

**GENERAL**

- These notes are to be read in conjunction with the specifications.
- This building has been designed in accordance with the 2011 edition of the Manitoba Building Code.
- The contractor shall be responsible for the design and installation of all necessary shoring, bracing and formwork. Formwork for new construction shall be bridged over existing services. Procedure must be approved by the design Engineer.
- Any unsound structural conditions observed or created during construction are to be reported to Engineer immediately.
- Coordinate size and location of all openings in structural members with trades involved. All openings not indicated on structural drawings to be approved by Engineer.
- Confirm the location of all sub-grade services prior to commencing site work.
- Verify all dimensions and elevations with architectural drawings prior to construction. Any discrepancies to be reported to engineer immediately. Do not scale drawings.
- Do not backfill against structure until main floor is in place.
- Confirm all existing conditions prior to construction. Any discrepancies or conflicts to be reported to Engineer immediately.

**C-I-P CONCRETE PILES**

- Cast-in-place piles are designed for an assumed skin friction of 284 PSF as per Silvestre S. Urbano Jr., P.Eng's Geotechnical Review dated March 19, 2013.
- Concrete for cast-in-place piles shall be 30 MPa @ 28 days using Sulfate Resisting Type 50 cement, 1 1/2" maximum size aggregate, 3 1/2" slump and 3% to 5% air entrainment. Vibrate the top 10 feet of each pile.
- Piles shall be no more than 2% out of plumb; and no more than 2" out of alignment.
- Pile reinforcing shall extend a minimum of 2'-0" into pilecap or grade beam/wall.
- Slab sub-base to be built up of "C-Base" granular fill compacted to 95% Standard Proctor Density in maximum 8" lifts. Final lift to be 6" "A-Base" granular fill compacted to 98% Standard Proctor Density. All compaction densities to be confirmed by an independent testing agency prior to placement of any concrete.

**CONCRETE**

- Concrete work shall be in accordance with CSA A23.1-09 for "Concrete Materials and Methods of Concrete Construction" including cold weather requirements when the temperature falls below 5°C.
- Provide one set of concrete test cylinders in accordance with CSA A23.1-09 for every 50 m<sup>3</sup> of concrete placed and a minimum of one set for each structural component.
- Performance specification as per A23.1-09 Table 5: (Include Performance or Prescriptive, not both)  
Concrete Strength @ 28 days:  
a. Precast conc. 35 MPa  
ii. Piles & pile caps 32 MPa  
iii. All other conc. 30 MPa  
  
Exposure Class:  
b. Precast conc. S-2  
ii. Piles & pile caps S-2  
iii. Parking structures above grade C-1  
iv. Curbs/sidewalks/driveways C-2  
v. All other conc. N
- Prescriptive specification as per A23.1-09 Table 5:  
a. Mix proportions-----  
b. Range of air content-----  
c. Slump range-----  
d. Concrete usage as per plan  
e. Other
- Walls, piers and columns shall be poured a minimum of 24 hours before slabs and beams.
- Provide dovetail anchor slots in concrete walls and columns where masonry abuts.
- All structural slabs framing into concrete walls or beams shall have a minimum 1 1/2" chase into supporting member x the height of the slab.
- Where concrete beams frame into concrete walls or other concrete beams and are poured later, provide 1 1/2" chase (height and width to match beam).
- The use of calcium chloride is not permitted.
- Construction joint keys in grade beams shall be formed at pile locations only.
- Construction joint keys in structural slabs to be formed at 1/3 span. Provide key width equal to half the thickness of the slab. Provide 15M dowels @ 24" o/c top & bottom.
- Saw cuts for slab on grade shall be 1" deep & 1/8" wide. Cutting to be done not sooner than 12 hours, and not later than 24 hours after the slab is poured. Cuts to be filled with approved bituminous compound or caulking.
- Slip joint all paving against structural members with 1/2" impregnated fibreboard.
- Coordinate the location of all items embedded in concrete work with Architectural, Mechanical & Electrical drawings.
- Engineer to be notified at least 48 hours in advance of all major pours.
- Refer to architectural drawings for concrete surfaces requiring architectural finishes.
- Where voidform is indicated on drawings use cardboard shearmat below structural slabs and low-density polystyrene below walls and gradebeams.
- Exterior sidewalks to be 4" thick concrete on compacted granular fill reinforced with 10M @ 12" o/c each way mid depth. Provide tooled control joints @ maximum 5'-0" o/c and construction joints @ maximum 20'-0" o/c.
- Concrete slab at exterior refuse container to be 6" thick concrete on compacted granular fill reinforced with 15M @ 12" o/c each way mid depth.

**ADHESIVE ANCHORING SYSTEM**

- Drill holes with ANSI B212.15 matched tolerance carbide tipped drill bits. Diamond coring holes is not permitted.
- Drilled hole specifications (diameter & depths) shall comply with manufacturer specifications and ICBP ER-5193.
- Allowable loads may be increased by 33-1/3% for short-term wind or seismic load resistance IAW ICBO ER-5193.
- When conducted, field proof test anchors 150-200% of manufacturer published allowable tension load. Torque testing is not permitted.
- Installation in holes with standing water is not permitted.
- Anchors will be tightened with a torque wrench. Use of an impact wrench is not permitted.
- Prepare base material and install all anchors as per manufacturer's requirements.

**MISCELLANEOUS METAL**

- Refer to architectural drawings for miscellaneous metal details.
- All steel shall conform to CSA G40.21-04
- Welded rebar anchors to be grade 300 weldable.
- All exposed miscellaneous metal to be reviewed for architectural appearance as per AISC Specification for Architecturally Exposed Structural Steel.

**REINFORCING**

- All bars to conform to CSA G30.18-M92:  
15M bars and larger to be grade 400  
10M bars and supporting rods to be grade 300 or better
- All steel to be detailed in accordance with the current ACI Detailing Manual.
- Minimum clear cover to reinforcing:  
3/4" structural slabs  
1" interior face of walls  
1 1/2" face of grade beams  
2" exterior face of walls, bottom of grade beams & walls  
3" pile caps  
3" bottom of footings
- All reinforcing shall be held in place with proper accessories.
- In concrete beams, bend horizontal reinforcing 24" around corners, or use extra corner bars 36" x 36".
- Top steel in beams shall be lapped at centre span, bottom steel shall be lapped at support.
- All reinforcing steel shall be cleaned of all dirt, grease and other deleterious materials prior to placing.
- All reinforcing shall be new billet deformed bars.
- Minimum reinforcing for equipment bases 10M @ 12" o/c each way.
- Reinforcing steel supplier to confer with contractor as to desired construction joint locations and supply dowels and bar lengths to accommodate these joints.
- Reinforcing steel supplier shall submit shop drawings for review of fabrication, sizes, dimensions, placement and splice locations.

**STRUCTURAL STEEL**

- All "W" and "HSS" sections shall be in accordance with CAN/CSA G40.21-04 M350W, all other sections shall be in accordance with CAN/CSA G40.21-04 M300W.
- All welding shall conform to CSA W59-03 (R2008); fabricators to be certified in accordance with CSA W47.1-09.
- Fabrication and erection shall be in accordance with CAN/CSA S16-09, "Limit States Design of Steel Structures".
- Steel erector shall be responsible for supplying and erecting all temporary bracing to provide stability for the structure as a whole, until all related structural framing is erected and completely installed.
- Fabricator shall notify the engineer of any proposed member substitutions or changed connection details.
- Holes required in steel sections must be approved by the engineer.
- All beams continuous over columns shall have 2 web stiffeners on each side, the same thickness as column unless noted, but not less than 3/8".
- No holes permitted in top of beams at columns where beams are continuous over columns, unless loss of section by holes is compensated by equal material area welded to side of flange.
- All structural steel shall receive at least one coat primer to CISC/CPMA standard 1-73a 1975.
- Use asphalt base paint (Flintkote 410-02 or eq.) at columns below slab.
- All high strength bolts to be in accordance with the latest edition of ASTM A325M.
- The shear capacity of all shear splices shall be at least equal to the shear capacity of the smaller beam, unless noted.
- The steel supplier shall shop weld 1 1/2" x 1/8" masonry anchors to all steel members in contact with masonry walls. Maximum spacing of ties shall be 32" o/c unless noted.
- Steel supplier is responsible for design and detailing of all structural steel connections not shown on drawings.
- Anchor bolts shall be supplied by structural steel supplier & set by general contractor. General contractor to supply and install 1" non-shrink grout under all base plates unless noted.
- Expansion anchors to be zinc-plated steel wedge type with the following design values in 30 MPa concrete:  
1/2"ø - 2000 lbs shear, 2000 lbs pull-out  
3/4"ø - 4000 lbs shear, 4000 lbs pull-out
- All exposed portions of ledge angles and connections to be coated with bituminous paint.
- Provide 3" x 3" x 1/4" angle framing around all deck openings greater than 18" x 18" unless noted.
- Structural steel supplier shall submit shop drawings for review of fabrication, sizes, dimensions and placement. All connections not shown on drawings are to be sealed by a Professional Engineer registered in the Province of Manitoba.

