

July 17, 2014

**BOARD OF COUNTY COMMISSIONERS  
ORANGE COUNTY, FLORIDA**

**ADDENDUM NO. 9 / IFB NO. Y14-792-PH**

**EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE  
AND REPUMP FACILITY**

**BID OPENING: July 24, 2014**

This addendum is hereby incorporated into the bid documents of the project referenced above. The following items are clarifications, corrections, additions, deletions and/or revisions to and shall take precedence over the original documents. Additions are indicated by underlining, deletions are indicated by ~~strikethrough~~.

The Bid Opening remains July 24, 2014 at 2:00 P.M.

**A. BIDDER QUESTIONS**

- 1. Spec section 09510-3 calls for a mineral composition- cast or molded. The Armstrong Fine fissured is not a cast or molded product. It is there standard mineral tile. What is the intent standard or cast?**

Answer: Armstrong, Standard Fine Fissured Mineral Fiber Tile.

- 2. Detail 2/A03 refers to Structural drawings for channel jamb at overhead doors. There is no reference to this on the Structural drawings. Please advise.**

Answer: This question appears to be referencing Detail 2/A11, not Detail 2/A03. The steel channel is not required. Remove steel channel from Detail 2/A11.

- 3. Finish Schedule shows no base in Rooms 101, 102, 103, 105, 107, 108 and 110. The Base Finish shows a PC-3 finish and the Wall Finish shows a PC-4 finish. Please clarify.**

Answer: There is no base material in these rooms as indicated, and the base finish at these locations should match the painted wall finish – colors to be selected by Owner.

4. **The perimeter fence detail as shown on sheet C22 conflicts with the technical specifications in section 02784 (top rails, corner posts, line posts, bottom rail, encasement, etc.). Please advise which should be followed.**

Answer: Use the information in Detail No. 32 on Drawing C22, EXCEPT use 1<sup>7</sup>/<sub>8</sub>-inch OD Sch 40 galvanized steel gate frame for Double Swing Gate, and 24-inch diameter by 66-inch deep concrete for setting each Walk Gate post. For the Sliding Gate, use the information in Detail No. 36 on Drawing C22, EXCEPT use double sets of 4-inch OD, Sch 40 galvanized steel posts (larger or equivalent number/size if recommended by sliding gate manufacturer) and 24-inch diameter by 66-inch deep concrete for setting each gate post with 60-inch embedment.

5. **On Drawing FP02, Generator Room 101 is being called out to be protected with a Pre Engineered Water Mist System. Can we protect this room with an Engineered HI FOG Water Mist system? Comparable to the Ansul AquaSonic Water-Atomizing Fire Suppression System?**

Answer: A Hi-Fog water mist system is the basis of design as addressed in the answer to Question 23 in Addendum No. 5. The County does not consider requests for substitution during bidding as stated in the answer to Question 9 in Addendum No. 4.

6. **On Drawing FP02, Note 6 under Fire Protection General Notes states that we are to use Galvanized material or stainless materials where possible. Can we use galvanized piping and fittings in the PW Sodium Hypochlorite Room 106? Can we use galvanized piping and fittings in the Generator Room 101?**

Answer: Galvanized steel piping and fittings, painted red in accordance with the specifications can be used in Room 106. Stainless steel materials listed for use with a water mist system are to be used due to the high pressures experienced by the piping in Room 101.

7. **Drawings C06 and C07 call for the pond underdrain to be PVC. Please specify the type of PVC to be used.**

Answer: The PVC pipe shall be ASTM D3034 Solvent Weld SDR35 perforated underdrain pipe with two rows of holes 1/2-inch in diameter on 5-inch centers and 120 degrees apart.

- 8. Specification 08333, Overhead Coiling Doors, calls for overhead door operations to contain a fusible link and smoke detector, but the doors are not fire-rated. Please clarify.**

Answer: Overhead doors are not fire rated and do not require a fusible link & smoke detector.

- 9. Please confirm that the interior overhead door #102F is to be insulated.**

Answer: Interior overhead door 102F is not insulated.

- 10. Has a Gopher Tortoise survey been done on the project location? If they are located during the project who will be responsible for the costs of removing or relocating the Gopher Tortoises? This question also applies to any other endangered or protected species.**

Answer: Yes, a gopher tortoise survey was performed, and there were no active burrows observed at the time of the survey. There were no other threatened or endangered species noted within the limits of Work during the time of the survey. If threatened or endangered species are encountered during the project, the Contractor shall comply with federal, State, and local laws. Costs of removal or relocating threatened or endangered species are not included in the Bid.

- 11. Specifications 02660 and 02662 both reference polypropylene swabbing devices. Detail 23 on Sheet 25 shows Swabbing Access Points. Is the Contractor required to leave any permanent access for Swabbing Devices above and beyond that shown on the Drawings?**

Answer: No, the Drawings show what is intended for Swabbing access at project completion.

- 12. Temporary Power required for Testing the System is hard to quantify without an estimated usage rate for the Pump Station. Can that Usage Rate be supplied prior to the Bid? If not, can an allowance be added for the Costs of Temporary Power for Testing?**

Answer: Temporary power for testing shall be included with the Bid; there will be no allowance for temporary power for testing. The testing shall be conducted as specified.

- 13. If the Pump Station is not being utilized upon Substantial Completion, are there any requirements for removing all the water used for leakage and system testing? Should all the water to be removed completely from all the tanks and piping?**

Answer: No, there are no requirements for removing all the water from the system after Substantial Completion. Water from leakage and system testing should not be in the system upon Substantial Completion. By that time, the tanks and piping will have been disinfected and flushed, with fresh water being introduced for coliform testing prior to being approved for service by DEP. The fresh water will remain for exercising the equipment.

- 14. If the Pump Station is not being utilized upon Substantial Completion, are there any requirements for decommissioning any or all the equipment after system testing?**

Answer: Decommissioning is not addressed in the Contract Documents.

- 15. There seems to be a cross-contamination possibility with the Pond and the Potable Water Storage Tank. If the pond water elevation should raise, the water could backup into the 12" drain thus leaving contaminants in the line. If Valves V20 and V21 are opened, the possibility for contamination exists.**

Answer: The tank floor is Elevation 81, which is well above the pond high water level at Elevation 75. If there is water in the tank, there will be no backflow towards the tank with Valves V20 and V21 open. Also, Valve V20 will only be opened to drain the tank, which will not be drained to the pond if the pond is full or nearly full.

- 16. In Addendum No. 5, the response to question 7 clarified Cisco IE3000 switches instead of the Garrettcom Ethernet switches. Is the Garrettcom training still in the project?**

Answer: Yes, both factory and onsite training sessions and associated costs remain in the project. The training is not tied to the construction schedule, and shall be scheduled with the Owner to coincide with the availability of four selected individuals. Refer to Section 13300, paragraphs 1.01A.4, 3.04C, and 3.04D, and the information below for training requirements. The training and costs include:

- The factory level training course (5 consecutive days for CT1 and CT2 courses), including travel with airfare, ground transportation from airport to lodging, per diem, and lodging for four individuals from Orlando, Florida to the training site in Indianapolis, Indiana to attend the full duration of the training

(assume travel the day before and the day after training session with lodging and per diem throughout); and

- The “onsite” training (location in Orange County, Florida to be determined by the Owner) on switch configurations, troubleshooting, connections, etc. for Garrettcom and Hirschmann switches by a Belden or Garrettcom-certified system integrator for at least four individuals for four hours related to the County’s network switches at other facilities.

Belden owns the Garrettcom product line. The contact for Belden is James LeBaube: 407-463-8577 or [james.lebaube@belden.com](mailto:james.lebaube@belden.com).

**17. Please provide further clarification in regards to the “2-year pre-paid service contract” requirements listed within the fire alarm specifications 16722-2 L...from past experience any post contract services (other than typical warranty costs) are priced and contracted after the system has been Tested & Inspected by the AHJ, and this is for multiple reasons... specifically:**

- Are annual T&I’s to be included in this price?
- Are quarterly T&I’s to be included in this price?
- What type of Central Station monitoring (wireless Radio? Phone Line?)
- Is the FA contractor to include a 2 year warranty on the system as well?

Answer: Yes, include annual and quarterly testing and inspections. Central station monitoring will be done via dedicated phone line on the FACP; the County has used BCI and ADT in the past. Yes, provide a 2-year warranty on the fire alarm system.

**18. Reference Section 16722-1.01-L: The addressable fire alarm system specifications indicate to include 2-year pre-paid service contract with central monitoring services as part of the fire alarm system. Please detail what this service contract shall include. Should annual system tests and inspections be included as well?**

Answer: Please refer to the answer to Question 17 above.

## **B. DRAWINGS**

**1. Drawing Nos. C04, C06, C07, C09, C10, C11**

REPLACE Drawings C04, C06, C07, C09, C10, and C11 with revised Drawings C04, C06, C07, C09, C10, and C11, ATTACHED.

**2. Drawing Nos. S03, S04, S05**

REPLACE Drawings S03, S04, and S05 with revised Drawings S03, S04, and S05, ATTACHED.

**3. Drawing Nos. H01, H03, H04**

REPLACE Drawings H01, H03, and H04 with revised Drawings H01, H03, and H04, ATTACHED.

**4. Drawing No. H05A**

INSERT new Drawing H05A, ATTACHED.

**C. SPECIFICATIONS**

**1. Section 13205 – PRESTRESSED CIRCULAR CONCRETE TANK**

In paragraph 1.02B, delete the word “as”.

**D. The Bidder shall acknowledge receipt of this addendum by completing the applicable section in the solicitation or by completion of the acknowledgement information on the addendum. Either form of acknowledgement must be completed and returned not later than the date and time for receipt of the bid.**

**All other terms and conditions remain the same.**

**Receipt acknowledged by:**

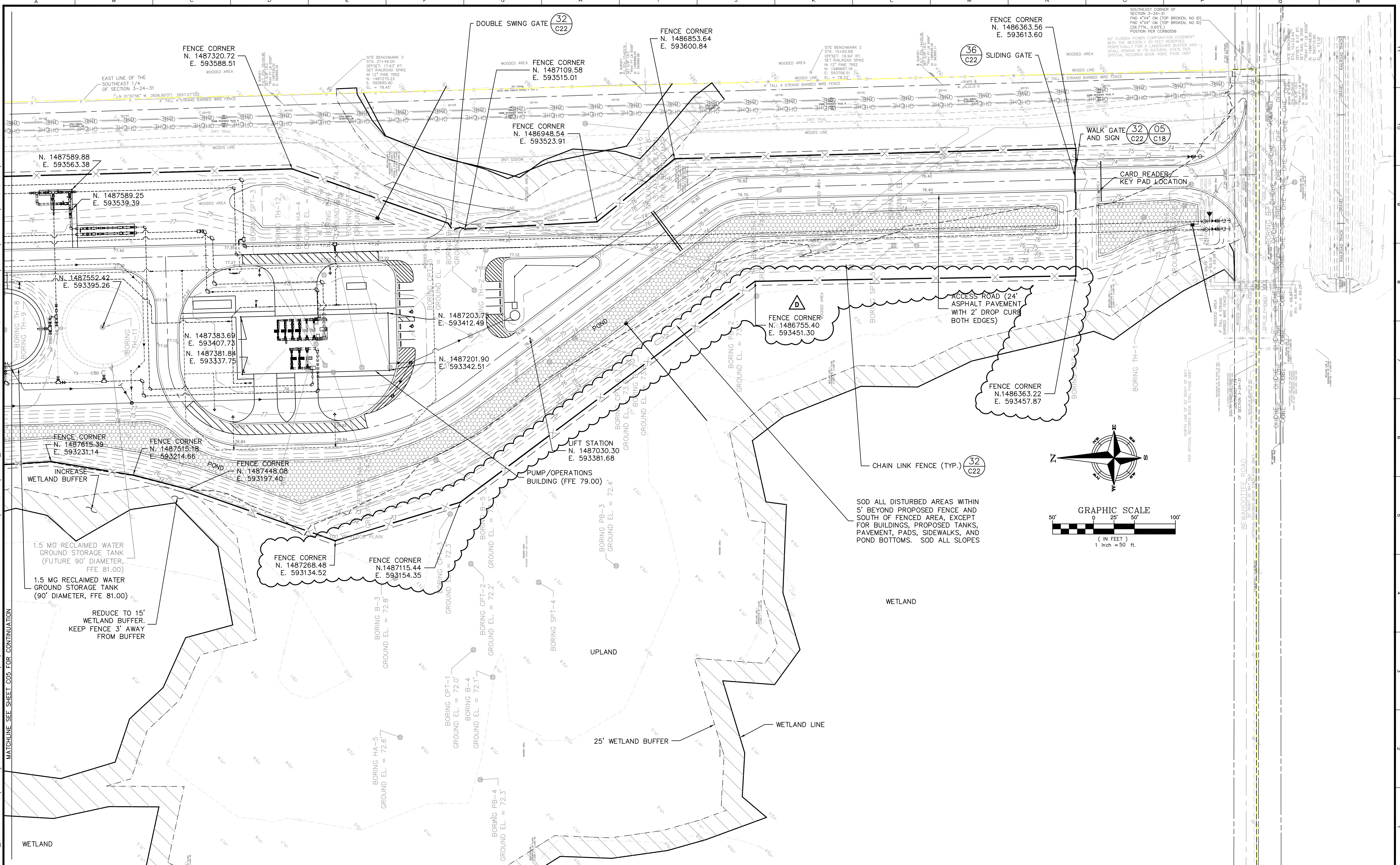
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Authorized Signature

\_\_\_\_\_  
Date Signed

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name of Firm

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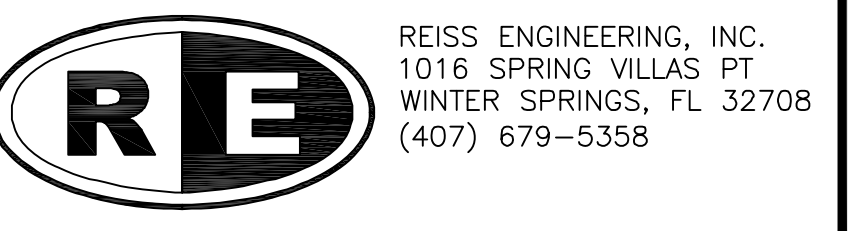
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C	2/21/14	100% DRAWINGS	
B	6/2013	90% DRAWINGS	
A	2/2013	60% DRAWINGS	

Issue Certification  
 Curtis I. Kunihiro, P.E.  
 Florida P.E. No. 33688  
 Reiss Engineering, Inc.  
 Certificate of Authorization No. 8181  
 1016 Spring Villas Pt.  
 Winter Springs, FL 32708

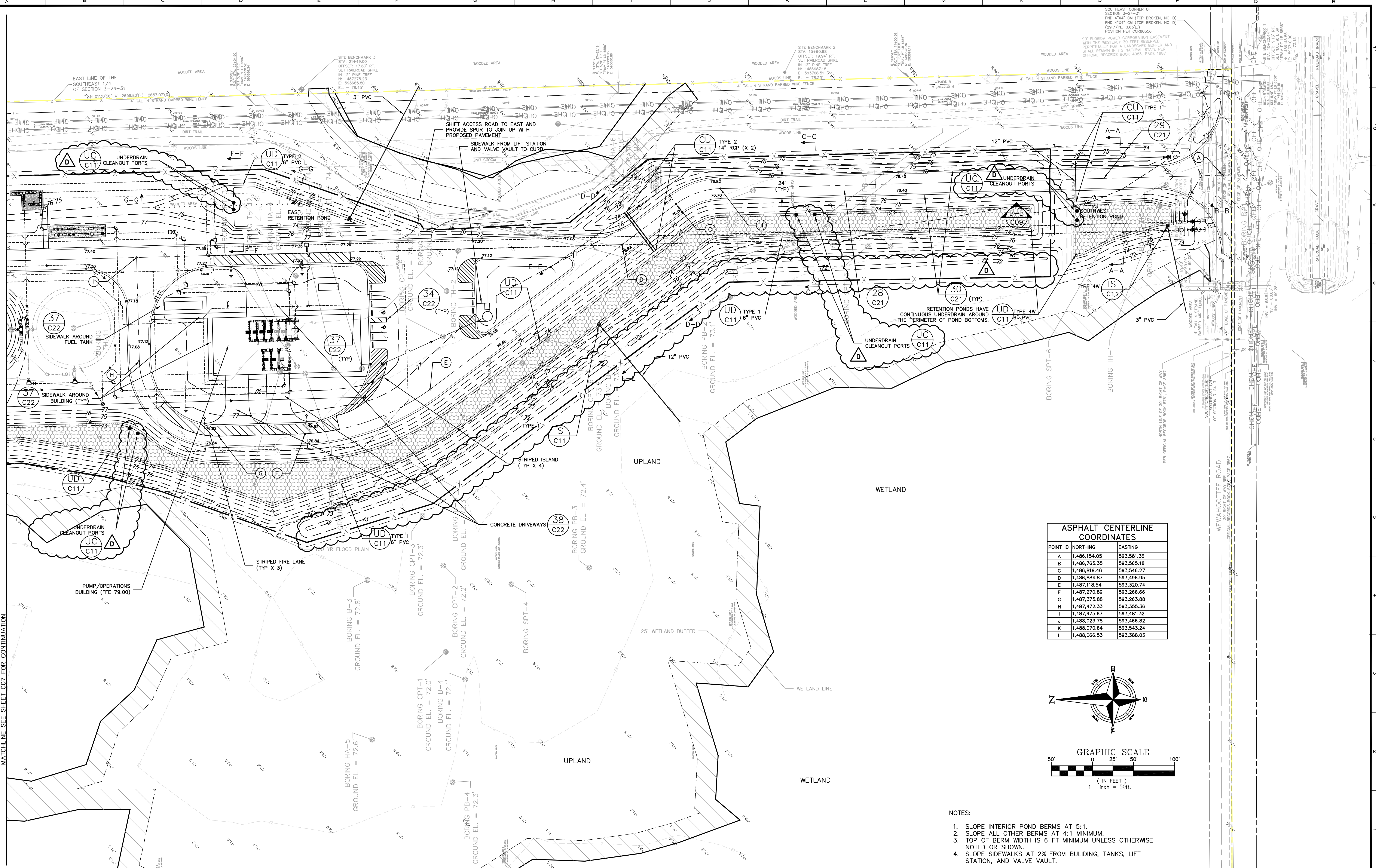
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 Reviewed MAC  
 Approved CLK  
 Date 2/21/14

ORANGE COUNTY  
 EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND REPUMP FACILITY  
 CIVIL  
 SITE PLAN SOUTH

PROJECT NO.: 110005	
SCALE: NOTED	REVISION: C
DRAWING NO. C04	SHEET NO.: 009 OF 108

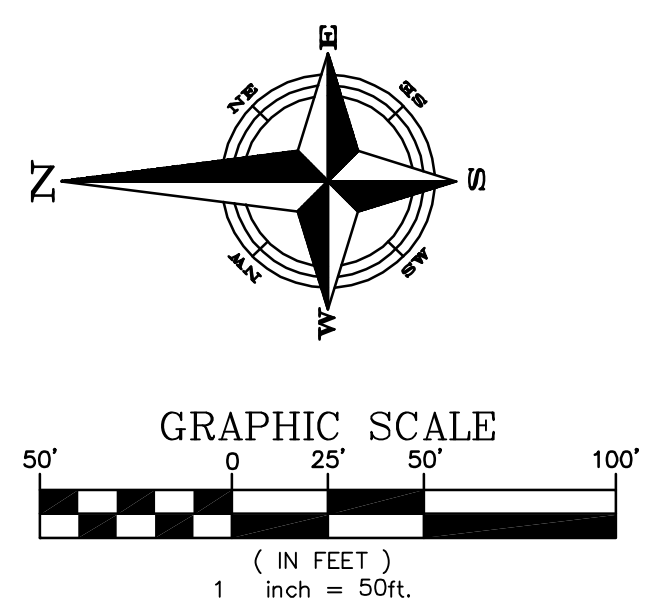


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**ASPHALT CENTERLINE COORDINATES**

POINT ID	NORTHING	EASTING
A	1,486,154.05	593,581.38
B	1,486,765.35	593,565.18
C	1,486,819.46	593,546.27
D	1,486,884.87	593,496.95
E	1,487,118.54	593,320.74
F	1,487,270.89	593,266.66
G	1,487,375.88	593,263.88
H	1,487,472.33	593,355.36
I	1,487,475.67	593,481.32
J	1,488,023.78	593,466.82
K	1,488,070.64	593,543.24
L	1,488,066.53	593,388.03



- NOTES:
1. SLOPE INTERIOR POND BERMS AT 5:1.
  2. SLOPE ALL OTHER BERMS AT 4:1 MINIMUM.
  3. TOP OF BERM WIDTH IS 6 FT MINIMUM UNLESS OTHERWISE NOTED OR SHOWN.
  4. SLOPE SIDEWALKS AT 2% FROM BUILDING, TANKS, LIFT STATION, AND VALVE VAULT.

MATCHLINE SEE SHEET C07 FOR CONTINUATION



REV	DATE	DESCRIPTION	BY
D	7/2014	ADDENDUM 9	RLL
C	2/21/14	100% DRAWINGS	RLL
B	6/2013	90% DRAWINGS	RLL
A	2/2013	60% DRAWINGS	RLL

**Issue Certification**  
 Oscar Vera, P.E.  
 Florida P.E. No. 70091  
 Liquid Solutions Group, LLC  
 Certificate of Authorization No. 27380  
 680 Valley Stream Drive  
 Geneva, FL 32732

Designed OV  
 Drawn RLL  
 Checked DN  
 Reviewed CLK  
 Approved OV  
 Date 2/21/14

ORANGE COUNTY  
 EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND REPUMP FACILITY  
 CIVIL  
 PAVING GRADING AND DRAINAGE—SOUTH

PROJECT NO.:	110005
SCALE:	NOTED
DRAWING NO.:	C06
REVISION:	D
SHEET NO.:	011 OF 108





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E	1,487,118.54	593,320.74
F	1,487,270.89	593,266.66
G	1,487,375.88	593,263.88
H	1,487,472.33	593,355.36
I	1,487,475.67	593,481.32
J	1,488,023.78	593,466.82
K	1,488,070.64	593,543.24
L	1,488,066.53	593,388.03



MATCHLINE SEE SHEET C08 FOR CONTINUATION

- NOTES:
1. SLOPE INTERIOR POND BERMS AT 5:1.
  2. SLOPE ALL OTHER BERMS AT 4:1 MINIMUM.
  3. TOP OF BERM WIDTH IS 6 FT MINIMUM UNLESS OTHERWISE NOTED OR SHOWN.



