



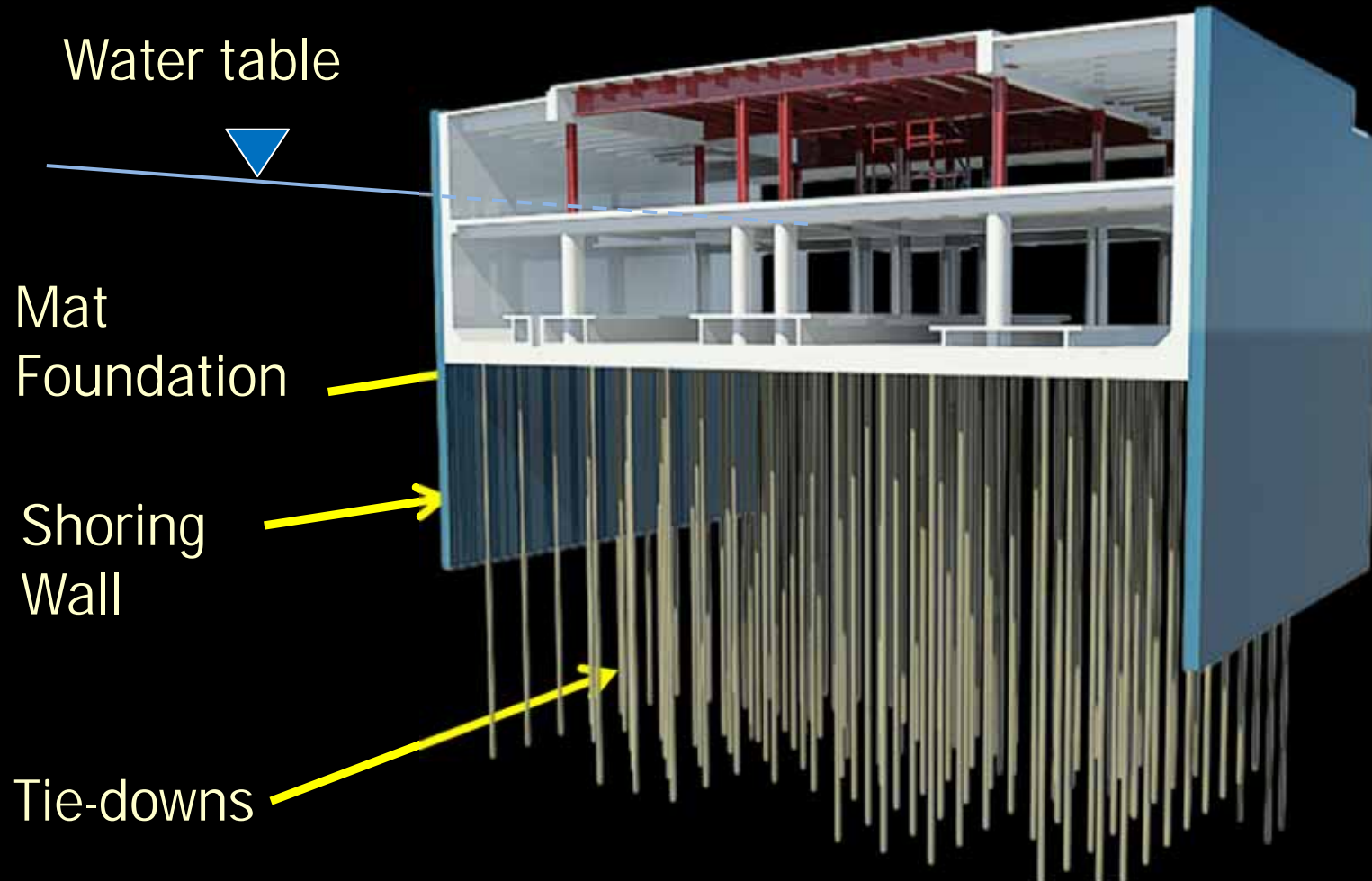
**Transbay Transit Center**  
**CAC Presentation**  
**Early Below Grade Package**  
14 February 2012

## EARLY BELOW GRADE PROCESS

- Currently executing the Buttress and Shoring Package
- Objectives
  - To include the substantial majority of below grade structural concrete work
  - Provide waterproofing for the mat slab and foundation walls
  - Incorporate cast-in elements for pipes, electrical and structural items
  - Incorporate a major seismic joint
  - Accommodate bracing and construction equipment platform (trestle)
  - Accommodate dewatering
  - Accommodate utility penetrations



# Shoring, Foundation & Train Box



### Slide 3

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**B12**

animate this slide to sequentially show:

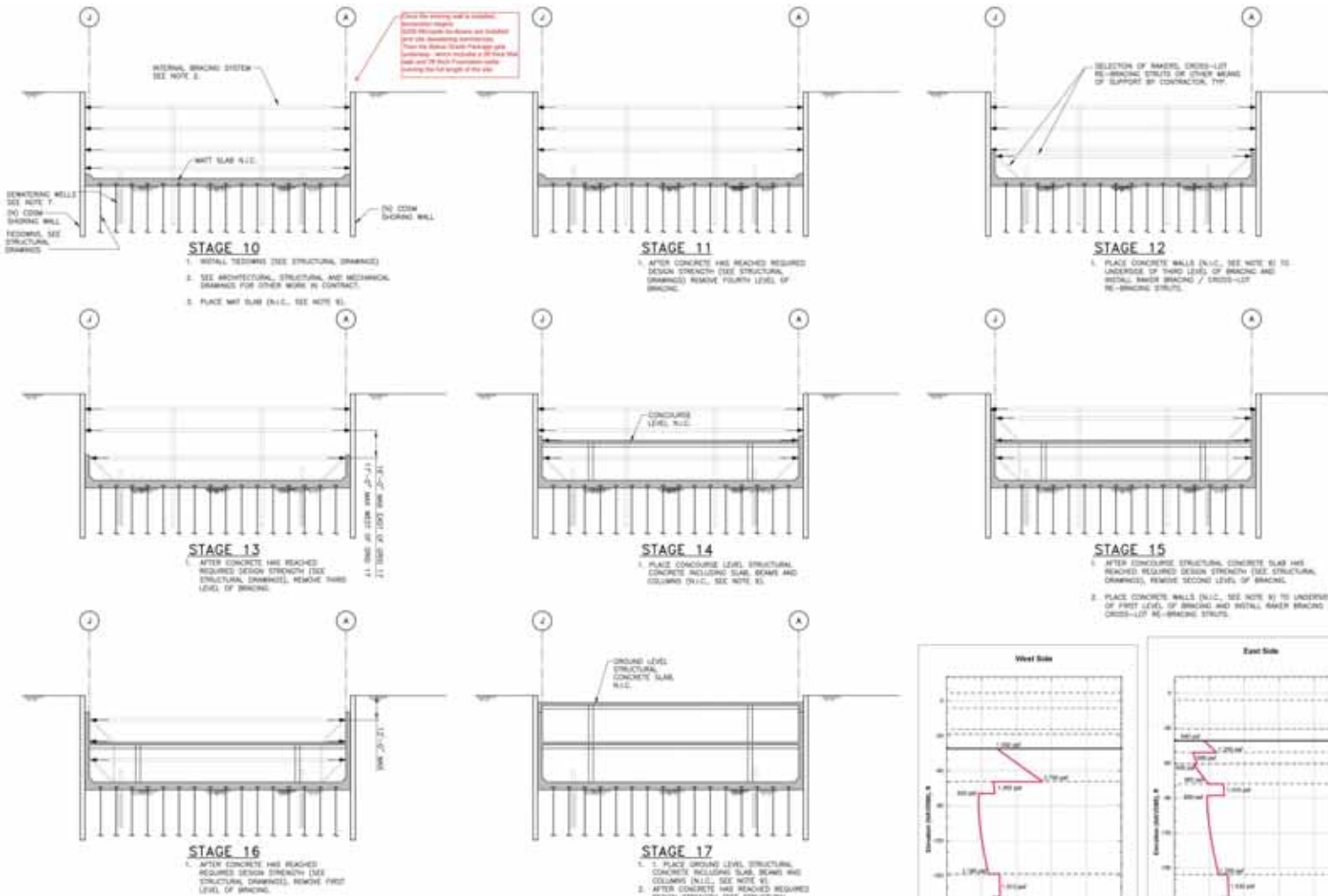
1. shoring walls
2. Mat slab (& shoring)
3. Lower concourse and columns

THEN ON A NEW SLIDE:

4. Steel frame & concrete ground floor slab
5. Steel superstructure

SHOW SHORING WALLS IN SAY BLUE, CONCRETE IN GREY; STEELWORK IN RED PRIMER

BGibbons, 9/15/2011

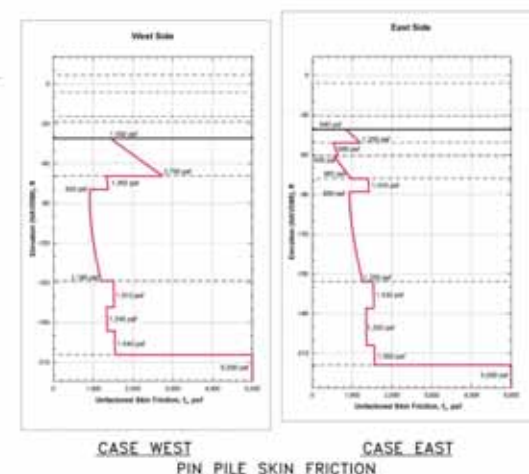


- Once the shoring wall is installed, excavation begins.
- 2250 Micropile tie-downs are installed and site dewatering commences.
- Then the Below Grade Package gets underway : which includes a 5ft thick Mat slab and 3ft thick Foundation walls running the full length of the site

