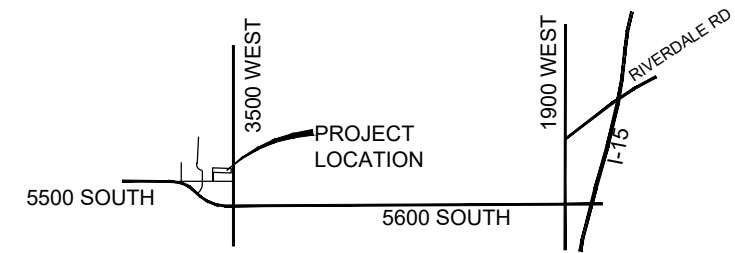


# OVERALL SITE PLAN

## WELL #1 TANK AND PUMP STATION

3500 WEST 5500 SOUTH  
PART OF SECTION 16,  
TOWNSHIP 5, RANGE 2,  
SALT LAKE BASE AND MERIDIAN  
ROY, WEBER, UTAH

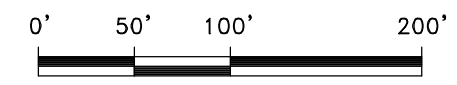
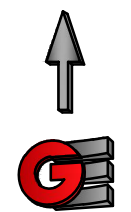
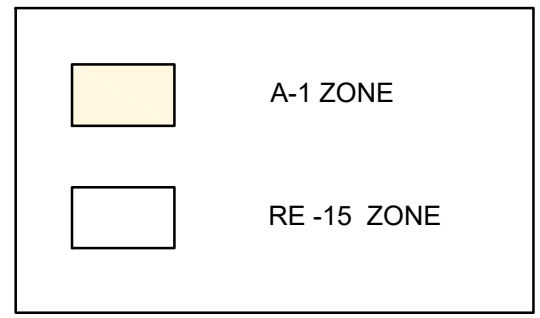


LOCATION MAP

- SHEET INDEX**
- C1 OVERALL SITE PLAN
  - C2 SITE PLAN
  - C3 LANDSCAPE PLAN
  - SW1 SWPPP
  - SW2 SWPPP
  - DT1 PUMP STATION TYPICAL

\*SEE S SHEETS FOR TANK STRUCTURE AND PUMP STATION.

AFFECTED PROPERTY  
15,096 SF (0.347 ACRES)



Scale in Feet  
1" = 100'



R:\0813 - HWID\1701 - Well 1 Tank Pump Station\DESIGN\DWG\Silo Plan.dwg, 4/24/2017 9:16:11 AM

Date:	4-3-17
Scale:	1" = 100'
Designed:	DW
Drafted:	KN
Checked:	RC

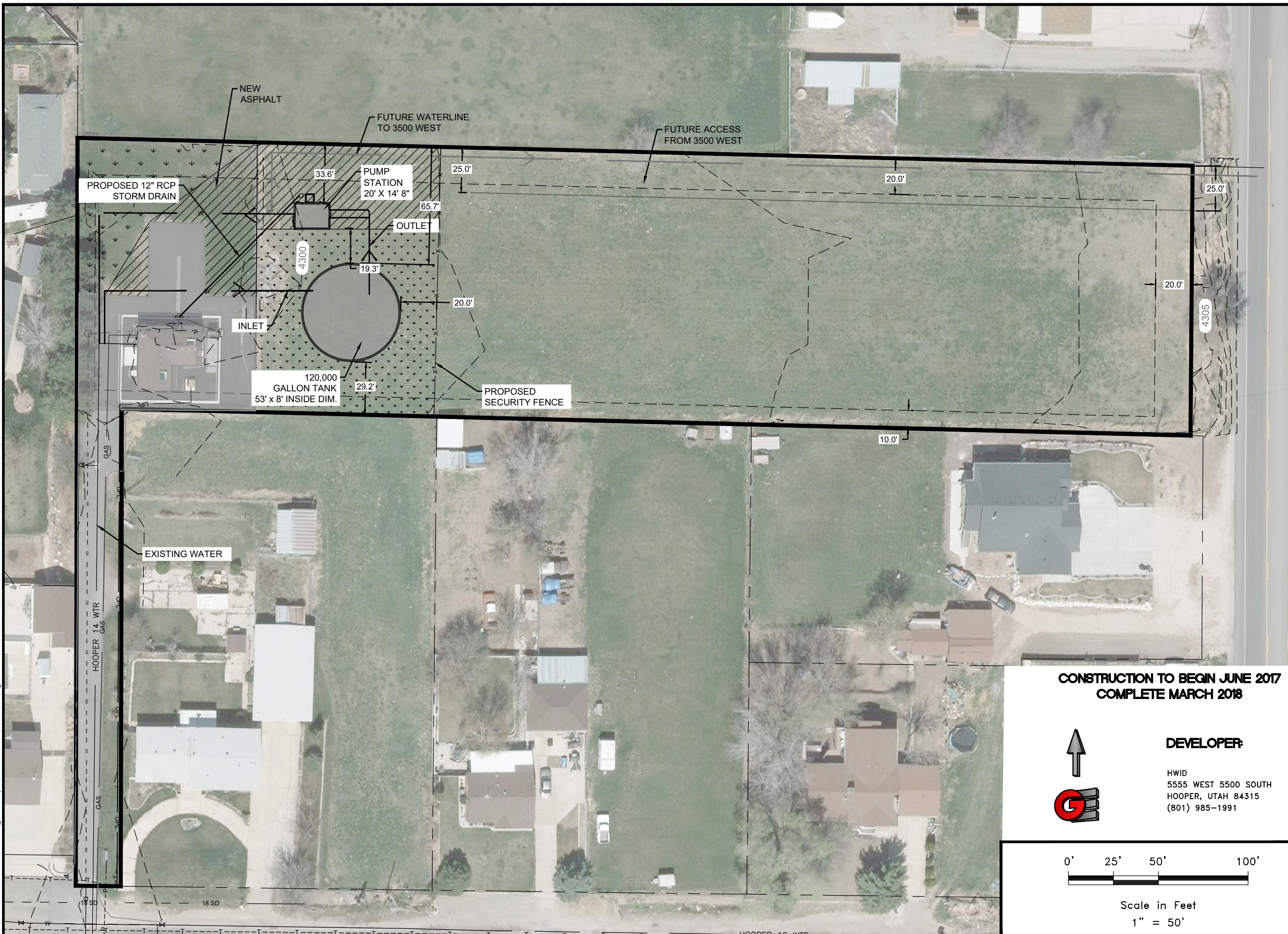
Revisions	Date	Description

**OVERALL SITE PLAN**  
**WELL #1 TANK AND PUMP STATION**  
**3500 WEST 5500 SOUTH**  
**ROY, WEBER, UTAH**

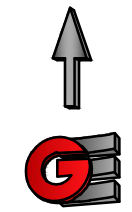
**GARDNER ENGINEERING**  
CIVIL - LAND PLANNING  
MUNICIPAL - LAND SURVEYING  
5150 SOUTH 375 EAST OGDEN, UT  
OFFICE: 801.476.0202 FAX: 801.476.0066



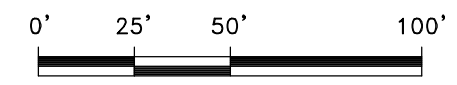
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**CONSTRUCTION TO BEGIN JUNE 2017  
COMPLETE MARCH 2018**



**DEVELOPER:**  
  
HWID  
5555 WEST 5500 SOUTH  
HOOPER, UTAH 84315  
(801) 985-1991



Scale in Feet  
1" = 50'

