

Project Name: UNIVERSITY OF CALIFORNIA, MERCED
CENTRAL PLANT/TELECOMMUNICATIONS RELIABILITY UPGRADE
Project No.: 900310

ADDENDUM NO. 3
to the
CONTRACT DOCUMENTS
September 25, 2014

Bids Due
September 30, 2014

- I. Bidder acknowledges that it is the Bidder's responsibility to ascertain whether any Addenda have been issued and if so, to obtain copies of such Addenda. Bidder therefore agrees to be bound by all Addenda that have been issued for this bid.

This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents. The following changes, additions, or deletions shall be made to the following documents as indicated and all other Contract Documents shall remain the same.

II. CLARIFICATIONS

- A. PRE-BID QUESTIONS – Questions received from bidders and responses are as follows:
1. Q. Is there secure staging area for fabricated materials? If so what size and where?
A. See Exhibit F for Material Laydown Yard. Area will be fenced.
 2. Q. BP2 - Sawcutting: Exhibit A - Scope of Work does not list new penetrations for 4 ea 10" equalizers through the roof shown on CP-M-212B. Are these openings existing?
A. These are new penetrations.
 3. Q. BP2 - Sawcutting: Sawcutting shown on EP-S-215F is dimensioned at 17'0", however new piping shown on EP-P-211F ties into Sump #4. Please clarify extent of demo.
A. Sawcutting needs to extend to sump #4.
 4. Q. BP2 - Sawcutting: There is an existing slab within the limits of the generator yard that is not shown on the drawings. Is this slab to be removed? Please provide dimensions and thickness of slab. Please verify if there are footings to be removed as well.
A. Existing slab thickness and reinforcing is unknown. Detail 1/EP-S-201F has been updated to indicate that the basis of bid shall be a 6" slab reinforced with #4 @12" o.c. each way at mid-depth. No footing removal is required in order to remove this 6" slab. For bidding purposes, assume the existing pad area is 10-feet by 20-feet.
 5. Q. BP3 – Concrete & Rebar: EP-S-201F shows an area of an existing slab that is being saw cut and patched back. Note states to provide rebar dowels to match existing slab. What is the size of existing rebar dowels and what is the spacing of existing rebar?
A. Existing slab reinforcing is unknown. Detail 1/EP-S-201F has been updated to indicate that the basis of bid shall be a 6" slab reinforced with #4 @12" o.c. each way at mid-depth.

6. Q. BP3 – Concrete & Rebar: Concrete Reinforcement note #12/EP-S-001 requires that rebar running through structural steel is to be welded to structural elements. Does this requirement apply to detail 7/EP-S-501? Welded studs are already present on this detail and it is unclear if rebar is making contact with the steel.
 - A. The note on #12/EP-S-001 is not meant to apply to a specifically detailed condition as shown in 7/EP-S-501. No welded rebar is required per detail 7/EP-S-501.
7. Q. BP3 – Concrete & Rebar: 1/EP-S-201F & 17/EP-S-501 both agree that the slab at the new service yard is to be 6" with # 5 rebar on 18" oc. However, nowhere is the required amount of aggregate base or any other slab requirements depicted. Please provide all required elements of the slab required in Bid package #3.
 - A. Subgrade preparation requirements are provided on the civil drawings and in the geotechnical report.
8. Q. BP3 – Concrete & Rebar: WS-E-201 shows a transformer pad & a pad at the diesel tank, please confirm that no new pads are required per this plan sheet. If so please provide appropriate details.
 - A. Confirmed, pads shown are existing.
9. Q. BP4 – Steel & Misc Metals: 4/CP-S-701 Shows an existing column, what is the depth of the web those two members?
 - A. The existing columns are W8x31's per the original construction drawings. Contractor to V.I.F.
10. Q. BP4 – Steel & Misc Metals: 1/CP-S-701 Shows Existing roof trusses what is the depth and spacing of vertical members?
 - A. At the truss ends, the dimension from bottom of the bottom chord to the work-point of the top chord is shown as 4'-3" per the original construction drawings. This dimension is shown as 4'-10" at mid-span of the truss. Contractor to V.I.F
11. Q. BP4 – Steel & Misc Metals: 1/CP-S-701 Shows Existing roof trusses what is the thickness of the L4x4 members that are being welded to?
 - A. The diagonal LL4x4's are called out as 1/2" thick per the original construction drawings. Contractor to V.I.F. Forell
12. Q. BP4 – Steel & Misc Metals: 2/EP-S-201F Shows the deck being puddle welded, would it be permissible to use Hilti pins with an equal connection design?
 - A. Mechanical connectors, including Hilti pins, may be used instead of puddle welds. Mechanical connectors shall be compatible with the deck product and listed in the deck's ICC report for use in resisting diaphragm shear forces.
13. Q. BP4 – Steel & Misc Metals: Please confirm that the steel service yard framing to be hot dipped galvanized. Please provide product of acceptable galvanizing repair coatings.
 - A. Confirmed. Service yard steel is to be hot-dipped galvanized. Repair coating shall conform to ASTM A780 per specifications (05 12 00 Section 2.4.C).
14. Q. BP4 – Steel & Misc Metals: 4,10/EP-A-800 Shows the 1/8" bent plate. It appears to be fastened to the coping cleat. Please show how this item is to be attached to the structure.
 - A. See added weld symbol at detail 4/EP-A-800.

15. Q. BP4 – Steel & Misc Metals: EP-A-800 does not show a cap plate are we to assume a 1/2" cap plate per 16/EP-S-501 at each post and tube end?
- A. A cap plate per 16/EP-S-501 should be provided at each tube. See added cap plate at detail 4/EP-A-800.
16. Q. BP4 – Steel & Misc Metals: 1-3/EP-A-800 shows 3/8" welded studs for the connections of the 20 gauge continuous channels. Would it be permissible to use 3/8" self-drilling self-tapping screws in lieu of the welded studs?
- A. Self tapping screws not permissible, as they would provide only a 2 thread engagement of the HSS, and would, subject to wind loads upon the panels, work loose over time.
17. Q. BP4 – Steel & Misc Metals: 7/EP-A-800 shows vertically welded angles to the HSS columns. Would it be permissible to use a self-drilling self-tapping screws in lieu of the welding?
- A. Self tapping screws not permissible, as they would provide only a 3 thread engagement of the HSS, and would, subject to wind loads upon the transom, work loose over time.
18. Q. BP4 – Steel & Misc Metals: 4/EP-A-201F shows a cross section of the steel structure. The cantilevered beam appears that it could be tapered. Please confirmed that the cantilever beams are not tapered.
- A. Beams are not tapered. See structural framing plan and details.
19. Q. BP4 – Steel & Misc Metals: KN16/CP-M-213B Shows an aluminum stair to be constructed to Cooling tower. The Bid form Central plant item #4 states the stair is to be galvanized steel. Which material is to be provided.
- A. Either material is acceptable. Contractor can choose to include a pre-manufactured aluminum stair, landing, and railing in the configuration shown on the drawing, or choose to include a custom steel stair, landing, and railing.
20. Q. BP4 – Steel & Misc Metals: CP-M-001 Cooling Tower Note 9 states that a new factory access platform is needed at this area around the cooling towers. Who's responsibility is the cooling tower support frame? Framing looks like it is existing per google earth. Please advise.
- A. Note 9 refers to the factory access platform and railing at the top of the cooling tower, which are not part of the metals scope. The access landing at the stair is not a factory component of the cooling tower, and is part of the metals scope. The cooling tower support frame is existing.
21. Q. BP4 – Steel & Misc Metals: CP-M-213B Please provide the structural and flooring details related to the stair connection to the factory access platform. Would an eccentric shear plate connection with slotted holes be a permissible connection?
- A. The access landing at the stair is not a factory component of the cooling tower. Metals subcontractor to provide shop drawings showing connections to existing cooling tower support frame and to roof structure as needed.
22. Q. BP4 – Steel & Misc Metals: CP-M-213B Shows 1 aluminum access ladder being relocated. Please confirm this is not in the Metals Package.
- A. Confirmed.
23. Q. BP4 – Steel & Misc Metals: Would it be permissible to shut down Services lane while hoisting stair?

- A. All street closures will need to be coordinated with Otto Construction to ensure that Campus Operations are not impacted.
24. Q. BP4 – Steel & Misc Metals: Item #13 States that all steel must be shop primed and ready to receive paint. Per AISC code of Standard Practice Subsection 6.5 the shop coat is intended to be temporary coating and typically not part of finish coating system. Will a standard shop primer suffice for this requirement or will the metals sub be responsible for the base coat of the finish painting system?
- A. Standard shop primer will suffice.
25. Q. BP4 – Steel & Misc Metals: There is a new opening at gridlines 10 & E.4 where the duct bank will enter the Central Plant. Will steel reinforcement be required at the new concrete wall opening?
- A. The maximum size opening shall be 2'-6" high by 3'-8" wide. No reinforcing is required for this penetration.
26. Q. BP4 – Steel & Misc Metals: EP-A-800 shows the screen wall framing. The posts are clearly shown but no horizontal members other than the 1/8" bent plate are shown. Please confirm that no horizontal structural members are needed to support the powder coated panels.
- A. Per panel manufacturer information, no additional horizontal members are required.
27. Q. BP4 – Steel & Misc Metals: 8/EP-A-800 shows L2x2 please confirm this is light gauge flashing and not to be provided by the steel package.
- A. Not light gauge material. See revised detail to clarify L2x2x1/8.
28. Q. BP4 – Steel & Misc Metals: 10/EP-A-800 shows a steel C channel referring to Structural drawings. No C Channel is shown on structural drawings. Please advise.
- A. C channel is used. See revised structural and architectural details.
29. Q. BP4 – Steel & Misc Metals: 2/EP-S-201F shows the 20 ga deck puddle welding to the structure. Would it be permissible to shot pin the deck with a pattern that provides an equal engineering value?
- A. Mechanical connectors, including Hilti pins, may used instead of puddle welds. Mechanical connectors shall be compatible with the deck product and listed in the deck's ICC report for use in resisting diaphragm shear forces.
30. Q. BP4 – Steel & Misc Metals: Do the shop drawings for the cooling tower stair need to be stamped by a professional engineer?
- A. The shop drawings for the stair do not need to be stamped by a registered engineer, as long as this is a pre-manufactured "buy-out" item (which is our assumption). On the other hand, if the contractor proposes to use a custom field-fabricated and assembled stair, then stamped drawings are required.
31. Q. BP4 – Steel & Misc Metals: Is the cooling tower stair to be attached to the existing framing?
- A. Yes, landing and stairs to be rigidly attached to existing cooling tower support frame and to roof structure as needed. Contractor to provide shop drawings prior to fabrication.
32. Q. BP4 – Steel & Misc Metals: Is there any tread, stringer or non-slip material requirement for the cooling tower stair?

- A. Provide OSHA compliant non-slip metal grated landing and stair tread surfaces. Limit stair rise to 8" maximum between treads.
33. Q. BP4 – Steel & Misc Metals: Will blocking for stair attachment to the roof be provided by others?
- A. Steel subcontractor is to provide all materials required for a complete installation of the stair.
34. Q. BP4 – Steel & Misc Metals: Is cutting and filling existing rebar per 6/EP-A-800 in the steel bid package?
- A. No.
35. Q. BP4 – Steel & Misc Metals: Who is the welding inspector for the project?
- A. The University will select and employ a qualified welding inspection firm to perform shop and field welding inspections. The University will notify the Construction Manager, Otto Construction, after the issuance of Notice to Proceed.
36. Q. BP4 – Steel & Misc Metals: Central Plant: item 11 states to coordinate hoisting with Otto. Will Otto be hoisting necessary materials to the roof for installation?
- A. No, sub is responsible for own hoisting. The intent of that item is that the location of hoisting, hours of hoisting, etc. need to be coordinated with Otto.
37. Q. BP5 – Roof Patch, Metal Panels & Sheet Metal: Please provide specs for existing roof system at Central Plant, as roof patching needs to match existing.
- A. Design specifications and product literature about the existing roofing system at the Central Plant does not appear to have survived. Prior to construction, field-verify the type of existing roofing system at the plant. Match existing roofing system at all conditions that require penetrations of the roofing system such as pipe penetrations, conduit penetrations, supports and curbs for stairways, etc. Refer to 9/CP-M-800 and 11/CP-M-800. For bidding purposes, assume the existing roof system is lightweight concrete pavers over fluid-applied urethane waterproofing.
38. Q. BP5 – Roof Patch, Metal Panels & Sheet Metal: EP-E-211C keynote 1 identifies a wall infill. Is waterproofing required at this infill, and if so, please provide a detail.
- A. It is acceptable to pack the existing 4" diameter cored opening with non-shrinking grout. The finishing of the exterior and interior surfaces of the in-fill should match the existing. For bidding purposes, assume a fluid-applied waterproofing at the exterior of the infill.
39. Q. BP4 – Steel & Misc Metals: What is the necessary clearance for the aluminum cross over bridge Height and width per KN17/CP-M-213B
- A. Provide 36" wide walk-over with 36"x36" landing. Limit stair rise to 8" maximum between treads. Fabricate stairs and landing height as needed to clear filter pipes plus 4" minimum.
40. Q. BP4 – Steel & Misc Metals: Please confirm that the platform for the cooling tower access stair is to be 4'0"x4'0" overall not clear.
- A. Confirmed.
41. Q. BP4 – Steel & Misc Metals: Ref: Detail 4/CP-S-701. Please provide the height of the new cover plates or elevation of the underside of the existing beam.

- A. The top of slab elevation is given as +15'-0" and the intersection beams are called out as W21x44 per the original construction drawings. Contractor to verify actual height in field.
42. Q. BP3 – Concrete & Rebar: Geotech report Design Recommendations 6.1 references a mat foundation at the generator yard with a moisture cut-off system (PVC membrane) at all sides not adjacent to buildings or pavement. Drawing show a conventional slab and footings in lieu of a mat slab and details do not show any membrane. Will the PVC membrane be required?
- A. The moisture cut-off system with membrane is required. All the requirements of the GeoTech report for this project must be followed. Also, refer to the revised sheet notes about the slabs, footings and GeoTech report on the Civil and Structural Drawings. The 6" slab on grade with #5@8" each way reinforcing meets the design recommendations of section 6.1 of the geotechnical report.
43. Q. BP3 – Concrete & Rebar: Ref: EP-E-211C, keynote 1. What is the size of the wall void that is to be filled with non-shrink grout?
- A. The existing conduit is 4" diameter.

III. **BIDDING/CONTRACT DOCUMENTS AND DIVISION 1 SPECIFICATIONS – VOLUME 1**

1. Replace Specifications Volume 1 Table of Contents
2. Replace 01 11 00.01 Sitework Summary of Work
3. Replace 01 11 00.02 Sawcutting Summary of Work
4. Replace 01 11 00.03 Rebar & Concrete Summary of Work
5. Replace 01 11 00.04 Steel Summary of Work
6. Replace 01 11 00.05 Metal Panel Summary of Work
7. Replace 01 11 00.06 Painting Summary of Work

V. **DIVISION 2 – 33 SPECIFICATIONS – VOLUME 2**

1. Replace Specifications Volume 2 Table of Contents
2. Add section 26 32 16 Generator Paralleling Control System Modifications
3. Replace section 33 11 10 Water Distribution System

V. **DRAWINGS**

Replace the following sheets:

CP-M-211B	MECHANICAL PLAN - LEVEL 1 SECTOR B
CP-M-212B	MECHANICAL PLAN - LEVEL 2 SECTOR B
CP-M-213B	MECHANICAL PLAN - ROOF SECTOR B
CP-M-600	MECHANICAL SECTIONS
CP-M-700	MECHANICAL DIAGRAM - CHILLED WATER

CP-E-211B	ELECTRICAL PLAN - LEVEL 1 SECTOR B
EP-G-001	DRAWING INDEX, BUILDING INFORMATION AND MAPS
EP-C-200F	CIVIL SITE CONDITIONS - SECTOR F
EP-C-220F	CIVIL GRADING PLAN - SECTOR F
EP-C-230F	CIVIL UTILITY PLAN - SECTOR F
EP-S-201F	STRUCTURAL PLAN - SERVICE YARD SECTOR F
EP-S-501	STRUCTURAL DETAILS
EP-A-201F	EXPANDED SERVICE YARD PLAN
EP-A-800	SERVICE YARD DETAILS - SECTOR F
EP-E-211C	ELECTRICAL PLAN - LEVEL 1 SECTOR C
EP-E-211F	ELECTRICAL PLAN - LEVEL 1 SECTOR F
EP-E-800	ELECTRICAL DETAILS
TR-E-011	ELECTRICAL PANELBOARD SCHEDULES
TR-E-211F	ELECTRICAL PLAN - LEVEL 1 SECTOR F
WS-C-101	CIVIL SITE CONNECTIONS

VI. ATTACHMENTS

1. Volume 1 Specifications Table of Contents
2. Volume 2 Specifications Table of Contents
3. Specification Section 26 32 16 Generator Paralleling Control System Modifications
4. Specification Section 33 11 10 Water Distribution System
5. 01 11 00.01 Sitework Summary of Work – Revision 1
6. 01 11 00.02 Sawcutting Summary of Work – Revision 1
7. 01 11 00.03 Rebar & Concrete Summary of Work – Revision 1
8. 01 11 00.04 Steel Summary of Work – Revision 1
9. 01 11 00.05 Metal Panel Summary of Work – Revision 1
10. 01 11 00.06 Painting Summary of Work – Revision 1
11. Drawing sheets listed above

UNIVERSITY OF CALIFORNIA, MERCED

**By: University of California, Merced
University's Representative**

Wenbo Yuan
Sr. Project Director

End of Addendum No. 3

ADDENDUM NO. 3

Contract Documents

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General Conditions for Otto Construction

Supplementary Conditions for Otto Construction

Site Map with Job Walk Location

Bid Form

BP 1 - Site Work

BP 2 - Sawcutting

BP 3 - Rebar & Concrete

BP 4 - Steel

BP 5 - Metal Panels

BP 6 - Painting

Bid Bond – NOT USED

Otto Subcontractor Agreement

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SPECIFICATIONS

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Division 1 Specifications

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	<i>01 11 00.02 Sawcutting Summary of Work ADDENDUM 3</i>
	<i>01 11 00.03 Rebar & Concrete Summary of Work ADDENDUM 3</i>
	<i>01 11 00.04 Steel Summary of Work ADDENDUM 3</i>
	<i>01 11 00.05 Metal Panel Summary of Work ADDENDUM 3</i>
	<i>01 11 00.06 Painting Summary of Work ADDENDUM 3</i>
01 21 00	Allowances – NOT USED
01 22 00	Unit Prices – NOT USED
01 23 00	Alternates
01 25 00	Product Options and Substitutions
01 26 13	Requests For Information
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01 35 40	Environmental Mitigation
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01 45 00	Quality Control
01 51 00	Temporary Utilities
01 56 00	Temporary Barriers and Enclosures
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01 57 23	Storm Water Pollution Prevention
01 60 00	Product Requirements
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01 73 23	Supporting from Building Structure
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01 73 35	Selective Demolition
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01 78 36	Guarantees, Warranties, Bonds, Service & Maintenance Contracts
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01 81 13 LEED™ Requirements – NOT USED

01 81 13.1 LEED Requirements Score Card – NOT USED

01 91 00 Commissioning

01 92 00 Operating and Maintenance

Technical Specifications

AEI Technical Narrative

March 31, 2014

List of Drawings

Sheet #	Sheet Description	Phase	Rev	Date
G-001	MASTER DRAWING INDEX	100% CD	0	8/18/2014
	CENTRAL PLANT COMPLETION			
CP-G-001	DRAWING INDEX, BUILDING INFORMATION, AND MAPS	100% CD	0	8/18/2014
CP-S-001	STRUCTURAL GENERAL NOTES	100% CD	0	8/18/2014
CP-S-002	STRUCTURAL GENERAL NOTES, ABBREVIATIONS AND LEGEND	100% CD	0	8/18/2014
CP-S-101	STRUCTURAL LOADING DIAGRAMS	100% CD	0	8/18/2014
CP-S-201	LOWER LEVEL FRAMING PLAN - SECTOR A, B, C	100% CD	0	8/18/2014
CP-S-202	UPPER LEVEL FRAMING PLAN - SECTOR A, B, C	100% CD	0	8/18/2014
CP-S-203	ROOF FRAMING PLAN - SECTOR A, B, C	100% CD	0	8/18/2014
CP-S-701	STRUCTURAL DETAILS	100% CD	0	8/18/2014
CP-M-000	MECHANICAL LEGEND, SYMBOLS, AND ABBREVIATIONS	100% CD	0	8/18/2014

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CP-M-001	MECHANICAL EQUIPMENT SCHEDULES	100% CD	0	8/18/2014
CP-M-002	CMC CHAPTER 11 CODE COMPLIANCE	100% CD	0	8/18/2014
CP-M-201B	MECHANICAL PLAN - LEVEL 1 SECTOR B MAKE-READY	100% CD	0	8/18/2014
CP-M-202B	MECHANICAL PLAN - LEVEL 2 SECTOR B MAKE-READY	100% CD	0	8/18/2014
CP-M-211B	MECHANICAL PLAN - LEVEL 1 SECTOR B	100% CD	1	9/23/14
CP-M-212B	MECHANICAL PLAN - LEVEL 2 SECTOR B	100% CD	1	9/23/14
CP-M-213B	MECHANICAL PLAN - ROOF SECTOR B	100% CD	1	9/23/14
CP-M-213C	MECHANICAL PLAN - ROOF SECTOR C	100% CD	0	8/18/2014
CP-M-600	MECHANICAL SECTIONS	100% CD	1	9/23/14
CP-M-601	MECHANICAL SECTIONS	100% CD	0	8/18/2014
CP-M-700	MECHANICAL DIAGRAM - CHILLED WATER	100% CD	1	9/23/14
CP-M-701	MECHANICAL DIAGRAM - CONDENSER WATER	100% CD	0	8/18/2014
CP-M-800	MECHANICAL DETAILS	100% CD	0	8/18/2014
CP-M-801	MECHANICAL DETAILS	100% CD	0	8/18/2014
CP-I-000	INSTRUMENTATION LEGEND, SYMBOLS, AND ABBREVIATIONS	100% CD	0	8/18/2014
CP-I-700	INSTRUMENTATION DIAGRAM - CHILLED WATER CONTROL	100% CD	0	8/18/2014
CP-I-701	INSTRUMENTATION DIAGRAM - CONDENSER WATER CONTROL	100% CD	0	8/18/2014
CP-I-702	INSTRUMENTATION DIAGRAM - POINTS LIST	100% CD	0	8/18/2014
CP-E-000	ELECTRICAL LEGEND, SYMBOLS AND ABBREVIATIONS	100% CD	0	8/18/2014
CP-E-001	ELECTRICAL FEEDER AND BRANCH CIRCUIT SCHEDULES	100% CD	0	8/18/2014
CP-E-011	ELECTRICAL PANELBOARD SCHEDULES	100% CD	0	8/18/2014

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CP-E-020	ELECTRICAL MV SINGLE-LINE DIAGRAM	100% CD	0	8/18/2014
CP-E-021	ELECTRICAL CENTRAL PLANT SINGLE-LINE DIAGRAM	100% CD	0	8/18/2014
CP-E-022	ELECTRICAL MCC-1 SINGLE-LINE DIAGRAM	100% CD	0	8/18/2014
CP-E-023	ELECTRICAL MCC-2 SINGLE-LINE DIAGRAM	100% CD	0	8/18/2014
CP-E-211B	ELECTRICAL PLAN - LEVEL 1 SECTOR B	100% CD	1	9/23/14
CP-E-211C	ELECTRICAL PLAN - LEVEL 1 SECTOR C	100% CD	0	8/18/2014
CP-E-212B	ELECTRICAL PLAN - LEVEL 2 SECTOR B	100% CD	0	8/18/2014
CP-E-213B	ELECTRICAL PLAN - ROOF SECTOR B	100% CD	0	8/18/2014
CP-E-213C	ELECTRICAL PLAN - ROOF SECTOR C	100% CD	0	8/18/2014
CP-E-800	ELECTRICAL DETAILS	100% CD	0	8/18/2014
	CAMPUS EMERGENCY POWER			
EP-G-001	DRAWING INDEX, BUILDING INFORMATION, AND MAPS	100% CD	1	9/23/14
EP-C-000	CIVIL LEGEND, SYMBOLS, AND ABBREVIATIONS	100% CD	0	8/18/2014
EP-C-200F	CIVIL SITE CONDITIONS - SECTOR F	100% CD	1	9/23/14
EP-C-210F	CIVIL PAVING & LAYOUT - SECTOR F	100% CD	0	8/18/2014
EP-C-220F	CIVIL GRADING PLAN - SECTOR F	100% CD	1	9/23/14
EP-C-230F	CIVIL UTILITY PLAN - SECTOR F	100% CD	1	9/23/14
EP-C-240F	CIVIL EROSION PLAN - SECTOR F	100% CD	0	8/18/2014
EP-S-001	STRUCTURAL GENERAL NOTES	100% CD	0	8/18/2014
EP-S-002	STRUCTURAL GENERAL NOTES, ABBREVIATIONS AND LEGEND	100% CD	0	8/18/2014
EP-S-201F	STRUCTURAL PLAN - SERVICE YARD SECTOR F	100% CD	1	9/23/14
EP-S-501	STRUCTURAL DETAILS	100% CD	1	9/23/14
EP-A-201F	EXPANDED SERVICE YARD PLAN	100% CD	1	9/23/14

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EP-A-800	SERVICE YARD DETAILS SECTOR F	100% CD	1	9/23/14
EP-E-000	ELECTRICAL LEGEND, SYMBOLS AND ABBREVIATIONS	100% CD	0	8/18/2014
EP-E-001	ELECTRICAL FEEDER AND BRANCH CIRCUIT SCHEDULES	100% CD	0	8/18/2014
EP-E-021	ELECTRICAL CENTRAL PLANT SINGLE-LINE DIAGRAM	100% CD	0	8/18/2014
EP-E-211C	ELECTRICAL PLAN - LEVEL 1 SECTOR C	100% CD	1	9/23/14
EP-E-211E	ELECTRICAL PLAN - LEVEL 1 SECTOR E	100% CD	0	8/18/2014
EP-E-211F	ELECTRICAL PLAN - LEVEL 1 SECTOR F	100% CD	1	9/23/14
EP-E-800	ELECTRICAL DETAILS	100% CD	1	9/23/14
EP-P-000	PIPING LEGEND, SYMBOLS, AND ABBREVIATIONS	100% CD	0	8/18/2014
EP-P-001	PIPING FUEL OIL SCHEDULE	100% CD	0	8/18/2014
EP-P-211F	PIPING PLAN - LEVEL 1 SECTOR F	100% CD	0	8/18/2014
EP-P-700	PIPING DIAGRAM - FUEL OIL SYSTEM	100% CD	0	8/18/2014
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	TELECOMMUNICATIONS RELIABILITY			
TR-G-001	DRAWING INDEX, BUILDING INFORMATION, AND MAPS	100% CD	0	8/18/2014
TR-M-000	MECHANICAL LEGEND, SYMBOLS, AND ABBREVIATIONS	100% CD	0	8/18/2014
TR-M-001	MECHANICAL EQUIPMENT SCHEDULES	100% CD	0	8/18/2014
TR-M-201E	MECHANICAL DEMOLITION PLAN - LEVEL 1 SECTOR E	100% CD	0	8/18/2014
TR-M-211A	MECHANICAL PLAN - LEVEL 1 SECTOR A	100% CD	0	8/18/2014
TR-M-211E	MECHANICAL PLAN - LEVEL 1 SECTOR E	100% CD	0	8/18/2014
TR-M-211F	MECHANICAL PLAN - LEVEL 1 SECTOR F	100% CD	0	8/18/2014
TR-M-700	MECHANICAL DIAGRAM - CHILLED WATER	100% CD	0	8/18/2014
TR-M-800	MECHANICAL DETAILS	100% CD	0	8/18/2014

RELIABILITY UPGRADE

TR-I-000	INSTRUMENTATION LEGEND, SYMBOLS, AND ABBREVIATIONS	100% CD	0	8/18/2014
TR-I-700	INSTRUMENTATION DIAGRAM - CHILLED WATER	100% CD	0	8/18/2014
TR-E-000	ELECTRICAL LEGEND, SYMBOLS AND ABBREVIATIONS	100% CD	0	8/18/2014
TR-E-001	ELECTRICAL FEEDER AND BRANCH CIRCUIT SCHEDULES	100% CD	0	8/18/2014
TR-E-011	ELECTRICAL PANELBOARD SCHEDULES	100% CD	1	9/23/14
TR-E-021	ELECTRICAL TELECOM BUILDING SINGLE-LINE DIAGRAM	100% CD	0	8/18/2014
TR-E-211E	ELECTRICAL PLAN - LEVEL 1 SECTOR E	100% CD	0	8/18/2014
TR-E-211F	ELECTRICAL PLAN - LEVEL 1 SECTOR F	100% CD	1	9/23/14
TR-T-000	TELECOM LEGEND, SYMBOLS AND ABBREVIATIONS	100% CD	0	8/18/2014
TR-T-201E	TELECOM - DEMO RACKS - LEVEL 1 SECTOR E	100% CD	0	8/18/2014
TR-T-202E	TELECOM - DEMO CABLE TRAY - LEVEL 1 SECTOR E	100% CD	0	8/18/2014
TR-T-211E	TELECOM - NEW RACKS - LEVEL 1 SECTOR E	100% CD	0	8/18/2014
TR-T-600	TELECOM - RACK ELEVATIONS	100% CD	0	8/18/2014
	CAMPUS WATER SUPPLY			
WS-G-001	DRAWING INDEX, BUILDING INFORMATION, AND MAPS	100% CD	0	8/18/2014
WS-C-000	CIVIL LEGEND, SYMBOLS, AND ABBREVIATIONS	100% CD	0	8/18/2014
WS-C-101	CIVIL SITE CONNECTIONS	100% CD	1	9/23/14
WS-E-000	ELECTRICAL LEGEND, SYMBOLS AND ABBREVIATIONS	100% CD	0	8/18/2014
WS-E-001	ELECTRICAL FEEDER AND BRANCH CIRCUIT SCHEDULES	100% CD	0	8/18/2014
WS-E-021	ELECTRICAL SINGLE-LINE DIAGRAM AND MCC ELEVATION	100% CD	0	8/18/2014
WS-E-201	ELECTRICAL PLAN - LEVEL 1	100% CD	0	8/18/2014

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GENERATOR PARALLELING CONTROL SYSTEM MODIFICATIONS

PART 1 - GENERAL

1.1 RELATED WORK

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
- B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- C. Section 26 05 29 - Hangers and Supports for Electrical Systems.
- D. Section 26 05 48 - Vibration and Seismic Controls for Electrical Systems.
- E. Section 26 05 53 - Electrical Systems Identification.
- F. Section 26 05 73 - Overcurrent Protective Device Coordination and Arc Flash Study.
- G. Section 26 08 12 - Power Distribution Acceptance Tests.
- H. Section 26 08 13 - Power Distribution Acceptance Test Tables.
- I. Section 26 28 13 - Fuses.
- J. Section 26 43 00 - Surge Protective Devices.
- K. Section 26 32 13 - Engine Generators

1.2 REFERENCE

- A. Work under this section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.3 DESCRIPTION OF WORK

- A. General: Provide all materials and perform all work required to modify and extend existing emergency power switchboard ESA as required to integrate the new 1MW generator and new automatic transfer switch serving the Telecom Building. Provide all switchboard and controls hardware, configuration, programming, and testing to allow operation of all three generators in parallel and to match the functionality of the existing system for automatic start-up and fail-over of generators, load management, etc.
- B. Field investigate and document all components of the existing generator paralleling switchgear system as required to verify existing components and connection points for required modifications.
- C. Obtain all information required from the generator manufacturer and perform all work to ensure that the generator communicates with the generator paralleling control system and is integrated to match existing functionality.

- D. Provide a new vertical section at the end of the existing paralleling switchgear, matching the construction of the existing switchboard, including the following:
1. Draw-out insulated case circuit breaker 1600AT/1600AF
 2. Voltage transformers
 3. Control power transformers
 4. Current Transformers (phase - in switchgear)
 5. Current Transformer (installed at generator neutral wye point)
 6. Multi-function synchronizing/protective relay (Woodward MFR13 or equal).
 7. Programmable logic controller
 8. Watt-meter
 9. Ammeter
 10. Touch-screen HMI
 11. Annunciator panel(s) with labeled indicating lights for status and alarm conditions.
 12. Voltage and speed control with synchronizing lights
 13. Engine control switch
 14. Lamp test switch
 15. Reset switch
- E. Provide all cabling, components, interconnections, and modifications to the existing control system (including the addition of new I/O for new generator/ATS points) required to:
1. Integrate the new vertical section into the power and control system of the existing paralleling switchgear lineup.
 2. Integrate the new 1MW generator with the modified paralleling switchgear lineup.
 3. Integrate the new automatic transfer switch with the modified paralleling switchgear lineup.
- F. Provide all system studies, configuration, and programming work to set all control, paralleling, and protective relaying functions for the new generator to match the existing generators, including ANSI device functions 25, 27, 32, 47, 51, 51N, 51V, 59, and 81O/U.
- G. Connect new automatic transfer switch into the paralleling switchgear and make all modifications required to integrate into the system, including assignment of a load-shedding priority level. Adjust load-shedding priority levels for other loads as required to place loads in the proper order.
- H. Modify the existing building automation system to incorporate the new generator and automatic transfer switch into any existing screens and trend data related to the generator system.

1.4 REFERENCE STANDARDS

- A. ANSI/IEEE C37.13 – Low-Voltage AC Power Circuit Breakers Used in Enclosures.
- B. ANSI/NECA 400 – Recommended Practice for Installing and Maintaining Switchboards.
- C. IEEE C62.41.2 Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits.
- D. NFPA 70 – National Electrical Code.
- E. NEMA AB 1 – Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit Breaker Enclosures.
- F. NEMA AB 3 – Molded-Case Circuit Breakers and Their Applications.
- G. NEMA FU 1 – Low-Voltage Cartridge Fuses.
- H. NEMA KS 1 – Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
- I. NEMA PB 2 – Dead-Front Distribution Switchboards.
- J. NEMA PB 2.1 – General Instructions for Proper Handling, Installation and Maintenance of Dead-Front Distribution Switchboards Rated 600 Volts or Less.
- K. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- L. UL 98 – Enclosed and Dead-Front Switches.
- M. UL 486A-486B – Wire Connectors.
- N. UL 489 – Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
- O. UL 869A – Reference Standard for Service Equipment.
- P. UL 891 – Dead-Front Switchboards.

1.5 SUBMITTALS

- A. Submit a complete set of coordinated shop drawings for the modified generator paralleling switchgear, including the following:
 - 1. Original switchgear shop drawings, with changes as required for modifications made as part of this work.
 - 2. Additional feeder section shop drawings, for the section added since original switchgear installation.
 - 3. New vertical section installed as part of this work.

B. Include the following information with the shop drawings:

1. Wiring diagrams:
 - a. Single-line diagrams with protective relaying and control features
 - b. Three-line diagrams with protective relaying and control features
 - c. Modbus communications diagrams
 - d. Breaker trip schematics
 - e. PLC and Remote I/O connection diagrams.
 - f. Annunicator panel diagrams.
 - g. Paralleling switchgear to generator controller integration wiring diagram.
2. General Arrangement:
 - a. Indicate front, plan, and side views of switchboards; access requirements (front, side, rear); overall dimensions and components list; shipping splits and weights.
 - b. Front elevation indicating location of devices and instruments.
 - c. Sections through switchboard showing space available for conduits.
 - d. Anchor bolt hole locations (dimensioned) and diameter.
3. Conduit entrance locations and requirements.
4. Nameplate legends.
5. Configuration and current rating of buses.
6. Ground bus.
7. Neutral bus.

C. Manufacturer's Installation Instructions:

1. Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

D. Functional Test Plan:

1. Submit a complete functional test plan and forms to allow witnessed verification that the modified generator paralleling switchgear has completely integrated the new generator and matches the functionality of the existing system.
2. Submit test plan a minimum of thirty (30) calendar days before the start of testing.

- E. Test Reports: Indicate field test and inspection procedures and interpret test results and corrective action taken for compliance with specification requirements.
- F. Complete review of this specification noting for each paragraph whether proposed equipment complies with project specifications or deviates. Justification must be given for each deviation.
- G. Closeout Submittals:
 - 1. Project Record Documents:
 - a. Include “as-built” shop drawings, showing the units as they were shipped from the factory, with any modifications made in the field during installation.
 - 2. Operation and Maintenance Data:
 - a. Include manufacturer’s recommended operating instructions, maintenance procedures and intervals, and preventive maintenance instructions.
 - b. Include spare parts data listing, source, and current prices of replacement parts and supplies.

1.6 SOURCE QUALITY CONTROL

- A. Obtain switchboards from one source and by single manufacturer.
- B. Regulatory Requirements:
 - 1. Comply with NFPA 70 for components and installation.
 - 2. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and indicated.
- C. Certifications:
 - 1. Furnish University’s Representative with Manufacturer Seismic Qualification Certification: Submit certification that switchboards, accessories, and components will remain physically intact to withstand seismic forces defined in Section 26 05 48 - Vibration and Seismic Controls for Electrical Systems. Include the following:
 - a. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, fumes, water, corrosive substances, construction debris, and traffic. Provide temporary heaters in switchboards as required to prevent condensation.
- B. Deliver switchboards in 54” maximum width shipping splits, individually wrapped for protection, and mounted on shipping skids. Mark crates, boxes, and cartons clearly to identify equipment. Show crate, box, or carton identification number on shipping invoices.

- C. Handle switchboards in accordance with NEMA PB 2.1 and ANSI/NECA 400. Use factory-installed lifting provisions. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.8 WARRANTY

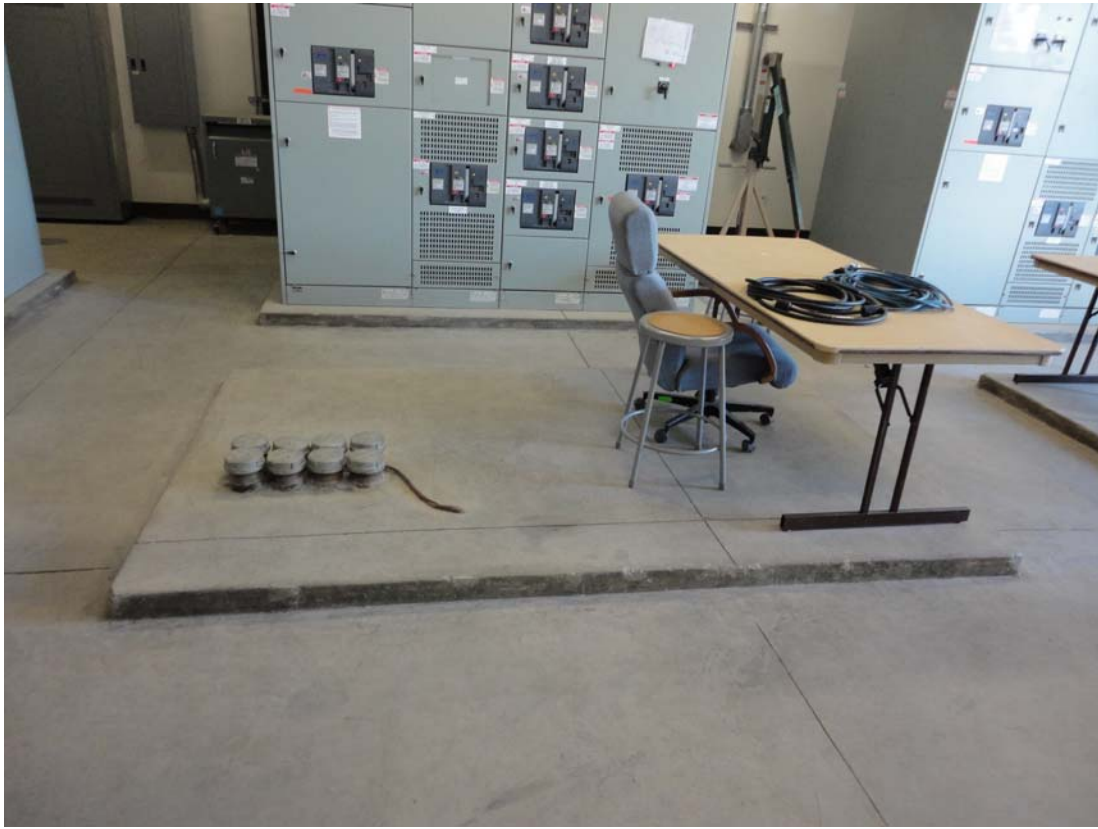
- A. Refer to Division 01 and Section 26 00 00 - General Electrical Requirements for general warranty requirements.
- B. Manufacturer shall provide standard 1 yr warranty against defects in materials and workmanship for products specified in this Section. Warranty period shall begin on date of substantial completion.

1.9 MAINTENANCE

- A. Extra Materials: Furnish extra materials described below that match product installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. Potential Transformer Fuses: Equal to 10% of amount installed for each size and type, but no fewer than 2 of each size and type.
 - 2. Fuses: Equal to 10% of amount installed for each size and type, but no fewer than 3 of each size and type.
 - 3. Indicating Lights: Furnish 6 of each type required. Equal to 10% of amount installed for each size and type, but no fewer than 2 of each size and type.

1.10 SPACE CONSTRAINTS

- A. The switchboards will be installed on existing concrete equipment pads, with existing incoming conduits stubbed up in them. These pads and conduits cannot be relocated. Take all measurements and furnish equipment as required to fit onto the existing pads and over the existing conduits. For information only - a photo of one of the existing pads is shown below:



PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. As required to integrate with existing switchgear.

2.2 RATINGS

- A. Nominal system voltage: As indicated on the drawings.
- B. Main bus continuous amp: As indicated on the drawings.
- C. Short circuit current rating: As indicated on the drawings.
- D. Brace switchboard components to withstand mechanical forces for symmetrical fault current shown.

2.3 CONSTRUCTION

- A. NEMA PB 2, UL 891.