**SHEET NOTES**

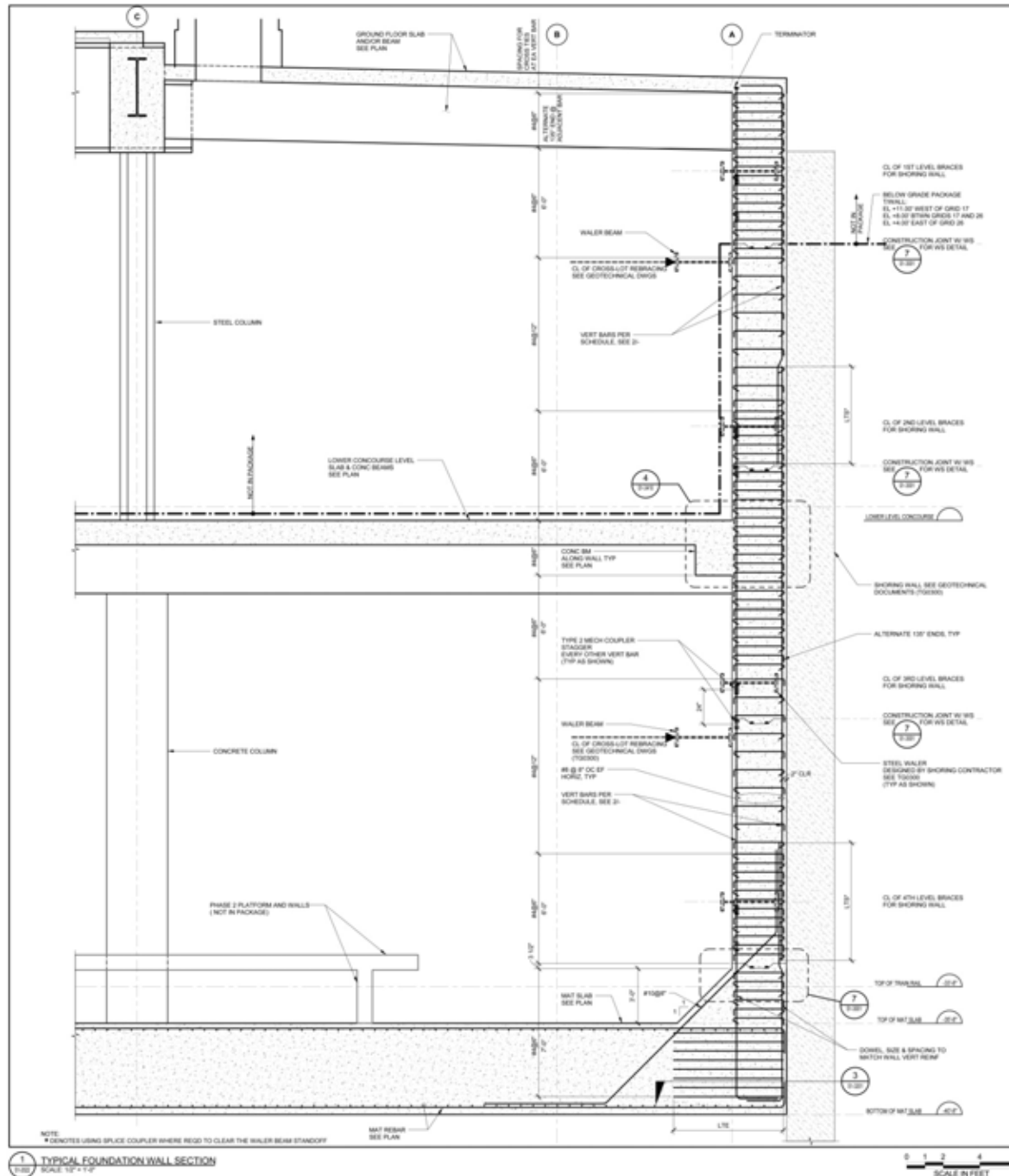
1. THE PURPOSE OF THIS DRAWING IS TO DOCUMENT THE INTERNAL BRACING, ELEVATION, EXCAVATION SEQUENCE, AND BUILD-OUT / WERKING SEQUENCE OF THE TRAIN BOX USED IN THE ANALYSIS OF THE SHORING WALL. THESE DRAWINGS DO NOT SHOW EXISTING CONDITIONS NOR ALL ELEMENTS OF THE PERMANENT STRUCTURE AS THESE VARY.
2. THE INTERNAL BRACING SYSTEM (INCLUDING BUT NOT LIMITED TO STRUTS, WALKERS, CORNER BRACING, SECONDARY BRACING, VERTICAL SUPPORT OF THE STRUTS, WALKER AND / OR STRUT ATTACHMENT DETAILS TO THE BOLDED PILES) SHALL BE DESIGNED, FURNISHED AND INSTALLED BY THE CONTRACTOR. REFER TO DT-1110 FOR SHORING WALL SUPPORT REACTIONS ASSOCIATED WITH THESE DRAWINGS FOR THE DESIGN OF THE INTERNAL BRACING SYSTEM.
3. SEE ARCHITECTURAL, MECHANICAL, STRUCTURAL AND DEMOLITION DRAWINGS FOR OTHER WORK IN THIS CONTRACT THAT MAY IMPACT THE CONSTRUCTION SEQUENCE.
4. ANY ADJUSTMENTS TO THE INTERNAL BRACING ELEVATIONS AND / OR EXCAVATION PARAMETERS SHOWN WILL REQUIRE THE CONTRACTOR TO RE-EVALUATE THE SHORING WALL / REDESIGN THE SHORING WALL AND SUBMIT CALCULATIONS TO THE EPA'S REPRESENTATIVE FOR APPROVAL. IN NO CASE SHALL THE BOLDED

5. FILE SIZE BE LESS THAN, NOR THE SPACING GREATER THAN, THAT SHOWN ON THESE DRAWINGS.
6. IF THE SOLDIER PILES ARE USED TO RESIST LOADS OTHER THAN THOSE SHOWN IN THE GEOTECHNICAL REFERENCE DESIGN REPORT, THE CONTRACTOR SHALL ANALYZE THE PILES AND SUBMIT CALCULATIONS TO THE EPA'S REPRESENTATIVE FOR APPROVAL.
7. STRUTS SHALL BE PRELOADED TO THE VALUES SHOWN ON DT-1110.
8. THE DEWATERING SYSTEM SHALL BE DESIGNED, FURNISHED, INSTALLED, MAINTAINED AND OPERATED BY THE CONTRACTOR.
9. SEE STRUCTURAL DRAWINGS FOR REQUIRED DESIGN STRENGTH OF PERMANENT STRUCTURAL ELEMENTS (N.I.C.).
10. REMOVAL NOTES N.I.C. ARE NOT IN THIS PACKAGE BUT SHALL BE INCLUDED IN THE CONTRACTOR'S SUBMITTAL OF WORK INSTALLED IN THIS PACKAGE.
11. SEE DT-1111 FOR INTERNAL BRACING ELEVATIONS.

