not conforming to the most stringent of Building Codes.
- E. Where a Conflict or Variation occurs between applicable Codes, Standards and/or the Contract Documents, the provisions of the most restrictive provision shall become the Requirement of the Contract Documents.

1.06 SUBMITTALS (ADDITIONAL REQUIREMENTS)

- A. General
- 1. Review of Contractor's submittals is for General Conformance with the Design Concept of the Project and General Compliance with the information given in the Contract Documents. Any action shown is subject to the Requirements of the Plans and Specifications. Contractor is responsible for quantities; dimensions which shall be confirmed and correlated at the Job Site; fabrication processes and techniques of construction; coordination of work with that of all other trades and satisfactory performance of their work.
 - 2. The Contractor shall review each submittal in detail for compliance with the Requirements of the Contract Documents prior to submittal. The Contractor shall "Ink Stamp" and sign each item of the submittal with a

statement "CERTIFYING THE SUBMITTAL HAS BEEN REVIEWED BY THE CONTRACTOR AND COMPLIES WITH ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS". The Contractor shall clearly and specifically identify each individual proposed substitution, substitution of equal or proposed deviation from the Requirements of the Contract Documents with a statement "THIS ITEM IS A SUBSTITUTION".

The burden of research, preparation of calculations and the furnishing of adequate and complete Shop Drawings information to demonstrate the suitability of Contractor's proposed substitutions and suitability of proposed deviations from the Contract Documents is the responsibility of the Contractor.

3. Departure from the submittal procedure will result in resubmittals and delays. Failure of the Contractor to comply with the Submittal Requirements shall render void any acceptance or any approval of the proposed variation. The Contractor shall then be required to provide the equipment or method without variation from the Contract Documents and without additional cost to the Contract.
4. The Contractor at no additional cost or delays to the Contract shall remove any work, material and correct any deficiencies resulting from deviations from the Requirements of the Contract Documents not approved in advance by the Owner prior to commencement of work.
5. Shop Drawings submitted by the Contractor, which are not specifically required for submittal by the Contract Documents, or Contractor Shop Drawings previously reviewed and resubmitted without a written resubmittal request to the Contractor, will not be reviewed, considered, or commented on. The respective Shop Drawing submittal/resubmittal will not be returned to the Contractor and will be destroyed without comment or response to the Contractor. The respective submittal shall be considered null and void as being not in compliance with the Requirements of the Contract Documents.

B. Material Lists and Shop Drawings

1. Provide name of manufacturer, brand name, type and/or catalog number of each item. Listing more than one Manufacturer for any one item of equipment, or listing items "As Specified", without both make and model or type designation, is not acceptable. The right is reserved to require submission of samples of any material whether or not particularly mentioned herein. Submittals consisting of a catalog of both specified and non-specified items shall have the specified items flagged.
2. Shop Drawings shall be submitted in completed groups of materials (i.e., all lighting fixtures or all switchgear, etc.). The Contractor shall verify dimensions of equipment and be satisfied as to fit and that they comply with all Code Requirements relating to clear working space about electrical equipment prior to submitting Shop Drawings for review. Submittals, which are intended to be reviewed as substitution or departure from the Contract Documents, must be specifically noted as such. The Requirements of the Contract Documents shall prevail regardless of the acceptance of the submittal.
3. The time required to review and comment on the Contractor's submittals will not be less than 14 calendar days, after receipt of the submittals at the office of FBA Engineering. The review of Contractor submittals and return

- to Contractor of submittals with review comments will occur in a timely manner conditioned upon the Contractor complying with all the following:
- a. The submittals contain complete and accurate information, complying with the Requirements of the Contract Documents.
 - b. Contractor's submittals are each marked with Contractor's approval "stamp", and with Contractor signatures.
 - c. The submittals are received in accordance with a written, Shop Drawing submittal schedule for each submittal. The Contractor distributes the schedule not less than 35-day calendar days in advance of the Shop Drawing Submittals, and the schedule identifies the calendar dates, the Contractor will deliver the various submittals for review.
4. Shop Drawings shall include the Manufacturers projected days for shipment from the factory of completed equipment, after the Contractor releases the equipment for production. It shall be the responsibility of the Contractor to ensure that all material and equipment is ordered in time to provide an orderly progression of the work. The Contractor shall notify the Owner's Representative of any changes in delivery, which would affect the project completion date.
5. Submittal Identification
- a. Each submittal shall be dated: with submittal transmission date; sequentially numbered and titled with submittal contents identification and applicable Specification/Drawing.
 - b. Each resubmittal shall be dated: with original submittal date and resubmittal transmission dates; sequentially numbered with original submittal number and sequential resubmittal revision number and titled with submittal contents identification and applicable Specifications/Drawing references.
 - c. Contractor shall provide a written response narrative with each resubmittal. Describe each response-action, resubmittal addition, change and deletion. Correspond each response to A/E specific review comment.
- C. The Contractor shall be responsible for incidental, direct and indirect costs resulting from the Contractor's substitution of; or changes to; the specified Contract Materials and Work.
- D. Maintenance and Operating Manuals
1. The Contractor shall furnish three hard copies plus a pdf copy of type-written Maintenance and Operating Manuals for all electrical equipment, fire alarm equipment, sound system equipment, etc., to the Owner.
 2. Instruct Owner's Personnel in correct operation of all equipment at completion of Project. Provide the quantity and duration of on-site instruction class as specified; but in no case less than 2-hour duration. Instruction class size shall be at the Owner's discretion.
 3. Maintenance and Operating Manuals shall be furnished as PDF documents and as hard copy bound in three-ring, hard-cover, plastic binders with table of contents. Manuals shall be delivered to the Owner's Representative, with an itemized receipt.

- E. Portable or Detachable Parts: The Contractor shall retain in his possession and shall be responsible for all portable and detachable parts or portions of the installation such as fuses, keys, locks, adapters, locking clips, and inserts until final completion of Contract Work. These parts shall then be delivered to the Owner's Representative with an itemized receipt.
- F. Record Drawings (Additional Requirements)
 - 1. Provide and maintain in good order a complete hard copy set of Electrical Contract "Record" prints. Changes to the Contract to be clearly recorded on this set of prints. At the end of the Project, transfer all changes to one set of PDF drawings to be delivered to the Owner's Representative.
 - 2. The actual location and elevation of all buried lines, boxes, monuments, vaults, stub-outs and other provisions for future connections shall be referenced to the building lines or other clearly established base lines and to approved benchmarks. If any necessary dimensions are omitted from the Record Drawings, the Contractor shall, at the Contractor's own expense, do all excavation required to expose the buried work and to establish the correct locations.
 - 3. The Contractor shall keep the "Record" Prints up to date and current with all work performed.

1.07 CLEANING EQUIPMENT, MATERIALS, PREMISES

- A. All parts of the equipment shall be thoroughly cleaned of dirt, rust, cement, plaster, etc., and all cracks and corners scraped out clean. Surfaces to be painted shall be carefully cleaned of grease and oil spots and left smooth, clean and in proper condition to receive paint finish.
- B. Unless otherwise noted, all new conduits, boxes, fittings, and raceways exposed to public view shall be painted to match surrounding wall colors.

1.08 JOB CONDITIONS - PROTECTION

Protect all Work, Materials and Equipment from damage from any cause whatever and provide adequate and proper storage facilities during the progress of the work. Provide for the safety and good condition of all the work until final acceptance of the work by the Owner and replace all damaged or defective work, materials, and equipment before requesting final acceptance.

1.09 EXCAVATION, CUTTING, BACKFILL AND PATCHING ADDITIONAL REQUIREMENTS

- A. General
 - 1. Perform excavation, cutting, backfill, and patching of the existing construction work as required for the proper installation of the new electrical work.
 - 2. Patching shall be of the same material, thickness, workmanship, and finish as existing and accurately match-surrounding work to the satisfaction of the Owner's Representative.
- B. Existing Underground Utilities
 - 1. Obtain from Owner all available Record Drawings for the existing facility and review to identify potential conflicts with new construction.

2. Contact Underground Service Alert to identify underground utilities in the area of new construction.
3. Dig by hand new trenches for underground electrical lines to avoid damaging existing unknown underground pipes and conduits. Repair damage to existing construction.
4. Contractor may, at no additional cost to owner, conduct ground penetrating radar tests along proposed trench routes to verify area is clear of existing pipes and conduits, and then utilize mechanical trenching in lieu of hand trenching referenced in Item 3 above.

1.10 IDENTIFICATION

A. Equipment Nameplates

1. Panelboards, terminal cabinets, circuit breakers, disconnect switches, starters, relays, time switches, contactors, push-button control stations, and other apparatus used for the operation or control of feeders, circuits, appliances, or equipment shall be properly identified by means of descriptive nameplates or tags permanently attached to the apparatus and wiring.
2. Nameplates shall be engraved laminated phenolic. Shop Drawings with dimensions and format shall be submitted before installation. Attachment to equipment shall be with escutcheon pins, rivets, self-tapping screws or machine screws. Self-adhering or adhesive backed nameplates shall not be used.

B. Wire and Cable Identification

1. Provide identification on each new individual wire and cable.
2. Permanent identification shall be provided at each termination location, splice location, pullbox, junction box and equipment enclosure.
 - a. Individual wire and cable larger than #6 AWG or 0.25-inch diameter, shall be provided with polypropylene identification tag holders, with yellow polypropylene tags interchangeable black alphanumeric characters, character height 0.25 inch. Attach identification tags with plastic "tie" wraps, minimum of two for each tag. As manufactured by Almetek Industries - "EZTAG" Series; or TECH Products - "EVERLAST" Series.
 - b. Individual wire and cable #6 AWG and smaller or smaller than 0.25-inch diameter, shall be provided with water and oil resistant, flexible, self-laminating pressure sensitive machine embossed plastic tags that wrap a minimum of 360 degrees around the wire/cable diameter. The entire tag shall then be covered with a clear flexible waterproof plastic cover wrapped a minimum of 540 degrees around the wire/cable diameter and completely covering the identification. As manufactured by: Brady Identification; or 3M; or Panduit.
 - c. Each identification tag location shall indicate the following information: circuit number, circuit phase, source termination and destination termination equipment name (or outlet number as applicable).
3. Install permanent identification after installation/pulling of wire/cable is complete, to prevent loss or damage to the identification.

- C. Update the circuit directories for each panel where existing circuits are vacated, and new circuits are connected.

1.11 TESTING

- A. The Contractor shall obtain an independent Testing Laboratory, provide all instrumentation and perform Tests on the electrical system and equipment as hereinafter described and further directed by the Owner's Representative. The Test shall be performed after the completion of all electrical systems included in the Contract Scope of Work. All Tests shall be recorded and documented and submitted to the Owner's Representative for review.
 - 1. All equipment and personnel required for set-up and testing shall be provided by the Contractor.
- B. Conduct ground resistance test at existing main switchboard ground bus prior to bonding the neutral conductor of the new transformer. Conduct ground resistance test at the new transformer neutral lugs after the bond connection is complete. Method of Obtaining Ground Resistance shall be in accordance with the 2006 IEEE Power and Energy Society recommendations.
- C. Ampere and Voltage Measurements
 - 1. Measure and record ampere and line voltage measurements under full load on main 208V supply feeder to the carousel under full load. Readings shall be taken at the load side of the feeder inside the carousel machine compartment.
 - 2. Ampere voltage readings shall be:
 - a. Phase A-B, A-C and B-C.
 - b. Phase A-Neutral, B-Neutral and C-Neutral.
 - 3. The ampere and voltage readings shall be not less than 10 minutes in duration. Record and submit the measured minimum, maximum and 20-minute average for each ampere and voltage values.
 - 4. Test equipment shall be accurate within plus or minus 1%.

1.12 ELECTRICAL WORK CLOSEOUT

- A. Prepare the following items and submit to the Owner's Representative before final acceptance.
 - 1. Test results as required under this Section.
 - 2. Local and/or State Code Enforcing Authority's final inspection certificates.
 - 3. Record Drawings as required under the General Conditions, pertinent Electrical General Provisions.
 - 4. Receipts transferring portable or detachable parts to the Owner's Representative when requested.
 - 5. Notify the Owner's Representative in writing when installation is complete and that a final inspection of this work can be performed. In the event any defect or deficiencies are found during this final inspection they shall be corrected to the satisfaction of the Owner's Representative before final acceptance can be issued.

END OF SECTION 26 05 00

SECTION 26 05 01

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 SCOPE

- A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:
1. Examine all other Sections for work related to those other Sections and required to be included as work under Division 26.
 2. General Provisions and Requirements for electrical work.

1.02 SUBMITTALS (ADDITIONAL REQUIREMENTS)

Submit Product Data Sheets for all boxes, relays, contactors, timeswitches, photocells, circuit breakers, transformers, safety switches.

PART 2 PRODUCTS

2.01 OUTLET AND JUNCTION BOXES

- A. General:
1. Flush or concealed outlet boxes and junction boxes.
 - a. Non-masonry and/or non-concrete locations provide pressed steel boxes. Steel thickness not less than 0.062-inch, hot-dip galvanized. Knockout (KO) type with conduit entrances and quantities size to match conduits shown connecting to respective junction box and outlet box.
 - b. UL-514 listed and labeled.
 - c. Minimum required box depth is exclusive of extension-ring depth.
 - d. Provide all boxes with matching cover plates. Cover plates shall be gasketed water-tight in wet and outdoor locations.
 - e. Boxes installed in masonry or concrete shall be UL "Concrete-Tight" approved for installation in concrete and shall allow the placing of conduit without displacing reinforcing bars.
 2. Provide boxes of proper Code size for the number of wires or conduits passing through or terminating therein. In no case shall box be less than 4.0-inches square by 2.125-inches deep, unless specified elsewhere or noted otherwise on the Drawings. 2.5-inches minimum depth for box width's exceeding 2-gang.
 3. Increase the minimum outlet box size to 4.69-inches square by not less than 2.125-inches deep, where one or more of the following conditions occurs:
 - a. More than two conduits connect to the outlet box.
 - b. Circuit or Conduit "Homerun" connects to outlet box.

4. Signal, Communication and Low Voltage:
 - a. Computer outlets: 4-inches square by 2.5-inches deep.
 5. Junction boxes shall be sized to comply with the following:
 - a. Code Requirements size based on the conduit quantities, conduit sizes and wire-fill connected to the junction box.
 - b. Junction box minimum size shall not be less than 4.69-inches by 4.69-inches by 2.5-inches deep, but not less than size indicated on the Drawings or required by Code.
 6. Provide extension rings on flush outlets to finish face of extension ring flush with finished building surfaces. Extension ring shall match outlet box construction and contain "Attachment Mounting-Tabs" for wiring devices. Extension rings shall be "Screw-Attached" to respective outlet box and maintain "Ground" bonding continuity.
 7. Outlet boxes installed in outdoor locations, or in wet locations, or in concrete/masonry, shall be cast-iron or cast-bronze, with threaded conduit hubs. UL rated for wet locations.
 - a. Aluminum boxes shall NOT be in contact with concrete or masonry. Die-cast aluminum or cast aluminum watertight electrical outlet boxes with threaded hubs may be provided as an alternate to cast-iron or cast-bronze outlet boxes, only where one or more of the following conditions occur:
 - 1) Outdoor locations above finish grade.
 - 2) Indoor wet locations surface or flush in walls or ceilings.
 8. Provide fixture-supporting devices in outlet boxes for surface mounted fixtures as required.
 9. Provide solid gang boxes for three or more devices, typically for line and low voltage switches, receptacles, low voltage/signal outlets, etc. for mounting devices behind a common device plate.
 10. Provide isolation barriers in outlet boxes between line voltage and low voltage devices.
 11. Outlet boxes installed penetrating into fire rated walls, fire rated floors, fire rated ceilings and all fire rated construction. The outlet boxes shall be UL listed, classified and labeled, for fire rated and temperature rated penetration of the respective fire rated surface and fire rated construction. The outlet box fire rating and temperature rating shall equal or exceed the fire/temperature rating of the surface/construction being penetrated. Provide UL listed and labeled supplemental fire and temperature protection to maintain ratings:
 - a. Wall and ceiling penetrations, tumescent fire wrap (external or internal of outlet box).
 - b. Floors provide subfloor supplemental fireproofing below floor box.
- B. Surface Outlet Boxes
1. Surface mounted outlet boxes, cast iron Type FS or FD, with threaded hubs as required. Box interior dimensions and interior volume capacity not less than required for "Press Steel Boxes", and "Sheet Steel Boxes". Provide plugs in all unused openings. Provide weatherproof gaskets for all exterior boxes.

2.02 PULLBOXES

- A. General
 - 1. Sizes as indicated on the Drawings and in no case of less size or material thickness than required by the Governing Code and AHJ.
 - 2. Exercise care in locating pullboxes to avoid installation in drain water flow areas and to clear existing condition interferences.
 - 3. UL listed and labeled for electrical circuits.
- B. General Purpose Sheet Metal Pullbox
 - 1. General purpose sheet steel pullboxes: Install only in dry protected locations with removable screw covers. Manufacturer's standard rust proofing and baked enamel finishes.
 - 2. Weatherproof sheet steel pullboxes: Fabricate of Code gauge steel. All surfaces interior and exterior hot-dip galvanized steel. Gasketed weather-tight cover of same material. Manufacturer's standard baked exterior enamel finish.