- B. Free-standing, dead-front type; vertical sections bolted together; sides and rear covered with removable bolt-on covers; adequate ventilation within enclosure; supporting frame: steel rigidly fastened together, with same outside dimensions as the enclosure.
- C. Adequate strength and rigidity necessary to resist conditions of use to which it may be subjected and to support equipment, devices and appurtenances contained therein.
- D. Incoming lug locations: Top or bottom, as applicable per drawings.
- E. Connection to the supply source by conduit and wiring.
- F. Connection to the tie breaker source/load by overhead busway.
- G. Environmental Limitations:
 - 1. Ambient temperatures: Not exceeding 40°C.
 - 2. Altitude: Not exceeding 2 km.
 - 3. Temperature rise: Not to exceed 65°C over a 40°C ambient environment, with no derating required.
- H. Device Mounting and Type:
 - 1. Front and rear accessible switchboard:
 - a. Main, tie, and feeder devices: Individually-mounted, draw-out, compartmentalized insulated-case circuit breakers.
- I. Bus:
 - 1. Material: Copper with silver or tin plating; copper: 98% conductivity. The bus bars shall have sufficient cross-sectional area to meet UL 891 temperature rise requirements through actual tests. The bus bars shall be standard density rated for 1000 amperes per square inch copper.
 - 2. Connections:
 - a. Bolted:
 - 1). Not fewer than 4 bolts for each 100 mm x 100 mm(4" x 4") contact.
 - 2). Not fewer than 2 bolts for each 50 mm x 50 mm(2" x 2") contact.
 - 3). Grade 5 bolts and conical spring-type washers.
 - 4). Clamp joints are not allowed.
 - 3. Sizing: Standard size, based on 65°C over 40°C.
 - 4. Main Phase Buses: Three phase, 4 wire; fully rated; uniform capacity for entire length of switchboard; ampacity as indicated on drawings; rated for the main protective device frame size or main incoming conductors.

5. All feeder device line and load connection straps: Rated to carry current rating of device frame (not trip rating).
 6. Support for Buses: Mounted on high-impact, non-tracking insulated supports; joints in the vertical bus are not permitted.
 7. Bus arrangement: A-B-C (left to right, top to bottom, front to rear).
- J. Ground Bus:
1. 1/4" x 2" minimum-size, hard-drawn copper of 98 percent conductivity, equipped with pressure connectors for feeder ground conductors. Bus shall be provided with lugs for incoming and outgoing equipment ground connections, as well as a #4/0 lug for connection to the building ground system.
- K. Neutral Bus: 100% of the ampacity of phase buses, equipped with pressure connectors for outgoing circuit neutral cables. Bus extensions for busway feeder neutral bus are braced.
- L. Hinged Front Doors: Allow access to metering and accessory compartments; concealed hinges; fastened by head bolts.
- M. Vertical Insulating Barrier: Between the breaker compartment and bus compartment.
- N. Barriers: Between adjacent sections.
- O. Hinged Front Doors: Over device compartments, with concealed hinges and fastened by hex head bolts.
- P. Rear Doors and Compartment Covers: Split height and fastened by hex head bolts.
- Q. Future Provisions: Fully equip spaces for future devices with bussing, mounting brackets, supports, and appurtenances, insulated and braced for short circuit currents, with continuous current rating as indicated on drawings. Extension of phase, neutral, and ground buses from both ends.
- R. Adequate lifting means.
- S. Dimensions: 96" maximum height, excluding floor sills, lifting members and pull boxes. Length and depth as required to fit on existing pad while allowing 4" from edge of switchboard to edge of pad on all sides.
- T. Line and Load Terminations: Compression type accessible from rear of switchboard, suitable for conductor materials and sizes as indicated on drawings; suitable for number, size and trip ratings.
- U. Enclosure: Steel, NEMA 250, Type 1:
1. Finished parts shall have an average paint thickness of 2-3 mils and shall withstand 600 hours of salt spray (per ASTM B 117 and ASTM D 1654) as well as 1000 hours of 100% humidity at 45 degrees Centigrade. Finish color shall be ANSI 61 gray.

2.4 SHORT CIRCUIT CURRENT RATING

- A. Each switchboard with minimum short circuit current rating as indicated on drawings.
- B. Switchboards: Marked with their maximum short circuit current rating at supply voltage.
- C. Switchboards: Fully rated. Series rated switchboards are not acceptable.

2.5 OVERCURRENT PROTECTIVE DEVICES

- A. Enclosed, Insulated-Case Circuit Breaker and Accessories: NEMA AB 1, UL 489; fully rated circuit breaker with interrupting capacity rating to meet available fault current.
 - 1. Drawout and compartmented circuit breaker mounting. Drawout design: Circuit breaker to be withdrawn from connected position, to test position, and to disengaged position. Draw out mechanism shall be mechanically interlocked with circuit breaker's trip mechanism so that breaker must be OPEN before it can be moved into or out of the CONNECTED position. The breaker shall automatically trip open if it is withdrawn while in CLOSED position. A CLOSED breaker shall trip open before it is racked into the engaged position. Main and tie breaker cubicles shall be provided with a position switch with a minimum of 4 NO and 4 NC contacts for indication of the breaker position. Main and tie breaker cubicles shall be provided with shutters to guard energized stabs while breaker is withdrawn from its cubicle.
 - 2. Two-step, stored-energy closing; electrically operated.
 - 3. The breaker mechanism shall be capable of being charged after closing the circuit breaker. It shall be possible to discharge the energy in the closing spring without closing the breaker main contacts. Manual charging handle of stored-energy mechanism and operation of devices shall be accomplished with compartment door closed and latched.
 - 4. A charging handle, closed pushbutton, open pushbutton and Off/On/Charge indicator located on the breaker escutcheon and visible with the breaker compartment closed.
 - 5. Main, tie, and feeder shall be controlled electrically by a control switch with a pistol grip handle mounted on an auxiliary compartment above the breaker. Green (open) and red (closed) indicating lights shall be mounted above the control switch to indicate breaker status. Control switches are not required for feeder breakers. Provisions for remote electrical operation of feeder breakers shall be furnished by wiring close and trip circuits to terminal blocks.
 - 6. Each insulated case circuit breaker shall be equipped with an electronic (solid-state microprocessor-based) trip units with interchangeable rating plug, trip indicators, field-adjustable settings and the following trip functions:
 - a. Adjustable Instantaneous trip.
 - b. Adjustable long-time pickup and time delay
 - c. Adjustable short-time pickup, time delay, and I^2t response.
 - d. Ground-fault pickup level, time delay, and I^2t response.

- e. Zone-selective interlocking: provide completely wired and configured zone-interlocking system between feeder breakers and upstream main and tie breakers.
 - f. Metering: Complete metering of voltage, current, and power for all three phases. With Modbus RTU communications capability.
 - g. Integral display unit capable of showing metering parameters and trip indicators.
- 7. Control Voltage: 120VAC.
 - 8. Listed for 100% of breaker's continuous ampere rating.

2.6 CONTROL POWER, COMPONENTS IDENTIFICATION, AND CONTROL WIRING

- A. Control Circuits: 120 V, supplied through secondary disconnecting devices from control-power transformer.
- B. On multi-source switchboards with AC control power, control power automatic throw-over equipment shall transfer control bus from one control power source to another when one is de-energized.
- C. Control-Power Fuses: Primary and secondary fuses for current-limiting and overload protection of transformer and fuses for protection of control circuits.
- D. Control components mounted within assembly, such as relays, pushbuttons, switches, etc.: Suitably marked for identification, corresponding to appropriate designations on manufacturer's wiring diagrams.
- E. Control Wiring: Type SIS, factory installed, with bundling, lacing, and protection included; flexible conductors for #8 AWG and smaller, for conductors across hinges, and for conductors for interconnections between shipping units; insulated locking spade terminals for all control connections, except where saddle type terminals, integral to a device; current transformer secondary leads, connected to short circuit terminal blocks; terminal blocks with suitable numbering strips for group of control wires leaving switchboard, with wire markers at each end of control wiring.

2.7 ACCESSORY COMPONENTS AND FEATURES

- A. Furnish portable test set to test functions of solid-state trip devices without removal from switchboard.
- B. Furnish one portable, floor-supported, roller-based, elevating carriage arranged for movement of circuit breakers in and out of compartments for present and future circuit breakers.
- C. Furnish set of tools for manually charging circuit breaker stored energy device.
- D. Lockout Devices: Circuit breakers with integral, lockout/tagout devices.

2.8 COMMUNICATIONS

- A. Pre-wire all power meters and breaker trip units in each switchgear lineup in a single chain to a Modbus TCP gateway mounted in the switchboard to provide a single point of connection from the meters and trip units to the building automation system (BAS).

PART 3 - EXECUTION

3.1 COORDINATION

- A. Instruct manufacturer about the location of incoming lugs, i.e., top or bottom feed based on incoming feeder entrance location.
- B. Coordinate installation of housekeeping concrete pad based on actual equipment supplied:
 - 1. Concrete: Per requirements in Division 03 – Concrete.
 - 2. Dimensions: Per requirements in Section 26 05 29 - Hangers and Supports for Electrical Systems.
- C. Coordinate with miscellaneous trades for equipment foreign to the electrical installation to be outside of dedicated electrical space.
- D. Coordinate with busway system manufacturer factory installation of termination fittings.
- E. Coordinate utility company metering equipment requirements.
- F. Verify with manufacturer that “touch-up” paint kit is available for repainting.

3.2 EXAMINATION

- A. Examine areas and surface to receive switchboards for compliance with requirements, installation tolerances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Verify that space indicated for switchboard mounting meets code-required working clearances.
- C. Notify University’s Representative of any discrepancies prior to submittal of product data and shop drawings.

3.3 INSTALLATION

- A. Install switchboard in accordance with NEMA PB 2.1 and ANSI/NECA 400.
- B. Switchboard mounting and seismic restraints:
 - 1. Install switchboard anchorage devices and seismic restraints based on design by an Engineer registered and licensed in the State of California, and to comply with Section 26 05 48 - Vibration and Seismic Controls for Electrical Systems for seismic criteria.

2. Bolt switchboards to concrete housekeeping pads, using anchor bolts in accordance with Section 26 05 29 - Hangers and Supports for Electrical Systems. Cast anchor bolt inserts into pads.
 3. Install bushing assemblies for anchor bolts for seismic restraints per requirements in Section 26 05 48 - Vibration and Seismic Controls for Electrical Systems.
- C. Install engraved plastic nameplates under provisions of Section 26 05 53 - Electrical Systems Identification for each switchboard, every instrument, overcurrent protective device and disconnect device. Attach nameplate to exterior of each switchboard using small corrosion-resistant metal screws and rivets. Do not use contact adhesive. Indicate switchboard manufacturer's name and drawing number, name, amperage, voltage, phase, number of wires, short circuit current rating (amp, RMS symmetrical and MVA 3-phase symmetrical) and momentary and fault-closing ratings (amp, RMS asymmetrical). For each overcurrent protective device and disconnect device, include circuit, load and area served, voltage/phase rating, and fuse size and type, when applicable.
- D. Provide framed, printed operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished metal, and cover instructions with clear acrylic plastic. Mount on front of switchboards.
- E. Install switchboards in dedicated electrical space per NFPA 70, and as indicated on drawings.
- F. Tighten electrical connectors and terminal according to equipment manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- G. Install fuses in fusible switch at job site per requirements in Section 26 28 13 - Fuses.
- H. Apply temporary heat to maintain temperature according to manufacturer's written instructions.

3.4 CONNECTIONS

- A. Ground switchboards according to Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- B. Connect power and control wiring according to Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.

3.5 FIELD QUALITY CONTROL

- A. Inspect switchboards for physical damage, proper alignment, connections, anchorage, seismic restraints and grounding.
- B. Test continuity of each circuit.
- C. Test switchboards per requirements in Sections 26 08 12 - Power Distribution Acceptance Tests and 26 08 13 - Power Distribution Acceptance Test Tables.

3.6 FUNCTIONAL TESTING

- A. Perform complete functional testing in accordance with the submitted and approved test plan. Provide the on-site services of at least one qualified representative from the generator manufacturer and one qualified representative from the paralleling switchgear supplier for a minimum of two eight (eight) hours days for witnessed functional testing of the generator system, beyond whatever time is required to modify the switchgear, make connections and otherwise perform the work.

3.7 REPAINTING

- A. Remove paint splatters and other marks from surface of equipment.
- B. Touch-up chips, scratches or marred finishes to match original finish, using manufacturer-supplied paint kit. Leave remaining paint with University.

3.8 ADJUSTING

- A. Set field-adjustable circuit breakers trip settings or change the trip settings to values indicated on drawings or recommended by the overcurrent protective device coordination study per Section 26 05 73 – Overcurrent Protective Device Coordination and Arc Flash Study.
- B. Field adjustments or changing of trip setting and adjustment or replacement of equipment to comply with Section 26 05 73 - Overcurrent Protective Device Coordination and Arc Flash Study; no additional cost to University.

3.9 CLEANING

- A. Vacuum dirt and construction debris from interior and exterior of equipment; do not use compressed air to assist in cleaning.

3.10 DEMONSTRATION AND TRAINING

- A. Provide training session by manufacturer for one workday at a job location, to train the University's personnel in the operation and maintenance of switchboards.
 - 1. Existing switchboards MSA and MSB are GE Powerbreak II switchboards. If this specific manufacturer and model of switchboard is provided, training is not required.

END OF SECTION 26 24 13

SECTION 33 11 10
WATER DISTRIBUTION SYSTEM

PART 1- GENERAL

1.1 SECTION INCLUDES

- A. Pipe and fittings for site domestic, utility water (irrigation service), and chilled water supply and return.
- B. Valves and appurtenances.

1.2 RELATED SECTIONS

- A. Section 31 25 00 Erosion and Sedimentation Control.
- B. Section 31 23 16.13 Trenching and Backfilling.

1.3 REFERENCES

- A. AWWA C508 - Swing-Check Valves for Waterworks Service, 2 In. Through 24 In. NPS; American Water Works Association; 2001 (ANSI/AWWA C508).
- B. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service; American Water Works Association; 2001 (ANSI/AWWA C509).
- C. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution; American Water Works Association; 1997 (ANSI/AWWA C900/C900a).
- D. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2001(R 2002) (ANSI B16.18).
- E. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; The American Society of Mechanical Engineers; 2001.
- F. ASTM B 88 - Standard Specification for Seamless Copper Water Tube; 2003.
- G. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding; American Welding Society; 2004 and errata.

1.4 SUBMITTALS

- A. See Section 01 33 00 Submittals for submittal procedures.
- B. Product Data: Provide data acknowledging that products meet requirements of standards referenced.
- C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Restraint Calculation: Provide calculations for mechanical restraint distances for all pipe joints. Provide data acknowledging that calculations provided conform to manufacturer's recommendations for size of pipe, type of pipe, and site soil type.
- F. Project Record Documents:
 - 1. Record location of pipe runs, connections, valves, restraints and invert elevations.
 - 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2- PRODUCTS

2.1 PIPE MATERIALS

- A. Plastic - 4 inches and over: PVC pipe shall be minimum Class 200 AWWA C900 (minimum Class 165 AWWA C905 for pipes 16 inches and larger). Underwriters' Laboratories, Inc. (UL) listed, Factory Mutual and National Sanitation Foundation (NSF) approved. Pipe shall be furnished in minimum standard lengths of 20 feet
 - 1. Fittings: AWWA C111, cast iron mechanical joint type, 250 pound working pressure, ductile iron, mechanical joints with SBR rubber ring gaskets. Flanged outlets shall conform to ANSI B16.1, 125 pounds.
 - 2. Bolts and nuts for flanges shall be Type 304 stainless steel, American Society for Testing and Materials (ASTM) A193, Grade B8M hex head bolts and American Society for Testing and Materials A194, Grade 8M, hex head nuts. Washers shall be of the same material as the bolts.
- B. Copper - Less than 4 inches: Copper Tubing ASTM B 88, Type K:
 - 1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
 - 2. Joints: Compression connection or AWS A5.8, BCuP silver braze.

2.2 VALVES

- A. Valves: Manufacturer's name and pressure rating marked on valve body.
- B. Valves less than 2 Inches:
 - 1. Bronze Gate Valve: Stockham Model B103/B104, Nibco Model T-113/S-113, or equal with non rising stem, class 125 minimum.
- C. Valves 2 inches through 12 inches:
 - 1. Gate valve: American Flow Control Series 2500, Mueller 2360 Series, or equal. Valve shall be resilient seat, with non-rising stem opening counter-clockwise with O-ring stem seal and suitable ends for connection to the type of pipe or fitting used.

The working pressure rating of gate valve shall be a minimum of 250 p.s.i.g. Buried valves shall have a 2 inch square operating nut. The interior and exterior of the body and bonnet shall be coated with fusion bonded epoxy. The body to bonnet bolts and nuts shall be stainless steel.

~~2.3~~ ~~HYDRANTS~~

- ~~A. Hydrant shall be AVK Model #2420 Standard Style Wet barrel, with two 2 1/2 inch outlets and one 4 1/2 inch outlet. All outlets shall have National Standard fire hose thread.~~

2.3 BACKFLOW PREVENTERS

- A. 12" Backflow Apollo RPLF 4A Series or approved equal, with maximum working water pressure of 175 psi, and capable of handling testing pressure of 250 psi minimum.**
- B. 10" Reducing Pressure Backflow Preventer shall Zurn Model 375, Apollo RP 4A, Ames, Febco, or other approved manufacturer with maximum working water pressure of 175 psi, and capable of handling testing pressure of 250 psi minimum.**

2.4 DRINKING FOUNTAINS

- A. Drinking fountains shall be MDF Model 440 SM.

2.5 BEDDING AND COVER MATERIALS

- A. Bedding: As specified in Section 31 23 16.13 Trenching and Backfilling.
- B. Cover: As specified in Section 31 23 16.13 Trenching and Backfilling.

2.6 COUPLINGS AND SLEEVES

- A. General: All couplings and sleeves shall be a minimum of 250 psi working pressure-rated unless otherwise noted.
- B. For DIP and PVC pipe:
1. Unless otherwise noted, couplings and sleeves for DIP and PVC shall be ductile iron conforming to AWWA C153, size 3 through 24 inch and AWWA C110 greater than 24 inch, and shall be 350 psi working pressure rated. AWWA C100 fittings shall be ductile iron only. Couplings, sleeves, and accessories shall be manufactured by U.S. Pipe TrimTyte, Union Foundry, Tyler; or equal.
 2. Unless otherwise noted, flanges on all DIP spools shall conform to AWWA C115.
 3. Push-on joints shall have SBR rubber ring gaskets.

4. All fittings shall be restrained joints. Pipes shall be restrained using a wedge-action, self-actuating lug type restraint device as manufactured by EBAA Iron Sales, StarGrip, or equal. Concrete thrust blocks are not permitted except at connections to existing unrestrained pipe or fittings or at fire hydrants.
5. All pipe joints within the minimum distances listed in the following table shall be restrained. Restraint shall be by use of locking gasket for ductile iron pipe. Restraint for PVC pipe shall by use of a restraint harness EBAA Series 2800, StarGrip, or equal.

Pipe Diameter, inches	Minimum Restraint Length, feet						
	Horizontal Elbows				Tee, Run & Branch	One-Size Reducer	Dead End
	11.25	22.5	45	90			
3	1	2	3	8	8		24
4	1	2	4	10	10	9	29
6	1	3	6	14	14	21	42
8	2	4	7	18	18	23	55
10	2	4	9	21	21	22	66
12	2	3	7	17	17	26	53
14	2	4	8	20	20	16	61
16	2	4	9	22	22	16	69
18	2	5	10	25	25	16	77
20	3	5	11	27	27	16	84
24	3	6	13	32	32	30	100
30	4	8	16	38	38	42	121
36	4	9	18	45	45	43	143

2.7 ACCESSORIES

A. Mechanical Restraints:

1. PVC Pipes: Certain Teed Certa Lock, Romac Grip Rings, or equal.
- B. Domestic Backflow Preventer: reduced pressure type backflow preventer, matching service size (unless otherwise indicated on Drawings), Wilkins, Watts, or equal. Provide removable, U.V. resistant, insulated blanket (fiberglass jacketing is not acceptable).
- C. Valve Boxes: Precast concrete with cast iron traffic covers with the word WATER embossed on the top surface of the lid. Christy G5 or equal. Cover shall be painted light blue (ICI Devoe DC41000 semi gloss or equal) for domestic water valves and white (ICI Devoe, DevFlex-659 White Semi Gloss 4206, or equal) for Utility water valves. For chilled water valves, the letters "CHW" shall be welded or embossed on the top surface of the lid and the cover shall be painted green. For all valves an identification number shall be welded

onto valve box rim. Identification number shall be assigned by Operations and Maintenance, Engineering Services.

- D. Miscellaneous nuts and bolts shall be stainless steel.
- E. Rods and Clamps: Socket clamps shall be stainless steel, four bolt type, equipped with stainless steel socket clamp washers and nuts Grinnell Fig. 595 and 594, Elcen Fig. 37 and 37X, or equal.
 - 1. Rods shall be stainless steel, 3/4 inch diameter.
- F. All underground water piping shall be accompanied by a Solid Core #10 copper tracer wire. Both ends of tracer wire shall be accessible at all utility valve boxes.
- G. Line Marker: Underground-type conductive line marker, permanent, brightly colored, continuous-printed plastic tape, intended for direct burial service; not less than 6 inches wide by 4 mils thick. Provide blue tape with "CAUTION WATER LINE BURIED BELOW" in black letters; Allen Systems Inc., Emed Co. Inc., or equal.
- H. Tapping Sleeve: Cast iron or stainless mechanical joint type sleeve, sized specifically for actual O.D. and piping material, Mueller, Clow, or equal.

PART 3- EXECUTION

3.1 PREPARATION

- A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare pipe connections to equipment with flanges or unions.

3.2 TRENCHING

- A. See Section 31 23 16.13 Trenching and Backfilling for additional requirements.
- B. Hand trim excavation for accurate placement of pipe to elevations indicated.
- C. Buried pipe shall have at least 36 inches of cover for pipes up to 8 inches, 40 inches of cover for 10 inch pipes, 44 inches of cover for 12 inch pipes and 48 inches of cover for 16" pipes and larger and 12 inches of clearance from other utilities.
- D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, and then complete backfilling.

3.3 INSTALLATION - PIPE

- A. Have on hand all installation manuals, brochures, and procedures for the equipment and materials concerned.

- B. Follow manufacturer instructions, where such are provided, in all cases that cover points not shown on the Drawings or specified herein. Manufacturer's instructions do not take precedence over the Drawings and Specifications. Where manufacturer's instructions are in conflict with the Drawings and Specification, submit the conflicting instructions to the University's Representative for clarification before performing the work.
- C. Use fittings to make all changes in direction and size unless otherwise indicated on the Drawings.
- D. Maintain factory plastic end covers on the pipe during storage. Caps shall be removed upon installation of pipe to insure cleanliness.
- E. Lay piping on a bed of the specified sand, at least 6-inches thick, on firm undisturbed earth. Remove loose rock, clods, and debris from the trench before placing bedding sand and before laying any pipe.
- F. The piping shall be made up with the pipe barrel bearing evenly along its full length on the sand bed on the bottom of the trench.
- G. In the case of steel or other rigid joint piping, excavate holes under joints and connections for access for making up, welding, testing and wrapping joints.
- H. Thoroughly clean out each section of pipe and fitting before lowering into the trench. Clean each pipe or fitting by swabbing-out, brushing-out, blowing-out with compressed air, washing-out with water, or by any combination of these methods necessary to remove all foreign matter.
- I. If cleaned pipe sections and fittings cannot be placed in the trench without getting dirt into the open ends, tie tightly woven canvas or other type of approved cover over the ends of the pipes and fittings until they have been lowered into position in the trench. After removal of the covers in the trench, completely remove foreign matter from the pipe ends and fittings.
- J. Do not lower any pipe or fitting into a trench that contains water. Pump water from wet trenches, and keep the trenches dry until the joints have been completed and the open ends of the pipes have been closed with watertight plugs or bulkheads. Do not remove the plug or bulkhead unless the trench is dry.
- K. Assemble lengths of PVC that are joined by couplings, Tyton type push-on joints, Ring-Tite, Fluid-Tite, or equal, such that centerline of two pipes being joined do not form an angle exceeding 2 inches in any plane. In addition, the angle formed in the vertical plane shall not exceed 1-1/2 inch.
- L. Transition plastic pipe to ductile iron when within 10 feet of a steam line. Provide 6 inches minimum powdered insulation around ductile iron sewer pipe when within 5 feet of steam line. Install insulation according to manufacturer's recommendations.
- M. Install trace wire on top of pipe.
- N. Install continuous line marker 18 inches above top of pipe; coordinate with Section 31 23 16.13 Trenching and Backfilling.

3.4 INSTALLATION - VALVES AND HYDRANTS

- A. Set valves on solid bearing.
- B. Center and plumb valve box over valve. Set box cover flush with finished grade.
- C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.
- D. Hydrant shall be installed with the outlets facing the street, with 4-1/2 inch opening no less than 2 feet or more than 7 feet from the street curb or edge of pavement.
- E. The center of the lowest outlet shall be no less than 18 inches above finished grade.
- F. Hydrants to be painted by University in accordance with National Fire Protection Association (NFPA) NFPA 24, edition 2002 requirements.
- G. Where subject to mechanical injury, hydrants to be protected in accordance with the requirements of the applicable editions of National Fire Protection Association (NFPA) 13, 14, and 24, and the appropriate editions of the California Building code and the California Fire Code, so as not to interfere with connection to the outlets.

3.5 CONNECTIONS TO EXISTING WATER SYSTEM

- A. Under no circumstances shall existing lines or utilities be interrupted without prior approval of the University. Submit a request for this approval to the University's Representative, and also state the maximum duration of shutdown. Operation of the central plant governs. The Contractor's schedule may have to be adjusted or work performed during off-hours.
- B. Schedule all outages for utility tie-in work well in advance, and by written notice to the University at least 7 working days in advance of the desired shutdown.
- C. In preparation for tie-ins to the utility systems, the Contractor shall coordinate with the University's Representative before draining and/or blowing the existing piping prior to start of tie-in work by the Contractor. In all cases, the University will close the appropriate valves to isolate the area of work.

3.6 FLUSHING

- A. The entire piping system shall be thoroughly flushed out until acceptance of the University's Representative. All tests shall be conducted at such times as directed by and in the presence of the University's Representative.

3.7 PIPE TESTING

- A. Water piping shall be hydrostatically tested at 150 psi pressure for four hours and proven watertight. Provide all instruments, facilities, and labor to conduct testing and placing in operation.

- B. Piping shall be tested in sections. Testing under this Section of the work shall be done before final connections to existing utility piping is made, with the provision that subsequent leaks, if developed, at these conditions shall be corrected.
- C. Any part of the system, including all accessories, that shows failure during testing shall immediately be repaired or replaced with new materials. The system shall be completely retested after repair for replacement. This procedure shall be repeated, if necessary, until all parts of the system withstand the specified tests. All retesting costs shall be part of the Contract.
- D. Leakage rate shall not exceed 1.5 gallons/hour/1000 feet of pipe over a 2-hour test period.
- E. Tests shall be witnessed by the University's Representative. At least 48 hours notice of tests shall be give.

3.8 DISINFECTION

- A. All domestic water piping shall be disinfected upon installation according to UCM Department of Environmental Health & Safety Standards.
- B. Disinfect fire hydrant lateral and line from point of connection to FH.

3.9 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Section 01 45 00 Quality Control.

3.10 CONSTRUCTION WASTE MANAGMENT

- A. Comply with the applicable provisions of Section 01 74 19 Construction Waste Management and Control including, but not limited to:
 - 1. Separate packaging materials by type and place in locations designated by the Contractor.
 - 2. Place unused scrap material in locations designated by the Contractor.

END OF SECTION 33 11 10



BID PACKAGE #1: SITE GRADING, PAVING, AND SITE UTILITIES

EXHIBIT A – SCOPE OF WORK – REVISION 1

**CENTRAL PLANT/TELECOMMUNICATIONS RELIABILITY UPGRADE (CPTU)
PROJECT NO: 900310
UNIVERSITY OF CALIFORNIA, MERCED**

Bid proposals must be received no later than **2:00pm on September 30, 2014**

Contact: Natalie Ghilain, Sr. Estimator
Phone: 916-441-6870
Fax: 916-441-6138
Email: nghilain@ottoconstruction.com

SCOPE OF WORK

Provide all labor, material, equipment, taxes and supervision necessary to perform all requirements of the following specification sections and drawings, and in complete accordance with the Contract Documents:

SPECIFICATIONS:

Volume 1 dated August 18, 2014
Volume 2 dated August 18, 2014
Geotech Report by Kleinfelder dated June 12, 2014
Potholing Report by Kleinfelder dated July 18, 2014
MEP Design-Assist RFP Documents - FOR REFERENCE & COORDINATION

Including but not limited to:

Division 01 – All Sections.
31 00 00 – Earthwork
31 10 00 – Site Clearing
31 22 10 – Finish Grading
31 23 16.13 – Trenching and Backfilling
32 15 00 – Aggregate Surfacing
32 12 00 – Flexible Paving
33 05 13 – Manholes and Structures
33 11 10 – Water Distribution System
33 40 00 – Storm Drainage

Subcontractor responsible for coordinating with work related to their specification sections.

DRAWINGS:

Central Plant Completion 100% CDs dated August 18, 2014
Campus Emergency Power 100% CDs dated August 18, 2014
Telecommunications Reliability 100% CDs dated August 18, 2014
Campus Water Supply 100% CDs dated August 18, 2014

Work includes, but is not limited to, the following items:

Campus Emergency Power:

1. Site clear & grub.
2. Construct building pad per Civil Drawings and Geotech Report.
3. Fine grade for concrete generator slab.
4. Patch AC Paving at duct bank.
5. Demolition of water line and storm drain, as shown on drawings.
6. New water line and new storm drain, as shown on drawings.
7. Utility trench protection per Cal OSHA as needed.
8. Offhaul of spoils generated by your work **to a location on campus, as directed by UCM Representative.**
9. Temporary gravel entrance into laydown yard.
10. Dust control on a daily basis for your work.
11. Traffic control for your work.
12. Coordinate all deliveries with Otto Construction.
13. **Demo existing 10'x20'x6" concrete slab at service yard. Assume slab is reinforced with #4 @12" o.c. each way at mid-depth.**
14. **Protection of existing surfaces required to complete your work.**

Campus Water Supply:

1. Remove and stockpile aggregate surfacing for installation of new piers, place and recompact after piers are installed.
2. Patch AC Paving at new underground water line.
3. Patch AC Paving around piers at new above ground water line.
4. Water line by Mechanical Contractor – not in Site Utilities scope.
5. **Remove and replace chain link fence as shown on drawings.**
6. **Protection of existing surfaces required to complete your work.**

General Provisions:

1. Examine the conditions under which the work is to be installed from a safety and sequential stand point and notify OTTO CONSTRUCTION in writing immediately if the conditions are unsafe or detrimental to proper performance prior to beginning work. Subcontractor is not to proceed until the required correction has been accomplished or addressed.
2. All work is to comply with the rules and regulations of the governing bodies having jurisdiction.
3. Provide all required certifications, necessary licenses, permits & fees specific to your scope of work.
4. Schedule coordination is of utmost importance. Subcontractor will work closely with OTTO CONSTRUCTION, other trade subcontractors, and inspectors to coordinate all work activities and their required inspections and tests. Provide assistance in establishing and updating the project schedule as needed.
5. Subcontractor to provide OTTO CONSTRUCTION and other trade subcontractors information (drawings, diagrams, data, templates, dimensions, embedments, etc.) for the purpose of coordinating work with other trade subcontractors. Subcontractor shall coordinate all work with the work of other trades through OTTO CONSTRUCTION for proper function and sequence to avoid misinterpretation, interference, and impact.
6. Prepare coordination drawings before beginning fabrication or delivery of materials to the project. Drawings shall include, but not be limited to piping, ducts, conduit, fixtures and equipment for all utilities, and should demonstrate that such items will fit in the space available within the structure.
7. Provide daily reporting to OTTO CONSTRUCTION site personnel, including crew roster.
8. All subcontractors must have qualified superintendent or foreman on site at all times while performing any work.

9. Work shall be performed by skilled tradesmen with experience in performing Subcontractor's work.
10. Specifications and drawings will be provided electronically by OTTO CONSTRUCTION. If hard copy plans or specifications are needed they are available at subcontractor's/supplier's expense.
11. All correspondence shall go through OTTO CONSTRUCTION, including but not limited to: submittals, RFI's, letters, memos, telecommunications, and e-mails. OTTO CONSTRUCTION shall be given ample notice and shall approve any contact with the architect, engineers, consultants, construction manager or government agencies.
12. Prior to starting work, all subcontractors shall attend a pre-installation meeting as required by the specifications or as requested by the construction manager or OTTO CONSTRUCTION.
13. Attend weekly coordination meetings as required.
14. Furnish two copies each of Material Safety and Data Sheets (MSDS) for all materials and products used in performance of the work.
15. Adhere to OTTO CONSTRUCTION'S safety program, including the requirement that all employees possess and wear code compliant personnel protection equipment (i.e. hardhats, boots, appropriate clothing, safety eyewear, etc.) at all times while on the project.
16. Submit a copy of your company's updated and current Injury & Illness Prevention Program and a job specific safety plan prior to mobilizing on the jobsite per contract documents.
17. Provide a schedule of values prior to the submission of first invoice.
18. Submit a draft copy of your monthly invoice by the 20th of each month to OTTO CONSTRUCTION'S Project Manager for review & approval. Billings must be submitted using our format or accompanied by our Application for Payment form, for work performed through the last working day of the month being invoiced. After PM approval, forward the original invoice to our main office by the 5th of the following month. Note, no payments will be made to subcontractors until the followings items are in place:
 - a. Subcontractor to walk site with Otto's Superintendent and Project manager to review billing.
 - b. OTTO CONSTRUCTION is in receipt of payment from the Owner
 - c. The subcontract agreement has been fully executed
 - d. Change Orders for which payment is being requested are fully executed
 - e. Acceptable certificates of insurance and endorsements are provided and current
 - f. Subcontractor and supplier lien releases are provided (each month)
 - g. Certified payroll & other public works paperwork is in compliance, if applicable
 - h. All compliance items required by this project have been submitted using the correct forms
19. Payments for materials or equipment stored on site shall be conditioned upon submission of bills of sale and Owner's approval.
20. Cost quotations for change orders shall include an itemized breakdown of labor, material, equipment and services (including all taxes). Cost quotations from lower-tier subcontractors are required.
21. Change order markups (overhead and profit) shall be per the requirements outlined in the specifications for all tiers of contractors and subcontractors.
22. OTTO CONSTRUCTION shall approve all proposed change orders, quotes and/or pricing prior to proceeding with any extra work.
23. Each subcontractor shall field-verify dimensions, materials, and conditions prior to beginning its work.
24. Provide hoisting, scaffolding, and unloading of materials and/or equipment for work.
25. Provide daily cleanup of work areas, and place debris in trash bins provided by OTTO CONSTRUCTION. Subcontractor shall be required to haul from the jobsite all materials and debris not normally associated with dumpster refuse, including, but not limited to material/debris type, composition, weight, and/or size at their own expense.
26. Keep parking lot and sidewalks clean from soil deposits and other debris relating to your scope of work.
27. Provide traffic plans and traffic controls as required during the delivery and performance of the work. Secure street closure permits as required to perform work. Subcontractor shall provide flagman, safety signs, flashers and barricades necessary to control pedestrian and vehicular traffic.

28. Take necessary precautions to protect all existing items & work in place while performing your scope of work, until acceptance of work.
29. Provide dewatering as required for own work activities.
30. All crane and forklift picks must be coordinated in advance with the project superintendent.
31. Provide electrical cords to distribute power to own work. Temporary electrical distribution boxes will be provided by others at fixed locations.
32. Provide task lighting for work activities. OTTO CONSTRUCTION shall provide access lighting.
33. Subcontractor shall provide temporary utilities if required during shutdown periods caused by own scope of work.
34. Subcontractor shall submit to OTTO CONSTRUCTION a written request for coordination and approval prior to removing any safety barrier and/or guardrail. Subcontractor shall be responsible to provide an alternate approved means of safety precaution and/or a full time watchman for the duration that the safety barrier and/or guardrail are removed.
35. Subcontractor shall remove and replace by day's end any site perimeter fencing necessary to perform its work.
36. Subcontractors will put back in place to their original location, any SWPPP items that are moved resulting from work activities and will notify the on site superintendent of any/all damaged SWPPP items before leaving the site. Any costs associated with non-compliance to the SWPP program or related work will be charged to the violating trades.
37. Furnish trench plate(s) as required, as it relates to scope of work.
38. Perform pre-tests prior to requesting inspections.
39. Pay for additional testing for corrective work.
40. All taxes are included in contract price.



BID PACKAGE #2: CONCRETE/ASPHALT SAWCUTTING

EXHIBIT A – SCOPE OF WORK – **REVISION 1**

**CENTRAL PLANT/TELECOMMUNICATIONS RELIABILITY UPGRADE (CPTU)
PROJECT NO: 900310
UNIVERSITY OF CALIFORNIA, MERCED**

Bid proposals must be received no later than **2:00pm on September 30, 2014**

Contact: Natalie Ghilain, Sr. Estimator
Phone: 916-441-6870
Fax: 916-441-6138
Email: nghilain@ottoconstruction.com

SCOPE OF WORK

Provide all labor, material, equipment, taxes and supervision necessary to perform all requirements of the following specification sections and drawings, and in complete accordance with the Contract Documents:

SPECIFICATIONS:

Volume 1 dated August 18, 2014
Volume 2 dated August 18, 2014
Geotech Report by Kleinfelder dated June 12, 2014
Potholing Report by Kleinfelder dated July 18, 2014
MEP Design-Assist RFP Documents - FOR REFERENCE & COORDINATION

Including but not limited to:

Division 01 – All Sections.

02 41 13 – Selective Site Demolition

Subcontractor responsible for coordinating with work related to their specification sections.

DRAWINGS:

Central Plant Completion 100% CDs dated August 18, 2014
Campus Emergency Power 100% CDs dated August 18, 2014
Telecommunications Reliability 100% CDs dated August 18, 2014
Campus Water Supply 100% CDs dated August 18, 2014

Work includes, but is not limited to, the following items:

Central Plant:

1. Sawcut deck penetrations as shown on CP-M-211B.
2. **Sawcut four (4) 11" roof penetrations for new equalizers.**

3. Protection of existing surfaces required to complete your work.

Campus Emergency Power:

1. Sawcut 9'0"x11'0" opening in concrete wall for new gate.
2. Sawcut concrete slab in Fuel Tank area, as shown on drawings.
3. Sawcut 3'0"x3'0" wall opening for new duct bank.
4. Sawcut pavement for existing duct bank.
5. Sawcut pavement for new duct bank.
- 6. Limits of sawcutting in Fuel Tank area are to extend to sump #4.**
- 7. Protection of existing surfaces required to complete your work.**

Telecommunications Reliability

1. Wall coring at chilled water lines will be by the Mechanical Contractor.
2. Five (5) 4" cores at Telecommunications Building.
- 3. Protection of existing surfaces required to complete your work.**

Campus Water Supply

1. Sawcut AC pavement at new water line.
- 2. Protection of existing surfaces required to complete your work.**

General Provisions:

1. Examine the conditions under which the work is to be installed from a safety and sequential stand point and notify OTTO CONSTRUCTION in writing immediately if the conditions are unsafe or detrimental to proper performance prior to beginning work. Subcontractor is not to proceed until the required correction has been accomplished or addressed.
2. All work is to comply with the rules and regulations of the governing bodies having jurisdiction.
3. Provide all required certifications, necessary licenses, permits & fees specific to your scope of work.
4. Schedule coordination is of utmost importance. Subcontractor will work closely with OTTO CONSTRUCTION, other trade subcontractors, and inspectors to coordinate all work activities and their required inspections and tests. Provide assistance in establishing and updating the project schedule as needed.
5. Subcontractor to provide OTTO CONSTRUCTION and other trade subcontractors information (drawings, diagrams, data, templates, dimensions, embedments, etc.) for the purpose of coordinating work with other trade subcontractors. Subcontractor shall coordinate all work with the work of other trades through OTTO CONSTRUCTION for proper function and sequence to avoid misinterpretation, interference, and impact.
6. Prepare coordination drawings before beginning fabrication or delivery of materials to the project. Drawings shall include, but not be limited to piping, ducts, conduit, fixtures and equipment for all utilities, and should demonstrate that such items will fit in the space available within the structure.
7. Provide daily reporting to OTTO CONSTRUCTION site personnel, including crew roster.
8. All subcontractors must have qualified superintendent or foreman on site at all times while performing any work.
9. Work shall be performed by skilled tradesmen with experience in performing Subcontractor's work.
10. Specifications and drawings will be provided electronically by OTTO CONSTRUCTION. If hard copy plans or specifications are needed they are available at subcontractor's/supplier's expense.
11. All correspondence shall go through OTTO CONSTRUCTION, including but not limited to: submittals, RFI's, letters, memos, telecommunications, and e-mails. OTTO CONSTRUCTION

- shall be given ample notice and shall approve any contact with the architect, engineers, consultants, construction manager or government agencies.
12. Prior to starting work, all subcontractors shall attend a pre-installation meeting as required by the specifications or as requested by the construction manager or OTTO CONSTRUCTION.
 13. Attend weekly coordination meetings as required.
 14. Furnish two copies each of Material Safety and Data Sheets (MSDS) for all materials and products used in performance of the work.
 15. Adhere to OTTO CONSTRUCTION'S safety program, including the requirement that all employees possess and wear code compliant personnel protection equipment (i.e. hardhats, boots, appropriate clothing, safety eyewear, etc.) at all times while on the project.
 16. Submit a copy of your company's updated and current Injury & Illness Prevention Program and a job specific safety plan prior to mobilizing on the jobsite per contract documents.
 17. Provide a schedule of values prior to the submission of first invoice.
 18. Submit a draft copy of your monthly invoice by the 20th of each month to OTTO CONSTRUCTION'S Project Manager for review & approval. Billings must be submitted using our format or accompanied by our Application for Payment form, for work performed through the last working day of the month being invoiced. After PM approval, forward the original invoice to our main office by the 5th of the following month. Note, no payments will be made to subcontractors until the followings items are in place:
 - a. Subcontractor to walk site with Otto's Superintendent and Project manager to review billing.
 - b. OTTO CONSTRUCTION is in receipt of payment from the Owner
 - c. The subcontract agreement has been fully executed
 - d. Change Orders for which payment is being requested are fully executed
 - e. Acceptable certificates of insurance and endorsements are provided and current
 - f. Subcontractor and supplier lien releases are provided (each month)
 - g. Certified payroll & other public works paperwork is in compliance, if applicable
 - h. All compliance items required by this project have been submitted using the correct forms
 19. Payments for materials or equipment stored on site shall be conditioned upon submission of bills of sale and Owner's approval.
 20. Cost quotations for change orders shall include an itemized breakdown of labor, material, equipment and services (including all taxes). Cost quotations from lower-tier subcontractors are required.
 21. Change order markups (overhead and profit) shall be per the requirements outlined in the specifications for all tiers of contractors and subcontractors.
 22. OTTO CONSTRUCTION shall approve all proposed change orders, quotes and/or pricing prior to proceeding with any extra work.
 23. Each subcontractor shall field-verify dimensions, materials, and conditions prior to beginning its work.
 24. Provide hoisting, scaffolding, and unloading of materials and/or equipment for work.
 25. Provide daily cleanup of work areas, and place debris in trash bins provided by OTTO CONSTRUCTION. Subcontractor shall be required to haul from the jobsite all materials and debris not normally associated with dumpster refuse, including, but not limited to material/debris type, composition, weight, and/or size at their own expense.
 26. Keep parking lot and sidewalks clean from soil deposits and other debris relating to your scope of work.
 27. Provide traffic plans and traffic controls as required during the delivery and performance of the work. Secure street closure permits as required to perform work. Subcontractor shall provide flagman, safety signs, flashers and barricades necessary to control pedestrian and vehicular traffic.
 28. Take necessary precautions to protect all existing items & work in place while performing your scope of work, until acceptance of work.
 29. Provide dewatering as required for own work activities.
 30. All crane and forklift picks must be coordinated in advance with the project superintendent.
 31. Provide electrical cords to distribute power to own work. Temporary electrical distribution boxes will be provided by others at fixed locations.