REV	DATE	DESCRIPTION	BY
D	7/2014	ADDENDUM 9	RLL
C	2/21/14	100% DRAWINGS	RLL
B	6/2013	90% DRAWINGS	RLL
A	2/2013	60% DRAWINGS	RLL

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 680 Valley Stream Drive  
 Geneva, FL 32732

Designed OV  
 Drawn RLL  
 Checked DN  
 Reviewed CLK  
 Approved OV  
 Date 2/21/14

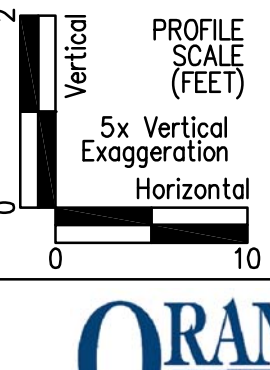
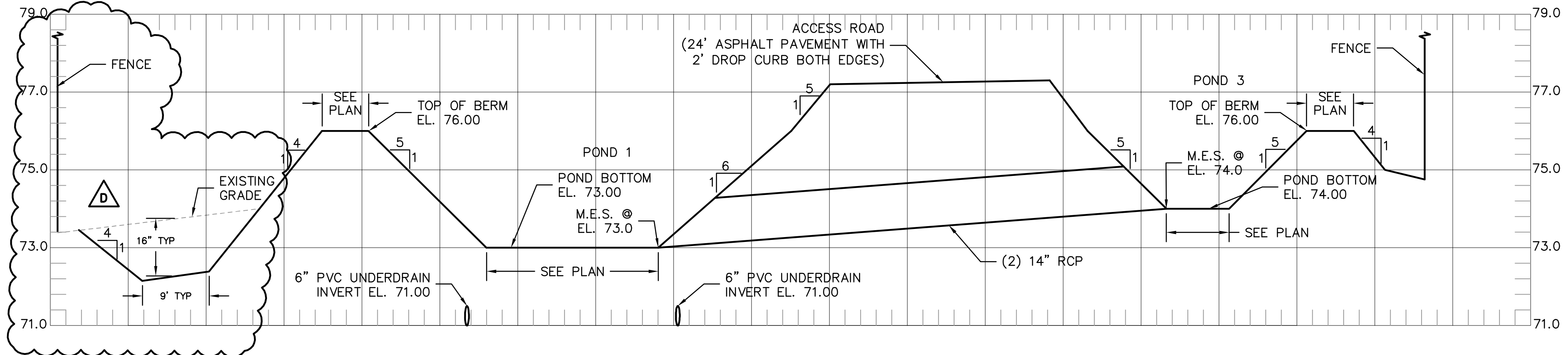
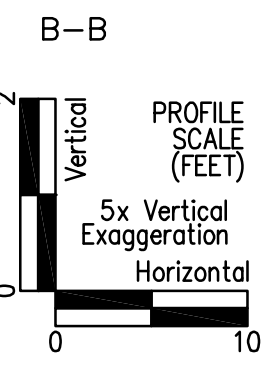
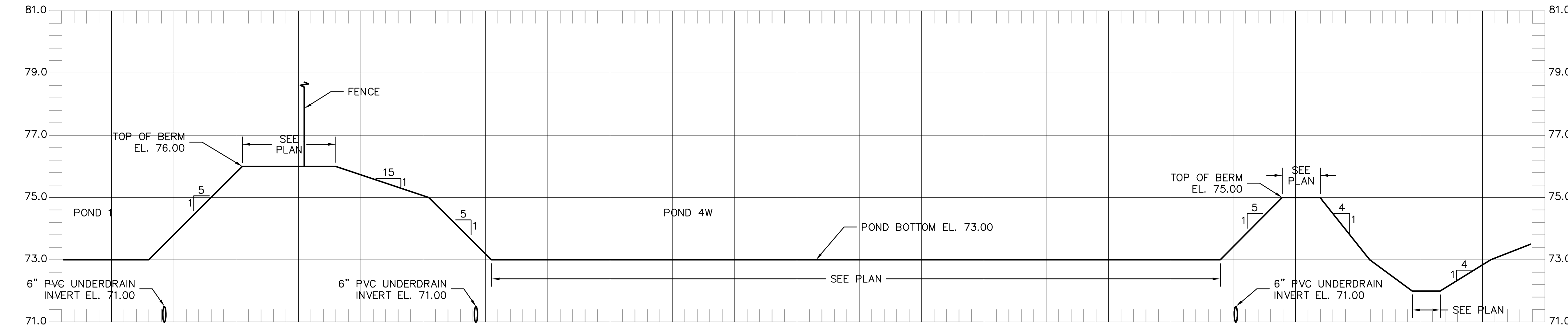
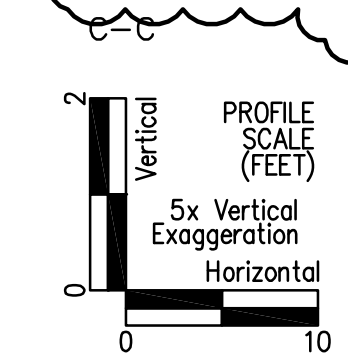
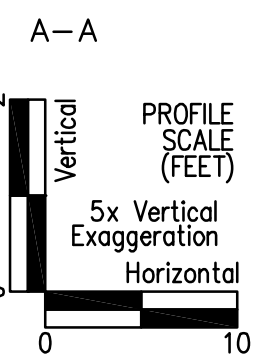
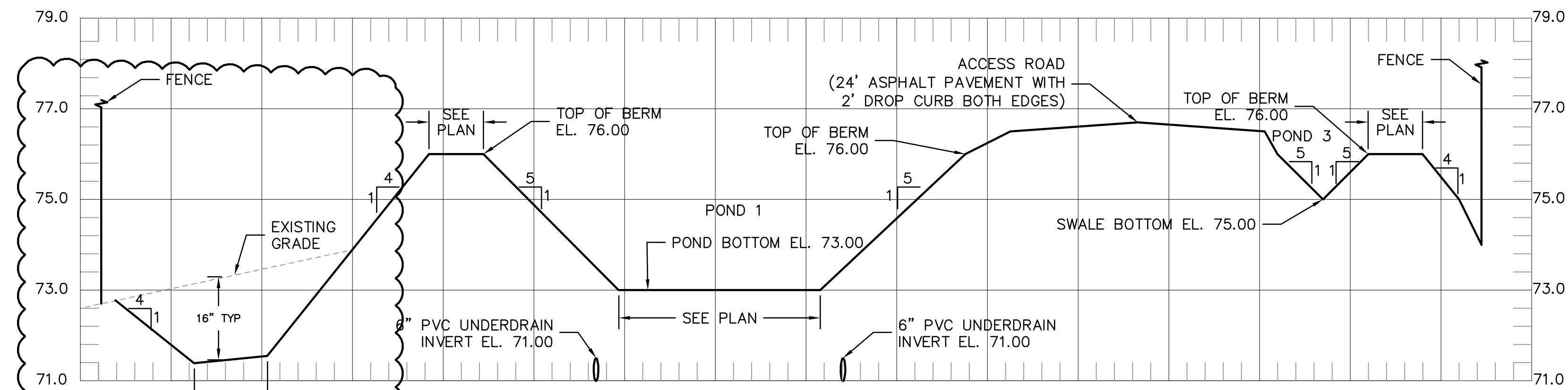
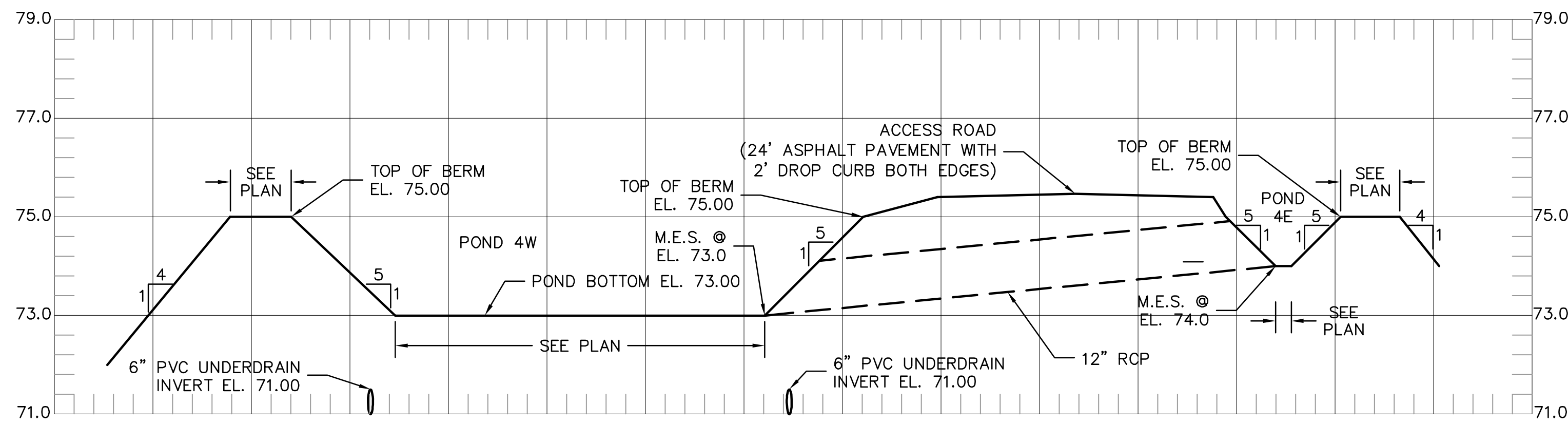
ORANGE COUNTY  
 EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND REPUMP FACILITY  
 CIVIL  
 PAVING GRADING AND DRAINAGE-NORTH

PROJECT NO.:	110005
SCALE:	NOTED
REVISION:	D
DRAWING NO.:	C07
SHEET NO.:	012 OF 108



REISS ENGINEERING, INC.  
 1016 SPRING VILLAS, FT  
 WINTER SPRINGS, FL 32708  
 (407) 679-5358

MATCHLINE SEE SHEET C06 FOR CONTINUATION



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 Geneva, FL 32732

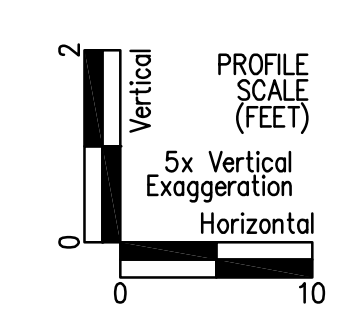
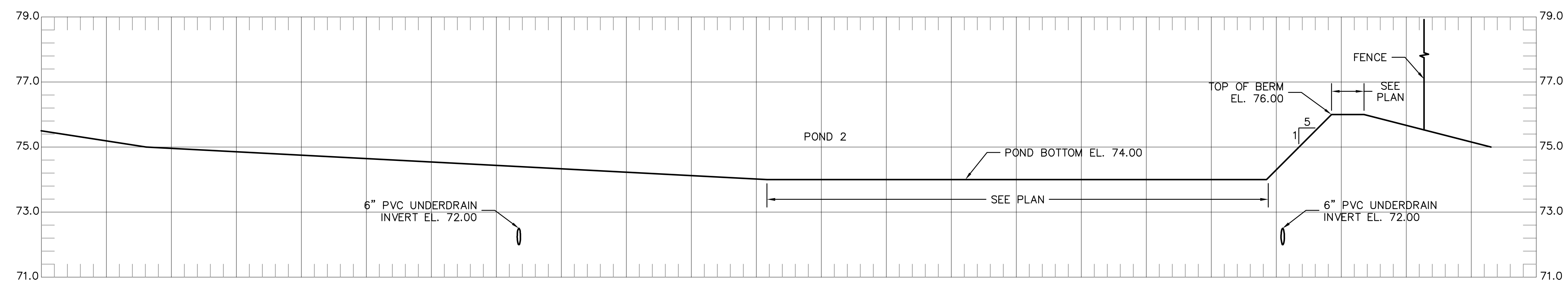
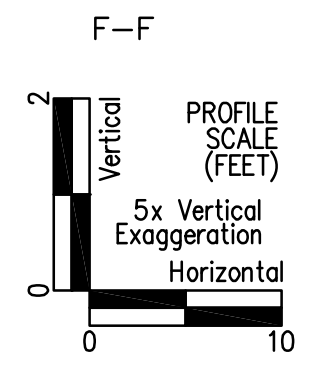
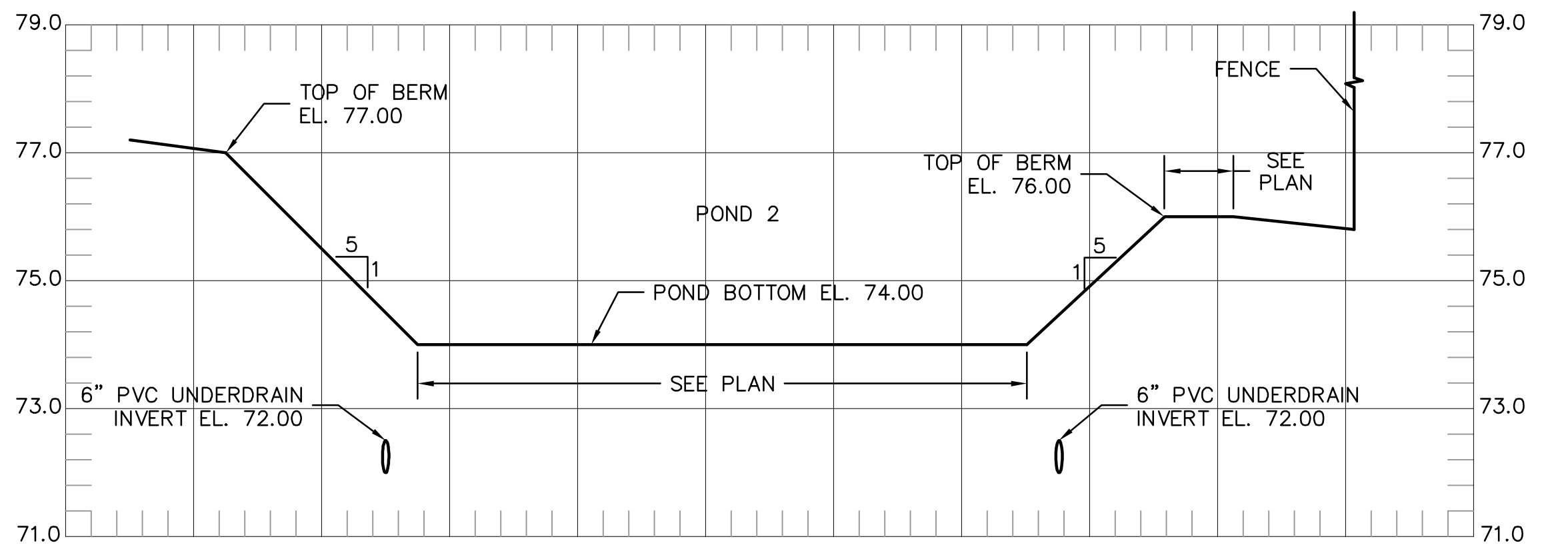
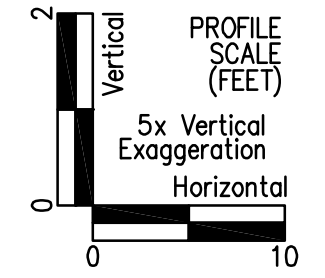
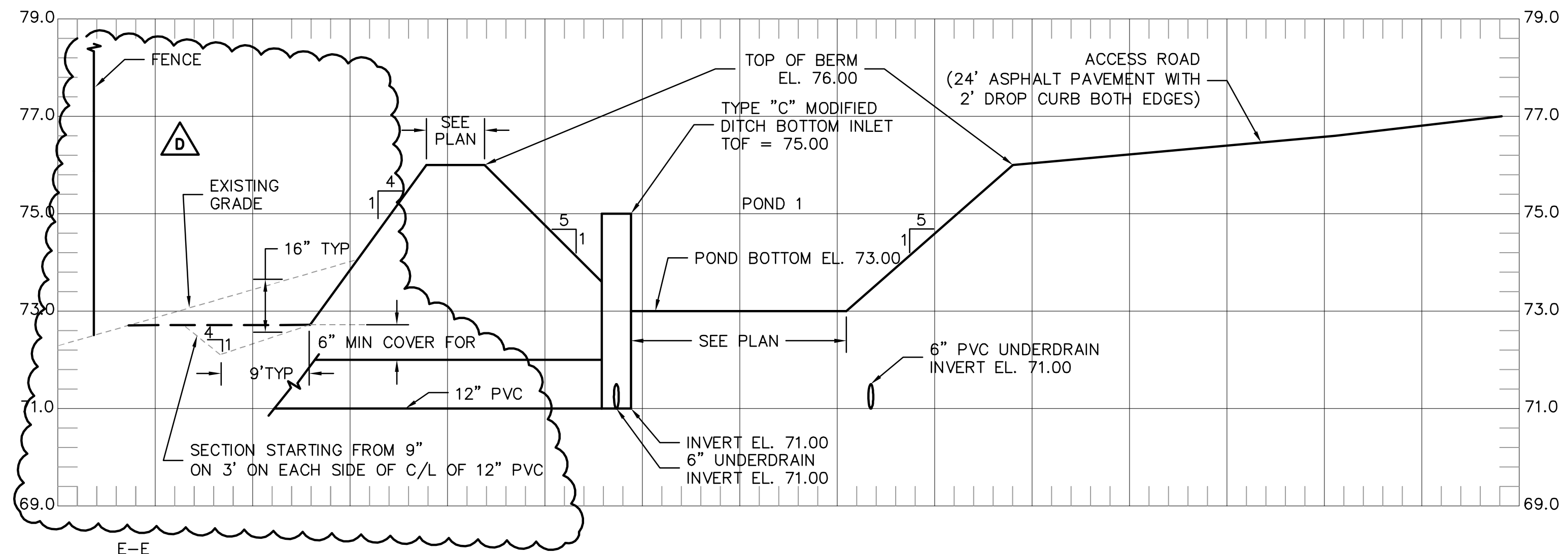
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ORANGE COUNTY  
 EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND REPUMP FACILITY  
 CIVIL  
 GRADING AND DRAINAGE SECTIONS AND DETAILS

PROJECT NO.: 110005	
SCALE: NOTED	REVISION: C
DRAWING NO. C09	SHEET NO.: 014 OF 108



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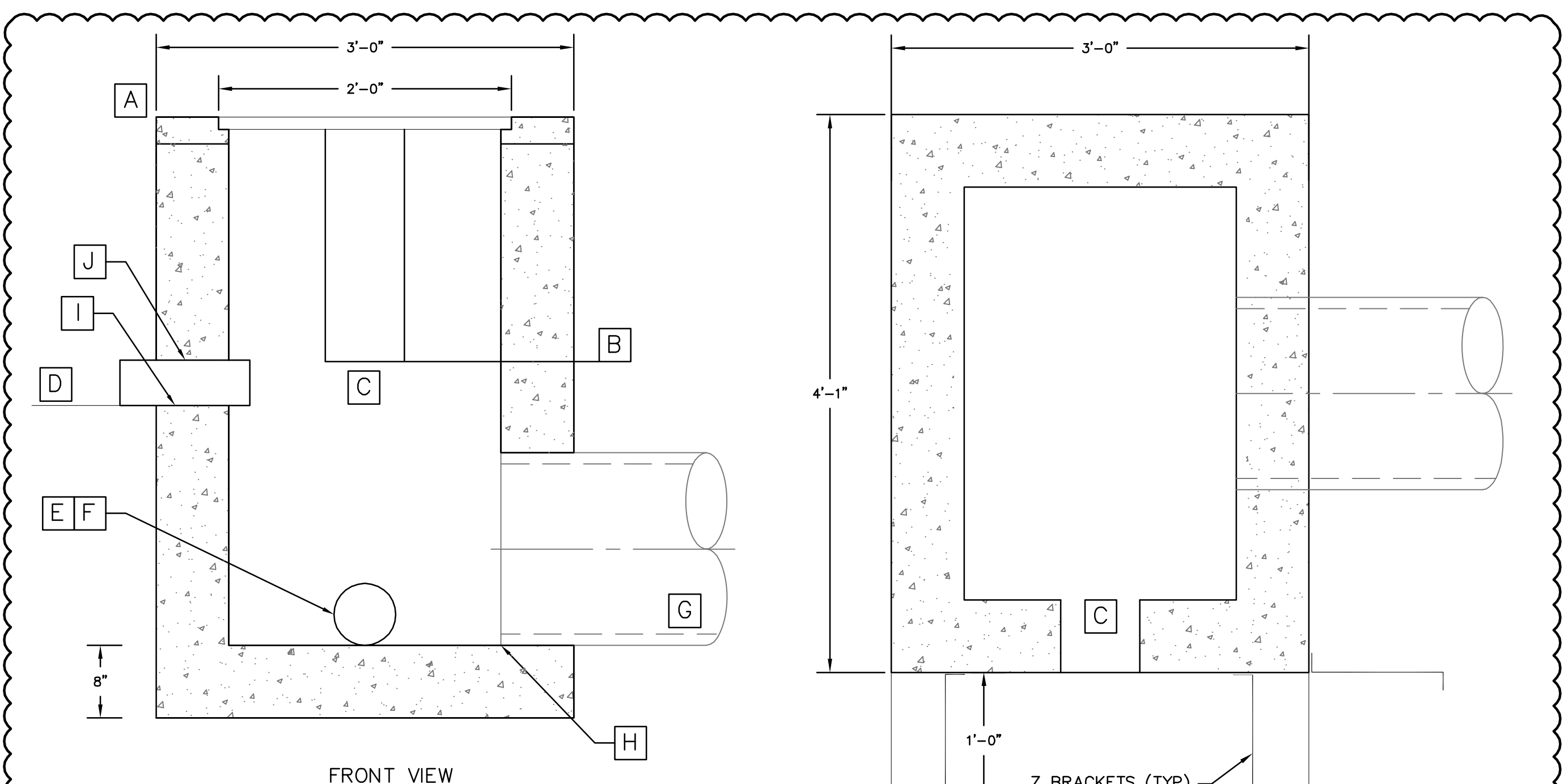
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 Date 2/21/14

ORANGE COUNTY  
 EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND REPUMP FACILITY  
 CIVIL  
 GRADING AND DRAINAGE SECTIONS AND DETAILS

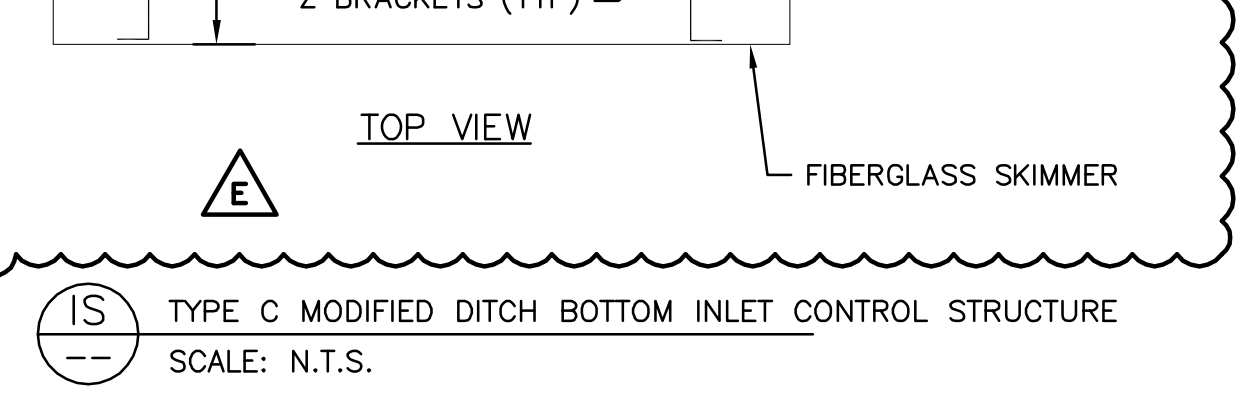
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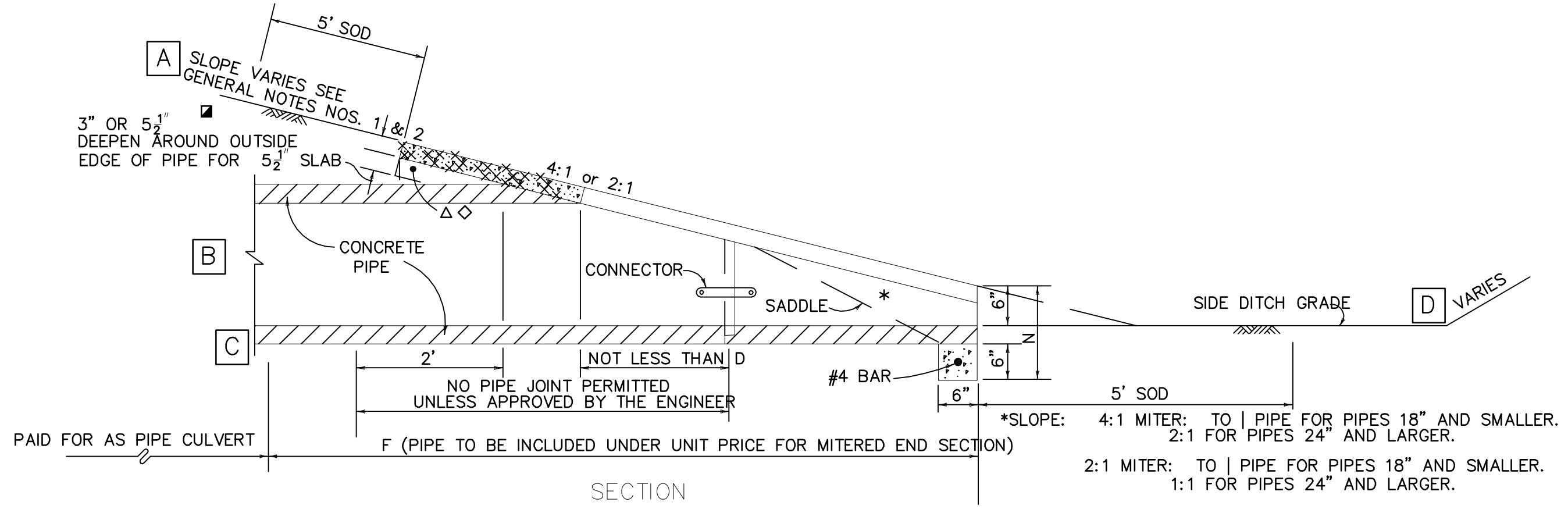
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ID	DESCRIPTION	UNIT	IS-1	IS-2	IS-4W
A	TOP OF STRUCTURE ELEVATION	ft.-NAVD	75.0	75.0	74.0
B	WEIR ELEVATION	ft.-NAVD	73.8	74.7	73.6
C	WEIR LENGTH	FEET	1.7	1.1	0.4
D	POND BOTTOM ELEVATION	ft.-NAVD	73.0	74.0	73.0
E	UNDERDRAIN DIAMETER	INCHES	6.0	6.0	6.0
F	UNDERDRAIN INVERT ELEVATION	ft.-NAVD	71.0	72.0	71.0
G	OUTLET PIPE DIAMETER	INCHES	12.0	3.0	3.0
H	OUTLET PIPE INVERT ELEVATION	ft.-NAVD	71.0	72.0	71.0
I	ORIFICE INVERT ELEVATION	ft.-NAVD	73.0	---	73.0
J	ORIFICE DIAMETER	INCHES	2.0	---	0.5