2.03 LINE VOLTAGE SWITCHES

- A. General
 - 1. Provide circuit switches totally enclosed, electrical insulating Bakelite or electrical insulating composition base, manual operator type with 277-volt 60Hz AC rating for full capacity contacts rated for all loads. Switch mounting-ears for screw attachment to outlet box. Switches shall be UL listed and labeled; conform to NEMA-WD1 and WD6.
 - 2. Switch ratings shall be 20 amp, unless indicated otherwise.
 - 3. All switches shall be of the same Manufacturer.
 - 4. Wiring devices shall be listed and labeled for connection of both "Solid" and "Stranded" copper circuit conductors.
- B. Line Voltage Switches Heavy Duty (Toggle – Type)
 - 1. Single Pole Switches – 20 amp at 277V

<u>Manufacturer</u>	<u>Toggle Type</u>	<u>Lock Type</u>
Hubbell	#HBL1221	#HBL1221-L
Legrand/P&S	#20AC1	#20AC1-L
Leviton	#1221	#1221-L
Cooper-Arrow/Hart	#AH1221	#AH1221-L
- C. Other Switches, Receptacles, Devices, and Outlets
 - 1. Special devices outlets and outlet locations shall be as indicated on the Drawings. Modify device and outlet characteristics to accommodate the actual install location conditions for each outlet.

2.04 STRUCTURAL AND MISCELLANEOUS STEEL

Structural and miscellaneous steel used in connection with electrical work and located out-of-doors or in damp locations, shall be hot-dip galvanized unless otherwise specified. Included are underground pull box covers and similar electrical items. Galvanizing averages 2.0 ounce per square foot and conforms to ASTM A123.

2.05 SAFETY SWITCHES

A. General

1. Disconnect switches shall all be rated:
 - a. 600 volt or 250 volt, as applicable, 60Hz AC.
 - b. Quick-make, quick-break, H.P.-rated, lockable.
 - c. NEMA Type HD heavy duty.
 - d. Fused Class "R", in NEMA Type 3 enclosure, lockable.
 - e. Number of poles and amperage as indicated on the Drawings.
2. Provide internal ground-lug and conductor landing lugs, size to match conductors shown on Drawings. Switch access door shall be interlocked with switch to prevent access inside switch when switch is "ON" closed position.
3. Maximum voltage, current, and horsepower rating clearly marked on the switch enclosure and switches having dual element fuses shall have rating indicated on the nameplate.
4. Switch and fuses ampere rating shall also comply with Manufacturer recommendation for the connected load.

2.06 TRANSFORMERS

A. General

1. Transformer windings shall be copper. Aluminum windings shall not be used.
2. Provide dry type transformers constructed to meet Underwriters' Laboratories Specification UL 506 and tested in accordance with ANSI and NEMA Standards. Performance on transformers equal to or better than ANSI, NEMA, IEEE and CEC/NEC published criteria.
 - a. 60Hz AC line and load.
3. UL Class 220°C insulation with maximum winding temperature rise of 115 °C in 40°C ambient at 100% continuous rated capacity with overload capacity per ANSI C57.12 and C57.96 vacuum impregnated core and coil insulation.
4. Transformers shall be equipped with not less than five 2.5% full capacity voltage taps, two above and three below normal voltage. Line and load terminals shall be accessible, located behind removable front cover plate. Transformer connects shall terminate in "Conductor-Lugs" to match line side incoming and outgoing secondary side conductors, shall occur on a common (same) side of transformer on insulated supports.
5. Provide wall mount and ceiling mount transformers support brackets, platforms and attachment structures for transformers.
6. Dry type transformers shall meet or exceed United States Department of Energy DOE 2016 standards of efficiencies for low voltage distribution transformers.
7. The physical dimensions of the transformer shall not exceed the size shown on the Drawings.
8. Transformer and transformer mounting shall be designed and tested and comply with Seismic Zone earthquake resistance seismic loads, typical for floor, wall and ceiling mount/suspended transformers. Bolt floor-mounted transformers to floor.
9. Provide other features as indicated on the drawings.

- B. Test Requirements:
1. The transformers shall be subjected to the following production tests:
 - a. Applied Potential
 - b. Induced Potential
 - c. No Load Loss.
 - d. Voltage Ratio.
 - e. Polarity
 - f. Continuity
 2. The Manufacturer shall have performed the following additional tests on transformer units identical to the design type being supplied to this Specification. Proof of performance of these tests in the form of test data sheets shall be provided at the Time Shop Drawings are submitted for approval.
 - a. Sound Levels
 - b. Temperature
 - c. Full Load and 50% Load Losses for linear and nonlinear loads
 - d. Voltage Regulation
 - e. Impedance
- C. Transformer Housing
1. Metal, air cooled enclosure
 - a. Removable NEMA – 3R enclosures, outdoor locations, with vent shields.
 - b. Provide screen protected ventilation for all openings, including bottom of housing, to prevent accidental contact with internal components and prevent rodent/insect entrance.
 2. Manufacture’s rust inhibitor primer and standard finish paint.
 3. Removable lifting and skidding provisions.
- D. Sound Levels: Transformer sound levels, between no loads to full load, shall be guaranteed by the Manufacturer not to exceed the following values:
- | | |
|------------------|-------|
| 9 kVA and below | 40dba |
| 10 kVA to 50 kVA | 45dba |

PART 3 EXECUTION

3.01 GROUNDING (ADDITIONAL REQUIREMENTS)

- A. Grounding shall be executed in accordance with all applicable Codes and Regulations, both of the State of California and local Authorities Having Jurisdiction.
- B. The Neutral of Each Transformer shall be grounded to the existing system ground bus as indicated on plans.
- C. Each Pullbox or Any other Enclosure in which Several Ground Wires are Terminated shall be equipped with a ground bus secured to the interior of the enclosure. The bus shall have a separate lug for each ground conductor. No more than one conductor shall be installed per lug.

- D. The Maximum Resistance to Ground shall not exceed 25 ohms.

3.02 OUTLET AND JUNCTION BOXES

A. General:

1. Accurately place boxes and securely fastens structural members. Where outlets are shown at same location but at different mounting heights, install outlets in one vertical line. Where outlets are shown at same location and mounting height, mount outlets as close together in a horizontal row as possible. Where the outlet boxes for switches and receptacles are shown at the same location and mounting height, mount in common outlet box with barriers between devices. Provide single piece multi-gang cover plate for close mounted outlet boxes. Where switches are shown on wall adjacent to hinge side of doors, box shall be installed to clear door when door is fully opened.
2. Flush mounted boxes shall be attached to not less than two parallel studs or structure members by means of metal supports. The support shall span between and attach to the structure members.
3. Boxes above accessible ceilings shall be attached to structural members. Where boxes are suspended, they shall be supported independently of conduit system by means of hanger rods and/or preformed steel channels. Boxes shall be supported independently of all piping, duct-work, equipment, ceiling hanger wires and suspended ceiling grid system.
4. Surface mounted outlets shall be attached to concrete or masonry walls by means of expansion shields.
5. Outlet Box Horizontal and Vertical Separation: Outlet boxes and device outlet rings installed flush in walls shall be horizontally and vertically separated by not less than 24-inches (edge of box to edge of box) from device outlet boxes and rings in common wall surfaces located on the opposite (back) side of the same wall.
 - a. Where the separation cannot be maintained, provide a solid backing behind and completely enclosing each outlet box.
 - b. The backing shall extend the width of the wall cavity (i.e., between "Studs" or masonry cells) behind the box and 12-inches above and below the outlet box centerline, completely enclosing the outlet box.
 - c. The backing shall consist of the following:
 - 1) $\frac{5}{8}$ -inch thick gypsum board anchored in place for "Stud" wall construction.
 - 2) Solid "Mortar" to completely fill the outlet box "Cell" behind the box in masonry construction.
6. Provide metal outlet boxes for each device. Install devices in metal outlet boxes. Typical for all wiring devices including switches, receptacles, line voltage devices, and low voltage/signal system devices.

B. Fire Wrap:

1. In fire rated walls and ceilings provide fire rated "Box-Wrap" around the outside of each outlet box placed in fire rated wall or ceiling. Install the fire wrap on exterior of box inside the wall or ceiling, to maintain the fire rating of wall or ceiling with the installed outlet boxes.

3.03 SWITCHES

A. General

1. Provide outlet boxes for all devices, switches, receptacles, both line-voltage and low-voltage.
2. Devices installed in wireways shall be installed flush in wireway assembly.
3. Install and screw attach devices into outlet boxes and wireways.
4. Provide ground circuit connections to all devices.
5. Provide branch circuit connections to all devices.
6. Install and adjust all cover-plates to be flush and level, with correct device identification.

END OF SECTION 26 05 01

SECTION 26 05 30

CONDUIT AND WIRE

PART 1 GENERAL

1.01 SCOPE

- A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation, and services necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:
1. Examine all other Sections for work related to those other Sections and required to be included as work under this Section.
 2. General Provisions and Requirements for electrical work.

1.02 SUBMITTALS (ADDITIONAL REQUIREMENTS)

Submit Product Data Sheets for all Wire, Supports, Conduit, Fittings and Splicing Materials.

PART 2 PRODUCTS

2.01 CONDUIT

- A. General
1. The interior surfaces of conduits and fittings shall be continuous and smooth, with a constant interior diameter. Conduits and conduit fittings shall provide conductor raceways of fully enclosed circular cross section. The interior surfaces of conduits and fittings shall be without ridges, burrs irregularities or obstructions. Conduits and fittings of the same type shall be of the same uniform weight and thickness.
 2. All fittings for metal conduit shall be suitable for use as a grounding means, pursuant to the applicable Code Requirements.
 3. Steel conduits shall have protective corrosion resistant hot-dip galvanized zinc coating on all interior and exterior surfaces, with clear organic polymer outer topcoat layer. Threads shall be hot-dip zinc coated after machine fabrication.
 4. Threads for metal conduit and metal conduit fittings shall be taper-pipe-thread, National Pipe Standards (NPS) and shall comply with ANSI-B1.20.1.
 5. Metal conduit termination connector fittings shall be provided with a Manufacturer installed, insulating throat bushing inside the fitting. The bushing shall protect the wire conductor insulation from cutting, nicks and abrasion during conductor installation and electrical load "cycling" after installation is complete. The bushing shall comply with UL 94V-0 flammability.

6. Provide conduit bonding/grounding jumper from metal enclosures with “Concentric Ring” knockouts, to positively ground/bond each respective conduit(s) to the metal enclosure.
- B. Rigid Metal Conduit (RMC)
1. Rigid metal, round tubing, machine threaded at both ends and rated for use as an equipment grounding conductor pursuant to applicable Codes.
 2. RMC raceway types shall be Rigid Galvanized Steel Conduit (RGS) and/or Intermediate Steel Conduit (IMC).
 3. RMC fittings shall be steel and compatible with RGS and IMC, rated for use as an equipment grounding conductor pursuant to applicable Codes. liquid and concrete tight, and appropriate for each application used.
- C. Electrical Metallic Tubing (EMT)
1. Rigid metal round tubing, “Thin Wall” steel construction, with non-threaded ends, and rated for use as an equipment grounding conductor pursuant to applicable Codes.
 2. EMT fittings shall be steel and compatible with EMT, rated for use as an equipment grounding conductor pursuant to applicable Codes. Couplings and connectors shall be exclusively compression type. Set screw type connectors shall not be used.
- D. Flexible Metal Conduit (FMC)
1. Round flexible conduit, fabricated from a single continuous steel strip. The steel shall be factory formed into continuous interlocking convolutions to form a complete lock between steel strips and provide raceway flexibility.
 2. FMC Fittings shall be malleable iron construction or steel and shall automatically cause the FMC raceway throat opening to be centered with respect to the fitting throat opening. Direct FMC conduit-to-FMC conduit coupling of FMCs shall not be permitted.
- E. Liquid Tight Flexible Metal Conduit (LTFMC)
1. The metal conduit core of LTFMC shall comply with the same Requirements as FMC conduit, with the addition of a thermoplastic exterior flexible jacket over the metal core.
 2. The exterior jacket shall be positively locked to the metal core to prevent jacket “Sleeving”.
 3. The LTFMC shall be rated for installation and operating service temperatures of between minus 20 degrees centigrade through plus 90 degrees centigrade.
 4. The LTFMC jacket shall be suitable for continuous exposure to sunlight, rainwater, water vapor, mineral oils and liquid solvents, without penetrating into the conduit and without deteriorating the jacket.
 5. Direct LTFMC conduit-to-LTFMC conduit coupling of LTFMC shall not be permitted.
 6. LTFMC fittings
 - a. Fittings shall include an external mechanical ground/bond wire connector.
 - b. The attachment of the fitting to LTFMC shall be threaded compression type onto the conduit core with locknut and liquid tight

jacket compression seal. The fitting shall automatically prevent “Sleeving” of the jacket.

- F. Rigid Non-Metallic Conduit (RNMC)
1. General
 - a. Conduit and fittings shall be 90-degree centigrade conductor rated. Fabricated from homogeneous material, free from visible cracks, holes or foreign inclusions, with integral “End-Bell”. The conduit and conduit fittings shall be watertight and airtight.
 - b. Conduit, conduit fittings and conduit fitting assembly “Solvent Cement” shall all be the product of the same Manufacturer. Conduit fittings shall be solvent cement welded watertight.
 - c. Conduit and fittings shall be identified with legible markings showing ratings, size and Manufacturers name.
 - d. RNMC and fitting shall be corrosion resistant, watertight.
 - e. Conduit shall be suitable for conductor operating temperatures from minus 20 degrees centigrade to 90 degrees centigrade.
 - f. RNMC shall comply with NEMA TC-2 (PVC 40 conduit, latest revision) and NEMA TC-3 (fittings, latest revision); UL 514 and UL 651 (latest revision).
 2. Polyvinyl Chloride (PVC)-RNMC shall be PVC-schedule 40 heavy wall construction.
- G. Expansion Joint, Deflection Joint and Seismic Joint Conduit Fittings
1. Expansion Conduit Fitting - Fitting shall provide for a minimum of 2-inches straight line movement between two connecting conduits in each direction (total 4-inches conduit expansion and contraction) parallel to the respective conduit lengths. Fitting shall be watertight.
 2. Deflection Conduit Fitting - Fitting shall provide for a minimum of 30 degrees angular deflection movement (“Shear” deflection) between two connecting conduits, in any direction perpendicular to the length of the respective conduits. Fitting shall be watertight.
 3. Combination Expansion/Deflection Conduit Fitting - Fitting shall provide the combined “expansion” and “deflection” movement capacity between two connecting conduits as described for separate “expansion” and “Deflection” conduit fittings. Fitting shall be approved for installation concealed in both masonry/concrete construction and exposed non-masonry/concrete construction. Fitting shall be watertight.
 4. Fittings shall comply with UL.
 5. Conduit fitting bonding jumper:
 - a. The grounding/bonding path of metal conduit shall be maintained by the fitting.
 - b. Provide a bonding jumper at each expansion, deflection, and combination expansion deflection conduit fitting.
 - c. The jumper shall be a bare flexible copper “Braid”. The copper braid electrical current carrying capacity shall be equal to the metal conduit.
 - d. Provide a factory terminated ground clamp on each end of the braid with adjusting steel conduit grounding clamps and connect to each respective conduit end.

H. Conduit Bodies Conduit Fitting

1. Conduit bodies shall provide conductor access with a removable conduit body cover and wiring area enclosed in metal housing. The conduit body shall facilitate pulling conductors.
2. In-line form "C" conduit bodies shall be prohibited.
3. The interior space "length" of 90 degree "Elbow" conduit bodies shall not be less than six times the diameter size of the largest conduit connecting to the conduit body.
4. Conduit body covers shall be removable, gasketed; watertight "Domed" metal covers "Mogul-Type" with threaded screw attachment to the conduit body.

2.02 CONDUIT SUPPORTS

A. General

1. Conduit Supports, hangers and fasteners for metal conduit shall be steel, hot dip zinc galvanized.
2. Threaded hardware shall be continuous, free running threads.
3. Conduit support systems, including support channels, pipe clamps, braces, anchors, hardware, fasteners, shall be sized to support the full capacity circuit conductors' weight, plus the installed conduit weight, plus the conduit fitting weight and support hardware weight, plus a 300 percent additional weight capacity safety factor.
4. Provide lock washer at each "bolted"/threaded connection.
5. Conduit supports, fasteners, channels, braces, hardware, anchors, pipe clamps, and hangers as manufactured by Unistrut or Kindorf.
6. Supports shall be free of "BURRS" and sharp edges.
7. Metal supports cut in the field shall be zinc galvanized after cutting to prevent rust.

B. Conduit Hangers

1. Threaded steel hanger rods.
 - a. Hanger rods smaller than 0.375-inches in diameter shall not be used for support of individual conduits.
 - b. Hanger rods smaller than 0.5-inches in diameter shall not be used for support of multiple conduits.
2. Conduit hanger wires shall be not less than 12-gauge steel.
3. Conduit hangers shall attach to structure fasteners with steel "Clevis" or "Swing" hangers and shall provide a minimum of 45 degrees of angular movement in any direction at the point of the conduit hanger attachment to the structure fasteners.
4. Conduits individually suspended by conduit hangers shall fasten to the respective hangers with "Clevis" type pipe hangers. The pipe hangers shall be steel, adjustable to fit conduit size and shall completely enclose the conduit circumference.

C. Conduit Support Channels

1. "C" Channels shall be factory preformed with a minimum 12 gauge thickness metal. The channel shall be factory "Punched" with regularly spaced slotted holes for fastener attachments along the length of the channel.