32. Provide task lighting for work activities. OTTO CONSTRUCTION shall provide access lighting.
33. Subcontractor shall provide temporary utilities if required during shutdown periods caused by own scope of work.
34. Subcontractor shall submit to OTTO CONSTRUCTION a written request for coordination and approval prior to removing any safety barrier and/or guardrail. Subcontractor shall be responsible to provide an alternate approved means of safety precaution and/or a full time watchman for the duration that the safety barrier and/or guardrail are removed.
35. Subcontractor shall remove and replace by day's end any site perimeter fencing necessary to perform its work.
36. Subcontractors will put back in place to their original location, any SWPPP items that are moved resulting from work activities and will notify the on site superintendent of any/all damaged SWPPP items before leaving the site. Any costs associated with non-compliance to the SWPP program or related work will be charged to the violating trades.
37. Furnish trench plate(s) as required, as it relates to scope of work.
38. Perform pre-tests prior to requesting inspections.
39. Pay for additional testing for corrective work.
40. All taxes are included in contract price.



BID PACKAGE #3: REBAR, BUILDING CONCRETE & SITE CONCRETE

EXHIBIT A – SCOPE OF WORK – **REVISION 1**

**CENTRAL PLANT/TELECOMMUNICATIONS RELIABILITY UPGRADE (CPTU)
PROJECT NO: 900310
UNIVERSITY OF CALIFORNIA, MERCED**

Bid proposals must be received no later than **2:00pm on September 30, 2014**

Contact: Natalie Ghilain, Sr. Estimator
Phone: 916-441-6870
Fax: 916-441-6138
Email: nghilain@ottoconstruction.com

SCOPE OF WORK

Provide all labor, material, equipment, taxes and supervision necessary to perform all requirements of the following specification sections and drawings, and in complete accordance with the Contract Documents:

SPECIFICATIONS:

Volume 1 dated August 18, 2014
Volume 2 dated August 18, 2014
Geotech Report by Kleinfelder dated June 12, 2014
Potholing Report by Kleinfelder dated July 18, 2014
MEP Design-Assist RFP Documents - FOR REFERENCE & COORDINATION

Including but not limited to:

Division 01 – All Sections.
03 10 00 – Concrete Forming
03 20 00 – Concrete Reinforcement
03 25 00 – Anchors & Dowels in Resin
03 25 30 – Expansion Anchors
03 30 00 – Cast-In-Place Concrete
03 35 00 – Concrete Finishing
03 39 00 – Concrete Curing
03 61 00 – Construction Grout
32 13 13 – Sitework Cast-In-Place Concrete

Subcontractor responsible for coordinating with work related to their specification sections.

DRAWINGS:

Central Plant Completion 100% CDs dated August 18, 2014
Campus Emergency Power 100% CDs dated August 18, 2014
Telecommunications Reliability 100% CDs dated August 18, 2014
Campus Water Supply 100% CDs dated August 18, 2014

Work includes, but is not limited to, the following items:

Central Plant:

1. Rebar and dowels at housekeeping pads, including tie wire and dobies.
2. Form, place, finish, housekeeping pads.
3. Installation of anchor bolts at housekeeping pads as shown on mechanical details. Anchor bolts provided by others.
4. Provide and install epoxy dowels at housekeeping pads.
5. All rebar to be identified and labeled prior to arrival on site.
6. Rebar shop drawings will be required.
7. Coordinate all deliveries with Otto Construction.
8. Clean up all debris related to your scope of work during installation and upon completion.
9. **Protection of existing surfaces required to complete your work.**
10. **Concrete wall repair at removal of ductbank conduit, shown on EP-E-211C. Void is 4" in diameter.**

Campus Emergency Power:

1. Rebar and dowels at Service Yard footings, stem wall, slab, and curb including tie wire and dobies.
2. Form, place, and finish Service Yard footings, stem wall, slab, and curb.
3. Excavate and haul-off spoils **to a location on campus, as directed by UCM Representative.**
4. Confirm layout with Otto Construction.
5. Service Yard housekeeping pads, including epoxy dowels.
6. Concrete pavement replacement at fuel lines, including rebar and epoxy dowels.
7. Include pump as needed for this work.
8. All rebar to be identified and labeled prior to arrival on site.
9. Rebar shop drawings will be required.
10. Coordinate all deliveries with Otto Construction.
11. Clean up all debris related to your scope of work during installation and upon completion.
12. **Install anchor bolts at steel columns. Anchor bolts provided by steel contractor.**
13. **Replacement of concrete sidewalk, valley gutter, and curb & gutter at duct banks shown on EP-E-211C and EP-E-211F, including rebar and epoxy dowels.**
14. **Replacement of concrete at fuel lines is to extend to Sump #4.**
15. **Protection of existing surfaces required to complete your work.**
16. **Concrete repairs at new gate opening in existing concrete wall, as shown on EP-A-800.**
17. **Moisture cut-off system with PVC membrane per Geotech Report.**
18. **Concrete & Rebar at ductbank wall penetration, as shown on 7/EP-E-800, detail added in Addendum 3.**

Campus Water Supply

1. Piers including excavation, haul-off, rebar cages, and concrete.
2. Coordinate location of piers with Mechanical trade partner.
3. Install anchor bolts, furnished by others.
4. Coordinate pour with Otto Construction in advance.
5. Include pump as needed for this work.
6. **Protection of existing surfaces required to complete your work.**

General Provisions:

1. Examine the conditions under which the work is to be installed from a safety and sequential stand point and notify OTTO CONSTRUCTION in writing immediately if the conditions are unsafe or detrimental to proper performance prior to beginning work. Subcontractor is not to proceed until the required correction has been accomplished or addressed.
2. All work is to comply with the rules and regulations of the governing bodies having jurisdiction.
3. Provide all required certifications, necessary licenses, permits & fees specific to your scope of work.
4. Schedule coordination is of utmost importance. Subcontractor will work closely with OTTO CONSTRUCTION, other trade subcontractors, and inspectors to coordinate all work activities and their required inspections and tests. Provide assistance in establishing and updating the project schedule as needed.
5. Subcontractor to provide OTTO CONSTRUCTION and other trade subcontractors information (drawings, diagrams, data, templates, dimensions, embedments, etc.) for the purpose of coordinating work with other trade subcontractors. Subcontractor shall coordinate all work with the work of other trades through OTTO CONSTRUCTION for proper function and sequence to avoid misinterpretation, interference, and impact.
6. Prepare coordination drawings before beginning fabrication or delivery of materials to the project. Drawings shall include, but not be limited to piping, ducts, conduit, fixtures and equipment for all utilities, and should demonstrate that such items will fit in the space available within the structure.
7. Provide daily reporting to OTTO CONSTRUCTION site personnel, including crew roster.
8. All subcontractors must have qualified superintendent or foreman on site at all times while performing any work.
9. Work shall be performed by skilled tradesmen with experience in performing Subcontractor's work.
10. Specifications and drawings will be provided electronically by OTTO CONSTRUCTION. If hard copy plans or specifications are needed they are available at subcontractor's/supplier's expense.
11. All correspondence shall go through OTTO CONSTRUCTION, including but not limited to: submittals, RFI's, letters, memos, telecommunications, and e-mails. OTTO CONSTRUCTION shall be given ample notice and shall approve any contact with the architect, engineers, consultants, construction manager or government agencies.
12. Prior to starting work, all subcontractors shall attend a pre-installation meeting as required by the specifications or as requested by the construction manager or OTTO CONSTRUCTION.
13. Attend weekly coordination meetings as required.
14. Furnish two copies each of Material Safety and Data Sheets (MSDS) for all materials and products used in performance of the work.
15. Adhere to OTTO CONSTRUCTION'S safety program, including the requirement that all employees possess and wear code compliant personnel protection equipment (i.e. hardhats, boots, appropriate clothing, safety eyewear, etc.) at all times while on the project.
16. Submit a copy of your company's updated and current Injury & Illness Prevention Program and a job specific safety plan prior to mobilizing on the jobsite per contract documents.
17. Provide a schedule of values prior to the submission of first invoice.
18. Submit a draft copy of your monthly invoice by the 20th of each month to OTTO CONSTRUCTION'S Project Manager for review & approval. Billings must be submitted using our format or accompanied by our Application for Payment form, for work performed through the last working day of the month being invoiced. After PM approval, forward the original invoice to our main office by the 5th of the following month. Note, no payments will be made to subcontractors until the followings items are in place:
 - a. Subcontractor to walk site with Otto's Superintendent and Project manager to review billing.
 - b. OTTO CONSTRUCTION is in receipt of payment from the Owner
 - c. The subcontract agreement has been fully executed
 - d. Change Orders for which payment is being requested are fully executed
 - e. Acceptable certificates of insurance and endorsements are provided and current
 - f. Subcontractor and supplier lien releases are provided (each month)
 - g. Certified payroll & other public works paperwork is in compliance, if applicable
 - h. All compliance items required by this project have been submitted using the correct forms

19. Payments for materials or equipment stored on site shall be conditioned upon submission of bills of sale and Owner's approval.
20. Cost quotations for change orders shall include an itemized breakdown of labor, material, equipment and services (including all taxes). Cost quotations from lower-tier subcontractors are required.
21. Change order markups (overhead and profit) shall be per the requirements outlined in the specifications for all tiers of contractors and subcontractors.
22. OTTO CONSTRUCTION shall approve all proposed change orders, quotes and/or pricing prior to proceeding with any extra work.
23. Each subcontractor shall field-verify dimensions, materials, and conditions prior to beginning its work.
24. Provide hoisting, scaffolding, and unloading of materials and/or equipment for work.
25. Provide daily cleanup of work areas, and place debris in trash bins provided by OTTO CONSTRUCTION. Subcontractor shall be required to haul from the jobsite all materials and debris not normally associated with dumpster refuse, including, but not limited to material/debris type, composition, weight, and/or size at their own expense.
26. Keep parking lot and sidewalks clean from soil deposits and other debris relating to your scope of work.
27. Provide traffic plans and traffic controls as required during the delivery and performance of the work. Secure street closure permits as required to perform work. Subcontractor shall provide flagman, safety signs, flashers and barricades necessary to control pedestrian and vehicular traffic.
28. Take necessary precautions to protect all existing items & work in place while performing your scope of work, until acceptance of work.
29. Provide dewatering as required for own work activities.
30. All crane and forklift picks must be coordinated in advance with the project superintendent.
31. Provide electrical cords to distribute power to own work. Temporary electrical distribution boxes will be provided by others at fixed locations.
32. Provide task lighting for work activities. OTTO CONSTRUCTION shall provide access lighting.
33. Subcontractor shall provide temporary utilities if required during shutdown periods caused by own scope of work.
34. Subcontractor shall submit to OTTO CONSTRUCTION a written request for coordination and approval prior to removing any safety barrier and/or guardrail. Subcontractor shall be responsible to provide an alternate approved means of safety precaution and/or a full time watchman for the duration that the safety barrier and/or guardrail are removed.
35. Subcontractor shall remove and replace by day's end any site perimeter fencing necessary to perform its work.
36. Subcontractors will put back in place to their original location, any SWPPP items that are moved resulting from work activities and will notify the on site superintendent of any/all damaged SWPPP items before leaving the site. Any costs associated with non-compliance to the SWPP program or related work will be charged to the violating trades.
37. Furnish trench plate(s) as required, as it relates to scope of work.
38. Perform pre-tests prior to requesting inspections.
39. Pay for additional testing for corrective work.
40. All taxes are included in contract price.



BID PACKAGE #4: STRUCTURAL STEEL & MISC. METALS

EXHIBIT A – SCOPE OF WORK – **REVISION 1**

CENTRAL PLANT/TELECOMMUNICATIONS RELIABILITY UPGRADE (CPTU)
PROJECT NO: 900310
UNIVERSITY OF CALIFORNIA, MERCED

Bid proposals must be received no later than **2:00pm on September 30, 2014**

Contact: Natalie Ghilain, Sr. Estimator
Phone: 916-441-6870
Fax: 916-441-6138
Email: nghilain@ottoconstruction.com

SCOPE OF WORK

Provide all labor, material, equipment, taxes and supervision necessary to perform all requirements of the following specification sections and drawings, and in complete accordance with the Contract Documents:

SPECIFICATIONS:

Volume 1 dated August 18, 2014
Volume 2 dated August 18, 2014
Geotech Report by Kleinfelder dated June 12, 2014
Potholing Report by Kleinfelder dated July 18, 2014
MEP Design-Assist RFP Documents - FOR REFERENCE & COORDINATION

Including but not limited to:

Division 01 – All Sections.

05 12 00 – ~~Specific Sections~~ **Structural Steel**

07 81 00 – Applied Fireproofing

Subcontractor responsible for coordinating with work related to their specification sections.

DRAWINGS:

Central Plant Completion 100% CDs dated August 18, 2014
Campus Emergency Power 100% CDs dated August 18, 2014
Telecommunications Reliability 100% CDs dated August 18, 2014
Campus Water Supply 100% CDs dated August 18, 2014

Work includes, but is not limited to, the following items:

Central Plant:

1. Shop drawings.
2. Steel plate reinforcing at existing columns.
3. Steel plate reinforcing at existing trusses.
4. Galvanized steel stair, landing and railing at cooling tower. Refer to sheet CP-M-213B for layout.
5. Prefabricated aluminum stile walk-over stair at roof.
6. Protect all equipment during welding operations.
7. Coordinate with Otto Construction the removal of fire proofing prior installation of column plates.
8. Maintain a clean working area and perform a full clean up upon completion of your scope of work.
9. Coordinate removal of roofing pavers as needed prior to installation of stairs.
10. Plate at column must remain clean of primer; this column must be fire proof upon completion by others.
11. Coordinate rigging of stairs with Otto Construction in advance.
12. All welding, bolts and misc. material required for a complete installation.
- 13. Spray Applied Fireproofing at columns that receive reinforcing plates.**
- 14. Protection of existing surfaces required to complete your work.**

Campus Emergency Power:

1. Shop drawings.
2. All welds must be performed by certified welders.
3. HSS columns at Service Yard, including post base shown on EP-A-800.
4. 1/8" bent plate and nelson studs at HSS columns, as shown on EP-A-800.
5. Canopy framing at Service Yard.
6. 20 ga metal deck at canopy at Service Yard.
7. Steel gate frame and hardware (panels by others) at Service Yard.
8. 1/4" steel plate at gate jambs.
9. Installation will be fully coordinate with Otto Construction and metal siding trade partner.
10. Coordinate delivery with Otto Construction in advance.
11. Provide bolts and pattern layout prior to concrete pour.
12. Misc. steel as required for a complete installation of yard enclosure.
13. All steel must be shop primed and ready to receive paint.
14. Delivery of steel must be coordinate with Otto Construction in advance.
- 15. Joint sealants at steel, as shown on EP-A-800.**
- 16. L2x2x1/8 angle at post base.**

General Provisions:

1. Examine the conditions under which the work is to be installed from a safety and sequential stand point and notify OTTO CONSTRUCTION in writing immediately if the conditions are unsafe or detrimental to proper performance prior to beginning work. Subcontractor is not to proceed until the required correction has been accomplished or addressed.
2. All work is to comply with the rules and regulations of the governing bodies having jurisdiction.
3. Provide all required certifications, necessary licenses, permits & fees specific to your scope of work.
4. Schedule coordination is of utmost importance. Subcontractor will work closely with OTTO

CONSTRUCTION, other trade subcontractors, and inspectors to coordinate all work activities and their required inspections and tests. Provide assistance in establishing and updating the project schedule as needed.

5. Subcontractor to provide OTTO CONSTRUCTION and other trade subcontractors information (drawings, diagrams, data, templates, dimensions, embedments, etc.) for the purpose of coordinating work with other trade subcontractors. Subcontractor shall coordinate all work with the work of other trades through OTTO CONSTRUCTION for proper function and sequence to avoid misinterpretation, interference, and impact.
6. Prepare coordination drawings before beginning fabrication or delivery of materials to the project. Drawings shall include, but not be limited to piping, ducts, conduit, fixtures and equipment for all utilities, and should demonstrate that such items will fit in the space available within the structure.
7. Provide daily reporting to OTTO CONSTRUCTION site personnel, including crew roster.
8. All subcontractors must have qualified superintendent or foreman on site at all times while performing any work.
9. Work shall be performed by skilled tradesmen with experience in performing Subcontractor's work.
10. Specifications and drawings will be provided electronically by OTTO CONSTRUCTION. If hard copy plans or specifications are needed they are available at subcontractor's/supplier's expense.
11. All correspondence shall go through OTTO CONSTRUCTION, including but not limited to: submittals, RFI's, letters, memos, telecommunications, and e-mails. OTTO CONSTRUCTION shall be given ample notice and shall approve any contact with the architect, engineers, consultants, construction manager or government agencies.
12. Prior to starting work, all subcontractors shall attend a pre-installation meeting as required by the specifications or as requested by the construction manager or OTTO CONSTRUCTION.
13. Attend weekly coordination meetings as required.
14. Furnish two copies each of Material Safety and Data Sheets (MSDS) for all materials and products used in performance of the work.
15. Adhere to OTTO CONSTRUCTION'S safety program, including the requirement that all employees possess and wear code compliant personnel protection equipment (i.e. hardhats, boots, appropriate clothing, safety eyewear, etc.) at all times while on the project.
16. Submit a copy of your company's updated and current Injury & Illness Prevention Program and a job specific safety plan prior to mobilizing on the jobsite per contract documents.
17. Provide a schedule of values prior to the submission of first invoice.
18. Submit a draft copy of your monthly invoice by the 20th of each month to OTTO CONSTRUCTION'S Project Manager for review & approval. Billings must be submitted using our format or accompanied by our Application for Payment form, for work performed through the last working day of the month being invoiced. After PM approval, forward the original invoice to our main office by the 5th of the following month. Note, no payments will be made to subcontractors until the followings items are in place:
 - a. Subcontractor to walk site with Otto's Superintendent and Project manager to review billing.
 - b. OTTO CONSTRUCTION is in receipt of payment from the Owner
 - c. The subcontract agreement has been fully executed
 - d. Change Orders for which payment is being requested are fully executed
 - e. Acceptable certificates of insurance and endorsements are provided and current
 - f. Subcontractor and supplier lien releases are provided (each month)
 - g. Certified payroll & other public works paperwork is in compliance, if applicable
 - h. All compliance items required by this project have been submitted using the correct forms
19. Payments for materials or equipment stored on site shall be conditioned upon submission of bills of sale and Owner's approval.
20. Cost quotations for change orders shall include an itemized breakdown of labor, material, equipment and services (including all taxes). Cost quotations from lower-tier subcontractors are required.
21. Change order markups (overhead and profit) shall be per the requirements outlined in the specifications for all tiers of contractors and subcontractors.

22. OTTO CONSTRUCTION shall approve all proposed change orders, quotes and/or pricing prior to proceeding with any extra work.
23. Each subcontractor shall field-verify dimensions, materials, and conditions prior to beginning its work.
24. Provide hoisting, scaffolding, and unloading of materials and/or equipment for work.
25. Provide daily cleanup of work areas, and place debris in trash bins provided by OTTO CONSTRUCTION. Subcontractor shall be required to haul from the jobsite all materials and debris not normally associated with dumpster refuse, including, but not limited to material/debris type, composition, weight, and/or size at their own expense.
26. Keep parking lot and sidewalks clean from soil deposits and other debris relating to your scope of work.
27. Provide traffic plans and traffic controls as required during the delivery and performance of the work. Secure street closure permits as required to perform work. Subcontractor shall provide flagman, safety signs, flashers and barricades necessary to control pedestrian and vehicular traffic.
28. Take necessary precautions to protect all existing items & work in place while performing your scope of work, until acceptance of work.
29. Provide dewatering as required for own work activities.
30. All crane and forklift picks must be coordinated in advance with the project superintendent.
31. Provide electrical cords to distribute power to own work. Temporary electrical distribution boxes will be provided by others at fixed locations.
32. Provide task lighting for work activities. OTTO CONSTRUCTION shall provide access lighting.
33. Subcontractor shall provide temporary utilities if required during shutdown periods caused by own scope of work.
34. Subcontractor shall submit to OTTO CONSTRUCTION a written request for coordination and approval prior to removing any safety barrier and/or guardrail. Subcontractor shall be responsible to provide an alternate approved means of safety precaution and/or a full time watchman for the duration that the safety barrier and/or guardrail are removed.
35. Subcontractor shall remove and replace by day's end any site perimeter fencing necessary to perform its work.
36. Subcontractors will put back in place to their original location, any SWPPP items that are moved resulting from work activities and will notify the on site superintendent of any/all damaged SWPPP items before leaving the site. Any costs associated with non-compliance to the SWPPP program or related work will be charged to the violating trades.
37. Furnish trench plate(s) as required, as it relates to scope of work.
38. Perform pre-tests prior to requesting inspections.
39. Pay for additional testing for corrective work.
40. All taxes are included in contract price.



BID PACKAGE #5: ROOF PATCHING, METAL PANELS & ARCHITECTURAL SHEET METAL

EXHIBIT A – SCOPE OF WORK – **REVISION 1**

**CENTRAL PLANT/TELECOMMUNICATIONS RELIABILITY UPGRADE (CPTU)
PROJECT NO: 900310
UNIVERSITY OF CALIFORNIA, MERCED**

Bid proposals must be received no later than **2:00pm on September 30, 2014**

Contact: Natalie Ghilain, Sr. Estimator
Phone: 916-441-6870
Fax: 916-441-6138
Email: nghilain@ottoconstruction.com

SCOPE OF WORK

Provide all labor, material, equipment, taxes and supervision necessary to perform all requirements of the following specification sections and drawings, and in complete accordance with the Contract Documents:

SPECIFICATIONS:

Volume 1 dated August 18, 2014
Volume 2 dated August 18, 2014
Geotech Report by Kleinfelder dated June 12, 2014
Potholing Report by Kleinfelder dated July 18, 2014
MEP Design-Assist RFP Documents - FOR REFERENCE & COORDINATION

Including but not limited to:

Division 01 – All Sections.

05 05 13 – Shop Applied Metal Finishes
07 42 13.26 – Exposed Fastener Metal Wall Panels

Subcontractor responsible for coordinating with work related to their specification sections.

DRAWINGS:

Central Plant Completion 100% CDs dated August 18, 2014
Campus Emergency Power 100% CDs dated August 18, 2014
Telecommunications Reliability 100% CDs dated August 18, 2014
Campus Water Supply 100% CDs dated August 18, 2014

Work includes, but is not limited to, the following items:

Central Plant Completion:

1. Roof patching at new rooftop equipment and curbs, including cutting roof pavers as necessary, and modifying membrane below pavers to maintain a watertight roofing system.
2. Coordinate removal of debris with Otto Construction.
3. Joint sealants, as needed, to complete your work.
4. Protection of existing surfaces required to complete your work.

Campus Emergency Power:

1. Metal wall panels at Service Yard, include powder coating.
2. 20 ga formed channel at screen wall columns.
3. 22 ga screen wall cap at Service Yard, include powder coating.
4. 22 ga flashing at canopy at Service Yard.
5. 22 ga gutter and downspout at canopy at Service Yard, include powder coating.
6. Gate panels at Service Yard, include powder coating.
7. All miscellaneous materials required for a complete installation of metal panel system.
8. Protection of existing surfaces required to complete your work.
9. Fluid-applied waterproofing at wall infill shown on EP-E-211C. Infill is 4" in diameter.
10. Fluid-applied waterproofing at ductbank penetration shown on EP-E-211C.

General Provisions:

1. Examine the conditions under which the work is to be installed from a safety and sequential stand point and notify OTTO CONSTRUCTION in writing immediately if the conditions are unsafe or detrimental to proper performance prior to beginning work. Subcontractor is not to proceed until the required correction has been accomplished or addressed.
2. All work is to comply with the rules and regulations of the governing bodies having jurisdiction.
3. Provide all required certifications, necessary licenses, permits & fees specific to your scope of work.
4. Schedule coordination is of utmost importance. Subcontractor will work closely with OTTO CONSTRUCTION, other trade subcontractors, and inspectors to coordinate all work activities and their required inspections and tests. Provide assistance in establishing and updating the project schedule as needed.
5. Subcontractor to provide OTTO CONSTRUCTION and other trade subcontractors information (drawings, diagrams, data, templates, dimensions, embedments, etc.) for the purpose of coordinating work with other trade subcontractors. Subcontractor shall coordinate all work with the work of other trades through OTTO CONSTRUCTION for proper function and sequence to avoid misinterpretation, interference, and impact.
6. Prepare coordination drawings before beginning fabrication or delivery of materials to the project. Drawings shall include, but not be limited to piping, ducts, conduit, fixtures and equipment for all utilities, and should demonstrate that such items will fit in the space available within the structure.
7. Provide daily reporting to OTTO CONSTRUCTION site personnel, including crew roster.
8. All subcontractors must have qualified superintendent or foreman on site at all times while performing any work.
9. Work shall be performed by skilled tradesmen with experience in performing Subcontractor's work.
10. Specifications and drawings will be provided electronically by OTTO CONSTRUCTION. If hard copy plans or specifications are needed they are available at subcontractor's/supplier's expense.
11. All correspondence shall go through OTTO CONSTRUCTION, including but not limited to: submittals, RFI's, letters, memos, telecommunications, and e-mails. OTTO CONSTRUCTION shall be given ample notice and shall approve any contact with the architect, engineers, consultants, construction manager or government agencies.

12. Prior to starting work, all subcontractors shall attend a pre-installation meeting as required by the specifications or as requested by the construction manager or OTTO CONSTRUCTION.
13. Attend weekly coordination meetings as required.
14. Furnish two copies each of Material Safety and Data Sheets (MSDS) for all materials and products used in performance of the work.
15. Adhere to OTTO CONSTRUCTION'S safety program, including the requirement that all employees possess and wear code compliant personnel protection equipment (i.e. hardhats, boots, appropriate clothing, safety eyewear, etc.) at all times while on the project.
16. Submit a copy of your company's updated and current Injury & Illness Prevention Program and a job specific safety plan prior to mobilizing on the jobsite per contract documents.
17. Provide a schedule of values prior to the submission of first invoice.
18. Submit a draft copy of your monthly invoice by the 20th of each month to OTTO CONSTRUCTION'S Project Manager for review & approval. Billings must be submitted using our format or accompanied by our Application for Payment form, for work performed through the last working day of the month being invoiced. After PM approval, forward the original invoice to our main office by the 5th of the following month. Note, no payments will be made to subcontractors until the followings items are in place:
 - a. Subcontractor to walk site with Otto's Superintendent and Project manager to review billing.
 - b. OTTO CONSTRUCTION is in receipt of payment from the Owner
 - c. The subcontract agreement has been fully executed
 - d. Change Orders for which payment is being requested are fully executed
 - e. Acceptable certificates of insurance and endorsements are provided and current
 - f. Subcontractor and supplier lien releases are provided (each month)
 - g. Certified payroll & other public works paperwork is in compliance, if applicable
 - h. All compliance items required by this project have been submitted using the correct forms
19. Payments for materials or equipment stored on site shall be conditioned upon submission of bills of sale and Owner's approval.
20. Cost quotations for change orders shall include an itemized breakdown of labor, material, equipment and services (including all taxes). Cost quotations from lower-tier subcontractors are required.
21. Change order markups (overhead and profit) shall be per the requirements outlined in the specifications for all tiers of contractors and subcontractors.
22. OTTO CONSTRUCTION shall approve all proposed change orders, quotes and/or pricing prior to proceeding with any extra work.
23. Each subcontractor shall field-verify dimensions, materials, and conditions prior to beginning its work.
24. Provide hoisting, scaffolding, and unloading of materials and/or equipment for work.
25. Provide daily cleanup of work areas, and place debris in trash bins provided by OTTO CONSTRUCTION. Subcontractor shall be required to haul from the jobsite all materials and debris not normally associated with dumpster refuse, including, but not limited to material/debris type, composition, weight, and/or size at their own expense.
26. Keep parking lot and sidewalks clean from soil deposits and other debris relating to your scope of work.
27. Provide traffic plans and traffic controls as required during the delivery and performance of the work. Secure street closure permits as required to perform work. Subcontractor shall provide flagman, safety signs, flashers and barricades necessary to control pedestrian and vehicular traffic.
28. Take necessary precautions to protect all existing items & work in place while performing your scope of work, until acceptance of work.
29. Provide dewatering as required for own work activities.
30. All crane and forklift picks must be coordinated in advance with the project superintendent.
31. Provide electrical cords to distribute power to own work. Temporary electrical distribution boxes will be provided by others at fixed locations.
32. Provide task lighting for work activities. OTTO CONSTRUCTION shall provide access lighting.
33. Subcontractor shall provide temporary utilities if required during shutdown periods caused by own

scope of work.

34. Subcontractor shall submit to OTTO CONSTRUCTION a written request for coordination and approval prior to removing any safety barrier and/or guardrail. Subcontractor shall be responsible to provide an alternate approved means of safety precaution and/or a full time watchman for the duration that the safety barrier and/or guardrail are removed.
35. Subcontractor shall remove and replace by day's end any site perimeter fencing necessary to perform its work.
36. Subcontractors will put back in place to their original location, any SWPPP items that are moved resulting from work activities and will notify the on site superintendent of any/all damaged SWPPP items before leaving the site. Any costs associated with non-compliance to the SWPP program or related work will be charged to the violating trades.
37. Furnish trench plate(s) as required, as it relates to scope of work.
38. Perform pre-tests prior to requesting inspections.
39. Pay for additional testing for corrective work.
40. All taxes are included in contract price.



BID PACKAGE #6: PAINTING

EXHIBIT A – SCOPE OF WORK – **REVISION 1**

**CENTRAL PLANT/TELECOMMUNICATIONS RELIABILITY UPGRADE (CPTU)
PROJECT NO: 900310
UNIVERSITY OF CALIFORNIA, MERCED**

Bid proposals must be received no later than **2:00pm on September 30, 2014**

Contact: Natalie Ghilain, Sr. Estimator
Phone: 916-441-6870
Fax: 916-441-6138
Email: nghilain@ottoconstruction.com

SCOPE OF WORK

Provide all labor, material, equipment, taxes and supervision necessary to perform all requirements of the following specification sections and drawings, and in complete accordance with the Contract Documents:

SPECIFICATIONS:

Volume 1 dated August 18, 2014
Volume 2 dated August 18, 2014
Geotech Report by Kleinfelder dated June 12, 2014
Potholing Report by Kleinfelder dated July 18, 2014
MEP Design-Assist RFP Documents - FOR REFERENCE & COORDINATION

Including but not limited to:

Division 01 – All Sections.

09 90 00 – Painting & Protective Coatings

Subcontractor responsible for coordinating with work related to their specification sections.

DRAWINGS:

Central Plant Completion 100% CDs dated August 18, 2014
Campus Emergency Power 100% CDs dated August 18, 2014
Telecommunications Reliability 100% CDs dated August 18, 2014
Campus Water Supply 100% CDs dated August 18, 2014

Work includes, but is not limited to, the following items:

Central Plant:

1. Prep, prime, and paint new steel plates at existing trusses.
2. **Patch epoxy flooring at new housekeeping pads. For bid purposes, assume a 24" strip around each pad.**

Campus Emergency Power:

1. Prep, prime, and paint new HSS columns at Service Yard.
2. Prep, prime, and paint new tube steel gate frame at Service Yard.
3. Prep, prime, and paint new metal deck at canopy at Service Yard.

Telecommunications Reliability

1. Prep, prime, and paint all interior walls at Telecom Room #OM4.
2. **Include 32 hours of touch-up painting.**

Campus Water Supply

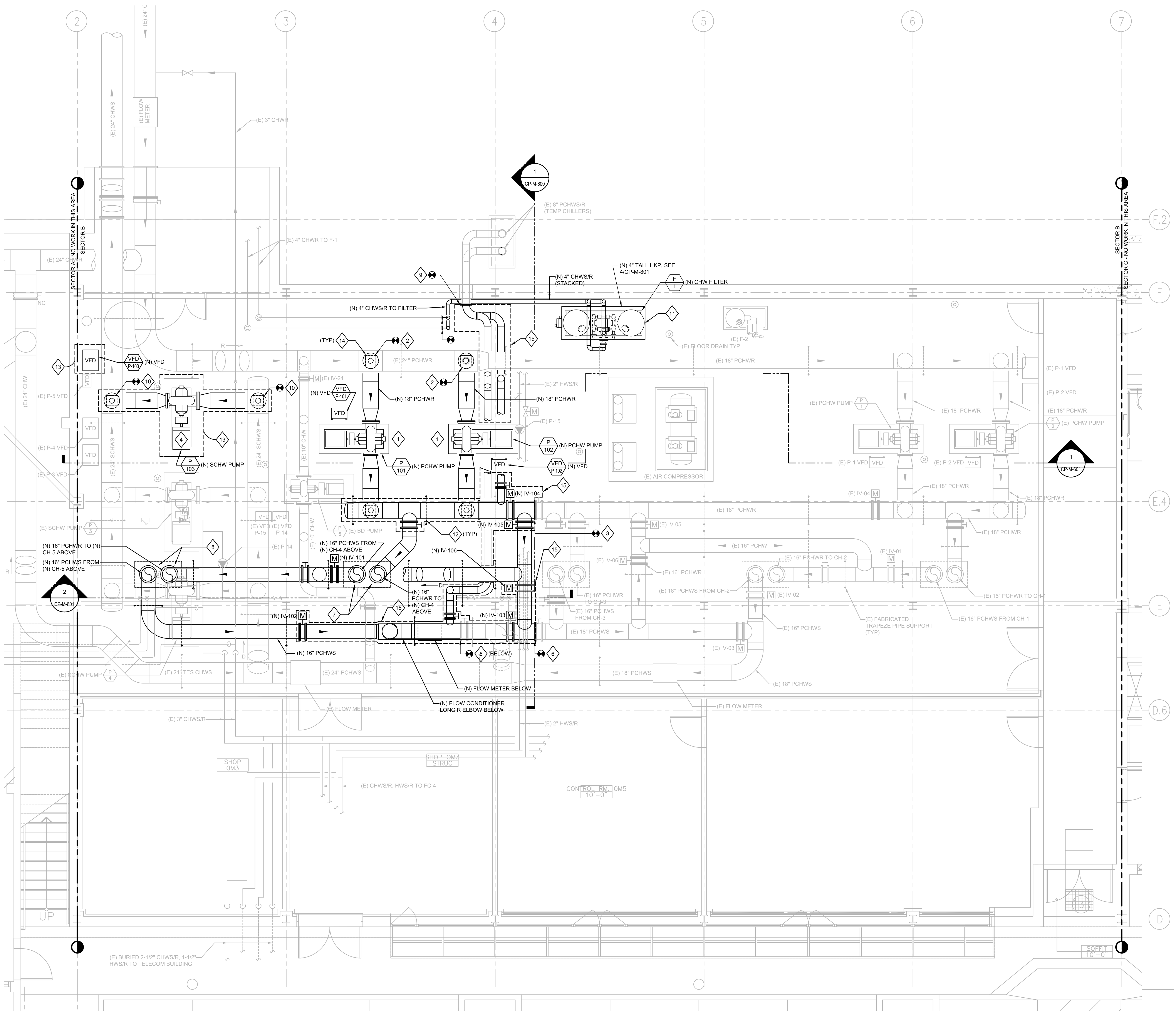
1. Prep, prime, and paint above-grade water piping to match existing.

General Provisions:

1. Examine the conditions under which the work is to be installed from a safety and sequential stand point and notify OTTO CONSTRUCTION in writing immediately if the conditions are unsafe or detrimental to proper performance prior to beginning work. Subcontractor is not to proceed until the required correction has been accomplished or addressed.
2. All work is to comply with the rules and regulations of the governing bodies having jurisdiction.
3. Provide all required certifications, necessary licenses, permits & fees specific to your scope of work.
4. Schedule coordination is of utmost importance. Subcontractor will work closely with OTTO CONSTRUCTION, other trade subcontractors, and inspectors to coordinate all work activities and their required inspections and tests. Provide assistance in establishing and updating the project schedule as needed.
5. Subcontractor to provide OTTO CONSTRUCTION and other trade subcontractors information (drawings, diagrams, data, templates, dimensions, embedments, etc.) for the purpose of coordinating work with other trade subcontractors. Subcontractor shall coordinate all work with the work of other trades through OTTO CONSTRUCTION for proper function and sequence to avoid misinterpretation, interference, and impact.
6. Prepare coordination drawings before beginning fabrication or delivery of materials to the project. Drawings shall include, but not be limited to piping, ducts, conduit, fixtures and equipment for all utilities, and should demonstrate that such items will fit in the space available within the structure.
7. Provide daily reporting to OTTO CONSTRUCTION site personnel, including crew roster.
8. All subcontractors must have qualified superintendent or foreman on site at all times while performing any work.
9. Work shall be performed by skilled tradesmen with experience in performing Subcontractor's work.
10. Specifications and drawings will be provided electronically by OTTO CONSTRUCTION. If hard copy plans or specifications are needed they are available at subcontractor's/supplier's expense.

11. All correspondence shall go through OTTO CONSTRUCTION, including but not limited to: submittals, RFI's, letters, memos, telecommunications, and e-mails. OTTO CONSTRUCTION shall be given ample notice and shall approve any contact with the architect, engineers, consultants, construction manager or government agencies.
12. Prior to starting work, all subcontractors shall attend a pre-installation meeting as required by the specifications or as requested by the construction manager or OTTO CONSTRUCTION.
13. Attend weekly coordination meetings as required.
14. Furnish two copies each of Material Safety and Data Sheets (MSDS) for all materials and products used in performance of the work.
15. Adhere to OTTO CONSTRUCTION'S safety program, including the requirement that all employees possess and wear code compliant personnel protection equipment (i.e. hardhats, boots, appropriate clothing, safety eyewear, etc.) at all times while on the project.
16. Submit a copy of your company's updated and current Injury & Illness Prevention Program and a job specific safety plan prior to mobilizing on the jobsite per contract documents.
17. Provide a schedule of values prior to the submission of first invoice.
18. Submit a draft copy of your monthly invoice by the 20th of each month to OTTO CONSTRUCTION'S Project Manager for review & approval. Billings must be submitted using our format or accompanied by our Application for Payment form, for work performed through the last working day of the month being invoiced. After PM approval, forward the original invoice to our main office by the 5th of the following month. Note, no payments will be made to subcontractors until the followings items are in place:
 - a. Subcontractor to walk site with Otto's Superintendent and Project manager to review billing.
 - b. OTTO CONSTRUCTION is in receipt of payment from the Owner
 - c. The subcontract agreement has been fully executed
 - d. Change Orders for which payment is being requested are fully executed
 - e. Acceptable certificates of insurance and endorsements are provided and current
 - f. Subcontractor and supplier lien releases are provided (each month)
 - g. Certified payroll & other public works paperwork is in compliance, if applicable
 - h. All compliance items required by this project have been submitted using the correct forms
19. Payments for materials or equipment stored on site shall be conditioned upon submission of bills of sale and Owner's approval.
20. Cost quotations for change orders shall include an itemized breakdown of labor, material, equipment and services (including all taxes). Cost quotations from lower-tier subcontractors are required.
21. Change order markups (overhead and profit) shall be per the requirements outlined in the specifications for all tiers of contractors and subcontractors.
22. OTTO CONSTRUCTION shall approve all proposed change orders, quotes and/or pricing prior to proceeding with any extra work.
23. Each subcontractor shall field-verify dimensions, materials, and conditions prior to beginning its work.
24. Provide hoisting, scaffolding, and unloading of materials and/or equipment for work.
25. Provide daily cleanup of work areas, and place debris in trash bins provided by OTTO CONSTRUCTION. Subcontractor shall be required to haul from the jobsite all materials and debris not normally associated with dumpster refuse, including, but not limited to material/debris type, composition, weight, and/or size at their own expense.
26. Keep parking lot and sidewalks clean from soil deposits and other debris relating to your scope of work.
27. Provide traffic plans and traffic controls as required during the delivery and performance of the work. Secure street closure permits as required to perform work. Subcontractor shall provide flagman, safety signs, flashers and barricades necessary to control pedestrian and vehicular traffic.
28. Take necessary precautions to protect all existing items & work in place while performing your scope of work, until acceptance of work.
29. Provide dewatering as required for own work activities.