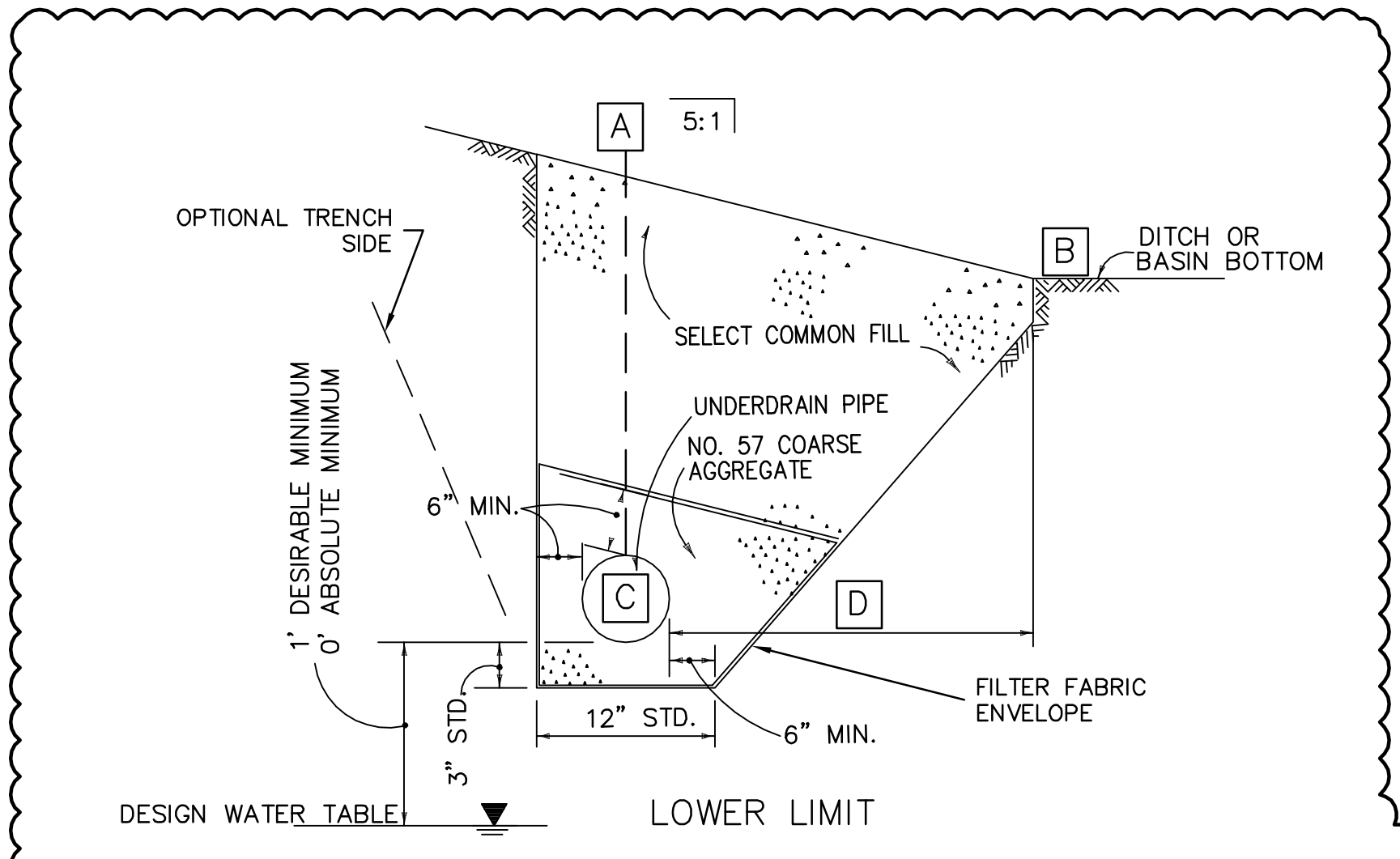


**IS** TYPE C MODIFIED DITCH BOTTOM INLET CONTROL STRUCTURE  
SCALE: N.T.S.



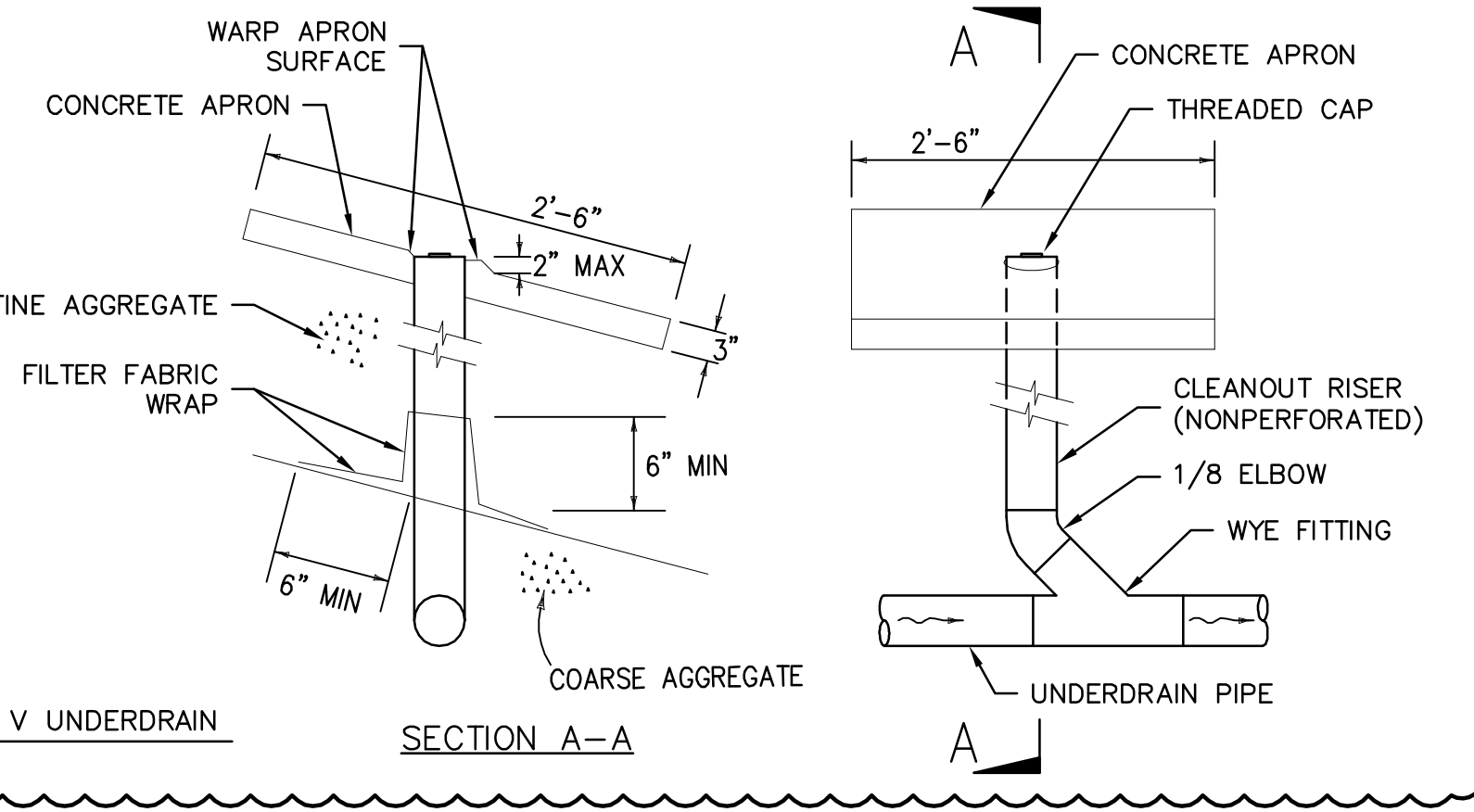
ID	DESCRIPTION	UNIT	CU-1(EAST)	CU-1(WEST)	CU-2(EAST)	CU-2(WEST)
A	ROAD ELEVATION	ft.-NAVD	77.0	77.0	77.3	77.2
B	CULVERT DIAMETER	INCHES	12.0	12.0	14.0	14.0
C	CULVERT INVERT ELEVATION	ft.-NAVD	74.0	74.0	74.0	73.0
D	POND BOTTOM ELEVATION	ft.-NAVD	74.0	73.0	74.0	73.0

**CU** CULVERT MITERED END SECTION  
SCALE: N.T.S.

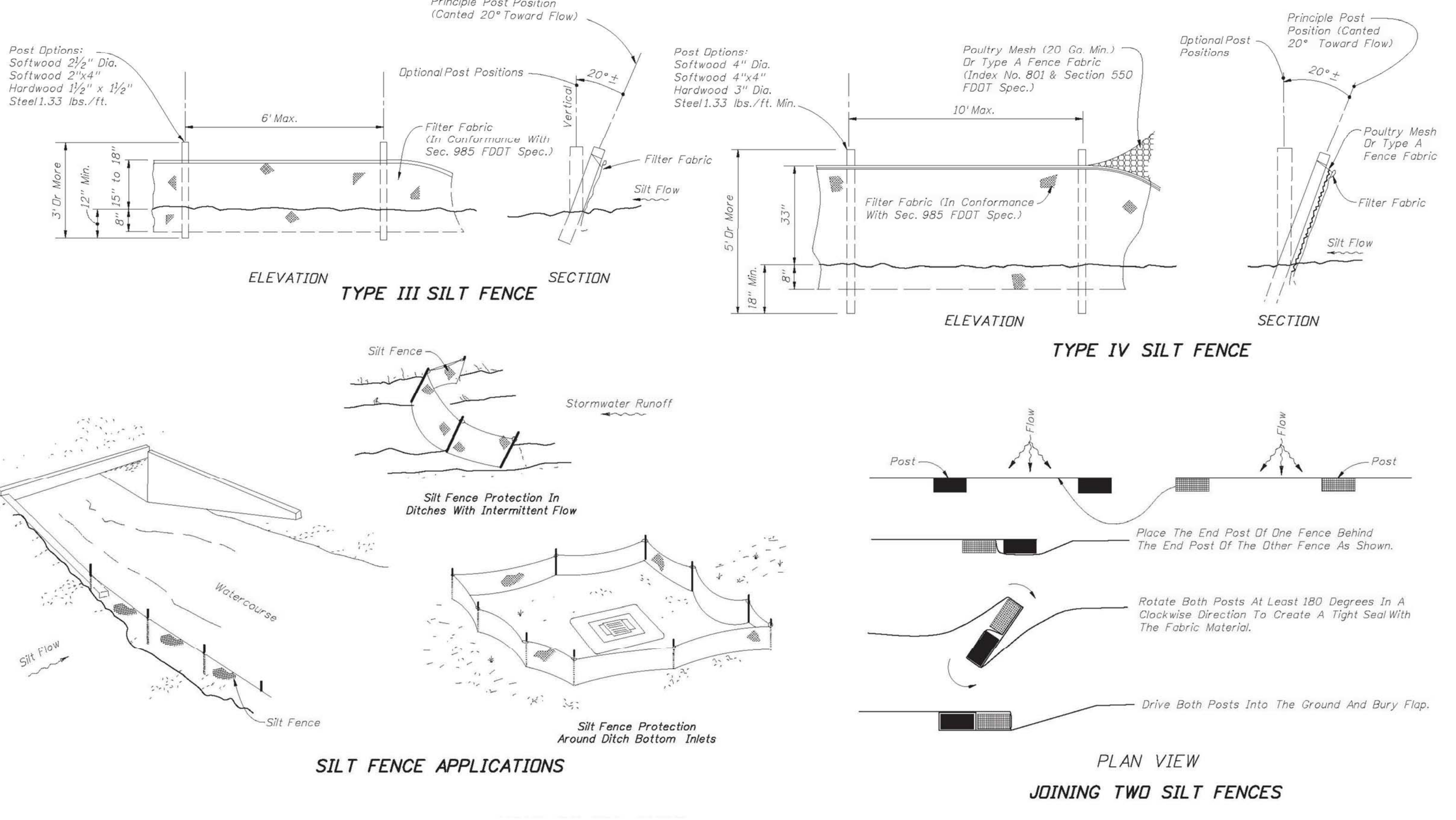


ID	DESCRIPTION	UNIT	UD-1	UD-2	UD-4W
A	POLLUTION ABATEMENT ELEVATION	ft.-NAVD	73.8	74.8	73.6
B	POND BOTTOM ELEVATION	ft.-NAVD	73.0	74.0	73.0
C	UNDERDRAIN DIAMETER	INCHES	6.0	6.0	6.0
D	UNDERDRAIN INVERT ELEVATION	ft.-NAVD	71.0	72.0	71.0

**UD** UNDERDRAIN  
SCALE: N.T.S.



**UC** CLEANOUT FOR TYPE V UNDERDRAIN  
SCALE: N.T.S.



**NOTES FOR SILT FENCES:**

1. TYPE III SILT FENCE TO BE USED AT MOST LOCATIONS. WHERE USED IN DITCHES, THE SPACING FOR TYPE III SILT FENCE SHALL BE IN ACCORDANCE WITH CHART 1, SHEET 1.
2. TYPE IV SILT FENCE TO BE USED WHERE LARGE SEDIMENT LOADS ARE ANTICIPATED. SUGGESTED USE IS WHERE FILL SLOPE IS 1:2 OR STEEPER AND LENGTH OF SLOPE EXCEEDS 25 FEET. AVOID USE WHERE THE DETAINED WATER MAY BACK INTO TRAVEL LANES OR OFF THE RIGHT OF WAY.
3. DO NOT CONSTRUCT SILT FENCES ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.
4. WHERE USED AS SLOPE PROTECTION, SILT FENCES ARE TO BE CONSTRUCTED ON OR ABOVE ORIGINAL GRADE TO AVOID CHANNELIZING RUNOFF ALONG THE LENGTH OF THE FENCE.
5. SILT FENCE TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR STAKED SILT FENCE (E).

**EROSION CONTROL:**

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AROUND THE PERIMETER OF THE SITE.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWELVE HOURS AFTER EACH STORM EVENT AND DISPOSE OF THE SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHING OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.

**EC** EROSION CONTROL  
SCALE: N.T.S.



REV	DATE	DESCRIPTION	BY
E	7/2014	ADDENDUM 9	RL
D	6/2014	ADDENDUM 5	RL
C	2/21/14	100% DRAWINGS	RL
B	6/2013	90% DRAWINGS	RL
A	2/2013	60% DRAWINGS	RL

Issue Certification  
Oscar Vera, P.E.  
Florida P.E. No. 70091  
Liquid Solutions Group, LLC  
Certificate of Authorization No. 27380  
680 Valley Stream Drive  
Geneva, FL 32732






Designed OV  
Drawn RL  
Checked DN  
Reviewed CLK  
Approved OV  
Date 2/21/14

ORANGE COUNTY  
EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND REPUMP FACILITY  
CIVIL  
EROSION CONTROL PLAN AND DETAILS

PROJECT NO.: 110005	SCALE: NOTED	REVISION: C
DRAWING NO. C11	SHEET NO.: 016	OF 108



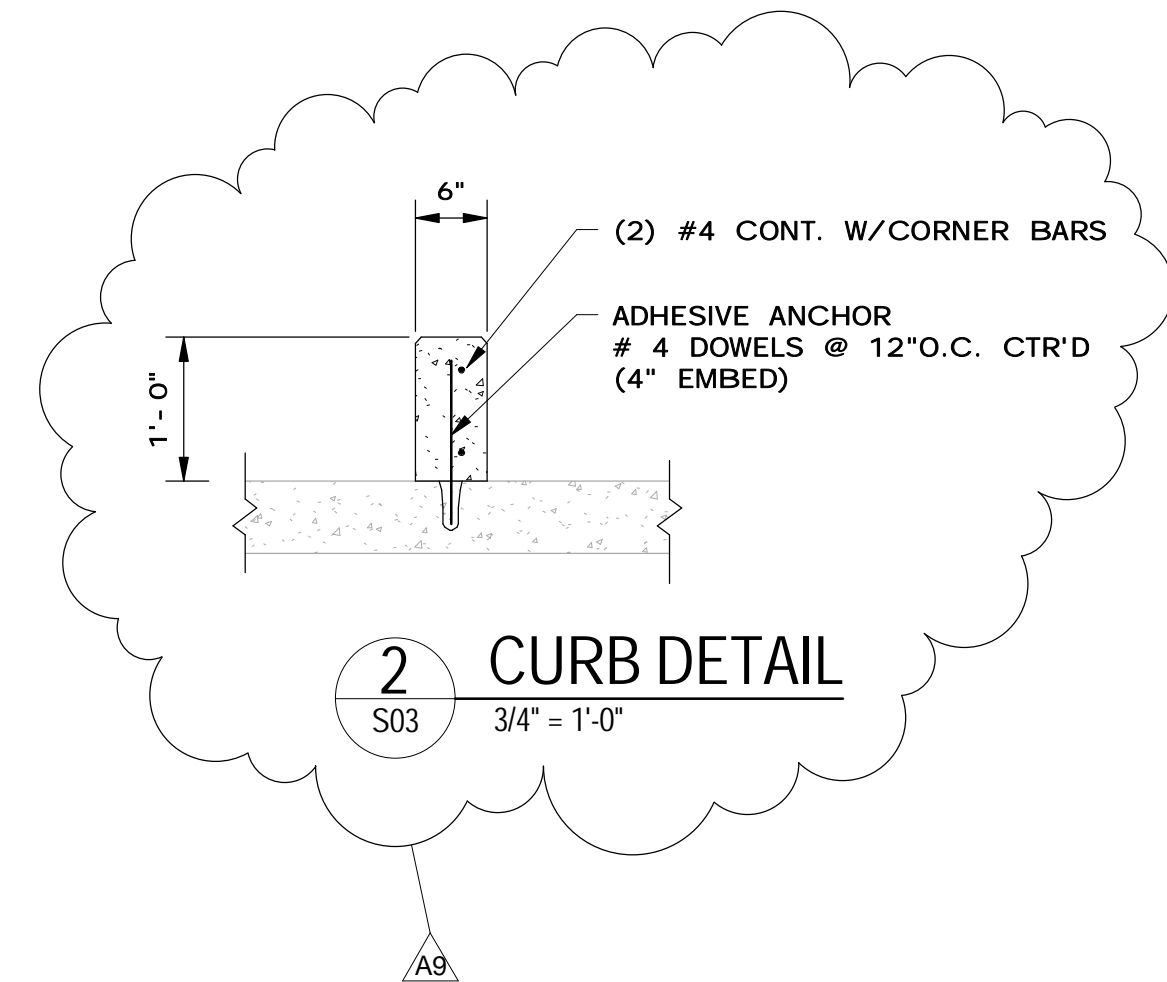
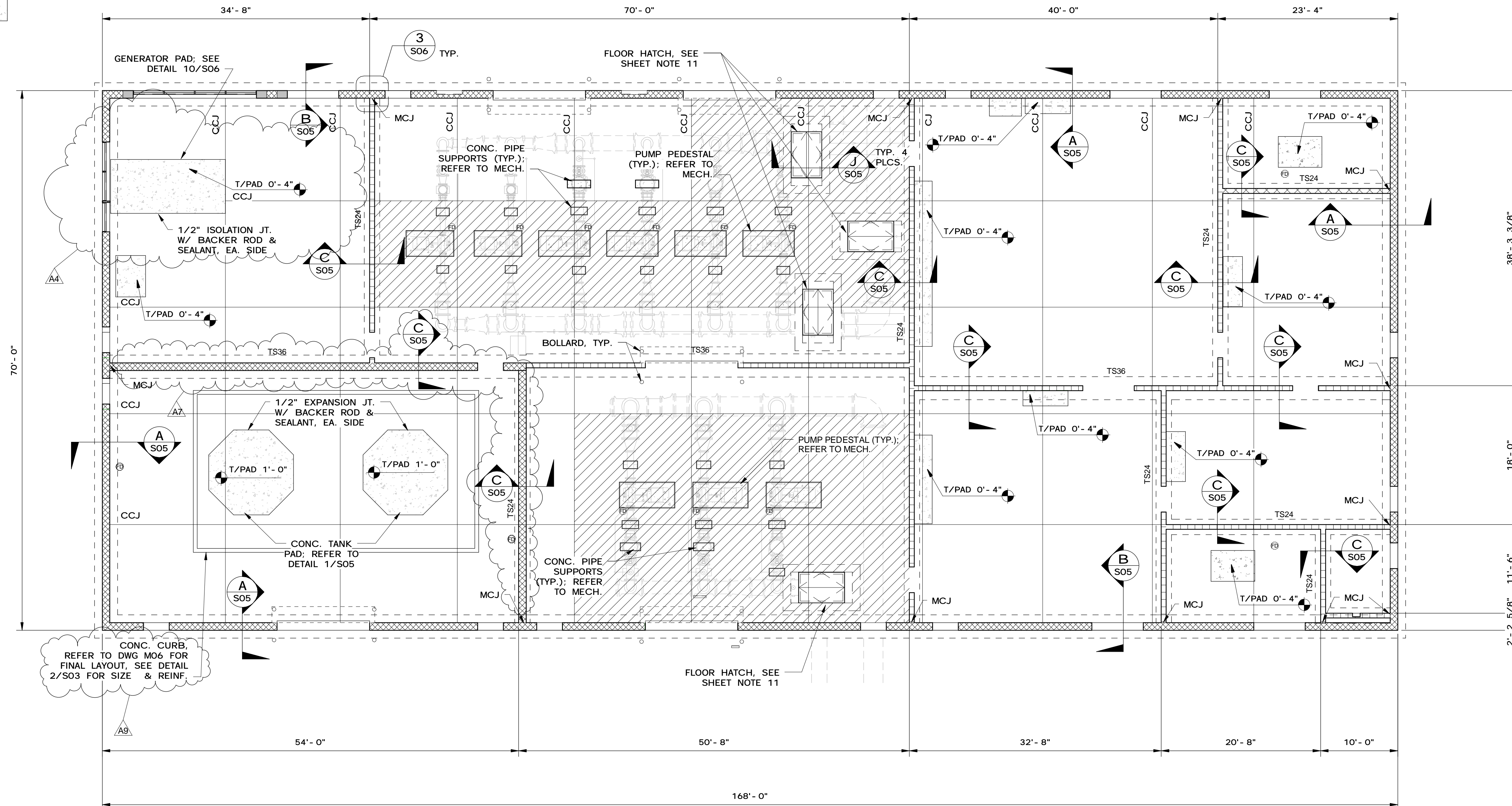
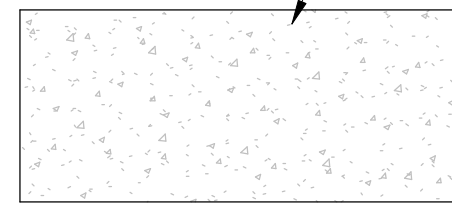
FOUNDATION PLAN LEGEND

-  DENOTES 12" CMU, REINF. WITH #6@32" O.C., CTR'D IN GROUTED CELL; PROVIDE 2#6 BARS AT EACH JAMBS ADJACENT TO OPENINGS, UNLESS NOTED OTHERWISE.
-  DENOTES 8" CMU; REINF. WITH #5@48" O.C., CTR'D IN GROUTED CELL
-  DENOTES 12X16 TIE COLUMN WITH 4#5 VERT. BARS W/ #3 (T2) TIES @ 12" O.C.
-  DENOTES AN 12" CONCRETE SLAB WITH #4@12" O.C. (TOP & BOT.)
-  DENOTES FLOOR DRAIN; REFER TO DETAIL 5/S06

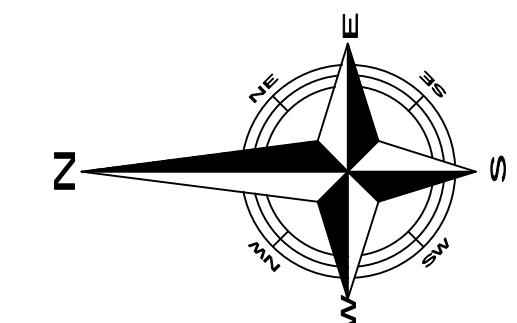
FOUNDATION/SLAB PLAN NOTES:

1. REFER TO SHEET S01 FOR GENERAL NOTES AND FOUNDATION DESIGN CRITERIA.
2. VERIFY ALL DIMENSIONS, ELEVATIONS, AND SLAB FINISHES WITH ARCHITECTURAL DRAWINGS BEFORE BEGINNING CONSTRUCTION. SEE ARCHITECTURAL DRAWINGS FOR SLOPES, DEPRESSIONS, DROPS, AND DRAIN LOCATIONS IN SLAB.
3. INTERIOR SLAB-ON-GRADE SHALL BE A MINIMUM 6" CONCRETE SLAB WITH ONE LAYER OF #4@12" O.C., EW, MID-DEPTH OF SLAB, UNLESS NOTED OTHERWISE NOTED. THE SLAB-ON-GRADE SHALL BE CAST OVER A COMPACTED SUBGRADE.
4. CCJ - DENOTES SLAB CRACK CONTROL JOINTS. REFER TO DETAIL 1/S06
5. CJ - DENOTES SLAB CONSTRUCTION JOINT. REFER TO DETAIL 1/S06
6. REFER TO CIVIL DRAWINGS FOR PROPOSED LAYOUT FOR FINISH GRADES, PAVEMENT, SIDEWALKS, AND DOOR STOOPS.
7. REFER TO ARCHITECTURAL DRAWINGS FOR THE EXACT LOCATION OF ALL MASONRY WALLS, EXTERIOR DOOR OPENINGS, ETC.
8. SEE SHEET S06 FOR TYPICAL DETAILS NOT CALLED OUT IN PLAN
9. ALL ELEVATIONS ARE REFERENCED TO FINISH FLOOR ELEVATION 0'-0" = 79.00 (SITE ELEVATION)
10. SEE DETAIL 6/S06 FOR CMU WALL REINFORCING REQUIREMENTS.
11. FLOOR HATCH SHALL BE ALUMINUM AND RATED FOR A 300 PSF LIVE LOAD.