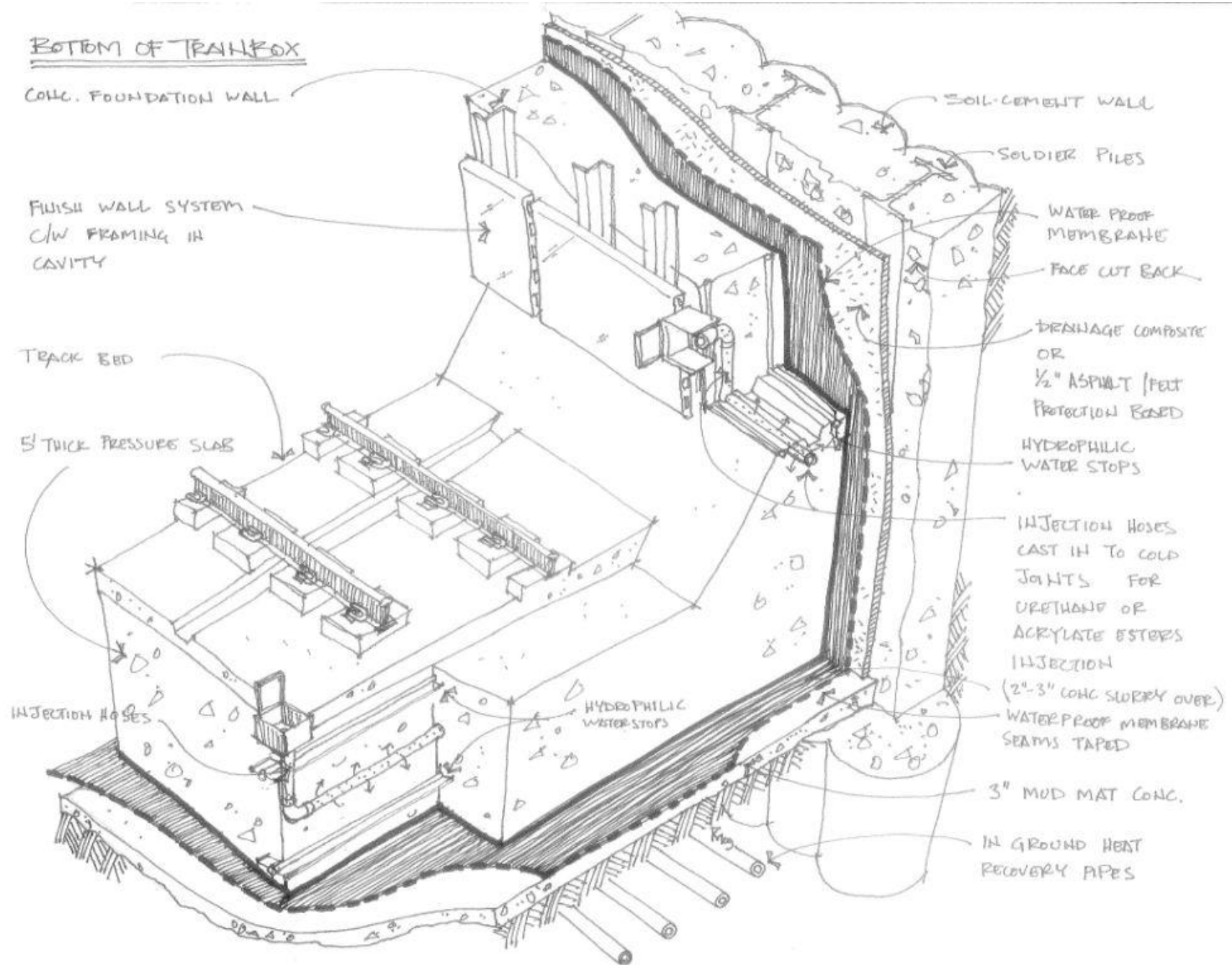


REFERENCE SHORING DESIGN SEQUENCE DIAGRAMS

Currently executing the Buttress and Shoring Package



To Include The Substantial Majority Of Below Grade Structural Concrete Work



Provide Waterproofing For The Mat Slab And Foundation Walls

JTA W 53/34

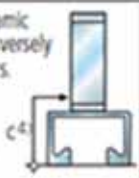
Load range 22.0 kN

30.8 kN

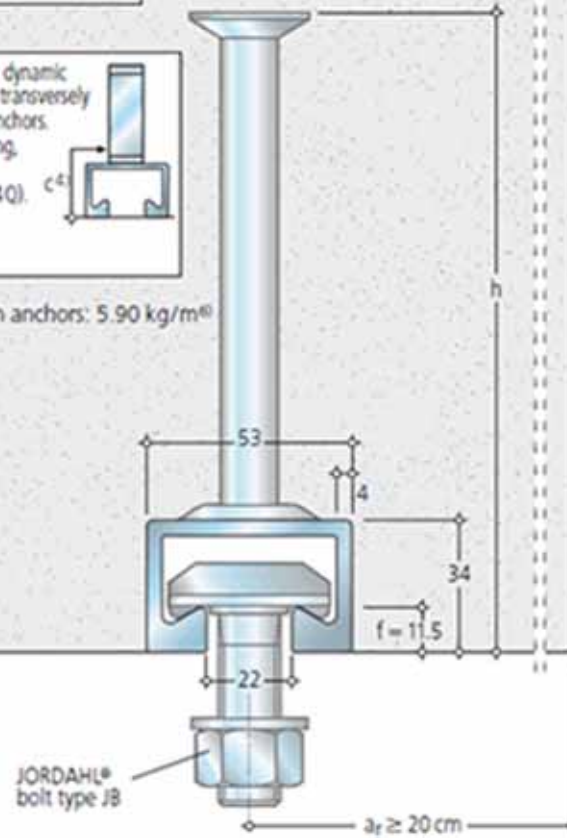


7.0 kN

Permitted for dynamic loading with transversely welded-on anchors. When ordering, specify (JTA W 53/34 Q).

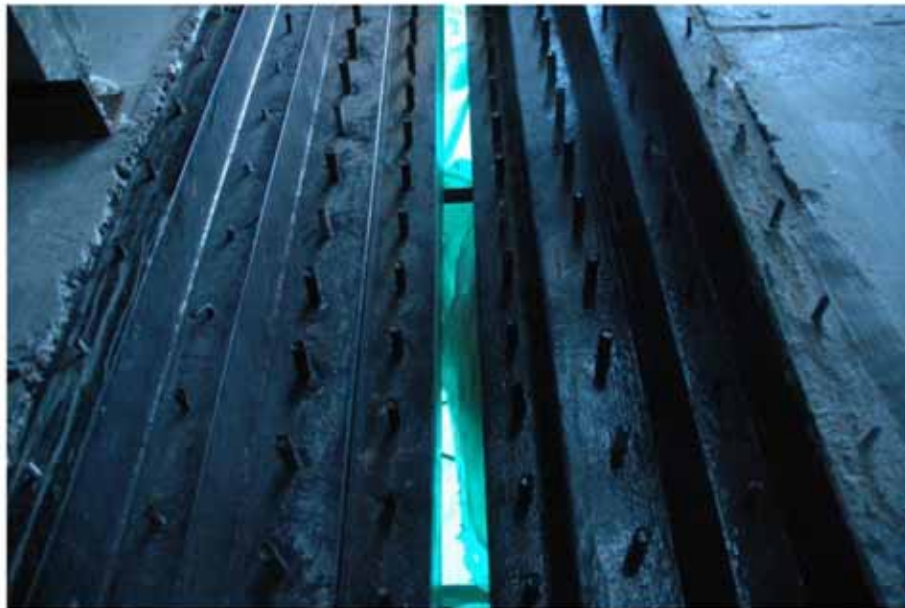
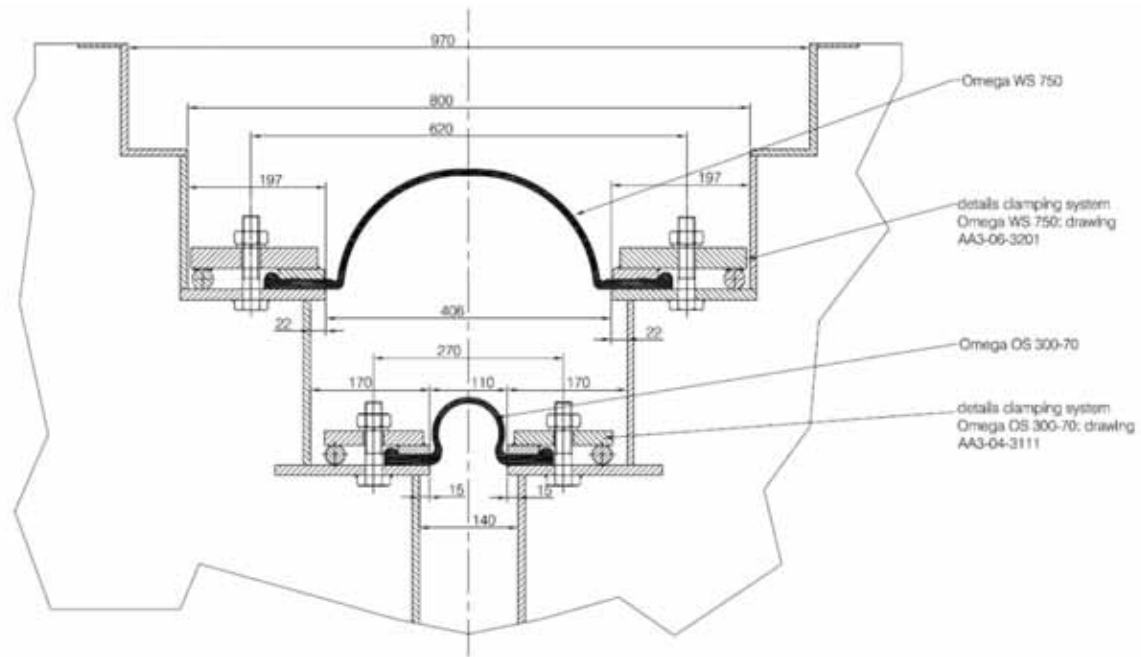