**STEEL DECK & LIGHT GAUGE METAL FRAMING**

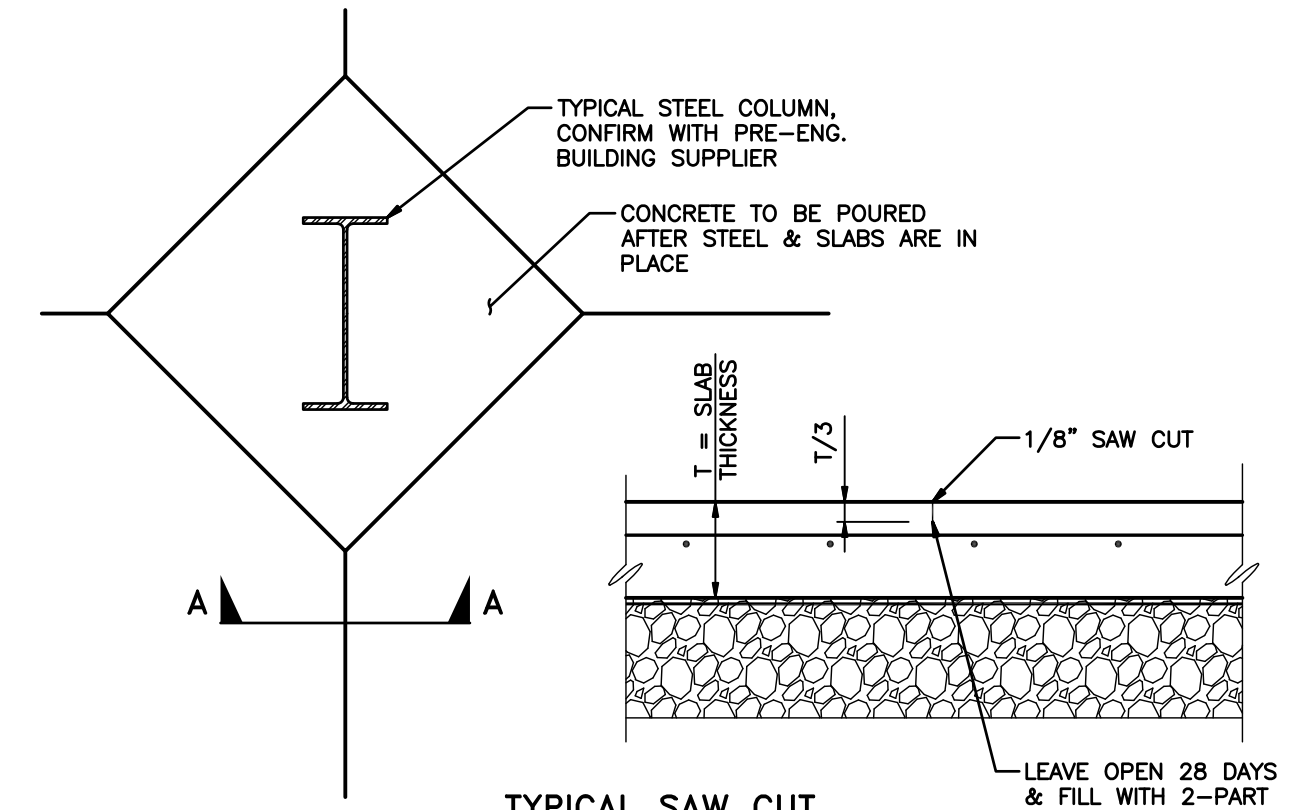
- Steel deck and light gauge metal framing to be designed in accordance with the latest issue of CSA 136-07 and CSA 136.1-07 to support the loads indicated on the drawings.
- Steel deck work to be performed in accordance with the latest edition of Canadian Sheet Steel Building Institute Standards for Roof and Floor Decks.
- Steel deck to be manufactured from ASTM A525 Grade A structural quality sheet steel; hot-dip galvanized to ZF025 wiped coat designation.
- Submit shop drawings sealed by a Professional Engineer registered in the Province of Manitoba, indicating decking plan, profiles, supports and design loads.
- Mechanically fasten side laps @ 12" o/c.
- Fasten deck to support members with 3/4" fusion welds @ 12" o/c.
- Reinforce deck openings up to 18" square with L2" x 2" x 3/16" each side. Extend reinforcing angles a minimum of two flutes beyond opening each side.

**STRUCTURAL LIGHT GAUGE STEEL FRAMING**

- Supply and install LG (light gauge) steel framing where indicated on structural and architectural drawings.
- Framing members to be cold-formed steel to ASTM A446 grade D and hot dipped galvanized to ASTM A525 G60. Minimum 20 ga. (0.033).
- Size of framing member to be sufficient to carry weight of finishing materials (minimum 10psf) plus a horizontal wind load as per external cladding notes or a vertical snow load as per plans.
- Provide lapped connections and fasten with minimum 3- #12 TEK screws.
- Support horizontal and vertical members at max. 4'-0" o/c. Use clip angles to structural steel framing, concrete, or masonry. Secure with 3/8" bolt or other approved fastener. Wire hangers are permitted where adequate lateral bracing is used.
- Submit 4 sets of shop drawings to the engineer and obtain approval prior to fabrication. Show all sizes, connection details, and material specifications. Work and design to conform to CAN S136. External cladding.
- Design external cladding/walls to carry the following unfactored wind pressures and sections:  

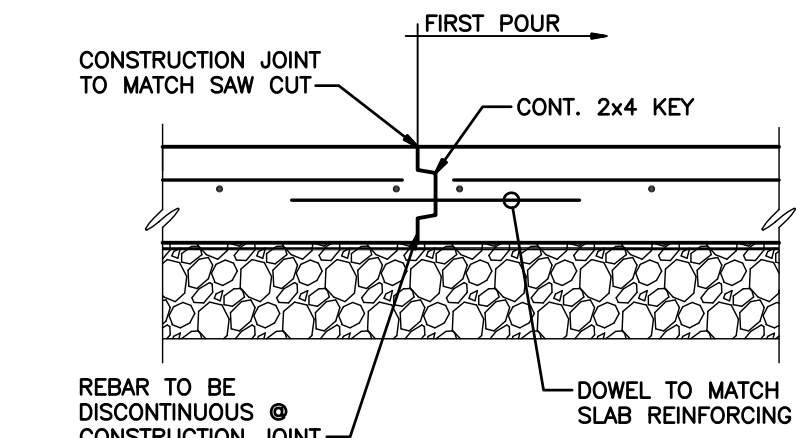
Height	Pressure
0 to 20 ft.	25 psf
20 to 39 ft.	28 psf
39 to 66 ft.	31 psf
66 to 98 ft.	35 psf
98 to 114 ft.	36 psf
144 to 210 ft.	41 psf
210 to 279 ft.	43 psf
- Maximum deflection for the above wind loads not to exceed L/360 (L-720 when used as backup for brick veneer). Minimum 18 gauge for all studs in veneer back walls.
- Stone pilaster framing to be self-supporting and braced to withstand wind and seismic forces.
- Minimum 2 screws required per connection.
- Steel studs to have bridging channel at 4'-0" o/c maximum.
- No coring or cutting of steel studs unless approved by engineer.
- Use no. 10-16 metal screws for non-load bearing stud connections.
- Erection Tolerances  
Plumb: 1/4" Spacing: 1/8" Stud to Web Gap: 1/4"
- Double stud at side for all interior openings up to 4'-0" width.
- Specifications for stud or track size and thickness:  

600 S	162	-	54
(a)	(b)	(c)	(d)
- Member depth in 1/100ths inches thus 600 means 600/100 = 6" (152mm)
- Style: S = Stud of joist sections  
T = Track sections  
U = Channel sections  
F = Furring channel sections
- Flange width in 1/100ths inches thus 162 means 162/100 = 1.62" (41.28mm)
- Designations thickness in 1/100ths inches thus 54/1000 = 0.054" (1.367mm)



**TYPICAL SAW CUT  
DETAIL A-A**  
3/4" = 1'-0"

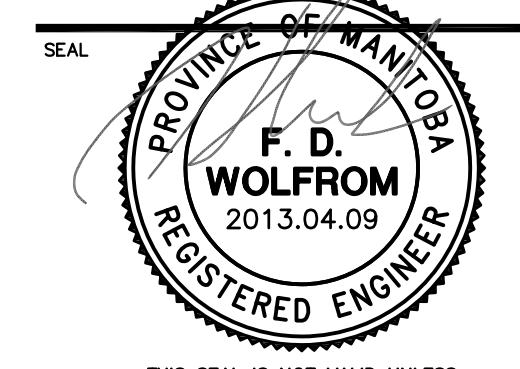
- NOTES:**
- SAW CUT 18-24 HOURS AFTER POURING SLAB.
  - MAXIMUM SPACING FOR SAW CUTS TO BE 21'-0" o/c UNLESS NOTED ON PLANS. FOR AREAS WITH TILE FINISH PROVIDE SAW CUTS TO MATCH CONTROL JOINTS IN FLOOR TILE.