FUEL TANK PAD;  
SEE DETAIL 9/S06



**1** FOUNDATION/SLAB PLAN  
S03 1/8" = 1'-0"



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ORLANDO, FLORIDA 32801  
PHONE: (407) 839-3955 FAX: (407) 839-3790



REV	DATE	DESCRIPTION	BY
F	7/16/14	ADDENDUM 9 (A9)	JTE
E	6/23/14	ADDENDUM 7 (A7)	JTE
D	6/2/14	ADDENDUM 4 (A4)	JTE
C	2/21/14	100% DRAWINGS	JTE
B	6/2013	90% DRAWINGS	JTE
A	2/2013	60% DRAWINGS	JTE

Issue Certification  
Matthew Petaja, PE  
Florida P.E. No. 61353  
Tetra Tech  
Certificate of Authorization No. 2429  
201 East Pine Street, Suite 1000  
Orlando, FL 32801

Designed M.PETAJA  
Drawn J.GREENWELL  
Checked C.COLEMAN  
Reviewed C.COLEMAN  
Approved C.COLEMAN  
Date 2/21/14

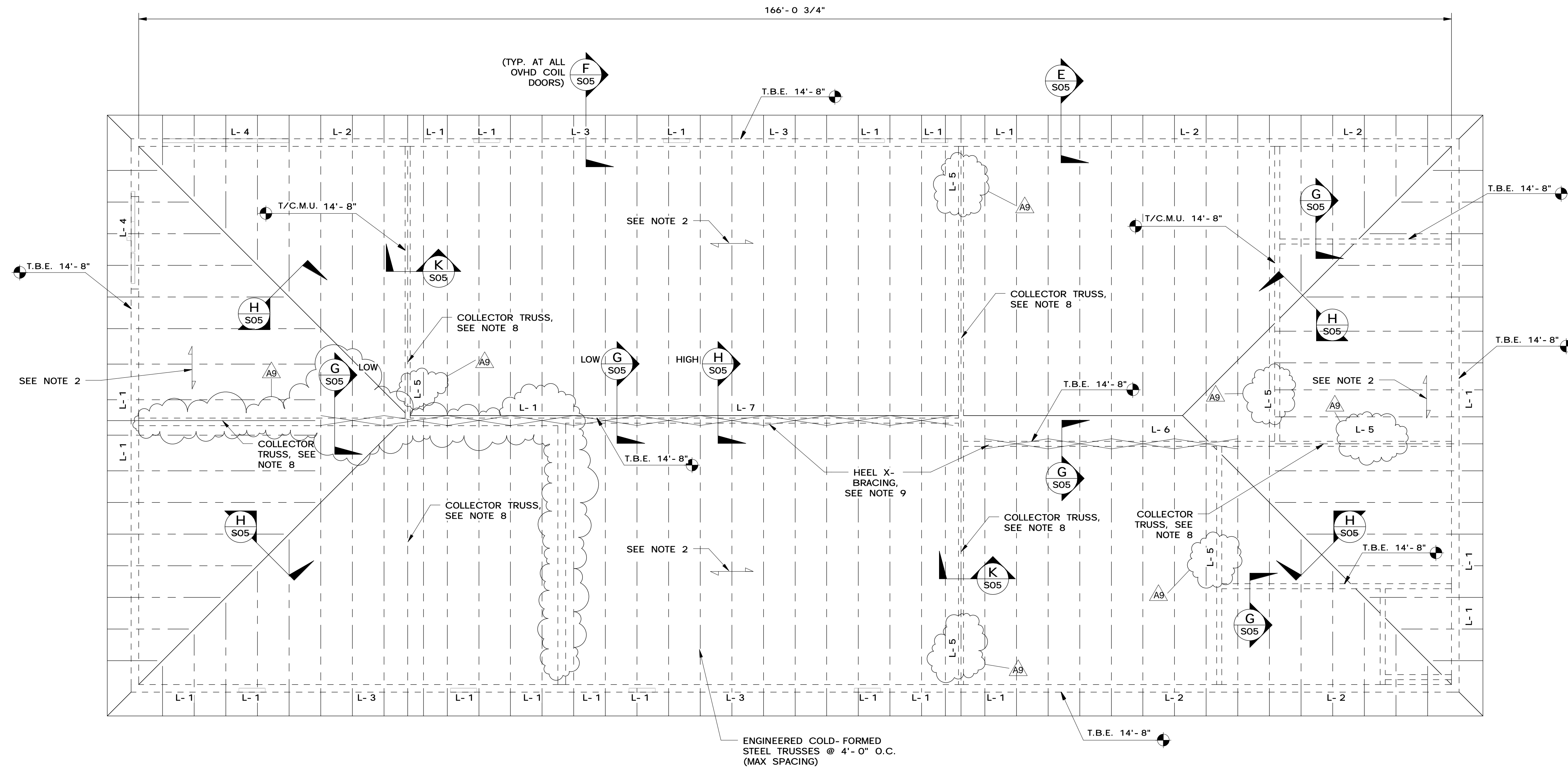
ORANGE COUNTY  
EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND  
REPUMP FACILITY  
STRUCTURAL  
OPERATIONS BUILDING FOUNDATION AND SLAB PLAN

PROJECT NO.:	110005
SCALE:	As Indicated
REVISION:	C
DRAWING NO.:	S03
SHEET NO.:	044 OF 108

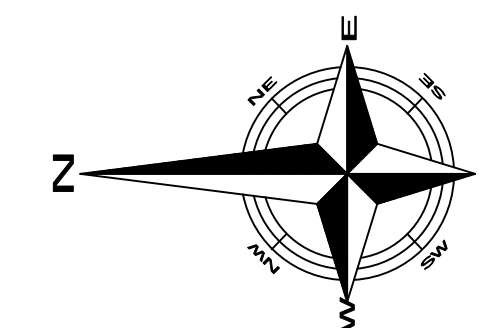
**RE** REISS ENGINEERING, INC.  
1016 SPRING VILLAS PT  
WINTER SPRINGS, FL 32708  
(407) 679-5358

ROOF FRAMING PLAN NOTES:

- REFER TO SHEET S01 AND S02 FOR GENERAL NOTES AND DESIGN CRITERIA.
- ROOF SYSTEM OVER CFS TRUSS SHALL CONSIST OF 1.5" METAL DECK (G60), TYPE B, 20 GAGE. FASTEN TO TRUSSES WITH #12 TEK SCREW @ 36/4" PATTERN ALONG EDGES AND SUPPORTING MEMBERS WITH 2#10 TEEK SIDELAP FASTENERS. FASTEN #12 TEK SCREWS @ 6" O.C. ALONG EDGES, OPENINGS, AND COLLECTORS.
- L# - DENOTES MASONRY LINTELS. REFER TO THE LINTEL SCHEDULE 2/S06.
- REFER TO SHEET S06 FOR TYPICAL DETAILS NOT CALLED OUT IN PLAN
- DENOTES A SHEAR TRUSS. DESIGN THE TOP CHORD FOR AN AXIAL (SERVICE) WIND LOAD OF 100(+/-) plf.
- TRUSS MANUFACTURER SHALL PROVIDE 16 GA x 9" CONT. (G60) BENT PLATE AT HIP AND RIDGE FOR DECK SUPPORT. REFER TO H/S06
- REFER TO DETAIL 8/S06 FOR TRUSS HEEL BLOCKING
- COLLECTOR TRUSS SHALL BE DESIGNED FOR A 100 (+/-) PLF AXIAL TOP CHORD LOAD WIND LOAD (SERVICE); TRANSFER LATERAL LOAD INTO THE TOP OF CMU WALL.
- TRUSS MANUFACTURER SHALL PROVIDE CFS HEEL BLOCKING CENTERED ON THE CMU WALL. BLOCKING SHALL EXTEND FROM ROOF DECK TO TOP OF CMU WALL AND SHALL BE INSTALLED AT A 1:1 SLOPE.



1 ROOF FRAMING PLAN  
S04 1/8" = 1'-0"



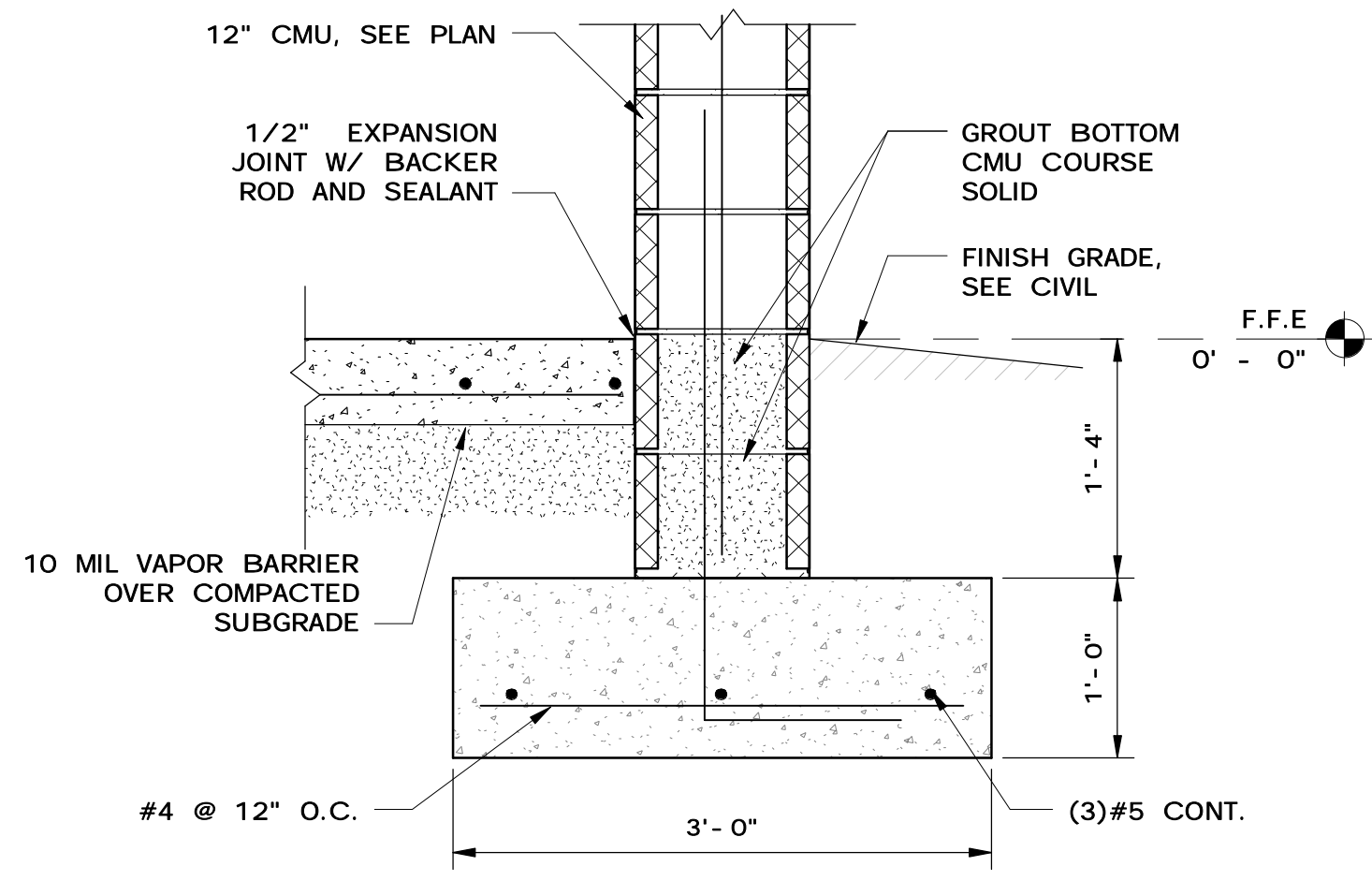
REV	DATE	DESCRIPTION	BY
F	7/16/14	ADDENDUM 9 (A9)	JTE
E	6/23/14	ADDENDUM 7 (A7)	JTE
D	6/2/14	ADDENDUM 4 (A4)	JTE
C	2/21/14	100% DRAWINGS	JTE
B	6/2013	90% DRAWINGS	JTE
A	2/2013	60% DRAWINGS	JTE

Issue Certification  
 Matthew Petaja, PE  
 Florida P.E. No. 61353  
 Tetra Tech  
 Certificate of Authorization No. 2429  
 201 East Pine Street, Suite 1000  
 Orlando, FL 32801

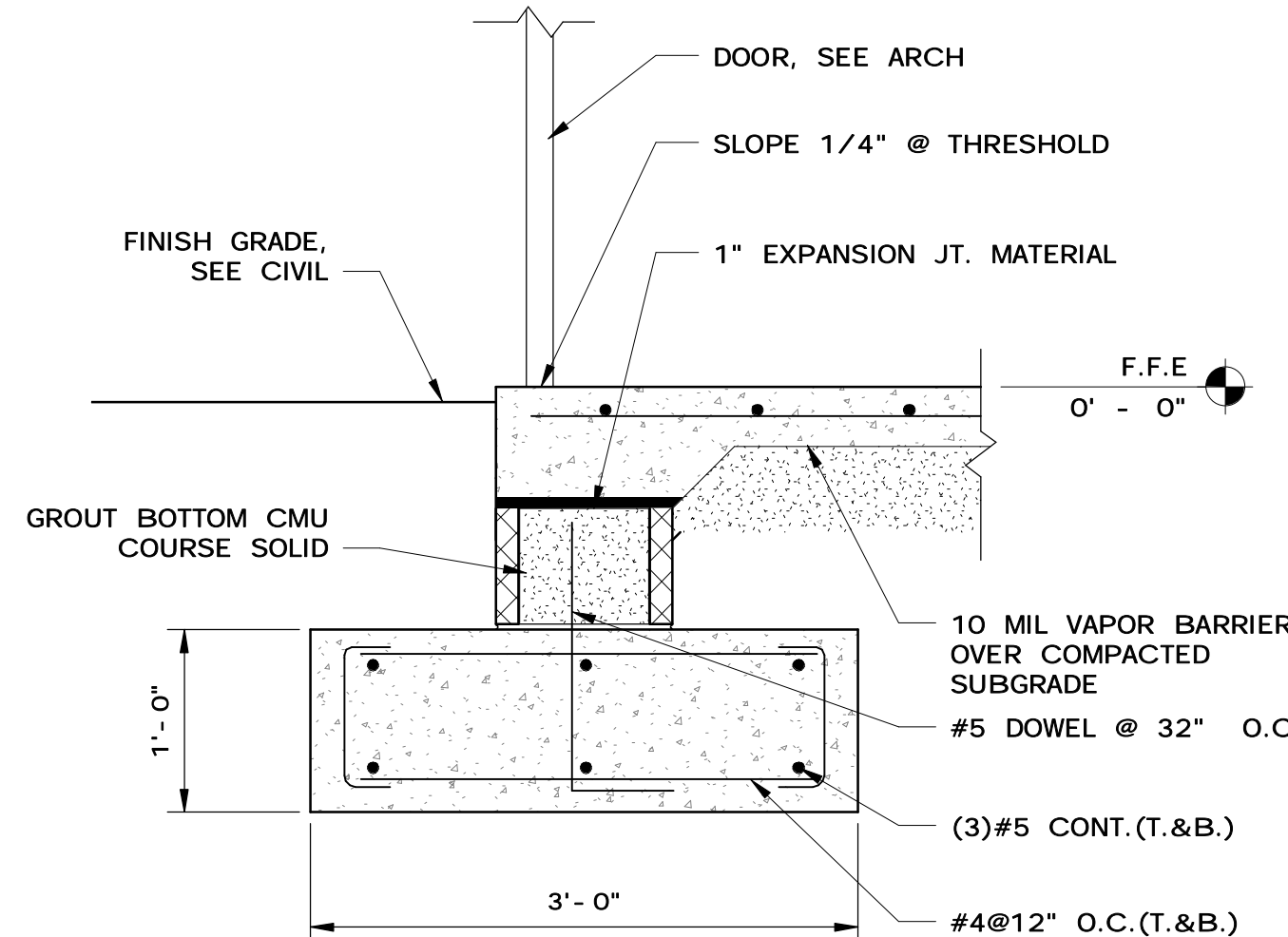
Designed M.PETAJA  
 Drawn J.GREENWELL  
 Checked C.COLEMAN  
 Reviewed C.COLEMAN  
 Approved C.COLEMAN  
 Date 2/21/14

ORANGE COUNTY  
 EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND  
 REPUMP FACILITY  
 STRUCTURAL  
 OPERATIONS BUILDING ROOF FRAMING PLAN

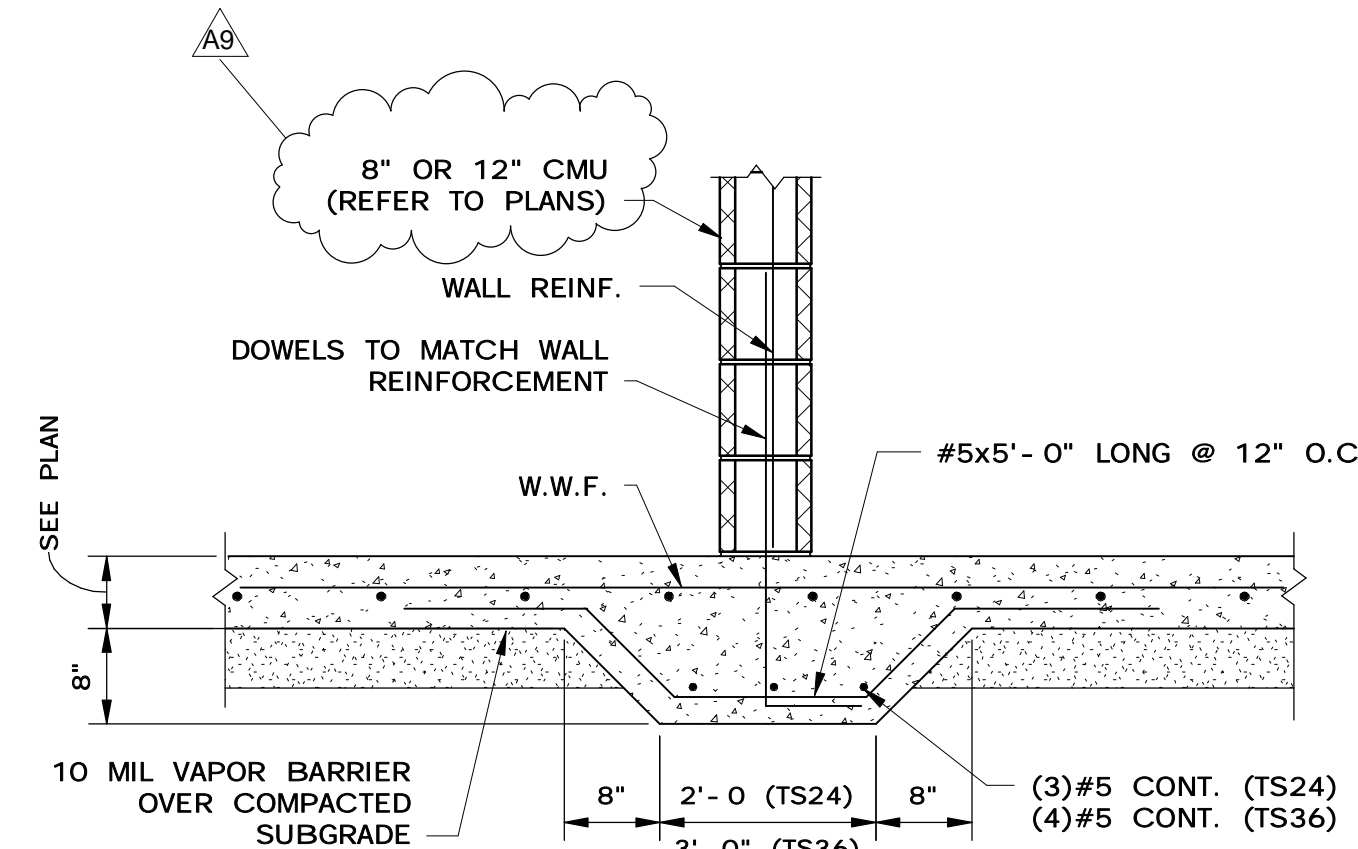
PROJECT NO.:	110005
SCALE:	As Indicated
REVISION:	C
DRAWING NO.:	S04
SHEET NO.:	045 OF 108



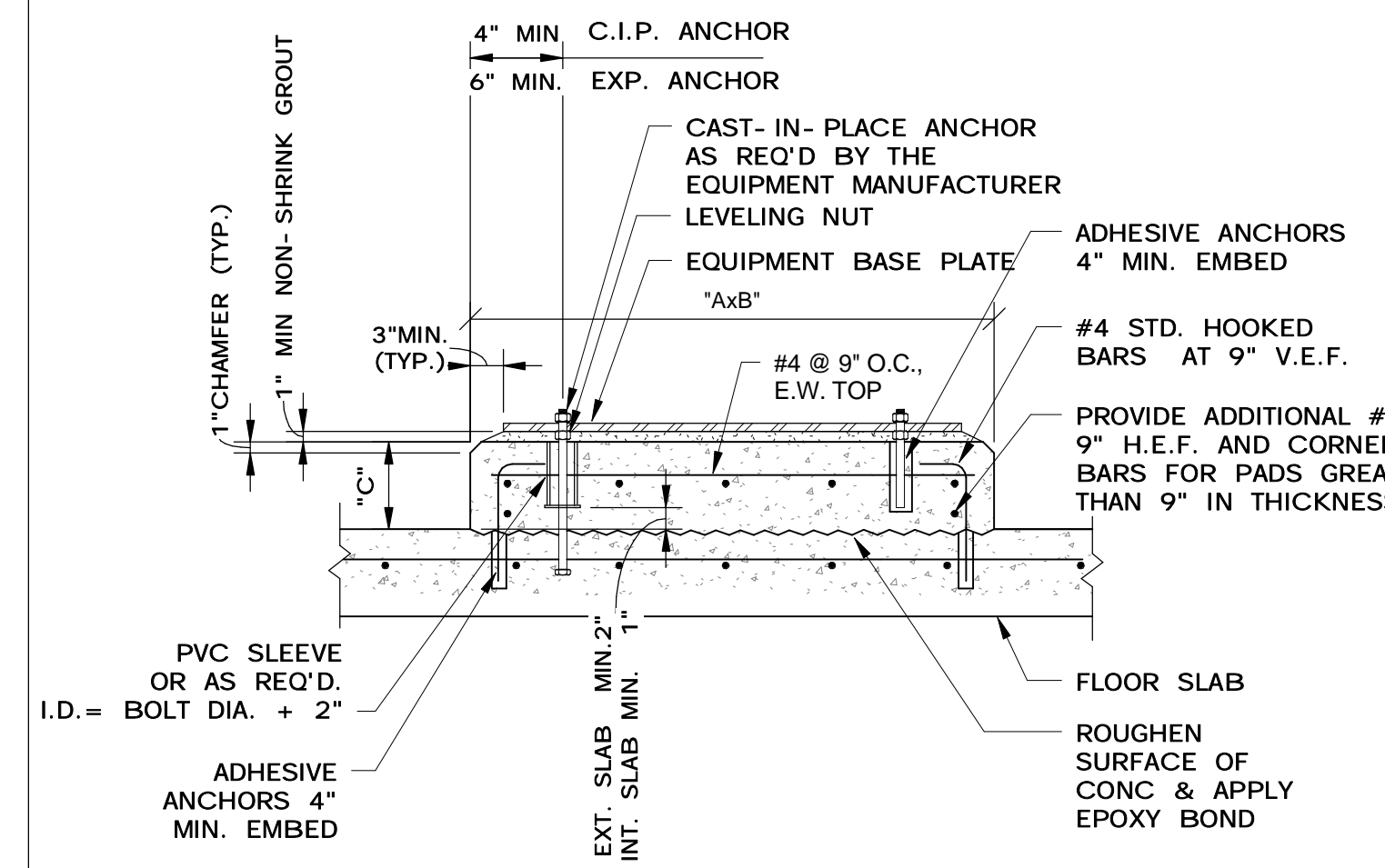
**A** SECTION  
S03 SCALE: 1" = 1'-0"