Weight with anchors: 5.90 kg/m<sup>60</sup>

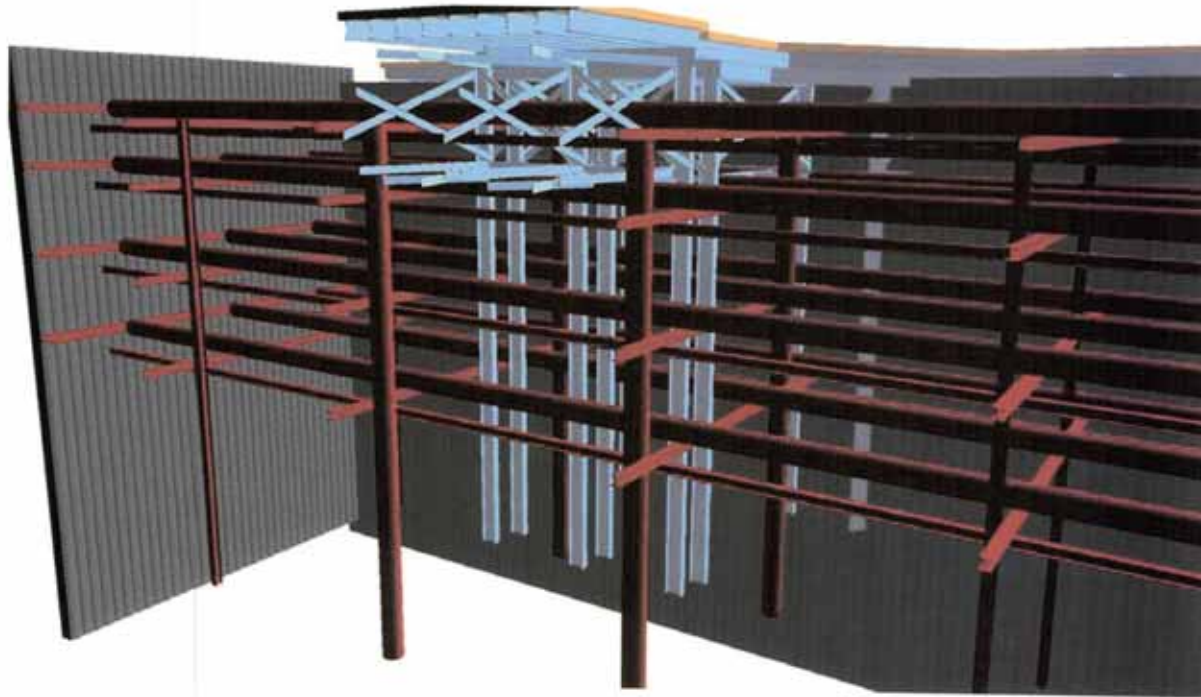
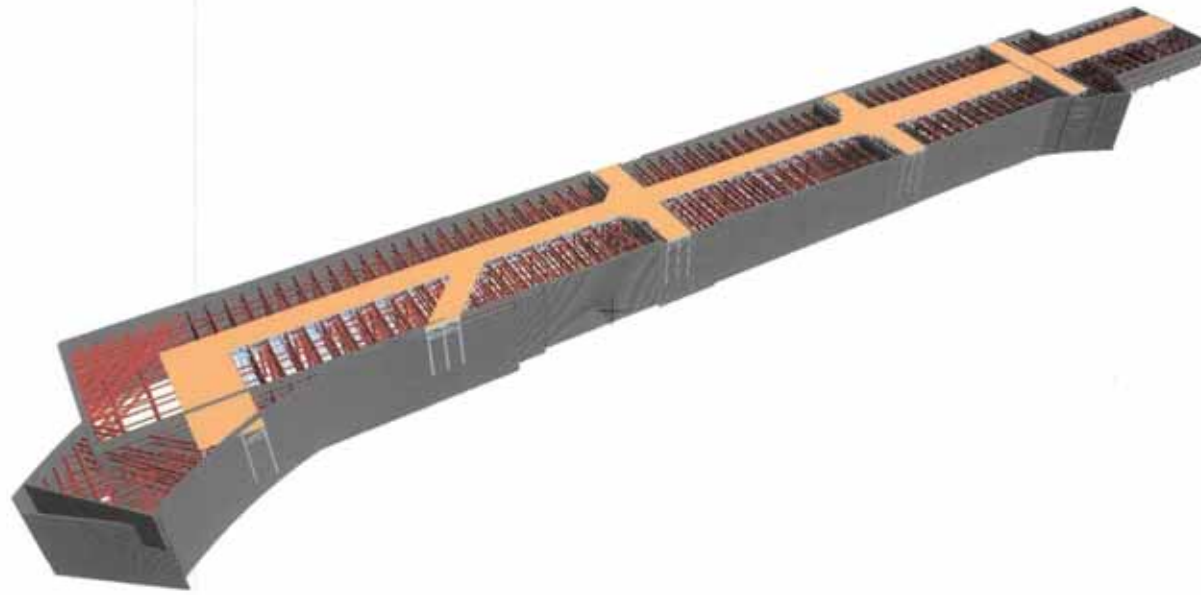


Incorporate Cast-in Elements For Pipes, Electrical And Structural Items

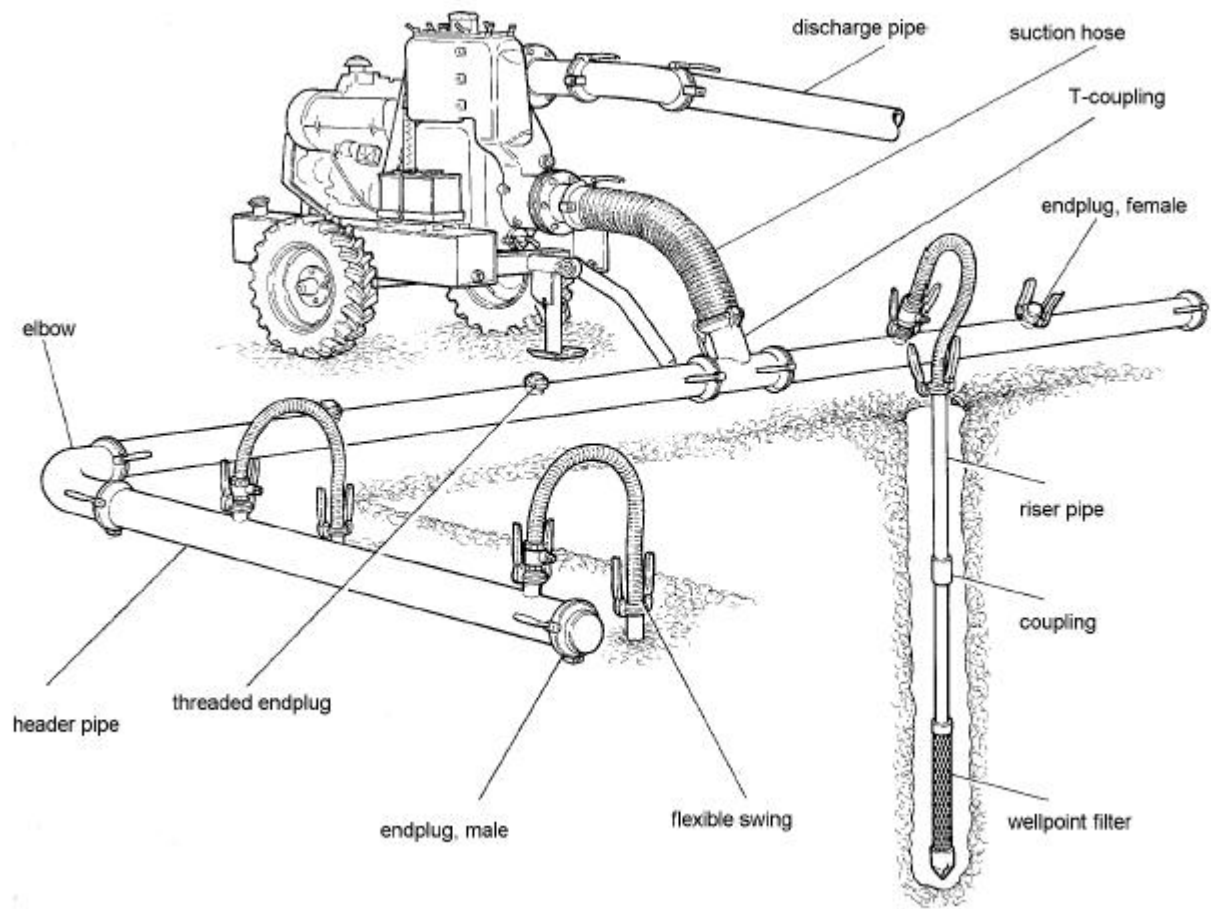




Incorporate a Major Seismic Joint



Accommodate Bracing And Construction Equipment Platform (Trestle)