2. Conduit support channels suspended from conduit hangers shall attach to conduit hangers with treaded connections. Provide a minimum of two (2) hangers (trapeze style) connected to each channel.
 3. Non-suspended conduit support channels shall connect to structure fasteners with threaded connectors.
- D. Fasteners, Seismic Earthquake Rated
1. Channel fasteners:
 - a. Channel fasteners shall “prelocate” and lock into the channel “turned lips” and channel “walls”.
 - b. A separate metal strap shall “tie” each conduit to each channel with conduit channel fasteners.
 2. Structure fasteners:
 - a. Structure fasteners for wall and floor mounted conduit attachments shall attach to existing masonry and concrete structures with structure fasteners using drilled, mechanical, expansion shield anchors.
 - b. Structure fasteners for wall and floor mounted conduit attachments shall attach to new masonry and concrete structures with structure fasteners using steel threaded inserts precast into the structures.
 - c. Structure fasteners shall center the support load above or below the beam flanges and reduce torsion-rotation forces exerted on the structural beam. Attach to steel structural members with “Swing-Beam Clamps”, with set-locking screw structure fasteners.
 - 1) Beam clamps shall include integral safety rod, strap or “J”-Hook to secure the attachment clamp to the beam flanges on both sides of the beam, with integral hanger rod attachment.
 - 2) Or double-ended beam clamp to secure the attachment clamp to the beam flanges on both sides of the beam, with integral hanger rod attachment.
 - d. Structure fasteners for wall and floor mounted conduit attachments shall attach to wood structural members with flush “Through-Bolted” wood beam/wood framing stud structure fasteners.
 - e. Structure fasteners for wall mounted conduit attachments shall attach to steel framing studs and steel structural elements with spot welded steel structure fasteners or drilled and bolted structure fasteners.
- E. Brace Connectors
1. Provide lateral brace connectors to resist horizontal, lateral and vertical movement of suspended conduits during seismic earthquakes.
 2. The braces shall connect from each conduit support, attach as close to the conduit as possible, and attach to fixed rigid, non-suspended building “Main” structural elements with fixed anchoring.
 3. Brace attachment connectors and fasteners shall be rigid preformed steel channels or flexible #10-gauge steel hanger wire.
 4. Connect and attach the brace connectors to fixed structural elements in the same manner as conduit support hangers. The connection of braces to structural elements shall be independent of the conduit support hanger structure fasteners.

2.03 ELECTRICAL POWER WIRE AND CABLE

- A. General
1. All wire and cable shall be single-conductor, annealed copper, insulated 600 volt, #12 AWG minimum unless specifically noted otherwise on the Drawings. Aluminum conductors shall not be used.
 2. Conductors #12 AWG and smaller shall be solid. Conductors #10 AWG and larger shall be stranded.
- B. Conductor Insulation
1. 600 Volt AC and/or DC insulated conductors installed entirely inside conduits, or enclosed inside wireways, or enclosed inside raceways, insulation shall be rated as follows.
 2. Indoor above Grade locations either concealed or exposed.
 - a. Dual rated THHN and THWN
 - b. Individually rated THHN-2
 - c. Individually rated THWN-2
 - d. XHHW-2
 3. All other enclosed raceway locations not described above.
 - a. XHHW-2
 - b. THWN-2
 - c. THW-2
- C. Insulation Color Coding and Identification
1. The following color code for branch circuits:
 - a. Neutral . . . White (Tape feeder neutrals with white tape near connections)
 - b. Normal Power

<u>120/208 Volt</u>	<u>480/277 Volt</u>
Ground Green	Ground Green
Phase A Black	Phase A Brown
Phase B Red	Phase B Orange
Phase C Blue	Phase C Yellow
 2. The color code for the neutral conductors shall be as follows:
 - a. 120/208 volt; Phase A - White with Black stripe; Phase B - White with Red stripe; Phase C - White with Blue stripe.
 - b. 277/480 volt; Phase A - White with Brown stripe; Phase B - White with Orange stripe; Phase C - White with Yellow stripe.
 3. Feeders identified as to phase or leg in each, switchboard, switchgear, panelboard and junction location with printed identifying tape.
 4. Fire alarm conductors: Use 600-volt, type THHN-2/THWN-2 conductors and color-coded per Equipment Manufacturer's recommendations and approved and listed for use on fire alarm systems by the State Fire Marshal.
 5. Color coding for mechanical and plumbing control wiring shall be an agreed upon color code between the Mechanical / Plumbing Contractor and the Electrical Contractor.

PART 3 EXECUTION

3.01 TRENCHING, FOOTINGS, SLEEVES

Provide Trenching, Concrete Encasement of Conduits, Backfilling, and Compaction for the underground electrical work, in accordance with applicable Sections of this Specification.

3.02 GROUNDING

- A. Grounding shall be executed in accordance with all applicable Codes and Regulations, both of the State and local Authorities Having Jurisdiction.
- B. Provide proper sized copper ground wire in the conduit with the feeder for use as an equipment ground. Metallic raceway systems shall be grounded to this ground wire.
- C. The Maximum Ground/Bond Resistance to the Grounding Electrode shall not exceed 1 ohm from any location in the electrical system. The maximum ground resistance of the grounding electrode to earth shall not exceed 25 ohms.
- D. Ground/Bond Conductors
 - 1. Provide dedicated, green insulation equipment ground/bond wire inside each conduit type and raceway as follows. Size the ground/ bond conductors to comply with CEC/NEC Requirements. The metal conduit or raceway shall not be permitted to serve (function) as the only (exclusive) electrical ground return path:
 - a. All types of nonmetallic conduit and all types of non-metallic raceways including but not limited to: RNMC - Rigid Nonmetallic Conduit.
 - b. FMC - Flexible Metal Conduit.
 - c. LTFMC - Liquid Tight Flexible Metal Conduit.
 - d. Metal and non-metal raceways.
 - e. RMC - Rigid Metal Conduit.
 - f. EMT - Electrical Metal Tubing.
 - 2. The equipment ground/bond wire shall be continuous from the electrical circuit source point of origin to the electrical circuit end termination utilization point as follows:
 - a. Every conduit and raceway path containing any length of the above identified conduits or raceway.
 - b. Every conduit path and raceway path connected to any length of the above-identified conduits and raceways.
 - 3. Provide ground/bond wire jumpers for conduit fittings with ground lugs, expansion and deflection conduit fittings at conduit fittings connecting between metallic and non-metallic raceways and to bond metal enclosures to conduit fittings with ground lugs.
- E. Ground Conductors for Branch Circuit Wiring shall be attached at each outlet to the back of the box using drilled and tapped holes and washer head screws, 6-32 or larger.

3.03 CONDUIT

A. General

1. The sizes of the conduits for the various circuits shall be as indicated on the Drawings, but not less than the conduit size required by Code for the size and quantity of conductors to be installed in the conduit.
2. Conduits shall be installed concealed from view. Install conduits concealed in walls, concealed below floors and concealed above ceilings, except as specifically noted otherwise. Conduits shall not be installed embedded in concrete floors.
3. Conduits shall be provided complete with conduit bends, conduit fittings, outlet boxes, pullboxes, junction boxes, conduit anchors/supports, grounding/bonding for a complete and operating conductor/wire raceway system.
4. Metal and nonmetal conduits shall be provided mechanically continuous between termination connection points. Metal conduit shall be provided electrically continuous between termination connection points.
5. Individual conduit paths and homeruns shown on the Drawings shall be maintained as separate individual conduits for each homerun and path.
6. Transitions between conduits constructed of different materials and occurring in above grade locations shall be allowed only at outlet boxes, junction boxes, pull boxes and equipment enclosures unless specifically indicated otherwise. Provide outlet boxes and junction boxes.
7. Metal conduit terminating to nonmetal enclosures; terminating into metal enclosures with "Concentric.ring" knockouts; terminating into metal enclosures with knockout reducing washers, including but not limited to equipment housings, outlet boxes, junction boxes, pull boxes, cable trenches, manholes, shall be provided with a ground/bonding lug integrated with the conduit termination conductor fitting construction, by the Fitting Manufacturer. The lug shall provide for connection of a grounding/bonding conductor (insulated or uninsulated). The grounding lug shall be located on the fitting, inside the termination enclosure.
8. The type of conduit, type of conduit fittings, and type of conduit supports, and method of conduit installation shall be suitable for the conditions of use and conditions of location of installation based on the Manufacturer's recommendations; based on the applicable Codes and based on the Requirements of the Contract Documents.

B. RMC Installation Locations

RGS, IMC conduits and RGS, IMC fittings shall be installed where exposed to view in the outdoor service yard, and risers on the canopy columns.

C. EMT Installation Locations

EMT conduit and EMT fittings shall be installed indoors and outdoors to serve lights under the new canopy.

D. FMC Installation Locations

FMC conduit and FMC fittings may be installed in the following locations for circuit conductors operating below 600 volts to ground; locations containing only “Non-Hazardous Materials”; only dry, interior locations:

1. Concealed in hollow non-masonry metal stud frame and wood stud frame fully enclosed walls.
2. Concealed above fully enclosed ceiling spaces.
3. FMC conduit shall be installed in continuous lengths between termination points. FMC shall not be “spliced” or coupled directly to FMC or any other conduit type under any circumstance.
4. The maximum continuous length of FMC that shall be installed between termination end points is 15-feet. Circuits requiring continuous conduit lengths exceeding 15 feet between termination end points shall be installed using either RMC or EMT conduits. FMC lengths shorter than 16-inches are prohibited.
5. The minimum size FMC conduit shall be as shown on the Drawings but not be less than the following:
 - a. FMC lengths of 6-feet or less, minimum FMC conduit size shall be 0.50-inch.
 - b. FMC lengths exceeding 6-feet, minimum FMC conduit size shall be 1.0-inch.

E. LTFMC Installation Locations

LTFMC conduit and LTFMC fittings may be installed for final electrical connection to the carousel input power terminals.

F. RNMC Installation Locations

RNMC conduit and RNMC fittings shall be installed in the following locations containing only “Non-Hazardous Material”:

1. Underground, concealed below earth grade, unless specifically noted or specified otherwise.
2. Non-metal type raceways and RNMC type conduit shall not be installed inside buildings.

G. Conduit Installation

1. Conduit Supports

- a. Securely and rigidly support all raceways/conduits from the building structure. Raceways/Conduits shall be supported independent of all piping, air ducts, equipment ceiling hanger wires, and suspended ceiling grid systems. Secure conduit to structural element by means of UL listed and approved hangers, fasteners, “C” Channels and pipe clamps.
- b. Provide conduit supports spaced along the length of the conduit as follows:
 - 1) RMC and EMT conduit, maximum not to exceed 96-inches on center; within 24-inches of each conduit bend and conduit termination location.
 - 2) FMC and LTFMC conduit, maximum not to exceed 24-inches on center; within 6-inches of each conduit bend and conduit termination location.

- c. Suspended conduit methods:
 - 1) Individual, suspended raceways/conduits separated by more than 12-inches from any other conduit and suspended from ceilings and roofs shall be supported as follows:
 - a) Conduits smaller than 1.5-inches by means of hanger rods or hanger wires.
 - b) Conduits 1.5-inches and larger by means of hanger rods.
 - c) The conduit shall attach to the hangers with pipe clamps.
 - 2) Suspended raceways/conduits positioned within 24 inches of any other conduit shall be grouped and supported by hanger rods using trapeze type conduit support channels ("C" channels). Conduits shall individually attach to common channels side-by-side, with pipe clamps.
 - d. Non-suspended conduit methods:
 - 1) Individual raceway/conduits placed against wall/ceiling/floors, placed inside hollow wall/ceiling construction or structure framing (i.e., "Dry- Wall" or plaster hollow wall construction), shall be secured by means of individual pipe clamps and fasteners attached to the framing studs or other structural members and the conduit/raceway.
 - 2) Provide common "C" Channel supports for all multiple raceways/conduits placed against vertical or horizontal surfaces and positioned within 24-inches of other raceways/conduits. Attach channels to the framing studs or other structural members. Attach the conduits/raceway individually to common channels, side-by-side, with pipe clamps.
 - 3) The use of toggle bolts is prohibited.
 - e. Conduit rising from floor for motor connection shall be independently supported if extending over 18-inch above floor. Support shall not be to a motor or ductwork, which may transmit vibrations.
 - f. Conduit shall not be installed in cast-in-place concrete floor slabs.
2. Conduit separation:
- a. Conduit installed underground or below building slab without full concrete encasement: Shall be separated from adjacent conduits of identical systems (i.e., signal to signal, data to data, power to power, control to control etc.) by a minimum of 3-inches. Conduits of non-identical systems (i.e., signal to power; data to power; power to control; signal to control, etc.) shall be separated by a minimum of 12-inches.
 - b. Conduit installed underground with full concrete encasement; shall be separated from adjacent conduits of similar systems (100 volt and less) by a minimum of 2-inches; conduits for non-power systems (100 volts and less to ground) shall be separated by a minimum of 6-inches from power circuits (over 100 volts to ground); conduits for power circuits shall be separated from adjacent conduits of similar power systems (over 100 volts to ground) by a minimum of 3-inches.

- c. Conduits shall be separated from hot water piping, exhaust flues/chimneys, steam piping, boilers, furnaces, ovens by a minimum of 12-inches.
- 3. Conduit concrete encasement:
 - a. Conduits larger than 1” which are run underground exterior to building slab shall be continuously concrete encased except where run under paved areas.
- 4. Underground conduits:
 - a. Provide trenching, excavation, shoring, and Backfilling required for the proper installation of underground conduits. Tops of backfill shall match finish grade.
 - b. Bottoms of trenches shall be cut parallel to “Finish Grade” elevation. Make trenches 12-inches wider than the greatest diameter of the conduit.
 - c. Back-filling Trenches for Conduits without Concrete Encasement:
 - 1) Conduits which are not required by the Contract Documents to be concrete encased and are located exterior to building slab, shall be set on a 3-inch bed of damp clean sand. Conduit trenches shall be backfilled to within 12-inches of finished grade with damp sand after installation of conduit is completed. Remainder of backfill shall be native soil or as specified for type of finished surface on grade.
 - 2) Conduits located under a building which are not required by the Contract Documents to be concrete encased, shall be completely backfilled and compacted with clean damp sand to the same level as the building foundation pad.
 - 3) Provide a continuous red wide flat plastic tracer tape with magnetic stripe located 12-inches above the conduits in the trench. The tracer tape shall be imprinted with “Warning-Electric Circuits” a minimum of 24-inches on center.
 - d. Backfilling trenches for conduits with Concrete Encasement Requirements by the Contract Documents:
 - 1) Trenches with all conduits concrete encased shall be back-filled with clean damp sand when located under building pads.
 - 2) Trenches with all conduits concrete encased and not located under a building pad and not located under paved areas shall be backfilled with clean damp sand or native soil.
 - e. Backfill material:
 - 1) Sand and native soil backfill of trenches shall be machine vibrated in 6-inch lifts to provide not less than 90% compaction of backfill.
 - 2) Concrete and slurry mix shall be machine vibrated during installation to remove “Air-Voids”.
 - 3) Soil shall have no stones, organic matter of aggregate greater than 3-inches.
 - 4) The slurry mix shall consist of concrete, clean sand and clean water mixture. Maximum shrinking of slurry mix shall not exceed 5% wet to dry.
 - f. Do not backfill until Owner’s Representative has approved Installation and As-Built Drawings are up to date. Promptly install

- conduits after excavation has been done, so as to keep the excavations open as short a time as possible. Excess soil from trenching shall be removed from the site.
- g. Install underground conduit, except under buildings, not less than 24-inches below finished grade in non-traffic areas and 30-inches below finished grade in traffic areas, including roads and parking areas. Not less than 48-inches below finished grade under public/private transit system right of way and railroad right of way. Dimensions shall be measured to the top of the conduit.
 - h. Conduit crossing existing underground utilities shall cross below the bottom depth of the existing utilities. If the top portion of the existing utility depth below finish grade exceeds 72-inches and the specified separation and depths are maintained when crossing over the top of the existing underground utility, the conduit may cross above the existing underground utility.
 - i. Provide long radius horizontal bends (minimum radius of 36-times the conduit diameter) in underground conduits where the conduit is in excess of 100-feet long.
 - j. Dewatering:
 - 1) Provide pumping to remove, maintain and dispose of all water entering the excavation during the time the excavation is being prepared, for the conduit laying, during the laying of the conduit, and until the backfill at the conduit zone has been completed. These provisions shall apply on a continuous basis. Water shall be disposed of in a manner to prevent damage to adjacent property. Trench water shall not be drained through the construction. Groundwater shall not be allowed to rise around the pipe until joining compound has firmly set.
 - 2) The Owner's Representative shall be notified 48 hours prior to commencement of dewatering.
5. Raceway/Conduits, which are installed at this time and left empty for future use, shall have 0.25-inch diameter polyvinyl rope left in place for future use. The pull rope shall be 500-pound minimum tensile strength. Provide a minimum of 5-feet of slack at each end of pull ropes.
6. Unless otherwise restricted by Structural Drawings and Specifications, the maximum size conduit permitted in walls, ceilings and roofs constructed of masonry or concrete shall not be greater than 25-percent of the concrete/masonry thickness. Conduits installed in these locations shall not cross.
7. Provide openings in building structures for conduit penetrations:
 - a. Existing construction shall be drilled (core drill masonry and concrete) and sealed after conduits are installed.
8. Conduit bends risers and offsets:
 - a. The minimum bend radius of "Factory or Field" fabricated conduit bends shall not be less than the following. The bend radius shall be measured at the surface, inside radius of the conduit wall:
 - 1) FMC and LTFMC conduit - conduit minimum bend radius 12-times the conduit diameter.
 - 2) RMC and EMT conduit minimum bend radius - conduit for power circuits over 100 volts and less than 600 volts, 8-times conduit diameter. Conduit for power circuits over 600

- volt, 12-times conduit diameter. Conduit for low voltage, signal and fiber optic circuits, 10-times conduit diameter.
- 3) RNMC conduit - conduit minimum bend radius 36-times the conduit diameter. Under building reduce minimum bend radius to 10-times the conduit diameter.
 - 4) Conduits for Utility Company conductors. Conduit minimum bend radius shall comply with the respective Utility Company Requirements.
9. Expansion joint, deflection joint and seismic joint fittings.
- a. Provide a conduit expansion fitting for each conduit length and conduit type as follows (Note - The installation of specified combination expansion/deflection fittings at seismic joints shall satisfy this spacing Requirement also):

	<u>Conduit Type</u>	<u>Conduit</u>	<u>Fitting Length</u>	<u>Spacing</u>
1)	RMC and EMT	Exposed exterior locations		200-ft
2)	RMC and EMT	Interior weather protected locations		400-ft
 - b. Provide a conduit combination expansion/deflection fitting for each conduit, crossing the following elements:
 - 1) At each building or non-building structure seismic joint.
 - 2) At each building on non-building structure expansion joint.
 - 3) At each conduit penetration of a "Sound-Rated" wall, floor or ceiling.
10. Provide two locknuts and an insulated throat bushing at each metal conduit terminating at enclosures, including but not limited to outlet boxes, junction boxes, terminal cabinets, transformers, switchboards, distribution panels and panelboards.
11. Provide metallic or plastic closure caps on all conduit ends during construction, until installation of conductors in the respective conduit.
12. Conduit run exposed, shall be run at right angles or parallel to the walls or structures. All changes in direction, either horizontally or vertically, shall be made with conduit outlet bodies as manufactured by Crouse Hinds, OZ or equal. Conduits run on exposed beams or trelliswork shall be painted to match surrounding surfaces.
13. Rigid steel conduit or electrical metallic tubing shall not be strapped or fastened to equipment subject to vibration or mounted on shock absorbing bases.
14. RMC conduit threads:
- a. Machine cut threads on RMC conduit required for field fabrication shall comply with NPS and ANSI-B1.20.1.
 - b. The length of bare metal exposed during thread fabrication shall be completely covered by conduit couplings and fittings. Additionally, the thread length shall insure that conduit joints will reach "Torque" tightness and become secure before conduit ends "Butt" together and before conduit ends "Butt" into the "Shoulders" of other conduit fittings.
 - c. Running threads or right/left-handed threads shall not be used to connect RMC.
15. RNMC conduit:
- a. Joints and fittings shall be solvent welded to RNMC conduit. Joints and fittings shall be watertight and airtight after fabrication.