Revisions	
Date	Description

Date: 4-3-17  
Scale: 1" = 50'  
Designed: DW  
Drafted: KN  
Checked: RC

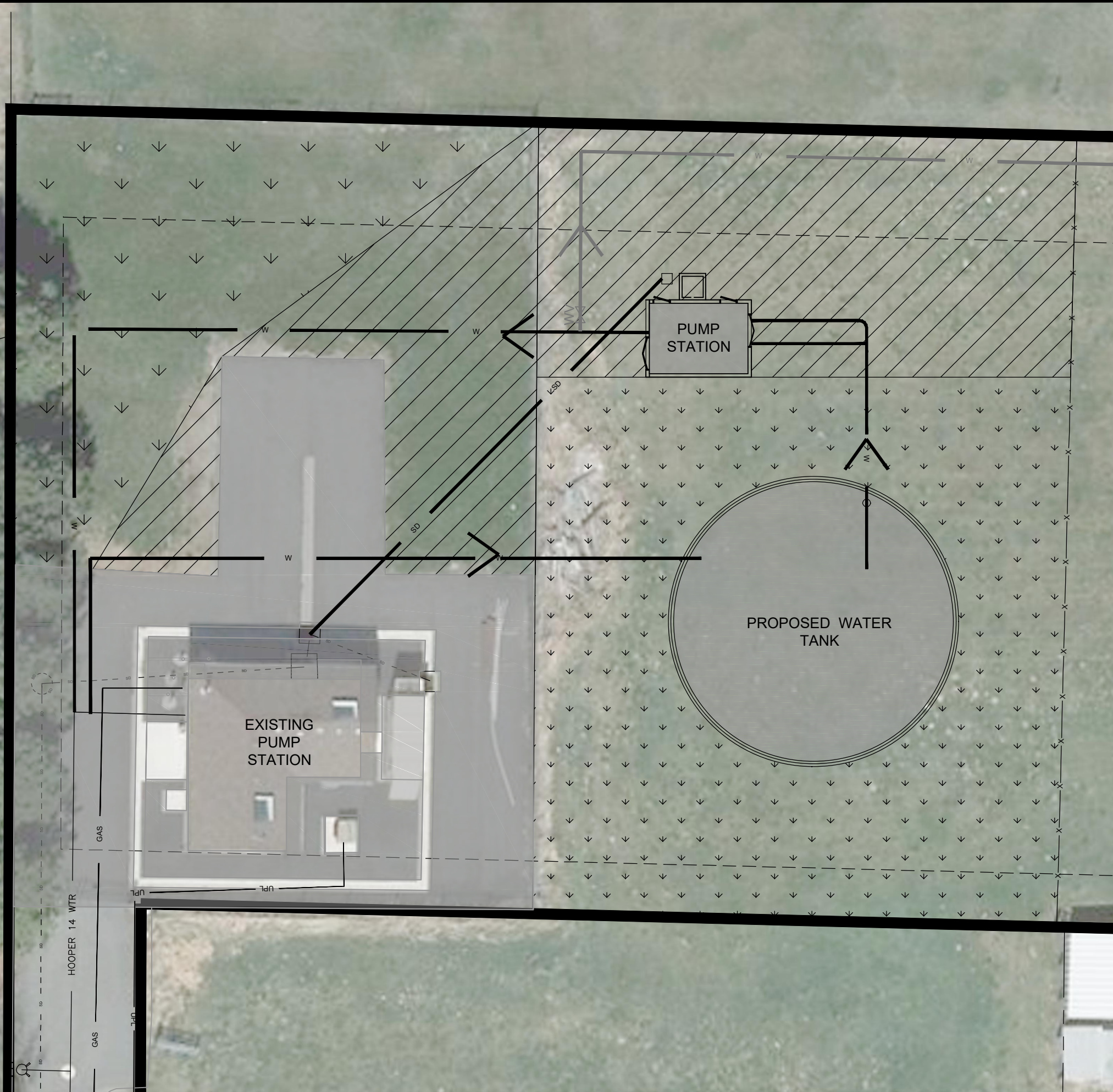
**SITE PLAN**  
**WELL #1 TANK AND PUMP STATION**  
**3500 WEST 5500 SOUTH**  
**ROY, WEBER, UTAH**

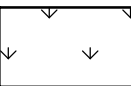
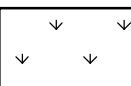


**GARDNER ENGINEERING**  
CIVIL - LAND PLANNING  
MUNICIPAL - LAND SURVEYING  
5150 SOUTH 3725 EAST OGDEN, UT  
OFFICE: 801.476.0202 FAX: 801.476.0066

C2  
2



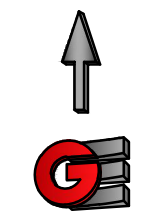
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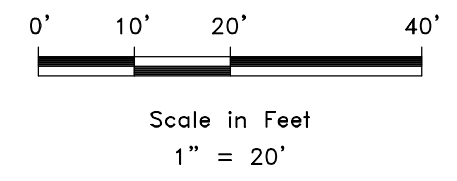
-  EXISTING LANDSCAPE
-  PROPOSED LANDSCAPE (SEE NOTE 1)
-  EXISTING ASPHALT
-  PROPOSED ASPHALT

SITE SUMMARY		
AREA	(sf)	
EXISTING CONCRETE	2,006	6.67%
EXISTING ASPHALT	4,715	15.69%
EXISTING BUILDING	867	2.88%
EXISTING LANDSCAPE	4,355	14.49%
PROPOSED ASPHALT	7,503	24.96%
PROPOSED BUILDING/STRUCTURE	2,669	8.88%
PROPOSED LANDSCAPE	7,943	26.43%
<b>TOTAL AREA</b>	<b>30,058</b>	<b>100.00%</b>

NOTES:  
 1. PROPOSED LANDSCAPE AREA - THE DISTURBED AREA WILL BE RE-SEEDED WITH NATIVE SEED MIX.



**DEVELOPER:**  
 HWID  
 5555 WEST 5500 SOUTH  
 HOOPER, UTAH 84315  
 (801) 985-1991



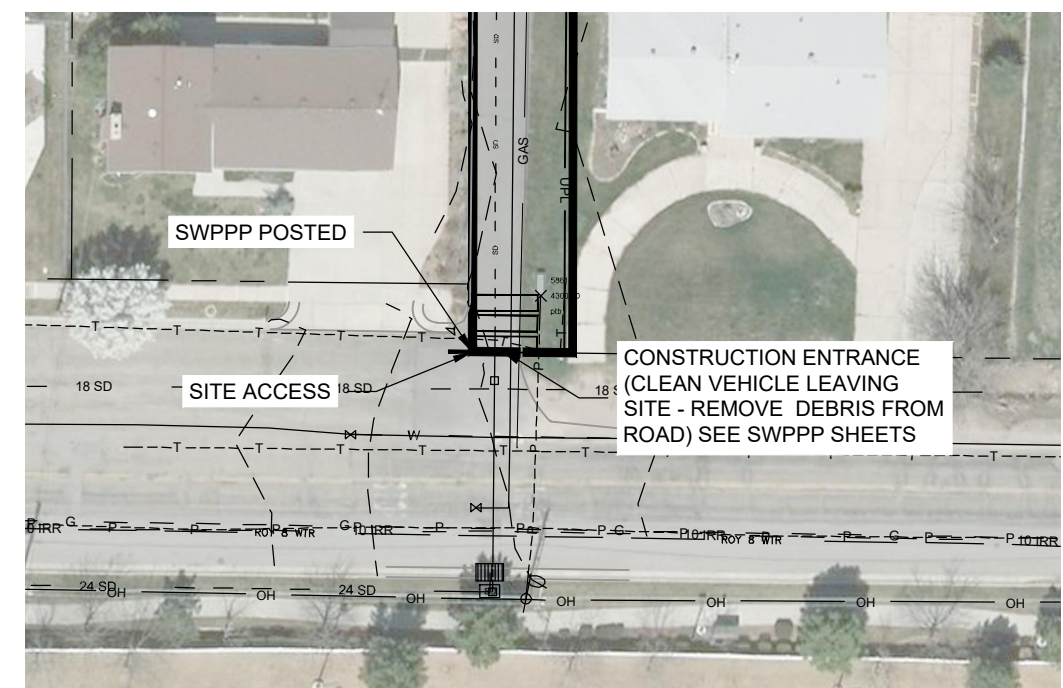
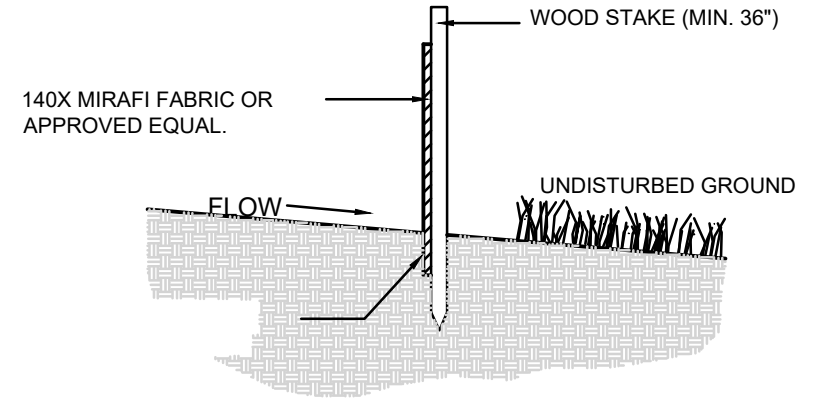
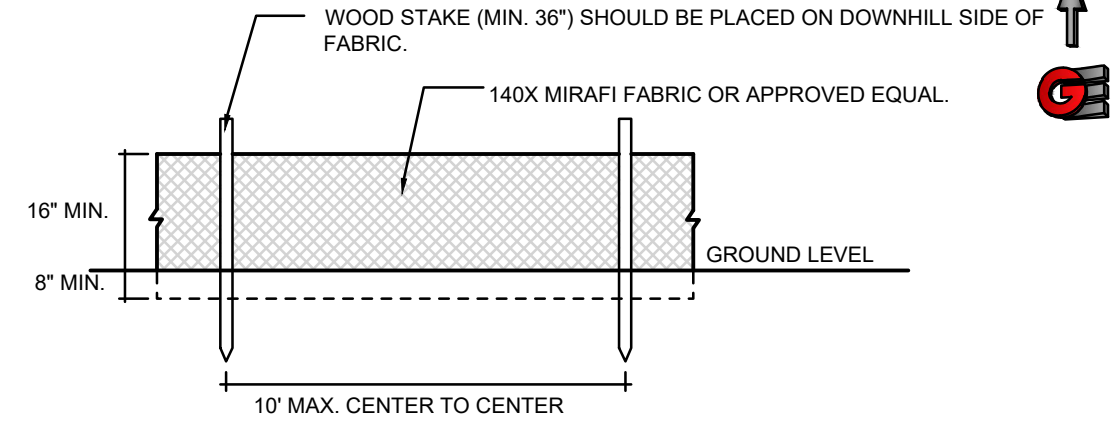
Revisions		Date	Description