**TYPICAL CONSTRUCTION JOINT**  
3/4" = 1'-0"

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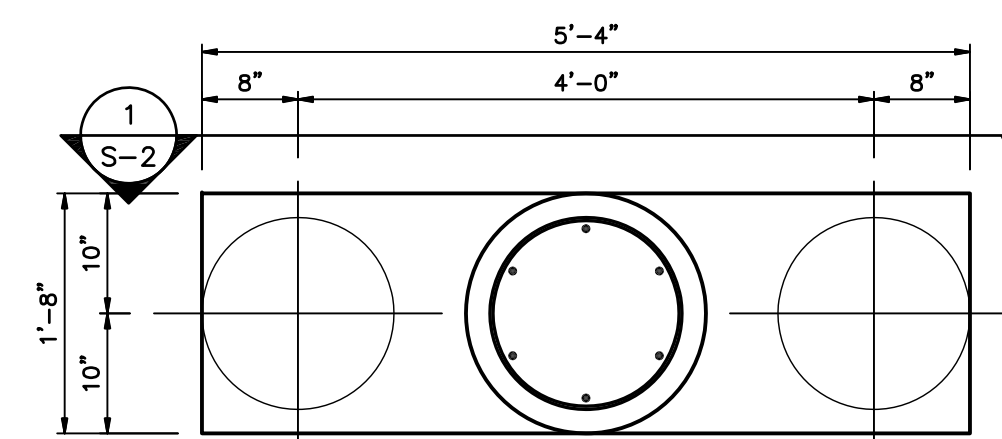
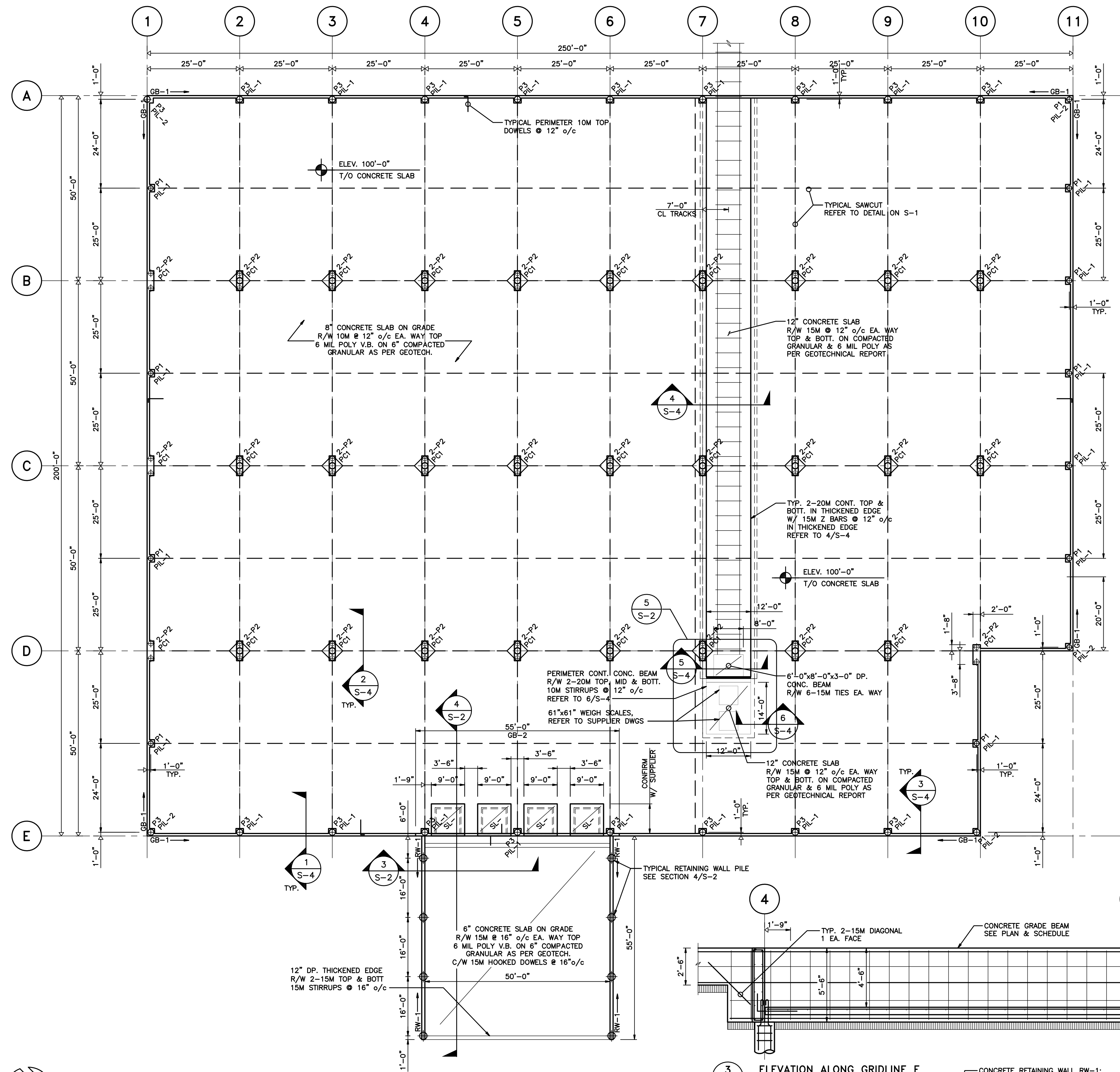


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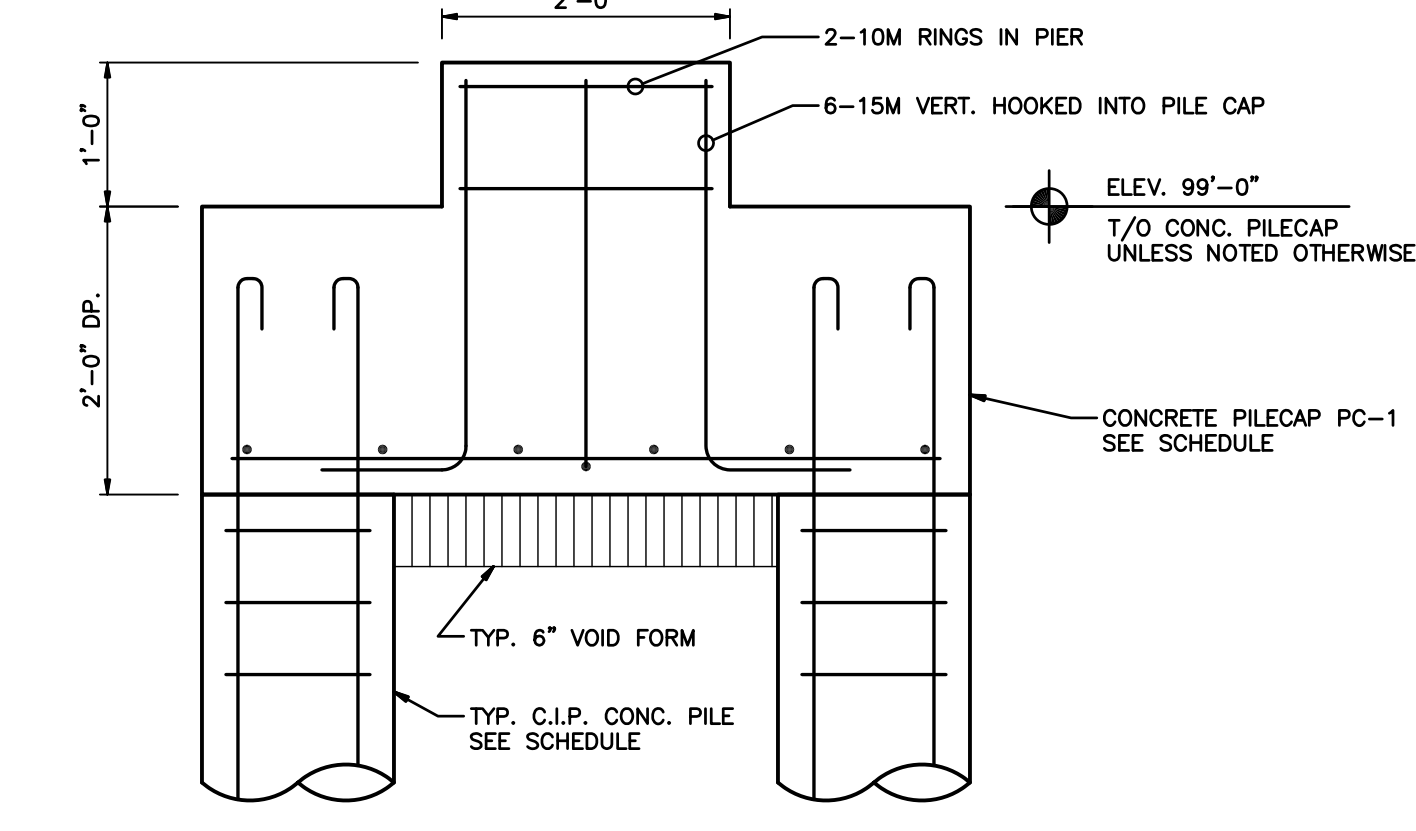
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**AG CHEMICAL STORAGE**  
555 HERVO ST.  
WINNIPEG, MANITOBA