30. All crane and forklift picks must be coordinated in advance with the project superintendent.
31. Provide electrical cords to distribute power to own work. Temporary electrical distribution boxes will be provided by others at fixed locations.
32. Provide task lighting for work activities. OTTO CONSTRUCTION shall provide access lighting.
33. Subcontractor shall provide temporary utilities if required during shutdown periods caused by own scope of work.
34. Subcontractor shall submit to OTTO CONSTRUCTION a written request for coordination and approval prior to removing any safety barrier and/or guardrail. Subcontractor shall be responsible to provide an alternate approved means of safety precaution and/or a full time watchman for the duration that the safety barrier and/or guardrail are removed.
35. Subcontractor shall remove and replace by day's end any site perimeter fencing necessary to perform its work.
36. Subcontractors will put back in place to their original location, any SWPPP items that are moved resulting from work activities and will notify the on site superintendent of any/all damaged SWPPP items before leaving the site. Any costs associated with non-compliance to the SWPP program or related work will be charged to the violating trades.
37. Furnish trench plate(s) as required, as it relates to scope of work.
38. Perform pre-tests prior to requesting inspections.
39. Pay for additional testing for corrective work.
40. All taxes are included in contract price.



1 MECHANICAL PLAN LEVEL 1 - SECTOR B
SCALE: 1/4" = 1'-0"



GENERAL NOTES

- MAKE-READY WORK REQUIRED. SMALL-BORE BRANCH PIPES, CONDUITS, SUPPORTS AND SEISMIC CABLE BRACE RELOCATIONS ARE REQUIRED AND SHALL BE COMPLETED PRIOR TO INSTALLATION OF NEW EQUIPMENT. SEE MAKE-READY PLANS.
- SEE DRAWINGS CP-M-700 AND CP-M-701 FOR PIPE SIZES, TYPES AND LOCATIONS FOR DEVICES, AND EQUIPMENT PIPING CONNECTIONS.

- INDICATES EXISTING FABRICATED TRAPEZE PIPE SUPPORT
- INDICATES NEW FABRICATED TRAPEZE PIPE SUPPORT

AUTOMATIC FIRE SPRINKLER WORK

THE CENTRAL PLANT IS FITTED WITH AN EXISTING AUTOMATIC FIRE SPRINKLER SYSTEM. THE CONTRACTOR SHALL MODIFY THE EXISTING SYSTEM AS REQUIRED SO THAT IT REMAINS CODE-COMPLIANT UPON COMPLETION OF THE NEW WORK SHOWN ON THESE DRAWINGS. AUTOMATIC FIRE SPRINKLER WORK INCLUDES BUT IS NOT LIMITED TO:

- REMOVING EXISTING SPRINKLER HEADS THAT ARE OBSTRUCTED BY THE INSTALLATION OF NEW PIPES, DUCTS AND EQUIPMENT. IF THE EXISTING BRANCH PIPE IS NOT REUSED FOR A NEW SPRINKLER HEAD, STRIP-BACK THE EXISTING BRANCH PIPE AND SUPPORTS TO THE NEAREST EXISTING BRANCH MAIN AND CAP.
- PROVIDING NEW SPRINKLER HEADS THAT MAY BE REQUIRED TO ACHIEVE THE PROPER SPRINKLER COVERAGE, HEAD SPACING, DISTANCES FROM OBSTRUCTIONS, AND SIMILAR CODE-GOVERNED REQUIREMENTS. THIS MAY INCLUDE INSTALLATION OF NEW BRANCH PIPES, PIPE SUPPORTS, AND TAPS INTO THE EXISTING BRANCH MAINS.
- REMOVAL OF EXISTING SPRINKLER HEADS, PIPES AND SUPPORTS THAT ARE IN SPATIAL CONFLICT WITH THE LOCATIONS OF NEW PIPES, DUCTS AND EQUIPMENT. THIS MAY INCLUDE INSTALLING NEW SPRINKLERS, BRANCH PIPES, AND PIPE SUPPORTS TO AVOID SPATIAL CONFLICTS.

PRIOR TO CONSTRUCTION, SUBMIT SHOP DRAWINGS, PRODUCT DATA AND HYDRAULIC CALCULATIONS FOR APPROVAL PREPARED BY A CALIFORNIA-LICENSED C16 FIRE PROTECTION CONTRACTOR. THE SHOP DRAWINGS SHALL SHOW ALL FIRE SPRINKLER WORK REQUIRED TO PROVIDE A COMPLETE, OPERATIONAL AND CODE-COMPLIANT FIRE SPRINKLER SYSTEM. DO NOT REUSE EXISTING SPRINKLER HEADS, PIPES, PIPE SUPPORTS OR STRUCTURAL ATTACHMENTS. ALL WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS.

SHEET NOTES

- NEW PRIMARY CHILLED WATER PUMP. PLACE ON NEW CONCRETE HOUSEKEEPING PAD, INSTALL PER 1/CP-M-800 (TYP OF 2).
- POC FOR NEW 18" PCHWR AT EXISTING BVF. TIE-IN NEW TO EXISTING (TYP OF 2).
- POC FOR NEW 18" PCHWR PUMP DISCHARGE HEADER. TIE-IN NEW TO EXISTING.
- NEW SECONDARY CHILLED WATER PUMP. PLACE ON NEW CONCRETE HOUSEKEEPING PAD, PIPE PER 2/CP-M-800. SEE NOTE 13 BELOW.
- POC FOR NEW 18" PCHWS PIPE. TIE-IN NEW TO EXISTING.
- POC FOR NEW 18" PCHWS PIPE. TIE-IN NEW TO EXISTING.
- NEW 18" PCHWS/R PIPES UP THROUGH FLOOR TO NEW CHILLER CH-4. SEE 1/CP-M-212B FOR CONTINUATION. SEE 5/CP-M-800.
- NEW 18" PCHWS/R PIPES UP THROUGH FLOOR TO NEW CHILLER CH-5. SEE 1/CP-M-212B FOR CONTINUATION. SEE 5/CP-M-800.
- POC FOR 8" PCHWS/R SERVING REMOTE TEMPORARY AIR-COOLED CHILLER.
- POC FOR NEW 18" SCHWS AT EXISTING BVF. TIE-IN NEW TO EXISTING (TYP OF 2). SEE NOTE 13 BELOW.
- NEW CHILLED WATER FILTER F-1. TIE BACKWASH DRAIN INTO EXISTING 2". TIE NEW TO EXISTING ICW. RE-ROUTE 4" CHWS/R PIPING TO OFFSET OVER AGAINST CONCRETE WALL. PLACE NEW HOUSEKEEPING PAD AND ANCHOR PER 4/CP-M-801.
- NEW FABRICATED TRAPEZE PIPE SUPPORT. SEE 7/CP-M-800.
- SCHW PUMP P-103 AND ASSOCIATED HKP. VFD. PIPING, FITTINGS, VALVES, ELBOW SUPPORTS, COMPONENTS AND ACCESSORIES FROM SUCTION ISOLATION VALVE P.O.C. TO DISCHARGE ISOLATION VALVE P.O.C. ARE TO BE PRICED SEPARATELY AS DEDUCT BID ALTERNATE NO 4.
- NEW ELBOW PIPE SUPPORT (TYPICAL AT ALL PUMP INLET/DISCHARGE PIPING ELBOWS) SEE 4/CP-M-800.
- ALL CHILLED WATER PIPES REQUIRED TO CONNECT AND OPERATE THE UNIVERSITY'S EMERGENCY AIR-COOLED CHILLERS MUST BE COMPLETE AND OPERATIONAL PRIOR MAY 1, 2015, OR A LATER DATE IF AGREEABLE TO THE UNIVERSITY. THIS INCLUDES RELATED BRANCH AND HEADER PIPES, AND THE EXISTING PRIMARY CHILLED WATER PUMPS. THE WORK TO CONNECT AND OPERATE THE EMERGENCY AIR-COOLED CHILLERS DOES NOT REQUIRE THE NEW WATER-COOLED CHILLERS (CH-4 AND CH-5) TO BE OPERATIONAL.



University of California
Merced, California

Project Name:
Central Plant/
Telecommunications
Reliability Upgrade
CENTRAL PLANT
COMPLETION

Project Number: 900310

Prime Engineer

- Consultants:
- ARCHITECT:
SIEGFRIED
3244 BROOKSIDE RD, SUITE 100
STOCKTON, CA 94104
(209) 943-2021
 - CIVIL ENGINEER:
SIEGFRIED
3244 BROOKSIDE RD, SUITE 100
STOCKTON, CA 94104
(209) 943-2021
 - STRUCTURAL ENGINEER:
FORELL / ELSSESSER ENGINEERS
160 FINE ST
SAN FRANCISCO, CA 94111
(415) 637-0700
 - COST ESTIMATOR:
AECOM
300 CALIFORNIA ST, SUITE 400
SAN FRANCISCO, CA 94104
(415) 981-1419

UNIVERSITY OF CALIFORNIA
MERCED FIRE MARSHAL
CDF-OFFICE OF STATE FIRE
MARSHAL APPROVED

Approval of this plan does not authorize or
approve any omission or deviation from
applicable regulations. Final approval is subject
to field inspection. One set of approved plans
shall be available on the project site at all times.
Reviewed By:
Project #: 900310
Authorization #:

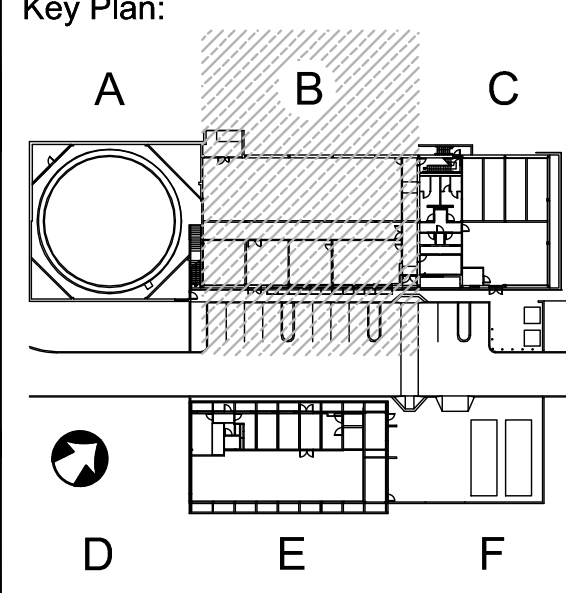
Seal and Signature



Drawing Stage:
100% CONSTRUCTION
DOCUMENTS

No.	Description	Issue Date
	100% DESIGN DEVELOPMENT	04.28.14
	90% CONSTRUCTION DOCUMENTS	06.06.14
	90% CONSTRUCTION DOCUMENTS	07.16.14
	100% CONSTRUCTION DOCUMENTS	08.16.14
1	ADDENDUM NO. 3	09.23.14

Drawn By: AEI
Revision Date: 09.23.14
Plot Date: 09.23.14
Scale: AS SHOWN

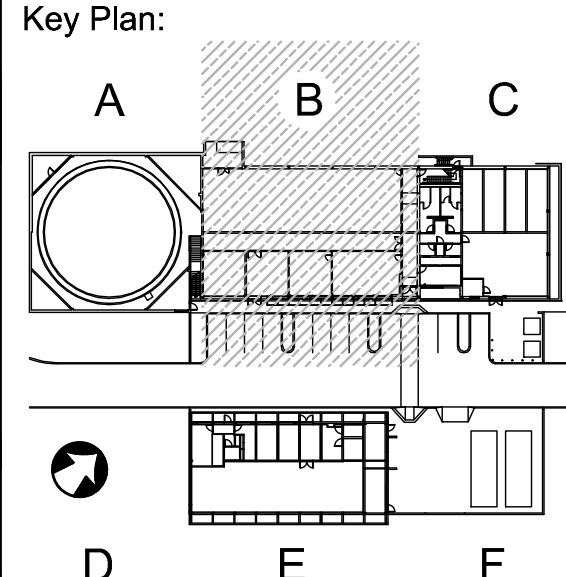


Drawing Title
MECHANICAL PLAN
LEVEL 1
SECTOR B

Drawing Number:

CP-M-211B

No.	Description	Issue Date
	100% DESIGN DEVELOPMENT	04.28.14
	90% CONSTRUCTION DOCUMENTS	06.06.14
	90% CONSTRUCTION DOCUMENTS	07.16.14
	100% CONSTRUCTION DOCUMENTS	08.16.14
1	ADDENDUM NO. 3	09.23.14



GENERAL NOTES

- MAKE-READY WORK REQUIRED. SMALL-BORE BRANCH PIPES, CONDUITS, SUPPORTS AND SENS. CABLE BRACE RELOCATIONS ARE REQUIRED AND SHALL BE COMPLETED PRIOR TO INSTALLATION OF NEW EQUIPMENT. SEE MAKE-READY PLANS.
- SEE DRAWINGS CP-M-700 AND CP-M-701 FOR PIPE SIZES, TYPES AND LOCATIONS FOR DEVICES, AND EQUIPMENT PIPING CONNECTIONS.
- PROTECT THE EXISTING CHILLER ROOM EPOXY FLOOR-COATING SYSTEM FROM DAMAGE. IF REQUIRED, PATCH AND REPAIR THE FLOOR-COATING SYSTEM PRIOR TO THE COMPLETION OF CONSTRUCTION AND RESTORE TO MATCH ORIGINAL CONDITION. UTILIZE MATCHING EPOXY COATING PRODUCTS AND METHOD OF APPLICATION.

- INDICATES EXISTING FABRICATED TRAPEZE PIPE SUPPORT
- INDICATES NEW FABRICATED TRAPEZE PIPE SUPPORT
- INDICATES EXISTING CLEVIS PIPE HANGER
- INDICATES NEW CLEVIS PIPE HANGER

AUTOMATIC FIRE SPRINKLER WORK

THE CENTRAL PLANT IS FITTED WITH AN EXISTING AUTOMATIC FIRE SPRINKLER SYSTEM. THE CONTRACTOR SHALL MODIFY THE EXISTING SYSTEM AS REQUIRED SO THAT IT REMAINS CODE-COMPLIANT UPON COMPLETION OF THE NEW WORK SHOWN ON THESE DRAWINGS. AUTOMATIC FIRE SPRINKLER WORK INCLUDES BUT IS NOT LIMITED TO:

- REMOVING EXISTING SPRINKLER HEADS THAT ARE OBSTRUCTED BY THE INSTALLATION OF NEW PIPES, DUCTS AND EQUIPMENT. IF THE EXISTING BRANCH PIPE IS NOT REUSED FOR A NEW SPRINKLER HEAD, STRIP-BACK THE EXISTING BRANCH PIPE AND SUPPORTS TO THE NEAREST EXISTING BRANCH MAIN AND CAP.
- PROVIDING NEW SPRINKLER HEADS THAT MAY BE REQUIRED TO ACHIEVE THE PROPER SPRINKLER COVERAGE, HEAD SPACING, DISTANCES FROM OBSTRUCTIONS, AND SIMILAR CODE-GOVERNED REQUIREMENTS. THIS MAY INCLUDE INSTALLATION OF NEW BRANCH PIPES, PIPE SUPPORTS, AND TAPS INTO THE EXISTING BRANCH MAINS.
- REMOVAL OF EXISTING SPRINKLER HEADS, PIPES AND SUPPORTS THAT ARE SPATIAL CONFLICT WITH THE LOCATION OF NEW PIPES, DUCTS AND EQUIPMENT. THIS MAY INCLUDE INSTALLING NEW SPRINKLERS, BRANCH PIPES, AND PIPE SUPPORTS TO AVOID SPATIAL CONFLICTS.

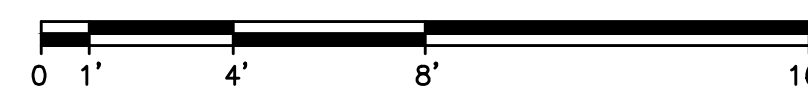
PRIOR TO CONSTRUCTION, SUBMIT SHOP DRAWINGS, PRODUCT DATA AND HYDRAULIC CALCULATIONS FOR APPROVAL. PREPARED BY A CALIFORNIA-LICENSED CIB FIRE PROTECTION CONTRACTOR. THE SHOP DRAWINGS SHALL SHOW ALL FIRE SPRINKLER WORK REQUIRED TO PROVIDE A COMPLETE, OPERATIONAL AND CODE-COMPLIANT FIRE SPRINKLER SYSTEM. DO NOT REUSE EXISTING SPRINKLER HEADS, PIPES, PIPE SUPPORTS OR STRUCTURAL ATTACHMENTS. ALL WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS.

SHEET NOTES

- NEW CHILLER. PLACE ON ISOLATORS ON NEW CONCRETE HOUSEKEEPING PAD. PIPE PER 2/CP-M-700 AND 2/CP-M-701 (TYP OF 2).
- NEW CONDENSER WATER PUMP. PROVIDE NEW INERTIA BASE TO MATCH EXISTING CW PUMPS. INSTALL PER 3/CP-M-800 (TYP OF 2).
- POC FOR NEW 18" CONDENSER WATER SUPPLY TO NEW PUMP. TIE-IN NEW TO EXISTING.
- POC FOR NEW 30" CONDENSER WATER SUPPLY HEADER. TIE-IN NEW TO EXISTING.
- POC FOR NEW 20" CONDENSER WATER EQUALIZER PIPE. TIE-IN NEW TO EXISTING.
- POC FOR NEW 30" CONDENSER WATER RETURN HEADER. TIE-IN NEW TO EXISTING.
- POC FOR NEW 24" CONDENSER WATER SUPPLY HEADER. TIE-IN NEW TO EXISTING.
- ROUTE NEW 6" CHILLER REFRIGERANT RELIEF VENTS UP THROUGH ROOF.
- REMOVE EXISTING SUPPLY-AIR BLANKOFF PLATES IN CHILLER ROOM FLOOR. RE-ACTIVATE EXISTING SUPPLY AIR BRANCHES FROM EXISTING AHU-1 IN LEVEL 1 SECTOR A. BALANCE EACH BRANCH TO 1750 CFM. INSTALL NEW WELDED, GALVANIZED 3x21x1/4" WATER STOP FRAME AROUND OPENINGS. SEAL BENEATH WITH WATERPROOF MASTIC. ATTACH TO CONCRETE W/1/2" HILTI KB-725 WITH 2" EMBEDMENT, EVENLY SPACED AROUND FRAME. TYPICAL 2 LOCATIONS.
- 22GA GALVANIZED SHEET METAL SUPPLY AIR HOOD. SEE 5/CP-M-801.
- PROVIDE RISER SUPPORTS, WATER STOPS AND UL RATED 1-HOUR FIRE STOPS AT EXISTING AND NEW CHILLER ROOM FLOOR PENETRATIONS FOR NEW CHWS/R PIPING. SEE 5/CP-M-800 AND 12/CP-M-801.
- NEW FABRICATED TRAPEZE PIPE SUPPORT. SEE 8/CP-M-800.
- PROVIDE NEW REFRIGERANT LEAK DETECTION SENSOR FOR ZONES 4 AND 5. INSTALL SENSOR PER DETAIL 9/CP-M-800 AND WRITTEN MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE NEW SENSOR TUBING (6MM O.D., 4MM I.D. NYLON TUBING) FROM EACH SENSOR TO SPARE PORTS ON EXISTING REFRIGERANT LEAK DETECTOR MONITOR. LEAK DETECTION SENSOR SHALL BE VULCAN MODEL SUITABLE FOR USE WITH EXISTING SON-8X MONITOR.
- NEW CLEVIS PIPE SUPPORT.
- BID ALTERNATE NO. 1: REPLACE EXISTING CHILLER CH-1, 2 AND 3 STARTERS WITH VFD'S.
- BID ALTERNATE NO. 2: REFURBISH CHILLER CH-3 INCLUDING: PUMP REFRIGERANT INTO CONDENSER BARREL AND CLOSE ISOLATION VALVES, SUPPORT COMPRESSOR-MOTOR ASSEMBLY, DISCONNECT FLANGES AT EVAPORATOR AND CONDENSER, DISCONNECT MOTOR MOUNTS. THEN REMOVE COMPRESSOR-MOTOR ASSEMBLY. PROVIDE AND INSTALL NEW COMPRESSOR-MOTOR ASSEMBLY. ADHERE STRICTLY TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- NEW CONDENSER WATER RETURN RISER SUPPORT. SEE 8/CP-M-801. (TYP OF 2).
- PROVIDE "PURGE FAN ON" TAMPER RESISTANT SWITCH IMMEDIATELY ADJACENT TO AND OUTSIDE OF EACH PRINCIPAL REFRIGERANT MACHINERY ROOM EXIT.
- PROVIDE DIFFERENTIAL PRESSURE SWITCH ACROSS PURGE FAN AND PROVIDE TWO COLORED AND LABELED INDICATOR LAMPS CORRESPONDING TO THE DIFFERENTIAL PRESSURE AT EACH "PURGE FAN ON" SWITCH. ONE LAMP SHALL INDICATE FLOW; ONE LAMP SHALL INDICATE NO FLOW.
- EXISTING BREAK-GLASS SWITCH FOR OFF-ONLY CONTROL OF CHILLERS IS IMMEDIATELY ADJACENT AND OUTSIDE PRINCIPLE MACHINERY ROOM EXIT AND IS CLEARLY IDENTIFIED.
- PROVIDE NEW 90 DBA HORN AND DISTINCTIVE STROBE LIGHT FOR LEVEL 2 ALARM INSIDE REFRIGERATION MACHINERY ROOM AND OUTSIDE EACH ENTRANCE TO THE REFRIGERATION MACHINERY ROOM WITH CLEARLY IDENTIFIED SIGNAGE.
- EXISTING REFRIGERANT LEAK DETECTION SYSTEM PROVIDES REMOTE INDICATION OF REFRIGERANT LEVELS THROUGH BAS WITH HARD-WIRED LEVEL-1 NOTIFICATION AND HARD-WIRED LEVEL-2 ALARM.
- PROVIDE PERMANENT SIGN GIVING THE FOLLOWING INFORMATION:
(1) NAME OF CONTRACTOR INSTALLING THE EQUIPMENT.
(2) SYSTEM CONTAINS R-134a (1,1,1,2-TETRAFLUOROETHANE) REFRIGERANT.
(3) CHILLERS CH-1,2,3 CONTAIN 2450 LBS OF REFRIGERANT EACH. CHILLERS CH-4,5 CONTAIN 3168 LBS OF REFRIGERANT EACH. COORDINATE LOCATION WITH OWNERS REPRESENTATIVE. SEE CP-M-002.
- PROVIDE SIGNAGE TO COMPLY WITH REQUIREMENTS OF NFPA 704 FOR REFRIGERATION MACHINERY ROOM. COORDINATE LOCATION WITH OWNERS REPRESENTATIVE. SEE CP-M-002.

1 MECHANICAL PLAN - LEVEL 2 SECTOR B

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



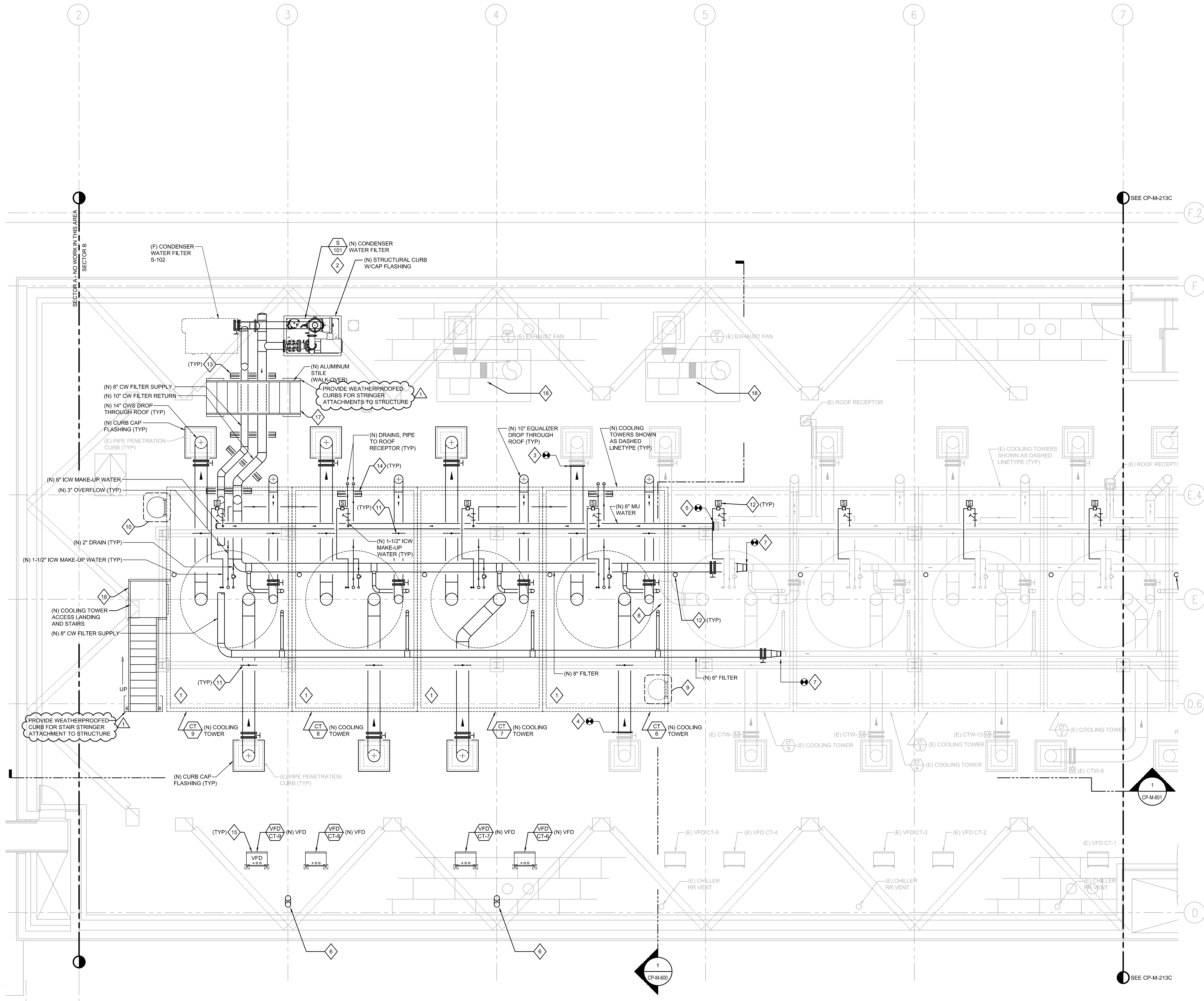
GENERAL NOTES

1. SEE DRAWING CP-M-701 FOR PIPE SIZES, TYPES AND LOCATIONS FOR DEVICES, AND EQUIPMENT PIPING CONNECTIONS.

---●--- INDICATES EXISTING CLEVIS PIPE HANGER
---●--- INDICATES NEW CLEVIS PIPE HANGER

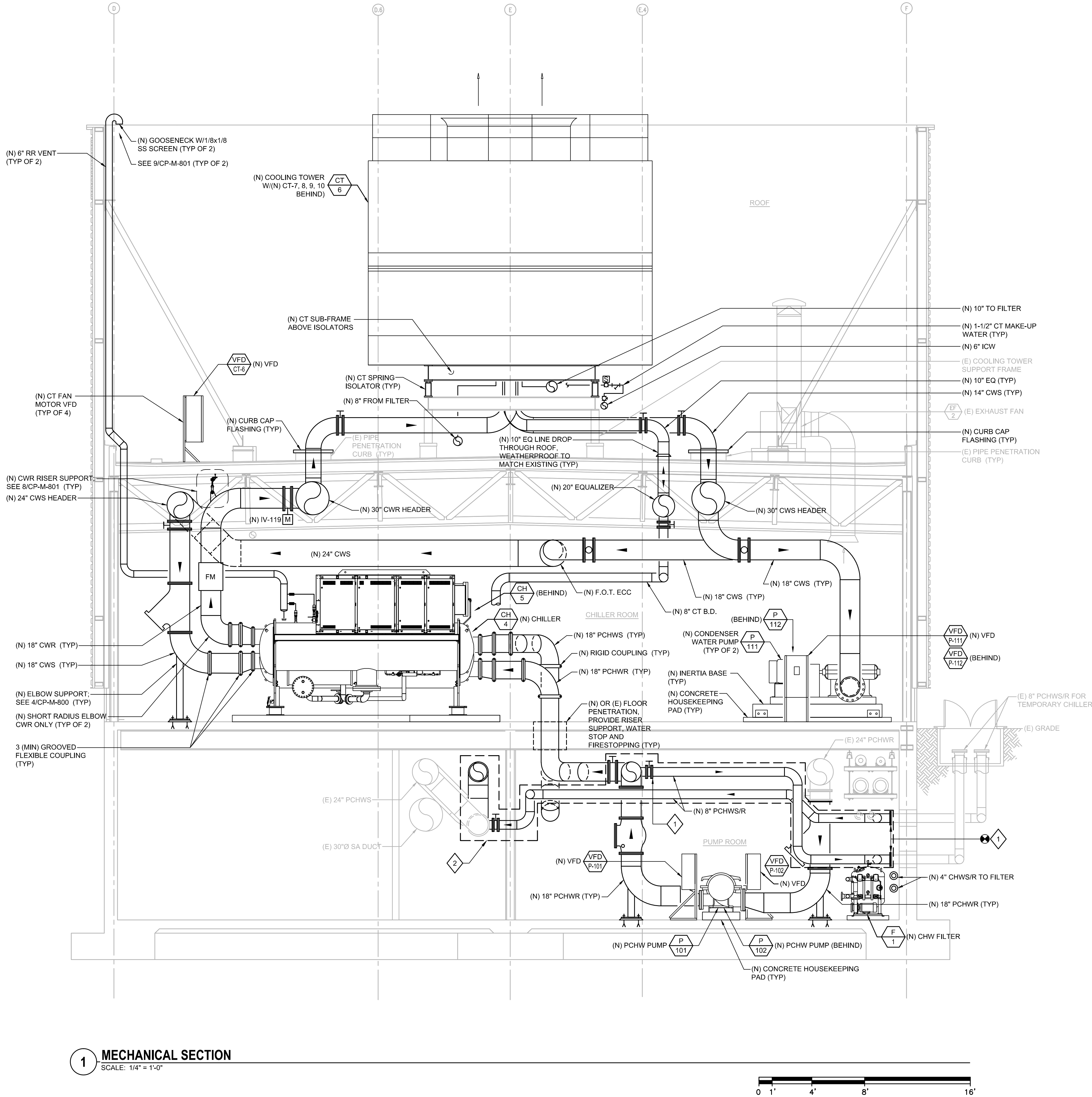
SHEET NOTES

- NEW COOLING TOWER, PIPE PER 2/CP-M-701 (TYP OF 4).
- NEW CONDENSER WATER FILTER, PIPE PER 2/CP-M-701.
- POC FOR NEW 14" CONDENSER WATER SUPPLY; REMOVE BLIND FLANGE, TIE-IN NEW TO EXISTING.
- POC FOR NEW 14" CONDENSER WATER RETURN; REMOVE BLIND FLANGE, TIE-IN NEW TO EXISTING.
- POC FOR NEW 6" COOLING TOWER MAKE-UP WATER; REMOVE CAP, TIE-IN NEW TO EXISTING.
- NEW 6" CHILLER REFRIGERANT RELIEF VENTS UP THROUGH ROOF. TERMINATE PER 9/CP-M-801.
- POC FOR NEW TO EXISTING CONDENSER WATER FILTER PIPING, REDUCE AS NEEDED.
- REMOVE EXISTING COOLING TOWER BASIN STAIRS (STAIRS NOT SHOWN FOR CLARITY).
- REMOVE EXISTING CAGED UPPER COOLING TOWER DECK ACCESS LADDER.
- RE-INSTALL EXISTING CAGED UPPER COOLING TOWER DECK ACCESS LADDER.
- NEW CWS/R, EQUALIZER, CT MAKE-UP WATER AND FILTER PIPES SUPPORTED FROM EXISTING COOLING TOWER SUPPORT FRAME WITH BEAM CLAMPS AND CLEVIS HANGERS. SEE 6/CP-M-800 (TYP OF ALL).
- REMOVE EXISTING FLOAT ACTUATED MAKE-UP WATER VALVE ASSEMBLY INCLUDING FLOAT ACTUATED VALVE, FLOAT AND LINKAGE. INSTALL NEW ELBOW DOWN ON EXISTING 1-1/2" MAKE-UP WATER LINE IN BASIN. INSTALL NEW ELECTRONIC WATER LEVEL CONTROL ASSEMBLY (BAC MODEL EWLC-IM-4, 4 PROBE CONTROL) INCLUDING CONDUCTIVITY ACTIVATED 4-PROBE LIQUID LEVEL CONTROLLER, SLOW-CLOSING SOLENOID MAKE-UP WATER VALVE, LINE-SIZE BYPASS (NOT SHOWN) AND STRAINER, STRAINER, NEW SOLENOID VALVE AND BYPASS TO BE INSTALLED BENEATH EXISTING COOLING TOWERS IN EASILY ACCESSIBLE LOCATION. SEE DETAIL 6/CP-M-801 (TYPICAL ALL EXISTING TOWERS).
- UTILIZE B-LINE DURA-BLOK DB48 ROOFTOP SUPPORT FOR NEW FILTER PIPING. LOCATE AT 8' O.C. MAX AND AT EACH CHANGE IN DIRECTION, MINIMUM (2) FOR EACH STRAIGHT RUN OF PIPE. ATTACH PIPES TO B44 STRUT WITH B2400 STRAP (TYPICAL).
- UTILIZE B-LINE DURA-BLOK DB ROOFTOP SUPPORT FOR CT DRAIN/OVERFLOW PIPING. LENGTH AS NEEDED TO ACCOMMODATE PIPES AND STRAPS. LOCATE AT 6' O.C. MAX AND AT EACH CHANGE IN DIRECTION, MINIMUM (2) FOR EACH STRAIGHT RUN OF PIPE. ATTACH PIPES TO B44 STRUT WITH B2400 STRAP (TYPICAL).
- NEW COOLING TOWER FAN VFD; SUPPORT AND ANCHOR PER 9-CP-M-800.
- PROVIDE PREFABRICATED OSHA COMPLIANT ALUMINUM COOLING TOWER BASIN ACCESS STAIRS AND LANDING WITH SAFETY RAILING. PROVIDE WEATHERPROOFED STRUCTURAL CURBS AND ATTACHMENTS TO EXISTING STRUCTURE AND TO EXISTING COOLING TOWER SUPPORT PLATFORM. SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION.
- PROVIDE PREFABRICATED OSHA COMPLIANT ALUMINUM STILE (WALK-OVER) STAIRS AND LANDING WITH SAFETY RAILING. PROVIDE WEATHERPROOFED STRUCTURAL CURBS AND ATTACHMENTS TO EXISTING STRUCTURE. SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION.
- PROVIDE DIFFERENTIAL PRESSURE SWITCH ACROSS PURGE FAN EXHAUST, SEE CP-M-002, TYP 2 LOCATIONS.



1 MECHANICAL PLAN - ROOF SECTOR B
SCALE: 1/4" = 1'-0"





GENERAL NOTES

- MAKE-READY WORK REQUIRED. SMALL-BORE PIPES, CONDUITS, SUPPORTS AND SEISMIC CABLE BRACE RELOCATIONS ARE REQUIRED AND SHALL BE COMPLETED PRIOR TO INSTALLATION OF NEW EQUIPMENT. SEE MAKE-READY PLANS.
- SEE DRAWINGS CP-M-700 AND CP-M-701 FOR PIPE SIZES, TYPES AND LOCATIONS FOR DEVICES, AND EQUIPMENT PIPING CONNECTIONS.

AUTOMATIC FIRE SPRINKLER WORK

THE CENTRAL PLANT IS FITTED WITH AN EXISTING AUTOMATIC FIRE SPRINKLER SYSTEM. THE CONTRACTOR SHALL MODIFY THE EXISTING SYSTEM AS REQUIRED SO THAT IT REMAINS CODE-COMPLIANT UPON COMPLETION OF THE NEW WORK SHOWN ON THESE DRAWINGS. AUTOMATIC FIRE SPRINKLER WORK INCLUDES BUT IS NOT LIMITED TO:

- REMOVING EXISTING SPRINKLER HEADS THAT ARE OBSTRUCTED BY THE INSTALLATION OF NEW PIPES, DUCTS AND EQUIPMENT. IF THE EXISTING BRANCH PIPE IS NOT REUSED FOR A NEW SPRINKLER HEAD, STRIP BACK THE EXISTING BRANCH PIPE AND SUPPORTS TO THE NEAREST EXISTING BRANCH MAIN AND CAP.
- PROVIDING NEW SPRINKLER HEADS THAT MAY BE REQUIRED TO ACHIEVE THE PROPER SPRINKLER COVERAGE, HEAD SPACING, DISTANCES FROM OBSTRUCTIONS, AND SIMILAR CODE-GOVERNED REQUIREMENTS. THIS MAY INCLUDE INSTALLATION OF NEW BRANCH PIPES, PIPE SUPPORTS, AND TAPS INTO THE EXISTING BRANCH MAINS.
- REMOVAL OF EXISTING SPRINKLER HEADS, PIPES AND SUPPORTS THAT ARE IN SPATIAL CONFLICT WITH THE LOCATIONS OF NEW PIPES, DUCTS AND EQUIPMENT. THIS MAY INCLUDE INSTALLING NEW SPRINKLERS, BRANCH PIPES, AND PIPE SUPPORTS TO AVOID SPATIAL CONFLICTS.

PRIOR TO CONSTRUCTION, SUBMIT SHOP DRAWINGS, PRODUCT DATA AND HYDRAULIC CALCULATIONS FOR APPROVAL PREPARED BY A CALIFORNIA LICENSED C-16 FIRE PROTECTION CONTRACTOR. THE SHOP DRAWINGS SHALL SHOW ALL FIRE SPRINKLER WORK REQUIRED TO PROVIDE A COMPLETE, OPERATIONAL AND CODE-COMPLIANT FIRE SPRINKLER SYSTEM. DO NOT REUSE EXISTING SPRINKLER HEADS, PIPES, PIPE SUPPORTS OR STRUCTURAL ATTACHMENTS. ALL WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS.

SHEET NOTES

- POC'S FOR 8\"/>
- ALL CHILLED WATER PIPES REQUIRED TO CONNECT AND OPERATE THE UNIVERSITY'S EMERGENCY AIR-COOLED CHILLERS MUST BE COMPLETE AND OPERATIONAL PRIOR MAY 1, 2015, OR A LATER DATE IF AGREEABLE TO THE UNIVERSITY. THIS INCLUDES RELATED BRANCH AND HEADER PIPES, AND THE EXISTING PRIMARY CHILLED WATER PUMPS. THE WORK TO CONNECT AND OPERATE THE EMERGENCY AIR-COOLED CHILLERS DOES NOT REQUIRE THE NEW WATER-COOLED CHILLERS (CH-4 AND CH-5) TO BE OPERATIONAL.

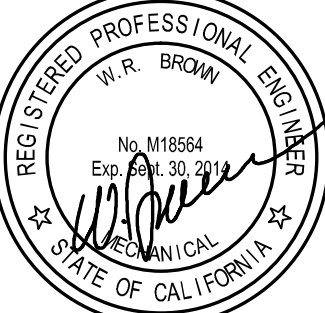
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UNIVERSITY OF CALIFORNIA
MERCED FIRE MARSHAL
CDF-OFFICE OF STATE FIRE
MARSHAL APPROVED

Approval of this plan does not authorize or
approve any omission or deviation from
applicable regulations. Final approval is subject
to field inspection. One set of approved plans
shall be available on the project site at all times.