Date: 4-3-17  
 Scale: 1" = 20'  
 Designed: DW  
 Drafted: KN  
 Checked: RC

**LANDSCAPE PLAN**  
**WELL #1 TANK AND PUMP STATION**  
**3500 WEST 5500 SOUTH**  
**ROY, WEBER, UTAH**

**GARDNER ENGINEERING**  
 CIVIL - LAND PLANNING  
 MUNICIPAL - LAND SURVEYING  
 5150 SOUTH 375 EAST OGDEN, UT  
 OFFICE: 801.476.0202 FAX: 801.476.0066

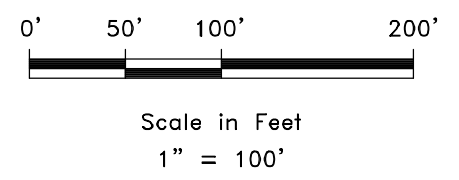




**LEGEND**

————— SILT FENCE

NOTE: ALL CONSTRUCTION TO CONFORM TO WEBER COUNTY STANDARDS AND SPECIFICATIONS.



Date: 4-3-17		Scale: 1" = 100'		Designed: DW		Drafted: KN		Checked: RC	
Revisions	Date	Description							

**SWPPP**  
**WELL #1 TANK AND PUMP STATION**  
**3500 WEST 5500 SOUTH**  
**ROY, WEBER, UTAH**

**GARDNER ENGINEERING**  
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 5150 SOUTH 375 EAST OGDEN, UT  
 OFFICE: 801.476.0202 FAX: 801.476.0066

**SW**  
**1**



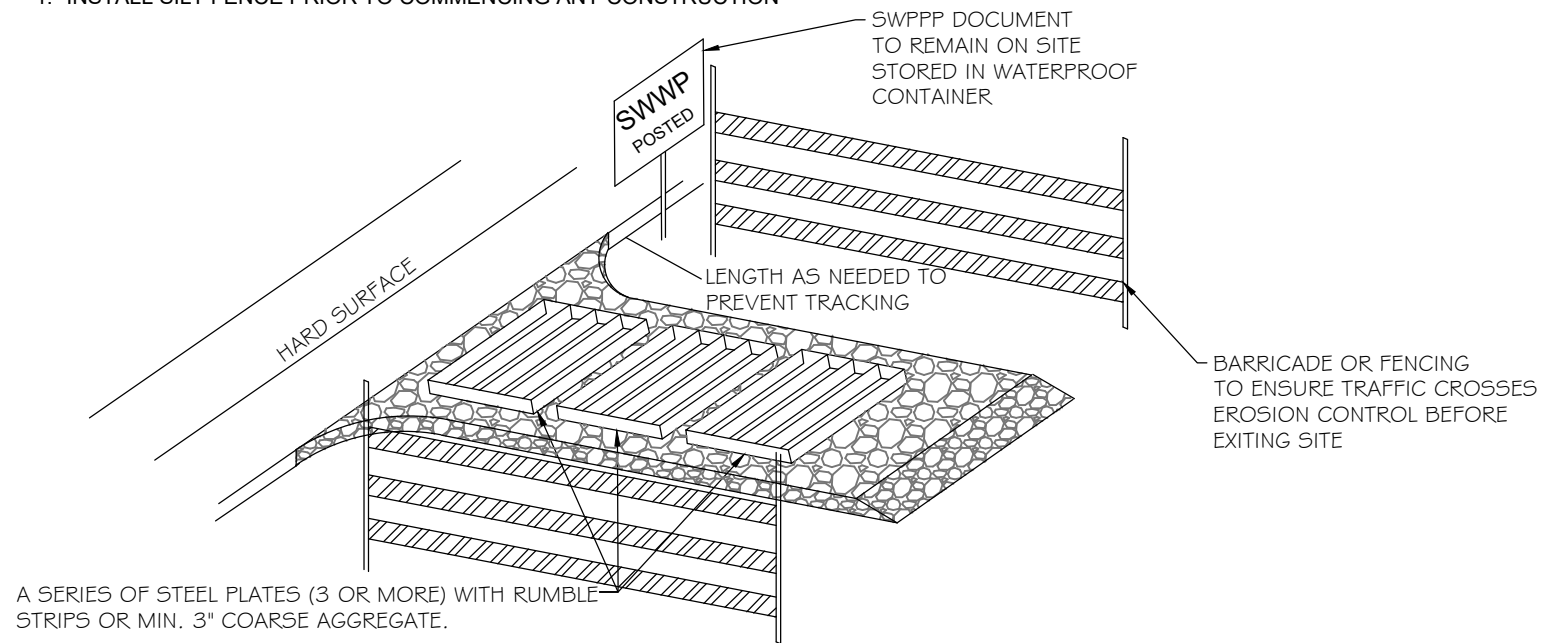
NOTE: ALL CONSTRUCTION TO CONFORM TO WEBER COUNTY STANDARDS AND SPECIFICATIONS.  
INSPECTION TO BE PERFORMED WEEKLY BY A RSI OR OTHER CERTIFIED INSPECTOR.

**STREET MAINTENANCE NOTES:**

1. REMOVE ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS IMMEDIATELY.
2. SWEEP PAVED AREAS THAT RECEIVE CONSTRUCTION TRAFFIC WHENEVER SEDIMENT BECOMES VISIBLE.
3. PAVEMENT WASHING WITH WATER IS PROHIBITED IF IT RESULTS IN A DISCHARGE TO THE STORM DRAIN SYSTEM OR NATURAL WATERWAY.