Accommodate Dewatering



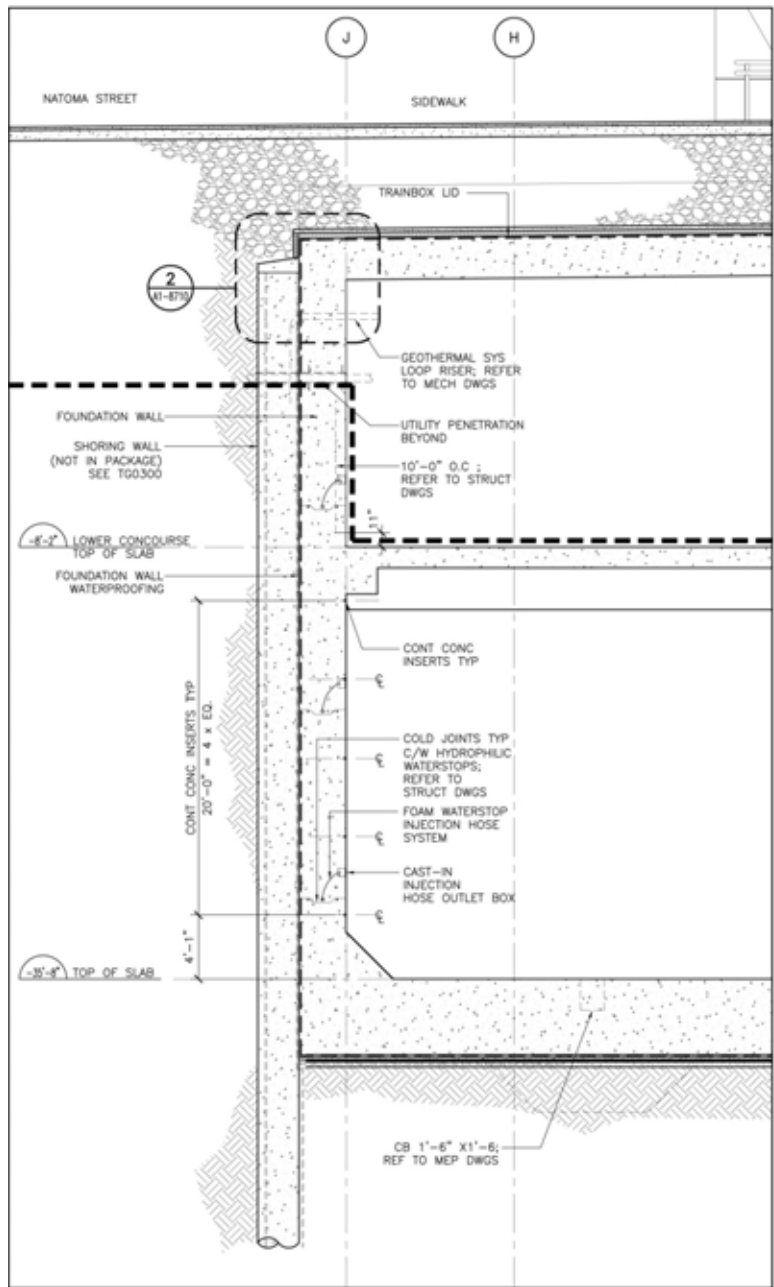


Accommodate Utility Penetrations

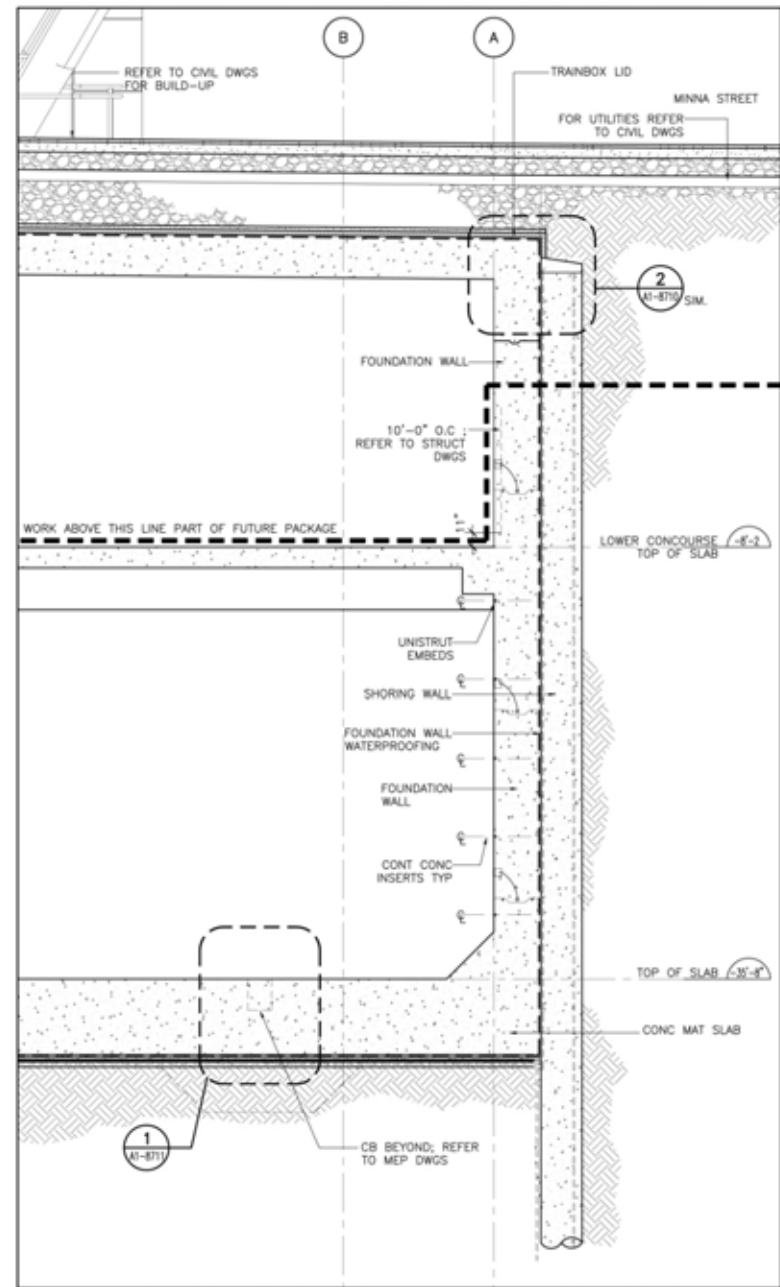


## EARLY BELOW GRADE DRAWINGS

- Approximately 450 drawings in the package
- Consultant drawings and specifications
  - Structural
  - Architectural
  - Mechanical
  - Electrical
  - Plumbing



1 WALL SECT. - FDTN WALL/ FIRST ST. SCALE: 1/4" = 1'-0" 0 2 4 8 12 SCALE IN FEET

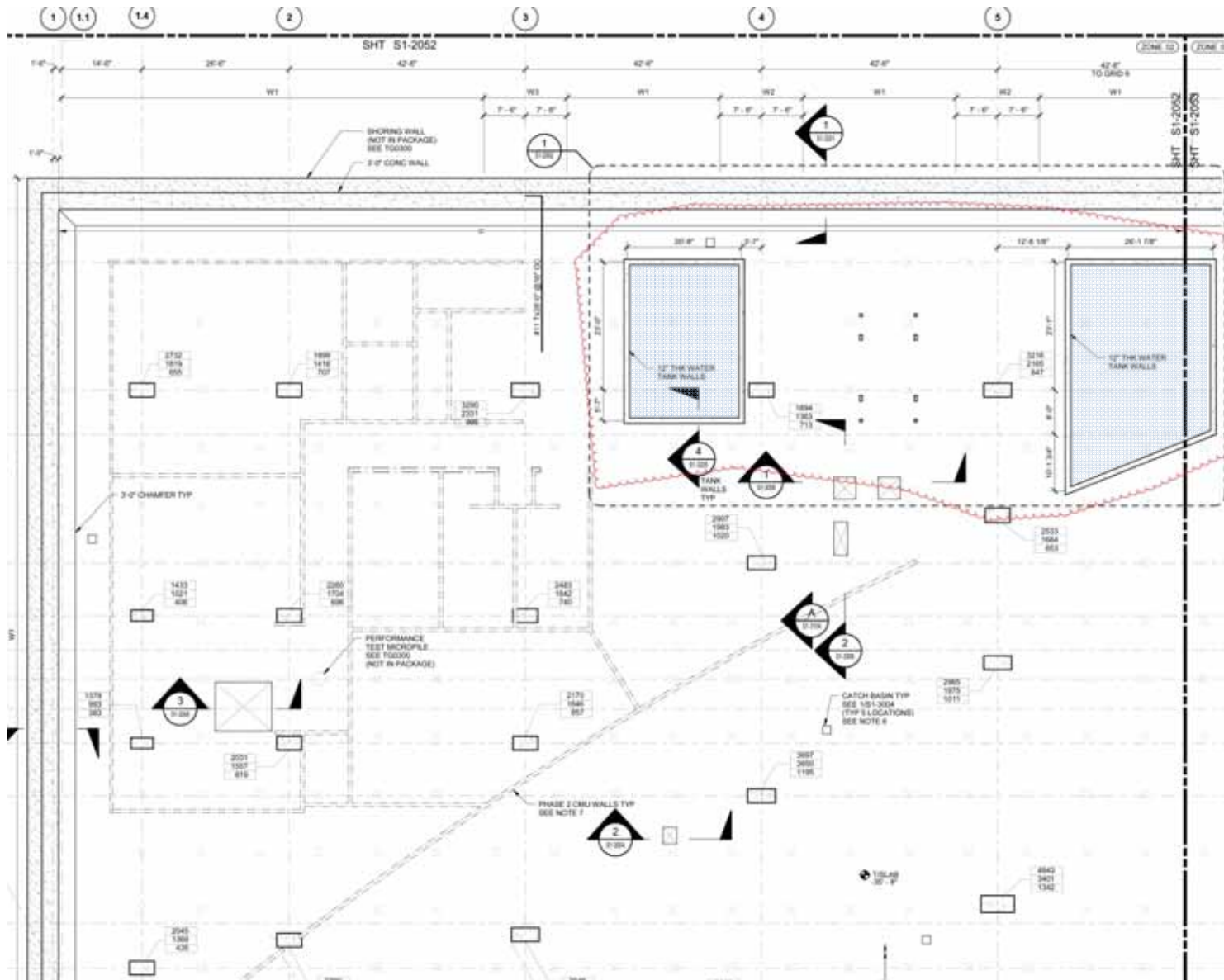


2 WALL SECT. - FDTN WALL - FIRST ST SCALE: 1/4" = 1'-0" 0 2 4 8 12 SCALE IN FEET

Scope of Early Below Grade Package

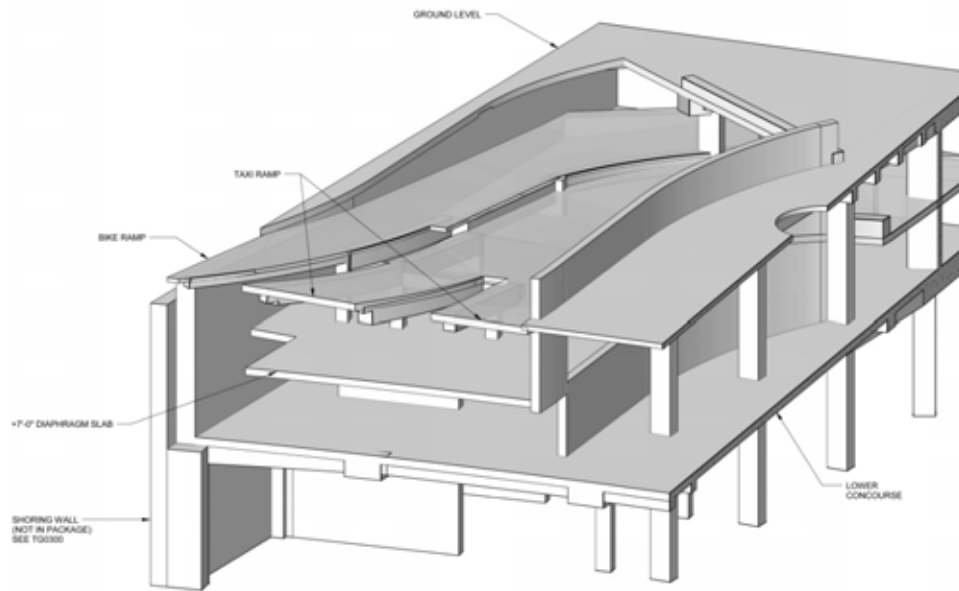
## STRUCTURAL

- Concrete Mat slab
- Foundation walls
- Concrete structural columns
- Water storage tanks
- Vehicle and Bike Ramps
- Tiedowns