Reviewed By: _____
Project #: 900310
Authorization #: _____

Seal and Signature

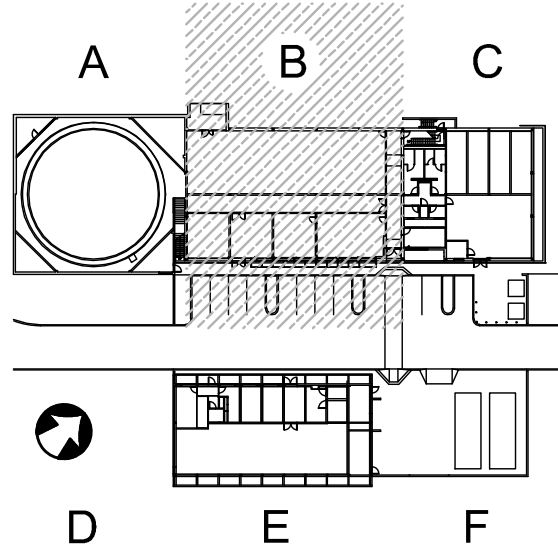


Drawing Stage:
100% CONSTRUCTION
DOCUMENTS

No.	Description	Issue Date
	100% DESIGN DEVELOPMENT	04.28.14
	50% CONSTRUCTION DOCUMENTS	06.06.14
	90% CONSTRUCTION DOCUMENTS	07.16.14
	100% CONSTRUCTION DOCUMENTS	08.16.14
1	ADDENDUM NO. 3	09.23.14

Drawn By: AEI
Revision Date: 09.23.14
Plot Date: 09.23.14
Scale: AS SHOWN

Key Plan:



Drawing Title
MECHANICAL
SECTIONS

Drawing Number:



1 EXISTING AND DEMOLITION CHILLED WATER SYSTEM DIAGRAM
SCALE: NONE

SCALE: NONE



2 NEW CHILLED WATER SYSTEM DIAGRAM

SCALE: NONE

1 REMOVE EXISTING CHILLED WATER FILTER F-1 AND ASSOCIATED PIPING. PROVIDE FILTER TO OWNER.

1 REMOVE EXISTING CHILLED WATER FILTER F-1 AND ASSOCIATED PIPING. PROVIDE FILTER TO OWNER.



Project Name:
Central Plant/
Telecommunications
Reliability Upgrade
CENTRAL PLANT
COMPLETION

Project Number: 900310

Prime Engineer

Consultants:

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UNIVERSITY OF CALIFORNIA
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Approval of this plan does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

Reviewed By: _____
 Project #: 900310
 Authorization #: _____

Seal and Signature

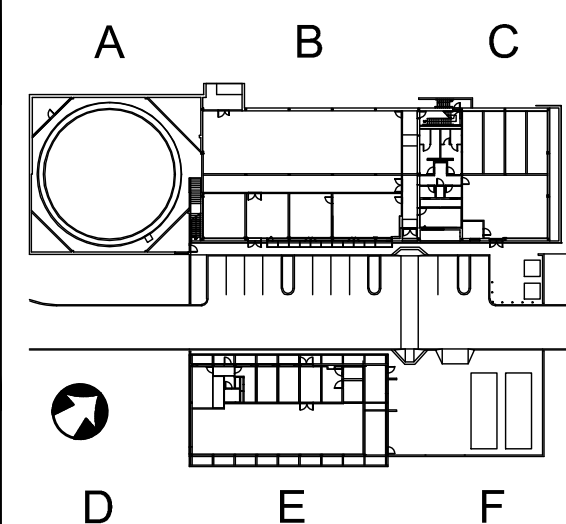


Drawing Stage:
100% CONSTRUCTION
DOCUMENTS

No.	Description	Issue Date
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Drawn By:	AEI
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Plot Date:	09.23.14
Scale:	AS SHOWN
Key Plan:	

Key Plan:



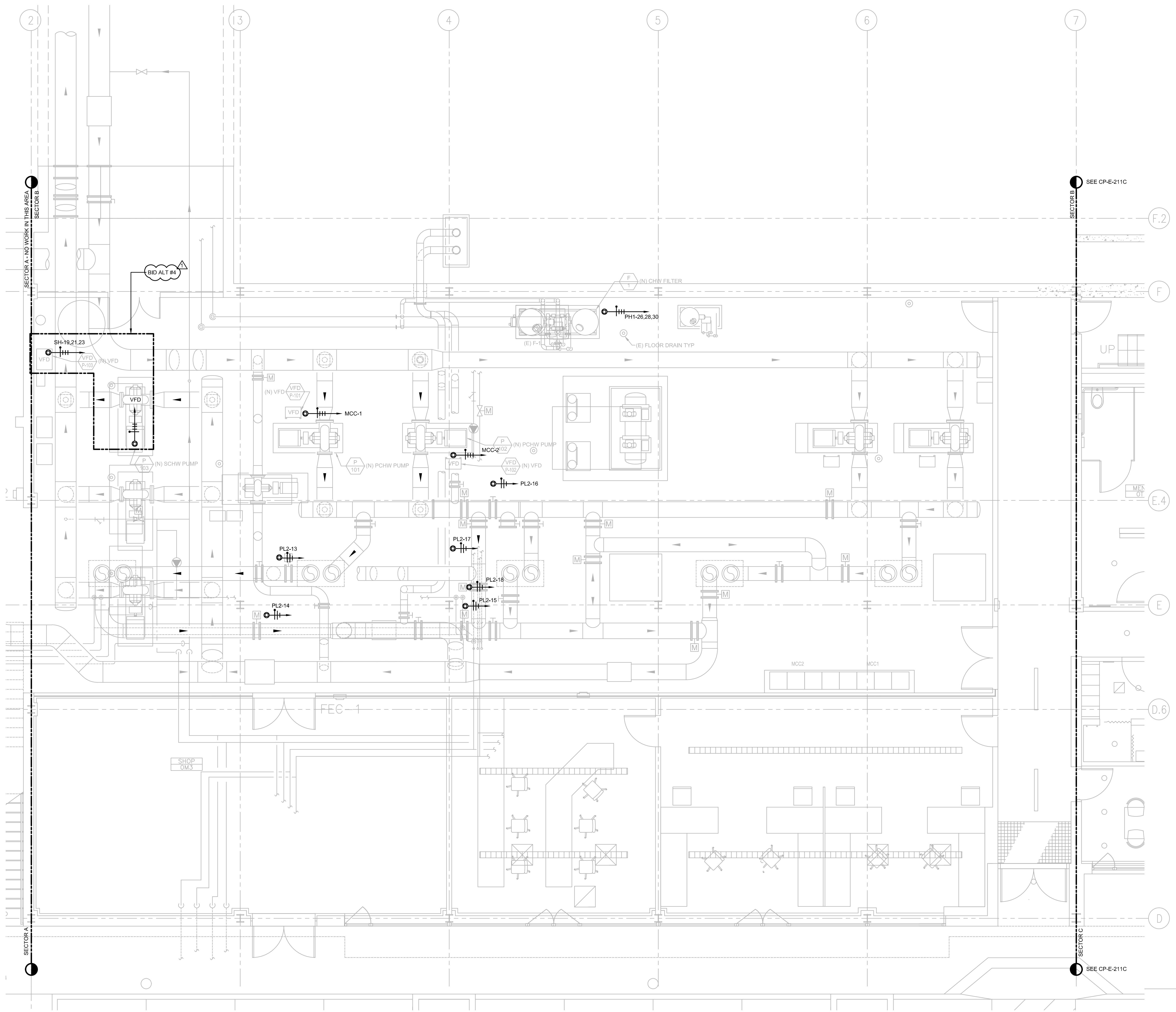
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**MECHANICAL
DIAGRAM
CHILLED WATER**

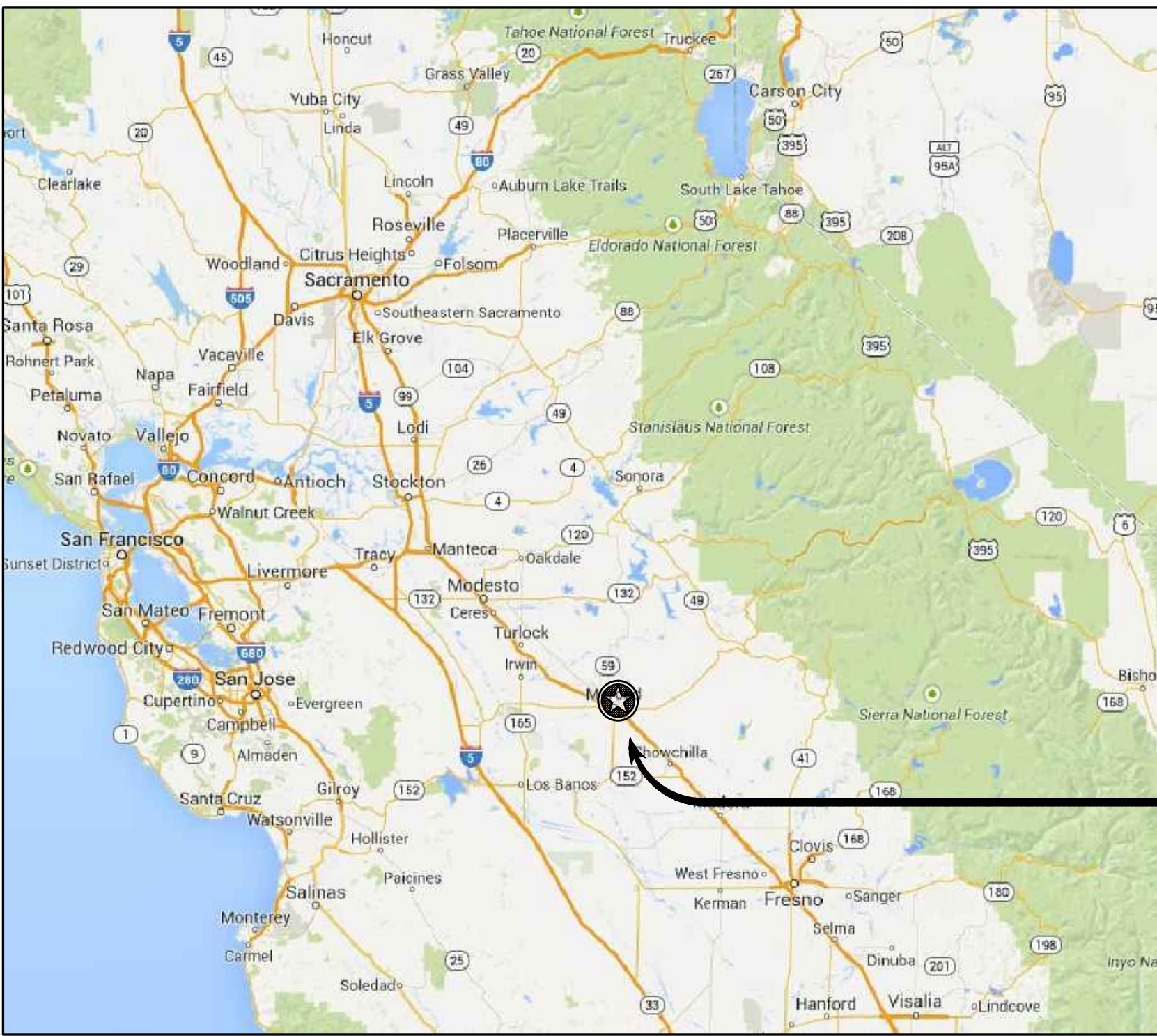
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CP-M-700

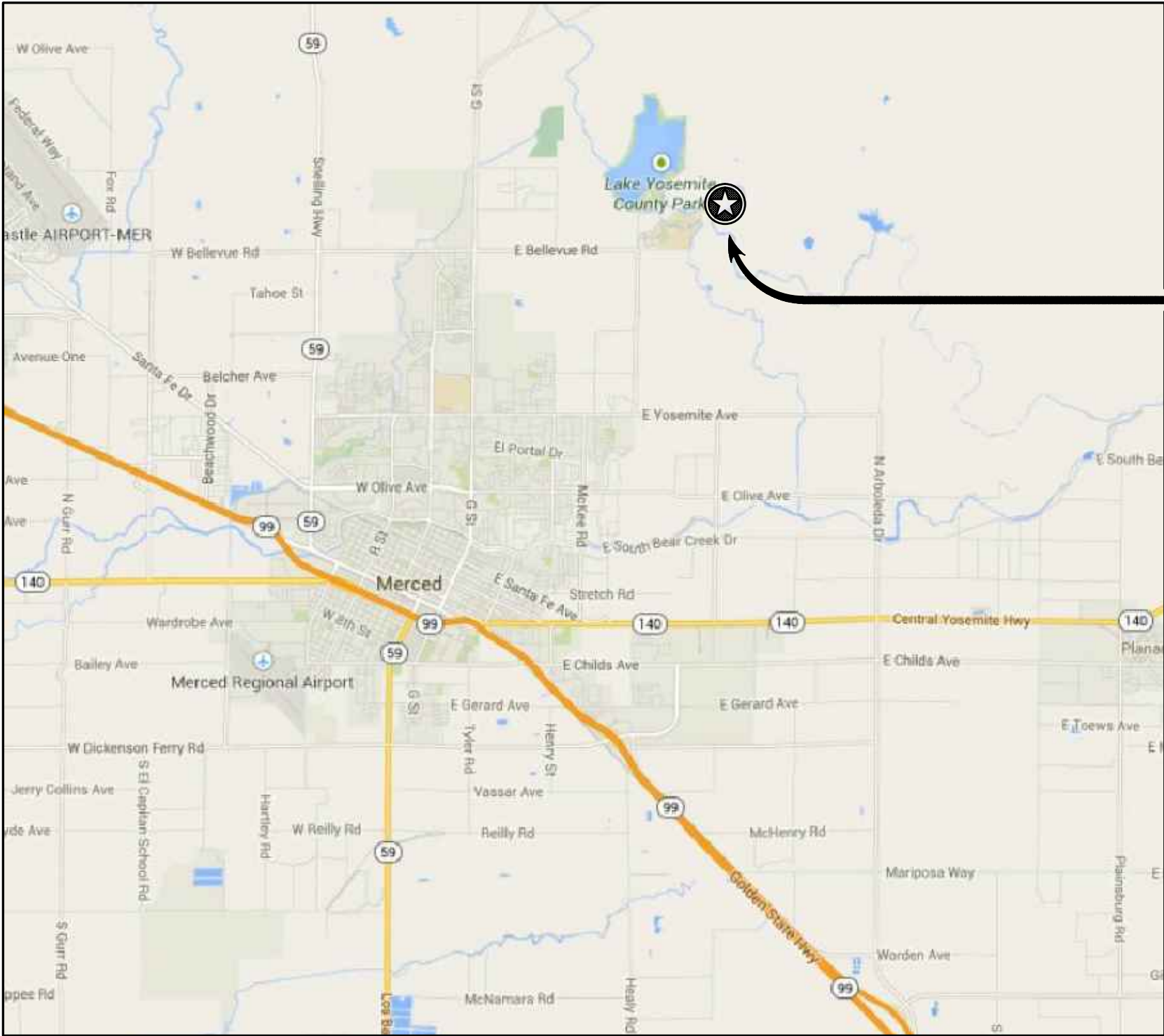
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1	ADDENDUM NO. 3	09.23.14



1 ELECTRICAL PLAN - LEVEL 1 SECTOR B
SCALE: 1/4" = 1'-0"



AREA MAP
NTS



VICINITY MAP
NTS

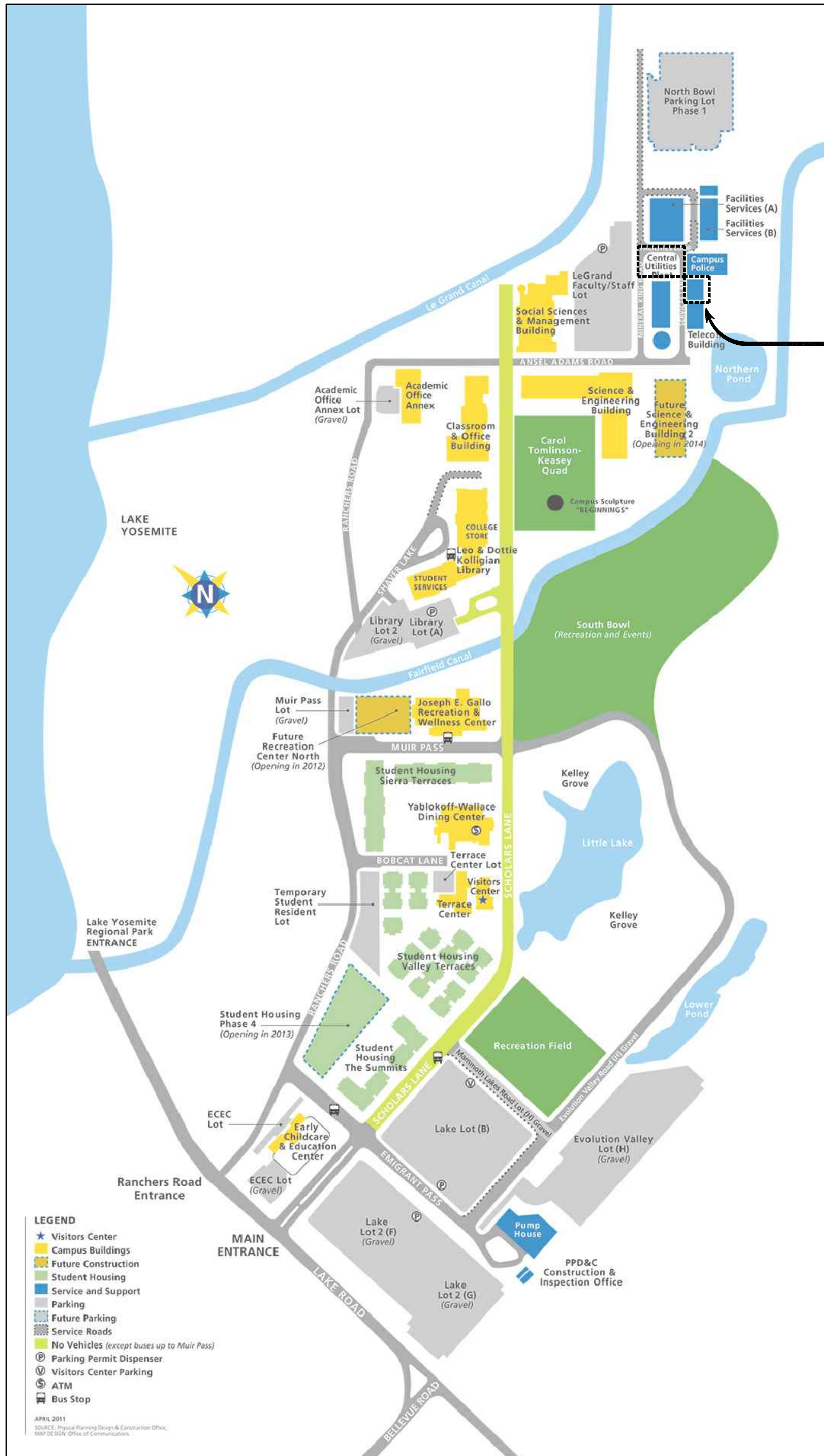
CODES

ALL PLANS AND WORK IN ON THIS PROJECT SHALL CONFORM TO THE FOLLOWING CODES:

- CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 24:
 - PART 2 2013 CALIFORNIA BUILDING CODE
 - PART 3 2013 CALIFORNIA ELECTRICAL CODE
 - PART 4 2013 CALIFORNIA MECHANICAL CODE
 - PART 5 2013 CALIFORNIA PLUMBING CODE
 - PART 6 2013 CALIFORNIA ENERGY CODE
 - PART 9 2013 CALIFORNIA FIRE CODE
 - PART 11 2013 CALIFORNIA GREEN BUILDING STANDARDS CODE
- TITLE 19 CALIFORNIA CODE OF REGULATIONS FIRE AND LIFE SAFETY REGULATIONS
- OTHER APPLICABLE CODES:
 - AMERICANS WITH DISABILITIES ACT OF 1990
 - NFPA 30 - FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE (2015)
 - NFPA 101 - LIFE SAFETY CODE (2015)

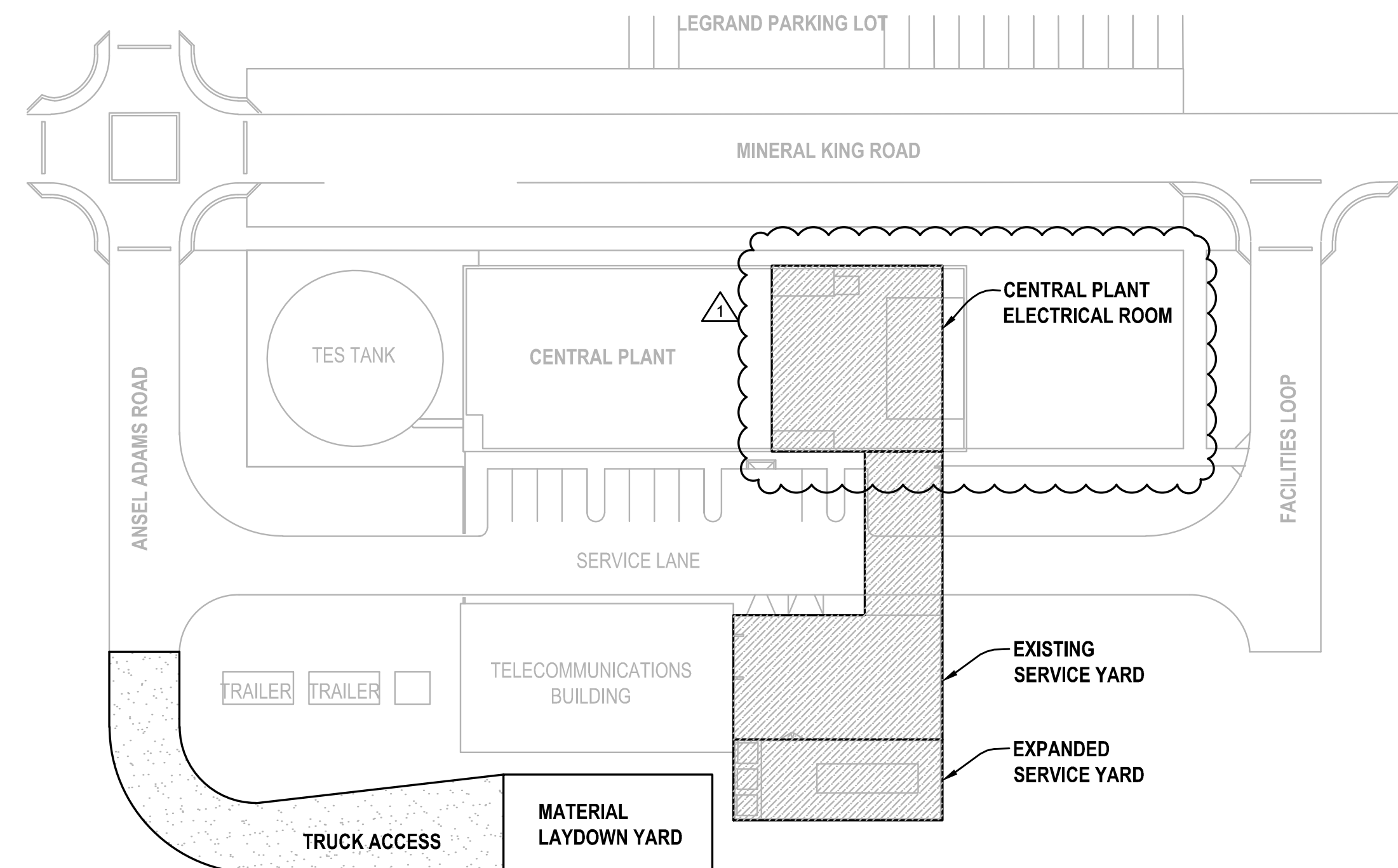
OCCUPANCY CLASSIFICATION		GROUP F OCCUPANCY		CBC Ref.
EMERGENCY POWER SERVICE YARD				306.1
LOCATION ON PROPERTY				
EMERGENCY POWER SERVICE YARD		NORTH	28'-6" TO ASSUMED PROPERTY LINE	503.3
		WEST	107'-6" TO CENTER OF RIGHT OF WAY	503.1
		SOUTH	> 150' (UNDEFINED) TO PROPERTY LINE	
		EAST	188'-0" TO CENTER OF RIGHT OF WAY	503.1
TYPE OF CONSTRUCTION		TYPE V-A		
BUILDING AREA				
EMERGENCY POWER SERVICE YARD		TOTAL	1,950	SF
OCCUPANT LOAD		(1 PER 300 SF)		
		TOTAL	7	
EXITS REQUIRED		1		
EXITS PROVIDED		1		
EXIT WIDTH REQUIRED		16	INCHES	
EXIT WIDTH PROVIDED		36		

CP CODE SUMMARY



CAMPUS KEY MAP

NTS



CONSTRUCTION STAGING PLAN

NTS

PROJECT DIRECTORY

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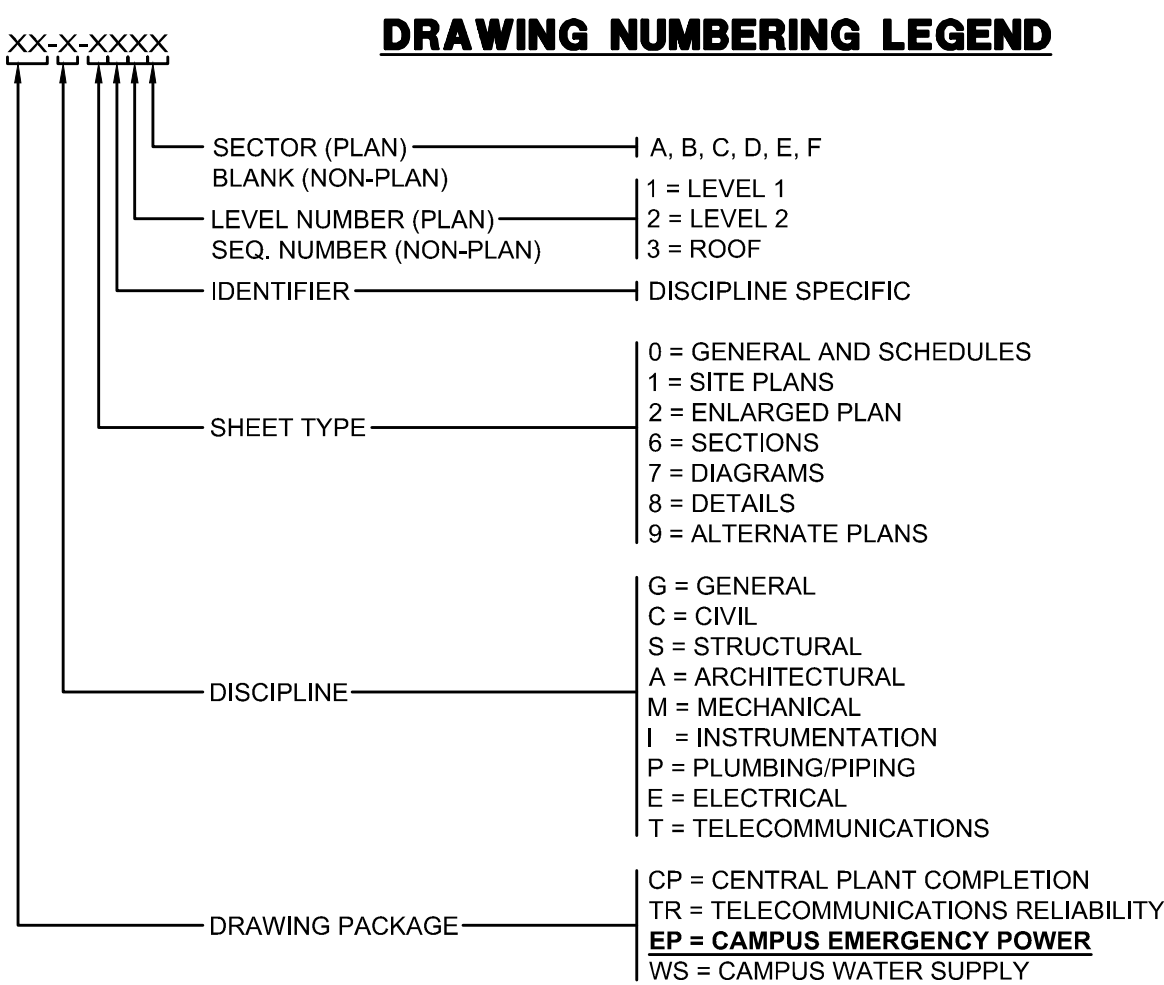
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DRAWING INDEX

GENERAL

COVER SHEET
DRAWING INDEX, BUILDING INFORMATION, AND MAPS

CIVIL

EP-C-000 CIVIL LEGEND, SYMBOLS, AND ABBREVIATIONS
EP-C-200F CIVIL SITE CONDITIONS - SECTOR F
EP-C-210F CIVIL PAVING & LAYOUT - SECTOR F
EP-C-220F CIVIL GRADING PLAN - SECTOR F
EP-C-230F CIVIL UTILITY PLAN - SECTOR F
EP-C-240F CIVIL EROSION CONTROL - SECTOR F

STRUCTURAL

EP-S-001 STRUCTURAL GENERAL NOTES
EP-S-002 STRUCTURAL GENERAL NOTES, ABBREVIATIONS AND LEGEND
EP-S-201F STRUCTURAL PLAN - SERVICE YARD SECTOR F
EP-S-501 STRUCTURAL DETAILS

ARCHITECTURAL

EP-A-201F EXPANDED SERVICE YARD PLAN
EP-A-800 SERVICE YARD DETAILS SECTOR F

ELECTRICAL

EP-E-000 ELECTRICAL LEGEND, SYMBOLS AND ABBREVIATIONS
EP-E-001 ELECTRICAL FEEDER AND BRANCH CIRCUIT SCHEDULES
EP-E-021 ELECTRICAL CENTRAL PLANT SINGLE-LINE DIAGRAM
EP-E-211C ELECTRICAL PLAN - LEVEL 1 SECTOR C
EP-E-211E ELECTRICAL PLAN - LEVEL 1 SECTOR E
EP-E-211F ELECTRICAL PLAN - LEVEL 1 SECTOR F
EP-E-800 ELECTRICAL DETAILS

PIPING

EP-P-000 PIPING LEGEND, SYMBOLS, AND ABBREVIATIONS
EP-P-001 PIPING FUEL OIL SCHEDULE
EP-P-211F PIPING PLAN - LEVEL 1 SECTOR F
EP-P-700 PIPING DIAGRAM - FUEL OIL SYSTEM
EP-P-800 PIPING DETAILS

BID ALTERNATES

ALTERNATE NUMBER

DESCRIPTION

ALTERNATE NO. 1 PROVIDE VFD DRIVES FOR EXISTING CHILLERS CH-1, CH-2 AND CH-3
ALTERNATE NO. 2 REFURBISH EXISTING CHILLER CH-3
ALTERNATE NO. 3 NEW VFD'S FOR THREE PUMPS AT PUMP HOUSE
ALTERNATE NO. 4 DEDUCTIVE ALTERNATE NEW SECONDARY CHILLED WATER PUMP



University of California
Merced, California

Project Name:

Central Plant/
Telecommunications
Reliability Upgrade
CAMPUS
EMERGENCY POWER

Project Number: 900310

Prime Engineer

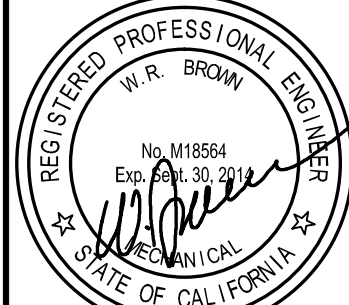
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(209) 943-2021
- STRUCTURAL ENGINEER:
FORELLELSESSER ENGINEERS
160 PINE ST.
SAN FRANCISCO, CA 94111
(415) 637-0700
- COST ESTIMATOR:
AECOM
300 CALIFORNIA ST., SUITE 400
SAN FRANCISCO, CA 94104
(415) 981-1419

UNIVERSITY OF CALIFORNIA
MERCED FIRE MARSHAL
CDF-OFFICE OF STATE FIRE
MARSHAL APPROVED

Approval of this plan does not authorize or
approve any omission or deviation from
applicable regulations. Final approval is subject
to field inspection. One set of approved plans
shall be available on the project site at all times.
Reviewed By: _____
Project #: 900310
Authorization #: _____

Seal and Signature



Drawing Stage:

100% CONSTRUCTION
DOCUMENTS

No.	Description	Issue Date
	100% DESIGN DEVELOPMENT	04.28.14
	50% CONSTRUCTION DOCUMENTS	06.06.14
	90% CONSTRUCTION DOCUMENTS	07.18.14
	100% CONSTRUCTION DOCUMENTS	08.18.14
1	ADDENDUM NO. 3	09.23.14

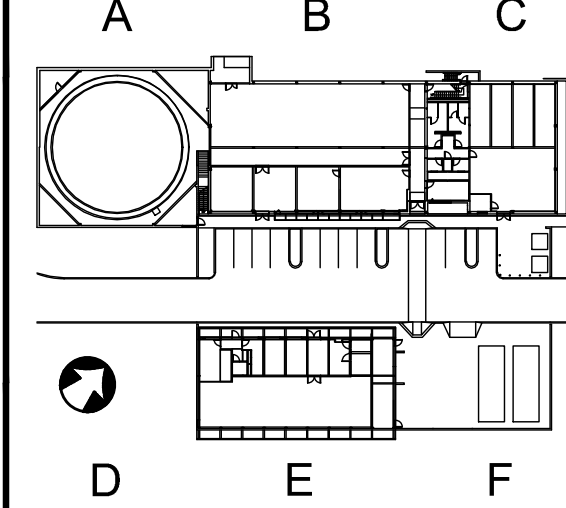
Drawn By: AEI

Revision Date: 09.23.14

Plot Date: 09.23.14

Scale: AS SHOWN

Key Plan:

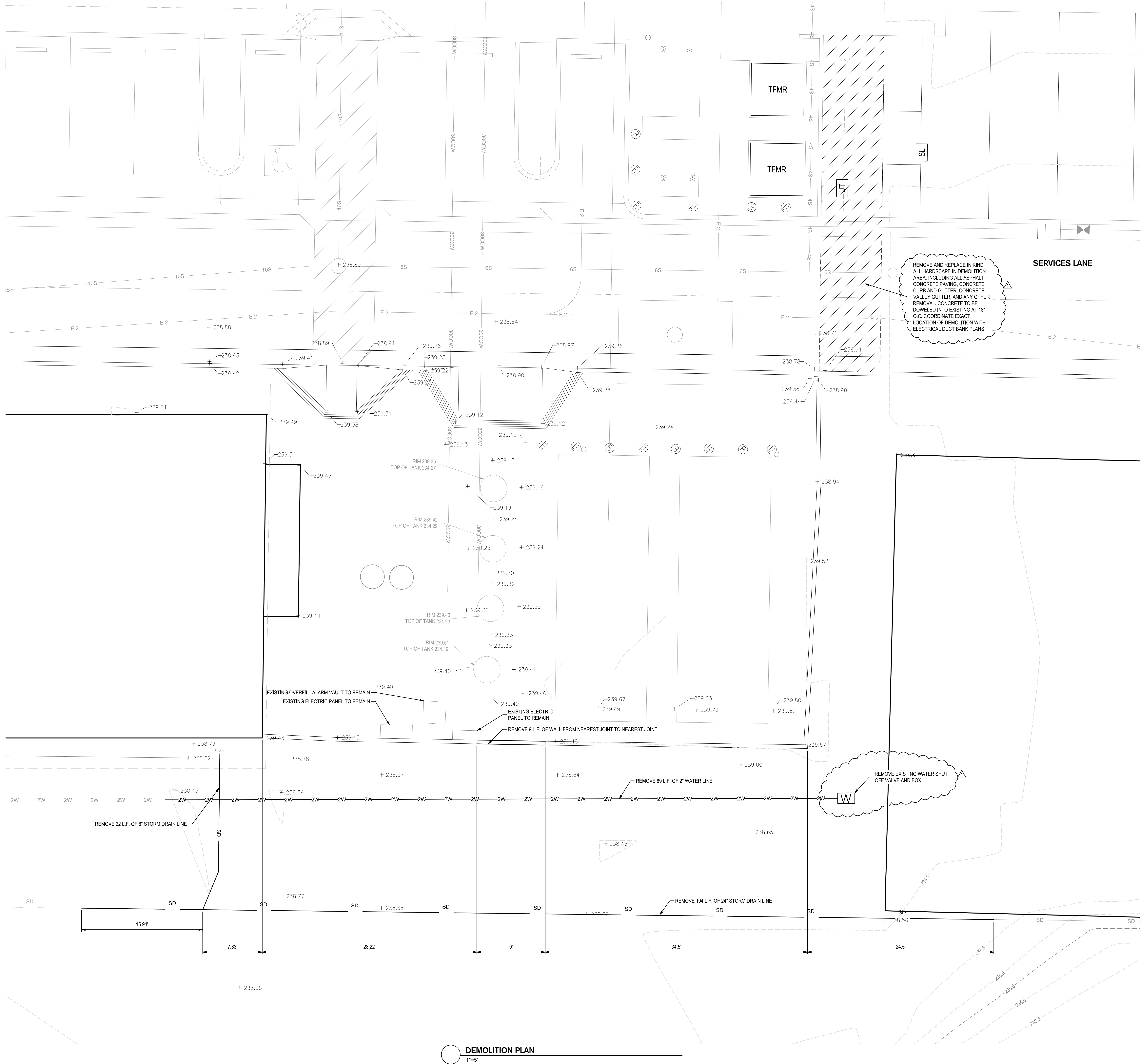


Drawing Title

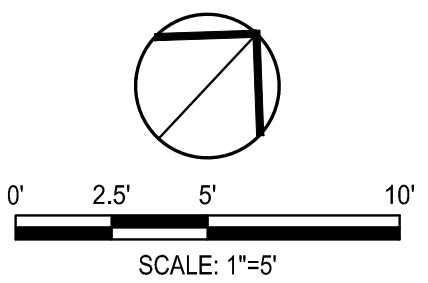
DRAWING INDEX,
BUILDING
INFORMATION
AND MAPS