DRAWING TITLE  
**GENERAL NOTES  
& DETAILS**

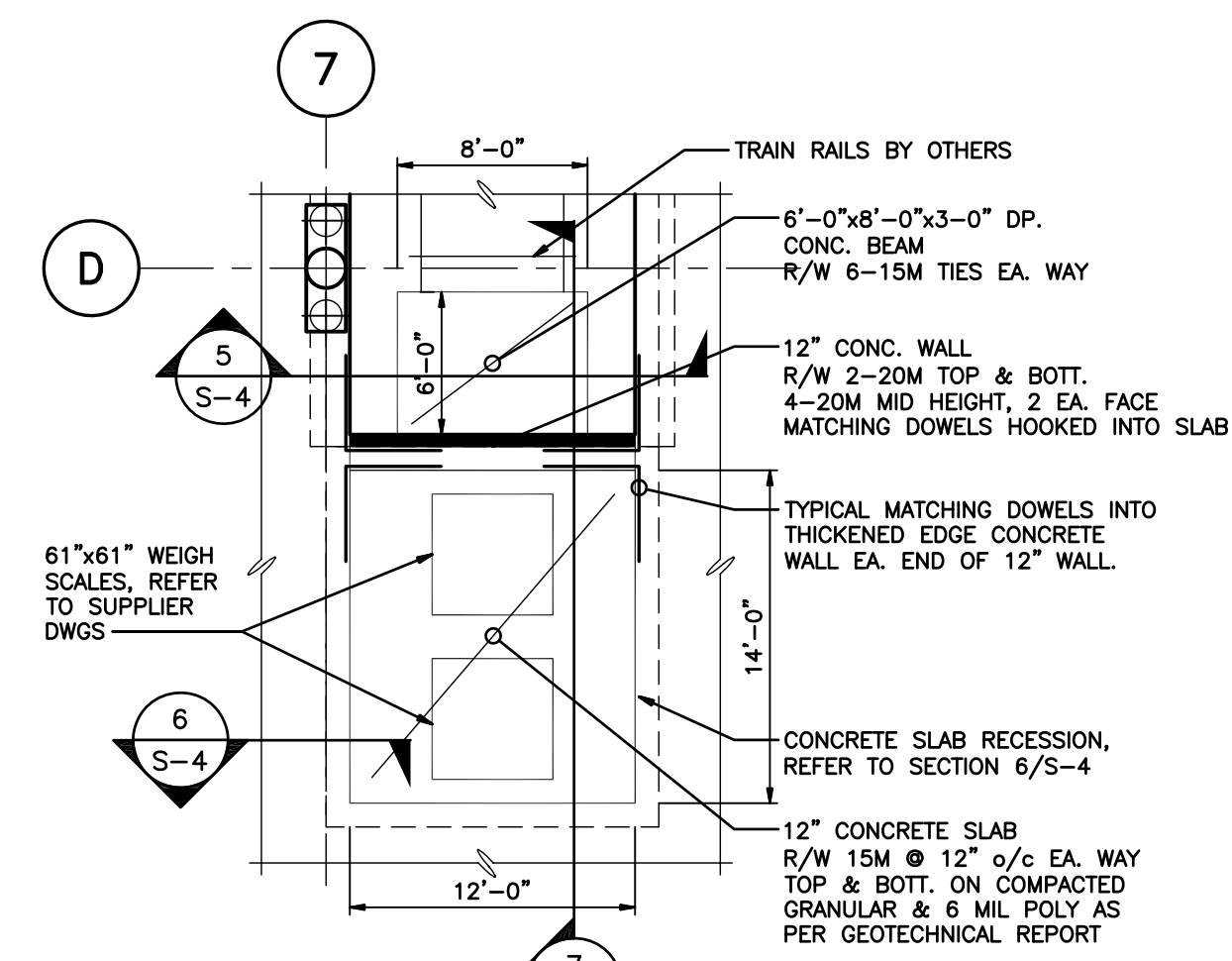
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FILE NO.	DATE	<b>S-1</b>
W13034	FEB. 2013	REVISION NO. 0



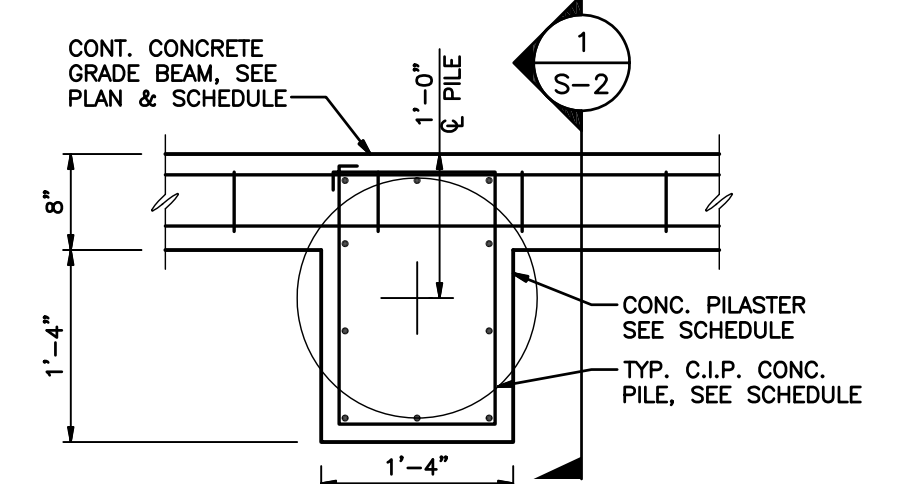
TYPICAL PC-1 PLAN  
3/4" = 1'-0"



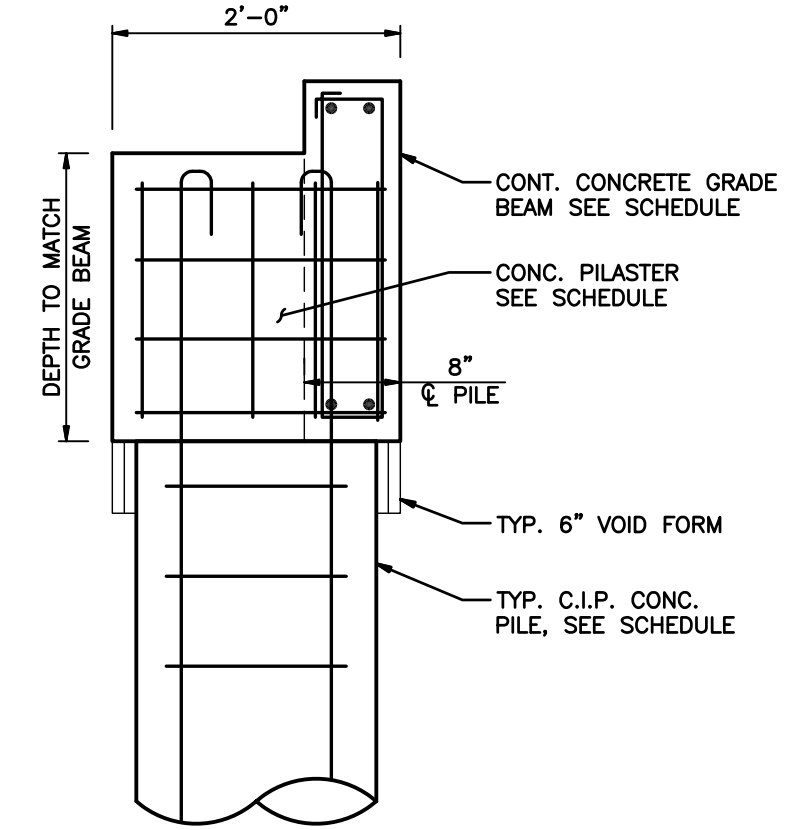
SECTION 1  
3/4" = 1'-0"



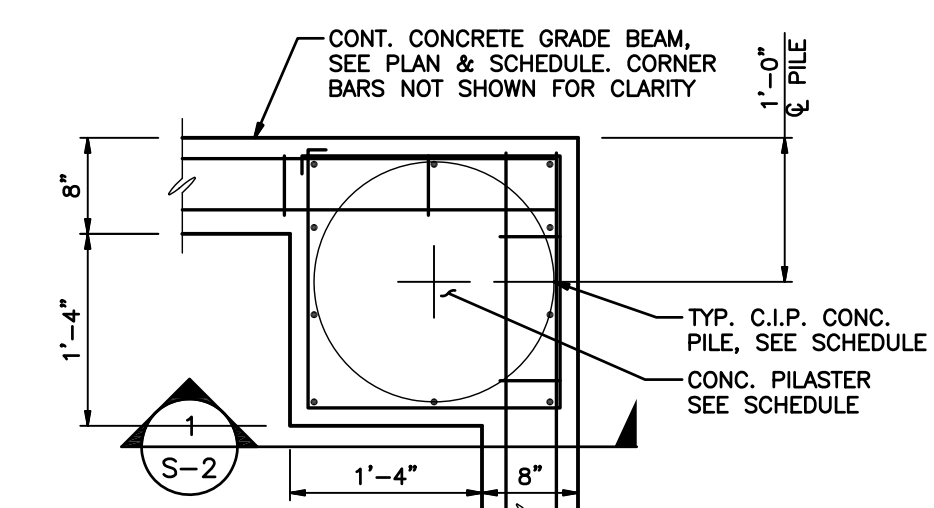
PARTIAL PLAN 5  
1/8" = 1'-0"



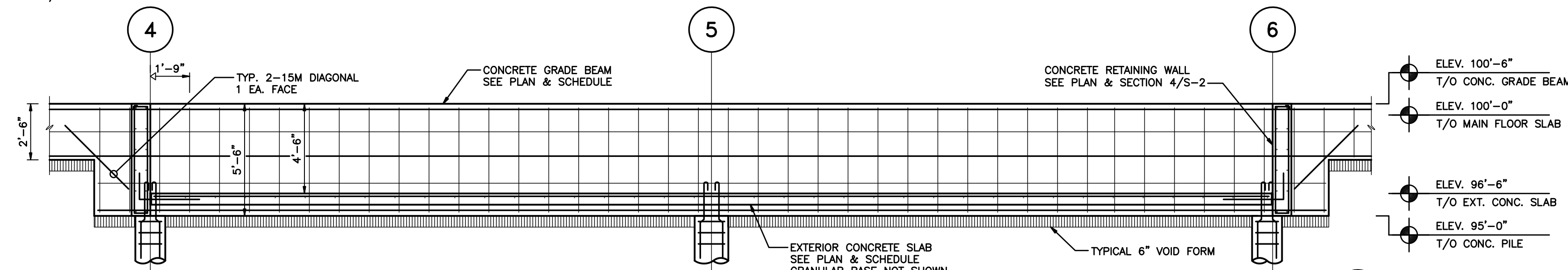
TYPICAL PIL-1 PLAN  
3/4" = 1'-0"