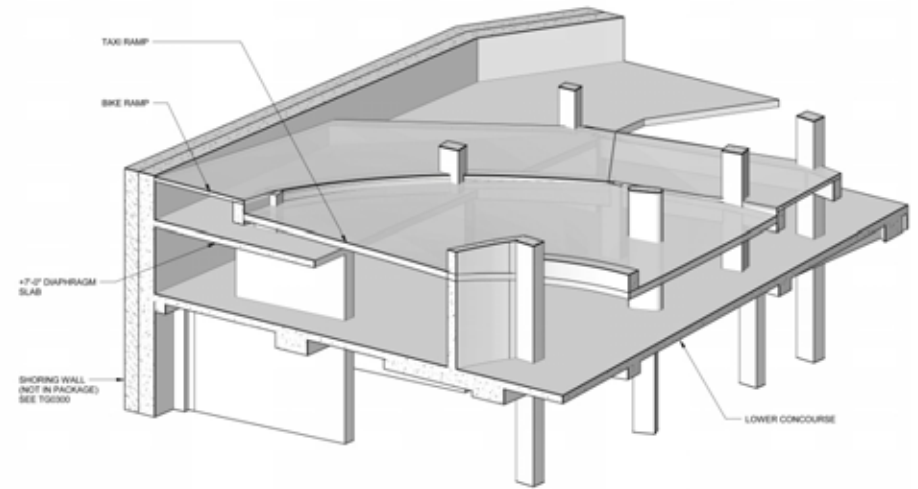


Water Storage Tanks

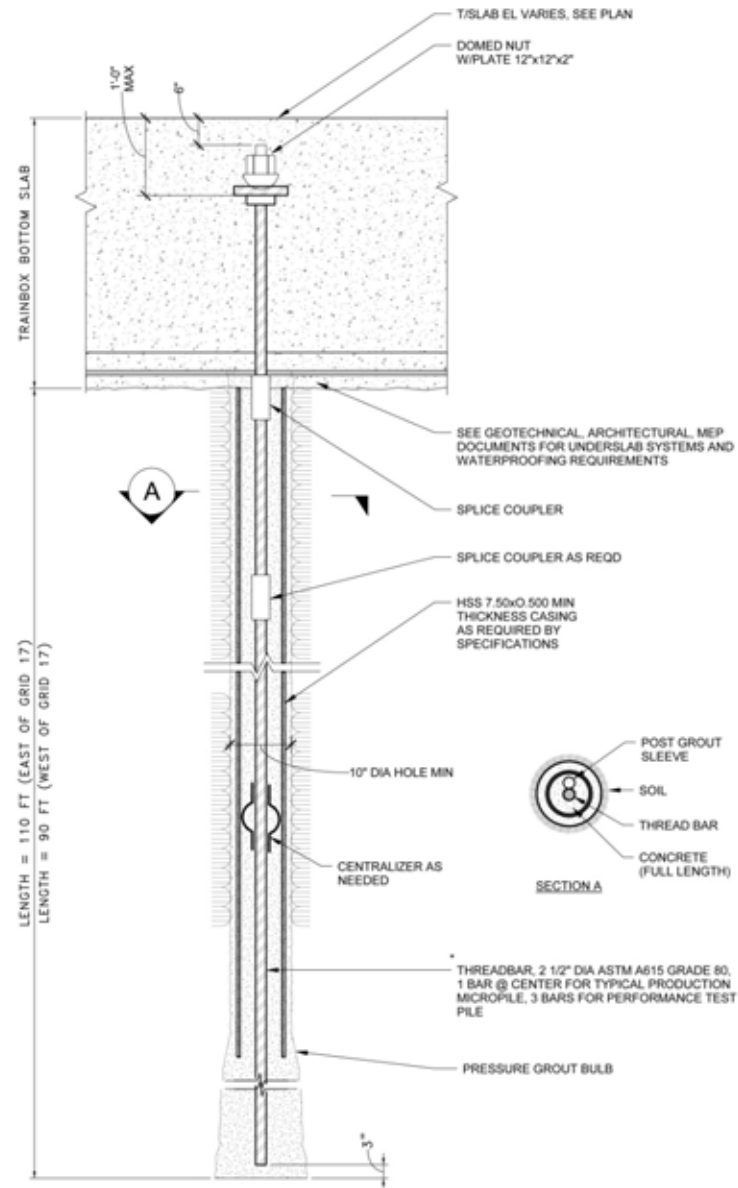




NOTES:  
1. CONTRACTOR TO COORDINATE WITH PACKAGE T03000



## Vehicle and Bike Ramps



- Installed in BSE package
- Top of micropiles cast in to Mat slab to hold down building
- Building expected to rise due buoyancy 1 1/2"
- Returns to rest after building is fully loaded

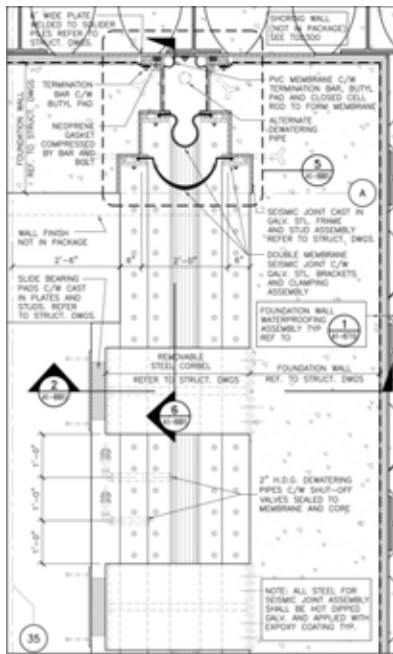
**NOTES:**

1. THE PILE EMBED LENGTHS SPECIFIED ARE FOR BIDDING PURPOSES ONLY. THE CONTRACTOR'S BID CAN BE BASED ON HIS OWN MICROPILE DESIGN. THE REQUIRED DESIGN LOAD OF THE PILE IS 200 KIPS IN TENSION. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE PILE TO MEET THE DESIGN LOAD REQUIREMENT TIMES A FACTOR OF SAFETY AND A FACTOR FOR ADJUSTMENT FOR TEMPORARY DRAINED CONDITION, AND STIFFNESS AND OTHER REQUIREMENTS STATED IN THE PROJECT SPECIFICATION. AS STATED IN THE SPECIFICATION, CONTRACTOR'S DESIGN IS TO BE VALIDATED BY A PERFORMANCE TEST PROGRAM TO BE CARRIED OUT AT THE BOTTOM OF THE EXCAVATION.
2. MICROPILE SHALL BE POST GROUTED PER FHWA-SA-97-070 AND CONSTRUCTED BY PRESSURE GROUTING THROUGH THE CASING.
3. \* THE REINFORCEMENT SPECIFIED IS A MINIMUM REQUIREMENT.

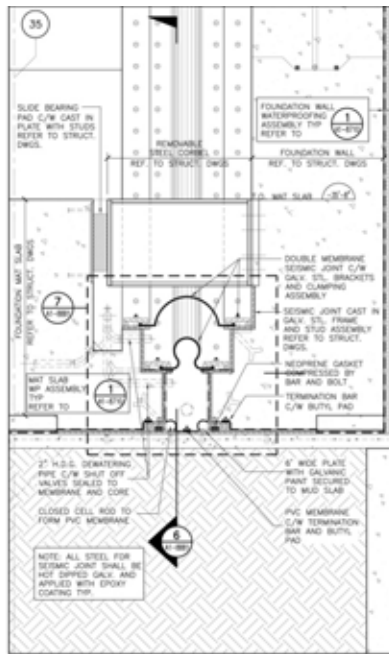
2300 Tiedowns

## ARCHITECTURAL

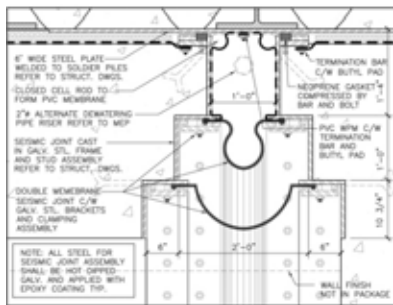
- Slab edge drawings
  - Locations of slab opening for stairs, escalators and elevators
  - Opening locations for drains, sumps, pipes and major conduits
- Room layouts
  - Provide location of reinforcing for future rooms
- Waterproofing
- Seismic joint
- Cast in channels
  - Support of future MEP items
  - Support of ceilings
  - Support of future overhead catenary power system for trains