**B** SECTION  
S03 SCALE: 1" = 1'-0"

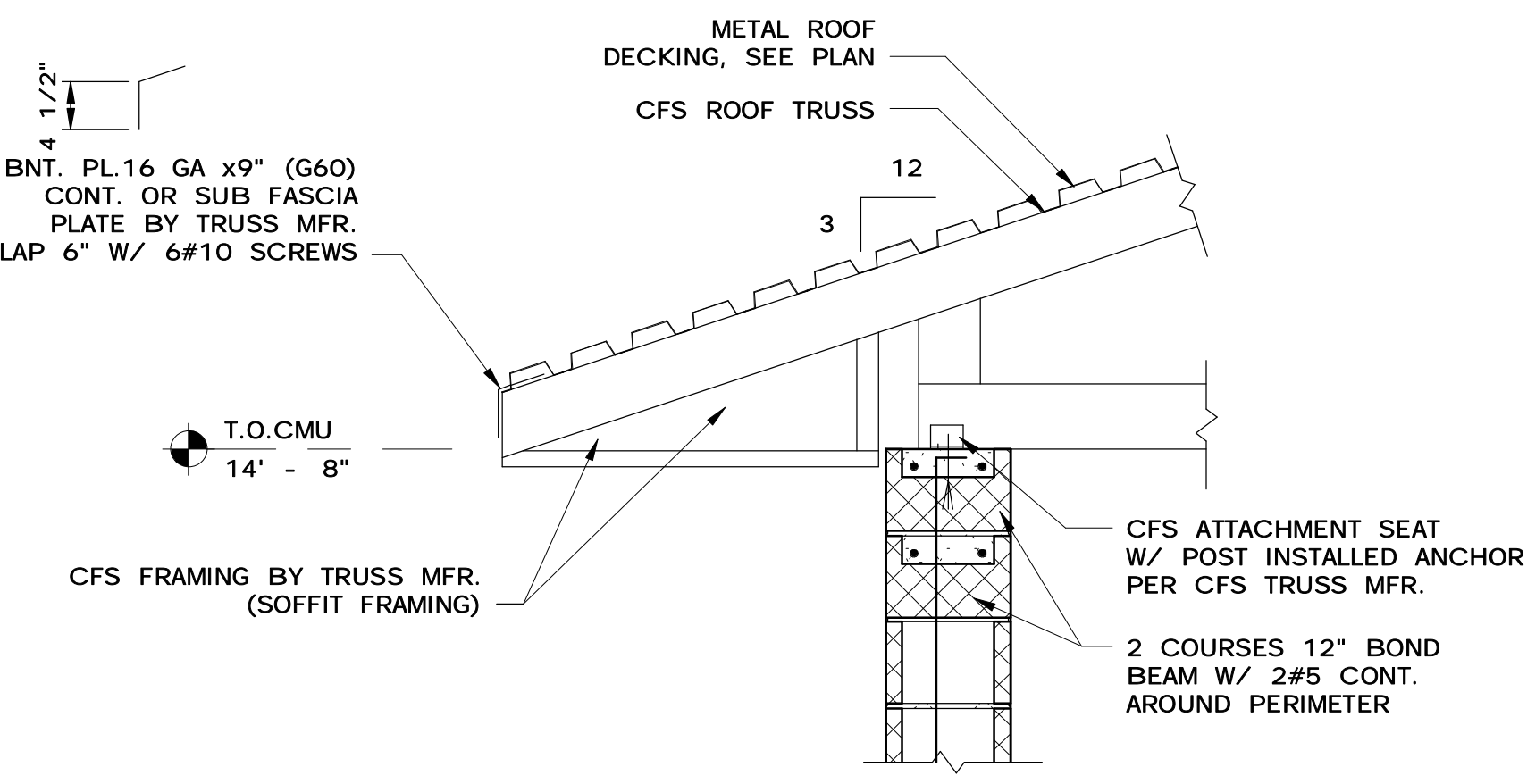


**C** SECTION  
S03 SCALE: 3/4" = 1'-0"

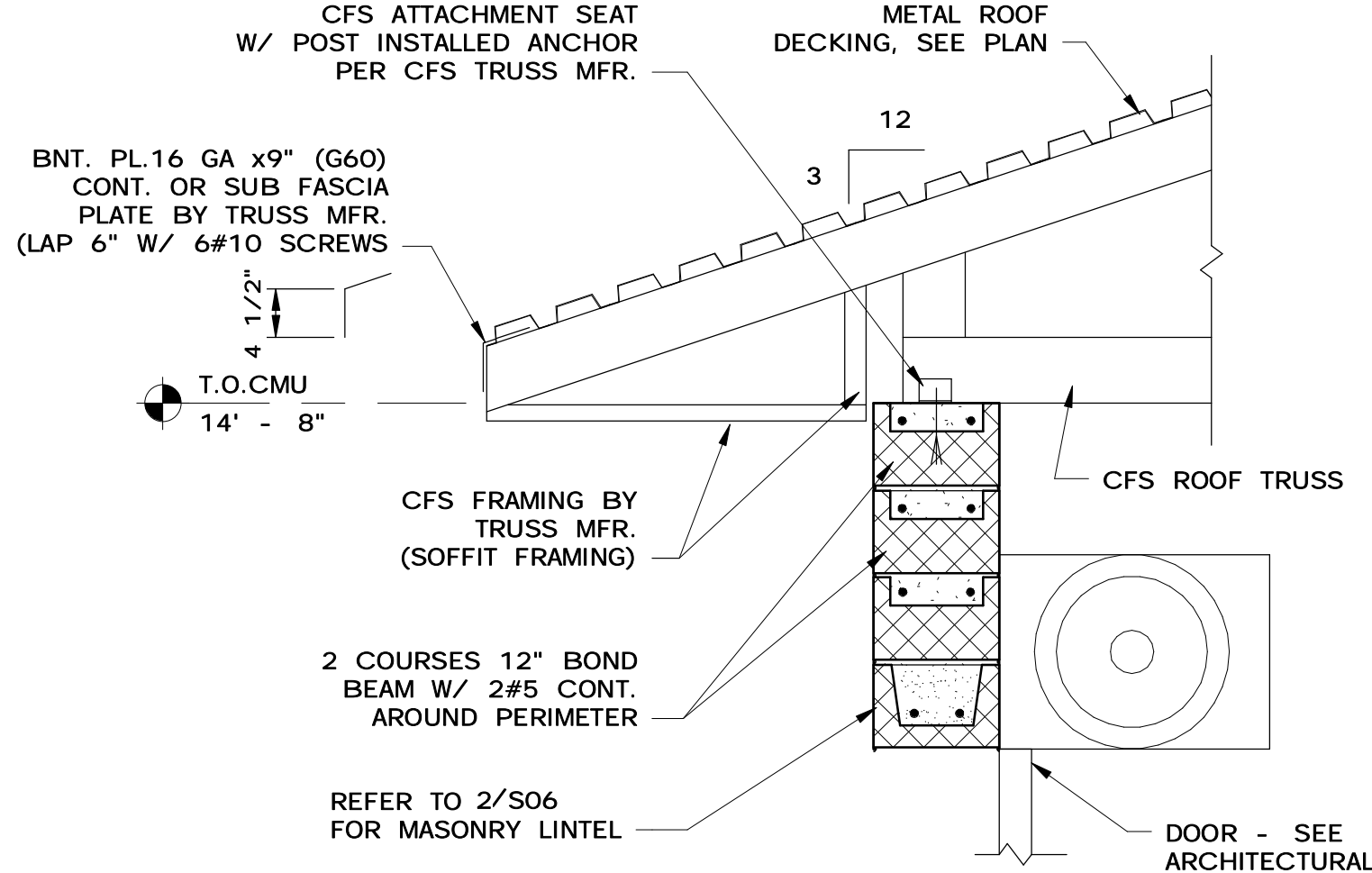


**D** SECTION  
S03 SCALE: 3/4" = 1'-0"

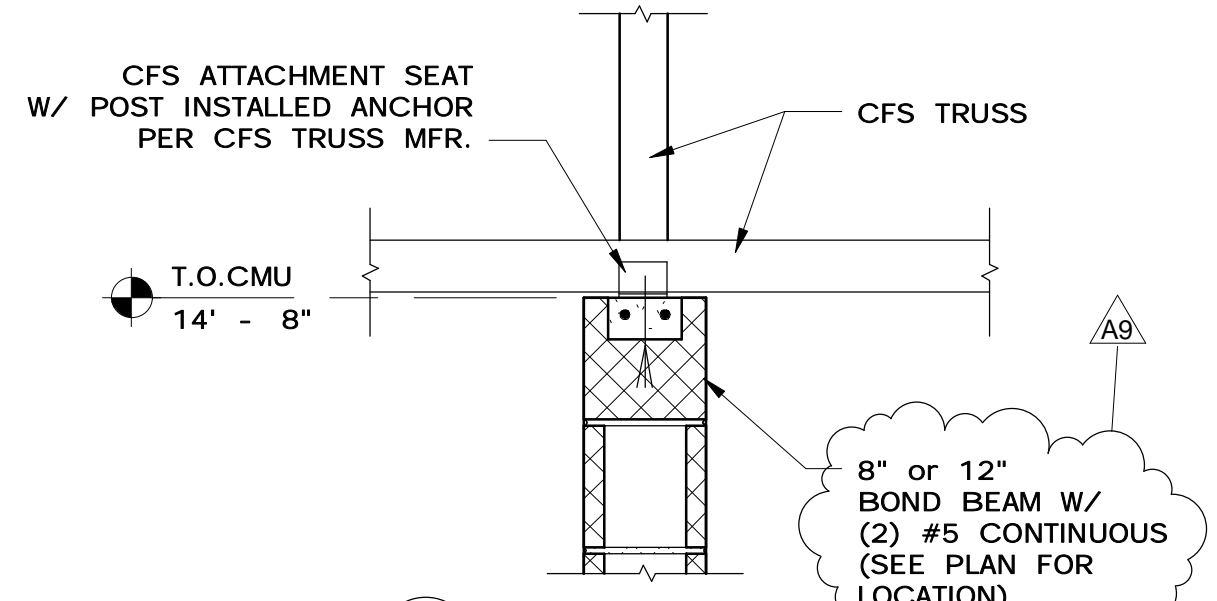
NOTE:  
"A", "B" & "C" DIMS. AS REQ'D TO SUIT EQUIPMENT. ("C" = 6" TYP. U.N.O.)



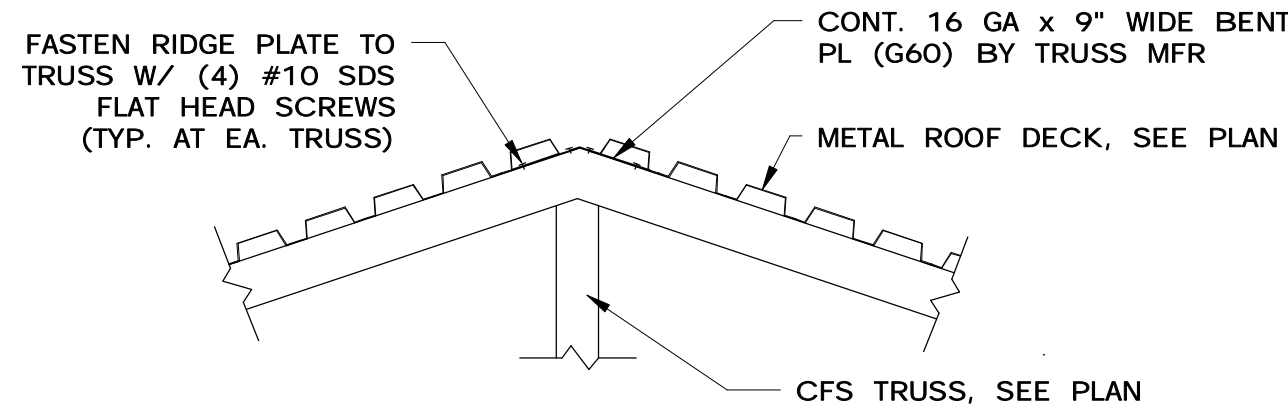
**E** SECTION  
S04 SCALE: 3/4" = 1'-0"



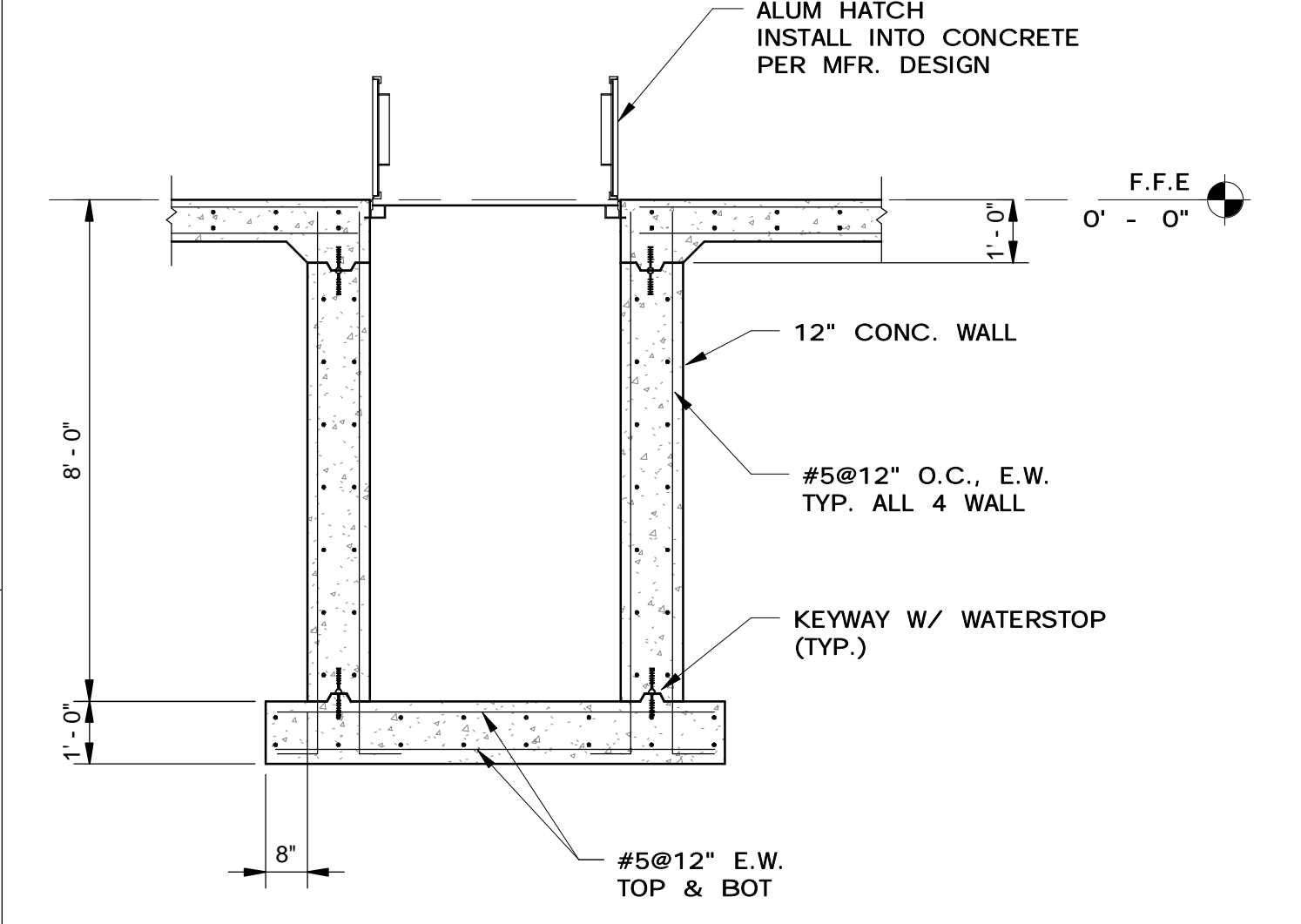
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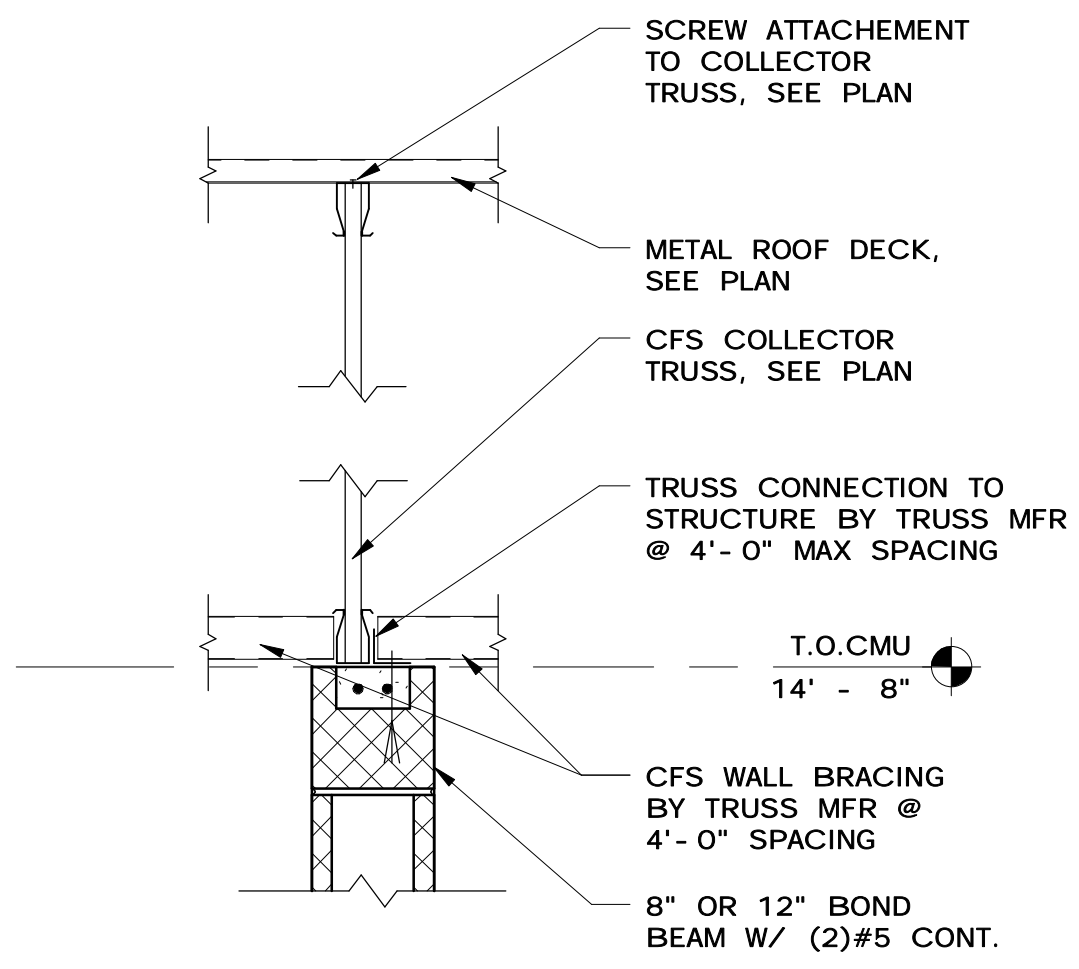
**G** SECTION  
S04 SCALE: 1" = 1'-0"



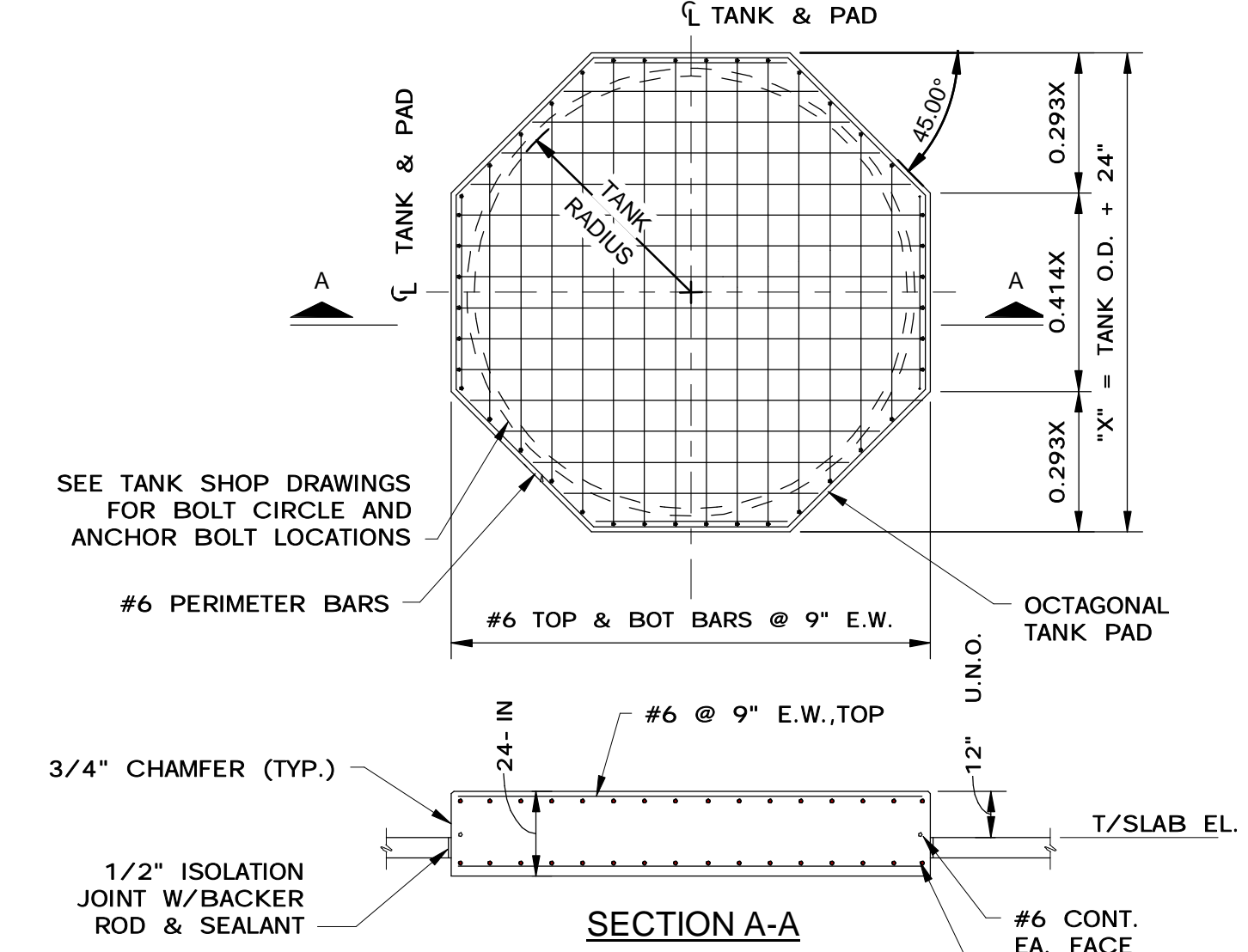
**H** SECTION  
S04 SCALE: 3/4" = 1'-0"



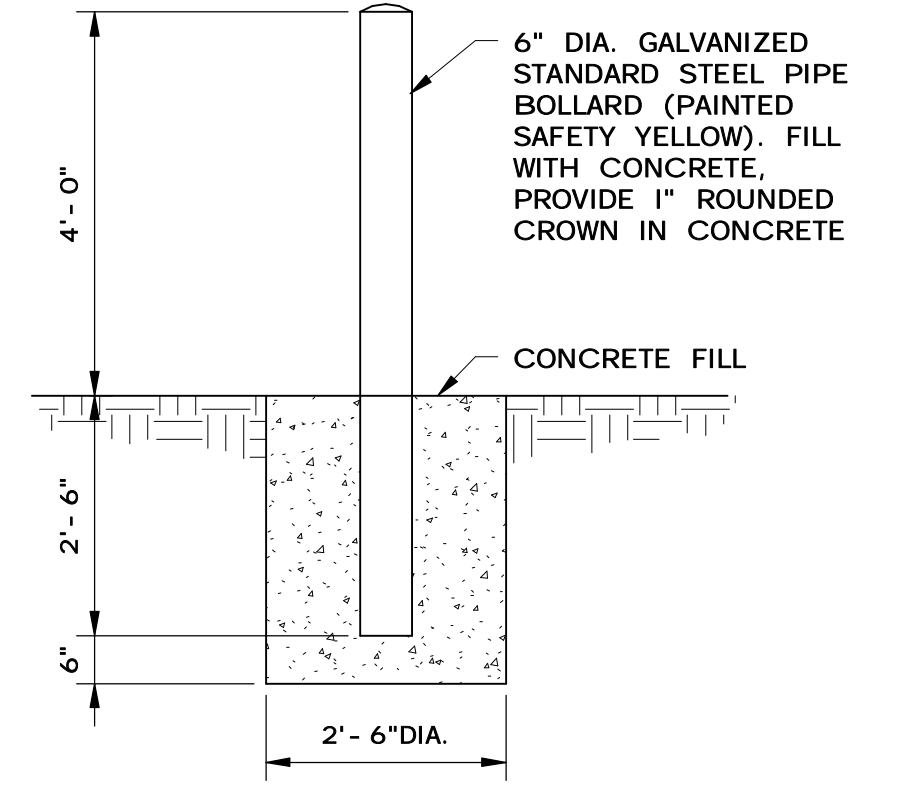
**J** SECTION  
S03 SCALE: 3/8" = 1'-0"