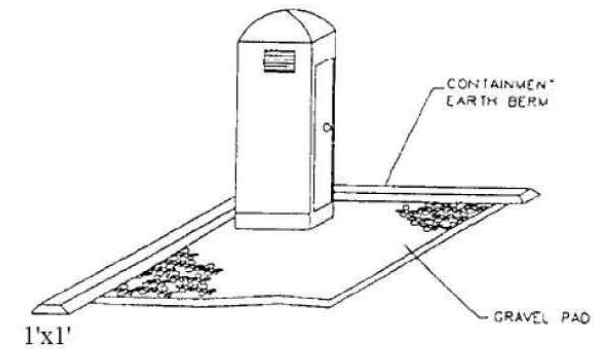
**EROSION CONTROL NOTES:**

1. INSTALL SILT FENCE PRIOR TO COMMENCING ANY CONSTRUCTION



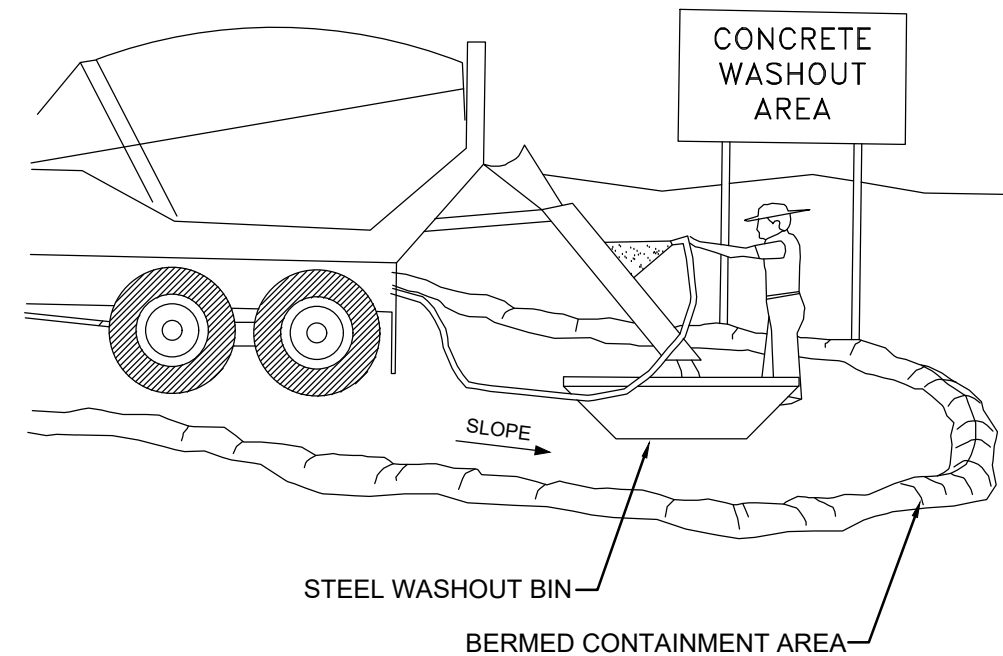
**ENTRANCE STABILIZATION NOTES:**

1. SEDIMENTS AND OTHER MATERIALS SHALL NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS SHALL BE STABILIZED SO AS TO PREVENT SEDIMENTS FROM BEING DEPOSITED INTO THE STORM DRAIN SYSTEMS. DEPOSITIONS MUST BE SWEEPED UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS INTO THE STORM DRAIN SYSTEM.
2. STABILIZED CONSTRUCTION ENTRANCE SHALL BE:
  - a. LOCATED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE TO OR FROM A HARD DRIVING SURFACE.
  - b. A SERIES OF STEEL PLATES WITH "RUMBLE STRIPS", AND/OR MIN. 3" COARSE AGGREGATE WITH LENGTH, WIDTH AND THICKNESS AS NEEDED TO ADEQUATELY PREVENT ANY TRACKING ONTO PAVED SURFACES.
3. ADDING A WASH RACK WITH A SEDIMENT TRAP LARGE ENOUGH TO COLLECT ALL WASH WATER CAN GREATLY IMPROVE EFFICIENCY.
4. ALL VEHICLES ACCESSING THE CONSTRUCTION SITE SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE SITES.



**TEMPORARY ON-SITE FACILITIES (PORTA-POTTY) NOTES:**

1. PREPARE LEVEL, GRAVEL SURFACE AND PROVIDE CLEAR ACCESS TO THE TOILETS FOR SERVICING AND FOR ON-SITE PERSONNEL.
2. CONSTRUCT EARTH BERM PERIMETER, CONTROL FOR SPILL/PROTECTION LEAK.
3. STAKE PORTA-POTTY TO GROUND TO PREVENT TIP OVER.



**CONCRETE WASTE MANAGEMENT NOTES:**

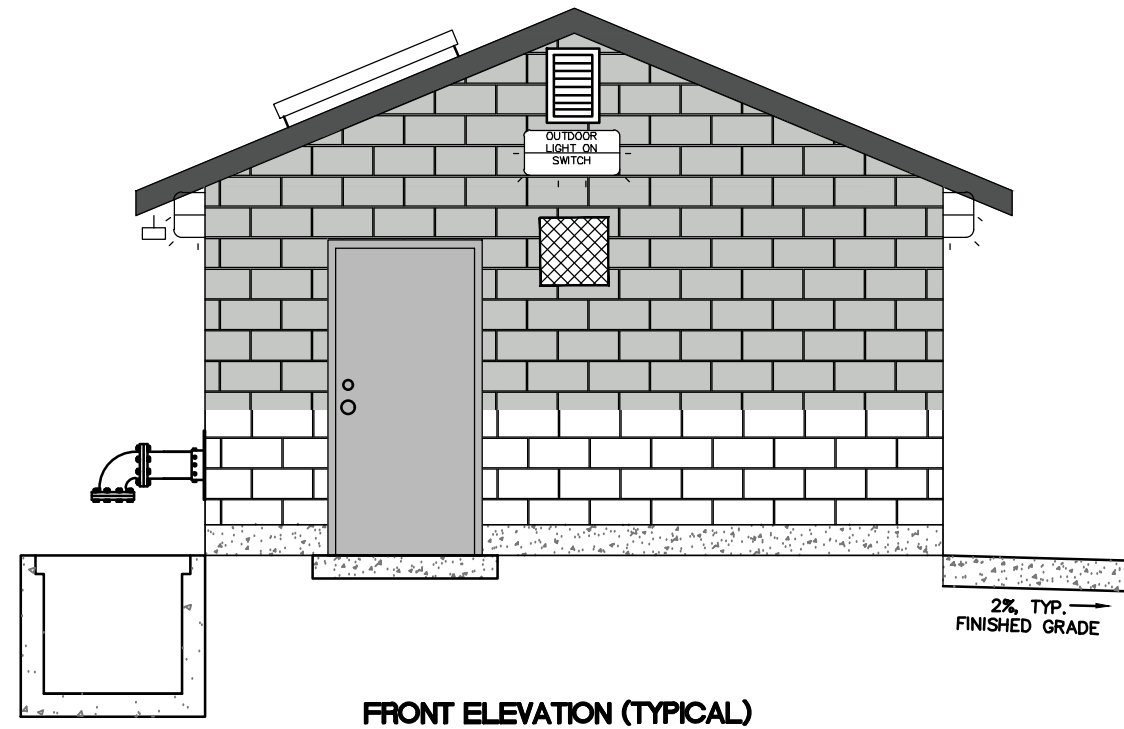
1. EXCESS AND WASTE CONCRETE SHALL BE DISPOSED OF OFF SITE OR AT DESIGNATED AREAS ONLY.
2. EXCESS AND WASTE CONCRETE SHALL NOT BE WASHED INTO THE STREET OR INTO A DRAINAGE SYSTEM.
3. FOR WASHOUT OF CONCRETE AND MORTAR PRODUCTS ONSITE, A DESIGNATED CONTAINMENT FACILITY OF SUFFICIENT CAPACITY TO RETAIN LIQUID AND SOLID WASTE SHALL BE PROVIDED.
4. ONSITE CONCRETE WASHOUT CONTAINMENT FACILITY SHALL BE A STEEL BIN OR APPROVED ALTERNATE.
5. SLURRY FROM CONCRETE AND ASPHALT SAW CUTTING SHALL BE VACUUMED OR CONTAINED, DRIED, PICKED UP AND DISPOSED OF PROPERLY.
6. CONCRETE WASH OUT TO BE EMPTIED WHEN IT REACHES 1/2 CAPACITY.

Date:	4-3-17
Scale:	#####
Designed:	DW
Drafted:	KN
Checked:	RC

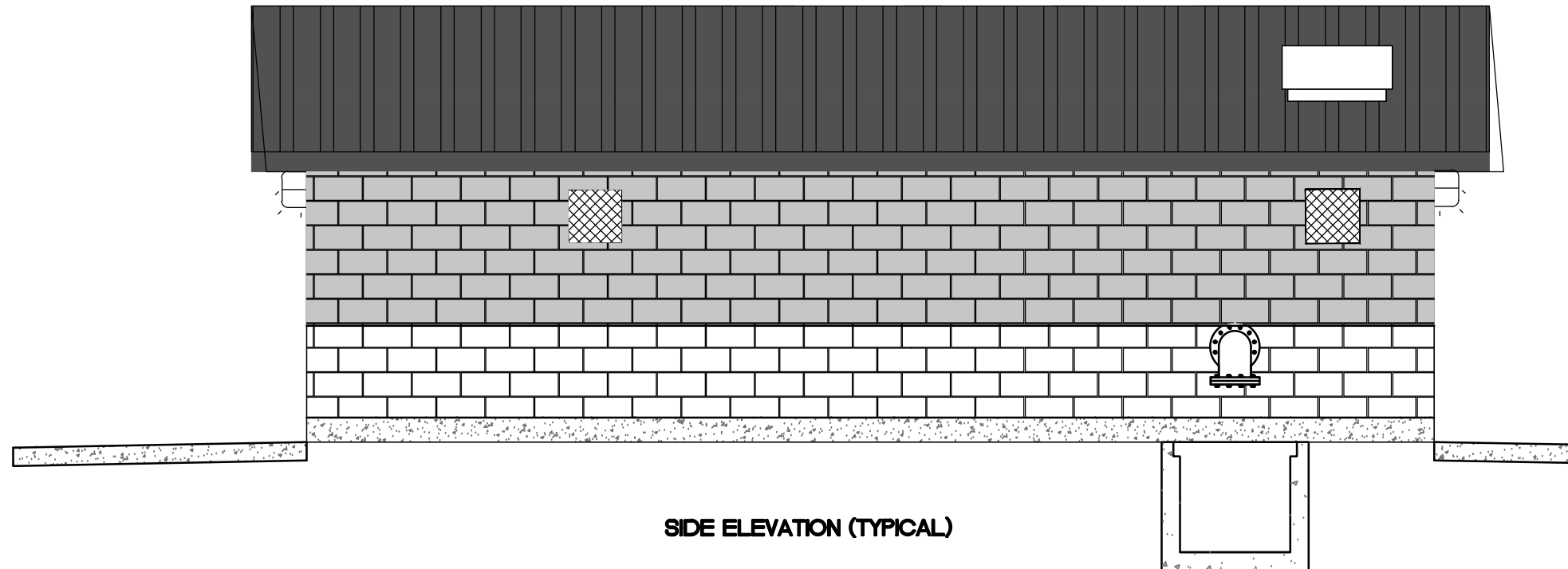
Revisions	Description
Date	

<b>SWPPP DETAILS</b>
WELL #1 TANK AND PUMP STATION
3500 WEST 5500 SOUTH
ROY, WEBER, UTAH

**GARDNER ENGINEERING**  
CIVIL - LAND PLANNING  
MUNICIPAL - LAND SURVEYING  
5150 SOUTH 375 EAST OGDEN, UT  
OFFICE: 801.476.0202 FAX: 801.476.0066