16. Tighten each conduit fittings and fitting appurtenance, to the "Torque" (allowable tolerance $\pm 5\%$) value recommended by the Fitting Manufacturer and applicable Code. If three or more conduit fittings are found to not follow the Manufacturer's "Torque" (tightness) recommendations, the following corrective actions shall occur:
 - a. The Contractor shall tighten "Re-Torque" the defective fittings and all similar conduit fittings installed as part of the Contract Documents in the presence of the Owner's Representative.
 - b. If the respective conduit fittings similar to the deficient "Torque Tightness" fittings are installed concealed in walls, floors, above ceilings or below grade, the Contractor shall expose the fitting, to allow retightening each similar conduit fitting to the Manufacturers recommended "Torque" values.
 - c. All the cost to repair the direct, indirect, incidental damages and Contract delays resulting from complying with these Requirements shall be the sole responsibility of the Contractor and shall be included in the bid price.

H. Conduit Bodies

1. Conduit bodies shall be installed in exposed conduit locations only or above accessible ceilings.
2. Conduit bodies shall be accessible for removing body cover and pulling wire through the conduit body.
3. Conduit bodies shall not be installed inside enclosed walls.

3.04 WIRE AND CABLE

- A. Branch Circuit and Fixture Joints for #10 AWG and Smaller Wire shall be made with UL-approved connectors listed for 600 volts, approved for use with copper and/or aluminum wire. Connector to consist of a cone-shaped, expandable coil spring insert, insulated with a nylon shell and two wings placed opposite each other to serve as a built-in wrench or shall be molded one-piece as manufactured by 3M-"Scotchlok".
- B. Branch Circuit Joints of #8 AWG and Larger shall be made with screw pressure connectors made of high strength structural aluminum alloy and UL-approved for use with both copper and/or aluminum wire as manufactured by Thomas & Betts. Joints shall be insulated with plastic splicing tape, tapered half-lapped and at least the thickness equivalent to 1.5-times the conductor insulation. Tapes shall be fresh and of quality equal to Scotch.
- C. Use UL Listed Pulling Compound for Installation of Conductors in Conduits.
- D. Correspond each Circuit to the Branch Number Indicated on the Panel Schedule shown on the Drawings except where departures are approved by the Owner's Representative.
- E. Control Wiring to conform to the Wiring Diagrams shown on the Mechanical Drawings and the Manufacturer's wiring diagrams.

- F. Neatly Group and Lace all wiring in panelboards and terminal cabinets with plastic ties at 3-inches on centers. Tag all spare conductors.

3.05 TESTING

A. Testing Conduit and Conduit Bends

The Contractor shall demonstrate the usability of all underground raceways, and field fabricated conduit bends installed as part of this Contract.

1. A round tapered segmented semi-rigid mandrel with a diameter approximately ¼-inch smaller than the diameter of the raceway, shall be pulled through each new raceway.
2. The mandrel shall be pulled through after the raceway installation is completed. Conduits which stubout only, may have the mandrel pulled after the concrete encasement is completed, but prior to completing the backfill.
3. Owner's Representative shall witness the Raceway Testing for usability.
4. Contractor shall repair/replace any conduit and conduit bend provided under this Contract which will not readily pass the mandrel during this Test.

END OF SECTION 26 05 30

SECTION 26 50 05

LIGHTING FIXTURES

PART 1 GENERAL

1.01 SCOPE

A. Work Included:

All labor, materials, appliances, tools, equipment necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete, as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:

1. Examine all other Specification Sections and Drawings for related work required to be included as work under Division 26.
2. General Provisions and Requirements for electrical work.

1.02 SUBMITTALS (ADDITIONAL REQUIREMENTS)

Provide complete Manufacturers Catalog Data Information for each light fixture (luminaire), driver, lamp, materials, auxiliary equipment/devices, finishes and photo-metrics.

1.03 QUALITY ASSURANCE (ADDITIONAL REQUIREMENTS)

A. Work and Materials shall be in full accordance with the latest Rules and Regulations. The publications shall be included in the Contract Document Requirements. If a conflict occurs between the following publications and any other part of the Contract Documents, the Requirements describing the more restrictive provisions shall become the applicable Contract definition:

1. UL – Underwriters' Laboratory:
 - a. UL – 8750 and 1598C: Light Emitting Diode – LED Equipment for use in Lighting Products and Replacements
2. NEMA – National Electrical Manufacturers Association:
 - a. NEMA – LE4: Recessed Luminaires Ceiling Compatibility
 - b. NEMA – SSL #1, #3 and #6: Electronic Drivers for LED; LED and Incandescent Lamp Replacement
 - c. NEMA – LSD #44, #45, #49 and #51: SSL-solid state lighting
3. United States Federal Government:
 - a. FCC – Part 18: EMI and RFI emissions limitations.
 - b. EPA: Energy conservation publications and waste disposal regulations.
4. ETL and C.B.M. Certified and Approved.
5. Electrical installation standards, National Electrical Contractors' Association:
 - a. NEIS/NECA/IESNA – 500: Recommended Practice for installing Indoor Commercial Lighting Systems.
 - b. NEIS/NECA/IESNA – 501: Recommended Practice for installing Exterior Lighting Systems

- c. NEIS/NECA/IESNA - 502: Recommended Practice for installing Industrial Lighting Systems.
6. Illuminating Engineering Society – IES (IESNA):
 - a. IES – LM41: Photometric and Reporting.
 - b. IES – 587: Transient Surge Protection.
 - c. IES – LM79: Solid State Lighting (SSL) Testing and Measurement.
 - d. IES – LM80: Testing for Lifetime of LED.
7. ANSI-American National Standards Institute:
 - a. ANSI – C81
 - b. ANSI – C82
 - c. ANSI – C62.41: Transient Withstand
 - d. ANSI – C78: Lamps
8. State California Code of Regulations - Title-24: Energy Code

PART 2 PRODUCTS

2.01 GENERAL

- A. Complete Fixture
 1. Provide light fixtures complete including lamps, drivers, housings, ceiling and wall trim "rings" for each ceiling type, mounting and adapter support brackets, diffusers/lenses and outlet boxes.
 2. Include an allowance of \$800.00 to furnish a light fixture for each lighting fixture outlet shown on Drawings without a fixture type designation. Include installation costs in base bid.
- B. Specific Fixture Requirements and Fixture Schedule Information
 1. The catalog numbers included in the description of the various types of lighting fixtures shall be considered to establish the type or class of the fixture with a particular Manufacturer only. The fixture length, lumen outputs, component materials, accessories, mounting type, ceiling, wall and install adapters, operation voltage, and all other components required to fulfill the total description of the fixture based on all drawing information, branch circuits, voltages, Specification information, and shall be included in the Contract Requirements regardless of whether or not the catalog number specifically includes these components.
 2. Lighting fixtures shall be the types as indicated in fixture schedule on the Drawings and as described in the Specifications.
 3. All fixtures of the same fixture type shall be the same Manufacturer and of identical finish and appearance, unless indicated otherwise on Drawings.
- C. Manufacturer Certification of Operation
 1. Lamps and power supplies (drivers) shall be recommended and certified by the respective Manufacturer(s), to be "matched" to operate correctly together, within the published characteristics, for efficacy, lamp starting, operating life hours, lumen output, power factor, power input, operating line ampere, sound intensity, and temperature.

2.02 LIGHT FIXTURES (LUMINARIES)

A. General

1. Lighting fixtures shall have all parts, drivers, sockets, support attachments, trim flanges and fittings necessary to complete and properly install the fixture at the indicated installation locations. All fixtures shall be provided with lamps of size and type specified.
2. Ceiling and/or wall surface mounted lighting fixtures shall not have any exposed chase nipples or conduit knockouts visible to view within fixture housing. Lighting fixtures mounted in continuous rows shall have chase nipples or conduit knockouts between lighting fixture housing but shall not have visible chase nipples/conduit knockouts on the visible ends of the continuous row of lighting fixtures.
3. Where fixture color is indicated to be selected by the Architect and / or Owner's Representative, provide two color chip samples for each color for review.
4. Recessed fixtures with attached junction box shall be provided with a junction box permanently attached to the plaster ring so that the junction box is accessible through the fixture opening when the fixture is removed. Connection between fixture and pull box shall be flexible metal conduit with not less than 16 AWG "AF" or "CF" type fixture rated copper wires, high temperature wire insulation for not less than 600 volts AC. The flexible conduit shall be sufficient length, so that when the fixture is removed, the pullbox is readily accessible.
5. Recessed fixtures shall be Underwriters' Laboratory approved for recessed installation with plaster frame and attached pull box. Lamp enclosure, reflectors and finish wiring shall not be installed until plastering is completed. Exposed finish trim shall not be installed until finish painting of the adjacent surface is completed.
6. The fixture shall bear Underwriters' Laboratory label of approval for the wattage and installation indicated.
7. Light fixtures installed outdoors, in damp or wet locations shall be UL labeled for said location as "damp-location" and "wet-location" for the respective installation location.
8. Fixtures in contact with thermal/building insulation shall be UL listed and rated for direct contact installation in thermal insulation systems.
9. Lighting fixtures installed in masonry and/or concrete construction. The fixture housing shall be rated for "concrete-pour" installation location.

B. Lens and Diffusers

1. Acrylic plastic or Plexiglas for the light fixture diffusers or fixtures lenses shall be 100% virgin material.
2. Diffusers shall be formed from cast sheet by a vacuum and/or pressure technique.
3. Lighting fixtures containing lamps with dichroic reflectors and light fixtures with non-dichroic lens/diffuser shall be rated for high temperature lamp operations resulting from lamp heat redirected (reflected) back into the fixture.

2.03 SOLID STATE LIGHTING (SSL), LIGHT EMITTING DIODES (LED) LAMPS, POWER SUPPLIES, AND LIGHT FIXTURES (ADDITIONAL REQUIREMENTS)

A. General

1. Solid State LED light source (lamps), related control equipment (driver-power supply), and luminaire (light fixture) optics for light output distribution.
2. Shall comply with the US-DOE Energy Star Program for SSL-LED.
3. Shall comply with the latest revision IESNA LM-79 and LM-80. Submit
4. SSL chromaticity shall comply with latest revision NEMA and ANSI – C78.377.

B. LED Lamps

1. Lamp lumen output and overall efficiency shall be based on the LED lamps installed in specified fixture and ambient operating temperature.
2. Lamp Color Rendition Index (CRI) shall equal or exceed CRI – 80, unless noted otherwise on Drawings.
3. CRI and lamp color temperature shall be same for all light fixtures of the same fixture type.

C. LED Power Supply (driver)

1. Combination of power supply and SSL – lamp shall be tested and certified by respective Manufacturers for performance and proper operation.
2. Provide dimming type driver where indicated on Drawings. Driver and dimming equipment shall be tested and certified by respective Manufactures for performance and proper operation.

PART 3 EXECUTION

3.01 LIGHT FIXTURE INSTALLATION

A. General

1. The Contractor shall verify actual existing ceiling and wall construction types as defined on record drawings and furnish all lighting fixtures with the correct mounting devices, trim rings, brackets whether or not such variations are indicated by fixture catalog number.
2. Install and connect lighting fixtures to the circuits and control sequences indicated on the Drawings and to comply with respective Manufacturer's instructions/recommendations.

B. Fixture Supports

1. The support wires for light fixture support shall be 12-gauge steel (minimum). The wires including their building and light fixture attachments shall provide support capacity of not less than four times the weight of the light fixture assembly. Provide additional light fixture support wires and building anchors to meet these Requirements, as part of the Contract. The support wires shall be anchored to the building structural elements above the ceiling.
2. Suspended fixtures weighing in excess of 40-pounds shall be supported independently of the fixture outlet box. Provide "aircraft" (minimum 12

gauge) steel hanger cable for suspended fixtures route cable concealed or in pendant where possible. Each cable attachment shall support four times the weight of the fixture assembly. Securely attach the cable to the building structure.

3. Surface mounted fixtures installed on drywall or plaster ceilings and weighing less than 40-pounds may be supported from outlet box. Provide structural supports above drywall or plaster ceilings for installation of fixtures weighing more than 40-pounds and secure fixture to structural supports. The use of toggle bolts is prohibited.

3.02 LENS AND DIFFUSERS

Lens, Diffusers, Internal Reflectors shall be completely cleaned of all dust, dirt and fingerprints after the installation of the light fixtures and lamps, and after all trades have completed work and prior to occupancy of the facility by the Owner.

END OF SECTION 26 50 05

SECTION 28 46 20

FIRE ALARM

PART 1 GENERAL

1.01 SCOPE

- A. Work Included: All labor, materials, appliances, tools, equipment necessary for and incidental to performing all operations in connection with furnishing, delivery, and installation of the work of this Section, complete, as shown on the Drawings and/or specified herein. Work includes, but is not necessarily limited to the following:
 - 1. Examine all other Specifications Sections and Drawings for related work required to be included as work under this Section.
 - 2. General Provisions and Requirements for electrical work.

1.02 SUBMITTALS (ADDITIONAL REQUIREMENTS)

- A. Submit Manufacturer's cut sheets for all fire alarm components, with specific model numbers and Power Requirements highlighted.
- B. Submit Installer qualifications.

1.03 APPLICABLE STANDARDS (ADDITIONAL REQUIREMENTS)

- A. General
 - 1. The equipment shall be listed, labeled, and approved for the application shown in the Contract Documents, as fire alarm equipment complying with the most recent versions of the Install Requirements of the following applicable Standards.
- B. Installation and Testing Completion
 - 1. Equipment Manufacturer shall be submitted to the Owner's Representative Certifying the installation has been tested, is operational and conforms to the Requirements of the Contract Documents, applicable Building Codes and AHJ.

1.04 EQUIPMENT QUALIFICATIONS

- A. General
 - 1. All equipment shall be the products named herein in order to match existing equipment at the site.
 - 2. The Fire Alarm Manufacturer products described are required by and at the specific direction of the Owner and approved by the Owner. Fire alarm system items described by Manufacturer's part number, shall comply with the Performance Specifications published by the Manufacturer's most recent catalog data sheets at the time of bid date and shall become the Requirements of the Contract Documents.
 - 3. The Fire Alarm System Installation Company shall be an Authorized Distributor and Service Provider for the fire alarm system equipment specified in the Contract Documents and furnished as part of Contract

Work. The Fire Alarm Installation Company shall be certified, and their staff shall be trained for the fire alarm system equipment furnished as part of Contract Work. Provide documentation from the Fire Alarm System Manufacturer demonstrating compliance in good standing with the "Authorized Distributor," "Service Provider," "Certification" and "Training" Requirements.

4. A Fire Alarm System Technician authorized by the Manufacturer of the fire alarm system shall supervise the Contractors installation, testing, certification and instruction of Owners' Personnel in the operation of the fire alarm system. The Technician shall be experienced with the specific system and licensed in the respective State for Fire Alarm Systems.

PART 2 PRODUCTS

2.01 GENERAL SYSTEM OPERATION

A. Alarm Conditions

1. Actuation of any manual or automatic alarm initiating device connected to the fire alarm system shall cause the following automatic functions. The automatic functions and actions shall be selectable by fire alarm system software program control functions and shall comply with the AHJ Requirements.
2. Audio and visual alarm evacuation signaling units shall activate continuously. Provide evacuation alarm "Coded" signaling and zoning to comply with AHJ.
3. The respective zone alarm annunciator and annunciator displays on the fire alarm control panel, remote annunciator panels, and remote annunciation/monitoring equipment shall be activated.
4. Activate the central alarm system, offsite central station equipment interface and activate telephone/dialer monitoring lines.