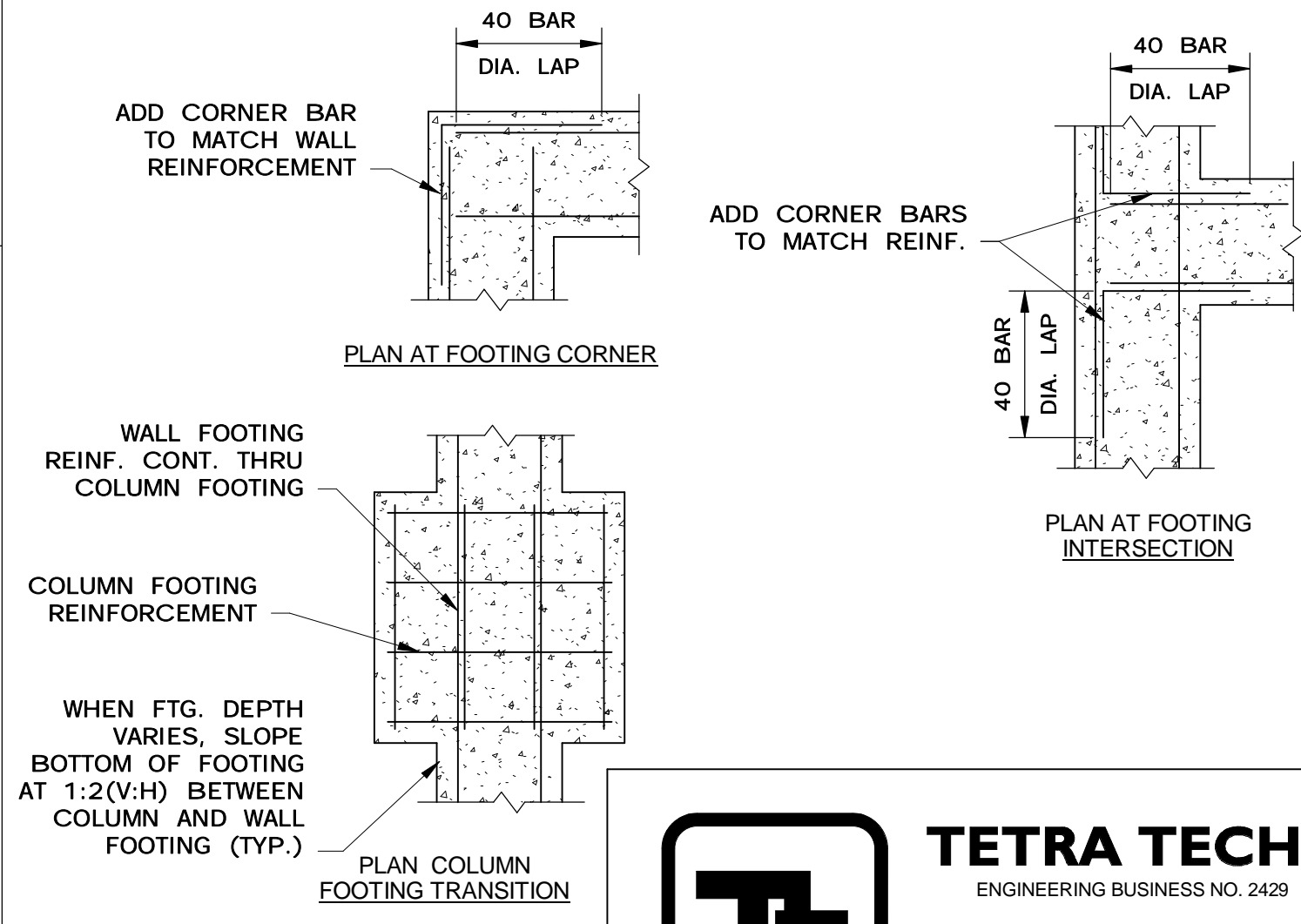
**K** SECTION  
S04 SCALE: 1" = 1'-0"



**1** ISOLATED OCTAGONAL TANK PAD  
SCALE: 3/4" = 1'-0"



**2** TYP. BOLLARD DETAIL  
SCALE: 1/2" = 1'-0"



**3** SECTION  
SCALE: 3/4" = 1'-0"



REV	DATE	DESCRIPTION	BY
F	7/16/14	ADDENDUM 9 (A9)	JTE
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D	6/2/14	ADDENDUM 4 (A4)	JTE
C	2/21/14	100% DRAWINGS	JTE
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A	2/2013	60% DRAWINGS	JTE

Issue Certification	
Designed	M. PETAJA
Drawn	J. GREENWELL
Checked	C. COLEMAN
Reviewed	C. COLEMAN
Approved	C. COLEMAN

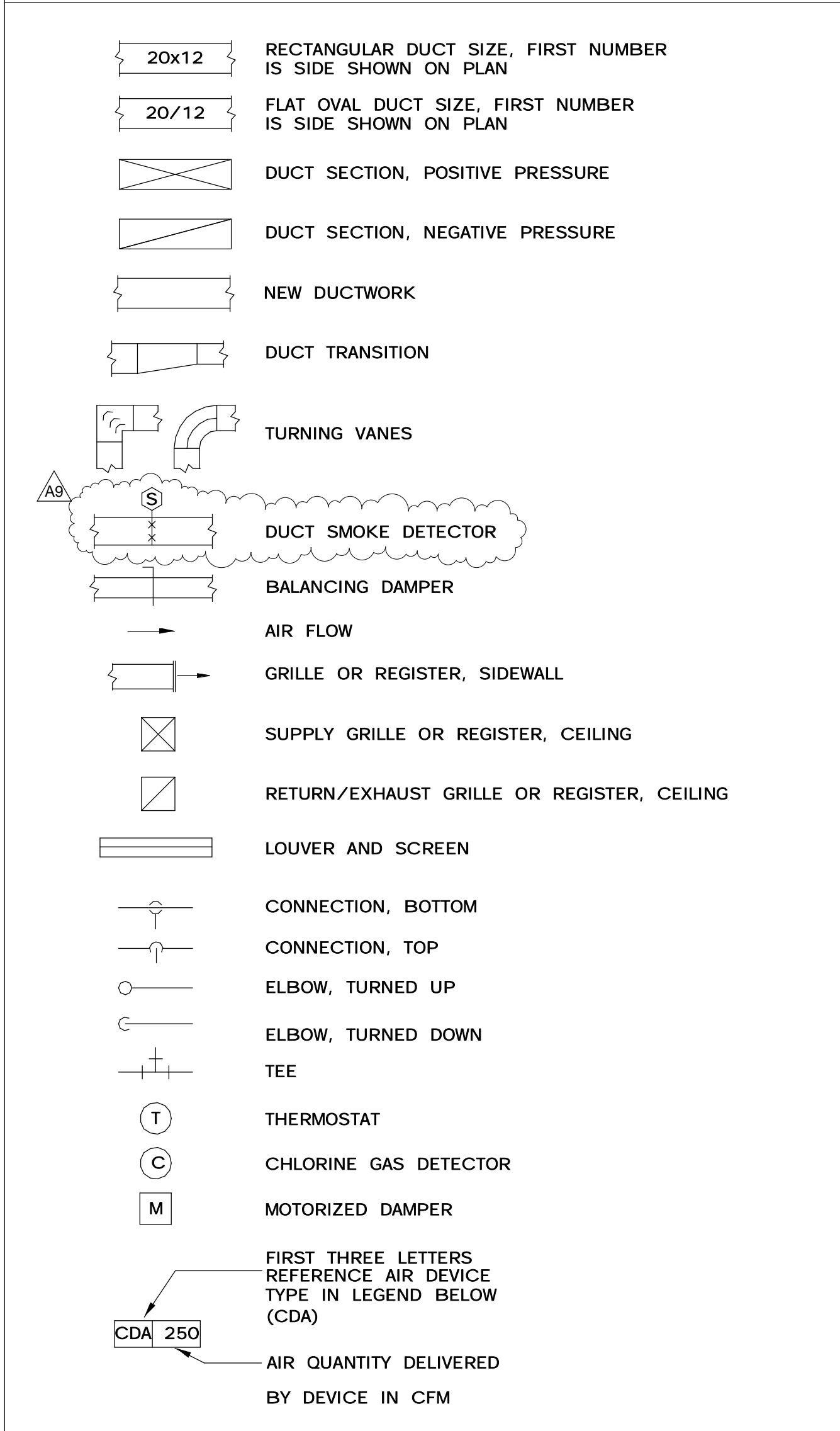
ORANGE COUNTY	
East Service Area Potable Water and Reclaimed Water Storage and Repump Facility	STRUCTURAL
OPERATIONS BUILDING SECTIONS	

ORANGE COUNTY  
EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND  
REPUMP FACILITY  
STRUCTURAL  
OPERATIONS BUILDING SECTIONS

PROJECT NO.:	
110005	
SCALE:	REVISION:
As Indicated	C
DRAWING NO.	SHEET NO.:
S05	046 OF 108



**MECHANICAL HVAC LEGEND**



NOTE:  
 ALL DUCT TAPS SHALL BE PER SMACNA STANDARDS LATEST EDITION.  
 THIS LEGEND IS FOR REFERENCE ONLY.  
 ALL SYMBOLS WHICH APPEAR WITHIN THE  
 LEGEND MAY NOT APPLY TO THIS PROJECT.

**MECHANICAL HVAC ABBREVIATIONS**

SYMBOL	DESCRIPTION
ABS	ABSOLUTE
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFG	ABOVE FINISH GRADE
AF	ABOVE FINISHED FLOOR
AP	ACCESS PANEL
BHP	BRAKE HORSEPOWER
CP- 1	CONTROL PANEL WITH DESIGNATION
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUATION
CU	CONDENSING UNIT
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
ENT	ENTERING
ESP	EXTERNAL STATIC PRESSURE
EUH	ELECTRIC UNIT HEATER
EF	EXHAUST FAN
F	FAHRENHEIT
FD	FIRE DAMPER
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FC	FREE COOLING
GAL	GALLONS
GL	GLYCOL FLUID PIPING
GPM	GALLONS PER MINUTE
HD	HEAD
HP	HORSEPOWER
L	LOUVER
LAT	LEAVING AIR TEMPERATURE
LP	LOUVERED PENTHOUSE
MAX	MAXIMUM
MIN	MINIMUM
UP	DUCT OFFSET UP
DN	DUCT OFFSET DOWN
N.T.S.	NOT TO SCALE
PD	PRESSURE DROP
REFRIG	REFRIGERANT PIPING (LIQUID AND SUCTION LINES)
S	DUCT SMOKE DETECTOR
SP	STATIC PRESSURE
SPEC	SPECIFICATION
STD	STANDARD
TEMP	TEMPERATURE
TYP	TYPICAL
V	VOLT
W	WATT
WG	WATER GAUGE
RS/RL	REFRIGERANT SUCTION/LIQUID
AHU	AIR HANDLING UNIT

**MECHANICAL HVAC GENERAL NOTES:**

- THESE DRAWINGS ARE SCHEMATIC IN NATURE AND ARE NOT INTENDED TO SHOW ALL POSSIBLE CONDITIONS. IT IS INTENDED THAT A COMPLETE SYSTEM BE PROVIDED WITH ALL NECESSARY EQUIPMENT, APPURTENANCES, AND CONTROLS, COMPLETELY COORDINATED WITH ALL DISCIPLINES. ALL PARAMETERS GIVEN IN THESE DOCUMENTS SHALL BE STRICTLY CONFORMED WITH. ANY ITEMS AND LABOR REQUIRED FOR A COMPLETE SYSTEM IN ACCORDANCE WITH ALL APPLICABLE CODES, STANDARDS, AND THESE CONTRACT DOCUMENTS SHALL BE FURNISHED WITHOUT OCCURRING ANY ADDITIONAL COST TO THE OWNER. CAREFULLY REVIEW ALL CONTRACT DOCUMENTS AND THE DESIGN OF OTHER TRADES BEFORE PREPARING SHOP DRAWINGS.
- ALL DUCTWORK SHALL BE MOUNTED WITHIN 12- 24 INCHES OF CEILINGS EXCEPT TO AVOID INTERFERENCES WITH OTHER CONSTRUCTION.
- COORDINATE EQUIPMENT AND PIPING WITH ALL OTHER DISCIPLINES AND TRADES. MAKE ALL OFFSETS AND TRANSITIONS TO COORDINATE WITH OTHER TRADES WITHOUT ANY ADDITIONAL EXPENSE TO THE OWNER.
- COORDINATE THE EXACT LOCATION AND SIZE OF ALL ROOF, WALL, AND SLAB PENETRATIONS WITH THE ARCHITECTURAL DRAWINGS.
- MAINTAIN PIPING A MINIMUM OF 7'- 0" A.F.F IN ALL MECHANICAL ROOMS. ALL PIPING SHALL BE LOCATED AS HIGH AS POSSIBLE.
- MOUNT THERMOSTATS WHERE INDICATED ON PLANS, 4'- 0" A.F.F. UNLESS NOTED OTHERWISE.
- ELECTRICAL CONTRACTOR TO VERIFY CONTROL VOLTAGES WITH EQUIPMENT AND PROVIDE ACCORDINGLY.
- MECHANICAL CONTRACTOR SHALL VERIFY NUMBER OF CIRCUITS REQUIRED WITH CONTROLS CONTRACTOR. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COMMUNICATING THIS REQUIREMENT WITH THE ELECTRICAL CONTRACTOR. ALL CIRCUITS FOR CONTROLS SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.
- ALL HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS SHALL COMPLY WITH ORANGE COUNTY APPENDIX D REQUIREMENTS, INCLUDING REQUIREMENTS FOR PRESSURE GAUGES AND MOUNTING TRIM FOR ELECTRICAL EQUIPMENT ASSOCIATED WITH HVAC.
- CONTRACTOR SHALL COORDINATE WITH AND PROVIDE LABOR AS REQUIRED TO INSTALL SUPPLY AND RETURN DUCT SMOKE DETECTORS ON ALL CIRCULATING AIR EQUIPMENT OF 2000 CFM AND GREATER CAPACITY EITHER IN A SINGLE UNIT OR A COMBINATION OF UNITS SERVING A SINGLE AREA IN ACCORDANCE WITH NFPA 90A, NFPA 72 AND FBCM 606. SHUTDOWN CONTROLS SHALL BE PROVIDED THROUGH THE BUILDING FIRE ALARM SYSTEM.

**DUCTWORK NOTES:**

- ALL DUCTWORK IS SHOWN AS FREE AREA INSIDE DIMENSIONS.
- USE 45 DEG. TAPS FOR ROUND TAKE OFFS. PROVIDE VOLUME DAMPER AT EACH TAKE OFF.
- DO NOT CONSTRUCT OR INSTALL TAPS OUT OF REDUCERS, TEES AND OR ELBOWS.
- ALLOW FOR FIELD MEASURED OFFSETS OR TRANSITIONS, ELBOWS ETC.
- SUPPORT ALL FLEXIBLE DUCTWORK AS SHOWN IN SMACNA FIGURE 3- 9, 1985, BUT NOT LESS THAN 6.0' CENTERS.
- DO NOT USE FLEX DUCT IN EXPOSED AREAS. MAXIMUM FLEX DUCT LENGTH TO DIFFUSERS SHALL NOT EXCEED FIVE FEET. MAXIMUM FLEX DUCT LENGTH AT ANY OTHER CONNECTION SHALL NOT EXCEED TWO FEET. FLEX DUCT SHALL NOT BE USED FOR ELBOWS.
- GRILLES, REGISTERS AND DIFFUSERS CONNECTED BY FLEXIBLE DUCT SHALL BE SUPPORTED INDEPENDENTLY OF THE FLEXIBLE DUCT.
- ELBOWS SHALL BE 90 DEG. ELLS WITH DOUBLE THICKNESS TURNING VANES OR WHERE SPACE PERMITS RADIUS FITTING WITH CENTERLINE RADIUS EQUAL TO 1.5 TIMES THE DUCT WIDTH CENTERLINE. NO OTHERS WILL BE ALLOWED.
- COORDINATE FINAL LOCATION OF ALL REGISTERS, GRILLES, DIFFUSERS ETC. WITH ARCHITECTURAL DRAWINGS AND LIGHTING PLANS.



REV	DATE	DESCRIPTION	BY
D	7/15/14	ADDENDUM 9 (A9)	JTE
C	2/21/14	100% DRAWINGS	JTE
B	6/2013	90% DRAWINGS	JTE
A	2/2013	60% DRAWINGS	JTE

Issue Certification  
 Donald S. Borden, P.E.  
 Florida P.E. No. 64172  
 Tetra Tech  
 2429  
 201 East Pine Street, Suite 1000  
 Orlando, FL 32801

Designed SBR  
 Drawn SBR/BJZ  
 Checked DSB  
 Reviewed DSB  
 Approved DSB  
 Date 2/21/14

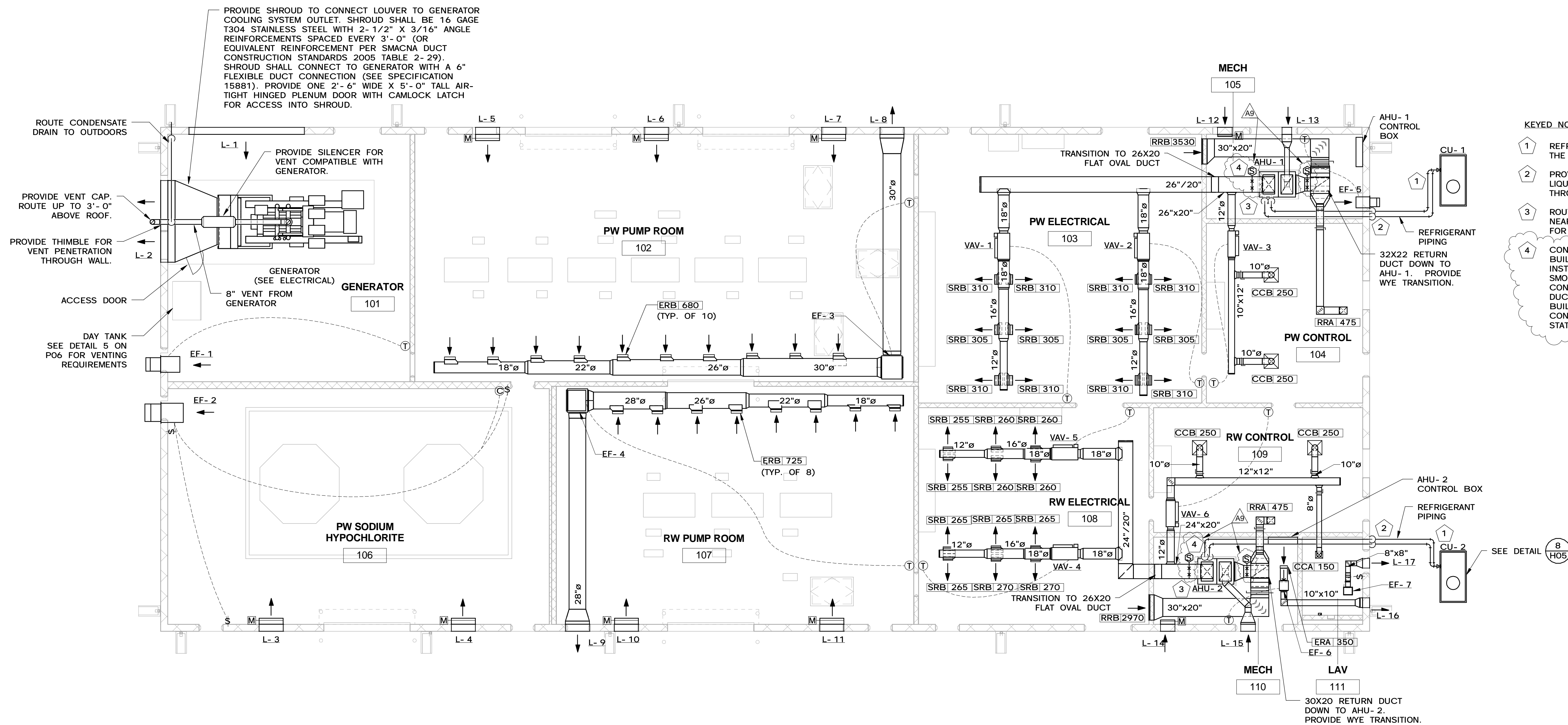
ORANGE COUNTY  
 EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND  
 REPUMP FACILITY  
 HVAC

**HVAC NOTES, ABBREVIATIONS, AND SYMBOLS**

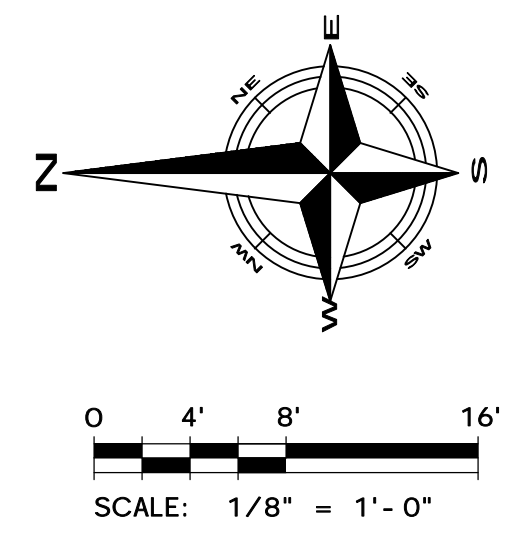
PROJECT NO.: <b>110005</b>	
SCALE: NOTED	REVISION: D
DRAWING NO. H01	SHEET NO.: 058 OF 108







- KEYED NOTES:
- 1 REFRIGERANT PIPING SHALL BE SIZED BY THE MANUFACTURER.
  - 2 PROVIDE PIPE SLEEVES FOR REFRIGERANT LIQUID AND SUCTION LINE PENETRATIONS THROUGH EXTERIOR WALL.
  - 3 ROUTE CONDENSATE DRAIN TO THE NEAREST FLOOR DRAIN. SEE PLUMBING FOR FLOOR DRAIN LOCATIONS.
  - 4 CONTRACTOR TO COORDINATE WITH BUILDING FIRE ALARM CONTRACTOR FOR INSTALLATION OF SUPPLY AND RETURN SMOKE DETECTORS AND SHUTDOWN CONTROLS ON SUPPLY AND RETURN DUCT. DETECTOR TO ALARM THROUGH BUILDING FIRE ALARM SYSTEM AND CONTROLS CONTRACTOR TO MONITOR STATUS AND PROVIDE REMOTE ALARM.