EXISTING WELL HOUSE DURING CONSTRUCTION  
(NEW PUMP STATION TO BE FINISHED SIMILAR TO EX WELL HOUSE)



**NOTE:**  
THE BOTTOM 6 COURSES OF BLOCK SHALL BE SPLIT FACE AND THE REMAINDER SHALL BE STANDARD 8X16 BLOCKS, ALL BLOCK, ROOFING, GABLE SIDING, ETC. SHALL MATCH THE EXISTING BUILDING, SUBMIT SAMPLES TO ENGINEER FOR APPROVAL PRIOR TO PURCHASE OF VISIBLE EXTERIOR MATERIALS.

Date: 4-3-17  
Scale:  
Designed: DW  
Drafted: KN  
Checked: RC

Revisions	Date	Description

**PUMP STATION**  
WELL #1 TANK AND PUMP STATION  
3500 WEST 5500 SOUTH  
ROY, WEBER, UTAH

**GARDNER ENGINEERING**  
CIVIL - LAND PLANNING  
MUNICIPAL - LAND SURVEYING  
5150 SOUTH 375 EAST OGDEN, UT  
OFFICE: 801.476.0202 FAX: 801.476.0066

**STRUCTURAL NOTES :**

**A. GENERAL**

1. THE STRUCTURAL NOTES ARE INTENDED TO COMPLEMENT THE PROJECT SPECIFICATIONS WHICH ARE PART OF THE CONSTRUCTION DOCUMENTS. SPECIFIC NOTES AND DETAILS ON THE DRAWINGS SHALL GOVERN OVER THE STRUCTURAL NOTES AND TYPICAL DETAILS.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE. IF ACTUAL CONDITIONS DIFFER FROM THOSE SHOWN ON CONTRACT DOCUMENTS, CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO FABRICATION OR CONSTRUCTION OF ANY AFFECTED ELEMENTS.
3. ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND/OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH ANY WORK INVOLVED. IN CASE OF CONFLICT, FOLLOW THE MOST STRINGENT REQUIREMENT AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
4. OBSERVATION VISITS TO THE SITE BY ARW ENGINEERS FIELD REPRESENTATIVES SHALL NEITHER BE CONSTRUED AS INSPECTION NOR APPROVAL OF CONSTRUCTION.
5. SEE SPECIFICATIONS FOR REQUIRED SUBMITTALS. SUBMITTALS SHALL BE MADE IN A TIMELY MANNER AS INDICATED IN SPECIFICATIONS. REVIEW OF SUBMITTALS BY ARW ENGINEERS IS FOR GENERAL COMPLIANCE ONLY AND IS NOT INTENDED AS APPROVAL. SUBMITTALS WHICH ARE UNCLEAR OR DIFFICULT TO READ SHALL BE REJECTED.
6. DURING AND AFTER CONSTRUCTION, BUILDER AND/OR OWNER SHALL KEEP LOADS ON STRUCTURE WITHIN THE LIMITS OF DESIGN LOADS.
7. TYPICAL DETAILS AND SECTIONS SHALL APPLY WHERE SPECIFIC DETAILS ARE NOT SHOWN.
8. THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH ANY CHANGES, MODIFICATIONS OR SUBSTITUTIONS.
9. THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY SHORING AND BRACING FOR ALL STRUCTURAL ELEMENTS UNTIL THE ENTIRE STRUCTURAL SYSTEM IS COMPLETED. CONTRACTOR IS RESPONSIBLE FOR DESIGN OF ALL SHORING.
10. THE CONTRACTOR SHALL COORDINATE AND VERIFY ALL LOCATIONS AND SIZES OF MECHANICAL EQUIPMENT OR OTHER EQUIPMENT BEFORE FABRICATING AND ERECTING STRUCTURAL ELEMENTS.

**B. SPECIAL INSPECTIONS**

1. SPECIAL INSPECTION OF ALL CONCRETE SHALL BE PROVIDED BY AN INDEPENDENT AGENCY EMPLOYED AS OUTLINED IN THE SPECIFICATIONS. CONTRACTOR SHALL COORDINATE AND COOPERATE WITH REQUIRED INSPECTIONS.

**C. BASIS OF DESIGN**

1. GOVERNING BUILDING CODE : ACI 318 / ACI 350 / ACI 350.3
- a. SNOW LOAD = 43 PSF (USE 100 PSF)
- b. MAXIMUM SOIL OVER COVER = NONE

**D. FOUNDATION**

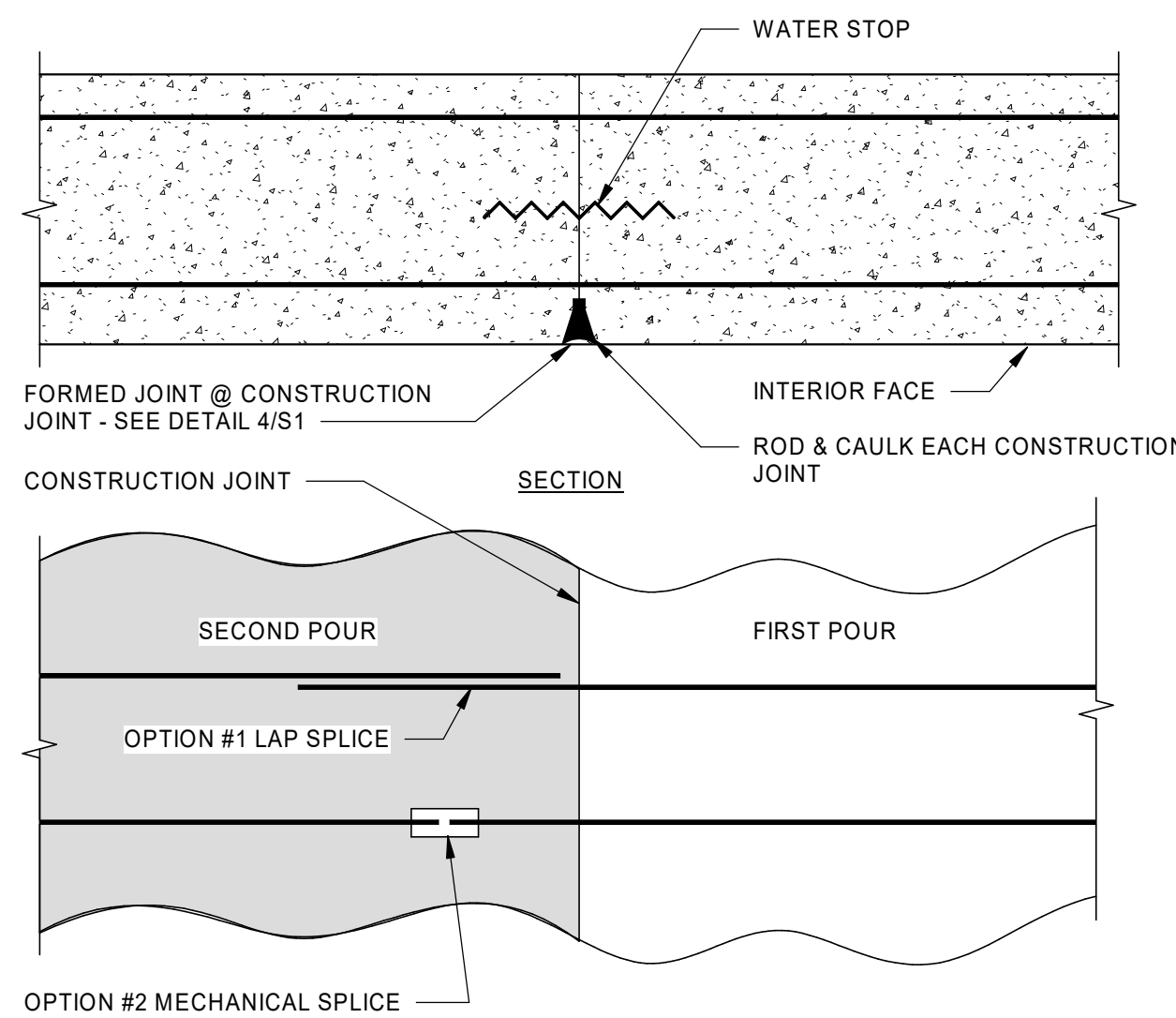
1. DESIGN SOIL PRESSURE : 2,000 PSF
2. SOILS REPORT BY : CMT  
REPORT # : 8408  
DATED : MARCH 7, 2017
3. SOIL PREPARATION UNDER FOOTINGS AND SLABS-ON-GRADE SHALL BE IN ACCORDANCE WITH THE SOILS REPORT.
4. UNLESS NOTED OTHERWISE, ALL FOOTINGS AT COLUMNS TO BE CENTERED BELOW COLUMNS