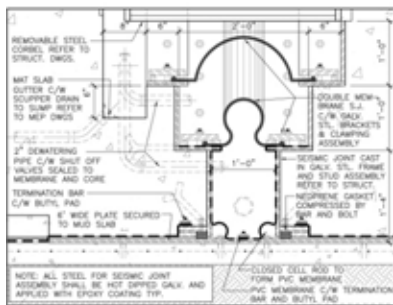
1 PLAN AT FOUNDATION WALL - S.J.  
 SCALE: 1/2" = 1'-0"



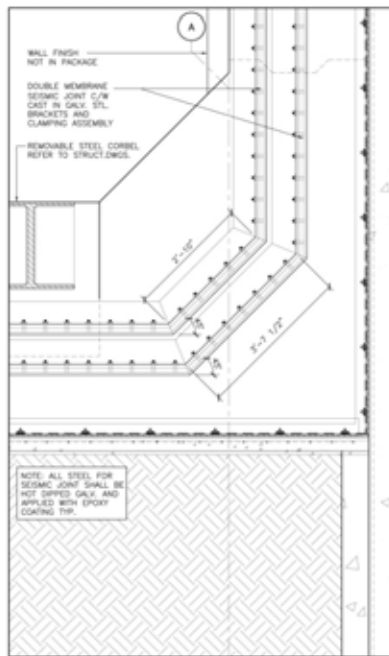
2 SECTION AT MAT SLAB - S.J.  
 SCALE: 1/2" = 1'-0"



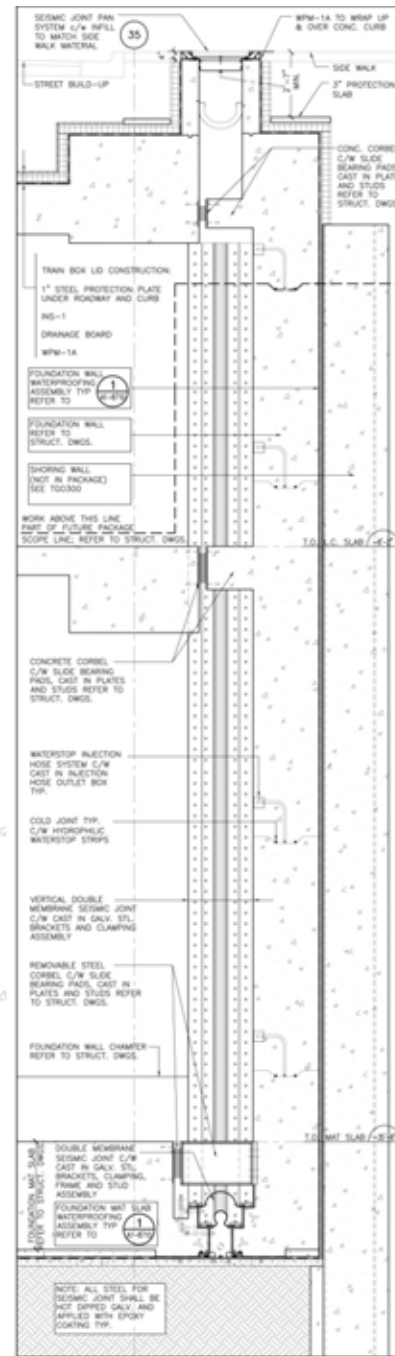
5 DETAIL PLAN - S.J.  
 SCALE: 1/2" = 1'-0"



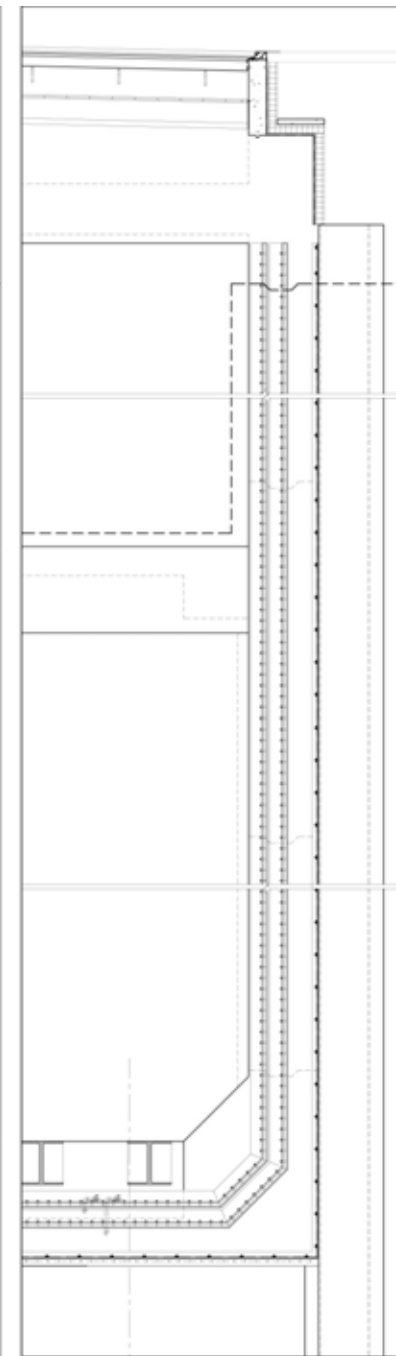
7 DETAIL SECTION - S.J.  
 SCALE: 1/2" = 1'-0"



6 SECTION AT FOUNDATION WALL S.J.  
 SCALE: 1/2" = 1'-0"



3 SECTION AT GRID 35 - S.J.  
 SCALE: 1/2" = 1'-0"



4 SECTION AT GRID A - S.J.  
 SCALE: 1/2" = 1'-0"

Seismic Joint



## MECHANICAL

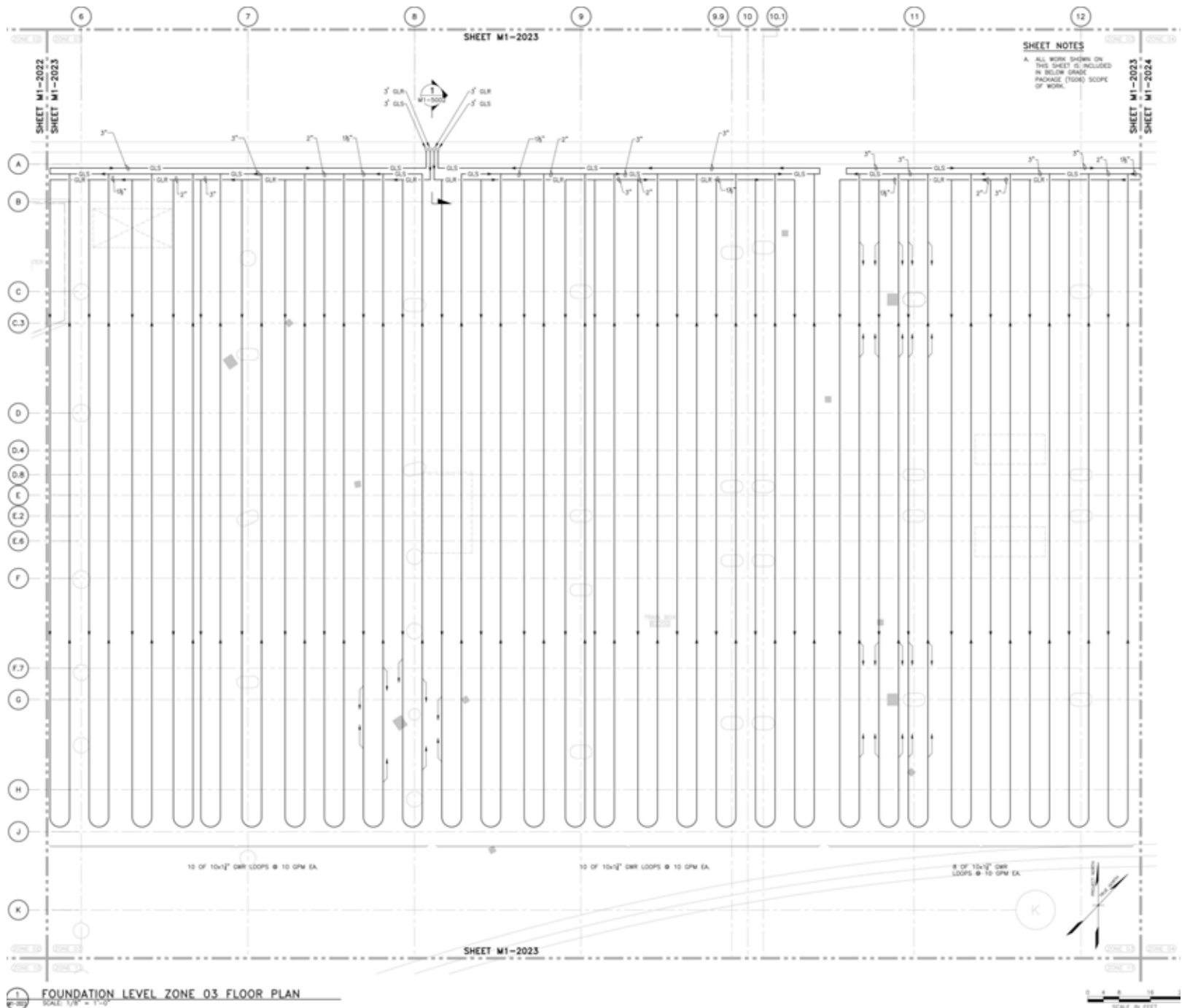
- Geothermal loop system

## ELECTRICAL

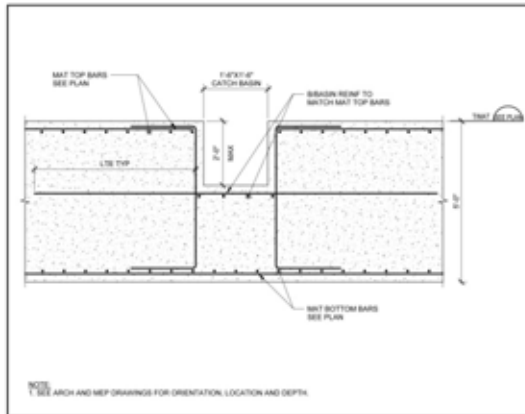
- Cast in boxes and conduits
- Grounding system