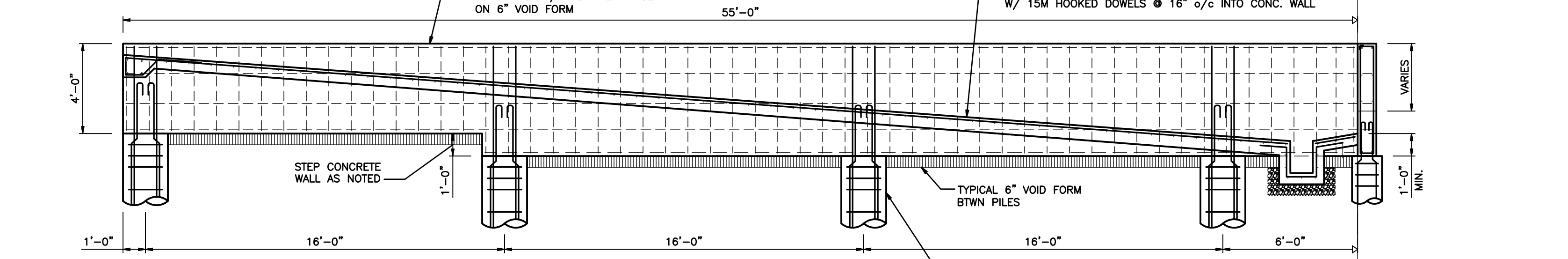
SECTION 2  
3/4" = 1'-0"



TYPICAL PIL-2 PLAN  
3/4" = 1'-0"



ELEVATION ALONG GRIDLINE E  
1/4" = 1'-0"



TYP. RETAINING WALL SECTION  
1/4" = 1'-0"

**FOUNDATION & MAIN FLOOR FRAMING PLAN**

1/16" = 1'-0"

**DESIGN LOADS:**  
DEAD LOAD = 100 PSF  
LIVE LOAD = 500 PSF

**C.I.P. CONCRETE PILE SCHEDULE:**  
P1:  
16" x 30'-0" LG. C.I.P. CONC. PILE  
R/W 5'-10M VERT. x 20'-0" LG.  
4-10M RINGS EQ. SPACED

P2:  
16" x 35'-0" LG. C.I.P. CONC. PILE  
R/W 5'-10M VERT. x 20'-0" LG.  
4-10M RINGS EQ. SPACED

P3:  
18" x 40'-0" LG. C.I.P. CONC. PILE  
R/W 4'-15M VERT. x 20'-0" LG.  
4-10M RINGS EQ. SPACED

NOTE: REFER TO SILVESTRE S. URBANO JR., P.ENG'S GEOTECHNICAL REVIEW DATED MARCH 19, 2013.

**CONCRETE PILE CAP SCHEDULE:**  
PC-1:  
20" x 5'-4" x 24" DP. PILE CAP  
R/W 6'-15M EA. WAY BOT.  
ON 6" VOID FORM  
W/ 20# CONCRETE PIER x12" DP  
R/W 6'-15M VERT. 2-10M TIES EQ. SPACED  
T/O PILE ELEVATION 97'-0" @ PC-1 U.N.O.

**CONCRETE PILE CAP SCHEDULE:**  
PIL-1:  
1'-0" x 2'-0" x 30" DP. PILE CAP  
R/W 10'-15M VERT.  
4-10M RINGS EQ. SPACED  
ON 6" VOID FORM  
T/O PILE ELEVATION 98'-0" @ PIL-1 U.N.O.

PIL-2:  
DIMENSIONS AS NOTED  
R/W 10'-15M VERT.  
4-10M RINGS EQ. SPACED  
ON 6" VOID FORM  
T/O PILE ELEVATION 98'-0" @ PIL-1 U.N.O.

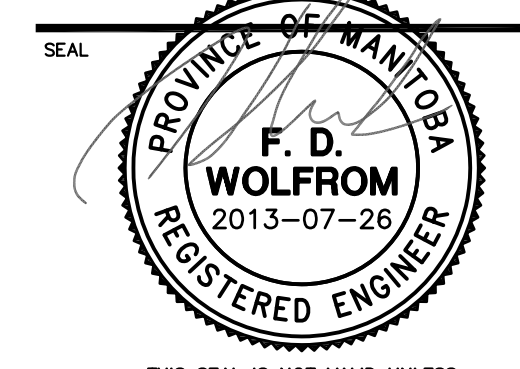
**CONCRETE GRADE BEAM SCHEDULE:**  
GB-1:  
8" x 30" CONC. GRADE BEAM  
R/W 2'-20M TOP & BOT.  
W/ 10M STIRRUPS @ 12" O/C  
ON 6" VOID FORM  
T/O GRADE BEAM ELEVATION = 100'-6"

GB-2:  
10" x 5'-6" CONC. GRADE BEAM  
R/W 2'-20M TOP & BOT.  
W/ 3-15M INTERMEDIATE EQ. SPACED  
10M STIRRUPS @ 18" O/C  
ON 6" VOID FORM  
T/O GRADE BEAM ELEVATION = 100'-6"

NOTE: ALL CONCRETE (EXCLUDING GRADE BEAMS) TO BE IMPERVIOUS BLEND, G.C. TO PROVIDE CONCRETE SPECIFICATION TO WOLFROM ENGINEERING LTD. FOR APPROVAL

No.	REVISION	DATE	BY
4	GENERAL REVISIONS TO TRAIN BAY & PITS	JULY 26/13	FDW
3	GENERAL REVISIONS TO TRAIN BAY & PITS	JULY 11/13	FDW
2	LOADING BAYS & EXT. CONC. SLAB	MAY 28/13	FDW
1	REVISED PILE LOCATIONS & PILE DIMS	MAY 07/13	FDW
0	ISSUED FOR CONSTRUCTION	APR. 09/13	FDW

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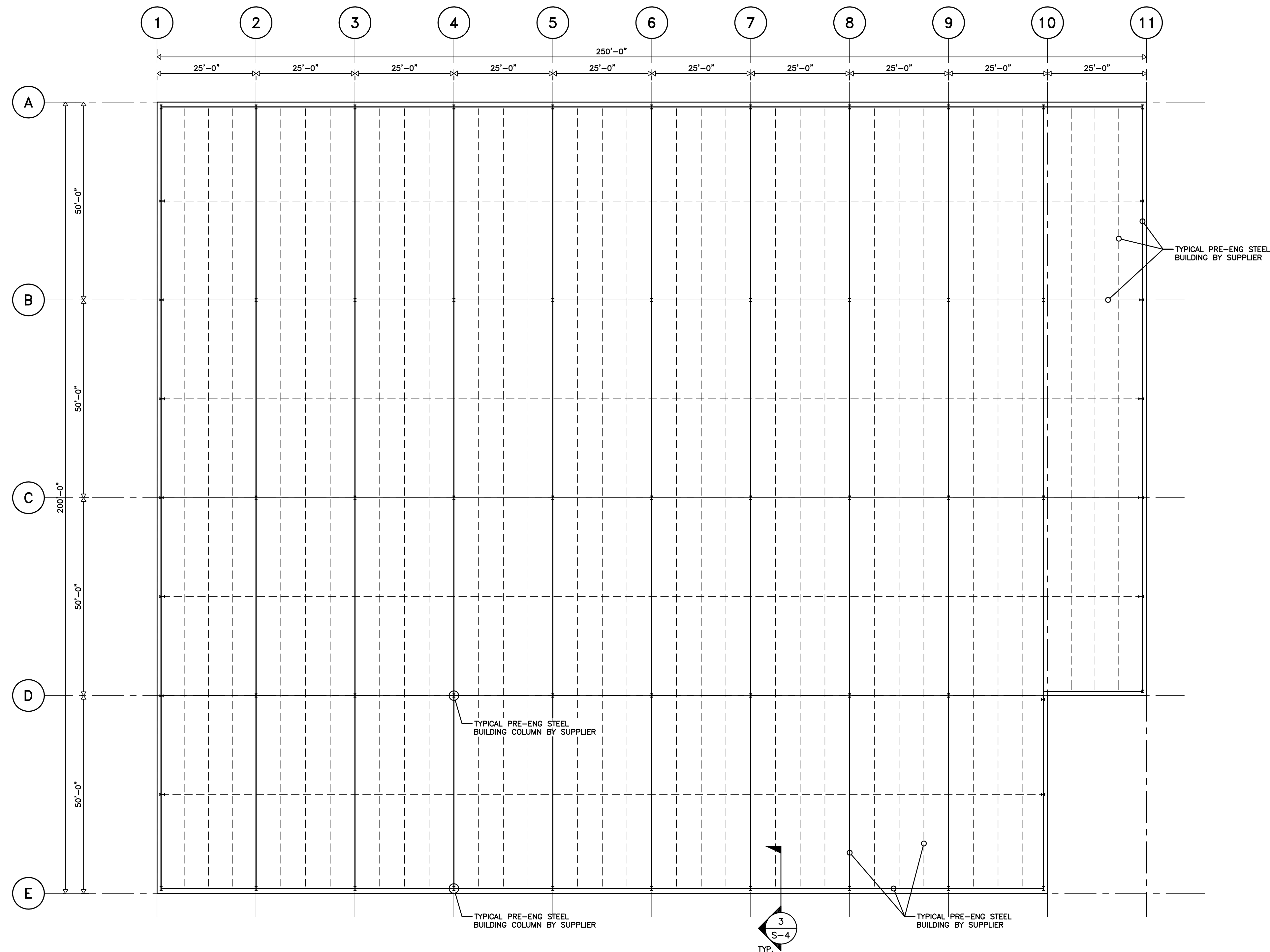


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FOUNDATION & MAIN FLOOR FRAMING PLAN