**E. CONCRETE**

1. ALL CONCRETE SHALL HAVE A DESIGN 28-DAY COMPRESSIVE STRENGTH AS FOLLOWS :  
a. FOOTINGS, SLAB ON GRADE, COLUMNS, WALLS, AND ROOF SLAB : 4500psi  
b. ALL CONCRETE SHALL HAVE AN AIR CONTENT OF 5% AND MAXIMUM WATER / CEMENT RATIO OF 0.40
2. NO PIPES, DUCTS, SLEEVES, ETC. SHALL BE PLACED IN STRUCTURAL CONCRETE UNLESS SPECIFICALLY DETAILED OR APPROVED BY STRUCTURAL ENGINEER. NO ALUMINUM PRODUCTS SHALL BE EMBEDDED IN CONCRETE. PENETRATIONS THRU WALLS WHEN APPROVED SHALL BE BUILT INTO THE WALL PRIOR TO PLACEMENT OF CONCRETE. REFER TO OTHER (CIVIL, ETC.) DRAWINGS FOR EXTENT AND LOCATION OF DEPRESSIONS, CURBS, RAMPS, ETC..
3. AROUND OPENINGS IN SUSPENDED CONCRETE SLABS, ADD REINFORCING BARS EQUIVALENT TO BARS CUT BY OPENING WITH HALF ON EACH SIDE OF OPENING. BARS SHALL RUN FULL LENGTH OF SPAN. SEE DETAIL 3/S1
4. CONSTRUCTION JOINTS NOT SHOWN ON THE PLANS SHALL BE MADE AND LOCATED SO AS TO NOT IMPAIR THE STRENGTH OF THE STRUCTURE AND AS APPROVED BY THE STRUCTURAL ENGINEER. PROVIDE WATERSTOP IN ALL VERTICAL AND HORIZONTAL JOINTS. ALL STEEL REINFORCING SHALL BE CONTINUOUS THROUGH COLD JOINTS, WITH LAP SPLICES AS INDICATED, UNLESS NOTED OTHERWISE.
6. SEE PROJECT SPECIFICATION FOR WATERPROOFING ADMIXTURE.

**F. REINFORCING STEEL**

1. ALL REINFORCING BARS SHALL CONFORM TO ASTM STANDARD A-615 GRADE 60 ADEQUATELY TIE AND SUPPORT ALL REINFORCING STEEL AS SPECIFIED BY ACI 315, TO MAINTAIN EXACT REQUIRED POSITION. ALL FIELD BENT DOWELS SHALL BE GRADE 40 WITH SPACINGS INDICATED REDUCED BY 1/3.
2. REINFORCEMENT SHALL HAVE THE FOLLOWING CONCRETE COVERAGE:  
a. CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH ..... 3"  
b. EXPOSED TO EARTH, WATER OR WEATHER:  
1. #6 & LARGER ..... 2"  
2. #5 & SMALLER ..... 2" (1 3/4" FOR #3 COLUMN TIES)  
c. SLAB ON GRADE  
1. PLACE REINFORCING AT CENTER OF SLAB UNLESS INDICATED OTHERWISE.
3. EXCEPT WHERE NOTED, CONTINUOUS REINFORCEMENT SHALL BE SPLICED WITH LAP SPLICES AT POINTS OF MINIMUM STRESS AS FOLLOWS:  
a. IN RESERVOIR WALLS. SEE DETAILS 1/S1, 2/S1 AND 1/S4.  
b. IN COLUMNS, USE 3/8 INCH LAP  
c. IN SUSPENDED SLAB, USE 48 BAR DIAMETER LAP AND STAGGER ADJACENT BAR SPLICES 24" MIN.  
d. IN SLAB-ON-GRADE, USE 30 BAR DIAMETER LAP.
4. ALL VERTICAL REINFORCING SHALL BE DOWELED TO FOOTINGS OR STRUCTURE BELOW WITH DOWELS TO MATCH. SPLICE LENGTHS SHALL COMPLY WITH NOTE F.3. DOWELS INTO FOOTINGS SHALL TERMINATE WITH A STANDARD HOOK, AND SHALL EXTEND TO WITHIN 4" OF THE BOTTOM OF THE FOOTING, BUT NOT MORE THAN 14" INTO FOOTING. SEE DETAILS FOR REQD. EMBEDMENT OR DOWELS.
5. DO NOT WELD REINFORCING.

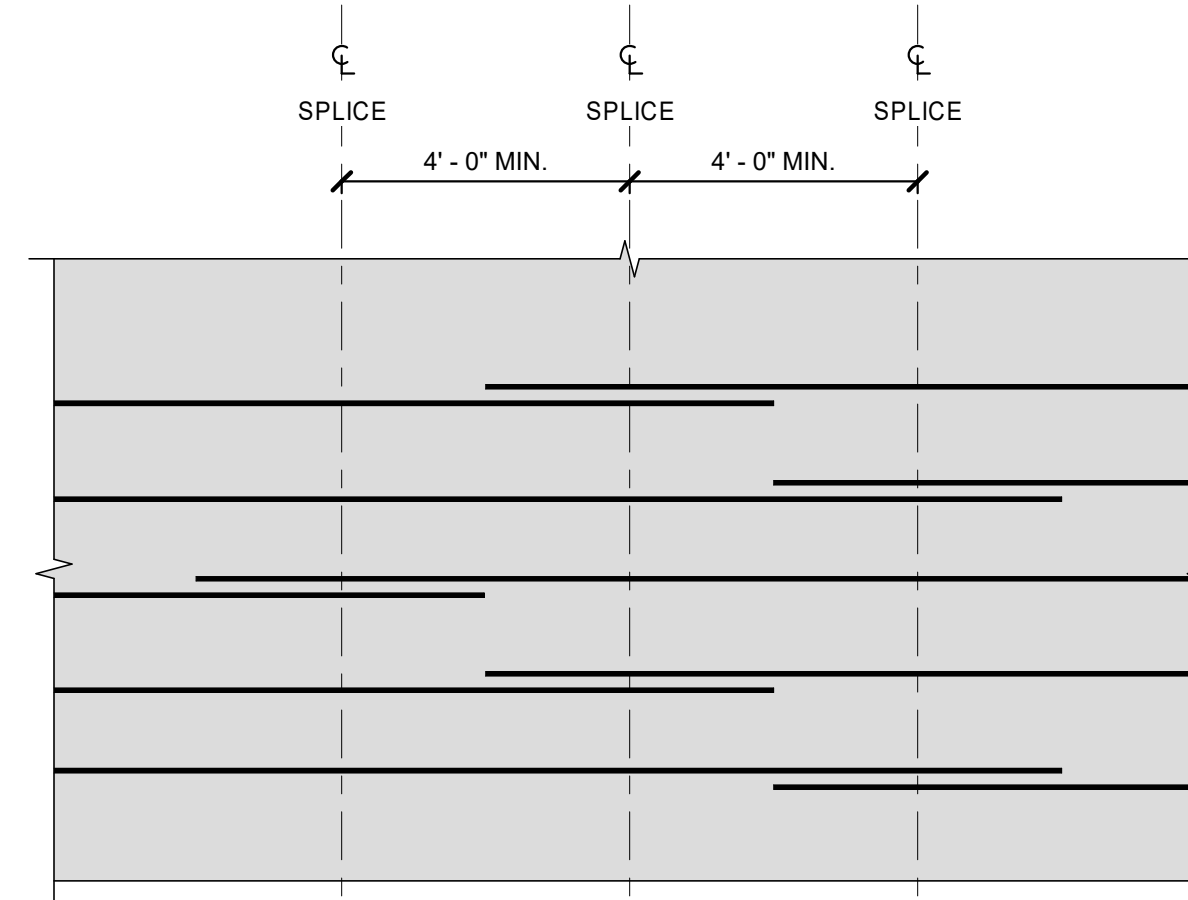


NOTES:  
1. FOR OPTION #1 - SPLICE LENGTHS ARE  
a. #5 BARS - 39"  
b. #6 BARS - 46"  
2. FOR OPTION #2 - USE MECHANICAL CONNECTORS WHICH ACHIEVE 125% OF THE STRENGTH OF THE BARS BEING SPLICED. SUBMIT A CURRENT ICC RESEARCH REPORT FOR APPROVAL PRIOR TO CONSTRUCTION.