## PLUMBING

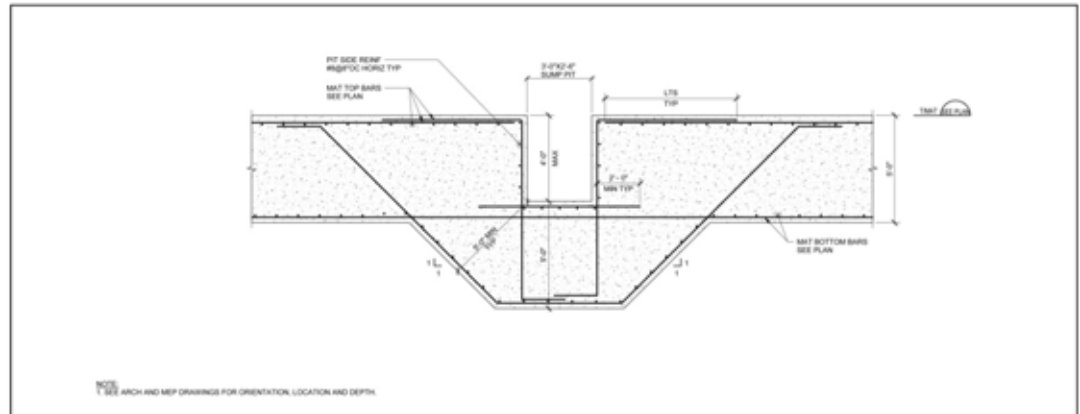
- Cast in pipes and sleeves for future pipes
- Sump pits and drains



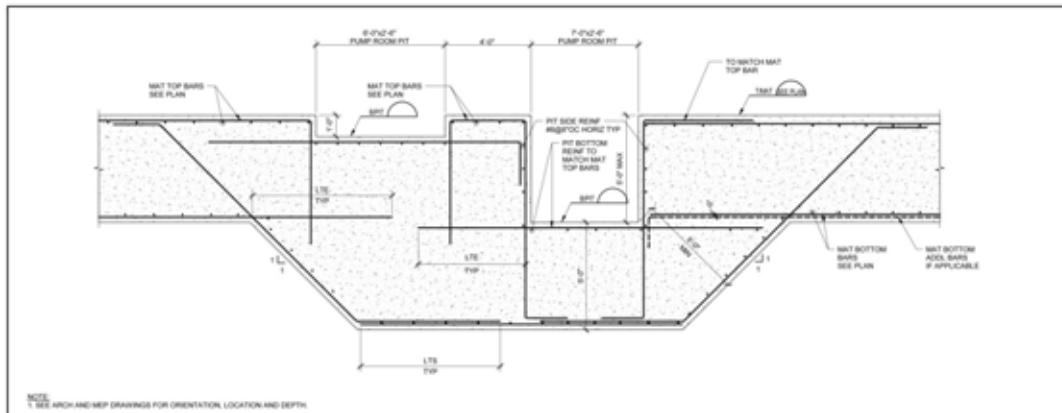
# Geothermal Loop System



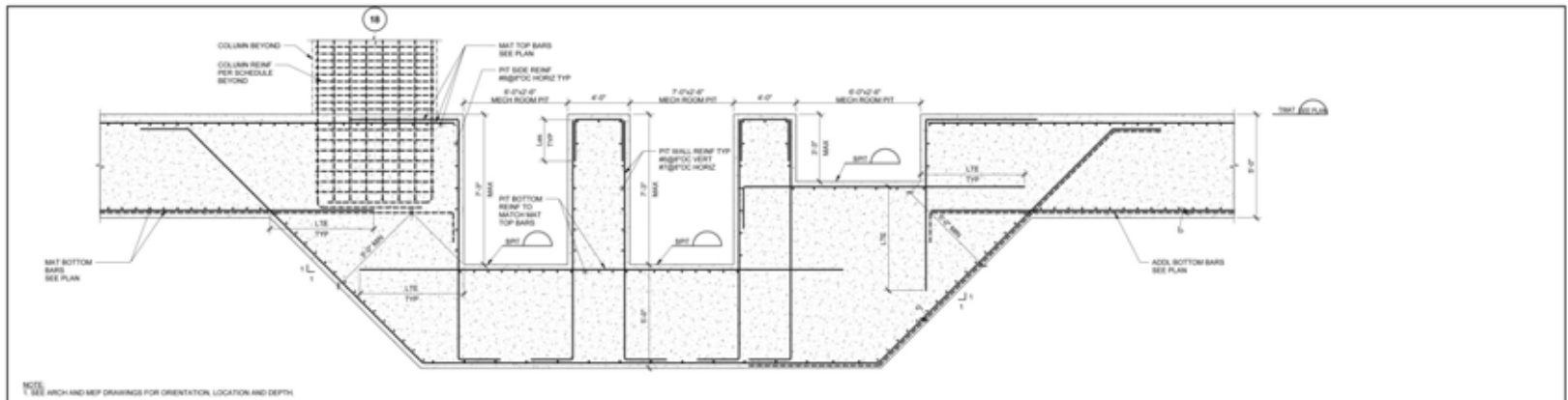
1 MAT DETAIL AT CATCH BASIN (DEPTH  $\le 2'-0''$ )  
SCALE: 1/4" = 1'-0"



2 MAT DEPRESSION SECTION - ONE PIT CASE  
SCALE: 1/4" = 1'-0"



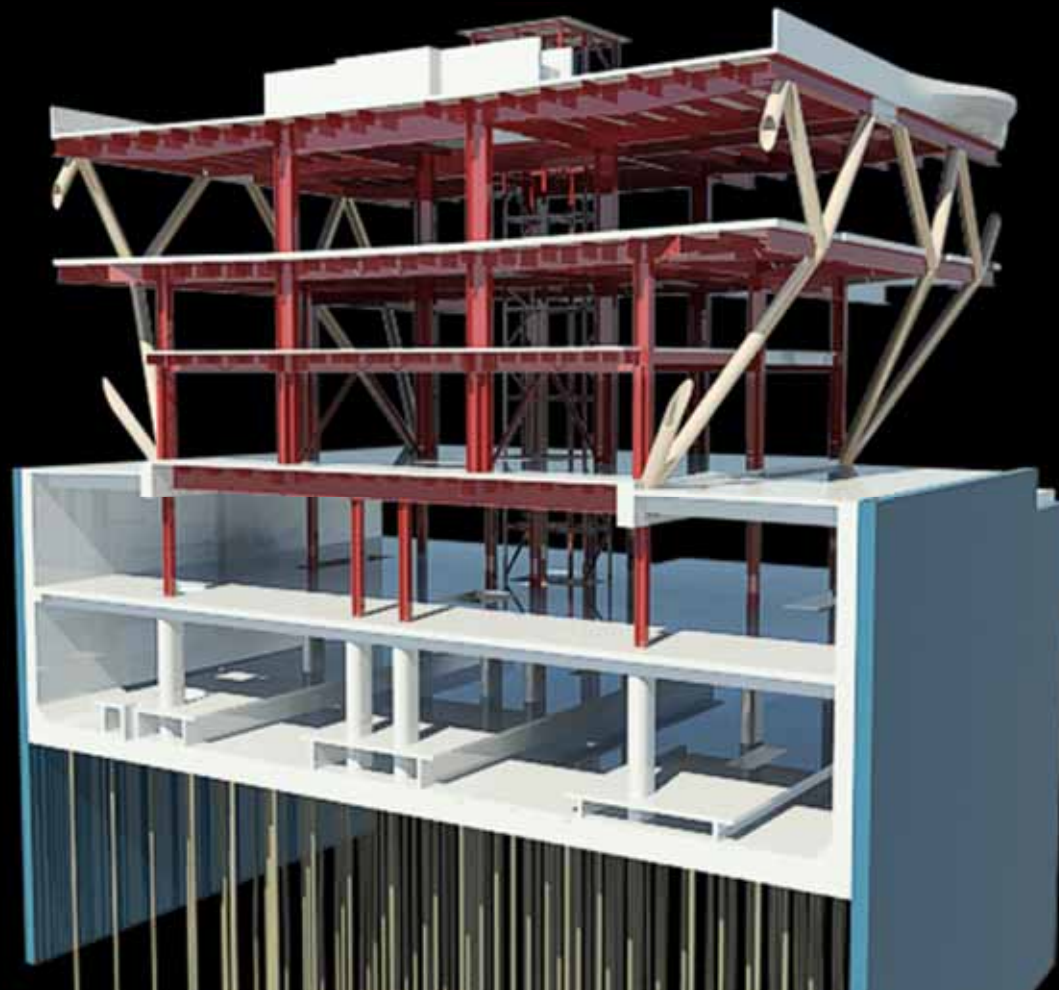
3 MAT DEPRESSION SECTION - TWO PIT CASE  
SCALE: 1/4" = 1'-0"



4 MAT DEPRESSION SECTION - THREE PIT CASE  
SCALE: 1/4" = 1'-0"



## Sump Pits and Drains



t3

Do not animate  
ttuser, 9/21/2011