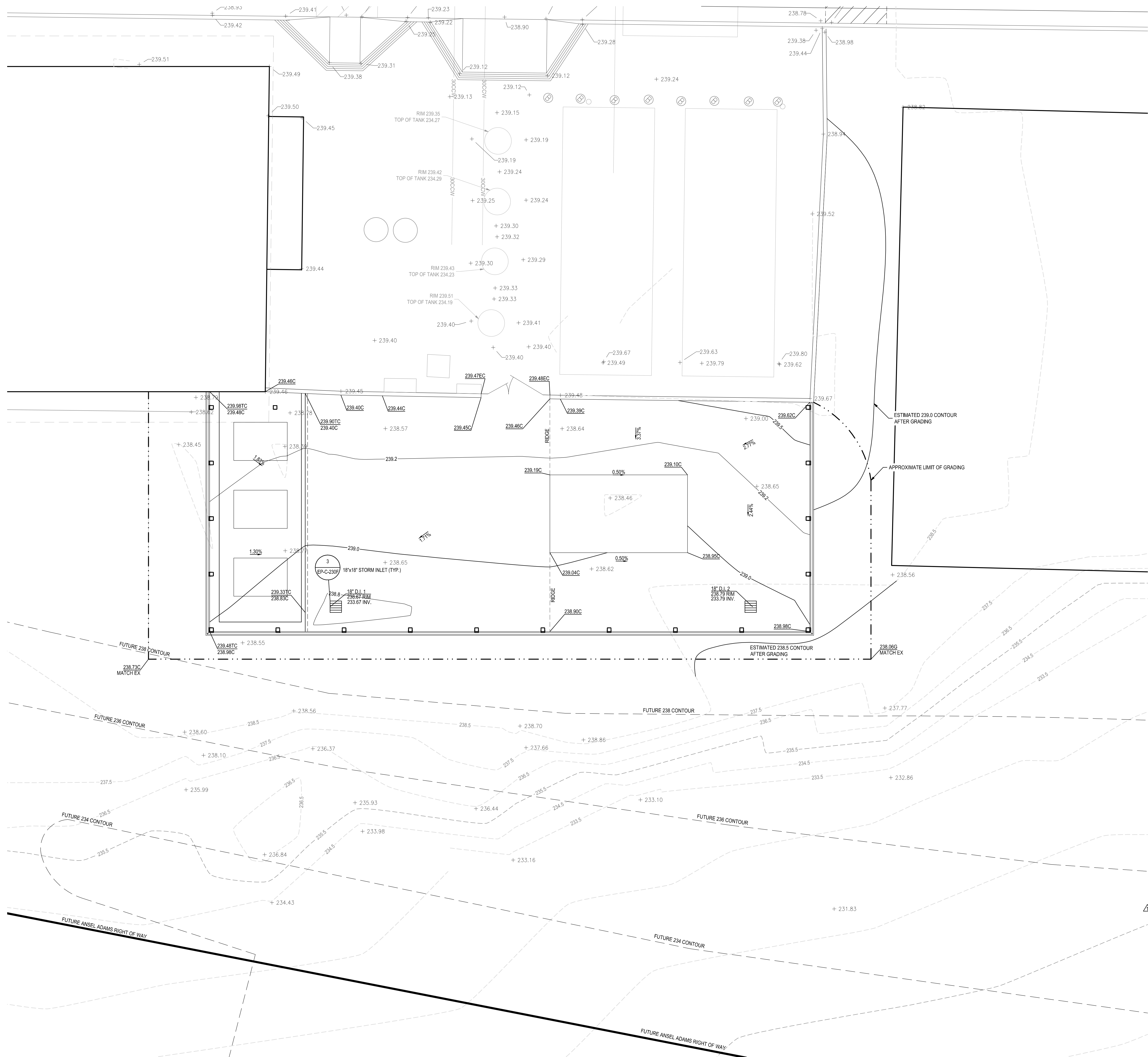
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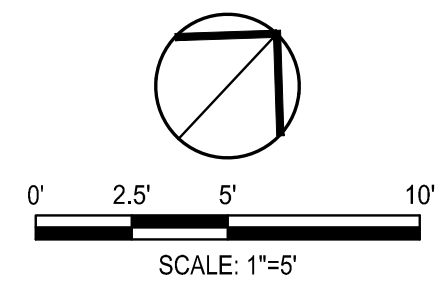
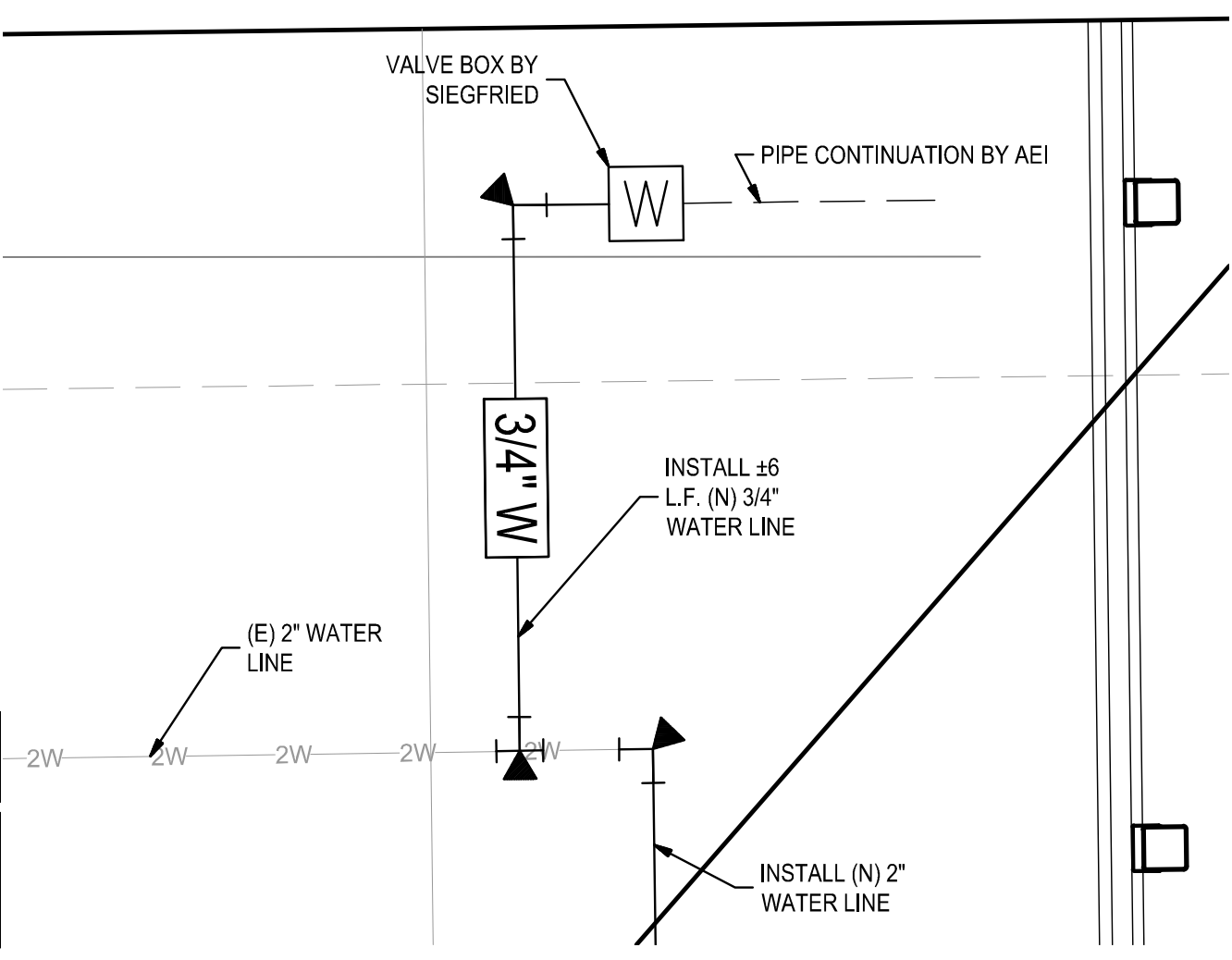
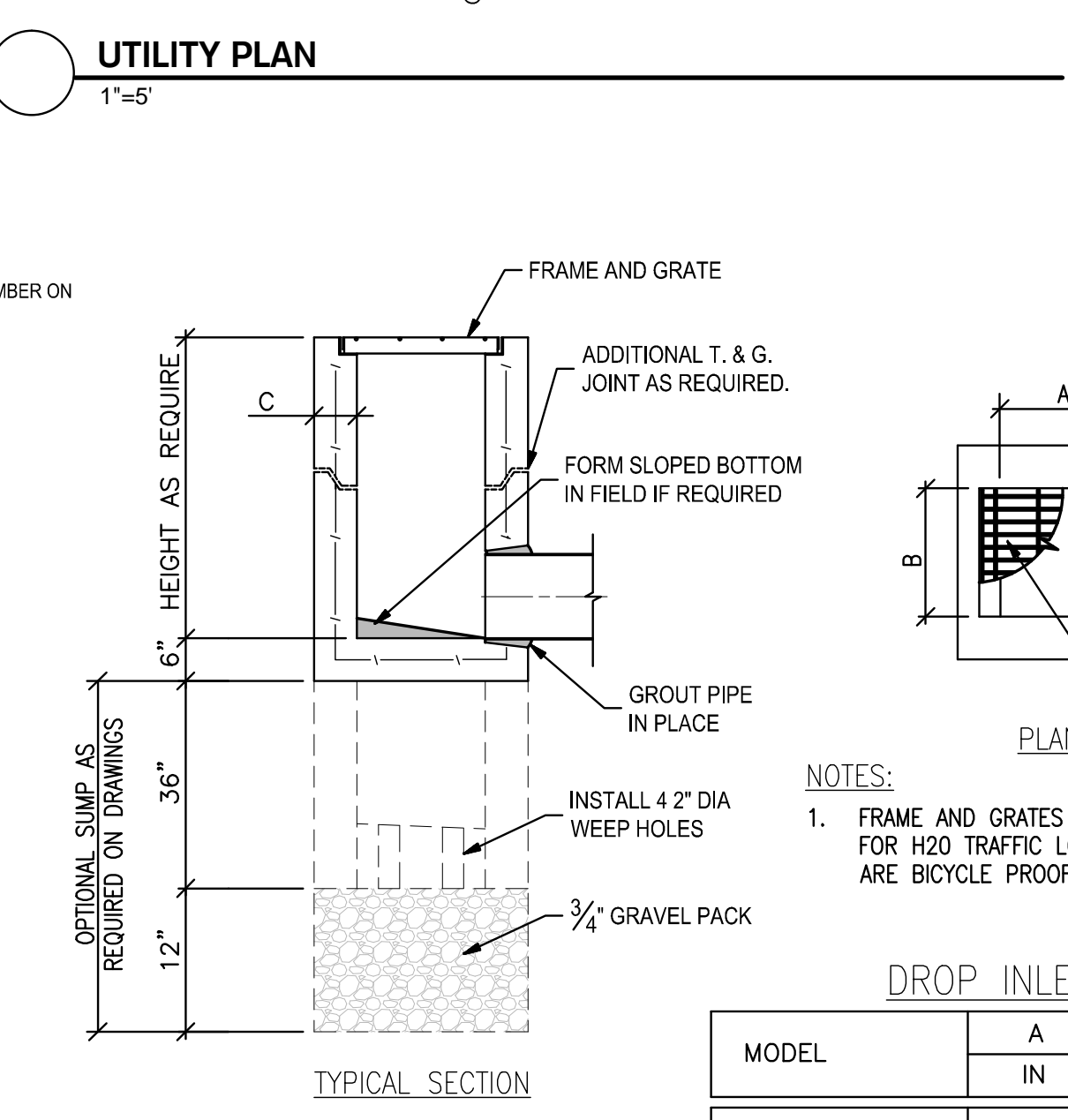
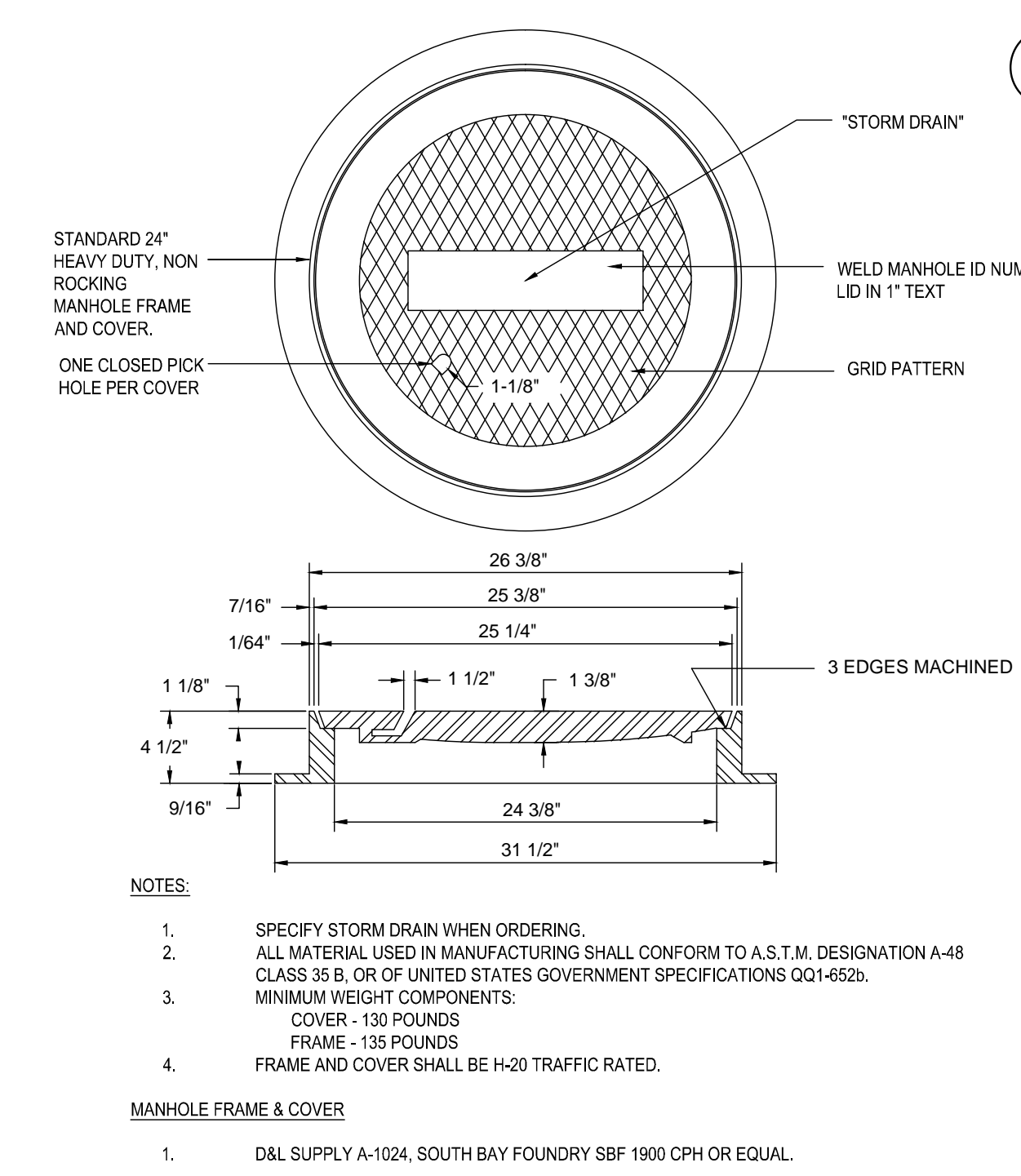
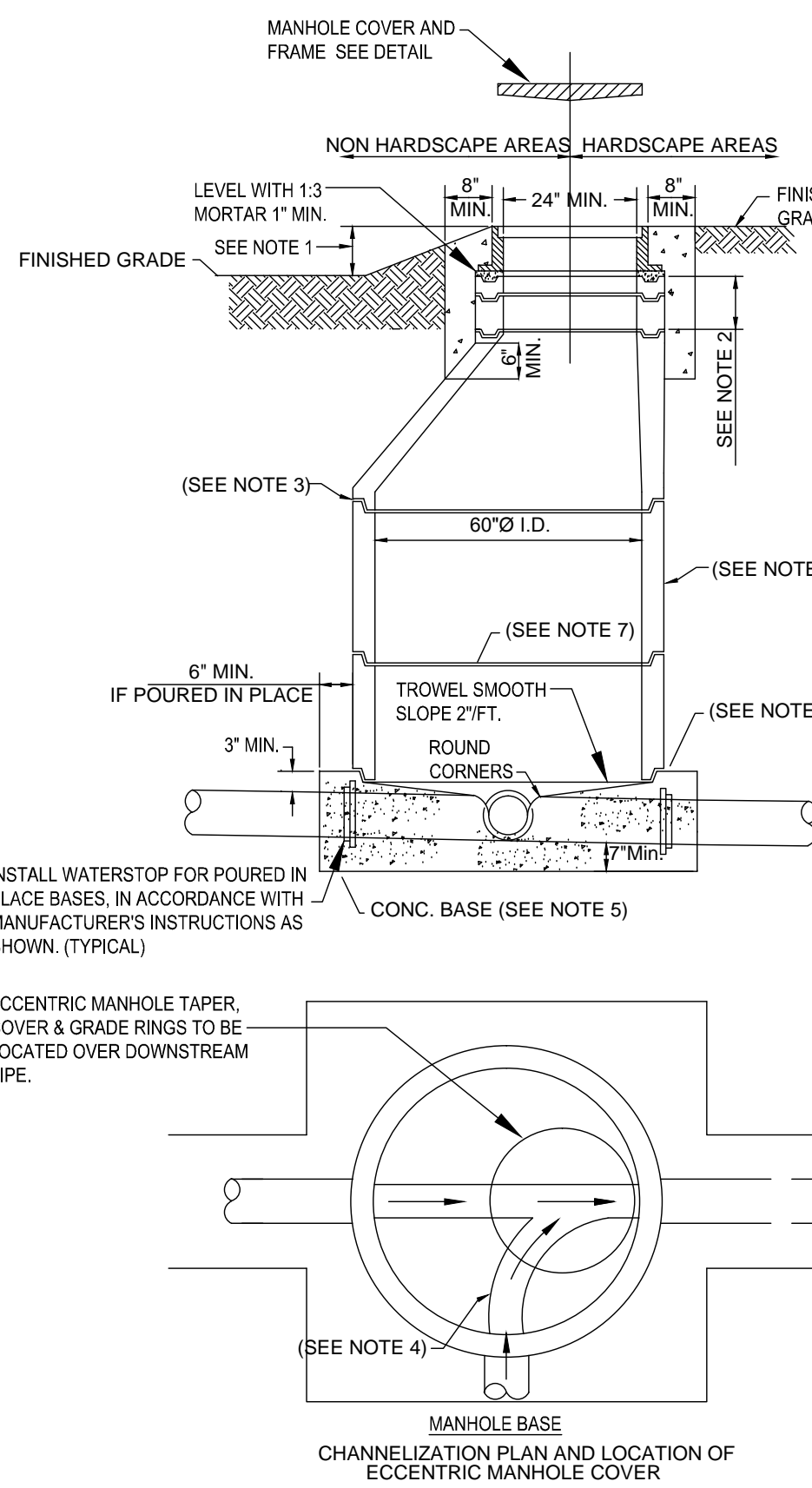
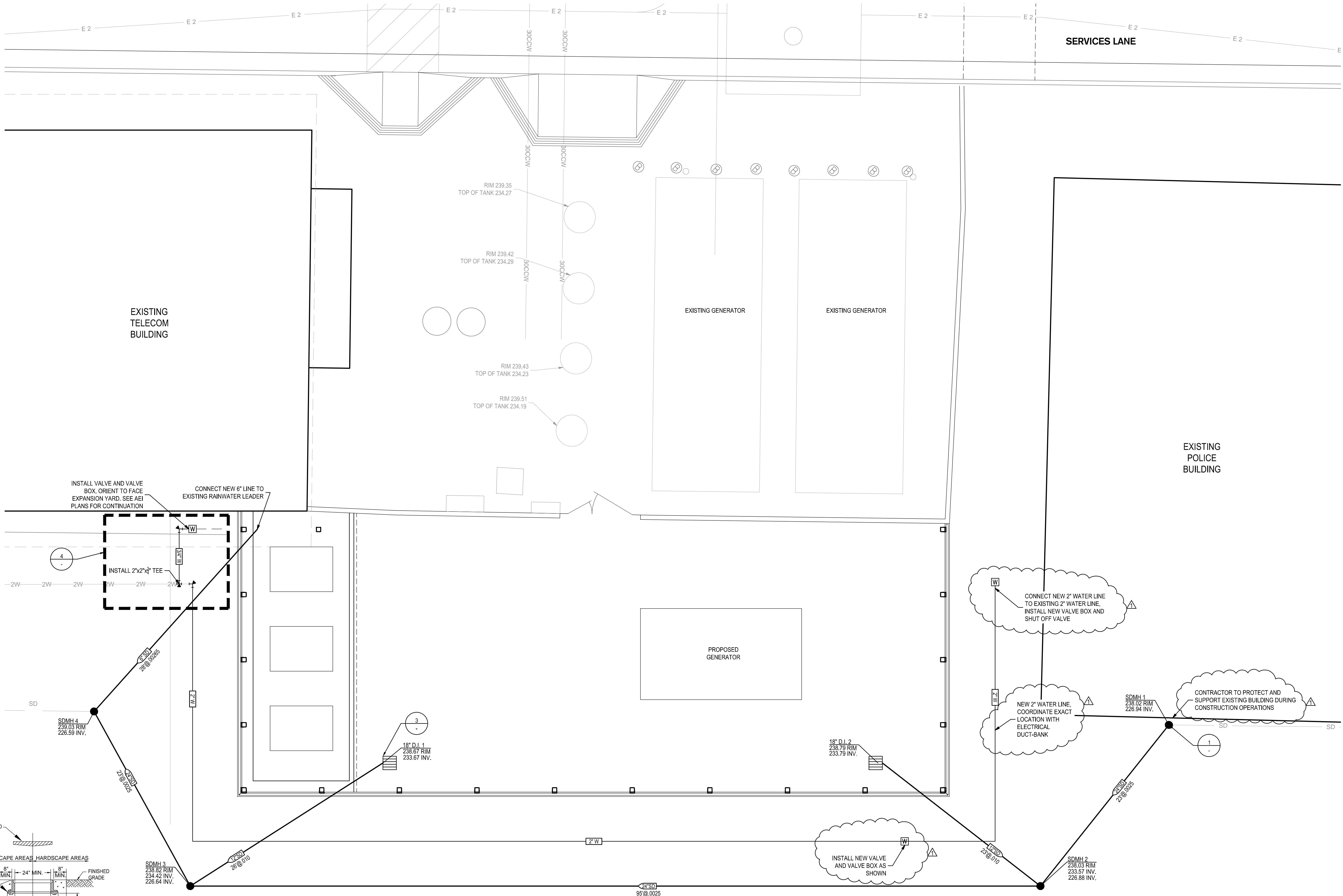
EP-G-001



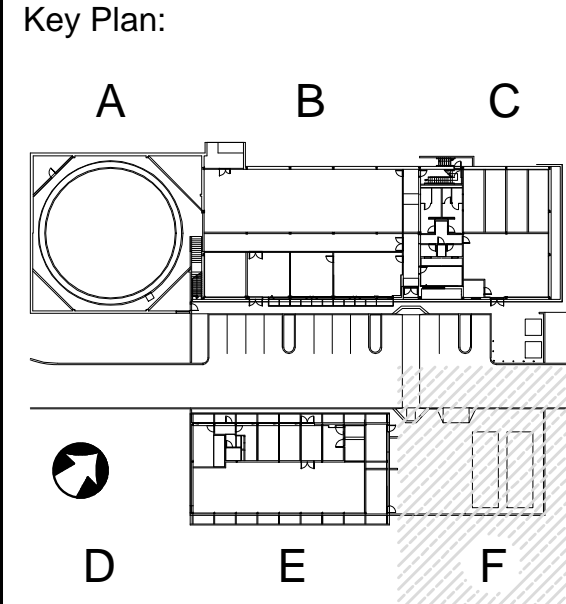
DEMOLITION PLAN
1"=5'

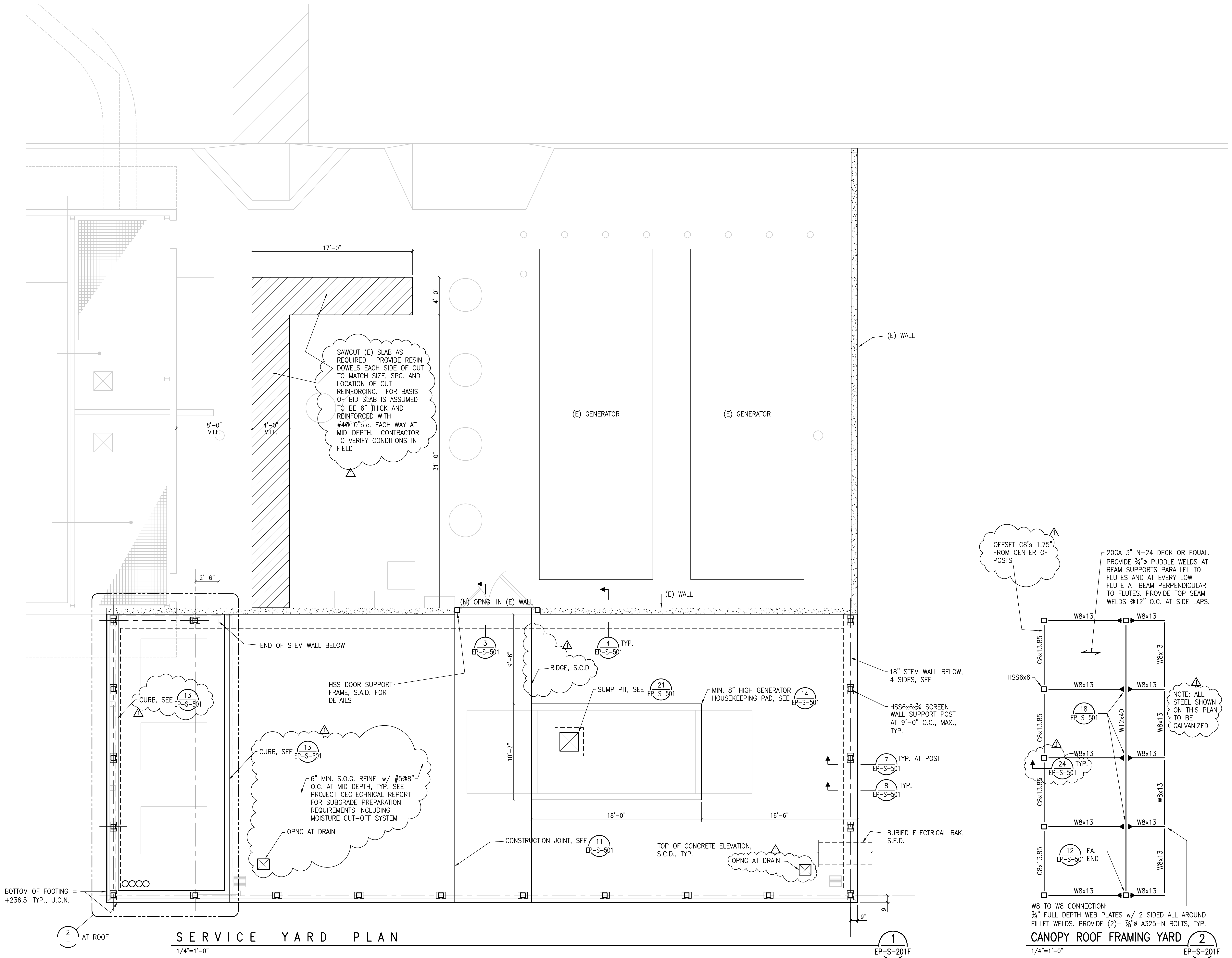






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1	ADDENDUM NO. 3	09.23.14





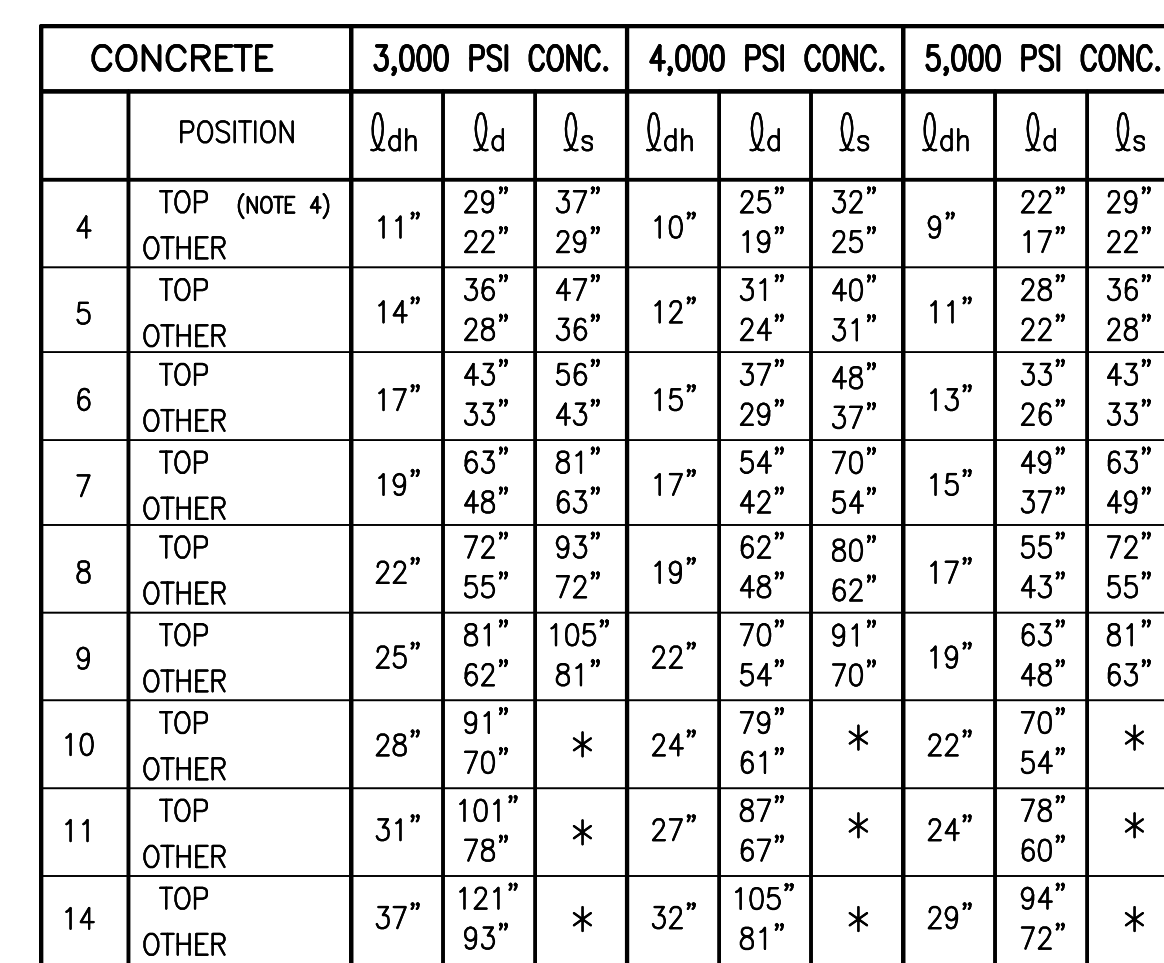
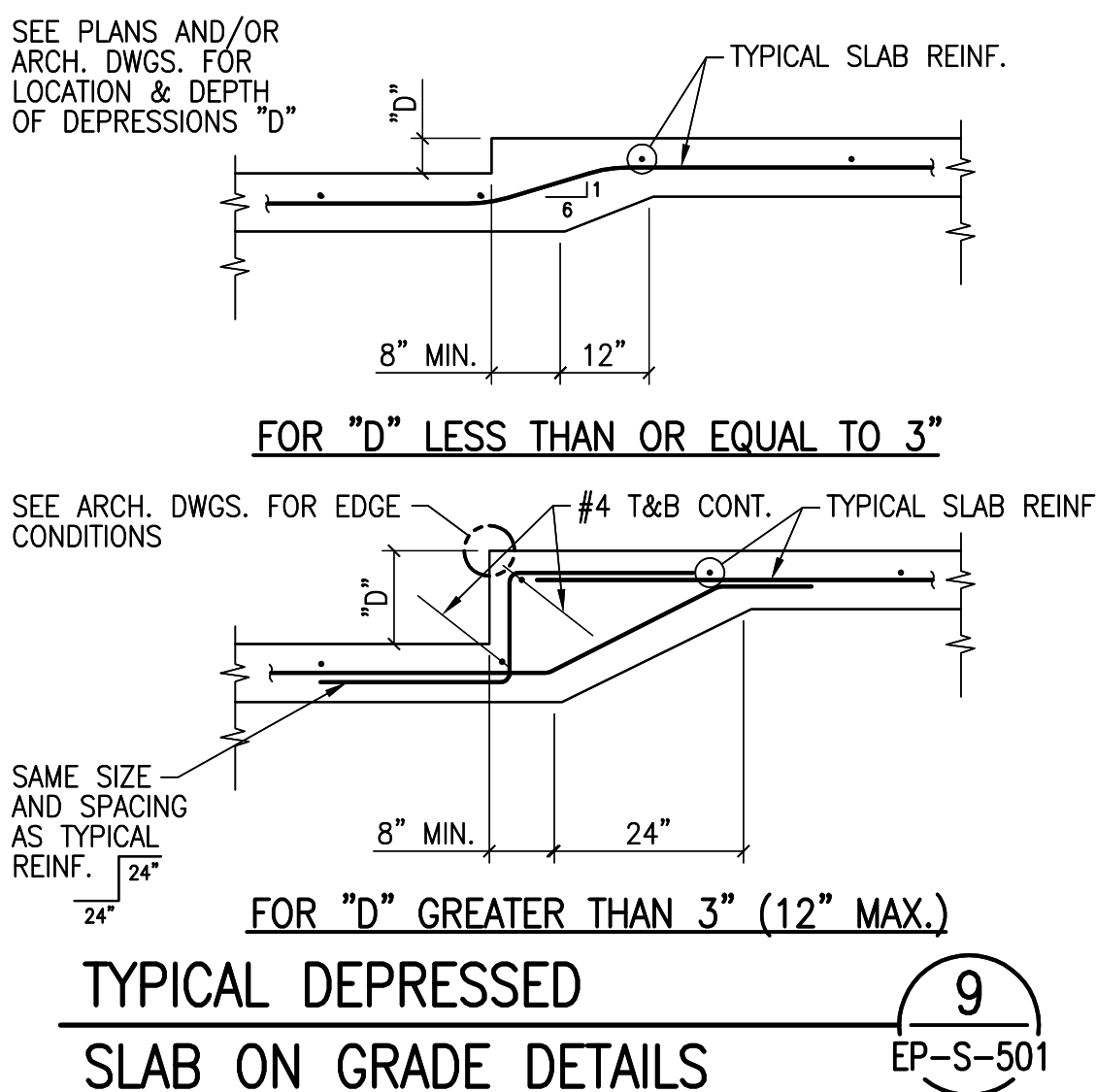
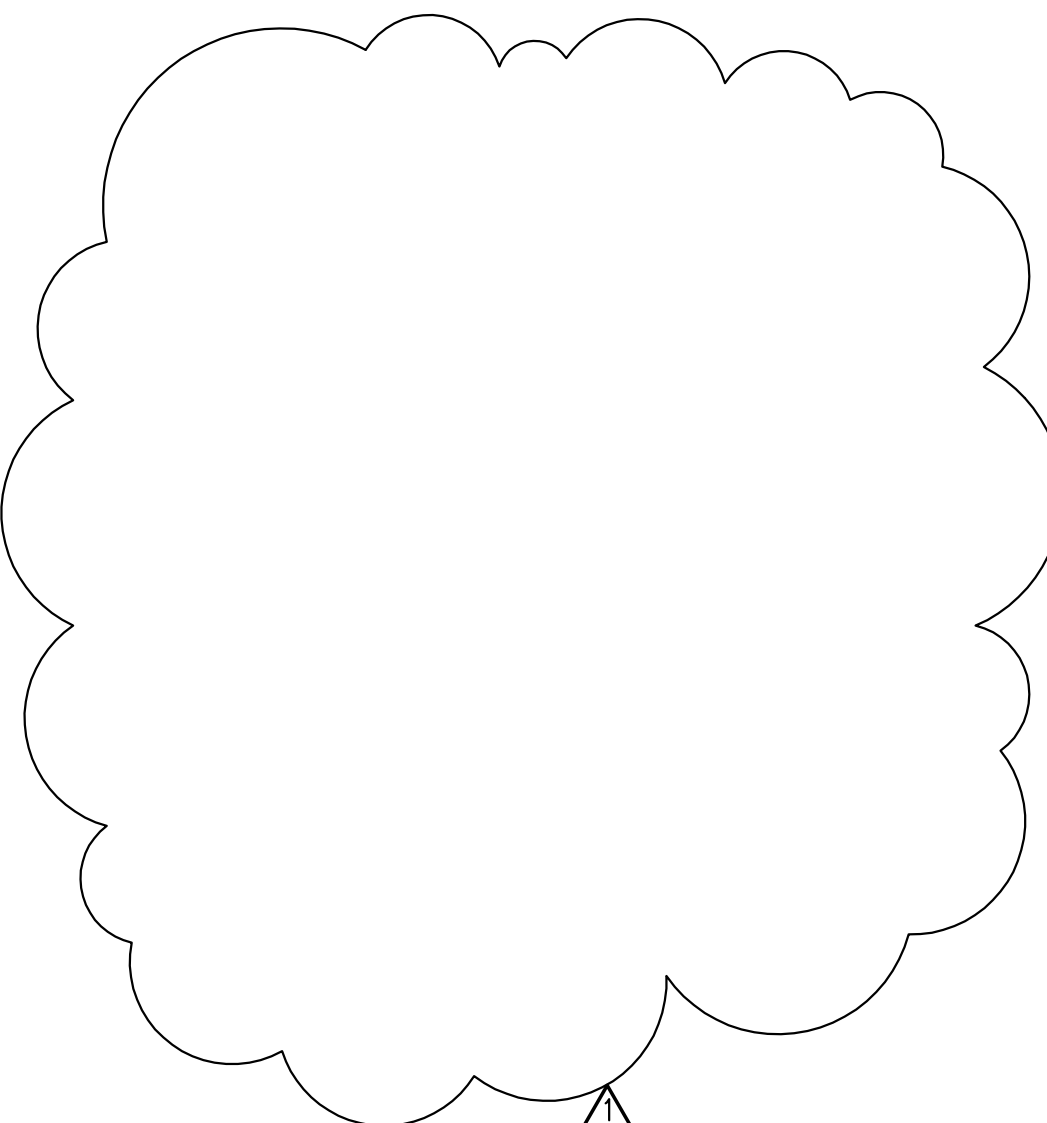


Diagram illustrating the plan or elevation view of a concrete slab with a sawcut edge and a 3" core.

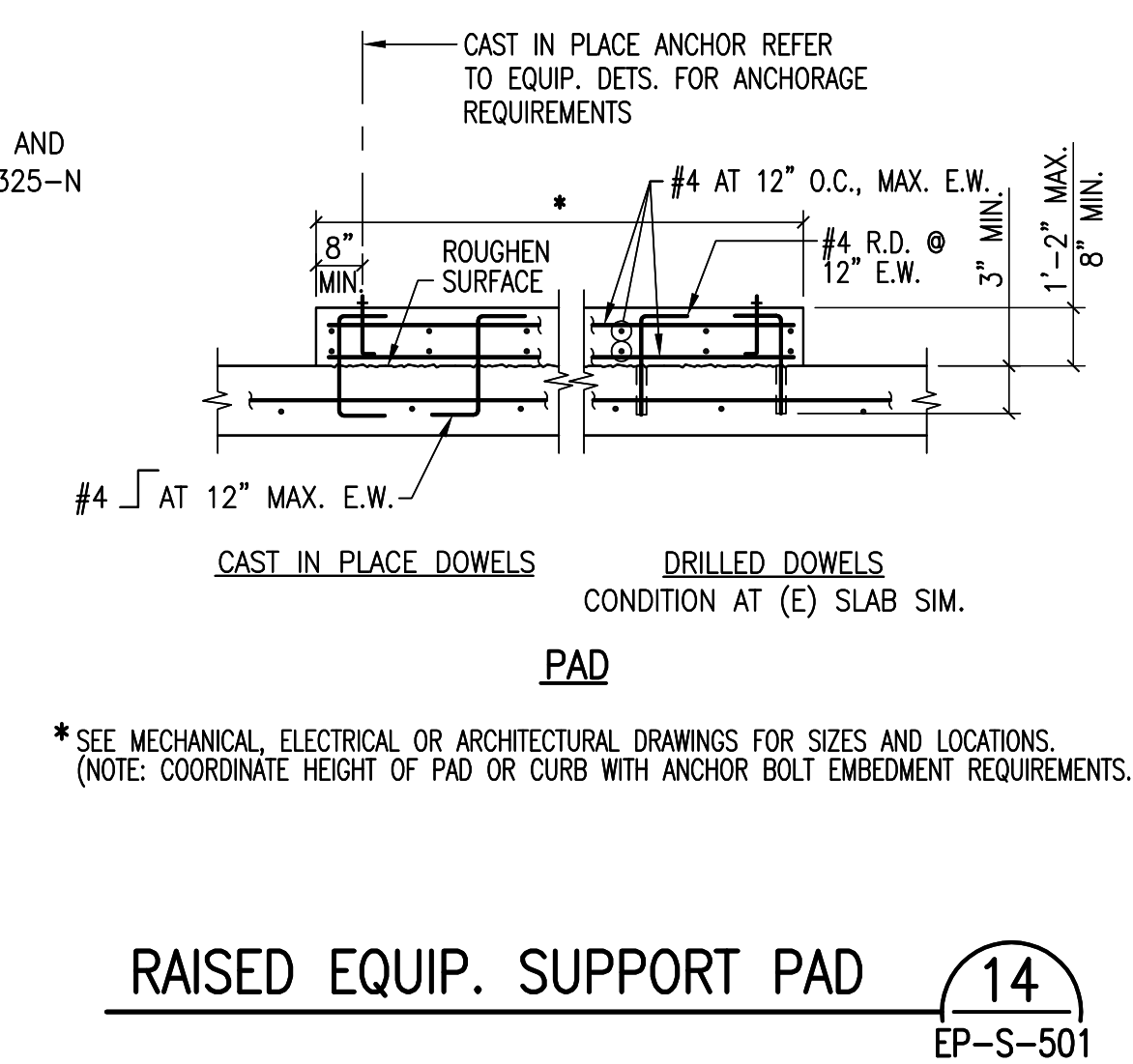
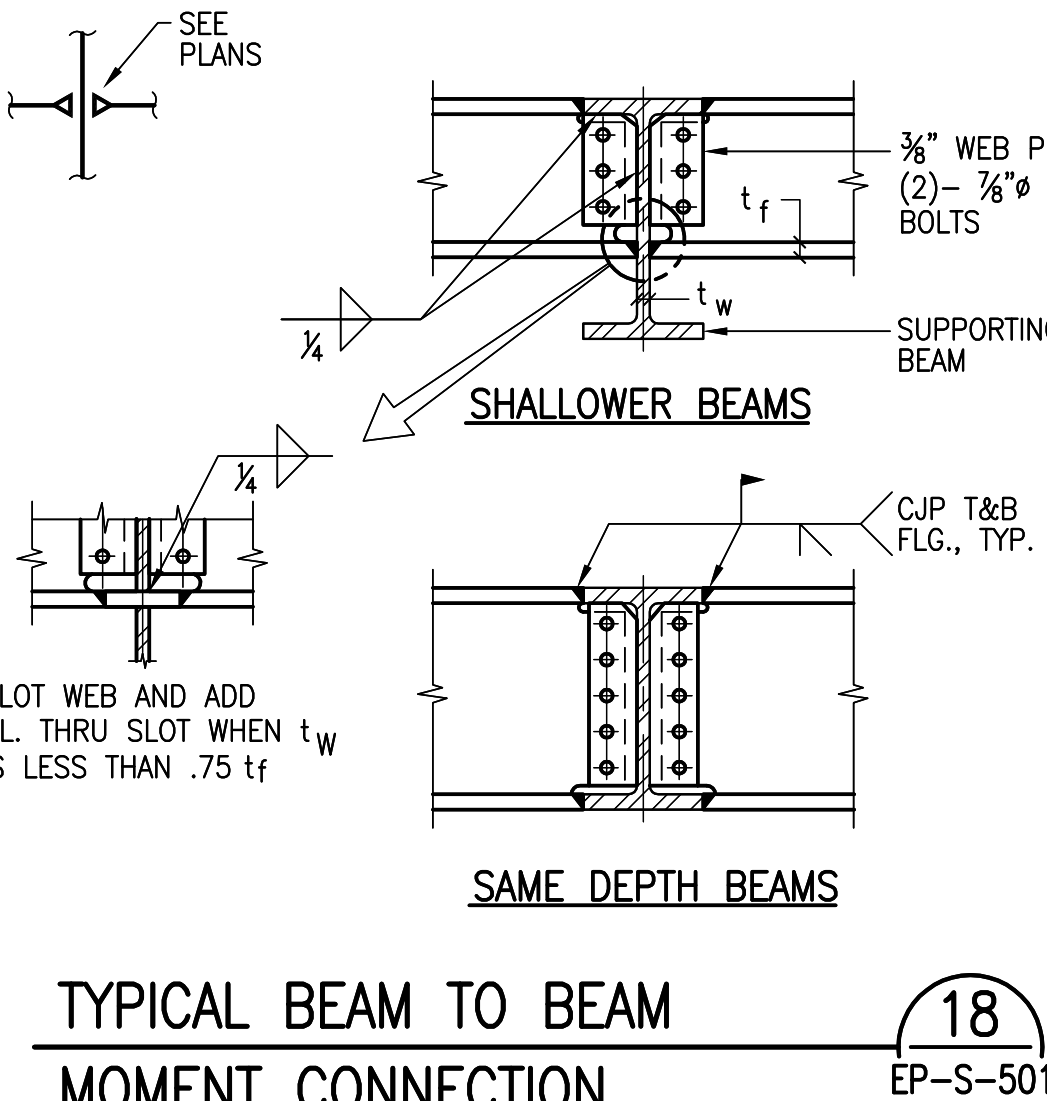
PLAN OR ELEVATION

NOTES:

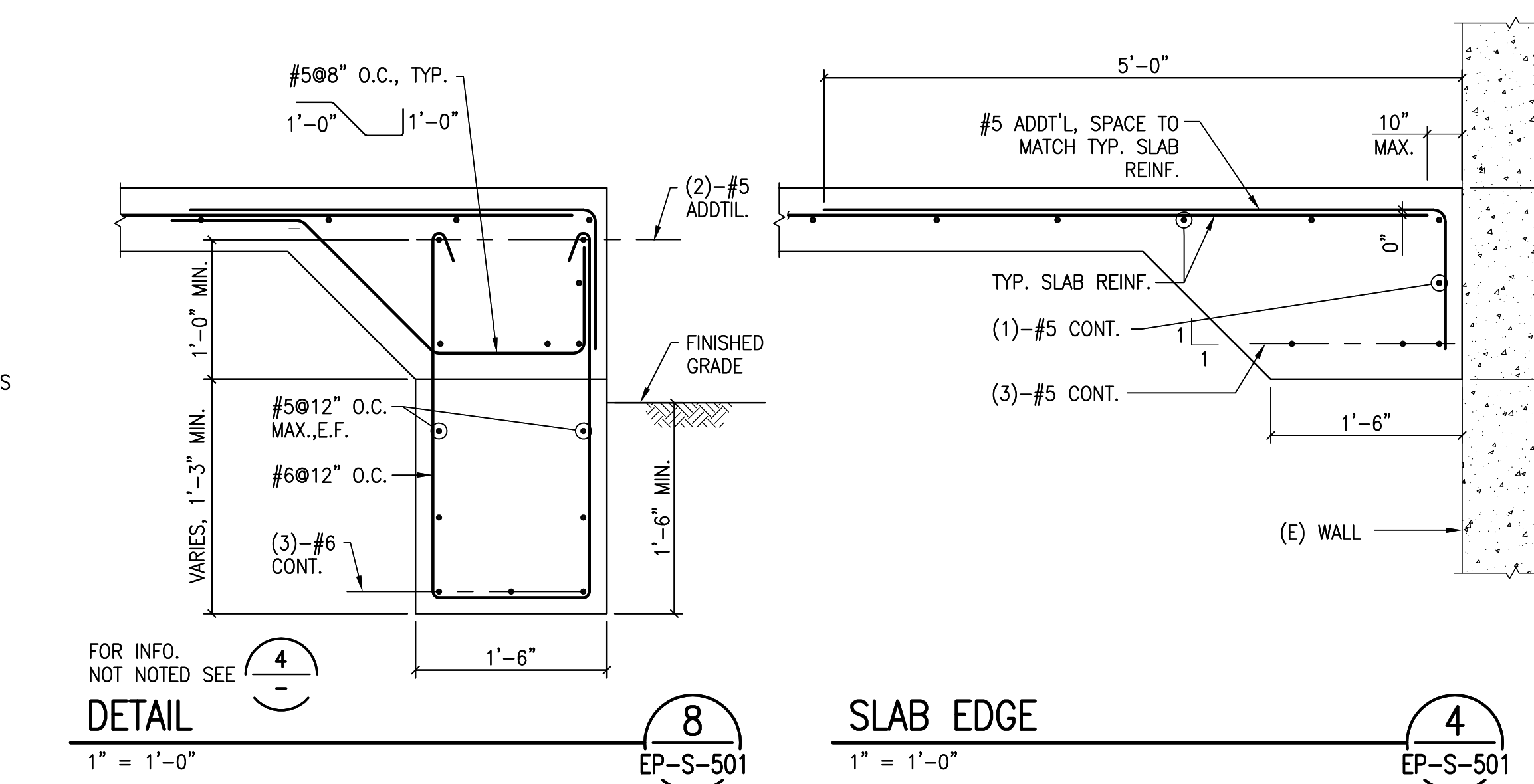
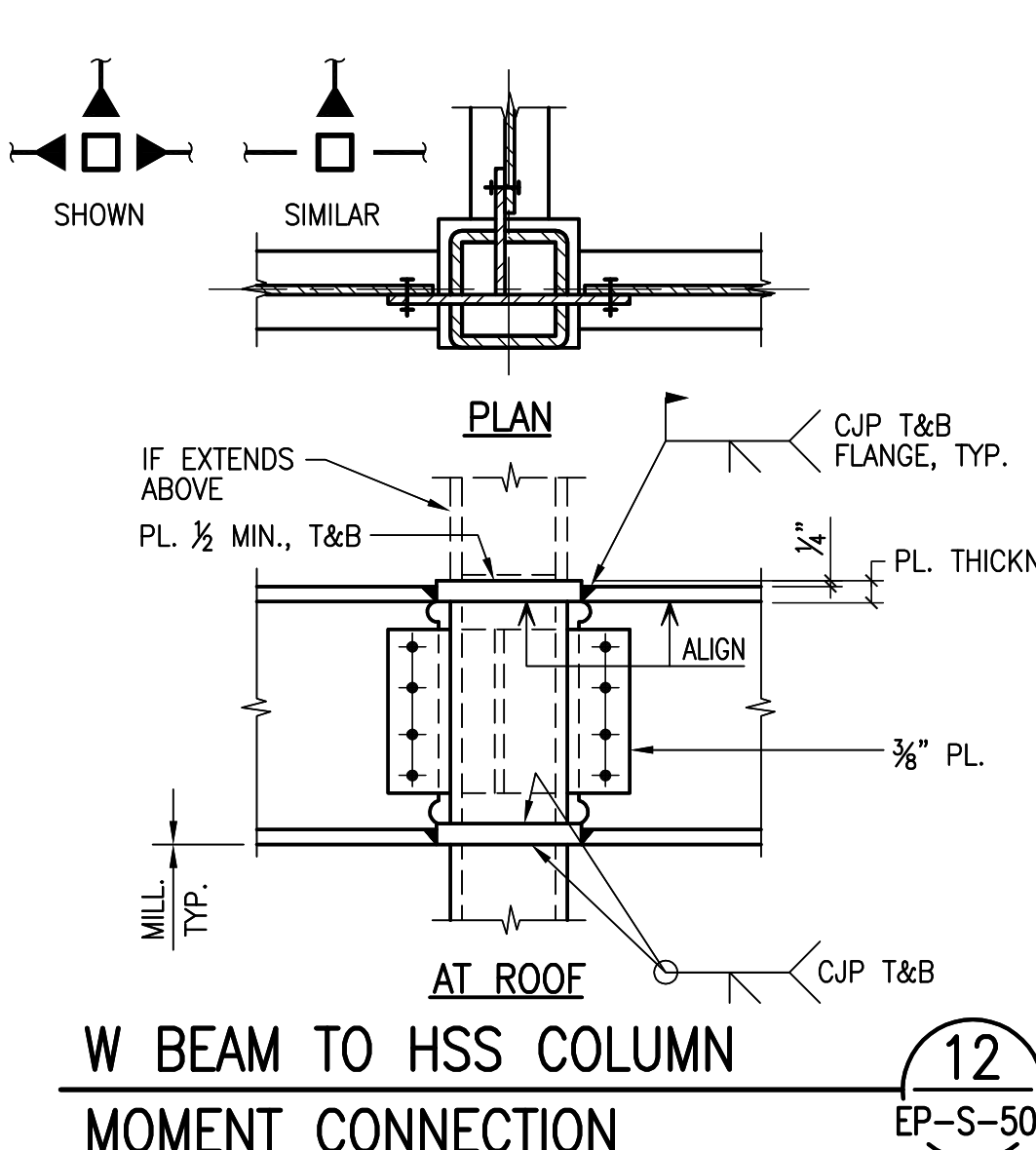
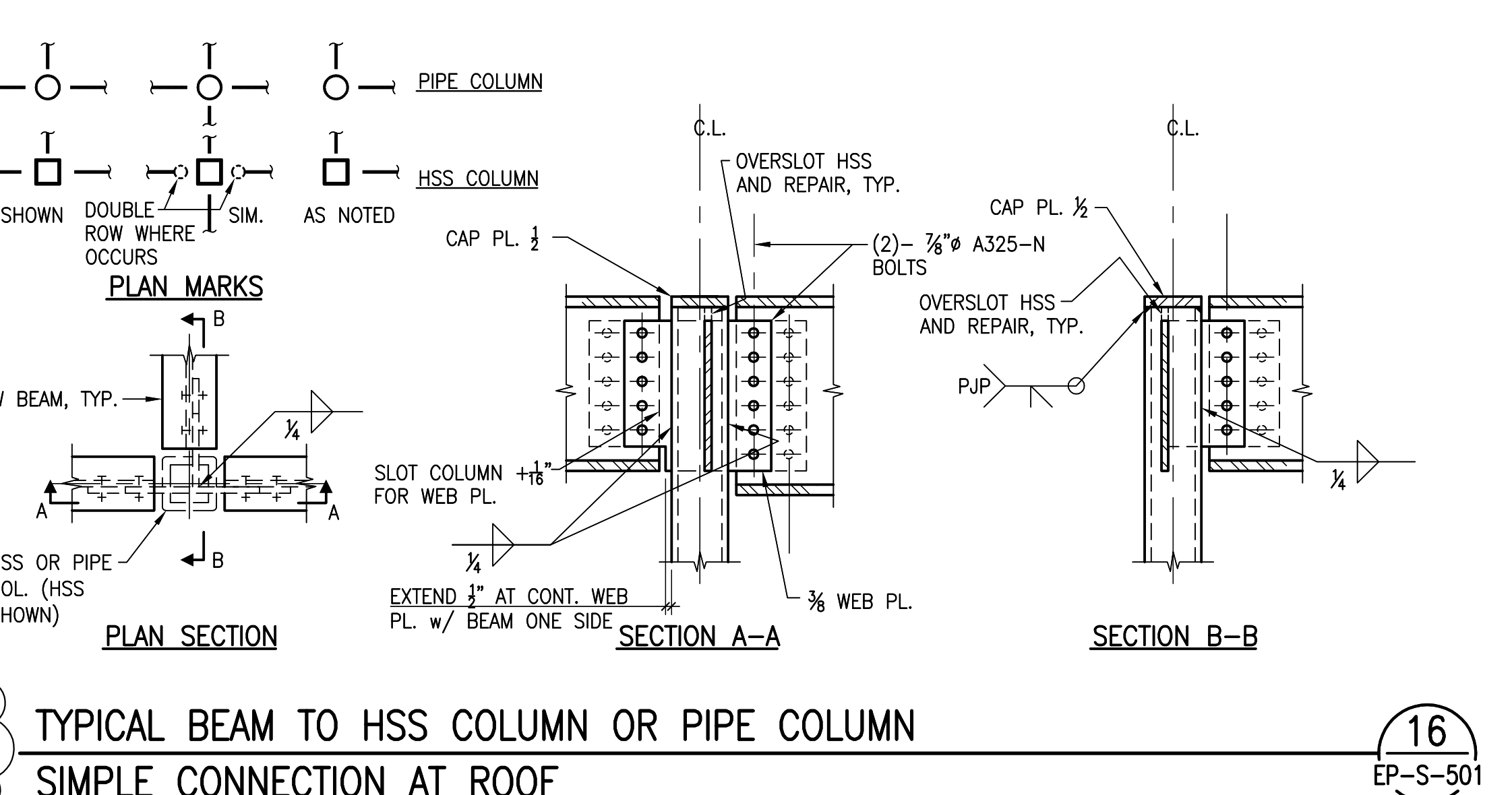
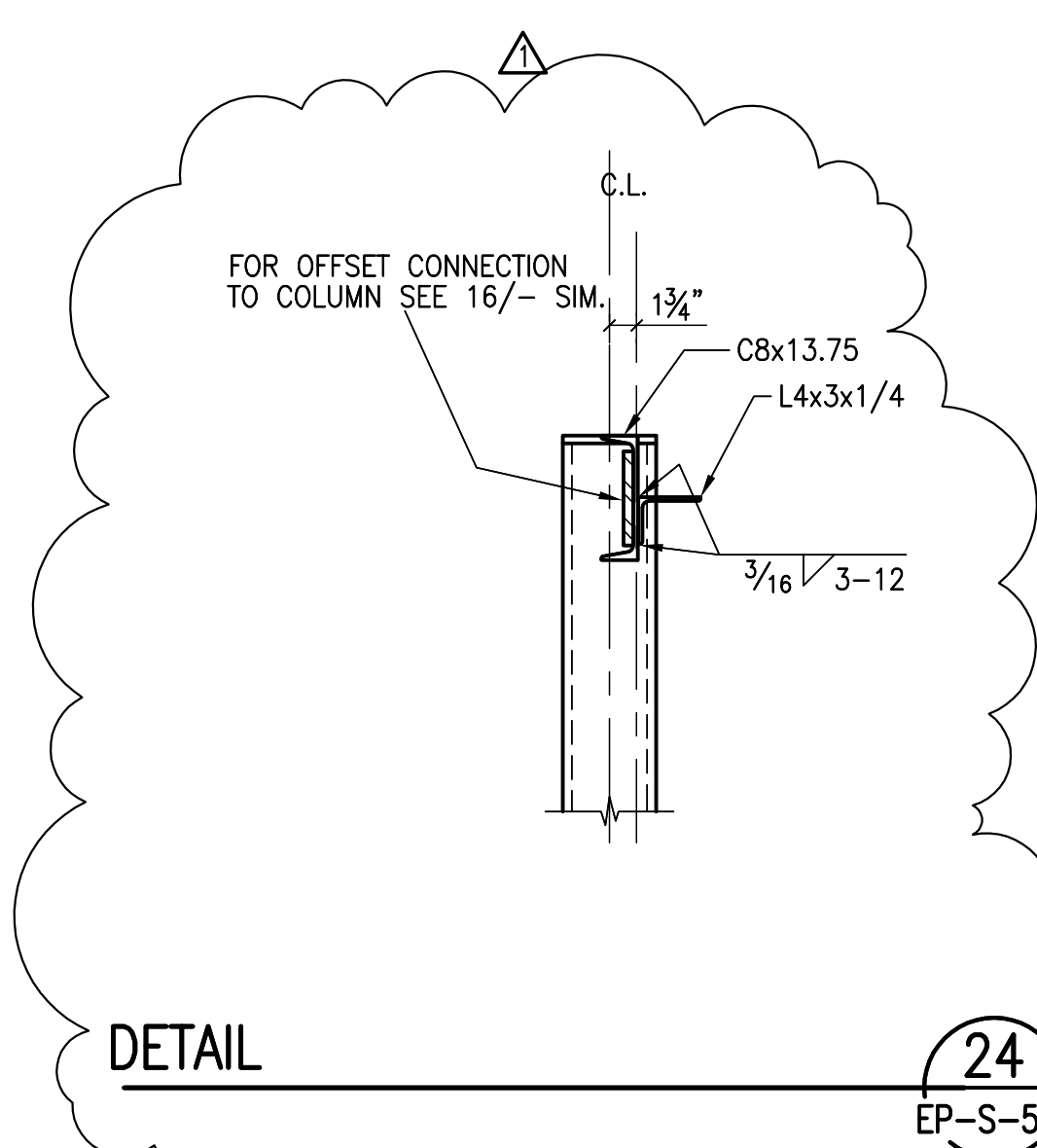
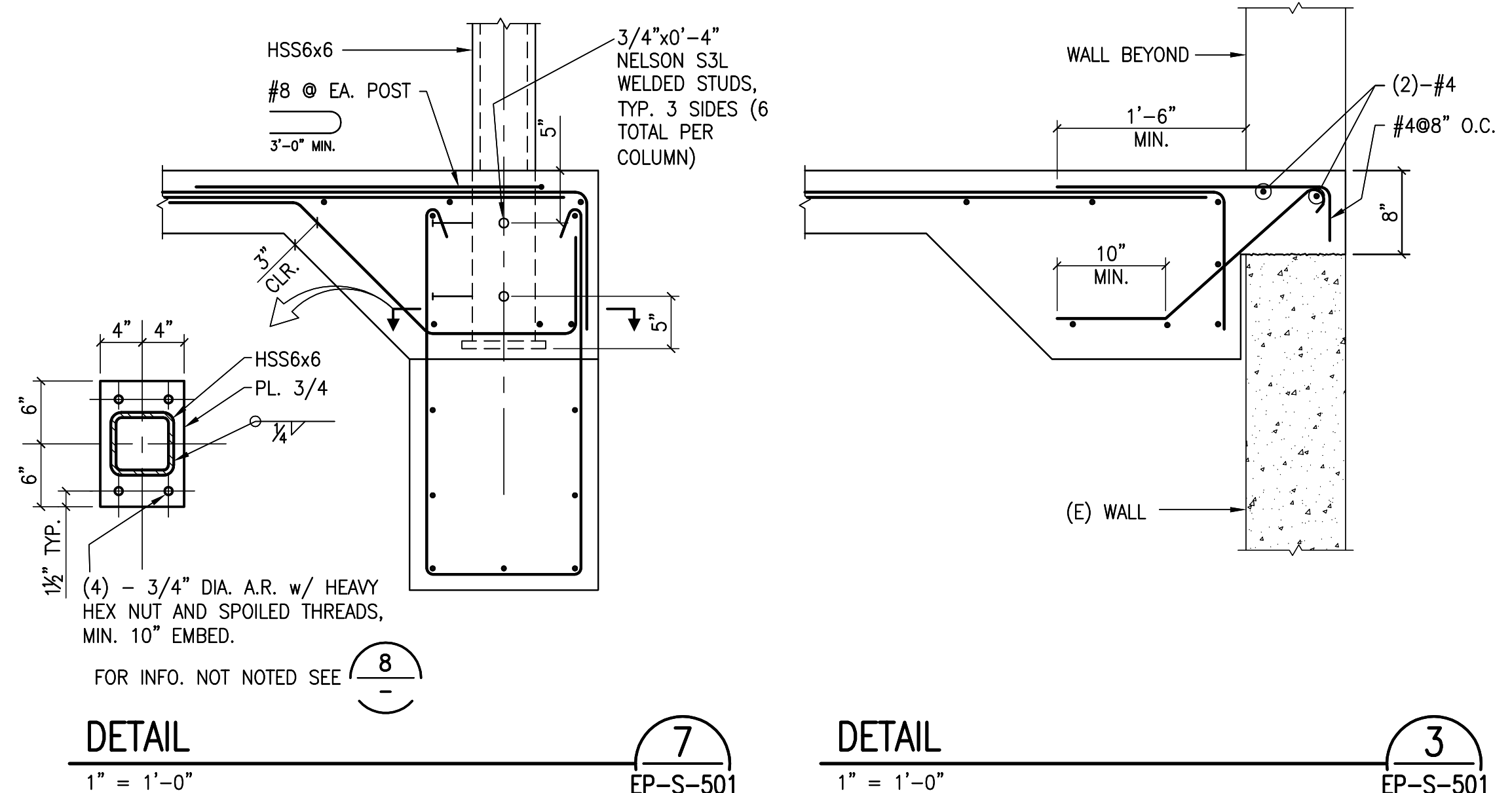
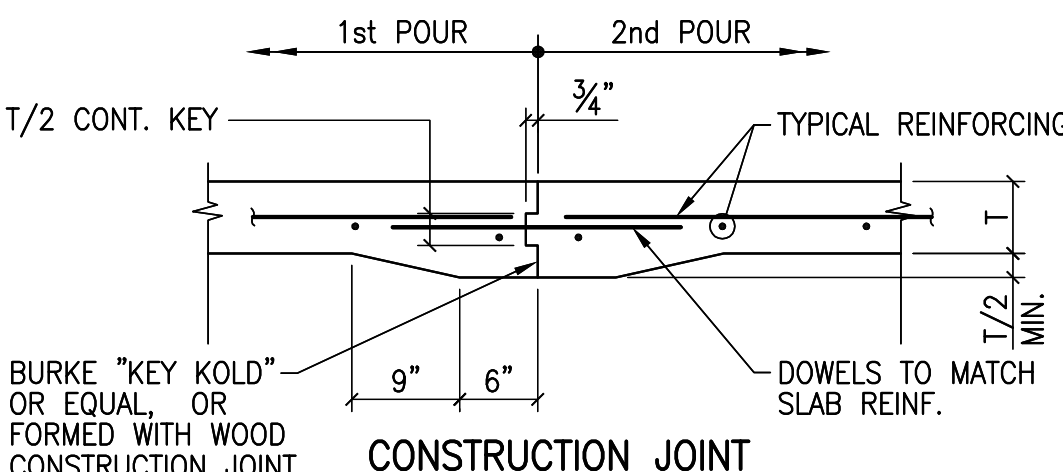
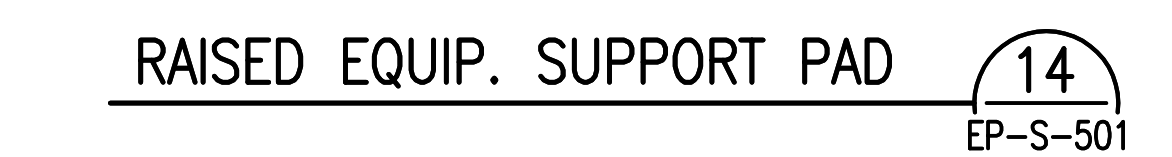
- CUT (N) OPENINGS AS FOLLOWS:
 - CORE HOLES AT EACH CORNER.
 - SAWCUT BETWEEN CORNERS.
 - CHIP AWAY REMAINING CONCRETE AT CORED HOLES.
- AT EXTERIOR LOCATIONS, CHIP AWAY CONCRETE TO 1/2" DEPTH ALL AROUND. CUT REINF. AND FILL w/ EPOXY.
- DO NOT CUT FOR (N) OPENINGS THRU JOINTS, BEAMS, NOTED ON STRUCTURAL DRAWINGS.

(N) OPENINGS IN (E) CONC.

22
EP-S-501

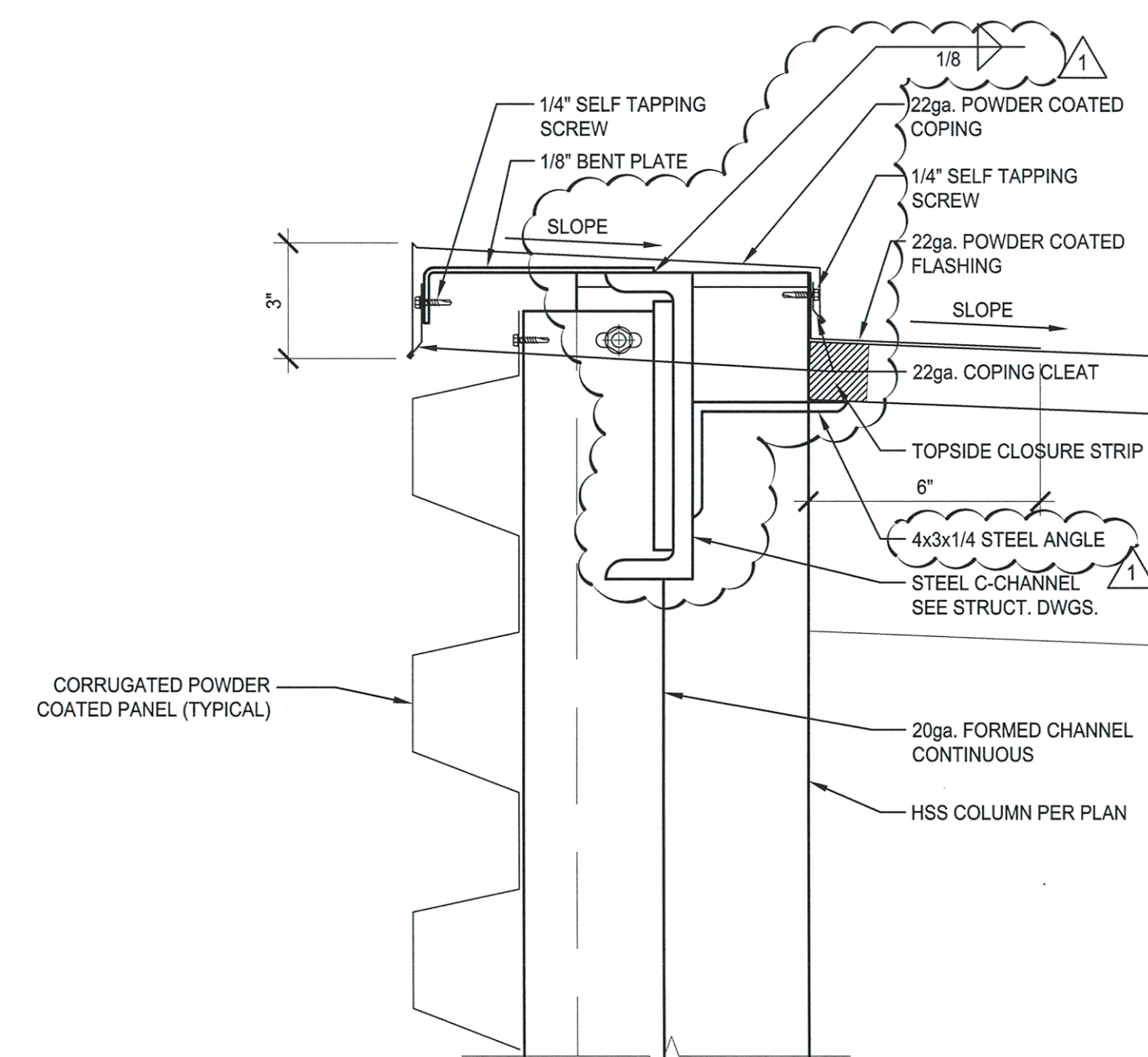
[illegible]

(N) OPENINGS IN (E) CONC. 22
EP-S-501

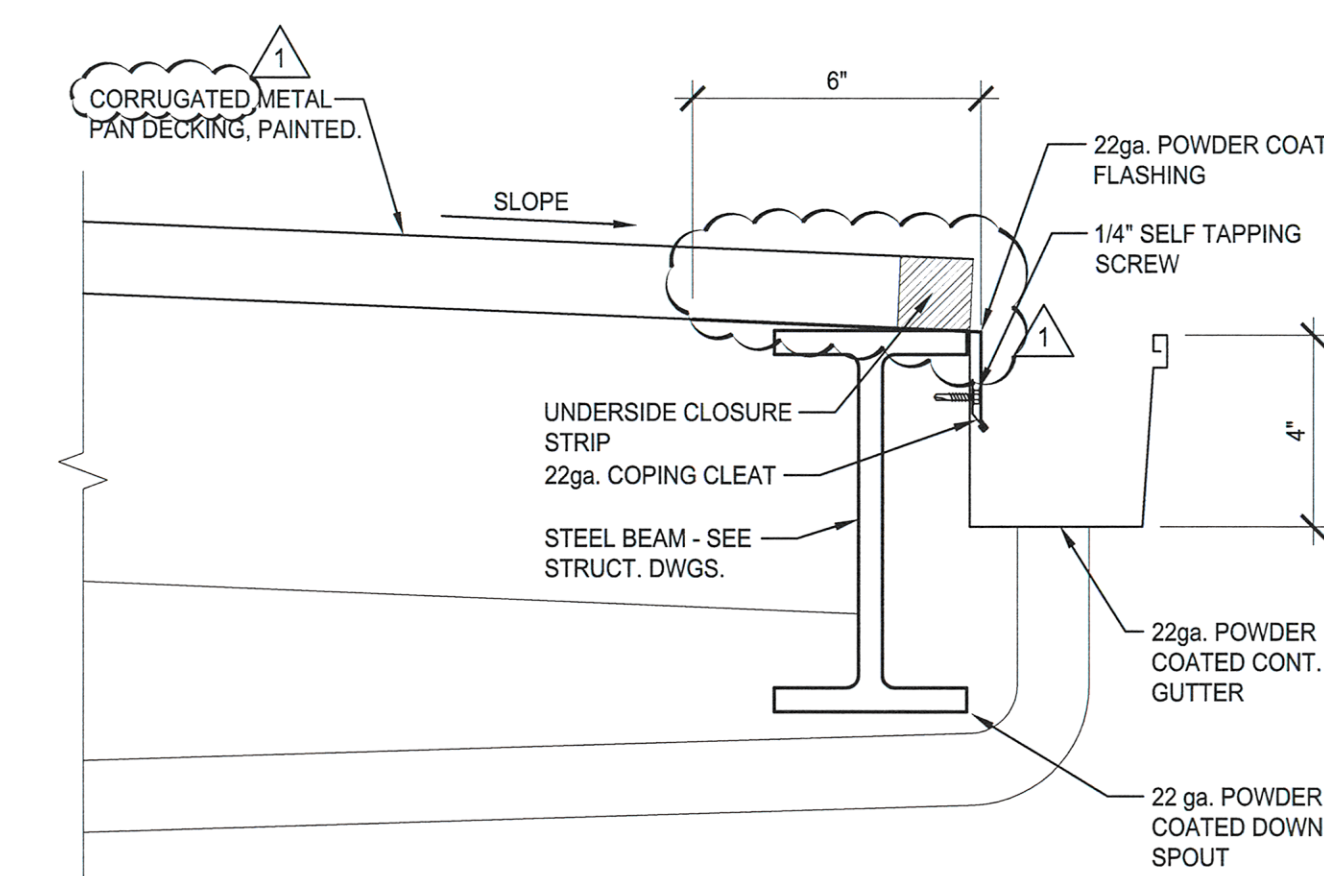


30x42

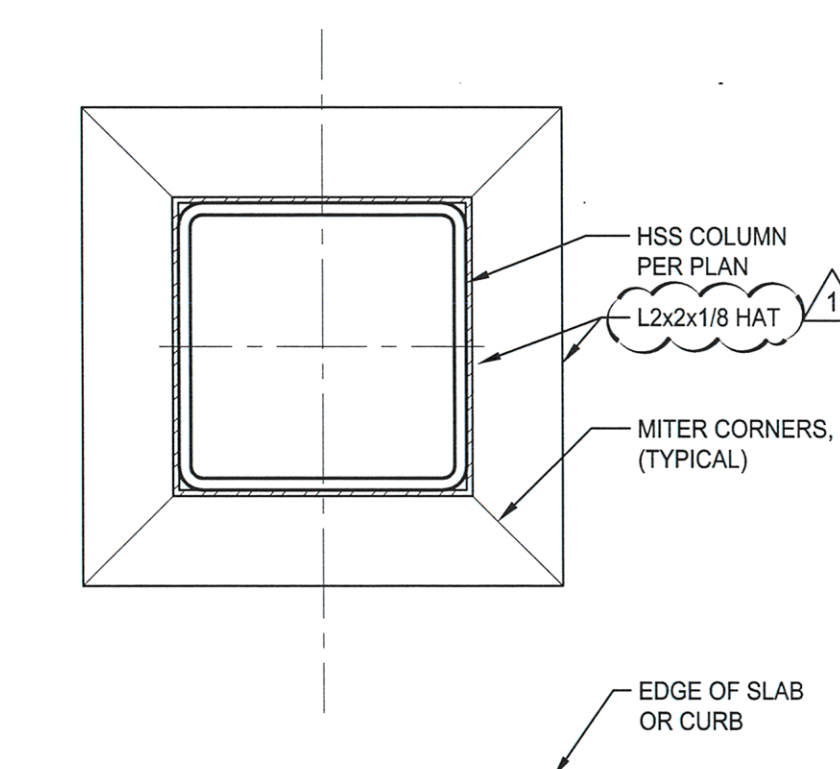
09/22/14 5:19:06 PM F:\13PROJECTS\13460 UC MERCED CENTRAL PLANT UPGRADE\IMPROVEMENT PLANS\EP-A-800 SERVICE YARD PLAN.DWG mebeno



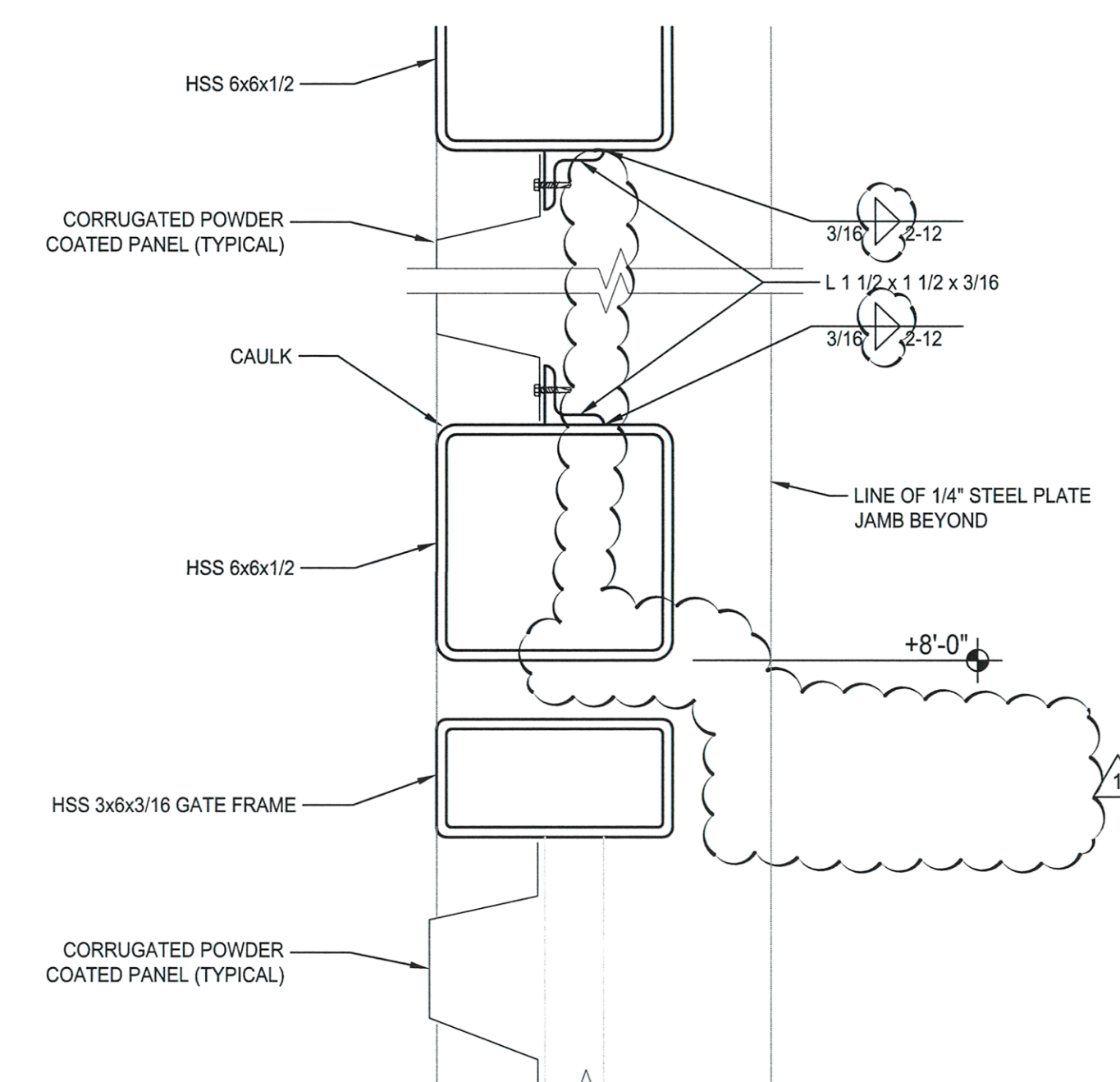
10 SCREEN WALL CAP AT CANOPY
3" = 1'-0"



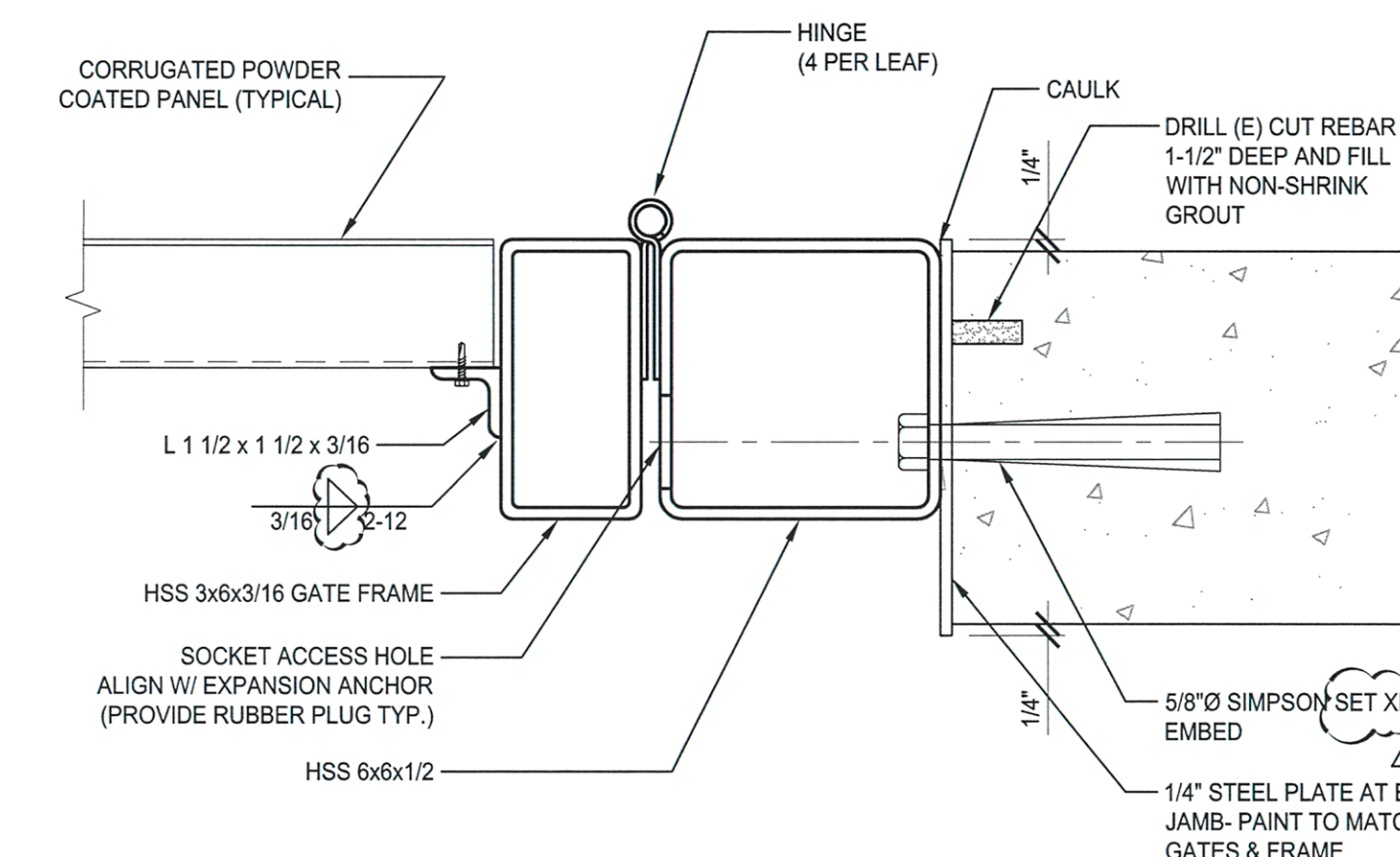
9 GUTTER DETAIL AT CANOPY
3" = 1'-0"



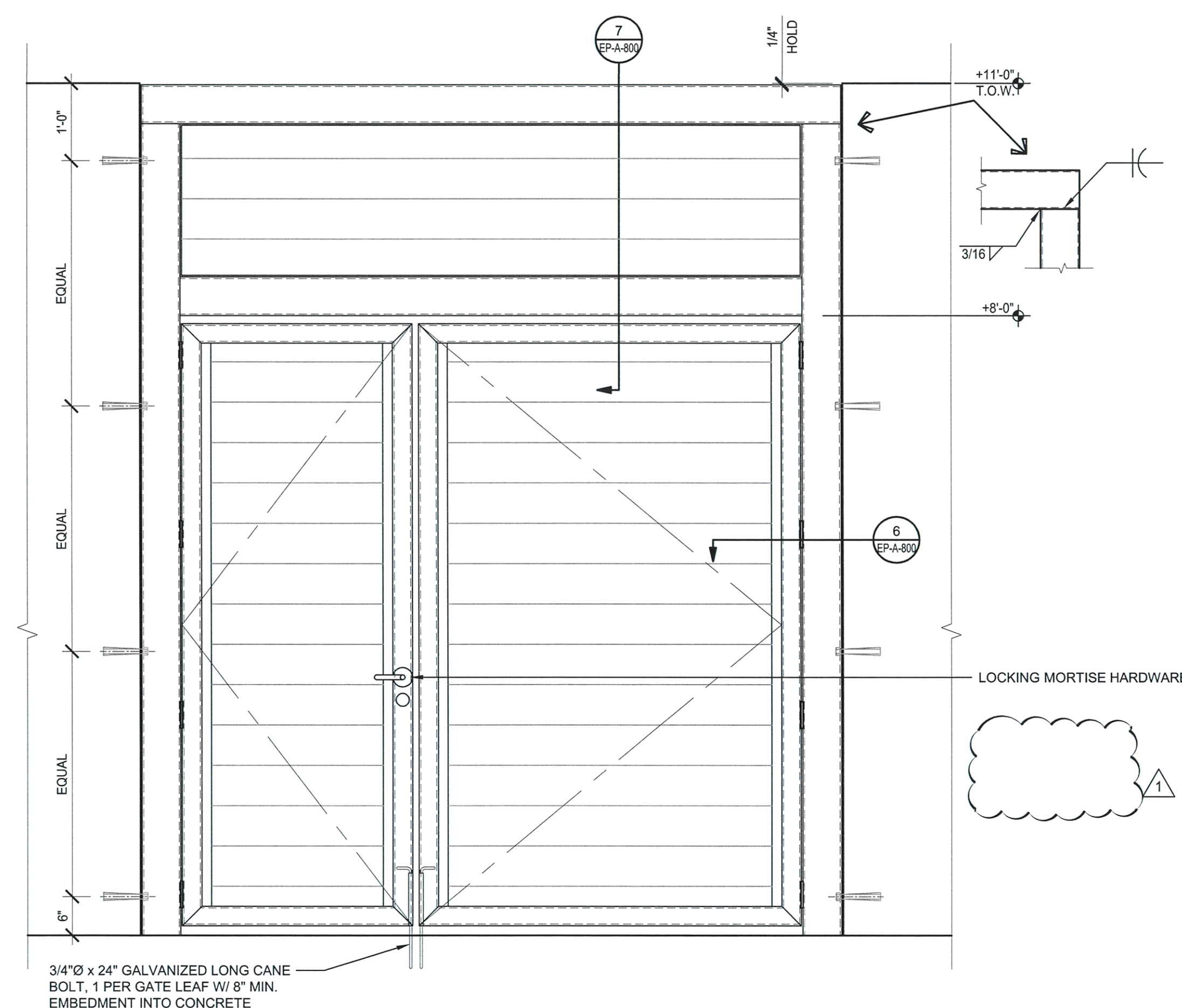
11 PLAN AT POST BASE
3" = 1'-0"



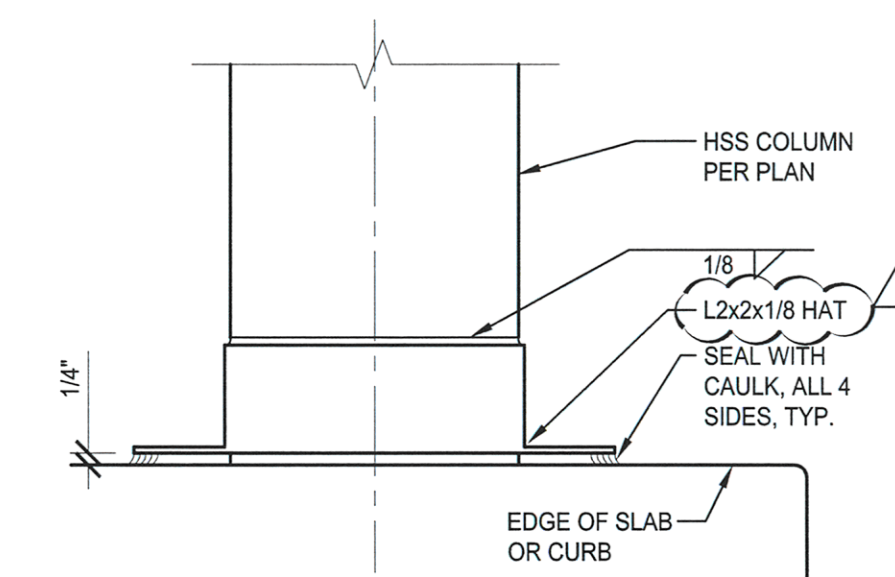
7 GATE HEAD DETAIL
3" = 1'-0"