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FILE NO.	DATE	<b>S-2</b>
W13034	FEB. 2013	REVISION NO. 4



**ROOF FRAMING PLAN**

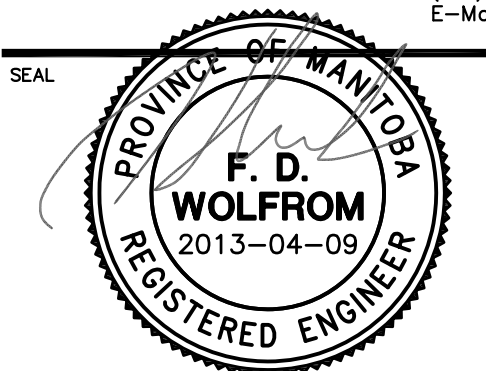
1/16" = 1'-0"

**DESIGN LOADS:**

DEAD LOAD = BY PRE-ENG BUILDING MANUFACTURER  
LIVE LOAD = 36 PSF

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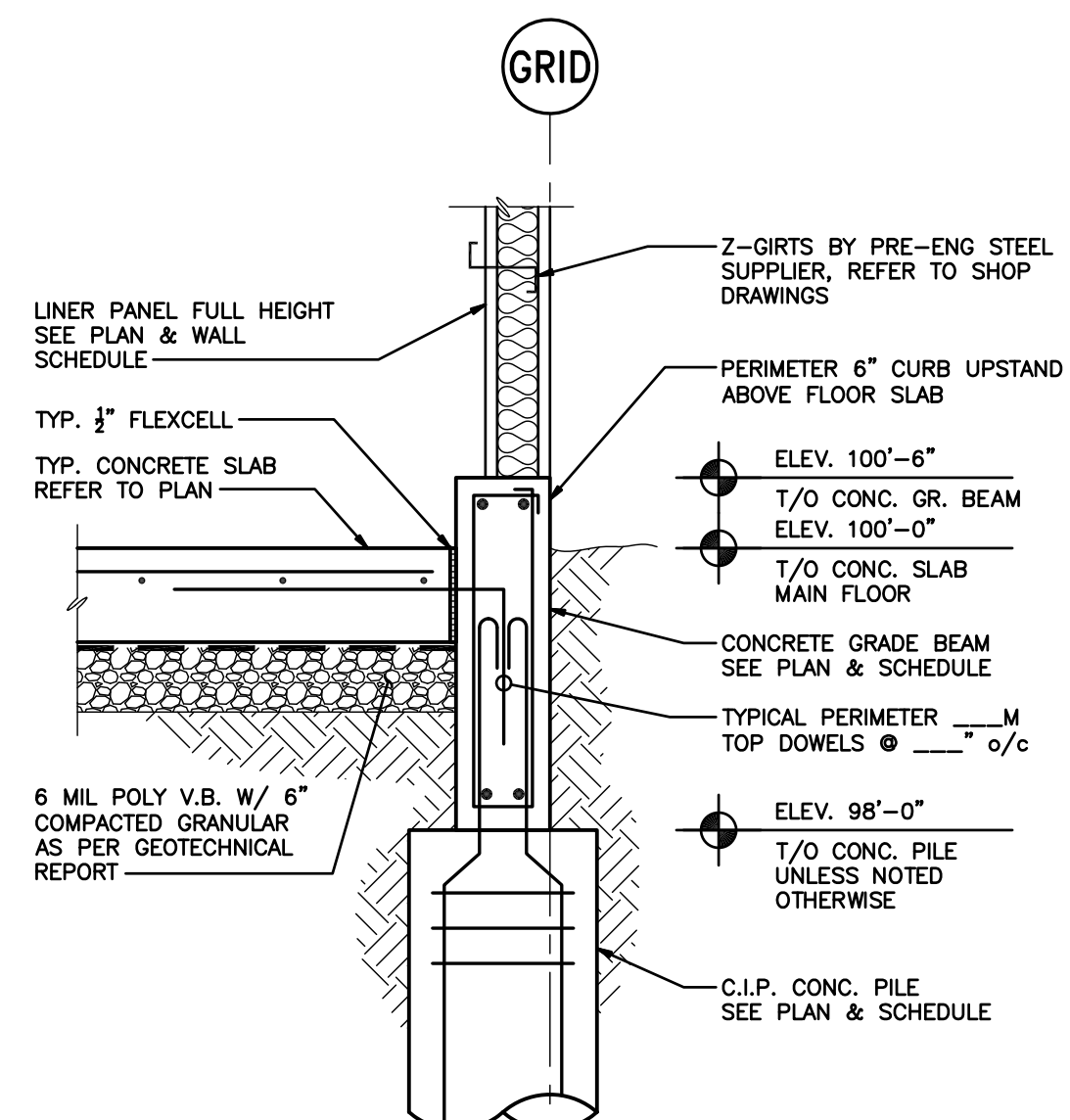


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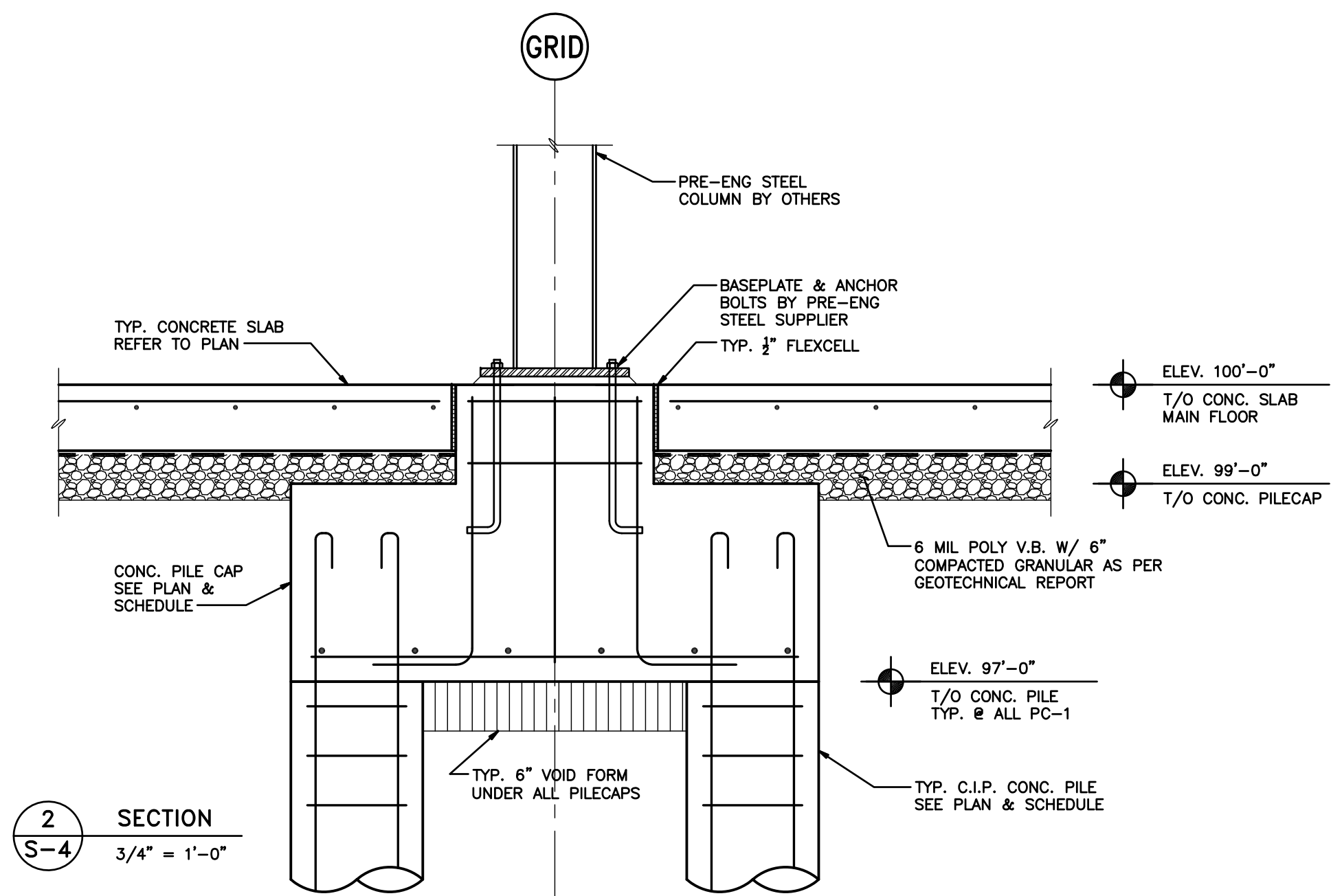
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DRAWING TITLE  
**ROOF FRAMING PLAN**