**TETRA TECH**  
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**REISS ENGINEERING, INC.**  
1016 SPRING VILLAS PT  
WINTER SPRINGS, FL 32708  
(407) 679-5358



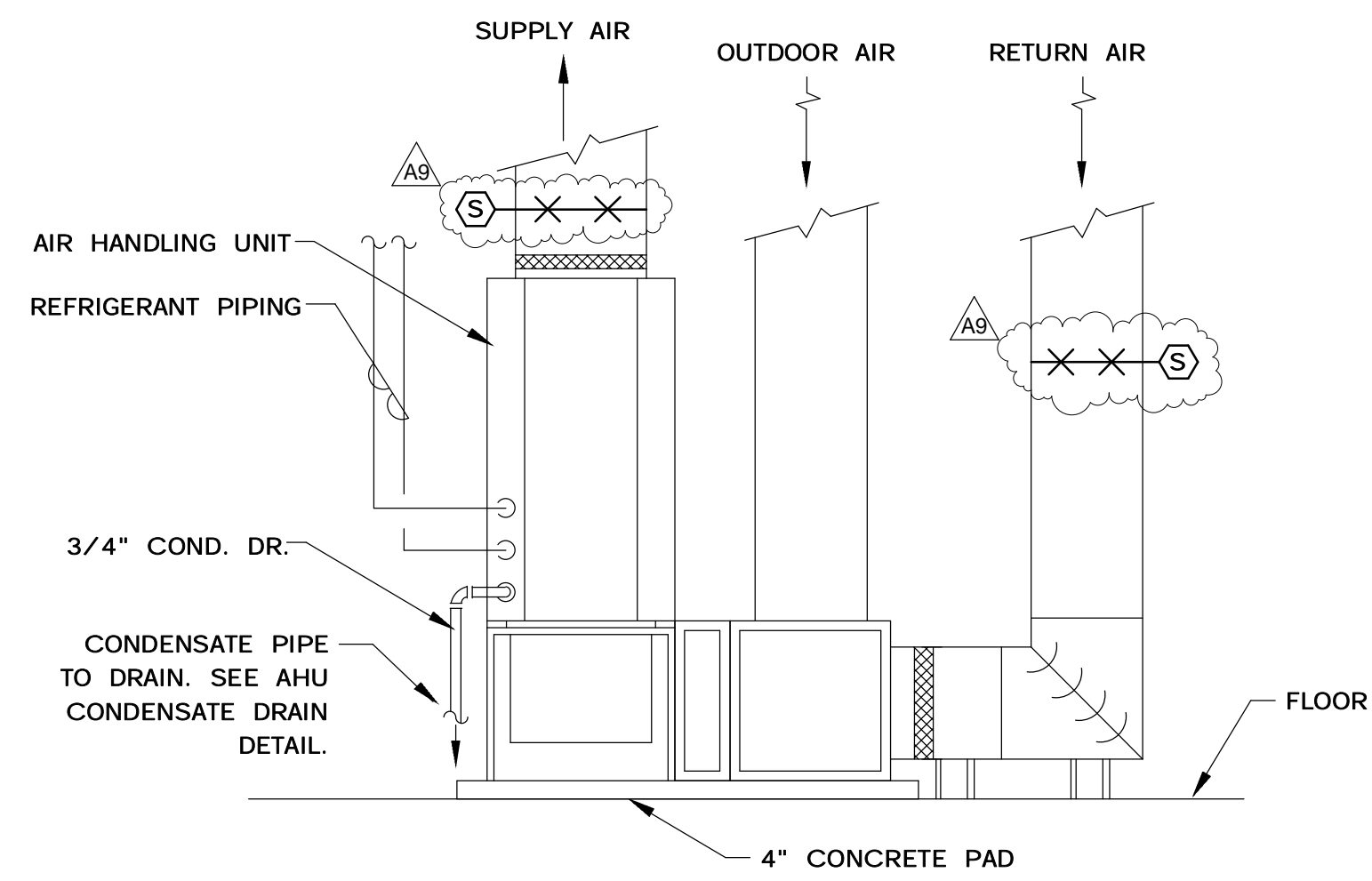
REV	DATE	DESCRIPTION	BY
D	7/15/14	ADDENDUM 9 (A9)	JTE
C	2/21/14	100% DRAWINGS	JTE
B	6/2013	90% DRAWINGS	JTE
A	2/2013	60% DRAWINGS	JTE

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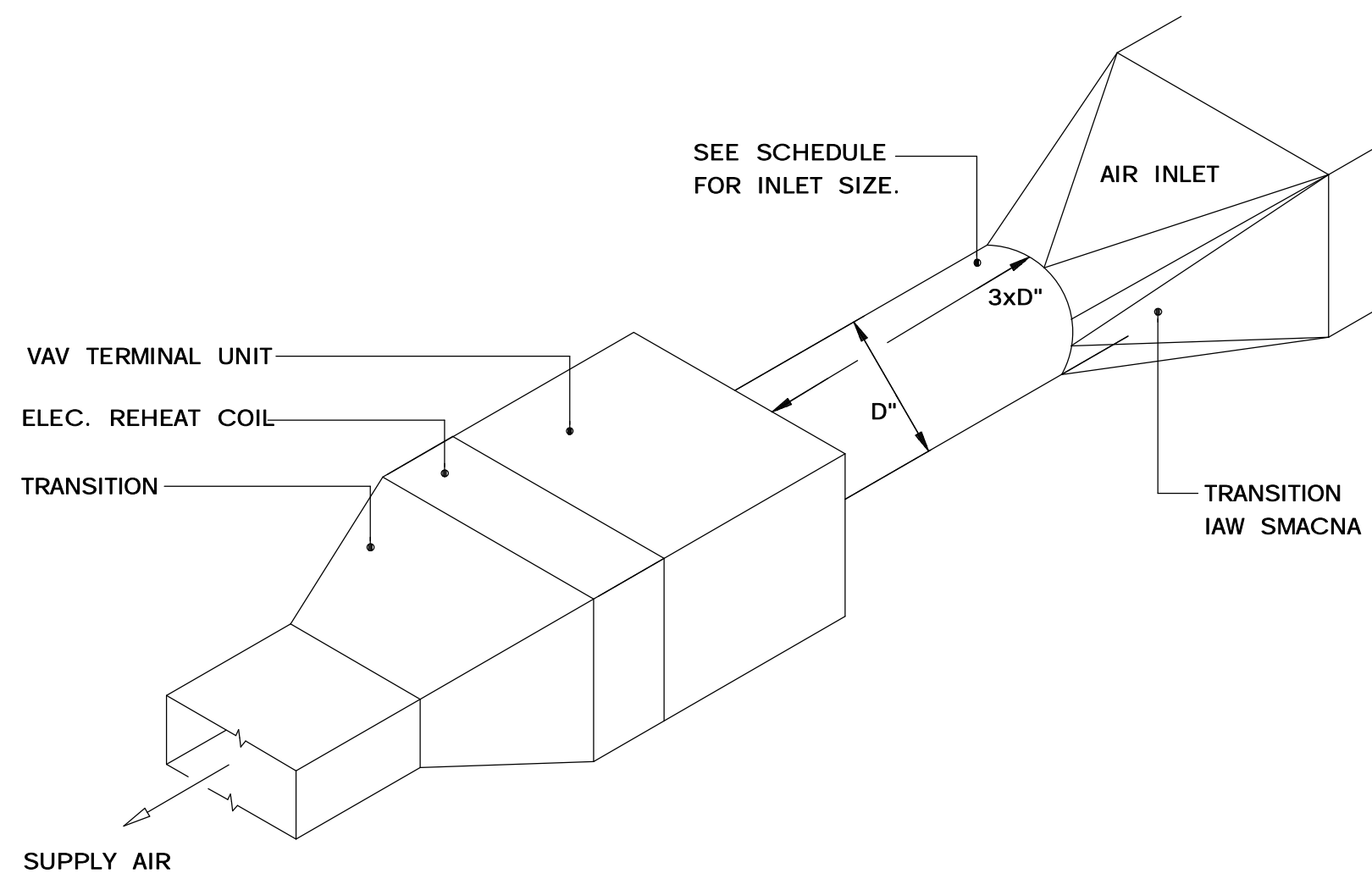
Designed SBR  
Drawn SBR/BJZ  
Checked DSB  
Reviewed DSB  
Approved DSB  
Date 2/21/14

ORANGE COUNTY  
EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND  
REPUMP FACILITY  
HVAC  
**OPERATIONS BUILDING HVAC PLAN**

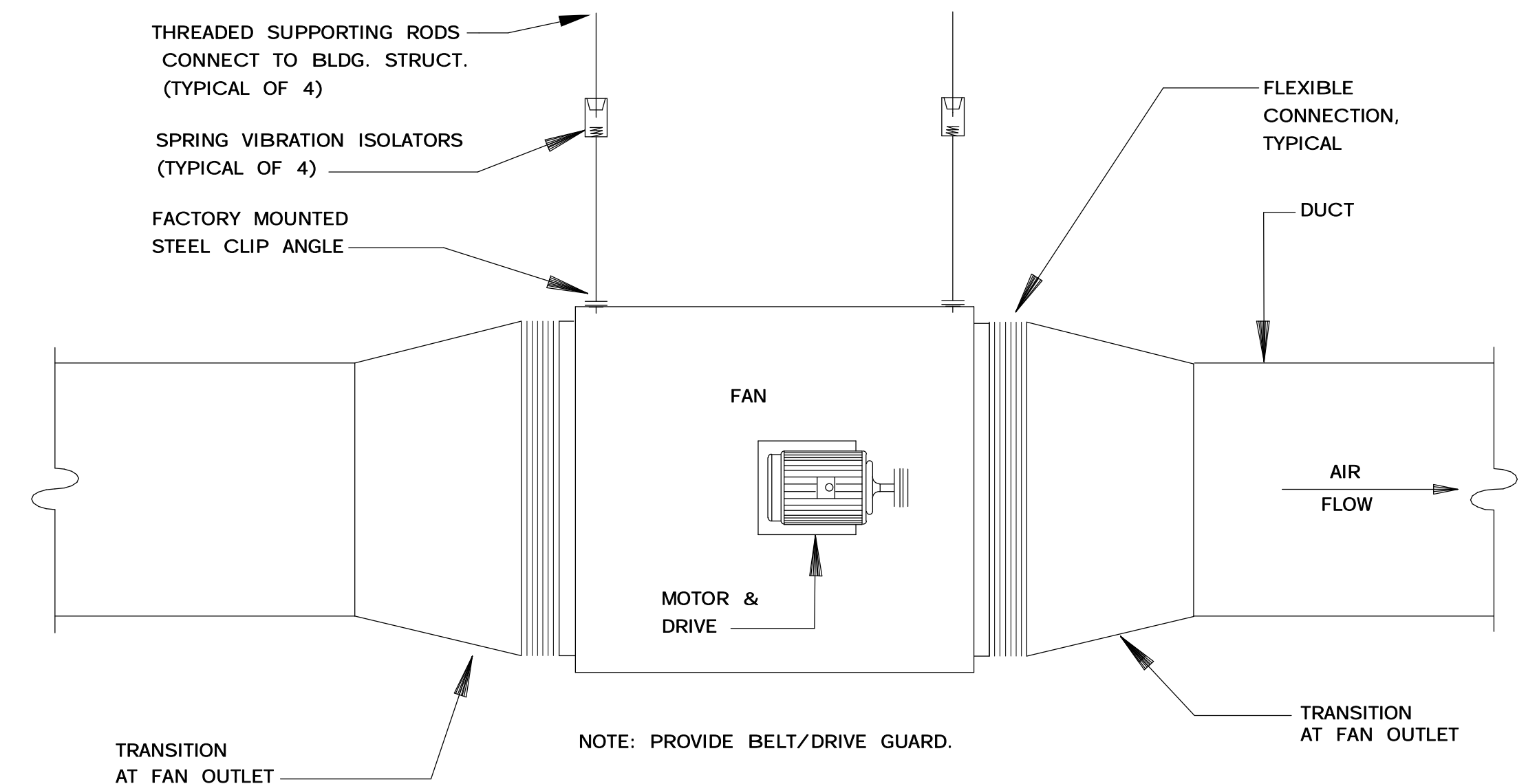
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**110005**  
SCALE:  
1/8" = 1'-0"  
DRAWING NO.  
**H03**  
REVISION:  
**D**  
SHEET NO.:  
**060 OF 108**



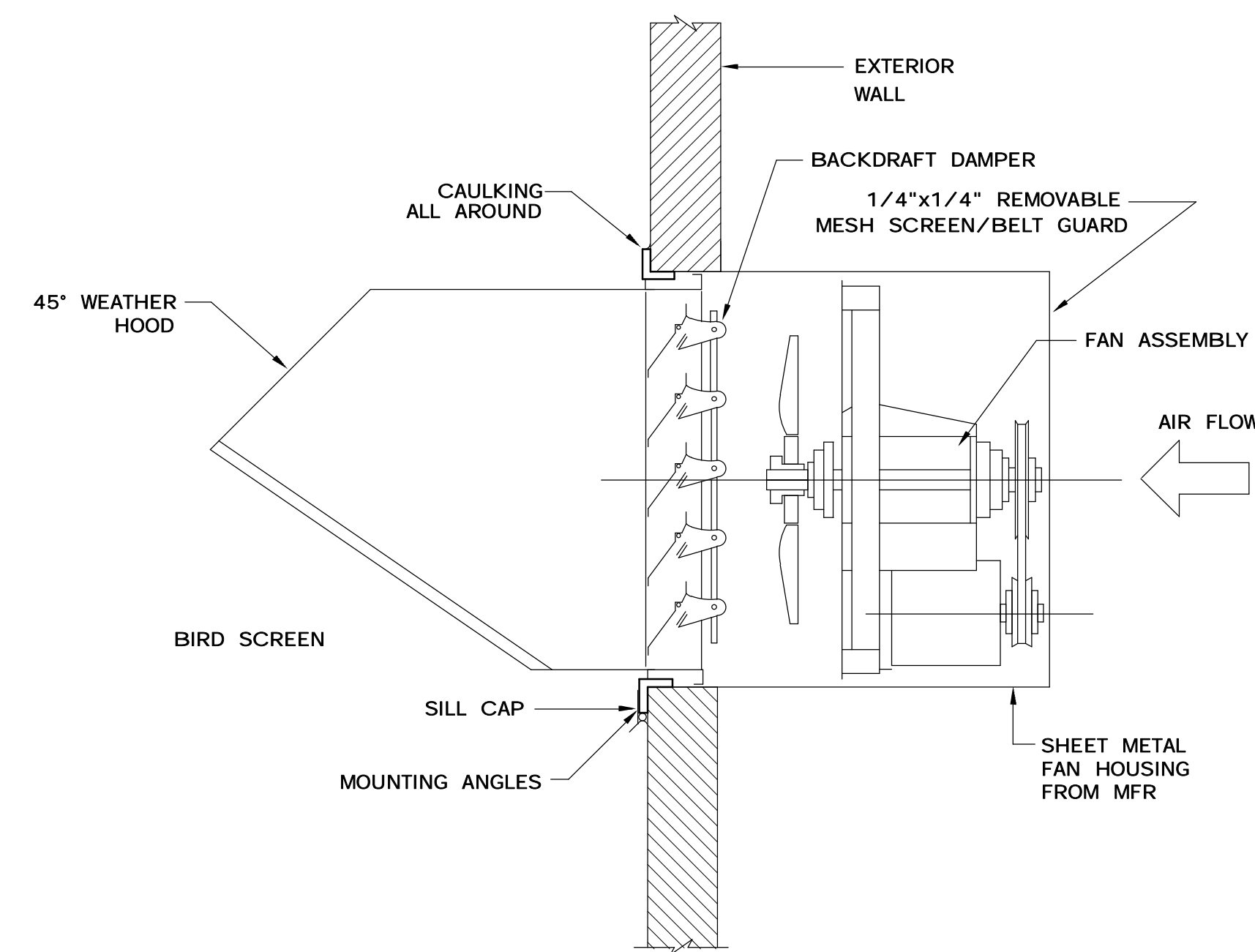
1 AHU DETAIL  
N.T.S.



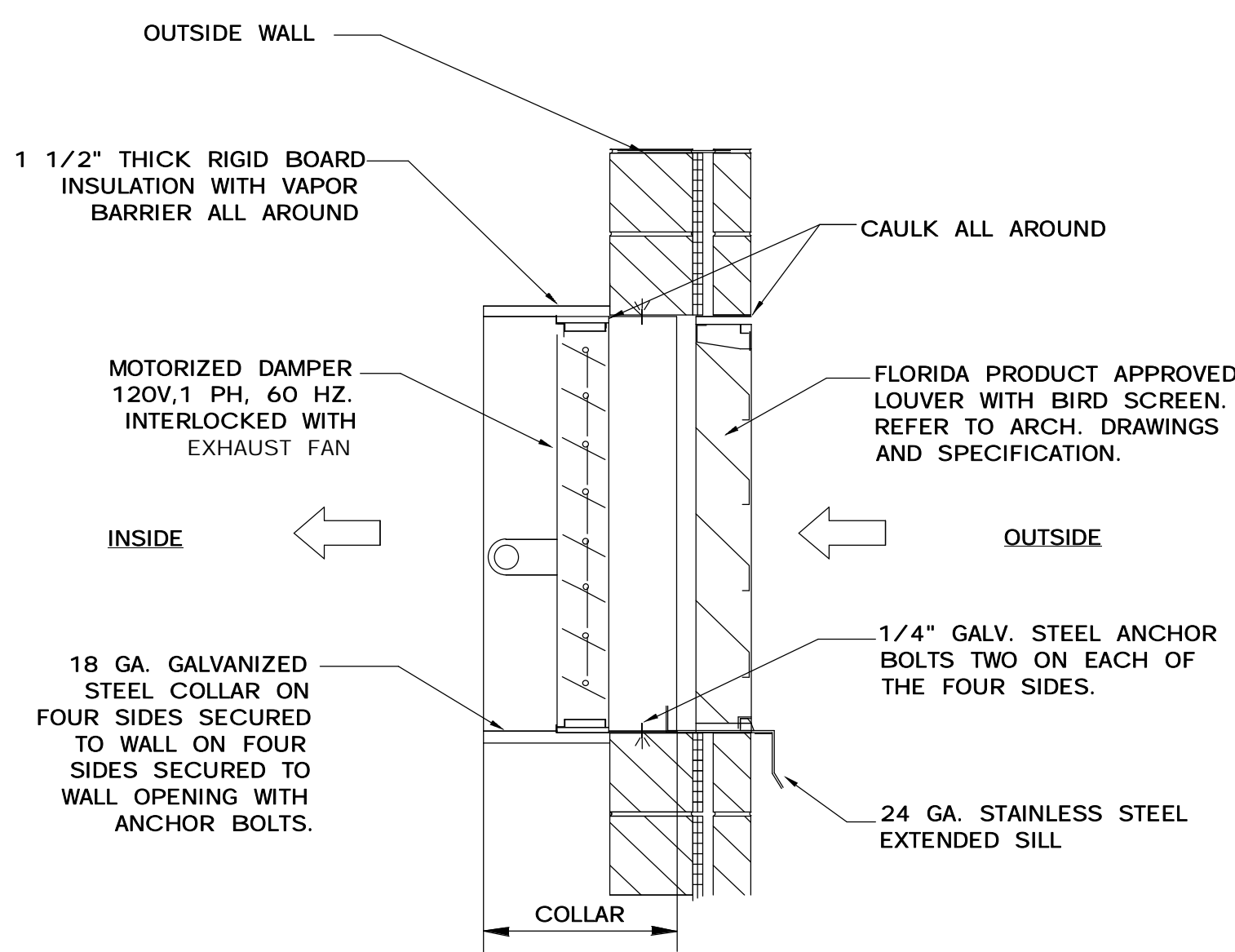
2 VAV TERMINAL UNIT DETAIL  
N.T.S.



3 IN-LINE FAN DETAIL  
N.T.S.

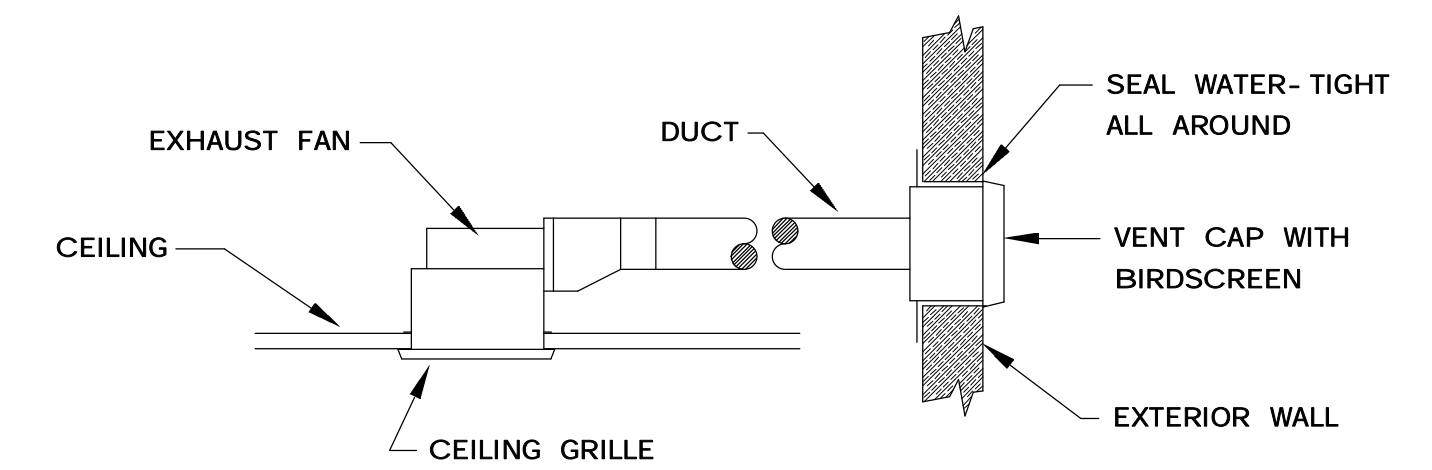


4 WALL EXHAUST FAN WITH DAMPER  
N.T.S.

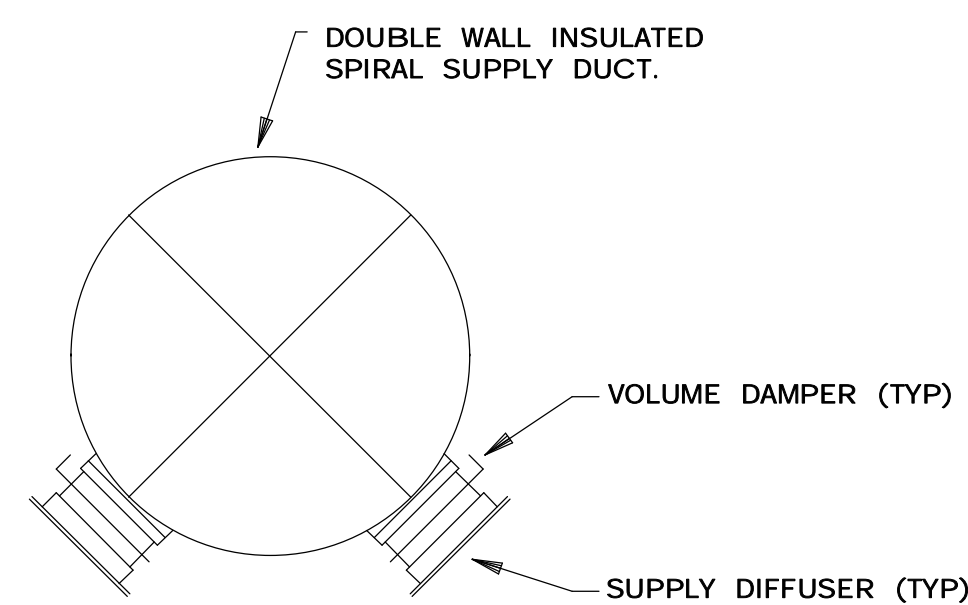


5 LOUVER/DAMPER DETAIL  
N.T.S.

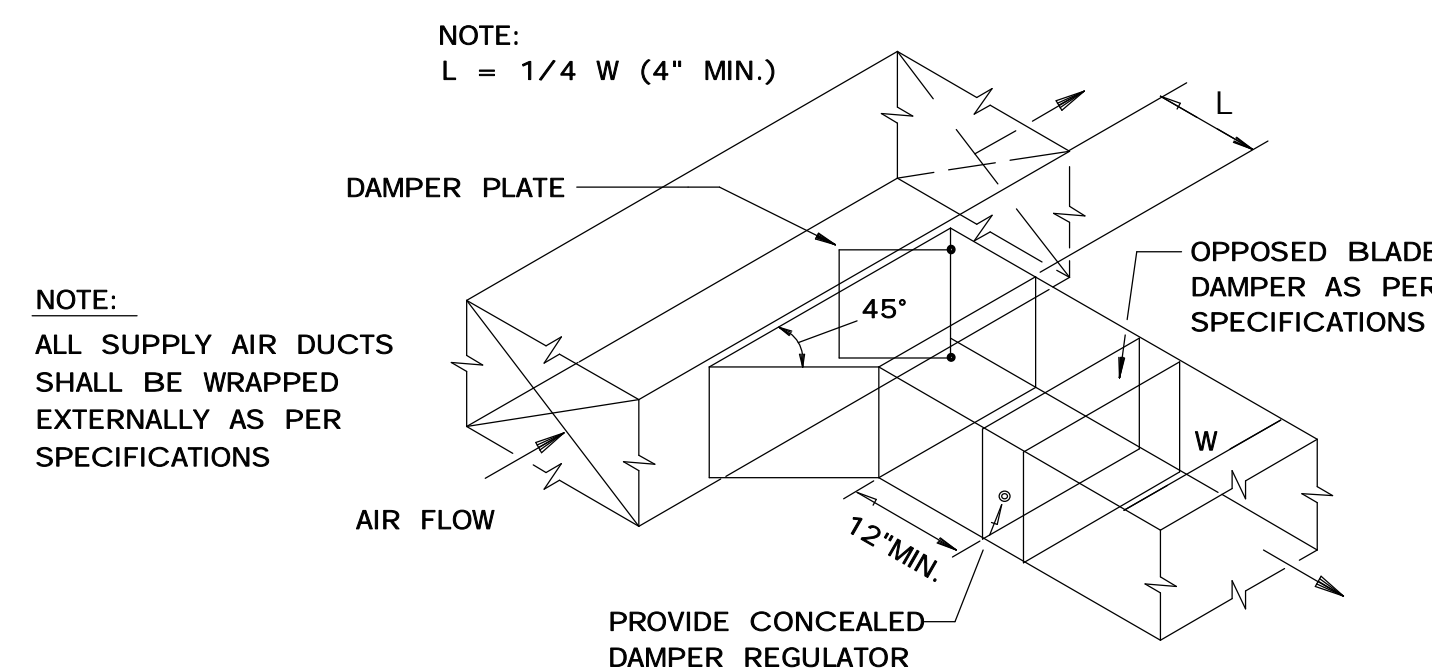
- NOTES:
- FOR LOCATION AND SIZE OF THE WALL OPENINGS, SEE PLANS.
  - LOUVER/DAMPER ASSEMBLIES TO BE ASSEMBLED AT LOUVER MANUFACTURER FACTORY.
  - EXTENDED SILL TO BE PROVIDED BY LOUVER MANUFACTURER.
  - MOTOR ACTUATORS TO BE SIZED AND INSTALLED BY LOUVER MANUFACTURER.
  - INSTALLATION OF LOUVER TO BE IN ACCORDANCE WITH LOUVER MANUFACTURER'S RECOMMENDATIONS.