B. Trouble Condition

1. Actuation of any status or supervisory trouble condition connected to the fire alarm system shall be monitored and cause the following automatic functions:
 - a. Activate the respective alarm zone trouble remote annunciator panels and annunciator display on the fire alarm control panel, remote annunciator panels and remote annunciation/monitoring equipment.
 - b. Sound and audible trouble signal on the fire alarm control panel, remote annunciator panels, and remote annunciation/monitoring equipment.
 - c. Activate the offsite central station trouble monitoring circuit.
2. Monitor and detect trouble/failure in any fire alarm systems electrical and electronic circuits, displays, operating software, communications devices, operator controls and equipment control devices.
3. Monitor and detect trouble that may prevent proper operation of any fire alarm initiating device/circuit, evacuation alarm device/circuit, communications device/circuit, control device/circuit etc., including breaks and/or shorts in circuits and display a trouble condition.

4. Each 120-volt AC electric power source connected to any fire alarm system component shall be monitored with indication by a "Power On" display annunciator. Upon normal source power outage, the system shall activate a power trouble condition display, and indicate a trouble condition.
5. Monitor the standby batteries and, upon a low battery condition or battery charging failure, activate the low battery display and indicate a trouble condition.
6. System ground detection shall be provided for the entire system. Upon ground detection, activate the ground detection display and indicate a trouble condition.
7. Smoke detector "Pre-Clean" pre-trouble condition and secondary "Dirty-Detector" trouble condition activate the respective detection display and indicate a trouble condition.

2.02 EXISTING FIRE ALARM CONTROL PANEL (FACP)

Modify, upgrade, and reprogram the existing FACP to fully interface with the new construction.

2.03 VOICE COMMUNICATION FIRE EVACUATION ALARM

A. General

1. Provide integrated audio/visual fire alarm one way voice evacuation, in combination with audible tone, alert/evacuation, and one way voice/communications system through evacuation speakers, and visual evacuation strobes. The system shall operate not less than four simultaneous independent voice channels, Evacuation, Alert and Auxiliary channels. Provide both local from the fire alarm control panel and distributed amplification remote from the fire alarm control panel, to optimize system performance. The entire voice systems and audio/visual circuits shall be supervised by the fire alarm control panel. The system shall provide zoned audio/visual fire evacuation alarm signaling.
2. The audio sound fire alarm evacuation system shall provide a sound intensity of not less than 15dBA above average ambient sound intensities, and 10dBA above maximum ambient sound intensity occurring for 60 seconds. Ambient sound intensities shall be measured after the Owner has occupied the building spaces. In no case shall the sound intensity of the evacuation devices be less than 90dBA or greater than 120dBA when measured 10-feet horizontally from the device.
3. Voice Systems Sound Intensity and Intelligibility.
 - a. Voice systems shall be audible, clear of distortion and intelligible, as defined in NFPA-72, IEC 60849 and 60268 and ANSI S3.2.
 - b. The audio voice system shall provide a Common Intelligibility Scope (CIS) of not less than 0.8, or score Speech Transmission Index (STI) of not less than 0.7 STI, average in normally occupied building spaces.
 - c. The Contractor shall provide additional work and materials to comply with these Requirements including but not limited to.
 - 1) Adjustment of system volumes and adjustment of audio-frequency audio frequency equalization.
 - 2) Adjustment location of speakers and respective circuits.

- 3) Provide additional audio preamplifiers, audio amplifiers, additional speakers and additional speaker circuits.
- d. The additional work and material shall be included in the Contractor's Scope of Work Contract-price. Shall be shown on submittal information.

B. Preamplifiers and Amplifiers

1. Voice system preamplifiers and amplifiers shall be solid state continuous duty:
 - a. Electronic amplification for audio alarm evacuation speaker circuits.
 - b. All amplifiers and preamplifiers shall be identical, respectively interchangeable and of the same Manufacturer as the fire alarm control panel.
 - c. Auxiliary output rated at 4-amp 24 Volt D.C. for operation of visual signaling evacuation alarm devices.
 - d. Quantity of amplifiers and preamplifiers shall be sufficient to supply not less than a continuous 2-watt audio signal to each and every audio speaker connected to the fire alarm system, but in no case less than required for specified sound intensities plus specified spare capacity for future expansion.
 - e. The voice evacuation amplifiers shall operate in a "sleep" mode to reduce electric energy consumption and automatically return to full rated output during a fire evacuation alarm condition.
2. Amplifier spare-capacity. Each preamplifier and amplifier shall be loaded to not more than 70% of specified output capacity, to allow for future expansion and possible changes in speaker watt "tap" settings.
3. Pre-amplifier shall provide audio master control for all voice evacuation related functions. Automatic gain control to provide low distortion voice announcements and tone generator evacuation signals. The quantity and output of the preamplifier shall be sufficient to drive all audio amplifiers to specified maximum output with not more than 5% total system "end-to-end" (including speakers) audio distortion in the described voice frequency range. The preamplifier shall provide individual separate source pre-amplification, volume controls, and tone controls for each separate input source including Firefighter's microphones, tone generators, prerecorded voice messages etc.

C. Tone Generator

1. Shall provide alert and evacuation signal audio tones. The generated tones shall be selectable by the fire alarm system software program control functions as follows:
 - a. Slow Woop (ascending or descending audio frequency).
 - b. "900Hz tone" steady and/or "chime" providing selection of the following tone/chime characteristics:
Temporal Coded 3; State of California Code; Zone Code; or 4-4-4.
 - c. Hi/Lo alternating tone frequency.
 - d. Siren variable wail.
 - e. 520Hz square wave
2. The tone shall automatically precede prerecorded voice messages and shall be manually controllable by Firefighter's override from the fire alarm control panel.

D. Pre-Recorded Voice Evacuation

1. Provide digital processing/conversion storage of prerecorded voice recording and storage of evacuation messages, minimum 15-minutes of messages. The prerecorded voice evacuation system shall also include the desired tone generator signal alert/evacuation with ten tones, in combination with the voice announcements. The pre-recorded information "playback" shall be selectable in any combination or individual sequence by the fire alarm system software program control functions, for each zone and by Fire-Fighter's manual override controls. The messages shall be stored in non-volatile memory to prevent the loss of the messages as a result of power failure.
2. The Firefighter's voice microphone module shall provide recording input for storage of voice evacuation announcements.
3. Provide an additional input port for a portable device to download pre-recorded evacuation announcements into the system.

2.04 EVACUATION ALARM DEVICES

A. General

1. Evacuation alarm devices shall activate automatically from the control panel. Devices shall operate on a Class "A", 4-wire (Class "B", 2-wire) supervised alarm evacuation circuit. Series wired alarm devices shall not be used.
2. Screw type terminals with numbered identification shall be provided for "IN-OUT" connections of the alarm circuit wiring.
3. Devices shall be installed in a metal box, 3.9-inch-deep maximum, flush mounting unless indicated otherwise on the Drawings. Provide extension ring to increase the box depth, on the mounting box, if additional depth is required to accommodate the evacuation alarm device. Size as required for the audible alarm indicating device and wiring connections. Provide a trim ring and metal grill cover assembly. Cover assembly shall be a minimum of 0.062-inch-thick flat stainless steel or aluminum. Finish color of cover "Red" unless selected otherwise by Owner's Representative. The word "FIRE" shall appear on the grill, minimum 0.5-inch-high letters. The grill shall be screw attached to the box. The grill shall be square/rectangular shape for wall mounted evacuation devices and round for ceiling mounted evacuation alarm devices.
4. A visual alarm indicating device shall be an integral part of the audible alarm box cover assembly, for wall mounted and ceiling mounted devices. Each audible evacuation alarm device shall incorporate an integral visual alarm indicator unless indicated otherwise on the Drawings.
5. Alarm initiating devices, audible evacuation alarm device and visual evacuation alarm devices shall each be connected to separate circuits and conductors. Do not connect these devices to the same circuit conductors. The separate audible evacuation circuits shall provide Coded or Non-Coded audible signaling independent of the visual evacuation alarms.
6. The audio sound fire alarm evacuation system shall provide a sound intensity of not less than 20dBA above average ambient sound intensities, and 5dBA above maximum ambient sound intensity occurring for 60 seconds. Ambient sound intensities shall be measured after the Owner has occupied the building spaces. In no case shall the sound intensity of

the evacuation devices be less than 90dBA or greater than 120dBA when measured 10-feet horizontally from the device.

B. Audible Evacuation Alarms

1. Voice speakers:

- a. Fire retardant, moisture/humidity resistant construction for both audible voice and tone notification of fire evacuation alarms, UL-1480 listed.
- b. Audio speaker input transformer, multiple transformer wattage settings to allow speaker wattage selection. Not less than four taps, one tap at low rating, one tap at high rating and two intermediate tap ratings. Input voltage rating to match respective circuit amplifier output rating. Speaker output circuit to match respective speaker impedance. Install inside the speaker housing.
- c. Metal, 6-inch nominal depth speaker housing flush ceiling installation locations, and metal 4-inch nominal depth on semi-flush wall install locations. Housing interior shall be lined with sound dampening fire resistive material. Tamper resistant, removable, sound-transparent speaker cover grill. Red grill finish color or colors selected by Architect.

C. Visual Evacuation Alarm Indicator

1. Lamp/Strobe internally illuminated projecting lens assembly, with flasher system. Unit shall flash on and off to provide visual indicating of fire alarm.
2. The word "FIRE" shall appear on the lens or lens plate. The lens shall project beyond the face of the cover assembly.
3. All visual evacuation alarm devices with a common evacuation alarm zone shall "Flash" in full synchronized unison or in random pattern, soft-ware programmable from the fire alarm control panel. The synchronized visual evacuation alarm devices shall not "Drift" out of synchronization at any time during operation.
4. The flash rate shall be software programmable from the fire alarm control panel for 1-3 flashes per second, with approximately 0.001 second flash duration.
5. Flash rate independent of audible device coded signal output.
6. Light source, Xenon high intensity flash strobe tube white/clear color, for Fire Alarm.
7. 75 candelas (cd) minimum, 180 candelas maximum flash intensity, at 10 feet distance along the direct line perpendicular axis viewing angle. The "Effective Intensity" of each flash shall not be less than 30 candelas from any viewing angle, but under any condition not less than required by AHJ. The flash intensity shall be "Field" adjustable over the specified range.
8. Photosensitive induced epilepsy:

Wherever three or more multiple visual evacuation alarm devices are visible from any single location, the devices shall be adjusted to reduce the risk of inducing photosensitive epilepsy seizure responses in susceptible people, using one or more of the following methods:

- a. Synchronizing the flash rate.
- b. Adjust the flash intensity.
- c. Adjust the physical location of the visual device.

- d. Devices installed closer than 55 feet distance "Sight-Line" together shall be synchronized flash rate.

PART 3 EXECUTION

3.01 FIRE ALARM SYSTEM CONFIGURATION

- A. Fire Alarm System Survivability
 1. The fire alarm system equipment, wiring/cables, alarm initiation, alarm evacuation and zoning shall be configured, supplied and installed so a single point failure and/or fire damage condition does not contribute to the disruption of the operation of the entire fire alarm system. The undamaged portions of the fire alarm system will continue to operate during a fire.
 2. Separate and isolated routing paths through the building shall be provided for fire alarm circuits to avoid total loss of fire alarm system communications resulting from failure and/or fire damage, for both lateral/horizontal distribution communication paths on each floor and vertical riser communication paths in multi-story building.
 3. Quantities and arrangements of components contained in fire alarm equipment shall ensure no single individual component failure will cause a failure of the equipment to provide the continued operation of the fire alarm system.

3.02 IDENTIFICATION (ADDITIONAL REQUIREMENTS)

- A. General
 1. The inside cover of alarm initiating devices and communicating devices shall be marked with the zone initiating number communications identification address corresponding to the zone number in the respective control panel. Marking shall be with a felt-tip pen or permanent label.

3.03 TESTING

- A. General
 1. Reprogram the existing fire alarm control panel as required to serve the new construction. All new portions of the fire alarm system shall be tested after the installation and software programming is complete.
 2. Individually activate each manual initiating station and verify correct alarm operation and control panel response, and remote equipment operation.
 3. Individually test each automatic initiating device and verify correct alarm operation, control panel response and remote equipment operation.
 4. The fire alarm system installation and operation shall be verified by the Manufacturer's Representative and a Written Manufacturer's Verification Certificate delivered to the Owner's Representative.
 5. Individually operate each control function.
 6. Test the battery back-up systems by disconnecting the incoming normal power and allowing the alarm system to operate 24 hours on battery power. Sound the alarm system for the specified reserve operation minutes at the end of 24 hours on battery power.

7. Fire alarm initiating devices: Test and verify each individual device with walk-around initiation, supervisory trouble test, and device missing test. Document each device type and address, physical location; activate/reset response time and sensitivity. Also activate each manual test button and automatic test sequence.
 - a. Each fire smoke detector, activation test with UL listed aerosol "Canned-Smoke".
 - b. Each fire heat detector activation test with "Heat-Gun", heat rate-of-rise, and temperature set point.
 - c. Water flow, pressure sensor, fire suppression system and tamper, simulate activation alarm initiation. Do not cause actual discharge of fire sprinklers or discharge of fire suppression systems, as part of fire alarm system testing procedures.
 8. Fire alarm evacuation devices: When the fire alarm system evacuation alarms are initiated, confirm each evacuation device location functions correctly. Document each device type and address, physical location, sound level intensity (audibility and intelligibility) for audible devices in each room with and without devices), visual (direct and indirect) intensity for visual devices, and activate/reset response time:
 - a. Central Station monitoring notification and response occurs.
- B. Audio Voice and Intelligibility Testing
1. The preamplifiers, amplifiers and speakers' sound levels and intelligibility shall be tested to ensure that the system meets the intelligibility standards for Life-Safety evacuation and notification systems.
 2. The sound from the speakers shall be a minimum of 15dB above the ambient noise level throughout the facility. Testing shall be done with a Sound Level Meter or an Audio Analyzer.
 3. Test the intelligibility of the speakers throughout the facility to ensure that the intelligibility meets the Requirements of the NFPA-72. The test shall be performed with an Audio Intelligibility Analyzer such as a Goldline DSP-30B or the Quest Technologies Sound Pro SE/DL.
 4. Areas of the building where occupants are not expected to be normally present shall be permitted to have a CIS score less than 0.8 if occupant can determine that a voice signal is being broadcast and they must walk no more than 10m (35-feet) to a location with a CIS score of at least 0.8. Areas including but not limited to:
 - a. Janitor closets
 - b. Storage rooms
 - c. Individual enclosed offices with two people or less occupancy and the office is smaller than 110 square feet floor space.
- C. Documents and Performance
1. Perform all electrical and mechanical tests required by the Equipment Manufacturer's certification form. Measure and adjust each automatic detection detector to the maximum stable sensitivity setting. Detector tests shall be performed with the detector at its operational location and under normal operational environmental conditions in the area. Bench settings are not acceptable. An operational check-out test and report shall be performed. Submit six copies of test report results.

The tests and report shall include, but not be limited to:

- a. A complete list of equipment installed and wired.
- b. Indication that all equipment is properly installed and functions and conforms with these Specifications.
- c. Test of each individual zone as applicable.
- d. Serial numbers, locations by zone and model number for each installed detector.
- e. Voltage (sensitivity) settings for each ionization and photoelectric detector as measured in place with the HVAC system operating.
- f. Response time on thermostats and flame detectors (if used).
- g. Technician's name, certificate number and date.
- h. The completed manual and automatic monitoring and control system shall be tested to ensure that it is operating properly. This test will consist of exposing the installed units to a standard fire test.

D. Acceptance Demonstration

1. Acceptance of the system shall also require a demonstration of the stability of the system. This shall be adequately demonstrated if the system operates continuously for a 90-day test period without any unwarranted alarms. In the event an unwarranted alarm(s) occurs, the Contractor shall repair, readjust or replace the defective equipment and detector(s) with new equipment and begin another 90-day test period. The Contractor shall recheck the equipment and detectors using the fire test after each readjustment or replacement of equipment and/or detectors.
2. Testing verification cycle shall be continuously repeated until the system successfully completes the testing. The test period shall not start until the Owner has obtained beneficial use of the building areas under tests.

E. After the Testing has been completed to the satisfaction of CFC 907.9 – 907.9.4.1 the Inspectors, provide the NFPA Certificate of Compliance to the District, the Local Fire Official, the Architect and DSA.

3.04 DETECTOR COMMISSIONING

A. The detector shall incorporate a push button to invoke self-learning modes to simplify Commissioning including:

1. A learning mode that determines the reference flow (normalized flow) based on environmentally induced flow changes during the Commissioning process.
2. Additionally, there shall be provision for a PC software tool to configure all user modifiable parameters of all system devices.

B. Commissioning Tests

1. All necessary instrumentation, equipment, materials and labor shall be provided by the Contractor.
2. The Contractor shall record all tests and system configuration to establish "Baseline Data" and a copy of these results shall be retained on site in the System Logbook as a part of required system documentation.
3. System Checks
 - a. Visually check all sampling tubes and sampling points to ensure that layout complies with the Specification.