**TYPICAL CONST. JOINT IN WALL DETAIL**

SCALE : NONE

1  
S1



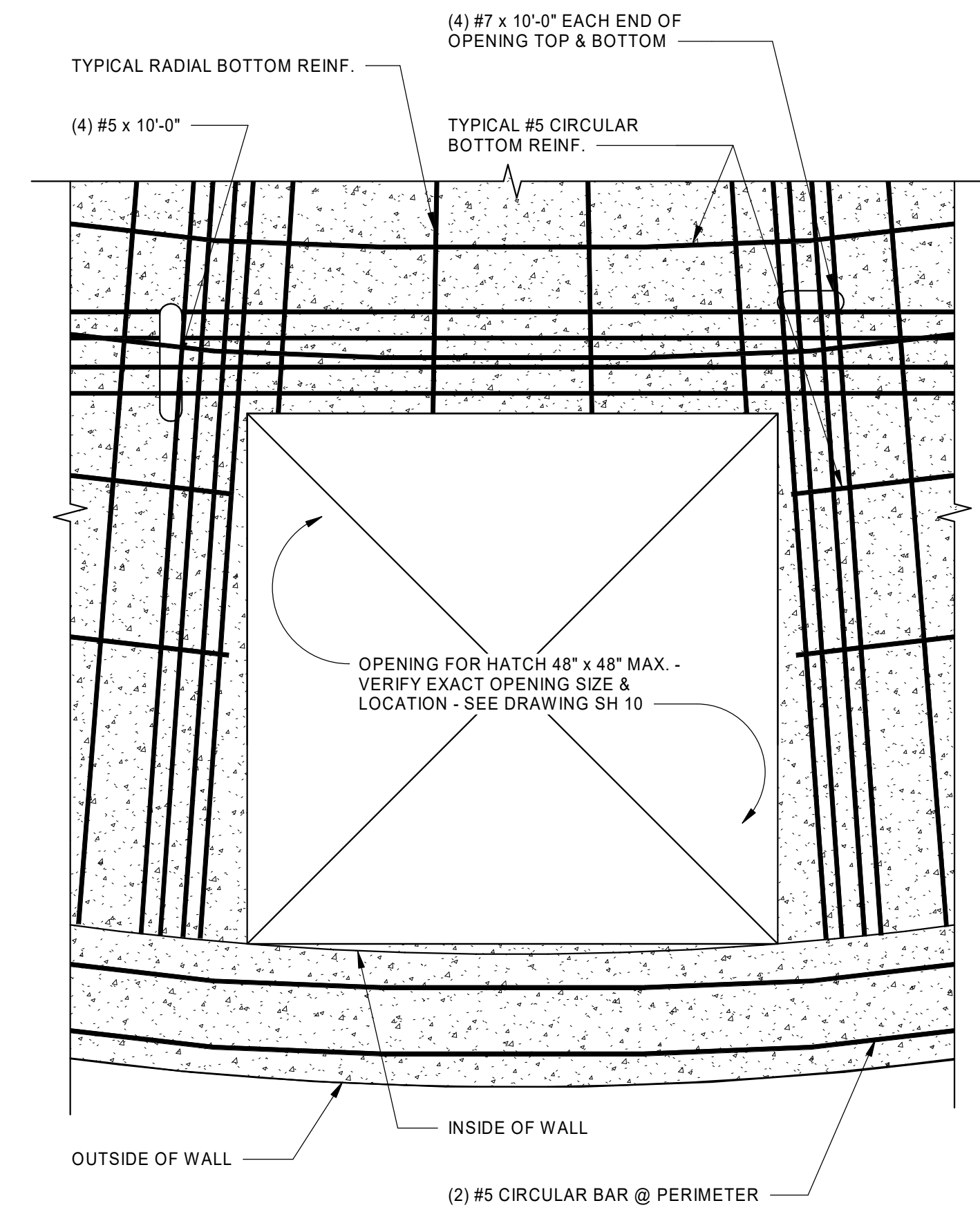
NOTES:  
SPLICES MAY NOT COINCIDE VERTICALLY MORE FREQUENTLY THAN EVERY THIRD BAR.

SPLICE LENGTHS  
#5 BARS - 39"  
#6 BARS - 46"