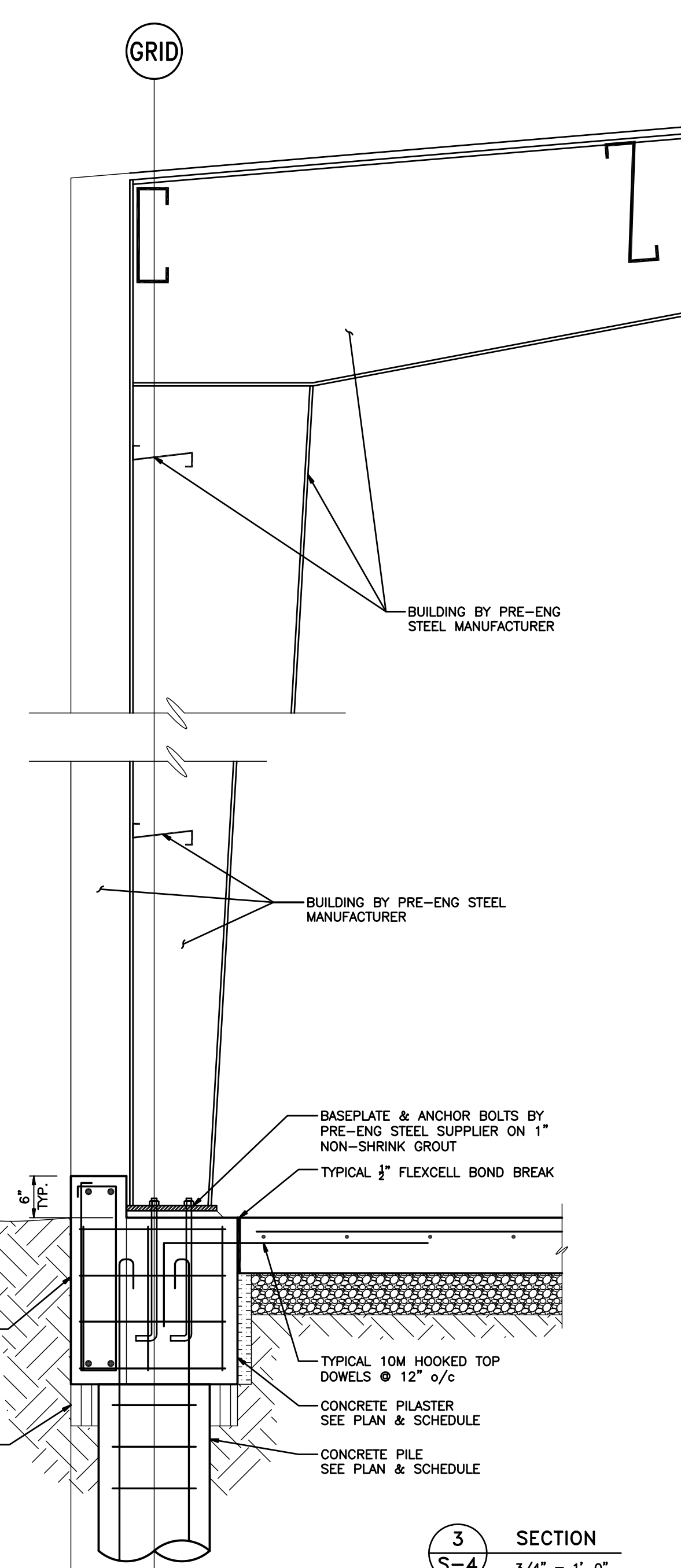
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W13034	DATE	REVISION NO. 0
	FEB. 2013	



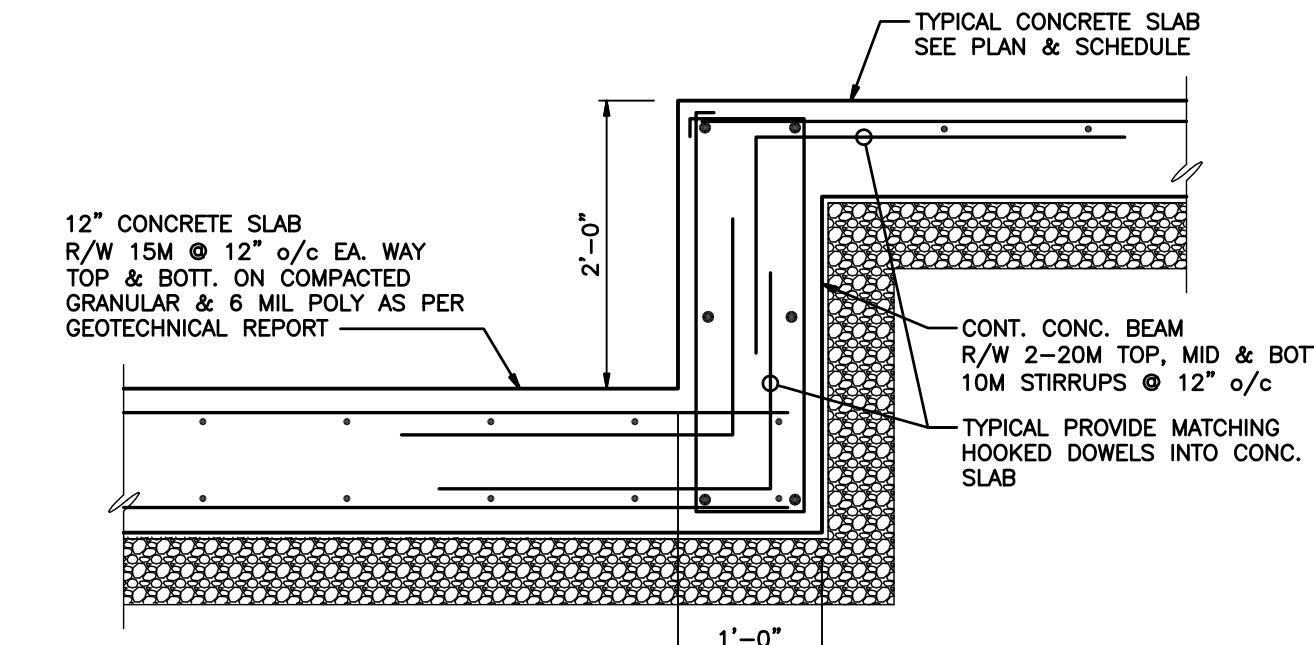
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S-4  
3/4" = 1'-0"



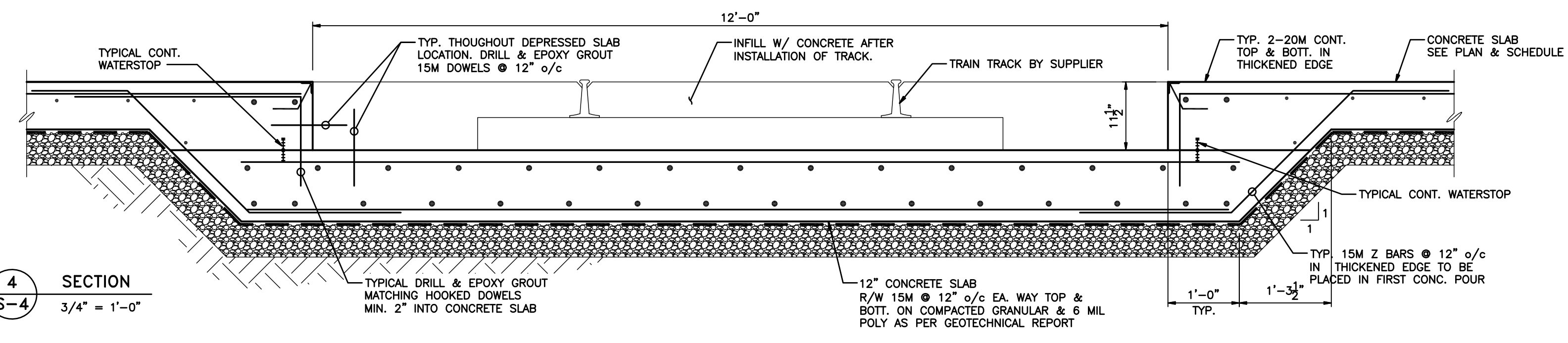
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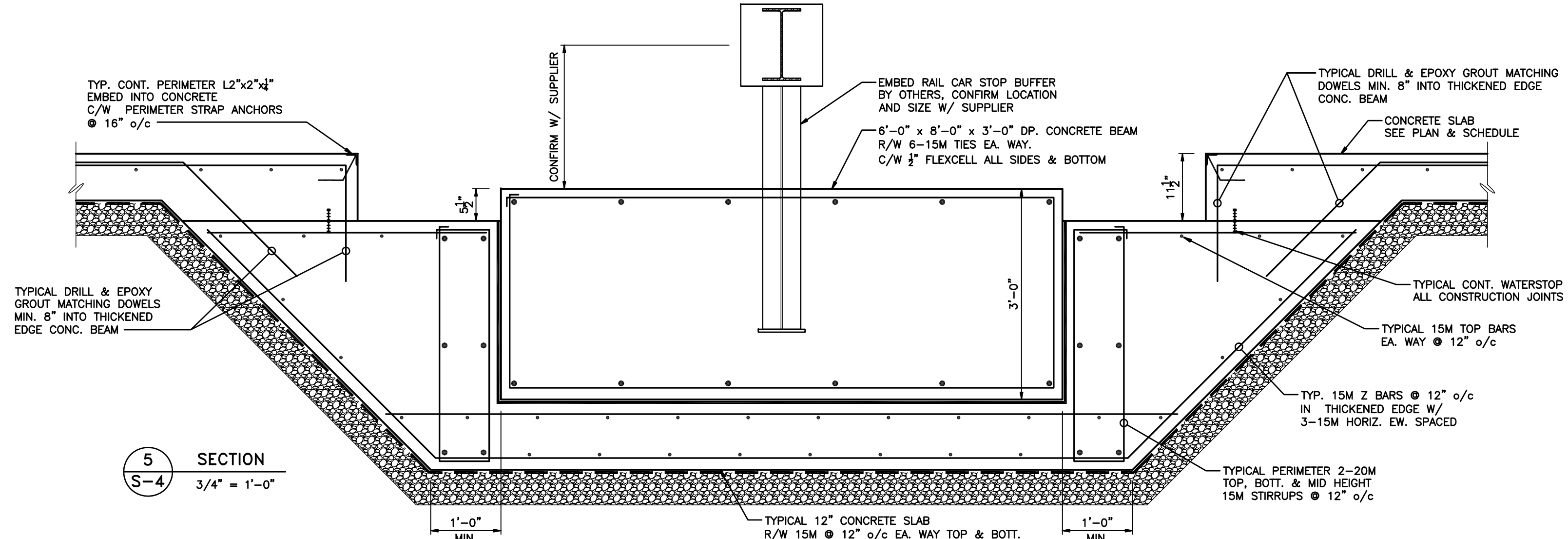
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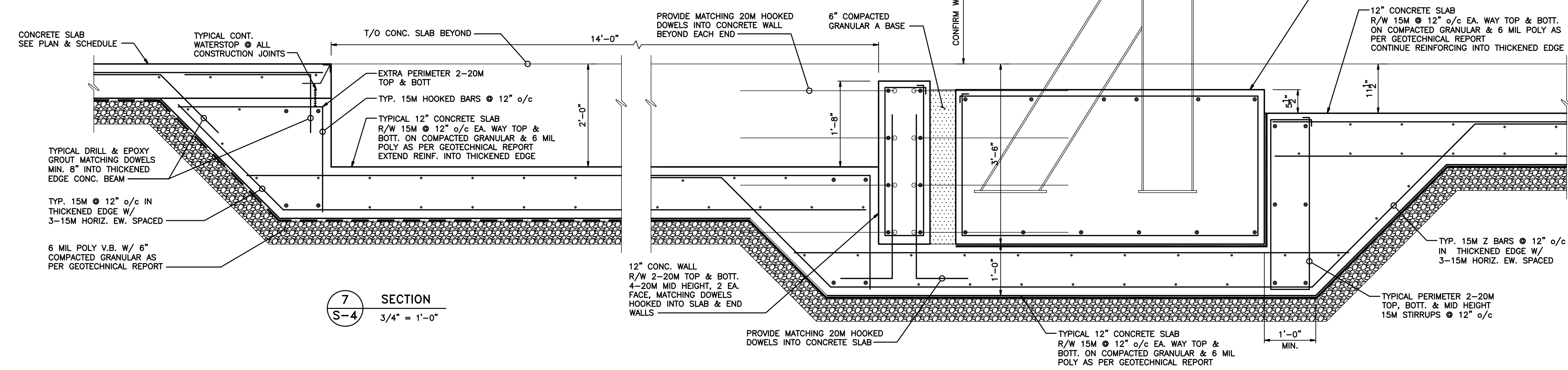
6 SECTION  
S-4  
3/4" = 1'-0"