- b. Connect power.
 - c. Connect VSC to USB / Ethernet port as per instructions in the product guide.
 - d. Wait 15 minutes for pump to warm up.
 - e. In Xtralis VSC configure the number of sampling tubes in use and maximum tube length.
 - f. Execute Normalization via Xtralis VSC. Note the detector will not normalize until 15 minutes after powering up.
 - g. Execute sample point test, which tests the presence of the sampling point.
4. Check the detector to ensure the following features are operational and programmed in accordance with the Specification:
 - a. Alarm threshold levels
 - b. Time delays
 - c. Sampling tubes in use
 - d. Detector address
 - e. Display address
 - f. Clock time and date
 - g. Air flow fault thresholds
 - h. Reset button operable
 - i. Touch screen operable where installed
 - j. Units set to U.S./S.I. (for US only) or metric for other regions
 - k. Check to ensure that all ancillary warning devices operate as specified.
 5. Check interconnection with the fire alarm panel to ensure correct operation by executing the Alarm Test, which checks all relay connections to the fire alarm panel.
 6. Place the detector in Smoke Test mode and measure the transport times by putting smoke in each sampling hole and by checking the transport times
 7. Activate the appropriate Fire Alarm zones and advise all concerned that the system is fully operational.
 8. Fill out the Logbook and Commissioning Report accordingly.

3.05 WIRING (ADDITIONAL REQUIREMENTS)

A. General

1. Review the total system point-to-point wiring and cable layout. Provide the correct quantities and types of wires, cables, outlets, and conduits/raceways to ensure the correct operation of the fire alarm system.
2. Final connections, testing, adjusting, and calibration shall be made under the direct supervision of a Factory-Trained Technician of the System Supplier.
3. All wiring and cables shall be in conduits/raceways. All conduits/raceways shall be installed and concealed in walls, above ceilings and in floors.
4. All wiring and cables in cabinets shall be neatly formed and laced.
5. Wiring shall be made up onto bolt and nut terminal blocks. Tag all spares. All wire conductors shall terminate on terminal strips with "Spade" "Eyebolt" type lugs, of adequate size for respective incoming and outgoing conductors. The terminal strips shall be labeled as to their use and wiring

- diagram shall be placed on/inside the equipment showing connections of all related equipment to these strips.
6. Wiring Requirements for shielding certain conductors from other conductors or routing of fire alarm circuits in separate isolated raceways shall be as recommended by the Manufacturer's Documentation and AHJ.
 7. The fire alarm circuits, location, quantities of raceways, circuit conductors and devices shown on the Drawings are schematic. Provide all conduit, raceways, wiring, cables, devices and conductors per Manufacturer's recommendations and as required by AHJ. Include all material and labor costs in the Contract price for compliance with providing a complete and operable fire alarm system.
 8. Wire and cable shall be type and size to ensure installed circuit voltage drop and signal loss does not exceed Manufacturer's recommendations, but in no case shall the voltage drop and/or signal loss exceed the values permitted by the AHJ, including allowances for spare capacity/devices.
 9. Provide End of the Line (EOL) circuit termination device on each wiring circuit, for the trouble supervisory monitoring of each circuit by the fire alarm system.
 10. All fire alarm raceways/conduit shall be installed concealed in public areas. All conductors and cables shall be installed in raceways/conduits.

3.06 SPECIAL INSTALLATION REQUIREMENTS

- A. General
 1. Whether or not shown on the Fire Alarm Drawings, the following systems shall be provided as part of the Contract. Provide fire alarm devices and connection of the systems to the fire alarm control panel including all material, labor, and cost in the Contract.
- B. Area Protection Automatic Smoke Detectors and Heat Detectors
 1. Area protection smoke detectors and heat detectors shall be ceiling mounted unless noted otherwise on the Drawings. Smoke detectors that are installed before final job site cleanup is complete by all trades shall be cleaned or replaced with new smoke detectors to match original smoke detectors.
 2. Provide detector quantities to ensure a minimum of one automatic detector for each 600 square feet of area, (and fraction thereof) for each building space where smoke detectors are required by the AHJ. In no case shall detector spacing exceed Manufacturer's or AHJ maximum recommendations/limits.
 3. Provide detector quantities to ensure the centerline to centerline spacing of installed detectors does not exceed Manufacturer's and AHJ's Requirements in the protected area.
 4. Locate area protection detectors a minimum of 48 inches horizontal distance from any air transfer grill/vent, air intake grill/vent and air discharge grill/vent.
 5. Provide connection of automatic initiating devices to the fire alarm multiplex control system with 0.75-inch conduit and digital multiplex communications conductors.

3.07 OUTLET BOXES (ADDITIONAL REQUIREMENTS)

- A. Device outlet boxes shall be flush mounted unless indicated otherwise on the Drawings. Provide extension rings to finish flush with finish surface. Where the Drawings indicate surface mounted devices, outlet boxes shall be cast metal with threaded hubs. Where the conduit entrances are not exposed for surface mounted devices, provide flush outlet box behind the device box and omit the conduit hubs on the device box.
- B. Size device boxes and outlet boxes per Manufacturer recommendation and as required by Building Code for wire fill and construction.
- C. Outlet boxes shall be listed and approved for fire alarm system use by AHJ and UL.

END OF SECTION 28 46 20

SECTION 31 60 00

CAST-IN-PLACE CONCRETE PILES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Drilling and minor grading for piles.
2. Cast-in-place concrete piles, their reinforcement and casing.

B. Work installed but furnished in other Sections:

1. Anchor rods, anchor rods and leveling plates: Division 5.

C. Related work:

1. General excavations, including removal of excavated materials resulting from pile drilling operation: Division 01
2. Concrete and reinforcing steel for work other than piles, including pile caps: Section 03 20 00, Concrete Reinforcing.

1.2 REFERENCES

- A. ACI 336.1-01 Standard Specification for the Construction of Drilled Piers.

1.3 SUBMITTALS

- A. Procedure: In accordance with Division 01

- B. Record drawings: Indicate location plan prepared and signed by a licensed surveyor with each pile identified and located in reference to the grid lines shown on the Drawings.

1.4 QUALITY ASSURANCE

- A. Tests and inspections: For materials tests refer to Section 03 20 00, Concrete Reinforcing and Section 03 30 00, Cast-in-place Concrete.

1.5 JOB CONDITIONS

- A. The depths of various types of soil materials are approximate and are given for general information in connection with this work. The capacities of the piles shall be as set forth in the report.

- B. Report utility lines encountered that are not indicated, or are in location other than indicated, on the Drawings to the Owner's Representative's attention who will issue instructions for proceeding with the work.

1.6 MEASUREMENT AND PAYMENT

- A. Bids shall be based on the number of piles, design length, and the shaft diameter indicated on the Drawings.
- B. Adjustments to Contract for change from design length and diameter caused by variations in soil conditions will be made on the net variation of the total quantities from design dimensions that vary by more than 10 percent from that shown on the Drawings.
- C. No additional compensation will be made for over-excavated shafts and rejected piles.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with applicable requirements of the following:
 - 1. Section 03 20 00, Concrete Reinforcing.
 - 2. Section 03 30 00, Cast-in-place Concrete.
- B. Steel casings (if required): ASTM A 134 or A 139; I.D. same size as pile diameter indicated.

2.2 CONCRETE DESIGN

- A. Concrete design, mixing, consistency and testing: Comply with applicable requirements of Section 03 30 00, Cast-In-Place Concrete.
- B. Compressive Strength of concrete: As noted on Structural Drawings but not less than 3,000 psi at 28-days.
- C. Slump: Maximum 6 in. to 7 in., except that where casing is used and removed, provide specially designed concrete with a minimum slump of 5 in. and with a retarder to prevent arching of concrete (during casing pulling) or setting of concrete until after casing is pulled.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to drilling, notify Owner's Representative so that they may be present during drilling operations.

- B. Continuous inspection by Owner's Representative will be provided during placing of reinforcement and concrete.

3.2 EXCAVATION

- A. Drill shafts to indicated elevations or as required by the Owner's Representative.
- B. Trim bottoms to lines and grades to leave a solid base to receive concrete.
- C. Install casing where sides of excavations are sloughing- off and when there is water penetration in the shaft.
- D. Drill shafts plumb and true to line, within 3 in. of the location shown on the Drawings, with variation from vertical not exceeding 1-1/2 in. in first 10 ft. plus 1% of the depth greater than 10 ft.
- E. Minus tolerance of pile diameters shall not be less than 1 in. of dimensions indicated at any cross section.
- F. Drill closely spaced shafts alternately.
- G. When excavation of any pile is completed, control inflow of water into the shaft to permit placing of concrete without separation of its constituent materials. Provide pumps when required so concrete can be placed in the dry.
- H. Remove loose materials from shaft before placing reinforcement and concrete.
- I. Accurately place reinforcement and securely tie in precise position with 16 gage (minimum) annealed steel wire at bar crossing.
 - 1. Suspend reinforcement from top and secure laterally in position.
 - 2. Make adequate provisions to insure that reinforcement will remain in place during placing of concrete, and that required concrete cover of steel is maintained.
- J. Set anchor bolts, bearing plates, and dowels where required to engage subsequent work, prior to placing concrete. Secure against displacement during placing of concrete.
- K. Use drilling equipment capable of drilling shafts as close to the existing construction as indicated on the Drawings.

3.3 PLACING CONCRETE

- A. Owner's Representative monitoring:
 - 1. Allow sufficient time for Owner's Representative to evaluate soil bearing capacity, to measure pile dimensions and plumbness, and amount of water, if any, in shaft.
 - 2. Place no concrete without Owner's Representative's approval and until reinforcement has been inspected by the Owner's Representative.

3. Piles completed prior to Owner's Representative approval are subject to rejection, and in the event of rejection, shall be replaced at no additional cost to the Owner.
4. If, in Owner's Representative's opinion, it is necessary to enter the excavation for adequate evaluation of soil bearing capacity, provide safe means of entering the shaft, casing when so requested, and suitable lighting as approved by the Owner's Representative.
5. Inspection by Owner's Representative will be in addition to that required for the placing of reinforcement and concrete as described in Sheet S00-02.

B. Placing:

1. Do not place concrete in or under water, except when placement method proposed by the Contractor has been submitted to, and is acceptable to the Owner's Representative.
2. Prior to placing concrete, bottom of piles shall be cleaned of all loose or disturbed material. As an alternate, use lean cement-water slurry having a maximum water-cement ratio of 0.5 shall be placed at the bottom of the pile in sufficient quantity to completely envelope all loose or disturbed materials unable to be removed. The slurry shall be mixed with the disturbed materials at the bottom of the pile by means of reverse rotation of the drilling tool.
3. Fill pile shafts as soon as possible after drilling and inspections; do not leave open overnight.
4. Fill closely spaced piles (less than 3 diameters) alternately, allowing concrete to set a minimum of 24 hours before drilling an adjacent hole or as permitted by Owner's Representative.
5. Concrete may be placed by dumping in free drop, not more than 5 feet from the surface provided that a hopper or other device is used to force concrete to drop straight down without hitting sides of the holes or the reinforcement before landing at bottom.
6. Deposit concrete continuously, or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within the shaft.
7. Carefully remove casing vertically (do not rotate) during the pouring of concrete, keeping top of concrete pour a minimum of 5 ft. above the bottom of the casing as it is withdrawn. After the casing has been withdrawn, pour additional concrete to compensate for the slump during withdrawal.
 - a. Check concrete level prior to, during and after pulling casing. Avoid vibrating concrete if casing is pulled.
 - b. Pull case before slump decreases below 5 in. as determined by field-testing.

8. Vibrate the full length of each pile such that voids do not exist in either the pile base or shaft.
9. Stop concrete in each pile at required elevation, level and screed off, leaving a relatively rough finish. Where cut-off elevation is above grade, form the top section and extend to the required elevation.
10. Use templates to set anchor bolts, leveling plates and other accessories to be embedded in piles.

3.4 FIELD QUALITY CONTROL

- A. In addition to verifying completed excavations, the Owner's Representative will maintain a daily log of all drilling, which shall be the official log for the work of this Section.
- B. The Contractor shall sign this log daily to indicate his acceptance of the data contained therein, and shall include the following:
 1. Identification mark and pile location.
 2. Shaft diameter.
 3. Elevations of pile top, bottom and adjacent grade.
 4. Depth drilled through overburden and through bedrock.
 5. Bearing strata description.
 6. Length, elevation and location of permanent casing, if used.
 7. Nature and location of obstructions.
 8. Water conditions during pile drilling and concrete placement.
- C. The Owner's Testing Agency will sample and test concrete during its placement as specified in Section 03 30 00, Cast-in-place Concrete.
- D. At completion of this work, provide the Owner's Representative with a survey, to verify the pile locations.

END OF SECTION

SECTION 33 34 00
STORM DRAIN SYSTEM

PART ONE - GENERAL

- *1.1 DESCRIPTION
- A. Furnish all labor, materials and equipment necessary to provide "on-site" Storm Drain System as shown on the Contract Drawing and specified herein, including:
1. Catch basin
 2. Connection to existing storm drain canal
- B. Repair and construct paving and bases after installation of Storm Sewerage System.
- C. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to the GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS and DIVISION 1 - GENERAL REQUIREMENTS and applicable section of the Project Manual.
 2. Site Demolition in Section 02 41 00.
 3. Earthwork in Section 02 31 00.
 4. Concrete Work in Section 03 30 00.
- 1.2 QUALITY ASSURANCE
- A. Bonded Contractor: For connection to City's Storm Drain System including any catch basin or structure, Contractor specializing in the Storm Drain System connection work of this section shall be preapproved, bonded, and certified by Los Angeles City Bureau of Engineering. Submit certificates verifying Contractor=s qualifications prior to start of work.
- B. Labor: Use adequate numbers of skilled laborers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- *C. Codes and Regulations: Conform to the applicable Los Angeles City Building Code and Amendments, Los Angeles City Bureau of Engineering Standard Plans, and the Standard Specifications for Public Works Construction (SSPWC), latest edition.
- *1.3 SUBMITTALS
- A. Comply with applicable provisions in the Section 01 33 00 - SUBMITTALS of DIVISION 1

- GENERAL REQUIREMENTS of the Project Manual.

- B. Product Data: Within 35 calendar days after the Contractor has received the City's "Notice to Proceed", submit:
1. Materials list of items proposed to be provided under this Section and other related Sections;
 2. Manufacturer's Specifications and other data needed to prove compliance with the specified requirements;
 3. Manufacturer's recommended installation procedures which, when approved by the City Engineer or the Consultant, will become the basis for accepting or rejecting actual installation procedures used on the Work.
- C. Contractor's proof of qualification.
- *D. Shop Drawings:
1. Submit complete shop fabrication drawings of all steel pipe, pipe specials and joint details. Contractor shall also submit a schedule of pipe marks accompanied by a plan showing the field location of each mark.
- E. Testing Data and Reports.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver material and products with certified delivery tickets to the job-site where directed by the City Engineer or the Consultant.
- B. Store materials on the job located where directed by the City Engineer or the Consultant and not interfering with work operations of this Section.
- C. Handle materials safely in a manner avoiding damage prior to and during installation and not damaging work of other trades.

1.5 PROTECTION

- A. Required:
- Furnish, erect and maintain barriers, lights and signs as necessary to protect the public, Contractor's and City's personnel and work under this Contract in accordance with Work Area Traffic Control Handbook until such time for backfilling of trenches and subsequent Contracted Site and "Street Work" operations.

*1.6 PERMIT

- A. Required:

1. Obtain Storm Drain Connection permit for connecting and discharging storm water into City street storm drain system as noted in Sections of GENERAL CONDITIONS and Section 01 11 20 – DESCRIPTION OF THE WORK in GENERAL REQUIREMENTS of the Project Manual or as otherwise directed by the City Engineer or the Consultant.
2. Street Repair A Permit for the installation of storm drain pipes in public right-of-ways.

*1.7 INSPECTION

A. Required:

1. All work outside the property lines regarding storm drain line connections to the street storm drain or gutters through sidewalk and curbs or as called for on the Contract Drawings, by the Storm Drain Connection Inspector of the Bureau of Contract Administration. Contractor shall make necessary arrangement in accordance with the permit requirements.
2. All work inside the property lines regarding storm drain lines shall be inspected by the Los Angeles City Department of Building and Safety.
3. Test pipes shall be selected from the lot and tested in accordance with the requirements specified in SSPWC, but not necessary limited to. At the place of manufacture, the City Engineer or Inspector will indicate tentative acceptance of the pipe for delivery by marking with the Agency stamp. Final acceptance will be made only when the project has been completed.
4. All pipe penetration and required fire stopping shall be inspected prior to any wall closure.

B. Notification: Contractor shall notify all local governing agencies and arrange for required inspection.

1.8 COORDINATION

A. Required: All on-site storm drain work shall be fully coordinated with other Contracted Work operations as per approved work scheduled.

PART TWO-PRODUCTS

*2.1 PIPE MATERIAL (As applicable)

- A. Reinforced Concrete Pipe: Cast Pipe wall type, As per Section 207-2 - REINFORCED CONCRETE PIPE of the Standard Specifications for Public Works Construction (SSPWC), sizes as indicated on the Contract Drawings.
- B. Non-Reinforced Concrete Pipe: "Extra Strength" complying with Section 207-1 - NON-

REINFORCED CONCRETE PIPE of SSPWC and ASTM C14 - SPECIFICATION FOR CONCRETE SEWER, STORM DRAIN, AND CULVERT PIPE, sizes as indicated on the Contract Drawings.

- D. Corrugated Metal Pipe: As per Section 207-11 - CORRUGATED STEEL PIPE AND PIPE ARCHES of the SSPWC; sizes as indicated on the Contract Drawings.
- G. Polyethylene Encasement: Furnished and installed for the protection of Ductile and Cast Iron pipes, fittings, valves and appurtenance if specified on the drawings or the provisions of the Project Manual in accordance with the requirements of ANSIA 21.5 (AWWA C-105).
- H. Pipe Sleeve: Use Schedule 10 Black Steel Pipe in concrete walls and floorings.
- I. Fire Seal: Use approved fire seal in all Fire rated wall on and flooring penetration shown in Section 07840 - FIRE STOPPING of the Project Manual.
- J. Sealant: Use approved sealant in all other wall and flooring penetration as shown in Section 07920 - CAULKING AND SEALANT of the Project Manual.