6 CEILING EXHAUST FAN DETAIL  
N.T.S.

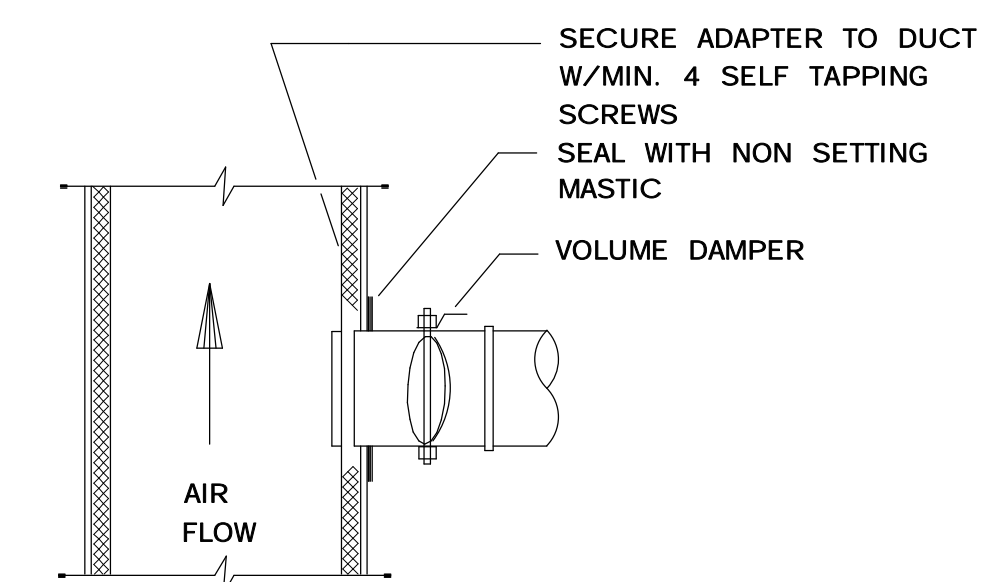


7 DUCT MOUNTED SUPPLY DIFFUSERS AT 45° ANGLE DETAIL  
N.T.S.



NOTE:  
ALL SUPPLY AIR DUCTS SHALL BE WRAPPED EXTERNALLY AS PER SPECIFICATIONS

8 BRANCH DUCT TAKE-OFF AND DAMPER DETAIL  
N.T.S.



9 ROUND DUCT TAKE-OFF DETAIL  
N.T.S.



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ORANGE COUNTY  
EAST SERVICE AREA POTABLE WATER AND RECLAIMED WATER STORAGE AND  
REPUMP FACILITY  
HVAC  
HVAC DETAILS

PROJECT NO.:	110005
SCALE:	NOTED
REVISION:	D
DRAWING NO.:	H04
SHEET NO.:	061 OF 108



RECTANGULAR DUCT HANGERS MINIMUM SIZE								
MAXIMUM HALF OF DUCT PERIMETER	PAIR AT 10 FT SPACING		PAIR AT 8 FT SPACING		PAIR AT 5 FT SPACING		PAIR AT 4 FT SPACING	
	STRAP	WIRE/ROD	STRAP	WIRE/ROD	STRAP	WIRE/ROD	STRAP	WIRE/ROD
P/2 = 30"	1" X 22 GA	10 GA (.135")	1" X 22 GA	10 GA (.135")	1" X 22 GA	12 GA (.106")	1" X 22 GA	12 GA (.106")
P/2 = 72"	1" X 18 GA	3/8"	1" X 20 GA	1/4"	1" X 22 GA	1/4"	1" X 22 GA	1/4"

WHEN STRAPS ARE LAP JOINED USE THESE MINIMUM FASTENERS:	SINGLE HANGER MAXIMUM ALLOWABLE LOAD	
	STRAP	WIRE OR ROD (DIA.)
1" X 18, 20, 22 GA - TWO #10 OR ONE 1/4" BOLT 1" X 16 GA - TWO 1/4" DIA. 1-1/2" X 16 GA - TWO 3/8" DIA. PLACE FASTENERS IN SERIES, NOT SIDE BY SIDE.	1" X 22 GA - 260 LBS. 1" X 20 GA - 320 LBS. 1" X 18 GA - 420 LBS. 1" X 16 GA - 700 LBS. 1-1/2" X 16 GA - 1100 LBS.	0.106" - 80 LBS. 0.135" - 120 LBS. 0.162" - 160 LBS. 1/4" - 270 LBS. 3/8" - 680 LBS. 1/2" - 1250 LBS. 5/8" - 2000 LBS. 3/4" - 3000 LBS.

- NOTES:**
- DIMENSIONS OTHER THAN GAGE ARE IN INCHES.
  - TABLES ALLOW FOR DUCT WEIGHT, 1 LB/SF INSULATION WEIGHT AND NORMAL REINFORCEMENT AND TRAPEZE WEIGHT, BUT NO EXTERNAL LOADS.
  - FOR CUSTOM DESIGN OF HANGERS, DESIGNERS MAY CONSULT SMACNA'S RECTANGULAR INDUSTRIAL DUCT CONSTRUCTION STANDARDS, THE AISI COLD FORMED STEEL DESIGN MANUAL AND THE AISC STEEL CONSTRUCTION MANUAL.
  - STRAPS ARE GALVANIZED STEEL; OTHER MATERIALS ARE UNCOATED STEEL.
  - ALLOWABLE LOADS FOR P/W ASSUME THAT DUCTS ARE 16 GA MAXIMUM, EXCEPT THAT WHEN MAXIMUM DUCT DIMENSION (W) IS OVER 60 IN, THEN P/W MAXIMUM IS 1.25W.
  - FOR UPPER ATTACHMENTS, SEE FIGURES 5-2 AND 5-3.
  - FOR LOWER ATTACHMENTS, SEE FIGURE 5-5.

**GALVANIZED SHEET METAL DUCTWORK NOTES:**

**SHEET METAL DUCTWORK**  
GALVANIZED STEEL DUCTWORK SHALL BE CARBON STEEL OF LOCK-FORMING QUALITY, HOT DIP GALVANIZED, WITH REGULAR SPANGLE-TYPE ZINC COATING, CONFORMING TO ASTM A-527/A527M-G90.

SHEET METAL GAGES AND REINFORCEMENT SHALL CONFORM TO THE LATEST EDITION SMACNA HVAC DUCT CONSTRUCTION STANDARDS, WITH THE EXCEPTION THAT 24 GAGE WILL BE THE THINNEST GAGE ALLOWED FOR RECTANGULAR DUCTWORK. SEE SPECIFICATION 15881 FOR ADDITIONAL REQUIREMENTS.

ROUND SHEET METAL DUCTS SHALL USE THE FOLLOWING GAGES:

DUCT DIA.	MAX. 2" W.G. POSITIVE STATIC PRESS.
3- 8	28
9- 14	26
15- 26	24
27- 36	22

**DUCTWORK SEALANT**  
DUCTWORK SHALL BE SEALED TO SMACNA SEAL CLASS C.

APPROVED CLOSURE SYSTEMS -- THE FOLLOWING CLOSURE SYSTEMS ARE APPROVED FOR RIGID METAL DUCT DESIGNED TO BE OPERATED AT PRESSURES 1 INCH WATER GAUGE OR GREATER AND FLEXIBLE DUCT WHEN THEY CONFORM TO THE APPROVED CLOSURE AND MECHANICAL ATTACHMENT REQUIREMENTS OF FMC SECTION 603.1:

- CONTINUOUS WELDS.
- MASTIC, MASTIC-PLUS- EMBEDDED FABRIC OR MASTIC RIBBONS.
- GASKETS.

SEALANT SHALL BE NON-FLAMMABLE WHEN WET, FIRE RESISTIVE WHEN DRY, AND SUITABLE FOR USE IN HIGH VELOCITY DUCTWORK. SHALL MEET NFPA 90A AND 90B AND BE UL CLASSIFIED. SEALANT SHALL HAVE A MAXIMUM 25 FLAME SPREAD AND 50 SMOKE DEVELOPED (DRY STATE) COMPOUND SPECIFICALLY FOR SEALING DUCTWORK.

TAPE FOR USE WITH DUCT SEALANT SHALL BE SPECIFICALLY DESIGNATED BY THE MANUFACTURER FOR DUCTWORK SEALING.

**DUCTWORK INSULATION NOTES:**

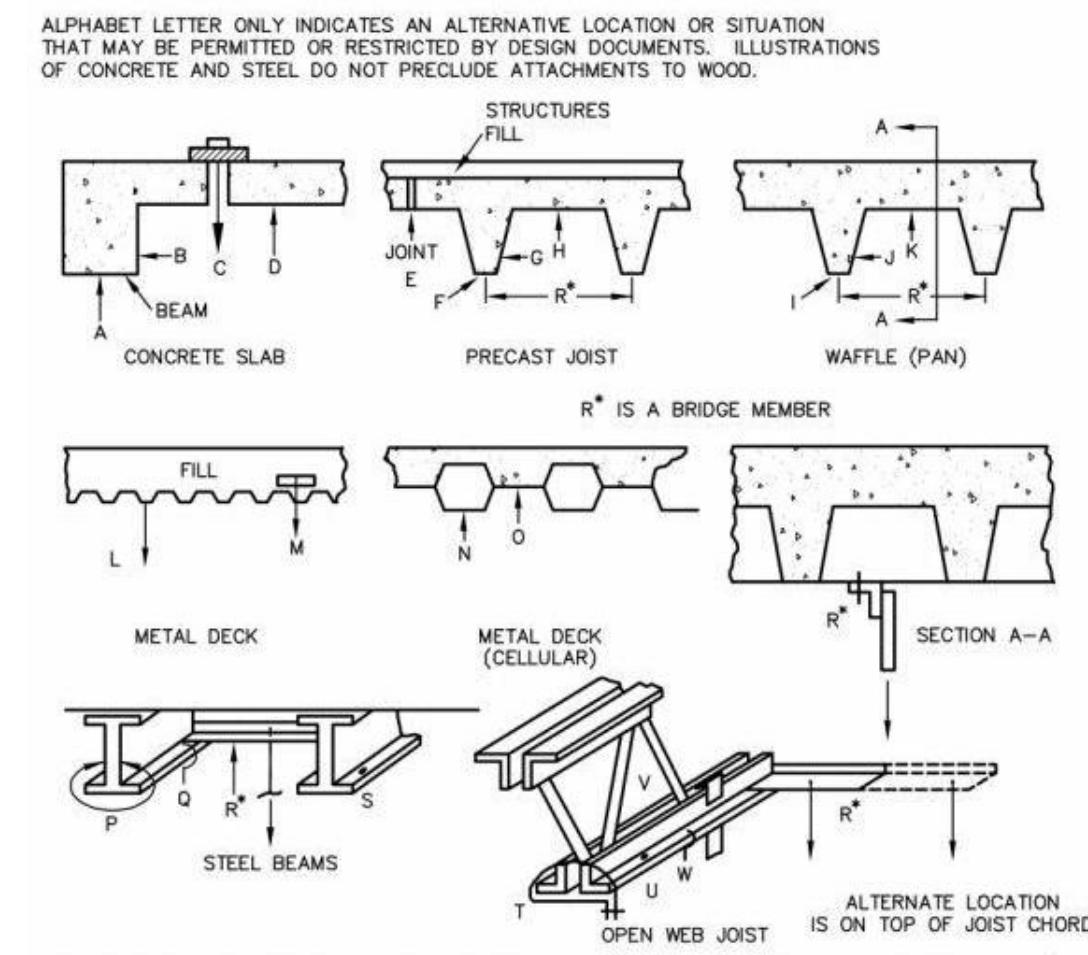
INSULATION SHALL COMPLY WITH FLORIDA ENERGY CODE TABLE 503.2.7 (FBCM 604). SEE SPECIFICATION 15258 FOR ADDITIONAL REQUIREMENTS. ALL DUCTWORK INSULATION SHALL PROVIDE A MINIMUM R VALUE OF 6.0 PER FEC.

**A. INTERIOR, CONCEALED SQUARE OR ROUND DUCTWORK**

USE FIBERGLASS BLANKET MADE OF FLAME - ATTENUATED GLASS FIBERS, BONDED WITH A THERMOSETTING RESIN, REINFORCED WITH FIBERGLASS SCRIM FACING LAMINATED TO UL RATED KRAFT, FSK FACING, .02 PERMS, .00035" FOIL THICKNESS PER ASTM E- 96, PROCEDURE A. 2" THICK, 0.75 PCF, 7.1 R VALUE. EQUAL TO MANVILLE, MICROLITE. FOR SQUARE DUCTS WITH ANY ONE DIMENSION NOT GREATER THAN 24". INSULATION SHALL BE WRAPPED AROUND DUCTS AND SECURED WITH OUTWARD CLINCHING STAPLES AT 4 INCHES O.C.. DUCTS 24 INCHES AND GREATER SHALL HAVE INSULATION ADDITIONALLY SECURED WITH STICK CLIPS ON 18 INCH CENTERS OR WITH 4 INCH WIDE BANDS OF ADHESIVE APPLIED ON 18 INCH CENTERS. INSULATION SHALL BE LAPPED A MINIMUM OF 4" AND ALL SEAMS AND PENETRATIONS SHALL BE SEALED WITH FSK DUCT TAPE.

**B. RECTANGLE, INTERIOR SUPPLY, RETURN, OUTSIDE RELIEF AND EXHAUST AIR DUCTWORK, EXPOSED.**

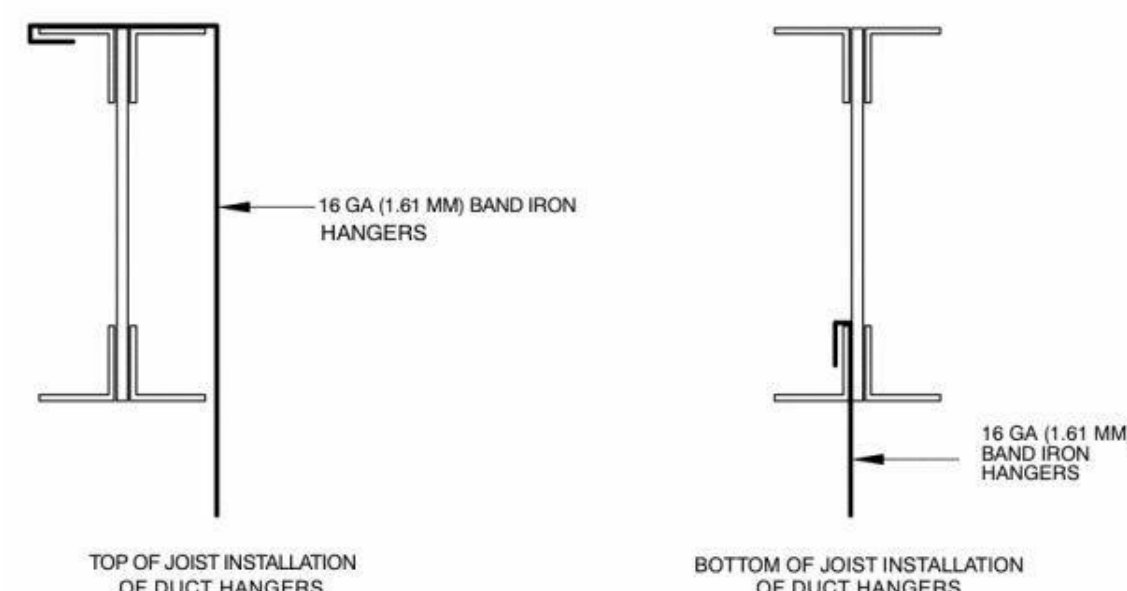
USE FIBERGLASS BOARD INSULATION, 3 LB. DENSITY, .23 K FACTOR MIL SPEC HH- 1- 558B.. INORGANIC GLASS FIBERS BONDED BY A THERMOSETTING RESIN WITH AN FSK JACKET IN COMPLIANCE WITH NFPA 90A AND 90B STANDARDS. EQUAL TO MANVILLE B14, 3 LB DENSITY, R- 8.7, 2" THICK WITH FSK JACKET. INSULATION SHALL BE APPLIED TO DUCTS WITH MECHANICAL FASTENERS SUCH AS STICK CLIPS OR WELD PINS AT 12 INCH CENTERS. INSTALL FIBERGLASS BOARD IN FULL PIECES. JOINTS AND SEAMS SHALL BE COVERED WITH 4" FSK TAPE. WHERE STANDING SEAMS OR ANGLE SUPPORTS EXCEED INSULATION THICKNESS AN ADDITIONAL LAYER OF BOARD WILL BE USED.



- CONVENTIONAL HANGER METHODS AND DEVICES**
- CONCRETE SCREW ANCHORS
  - CONCRETE INSERTS, SINGLE
  - CONCRETE INSERTS, SLOTTED
  - POWDER ACTUATED FASTENERS
  - GAS DRIVEN FASTENERS
  - "C" CLAMPS
  - WELDED STUDS
  - FRICITION CLAMPS
  - STRAP
  - ROD, THREADED, UNTHREADED
  - BRIDGE
  - BEAM CLAMP, HALF FLANGE
  - BEAM CLAMP, FULL FLANGE
  - EYE BOLT (OR ROD)
  - TOGGLE BOLTS
- DRILLED HOLE AND BOLT STANDION**
- SELF TAPPING SCREWS PLUS STRAPS
  - DROP IN EXPANSION ANCHORS
  - KNEE BRACKET FROM WALL
  - LAG SCREW EXPANSION ANCHOR
  - NAILLED PIN FASTENERS
  - RIVETS
  - SWAY BRACING
  - "TISH" PLATE OR WASHER AND ROD
  - HOOK OR LOOP
  - VIBRATION ISOLATOR
  - WIRE
- NOTE:** CABLE HANGING SYSTEMS WITH ADJUSTABLE MECHANICAL DEVICE SELECT HANGERS FOR TYPE OF STRUCTURE AND SUSPENSION. DO NOT EXCEED ALLOWABLE OR SPECIFIED LOAD LIMITS.
- ALLOWABLE LOAD ON UPPER ATTACHMENT IS 1/4 OF FAILURE LOAD

(REFERENCE SMACNA 2005, CHAPTER 5)

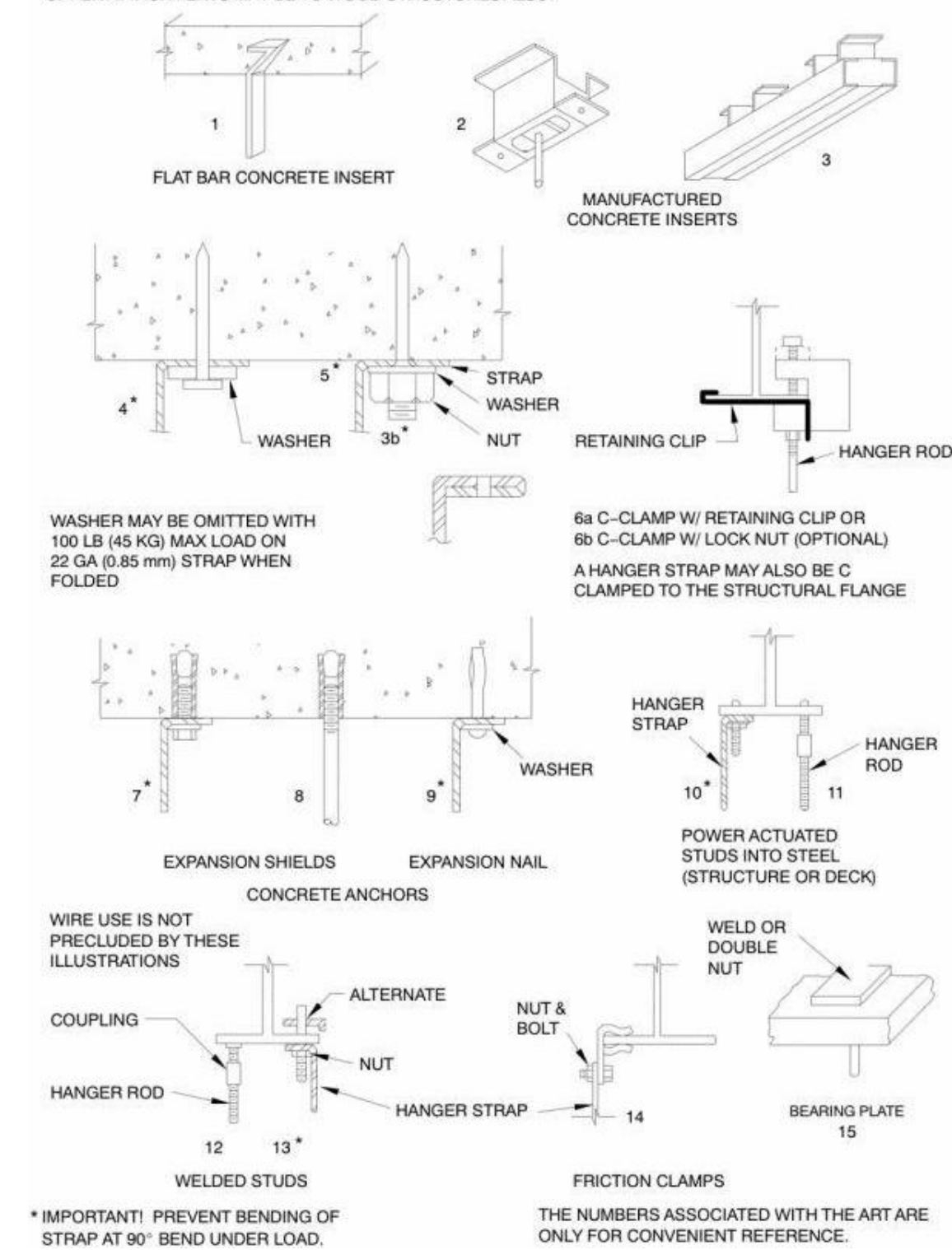
**5-1 HANGER ATTACHMENTS TO STRUCTURES**  
N.T.S.



(REFERENCE SMACNA 2005, CHAPTER 5)

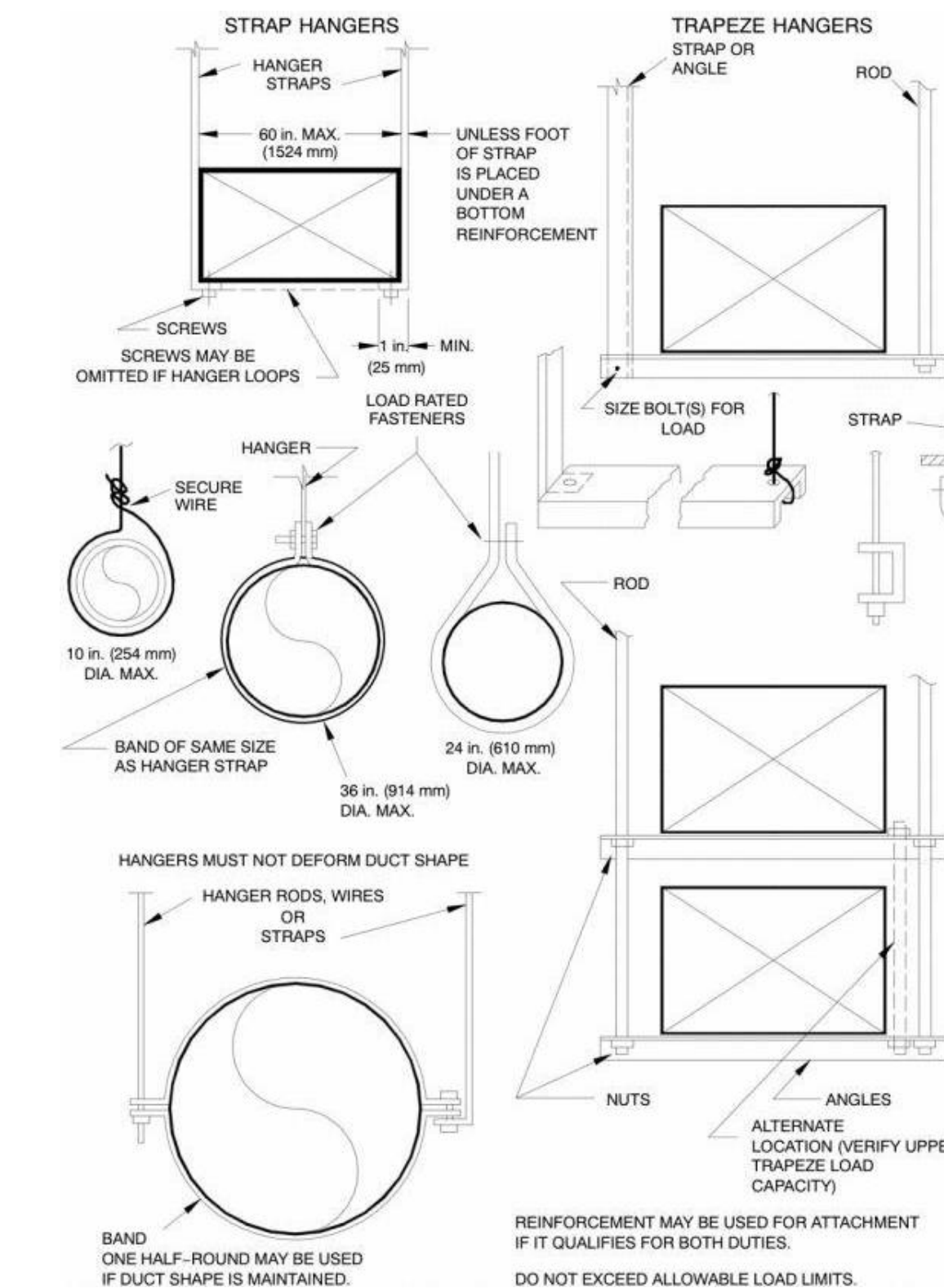
**5-3 ALTERNATIVE JOIST ATTACHMENTS**  
N.T.S.

UNLESS OTHERWISE APPROVED ALLOWABLE LOAD ON UPPER ATTACHMENT IS 1/4 OF FAILURE LOAD. UPPER ATTACHMENTS MAY BE TO WOOD STRUCTURES ALSO.



(REFERENCE SMACNA 2005, CHAPTER 5)

**5-2 UPPER ATTACHMENT DEVICES - TYPICAL**  
N.T.S.



(REFERENCE SMACNA 2005, CHAPTER 5)

**5-5 LOWER HANGER ATTACHMENTS**  
N.T.S.

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REV	DATE	DESCRIPTION	BY
D	7/15/14	ADDENDUM 9 (A9)	JTE

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