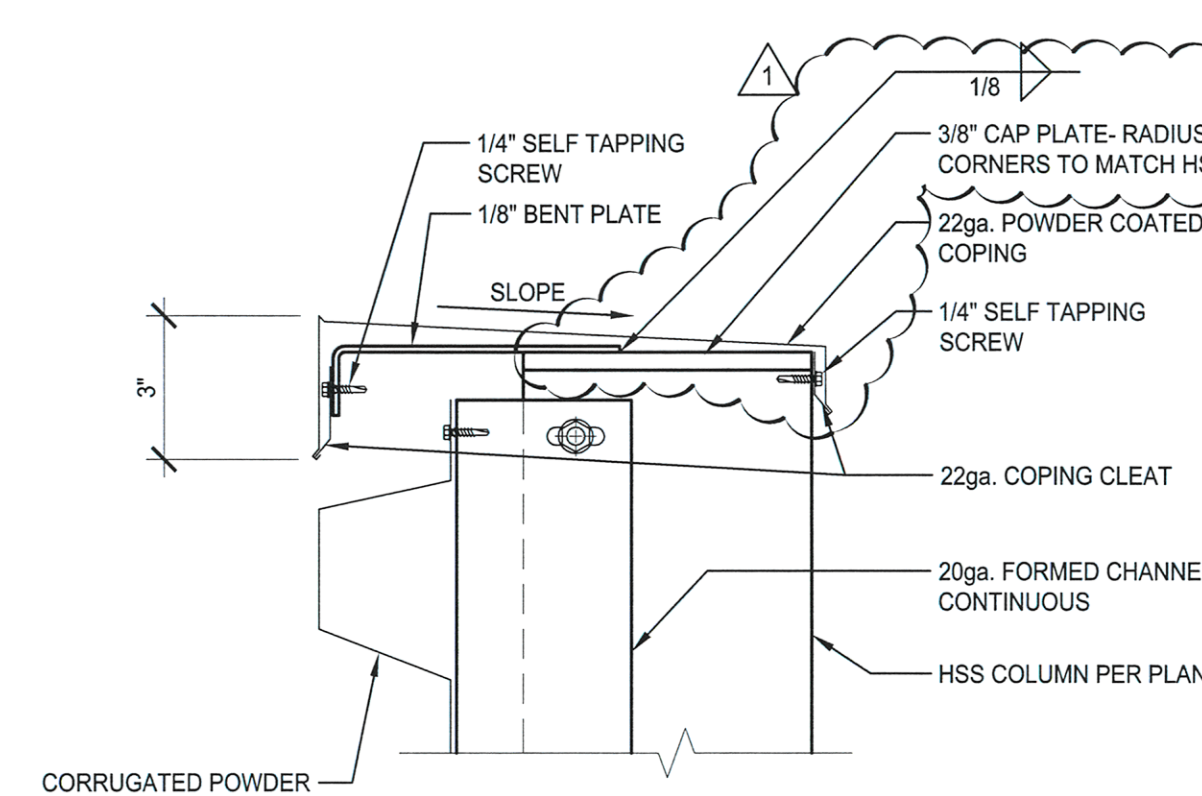
6 GATE JAMB DETAIL
3" = 1'-0"



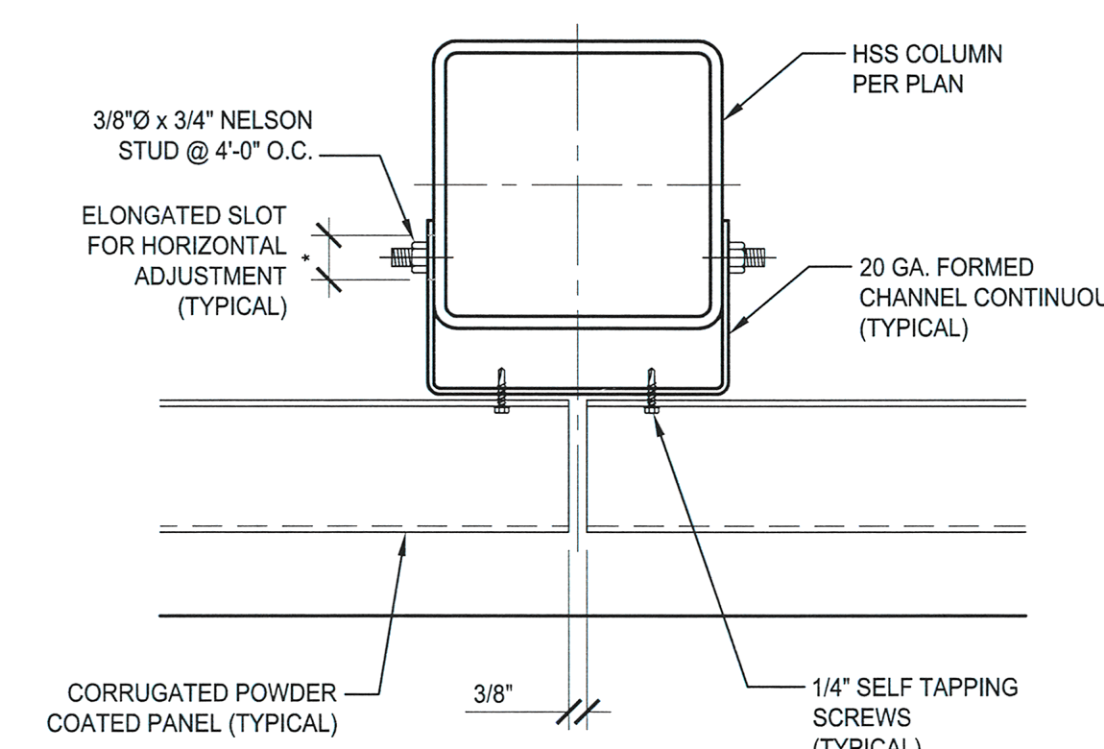
GATE ELEVATION (NORTH)



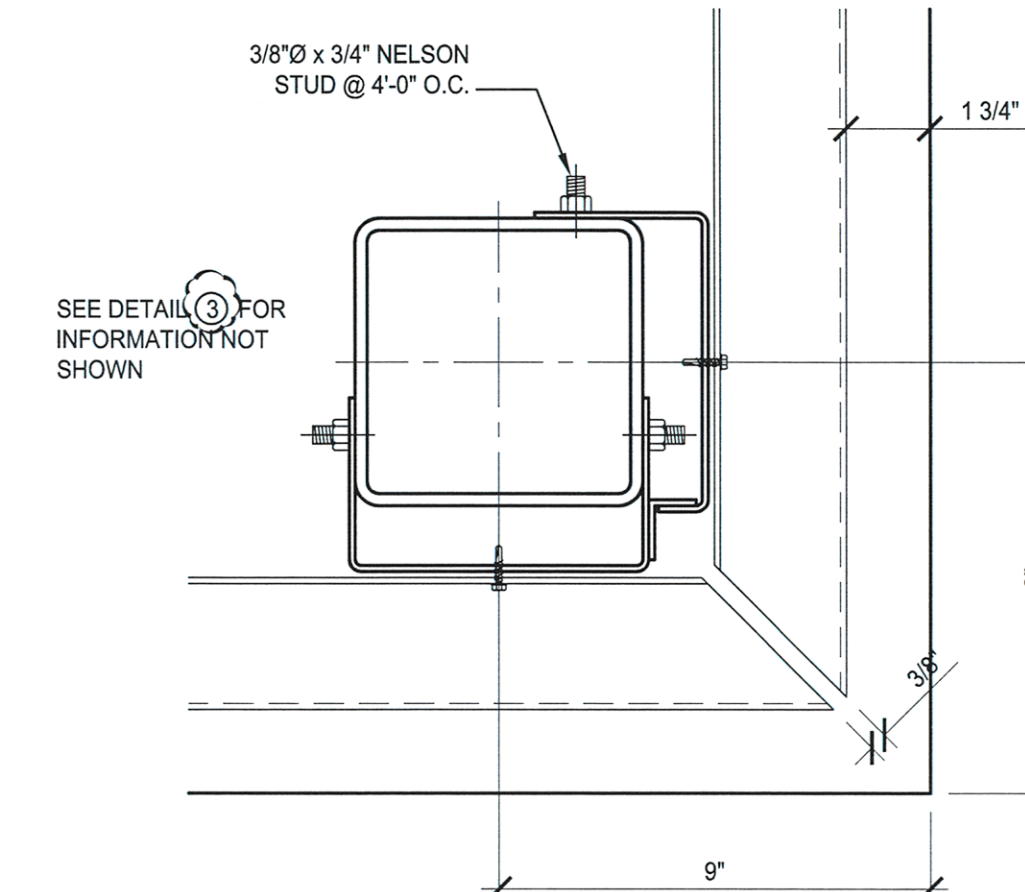
8 SECTION AT POST BASE
3" = 1'-0"



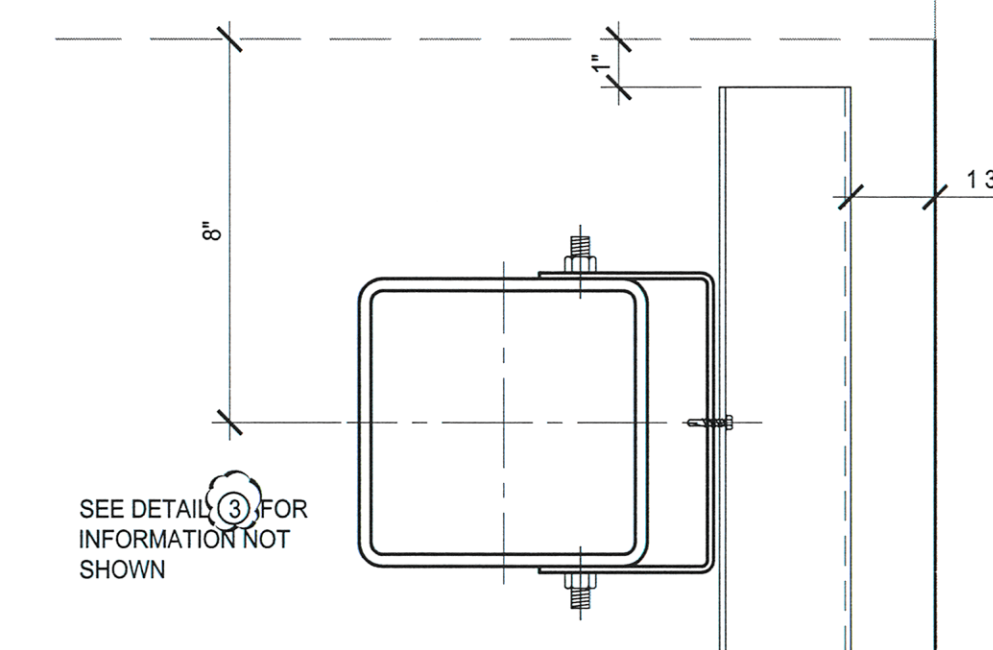
4 SCREEN WALL CAP
3" = 1'-0"



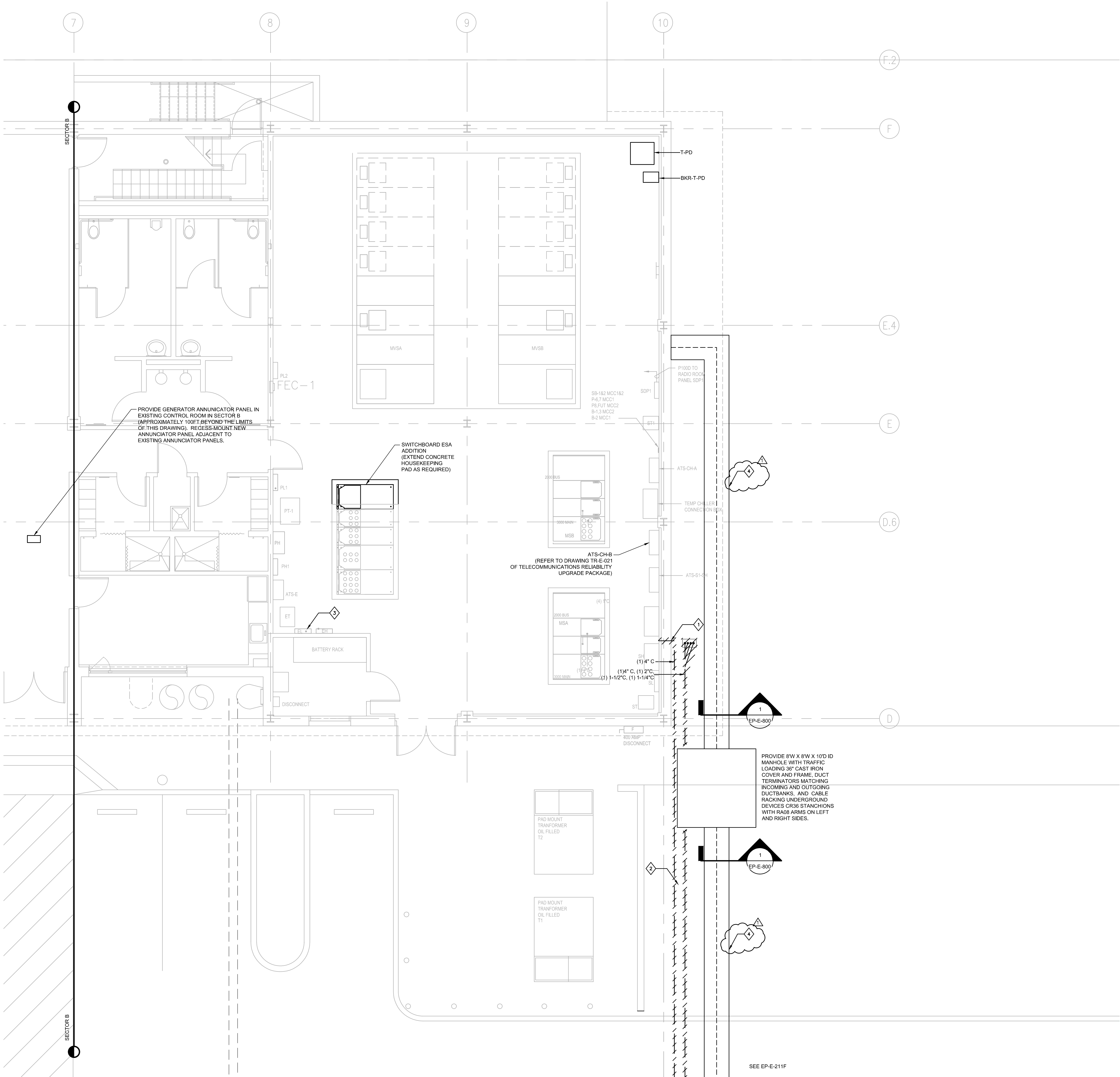
3 SCREEN WALL AT COLUMNS
3" = 1'-0"



2 SCREEN WALL CORNER
3" = 1'-0"



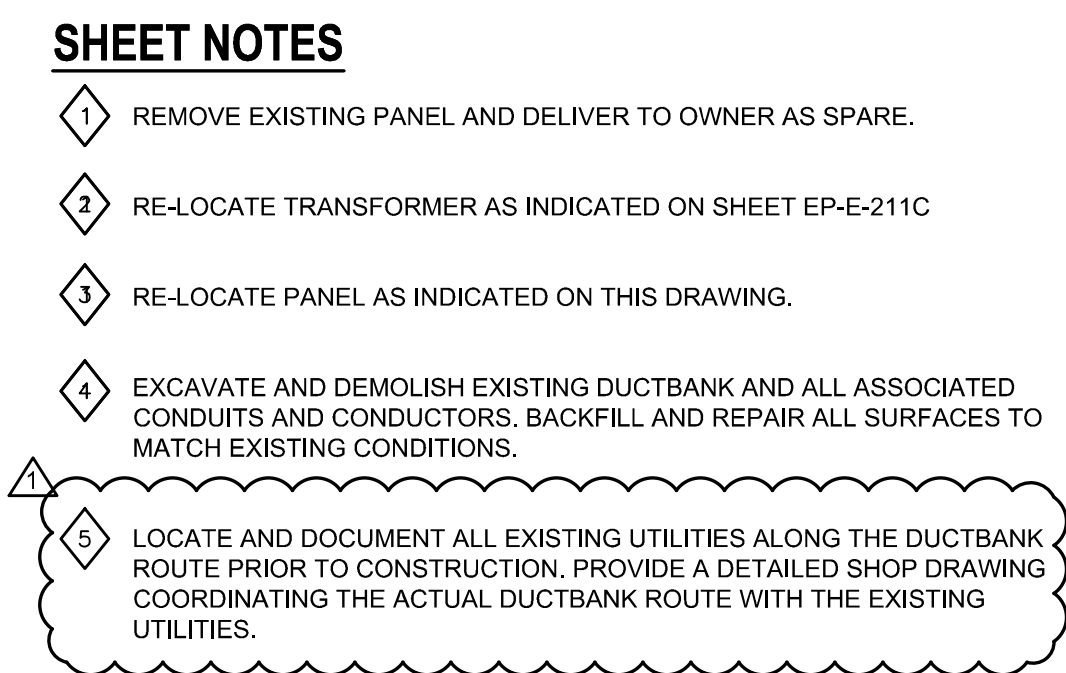
1 SCREEN WALL END
3" = 1'-0"



SHEET NOTES

- DEMOLISH EXISTING CONDUIT BACK TO SOURCE. FILL WALL VOID WITH NON-SHRINK GROUT.
- EXCAVATE AND DEMOLISH EXISTING DUCTBANK AND ALL ASSOCIATED CONDUITS AND CONDUCTORS. BACKFILL AND REPAIR ALL SURFACES TO MATCH EXISTING CONDITIONS.
- PROVIDE NEW 100A/2P BREAKER IN PANEL EL FOR GEN #3 ACCESSORY PANEL.
- LOCATE AND DOCUMENT ALL EXISTING UTILITIES ALONG THE DUCTBANK ROUTE PRIOR TO CONSTRUCTION. PROVIDE A DETAILED SHOP DRAWING COORDINATING THE ACTUAL DUCTBANK ROUTE WITH THE EXISTING UTILITIES.

No.	Description	Issue Date
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	100% CONSTRUCTION DOCUMENTS	08.18.14
1	ADDENDUM NO. 3	09.23.14



VOLTAGE: 480Y/277V PHASE / WIRE: 3P / 4W												MAIN BREAKER: BUS AMPACITY:												400 A 400 A	
(E) Panelboard CH																									
MOUNTING: SURFACE												SCCR RATING:												42k	
LOAD DESCRIPTION		NOTE	A	B	C	CB	CKT.	CKT.	CB	A	B	C	NOTE	LOAD DESCRIPTION											
TELECOM			1.80			20/1	1	2	15/3	3.30				LIEBERT AC3											
TELECOM				1.70		20/1	3	4	-		3.30			-											
TELECOM					1.60	20/1	5	6	-			3.30		-											
AC-1			3.72			15/3	7	8	15/3	3.72				AC-2											
-				3.72		-	9	10	-		3.72			-											
-					3.72	-	11	12	-			3.72		-											
XFMR CT			17.00			125/3	13	14	-					UNUSABLE SPACE											
-				15.40		-	15	16	-					UNUSABLE SPACE											
-					18.60	-	17	18	-					UNUSABLE SPACE											
UPS-A			3.30			15/3	19	20	150/3					UPS-A											
-				3.30		-	21	22	-					-											
-					3.30	-	23	24	-					-											
SPACE						20/1	25	26	15/3	3.30				F.C. 6											
SPACE						20/1	27	28	-	3.30				-											
SPACE						20/1	29	30	-	3.30				-											
RESTROOM LIGHTS			4.40			20/1	31	32	20/1					SPARE											
SPARE						20/1	33	34	20/1					SPARE											
SPARE						20/1	35	36	20/1					SPARE											
SUB PNL			10.00			100/3	37	38	15/3	3.30				LIFT STATION											
-					10.00	-	39	40	-		3.30			-											
-						-	41	42	-			3.30		-											
LOAD SUMMARY												TOTAL CONNECTED												TOTAL NEC	
MOTOR LOADS												CONN. KVA												NEC KVA	
42.12												100%												42.12	
ADDL 25% OF LARGEST MOTOR FOR DEMAND: 25% x 11.16												25%												2.79	
LIGHTING / CONTINUOUS LOADS												4.40												125%	
RECEPTACLES (FIRST 10KVA)												0.00												100%	
RECEPTACLES (OVER 10KVA)												0.00												50%	
EQUIPMENT LOADS												99.60												100%	
TOTALS:												146.12												150.01	
Notes:																									

A1 PANEL CH-A DEMOLITION

VOLTAGE: 480Y/277V PHASE / WIRE: 3P / 4W												MAIN BREAKER: BUS AMPACITY:												400 A 400 A																	
(E) Panelboard CH-A														SCCR RATING:														42k													
MOUNTING: SURFACE														SCCR RATING:														42k													
LOAD DESCRIPTION														NOTE		A		B		C		CB		CKT.		CKT.		CB		A		B		C		NOTE		LOAD DESCRIPTION			
TELECOM																1.80						20/1		1		2		15/3		3.30						LIEBERT AC3					
TELECOM																		1.70				20/1		3		4				3.30						-					
TELECOM																		1.60		20/1		5		6								3.30									
AC-1																3.72				15/3		7		8		15/3		0.94						(N) P-1							
-																		3.72				9		10				0.94													
-																				3.72				11		12				0.94											
XFMR CT.																17.00				125/3		13		14														UNUSABLE SPACE			
-																		15.40				-		15		16												UNUSABLE SPACE			
-																				18.60				-		17		18										UNUSABLE SPACE			
F.C. 6																3.30				15/3		19		20		150/3												UPS-A			
-																		3.30				-		21		22												-			
-																				3.30				-		23		24										-			
PANEL CH-B																53.12				400/3		25		26														UNUSABLE SPACE			
-																		51.12				-		27		28												UNUSABLE SPACE			
-																				51.12				-		29		30										UNUSABLE SPACE			
RESTROOM LIGHTS																4.40				20/1		31		32		20/1														SPARE	
SPARE																				20/1		33		34		20/1												SPARE			
SPARE																				20/1		35		36		20/1												SPARE			
SUB PNL																10.00				100/3		37		38		15/3		3.30										LIFT STATION			
-																		10.00				-		39		40				3.30								-			
-																				10.00		-		41		42						3.30						-			
LOAD SUMMARY																		CONN. KVA		NEC FACTOR		NEC KVA		TOTAL CONNECTED														TOTAL NEC			
MOTOR LOADS																33.78		100%		33.78		PHASE A: 100.88 KVA														PHASE A: 102.43 KVA					
ADDITIONAL 25% OF LARGEST MOTOR FOR DEMAND: 25% x 11.16																		25%		2.79		PHASE B: 92.78 KVA														PHASE B: 93.21 KVA					
LIGHTING / CONTINUOUS LOADS																9.50		125%		11.88		PHASE C: 95.88 KVA														PHASE C: 96.28 KVA					
RECEPTACLES (FIRST 10KVA)																0.00		100%		0.00																					
RECEPTACLES (OVER 10KVA)																0.00		50%		0.00																					
EQUIPMENT LOADS																246.28		100%		246.28		349.0 AMPS														355.0 AMPS					
																TOTAL:		289.64		234.71																					
Notes:																																									

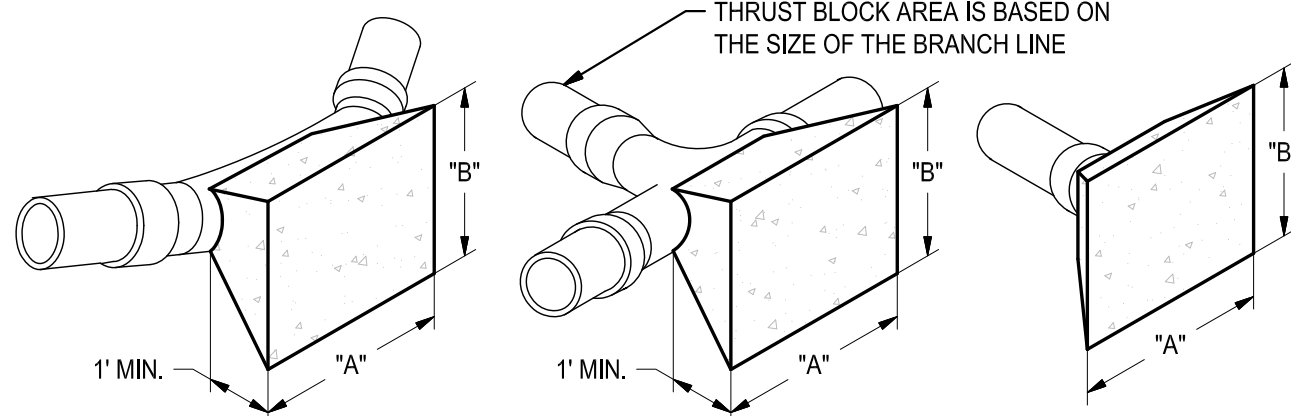


PAVING LEGEND

SYMBOL	DESCRIPTION
	REMOVE AND REPLACE EXISTING ASPHALT CONCRETE AFTER DEMOLITION WITH 8" A.C. DEEPLIFT OVER COMPACTED NATIVE SOIL TO 95% RELATIVE COMPACTION.

NOTES:

- ALL PIPE TO BE 12" JM EAGLE C900 DR-18
PRESSURE CLASS 235 OR APPROVED EQUAL
- ALL THRUST BLOCK CONCRETE SHALL BE PER
SPECIFICATIONS: SEE 32-13-13 SITEWORK
CAST-IN-PLACE CONCRETE FOR FURTHER
DETAILS.
- ALL NEW PIPE SHALL UNDERGO A 200 PSF-2
HOUR WATER PRESSURE TEST



TYPICAL THRUST BLOCK
BEND

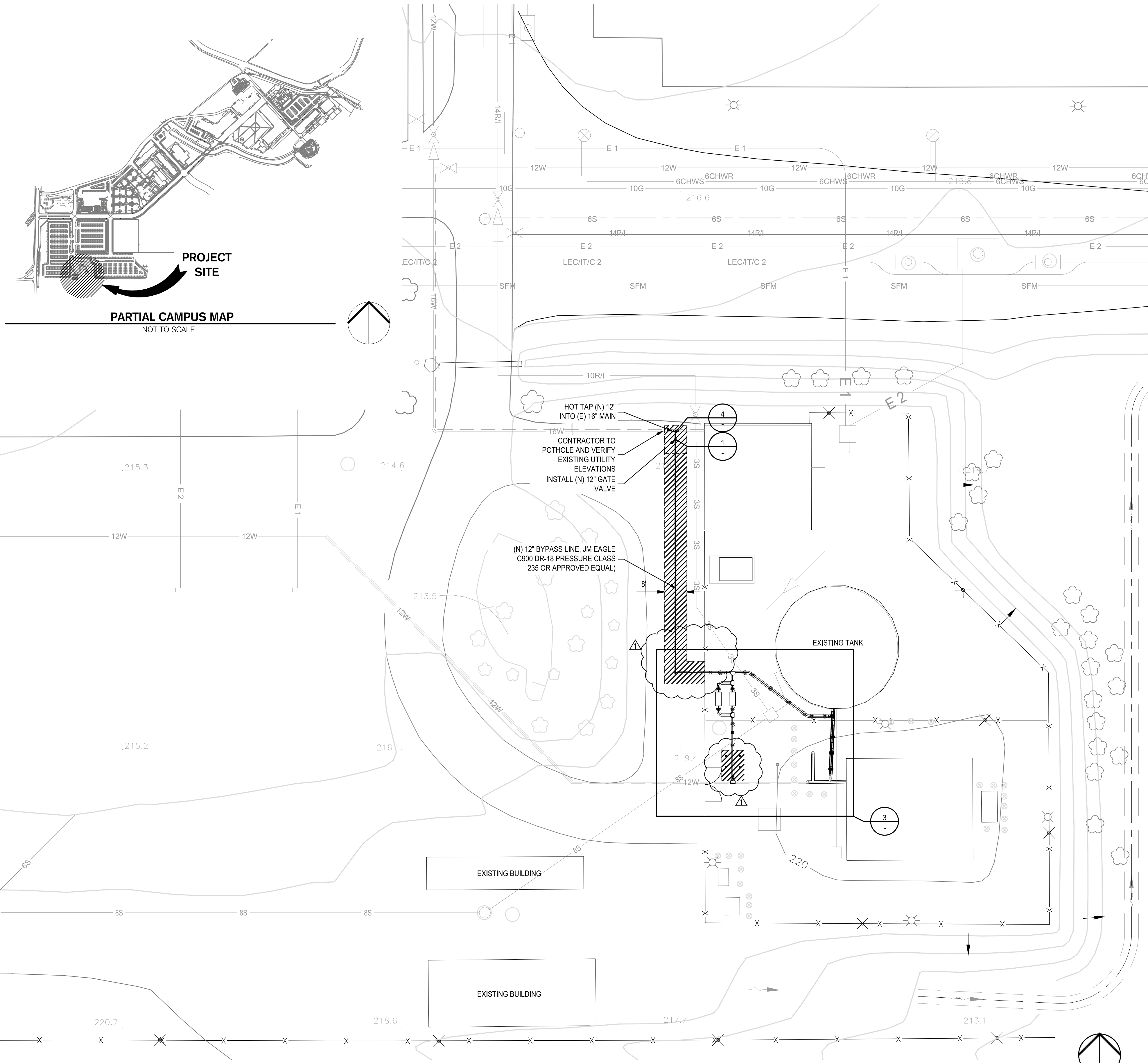
TYPICAL THRUST BLOCK
TEE OUTLET

TYPICAL THRUST BLOCK
DEAD END

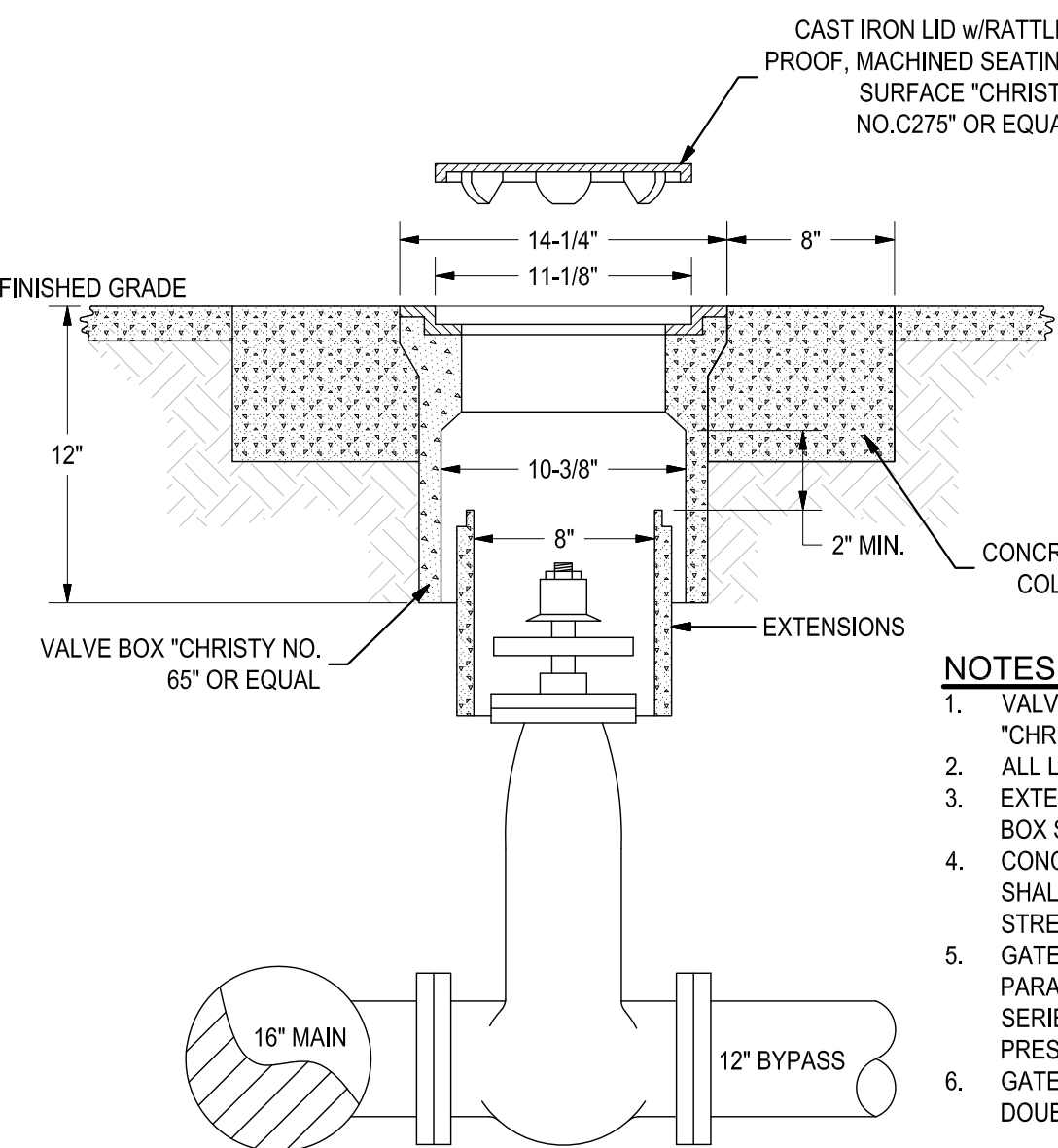
NOTES:

- ALL THRUST BLOCKS SHALL SHALL
BE POURED AGAINST UNDISTURBED
SOIL.
- RESTRAINT SYSTEM FOR VERTICAL
PIPE BENTS SHALL BE APPROVED
BY THE CITY ENGINEER.
- THRUST RESTRAINT SYSTEMS FOR
PIPES LARGER THAN 12" SHALL BE
DESIGNED ON A CASE BY CASE
BASIS AND SHALL BE APPROVED BY
THE CITY ENGINEER.

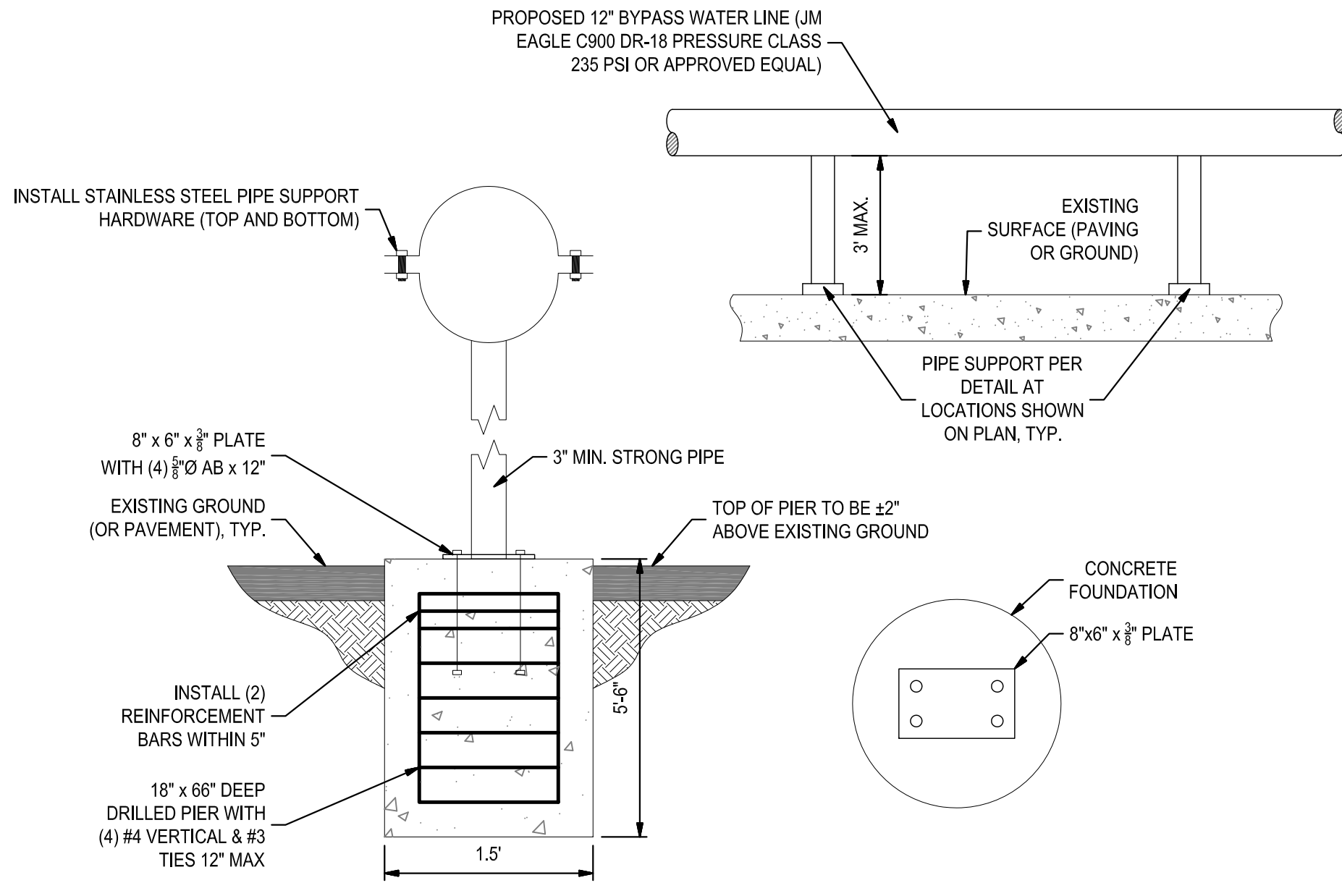
4 THRUST BLOCK CHART
NO SCALE



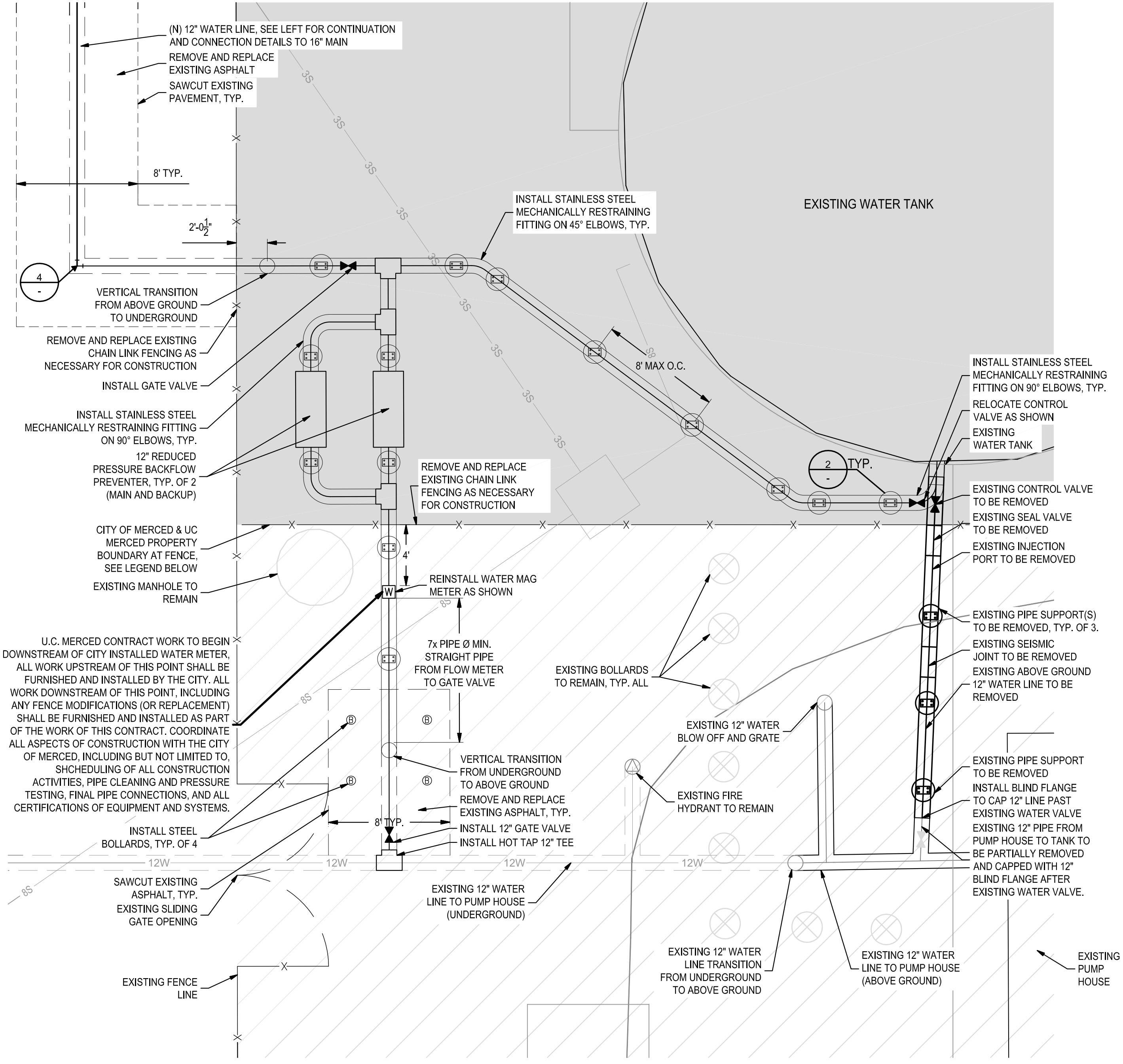
DEMOLITION & INSTALLATION PLAN
1"=20'



1 VALVE BOX DETAIL
SCALE: NO SCALE



2 PIPE SUPPORT DETAIL
SCALE: NO SCALE



3 WATER CONNECTION DETAIL AT TANK
SCALE: 1" = 10'