*2.2 CONCRETE MATERIALS

- A. Required for Catch Basins: Concrete having a compressive strength of 3250 psi at 28 days as per Section 303 of the SSPWC and in Section 033000 - CAST-IN-PLACE CONCRETE of the Project Manual.

*2.3 CATCH BASIN GRATE AND FRAME

Alhambra Foundry Ltd., Alhambra, California, No. A-2012 Standard Heavy Weight Traffic Cast Iron (square or rectangular grate and frame), size as indicated on the Contract Drawings, or equal.

2.5 MISCELLANEOUS MATERIALS (As Applicable)

- A. Miscellaneous Metals: See Section 05 50 00 - METAL FABRICATIONS of the Project Manual.
- B. Grout: See Section 033000 - CAST-IN-PLACE CONCRETE of the Project Manual.
- C. Mortar: Comply with requirements of ASTM C270 - SPECIFICATION FOR MORTAR FOR UNIT MASONRY, Type "M" except the maximum placement time shall be one hour. No mortar shall be used which has begun to set; retempering not permitted.
- D. Pipe Bedding and Backfill Materials: See Sub-Section 3.3 hereinafter, Section 02310-EARTHWORK of SSPWC and other Sections of the Project Manual.

- 1. Sand shall be graded as follow:

<u>Sieve size</u>	<u>Percentage Passing Sieves</u>
3/8"	100%

No. 4	60-100%
No. 8	65 - 90%
No. 16	45 - 70%
No. 30	25 - 45%
No. 50	10 - 20%
No. 100	2 - 8%
No. 200	0 - 4%
No. 220	0 - 3%

2. Concrete shall be in accordance with the Los Angeles City Bureau of Engineering Standard Plan S-251, latest edition.

PART THREE - EXECUTION

3.1 SURFACE CONDITIONS

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completions of the Work. Do not proceed until detrimental conditions are corrected as directed by the City Engineer or the Consultant.

3.2 EXCAVATING AND TRENCHING

A. General:

1. Conform to the requirements as specified on the drawings, Los Angeles City Plumbing Code, Standard Specifications for Public Works Construction and other sections of the Project Manual. Case 1 Bedding installation of Los Angeles City Bureau of Engineering Standard Plan S-251, latest edition shall be used for all piping laying. Any piping with 8 feet or more cover or backfill, trench width shall not exceed the maximum allowable trench width as shown in Standard Plan S-251.
2. Excavate trenches to provide for a minimum 4-inch thickness of bedding sand below bottom of pipe couplings. There shall be a minimum side clearance of 6 inches on each side.

*B. Provide excavation and trenches for storm drain piping systems, concrete catch basins indicated on the Contract Drawings in accordance with applicable requirements specified in Section 023100 - EARTHWORK.

3.3 STORM DRAIN SYSTEM CONSTRUCTION

- A. General: In strict accordance with pipe manufacturers recommendations and the Los Angeles City Plumbing Code and the SSPWC.
- B. Installation of Pipe: In accordance with Sec. 306-1.2 INSTALLATION OF PIPE of the SSPWS on unyielding bedding foundations with uniform bearing under full length of pipe barrels; walking on or disturbing pipe in any manner after joints have been made, not permitted; at close of each day's work or whenever work is stopped for any reason,

protect ends of pipe with temporary tight fitting closures. Slope as per Contract Drawings.

- C. Seal all wall and flooring penetrations and sleeves with applicable fire stopping or sealant material. Obtain inspection prior to wall closure or trench backfill.
- D. Bedding:
 - 1. Provide for a minimum 4-inch thickness of bedding sand below bottom of pipe barrels; any over-excavations may require concrete pipe bedding and to be filled with slurry backfill or structural backfill in accordance with Standard Plan S-251, latest edition, at Contractor's expense; bedding sand to be tamped and compacted and accurately graded and shaped to support bottom quadrant of pipe, with coupling holes dug prior to placement of pipe.
 - 2. Backfill: Provide sand backfill to an elevation of 12 inches over the top of the pipe and floor in accordance with Section 306-1.3.3 – WATER DENSIFIED BACKFILL. Use clean earth material for remainder of backfill to required finish grade and compact for yard paving.
- E. Pipe Juncture With Concrete Structures: Set pipe ends as necessary for casting-in-place or grouting-in-place after construction of such structures. Junctures with existing storm drain channels to be in accordance with the standards and specifications of the Los Angeles County Flood Control District.
- F. Fill Joints: (Other than wedge-lock type) with mortar troweled smooth on inside of pipe; keep mortar joints damp until backfill is placed.
- G. Pipe Juncture With Concrete Structures: Set pipe ends as necessary for casting-in-place or grouting-in-place after construction of such structures.
- H. Pipe Joints of Corrugated Pipe: Field jointing shall conform to provisions of Section 306-1.2.7 - FIELD JOINTING OF CORRUGATED METAL PIPE of the SSPWC. Provide prefabricated turns and bends on change in direction, joints to meet job needs.

*3.4 CONCRETE STRUCTURES

- A. General: Catch basins, etc. as indicated on the Contract Drawings.
- B. Materials:
 - 1. Concrete: As specified in Sections 03 30 00 CAST-IN-PLACE CONCRETE.
 - 2. Grates, Frames and Covers
- C. Construction: As indicated on the Drawings and specified in Section 033000 - CAST-IN-PLACE CONCRETE.
- D. Catch Basins: Section 303-1- CONCRETE STRUCTURE and 303-1.4.4(b) - STANDARD CATCH BASIN of the SSPWC as applicable. Forms to be of 1-inch minimum thick plywood; remove forms minimum 24-hours after concrete pour; top surface of catch basins to conform to drawing details or paving grades and as directed by

the City Engineer or the Consultant; steel trowel finish and lightly brushed with bristle brush all exposed surfaces; gratings and frames to be set flush and level with top surface of basin or as otherwise indicated on the Contract Drawings.

- E. Maintenance Holes: Construct at location and to elevations indicated on the Contract Drawings, in accordance with details and materials noted thereon; set precast concrete segments with full mortar joints troweled smooth on interior of manhole; set cover frames in full mortar bed and accurately to meet paving grades.

*3.5 BACKFILL

- A. As specified in "Sand and Backfill" subsections of Sections 02 31 00 - EARTHWORK and provisions herein, including approval, place approved washed sand 12-inches above top of pipe and the balance of backfill shall be approved clean earth material free from rock or large clods larger than 1-inch in size. If excavated material is unsuitable or rejected; Contractor shall provide approved imported materials as necessary to complete the work.
- B. No backfill material shall be deposited against the concrete structure until the concrete has developed not less than the specified 28 - day compressive strength.

3.6 DISSIPATORS

- A. Not Applicable

*3.7 STREET WORK

- A. Not Applicable

*3.8 TESTING (As Applicable)

- A. Required: Provide personnel and equipment necessary, and perform tests required to demonstrate that the work of this Section has been completed in accordance with the specified requirements.
- B. Hydrostatic Test on Watertight Joints:
 1. Make a hydrostatic test on each watertight joint. Test one sample of each type watertight joint used. If one sample fails because of faulty workmanship, test an additional joint.
 2. Make tests in concrete pipe and clay pipe at an internal hydrostatic pressure of 10 psi for 24-hours.
 3. Replace or repair joints found to be faulty. Repeat the test and repair cycle until joints are demonstrated to meet the specified requirements.

END OF SECTION

SECTION 48 14 00

PHOTOVOLTATIC SOLAR ENERGY COLLECTION

PART 1 -GENERAL

1 .01 DESCRIPTION: Division 1 applies to this Section. Provide solar electric photovoltaic system, complete as shown and specified.

A. Work Specified in this Section:

1. Solar roof panels
2. Terminal and combiner boxes
3. Solar array DC disconnect switch
4. DC to AC inverter
5. Isolation transformer
6. AC disconnect switch
7. Data and acquisition monitoring system

B. Related Work Specified Elsewhere:

1. Roof Deck System.
2. Wiring and conduits from solar roof panels to the Solar Electric System Balance of System equipment.
3. Utility interface and utility-required equipment

1.02 DEFINITIONS

A. Abbreviations used in this section have the following meanings:

AC	Alternating current
DAS	Data acquisition and monitoring system
DC	Direct Current
deg. or °	Degree
kW	Kilowatt
kwh	Kilowatt hour
%	percent
PV	Photovoltaic
V	Volt
W	Watt

1.03 DESCRIPTION OF SYSTEM:

- A. The system includes Installation of a DC utility grid connected PV system. Provide engineering, design, sizing and installation, including insulation, connectors, electric panels and breakers necessary to install an operational system as specified hereinafter.
- B. Provide upgrades and modifications to the Owner's existing main electrical panel, as

required to accommodate the PV system.

- C. The system shall be a crystalline thin film panel PV system mounted directly on the roofing specified in Section 07 22 00 – Roof Deck Systems.
- D. The system shall consist of an array of PV modules, mounting structure, terminal and combiner boxes, quick-connect electrical connectors, DC wiring, DC disconnect, circuit breakers, grid-connected inverter, AC disconnect, AC wiring, DAS and isolation transformer.
- E. The system shall be arranged to interconnect with the facility's existing electric system, and shall default to go offline during a utility power outage and automatically return on line when utility power is restored.
- F. Verify that the existing facility electric panel can support the installation of the PV system, and upgrade the panel as required.
- G. Seismic and Wind: The completed system shall meet requirements for FM 1-90 wind resistance.
- H. The completed system shall comply with requirements for a Type A fault, soil type SD, with a safety factor of 1.5.
- I. Provide a DAS as specified hereafter
- J. System commissioning of installed photovoltaic array as specified hereafter, and as required to meet requirements of utility and state loan and rebate programs.

1.04 QUALITY ASSURANCE

- A. System Compatibility: The PV specified herein, the single ply roofing specified in Section 07 23 00.
- B. Manufacturer: Company specializing in manufacture of solar electric photovoltaic systems with a minimum of 5 continuous years of documented experience, and having successfully completed not fewer than 5 local projects.
- C. Installer: Company with a minimum of 5 years documented experience in the installation of solar electric photovoltaic system, trained and certified by solar electric photovoltaic system manufacturer, and capable of showing not less than 5 satisfactory, local installations.
- D. The photovoltaic modules shall be certified by Underwriter Laboratories (UL), and shall conform to UL Standard 1703 Standard for Safety for Flat-Plate Photovoltaic Modules and IEEE Standard 1262, Recommended Practice for Qualification of Photovoltaic (PV) Modules and Panels. The system shall be comprised of UL listed components in cases where a UL listed components is available.
- E. Photovoltaic modules shall be tested in the factory for design performance.
- F. Inverters shall be factory tested for performance.
- G. The installation shall conform to Title 24 requirements for roof and equipment access.

- H. Compliance with Regulatory Requirements: The installation of solar panels and electrical components shall be performed in compliance with IEEE 928, IEEE 929, IEEE 1374, IEC 1277, NFPA 70 Article 690 and 705, the National Electrical Safety Code, Occupational Safety and Health Administration (OSHA) regulations, International Building Code (IBC), Title 24, and local requirements.
- I. Environmental Impact Characteristics: The system shall qualify for Leadership in Energy and Environmental Design (LEED) credit category EA 2.2 (10 percent annual electrical energy cost supplied by solar sources).
- J. Pre-Installation Meeting: After approval of submittals but prior to beginning installation of work of this Section, conduct a meeting at the site attended by Architect, Contractor, installers of roof panel system and related electrical work to be installed with the system, to describe in detail the installation process and to establish agreement, coordination, safety and responsibilities. Prepare a detailed report of this meeting and furnish copies to the Architect and all attendees.

1.05 SUBMITTALS

- A. Product Data: Submit for product data sheets for all components of the system, including the following:
 - 1. Solar roof panels, describing physical characteristics, sizes, patterns, and method of installation.
 - 2. Combiner boxes,
 - 3. Inverter
 - 4. Transformer
 - 5. Roof attachment clips.
 - 6. KWH Meter and Logger
- B. Shop Drawings: Submit complete shop drawings showing plans, sections, elevations and details.
 - 1. Roof plan with panel layout
 - 2. Mounting system design showing details of the roof/PV system interface.
 - 3. Include locations and types of connectors of solar panels to single ply roofing.
 - 4. Show all roof structures and screens, dimensioned for size and location.
 - 5. Provide site plans and elevations showing all adjoining shading structures, including trees, adjacent buildings and structures. indicate location, height, and type of structure.
 - 6. Electrical single line diagram. Indicate system layout and required connections to the Owner's electrical system.

7. Transformers, showing performance data and evidence of factory tests in accordance with ANSI Test Code C57.12.91 for Dry Type Transformer.
8. Electrical equipment room layout drawing to scale.

C. Manufacturer's Experience Record: Submit evidence showing satisfactory experience over a period of 5 years, together with not less than 5 local projects furnished over a period of not less than 5 years. Include contact names and phone numbers.

D. Installer's Experience Record: Submit certification from manufacturer of PV system that installer is trained and authorized to install the system, and has satisfactorily completed not fewer than 5 local installations within the last 5 years.

E. Test Reports: Provide the following:

1. Reports of factory tests of design performance of photovoltaic modules.
2. Reports of factory tests for performance of inverters.

F. Calculations:

1. Submit calculations showing that the existing panel will support the loads imposed by the PV system, and if required, show modifications to existing equipment.
2. Submit engineering calculations for system design and performance, and for resistance to wind and seismic loads. Calculations shall be signed by a professional engineer licensed in the State of California.
3. Submit array calculations including string design, string amperage, array amperage, and DC voltage.

G. Installation Instructions: Submit manufacturer's detailed installation manual.

H. Code Approvals: Submit evidence indicating compliance with state and local building codes and per the LEED v.4 rating system.

I. Closeout Submittals:

1. Record Drawings: Provide complete drawings showing dimensioned locations of panels, combiner boxes, disconnect switches and isolation transformer. Provide complete wiring and circuit diagrams, and conduit layout. Show electrical equipment including installation profiles. Provide record drawings of electrical equipment enclosure.
2. Start Up: Provide complete system start-up data sheets and start-up procedure checklists.
3. Operations and Maintenance Manual. Furnish complete operation and maintenance manuals to the Owner at time of system startup. Include manufacturer's recommended cleaning and maintenance data. Include

maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.06 DELIVERY, STORAGE AND HANDLING:

- A. PV panels shall be stored in an ambient temperature of 40' F to 80' F. Panels shall be delivered to the site in the original unopened containers or wrappings. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture. Leave protective packaging in place until panels are installed. Panels shall be handled so that the solar modules are not creased or bent and panels shall not be coiled tighter than 18 inches in diameter.

1.07 PROJECT SITE CONDITIONS

- A. Coordination: The installation of solar PV membrane roofing system requires close coordination between the work of installation of the basic roofing system, the electrical conduits connecting the various components, the installation of the panels and their connections, and the wiring and connections to the combiner boxes, DC disconnect, inverters, AC disconnect and isolation transformer.

1.08 SYSTEM STARTUP

- A. Furnish the services of a trained representative of the solar panel manufacturer to instruct the Owner's personnel in operation and routine maintenance of the solar panel system for a period of not less than one day at a time directed by Owner.

1.09 WARRANTIES

- A. Provide PV panel manufacturer's written 20 year warranty on solar panels against all defects in materials or workmanship for 20 years, covering power output of panels, exposed wiring against UV degradation. Power output not exceed a 20% drop in output at the end of 20 years. The output shall allow for an annual degradation of one percent. If the system does not meet the performance criteria, Contractor shall perform modifications to the system to increase the output to specified criteria.
- B. Provide installer's warranty against defects in workmanship for 3 years.
- C. The first true-up shall occur after two complete years of system performance, and shall occur every year afterwards, through the five years guarantee period.
- D. If the system does not meet the performance criteria during any true-up period, the Contractor shall do what is necessary to modify the system so that in all future years the Owner receives the benefit of the kW AC for the life of the system.
- E. The only criteria that will be considered in determining system performance shall be annual kW AC output measured by the onsite Electric Meter included as part of the DAS

PART 2 -MATERIALS

2.01 ACCEPTABLE MANUFACTURER: Unisolar

2.02 GENERAL

- A. Exterior materials shall be sunlight and UV resistant, and shall be designed to withstand the temperatures to which they are exposed.
- B. Dissimilar materials should be Isolated from one another using non-conductive shims, washers, or other approved methods.
- C. Metals shall be hot dipped galvanized steel or anodized aluminum.
- D. Aluminum shall not be placed in direct contact with concrete materials.
- E. Fasteners shall be stainless steel
- F. Electrical conduits shall be galvanized and unpainted
- G. Structural members shall be corrosion resistant aluminum, Alloy 6061 or 6063.
- H. Electrical equipment shall be rated for the current and voltage rating necessary for the application.
- I. Over-current protection devices shall be provided with trip ratings no greater than the de-rated amperage for the conductor it protects.

2.03 PV PANELS: Photovoltaic modules shall be Unisolar Model PVL 136, listed as CEC eligible equipment, and qualifying for state and utility loan and rebate programs.