4 SECTION  
S-4  
3/4" = 1'-0"



5 SECTION  
S-4  
3/4" = 1'-0"

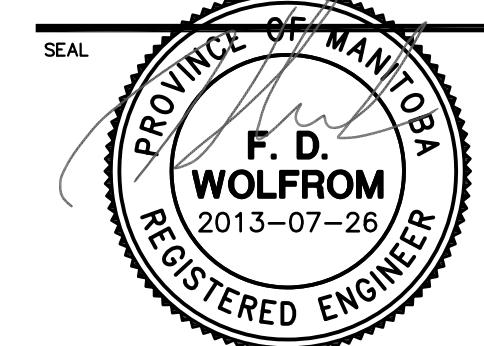


7 SECTION  
S-4  
3/4" = 1'-0"

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2	REVISED TRAIN PIT & BUMPER SECTIONS	JULY 26/13	FDW
1	TRAIN PIT & BUMPER SECTIONS	JULY 11/13	FDW
0	ISSUED FOR CONSTRUCTION	APR. 09/13	FDW
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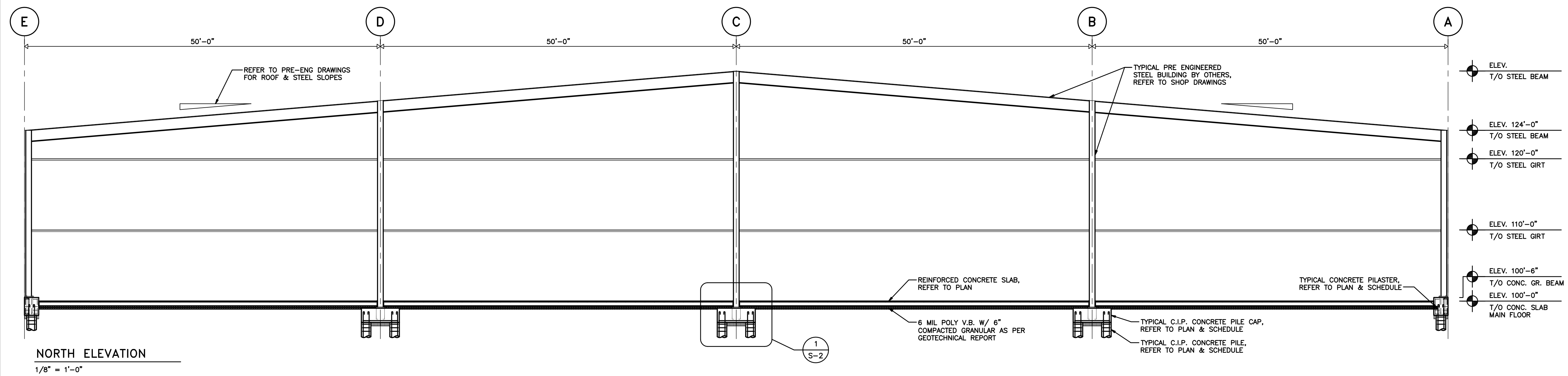
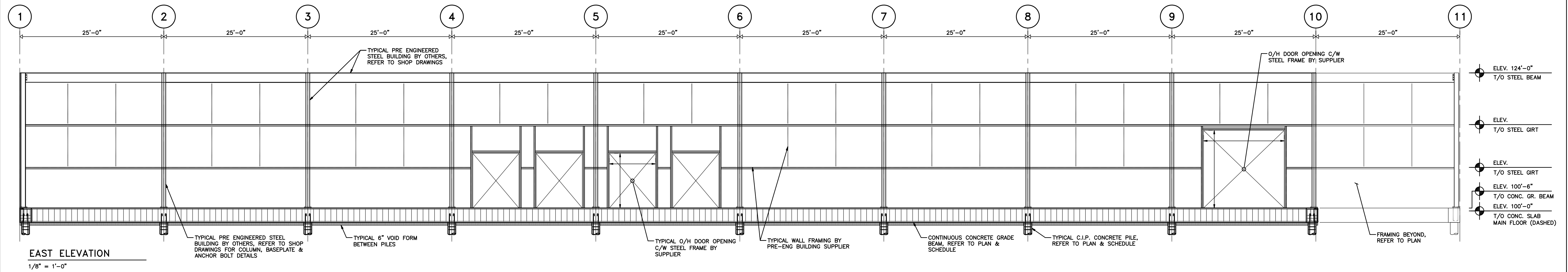
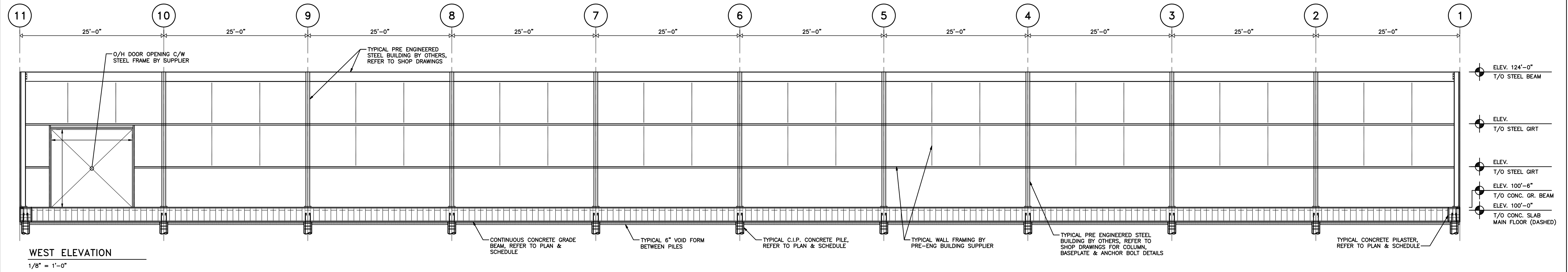
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555 HERVO ST.  
WINNIPEG, MANITOBA

DRAWING TITLE  
**SECTIONS & DETAILS**

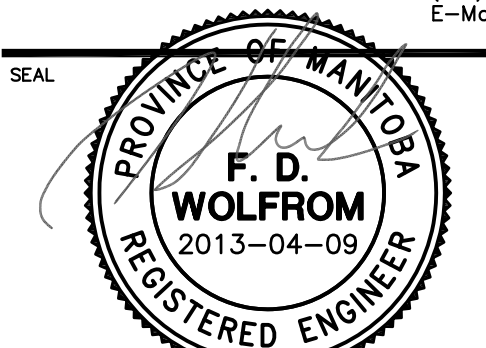
DRAWN BY	SCALE	DRAWING NO.
FILE NO.	DATE	<b>S-4</b>
W13034	FEB. 2013	REVISION NO. 2





0	ISSUED FOR CONSTRUCTION	APR. 09/13	FDW
No.	REVISION	DATE	BY

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JOB TITLE  
**AG CHEMICAL STORAGE**  
555 HERVO ST.  
WINNIPEG, MANITOBA

DRAWING TITLE  
**ELEVATIONS**

DRAWN BY	SCALE	DRAWING NO.
FILE NO.	DATE	<b>S-5</b>
W13034	FEB. 2013	REVISION NO. 0