2.04 INVERTER

- A. The inverter shall be manufactured by Xantrex, or equal, rated at 10% greater than the PV systems AC output. The inverter shall be sized so that it can operate the PV array at maximum power for the coldest and hottest expected array operating temperatures and irradiance levels up to 1,100 watts/m².
- B. The inverter shall be on the CEC eligible equipment list, and qualify for utility and state rebate and loan programs.
- C. The inverter shall include:
 - 1. Automatic operation includes start-up, shut-down, self-diagnosis, and fault detection.
 - 2. Digital Signal Processor (DSP) based controls with self-diagnosis and LCD for display or operating status.
 - 3. Inverter shut off and reset switch.

4. Over- and under- voltage and frequency protection, shutting down the inverter in compliance with ULI 741.
5. Anti-islanding protection to prevent back-feeding inverter-generated power to the grid in the event of a utility outage.
6. User definable power tracking, matching the inverter to the array, as well as adjustable delay periods to customize system shut-down sequences.
7. Continuous power rating that exceeds the PV array output.

D. Physical and Electrical Characteristics

1. 208 Volts, three phase AC +1-10%
2. Nominal AC frequency of 60HZ, +/-0.5 HZ
3. Line Power Factor greater than 0.99 at and above 20% of rated power
4. AC current distortion at rated power shall be less than 5% THD.
5. Maximum open circuit voltage shall be 600V.
6. Maximum efficiency shall be greater than 95%.
7. Standby tare losses shall be 30 watts or less
8. Ambient temperature rating shall be from minus 4F to 122F.
9. Enclosure shall have an environmental rating of NEMA 3R
10. Non-condensing relative humidity rating from zero to 95%
11. AC disconnects -NEMA 3R rated wall mount enclosure; load break rated.
12. DC disconnects -NEMA rated wall mount enclosure: 600 VDC load break rated.

2.05 TRANSFORMERS

- A. Provide dry type, enclosed and ventilated transformers as indicated herein. Transformer shall be Acme Transformer, or as indicated on approved submittals.
- B. Transformers shall be designed for indoor use.
- C. Each transformer shall incorporate an electrostatic shield for the attenuation of voltage spikes, line noise, and transients.
- D. Each transformer shall terminate in copper bus bar.
- E. Transformer shall be designed, constructed and rated in accordance with UL, CSA, NEMA, ANSI, IEEE, and OSI-IA standards.
- F. Transformers shall be the ventilated type, incorporating a 220 degree C insulation system and designed not to exceeded 11 5 degree C temperature rise above a 40 degree C ambient under full load conditions- In addition, the transformer shall have the ability to carry continuous 15% overload without exceeding a 150 degree C rise above ambient.
- G. Transformer enclosure finished shall be ASA 61 grey, or other pre-approved color, powder

polyurethane paint. Transformer enclosure temperature shall not exceed 50 degrees C plus. The ambient under any condition of loading at any specified temperature rise at or below 150 degrees C.

- H. Transformer enclosures shall be ULINEMA Type 2 and UL 3R listen with the addition of a weather shield and shall be so marked on the Transformer.
- I. Transformers shall incorporate vibration isolation pads in their construction located between the transformer core and coil assembly and the transformer case. External vibration isolation pads shall not be used as they tend to increase audible noise. Transformers shall be floor mounted on a concrete pad. All connections to the transformers shall be made by means of flexible metallic conduit.
- J. Transformer enclosures shall be grounded per the National Electric Code.
- K. Transformers shall be 208 volts, three phases, 60 hertz primary; and 480, three phase, 89 hertz secondary, and shall be designed to be compatible with the existing facility electrical distribution. KVA rating shall exceed the AC output of each system. Contractor to provide all necessary lugs for all transformers.

PART 3 -INSTALLATION

3.01 GENERAL

- A. The installation shall be completed without affecting existing piping and/or wires.
- B. The installation shall be completed with a minimum of impact on the environment.
- C. System installation shall conform to manufacturer's installation recommendations as approved.
- D. Electrical connections and terminations shall be fully tightened, secured, and strain relieved as appropriate.
- E. Mounting equipment shall be installed to the manufacturer's specifications. All cables, conduit, exposed conductors, and electrical boxes should be secured and supported according to code requirements.
- F. Conform to national and local electric and California Building Code requirements.
- G. Conform to environmental regulations.
- H. Obtain and pay for required permits.
- I. Power to emergency circuits shall not be interrupted for more than 20 minutes and, unless otherwise permitted, shall occur on a Sunday. Power to other circuits shall not be interrupted for more than 2 hours and shall only occur between 7:00 PM and 5:00 AM

weekdays or anytime on weekends. Provide a minimum of 48 hours notice to Owner prior to any shutdown.

- J. All series connected strings & modules shall include a series fuse as required by UL and NEC to prevent wiring to other system components. Parallel connections of module in individual source circuits are not permitted. Parallel connected cells within individual modules are allowable as long as the module listing allows for the series fuse required for this configuration.
- K. System switching and metering equipment shall have convenient access for resetting or repair during electrical outages, and regular monitoring for data retrieval.
- L. Hose-bib installation: Coordinate the installation of one hose bib on the roof to facilitate future PV Panel cleaning. Hose bibs shall be commercial grade with water key for locking. Hose bib shall not be visible from ground level.
- M. Electrical equipment shall be installed at the locations as indicated. The installation meets structural and seismic requirements. Electrical equipment shall be installed on a concrete pad. The size of the pad shall be as indicated or as determined by the final approved electrical equipment layout with a 1 foot extension on the sides and a four foot extension in the front.
- N. The electrical equipment shall be protected from weather.

3.02 SYSTEM ELECTRICAL

- A. Electrical construction shall meet all National Electric Code and California Electrical Code.
- B. The modules shall be interconnected using cable assemblies. The pigtailed shall be quick-connect electrical wiring connections rated for the application.
- C. Wiring shall be listed for a minimum operation of 600 volts and temperature rating of 90 degrees C in wet locations. All current carrying conductors shall be enclosed in conduit excluding module interconnections and connections from individual module strings to the combiner boxes.
- D. Each system shall have at least one terminal box, providing a watertight entry to the conduit leading to the combiner box. The terminal box and combiner box can be one physical unit.
- E. Each system shall have a combiner box, containing fuses and a bus to combine the outputs of the strings as indicated on the drawings.
- F. Each system shall have at least one inverter. Inverter installation shall meet applicable UL 1741, IEEE Standard 929-2000 and standard 51.9, NEC codes, and the latest applicable ANSI and FCC standards and addenda.
- G. An isolation transformer shall be part of each system for interfacing to each buildings electrical system.
- H. The installation shall be completed with a minimum of impact on the environment.

- I. System installation shall conform to Manufacturer's installation manual and approved project drawings and specifications.

3.03 MONITORING AND DATA ACQUISITION SYSTEM:

- A. DAS shall be provided as part of the system. The DAS shall include instrumentation that allows the measurement of:

1. Ambient temperature
2. PV panel temperature
3. Wind speed
4. Horizontal surface solar irradiation
5. DC system voltage
6. DC system current
7. AC system power output measures at the output of the isolation transformer

- B. The DAS shall capture and store data on 15 minute intervals.

- C. The DAS shall include a data-logger, modem for data retrieval (minimum requirement), NEMA 4 enclosure, dry bulb temperature measuring device with a radiation shield, anemometer, and solar sensor.

- D. All measurement equipment shall be revenue grade.

- E. Data shall be downloaded to the system manufacturer's computer system at increments of no more than 15 minutes, and downloads shall take place at minimum on an hourly basis.

- F. Data shall be capable of retrieval by the Owner at any time via web browser or dial modem download. This capability shall be ongoing for the life of the system.

- G. Real-Time display and historical charting shall provide the following information. This information can be viewed via the Internet for a minimum of 12 months from system start up. Utilize a regression to establish the system rating at PV-USA Test Conditions as the basis for projecting system output.

1. Instantaneous system output in kW.
2. Instantaneous and year to date irradiation in watts/square meter
3. Instantaneous ambient temperature in degrees Fahrenheit.
4. Instantaneous wind speed.
5. Daily system output in kWh: Any day and day to hour.
6. Monthly system output in kWh: Any month and month to date.
7. Annual system output in kWh: Any year and year to date.
8. Graphical comparison of protected system output to actual output daily for any

specified day.

9. Graphical and tabular display & historical output data including predicted output calculated by the regression analysis.
10. Instantaneous array temperature data is not part of the real-time display, but array temperature can be included in the graphs.

3.04 SYSTEM START-UP

- A. System Output Measurement: Establish the initial system output to prove that the system is performing as designed, and to establish a baseline for long term performance. The system output shall be verified after construction of the system has been completed, on a clear, sunny day.
1. Prior to inverter startup, voltages shall be recorded for each string, each sub-array, and the entire array. Measurements shall be recorded and provided to the Owner in a clear, tabular format. Each voltage measurement shall include the following ancillary data: the date, the time of day that the measurement was taken; a sample panel temperature at the time; the dry-bulb temperature at the time; and the solar irradiation at the time. The strings that make up each sub-array shall be clearly identified on a drawing by number
 2. After inverter startup, current shall be recorded for each string, each sub-array, and the entire array. Measurements shall be recorded and provided to the Owner in a clear, tabular format. Each voltage measurement shall include the following ancillary data: the date; the time of day that the measurement was taken; a sample panel temperature at the time; the dry-bulb temperature at the time; and the solar irradiation at the time. The strings that make up each sub-array shall be clearly identified on a drawing by number.
 3. Each module shall be factory flash tested using Standard Test Conditions (STC) to establish the performance of each PV module.
 4. Field collected data shall be recorded and submitted to the Owner.
- B. Start-up shall be in accordance with the various component manufacturers' recommendations as approved.
- C. On-site training: Provide not less than 2 on-site training sessions at times directed by Owner. One session shall be for the entire facility staff focusing on safety. The second training shall be for facility maintenance staff and shall focus on maintenance and safety.

- 3.05 PROJECT COMPLETION: Clean all equipment and PV panels. Clean all work areas, remove and dispose of debris.

END OF SECTION

Discovery Cube Los Angeles Courtyard Improvement Project

MITIGATION MONITORING AND REPORTING PROGRAM



Prepared For:

City of Los Angeles
Department of Recreation and Parks
221 North Figueroa Street, Room 400
Los Angeles, California 90012



MITIGATION MONITORING AND REPORTING PROGRAM

Public Resources Code, Section 21081.6 (Assembly Bill 3180) requires that mitigation measures identified in environmental review documents prepared in accordance with California Environmental Quality Act (CEQA) are implemented after a project is approved. Therefore, this Mitigation Monitoring and Reporting Program (MMRP) has been prepared to ensure compliance with the adopted mitigation measures during the Discovery Cube Los Angeles Courtyard Improvement (Project). The City of Los Angeles is the agency responsible for implementation of the mitigation measures identified in the Initial Study/Mitigated Negative Declaration.

This MMRP provides the City of Los Angeles with a convenient mechanism for quickly reviewing all the mitigation measures including the ability to focus on select information such as timing. The MMRP includes the following information for each mitigation measure:

- The phase of the project during which the required mitigation measure must be implemented;
- The phase of the project during which the required mitigation measure must be monitored; and
- The monitoring agency.

The MMRP includes a checklist to be used during the mitigation monitoring period. The checklist will verify the name of the monitor, the date of the monitoring activity, and any related remarks for each mitigation measure.

MITIGATION MONITORING AND REPORTING PROGRAM					
Mitigation Measure	Implementation Phase	Monitoring Phase	Monitoring Agency	Compliance Verification	
				Initial	Date
<p>BIO-1: Nesting Birds – Project activities that will remove or disturb potential nest sites will be scheduled outside the breeding bird nesting season. The breeding bird nesting season typically extends from February 15 through September 15.</p> <p>If Project activities cannot be avoided during February 15 through September 15, a qualified biologist will conduct a pre-construction breeding bird survey for breeding birds and active nests or potential nesting sites within the limits of Project disturbance. The survey will be conducted at least seven days prior to the onset of scheduled activities, such as mobilization and staging. It will end no more than three days prior to vegetation, substrate, and structure removal and/or disturbance.</p> <p>If no breeding birds or active nests are observed during the pre-construction survey or they are observed and will not be impacted, Project activities may begin, and no further mitigation will be required.</p>	Phase 1 Pre-Construction; Construction	Phase 1 Pre-Construction; Construction	City of Los Angeles		

MITIGATION MONITORING AND REPORTING PROGRAM					
Mitigation Measure	Implementation Phase	Monitoring Phase	Monitoring Agency	Compliance Verification	
				Initial	Date
<p>If a breeding bird territory or an active bird nest is located during the pre-construction survey and will potentially be impacted, the site will be mapped on engineering drawings and a no activity buffer zone will be marked (fencing, stakes, flagging, orange snow fencing, etc.) a minimum of 100 feet in all directions or 500 feet in all directions for listed bird species and all raptors. The biologist will determine the appropriate buffer size based on the type of activities planned near the nest and the type of bird that created the nest. Some bird species are more tolerant than others of noise and activities occurring near their nest. This no-activity buffer zone will not be disturbed until a qualified biologist has determined that the nest is inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, or the young will no longer be impacted by Project activities. Periodic monitoring by a biologist will be performed to determine when nesting is complete. Once the nesting cycle has finished, Project activities may begin within the buffer zone.</p> <p>If listed bird species are observed within the Project site during the pre-construction survey, the biologist will immediately map the area and notify the appropriate resource agency to determine suitable protection measures and/or mitigation measures and to determine if additional surveys or focused protocol surveys are necessary. Project activities may begin within the area only when concurrence is received from the appropriate resource agency.</p> <p>Birds or their active nests will not be disturbed, captured, handled, or moved. Active nests cannot be removed or disturbed; however, nests can be removed or disturbed if determined inactive by a qualified biologist.</p>					
<p>CUL-1: Environmental Training: prior to construction of the Project, the Project owner shall retain a qualified archaeologist that meets the Secretary of Interior qualifcators for archaeology. The archaeologist will prepare an Inadvertent Discovery Plan that will provide a cultural resource briefing that includes all applicable laws and penalties pertaining to disturbing cultural resources, a brief discussion of the prehistoric and historic regional context and archaeological sensitivity of the area, types of cultural resources found in the area, instruction that Project workers will halt construction if a</p>	Phase 2 Pre-Construction; Construction	Phase 2 Pre-Construction; Construction	City of Los Angeles		

MITIGATION MONITORING AND REPORTING PROGRAM					
Mitigation Measure	Implementation Phase	Monitoring Phase	Monitoring Agency	Compliance Verification	
				Initial	Date
<p>cultural resource is inadvertently discovered during construction, and procedures to follow in the event an inadvertent discovery is encountered, including appropriate treatment and respectful behavior of a discovery (e.g., no posting to social media or photographs). The archaeologist will present the initial cultural resource environmental training to all Project construction personnel and a handout identifying the key points will be provided. If requested, a local tribal representative(s) shall be invited to participate in the environmental training to discuss or provide text from a tribal cultural perspective regarding the cultural resources within the region.</p>					
<p>CUL-2: Inadvertent Discovery of Archaeological Resources During Construction – The Project owner shall retain a qualified archaeologist that meets the Secretary of Interior qualifcators for archaeology. The archaeologist will prepare an Inadvertent Discovery Plan for the Project that will outline procedures and contacts for an inadvertent discovery. In general, during Project-level construction, should subsurface archaeological resources be discovered, all activity 100 feet of a “find” shall stop and the qualified archaeologist shall be contacted to assess the significance of the find according to CEQA Guidelines Section 15064.5 and/or National Register of Historic Places criteria (as applicable). The archaeologist shall have the authority to halt any Project-related construction activities that could impact potentially significant resources. If any find is determined to be significant, the archaeologist shall determine, in consultation with the implementing agencies and any local Native American groups expressing interest, appropriate avoidance measures or other appropriate mitigation. Ground-disturbing activities shall not continue until the discovery has been assessed by the archaeologist. The archaeologist shall be afforded the necessary time to assess the find. With monitoring, construction activities may continue on other areas of the Project site during evaluation and treatment of historic or unique archaeological resources. Under CEQA Guidelines Section 15126.4(b)(3), preservation in place is the preferred means to avoid impacts to archaeological resources qualifying as historical resources. Methods of avoidance may include, but shall not be limited to, (i) Project re-</p>	<p>Phase 2 Construction</p>	<p>Phase 2 Construction</p>	<p>City of Los Angeles</p>		

MITIGATION MONITORING AND REPORTING PROGRAM					
Mitigation Measure	Implementation Phase	Monitoring Phase	Monitoring Agency	Compliance Verification	
				Initial	Date
route or re-design, (ii) Project cancellation, or (iii) identification of protection measures such as capping or fencing. Consistent with CEQA Guidelines Section 15126.4(b)(3)(C), if it is demonstrated that resources cannot be avoided, the qualified archaeologist shall develop additional treatment measures, such as data recovery or other appropriate measures, in consultation with the implementing agency and any local Native American representatives expressing interest in prehistoric or tribal resources. If an archaeological site does not qualify as an historical resource but meets the criteria for a unique archaeological resource as defined in Section 21083.2, then the site shall be treated in accordance with the provisions of Section 21083.2.					
GEO-1: Inadvertent Discoveries of Paleontological Resources – Inadvertent Discoveries of Paleontological Resources — If the construction staff or others observe previously unidentified paleontological resources during ground disturbing activities, they will halt work within a 200-foot radius of the find(s), delineate the area of the find with flagging tape or rope (may also include dirt spoils from the find area), and immediately notify a qualified Paleontologist. Construction will halt within the flagged or roped-off area. The Paleontologist will assess the resource as soon as possible and determine appropriate next steps in coordination with the City. Such finds will be formally recorded and evaluated. The resource will be protected from further disturbance or looting pending evaluation.	Phase 2 Construction	Phase 2 Construction	City of Los Angeles		



Discovery Cube