**TYPICAL REINF. BAR SPLICE DETAIL**

SCALE : NONE

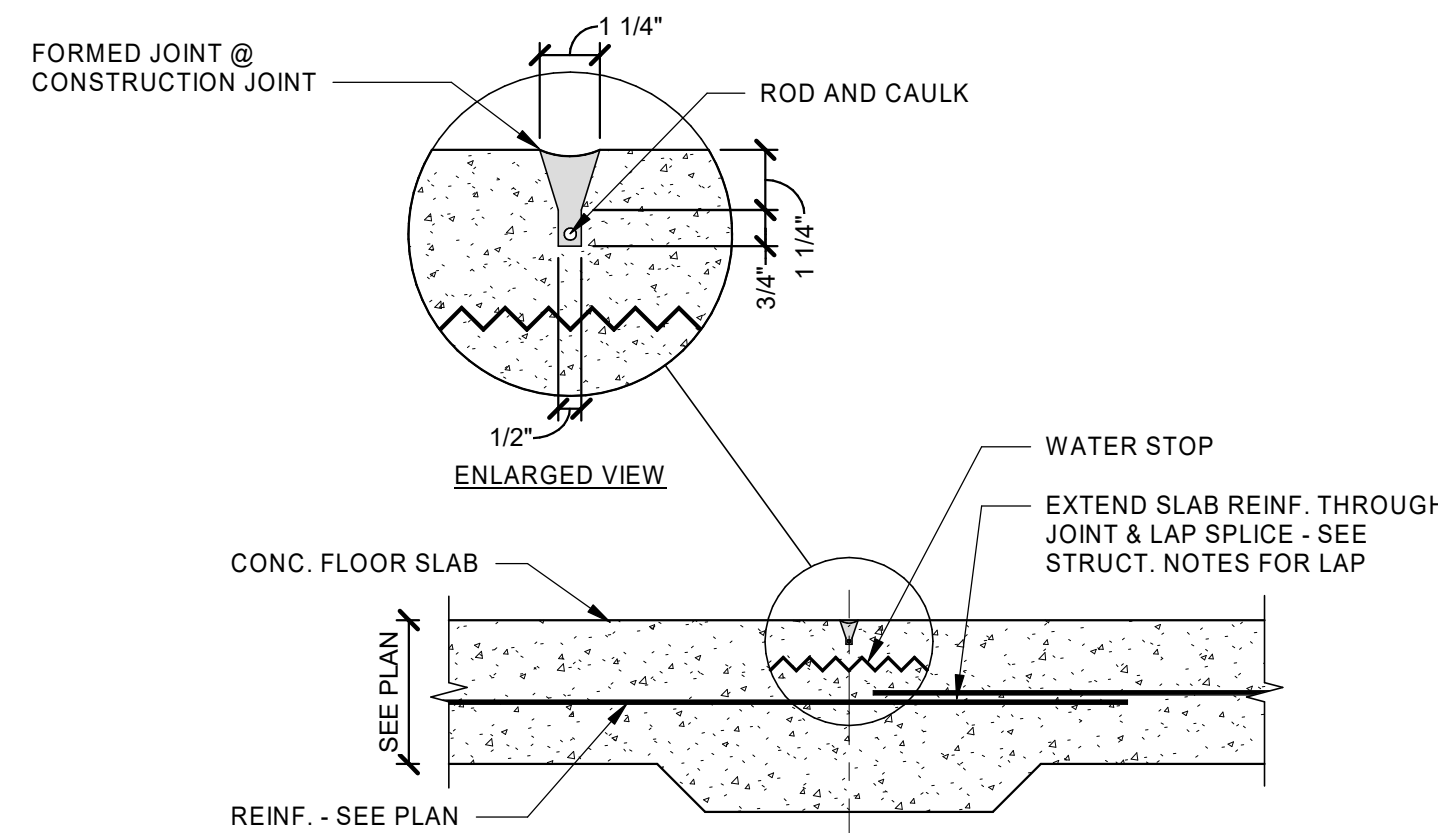
2  
S1



**TYPICAL HATCH OPENING**

SCALE : NONE

3  
S1

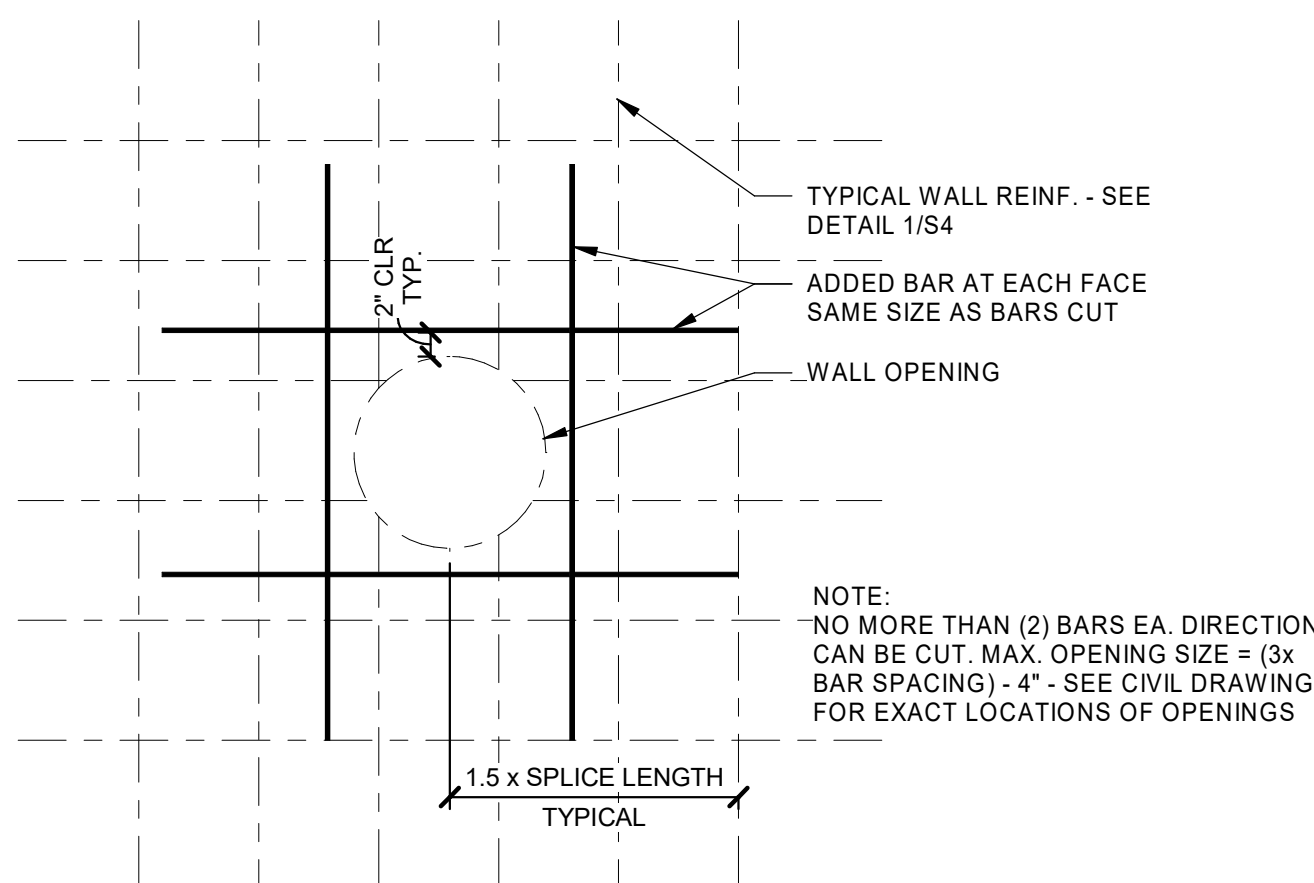


NOTE:  
IT IS NOT ANTICIPATED THAT THIS DETAIL WILL BE REQD. IT IS ONLY PROVIDED TO GIVE THE CONTRACTOR THE OPTION OF POURING THE FLOOR WITH MULTIPLE POURS

**TYP. CONST. JOINT IN FLOOR SLAB DETAIL**

SCALE : NONE

4  
S1



NOTE:  
NO MORE THAN (2) BARS EA. DIRECTION CAN BE CUT. MAX. OPENING SIZE = (3x BAR SPACING) - 4" - SEE CIVIL DRAWINGS FOR EXACT LOCATIONS OF OPENINGS

**TYPICAL WALL OPENING DETAIL**

SCALE : NONE

5  
S1

Date	3/13/15
Engineer	ZCH
Drawn By	ZWT
Checked By	DLP
ARW Project No.	17022

REVISION	DESCRIPTION

**STRUCTURAL NOTES & SCHEDULES**  
WELL #1 TANK AND PUMP STATION  
**3500 WEST 5500 SOUTH**  
ROY, WEBER, UTAH

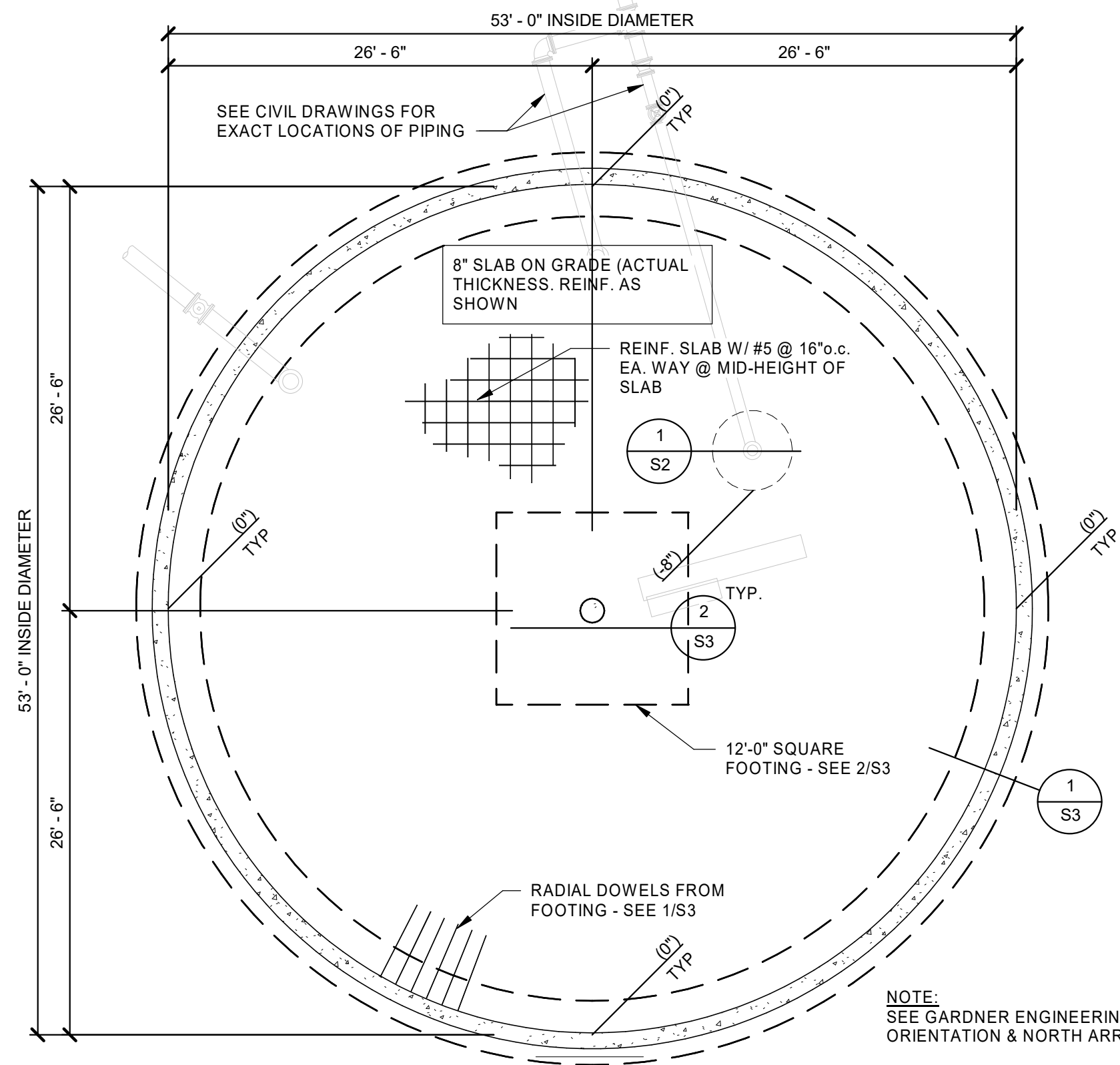
**GARDNER ENGINEERING**  
CIVIL - LAND PLANNING  
MUNICIPAL - LAND SURVEYING

**ARW ENGINEERS**  
Structural Consultants  
P.O. BOX 786-0003 • 801-786-4658

SHEET NUMBER	SHEET NAME
S1	STRUCTURAL NOTES & SCHEDULES
S2	STRUCTURAL PLANS
S3	DETAILS

**S1**



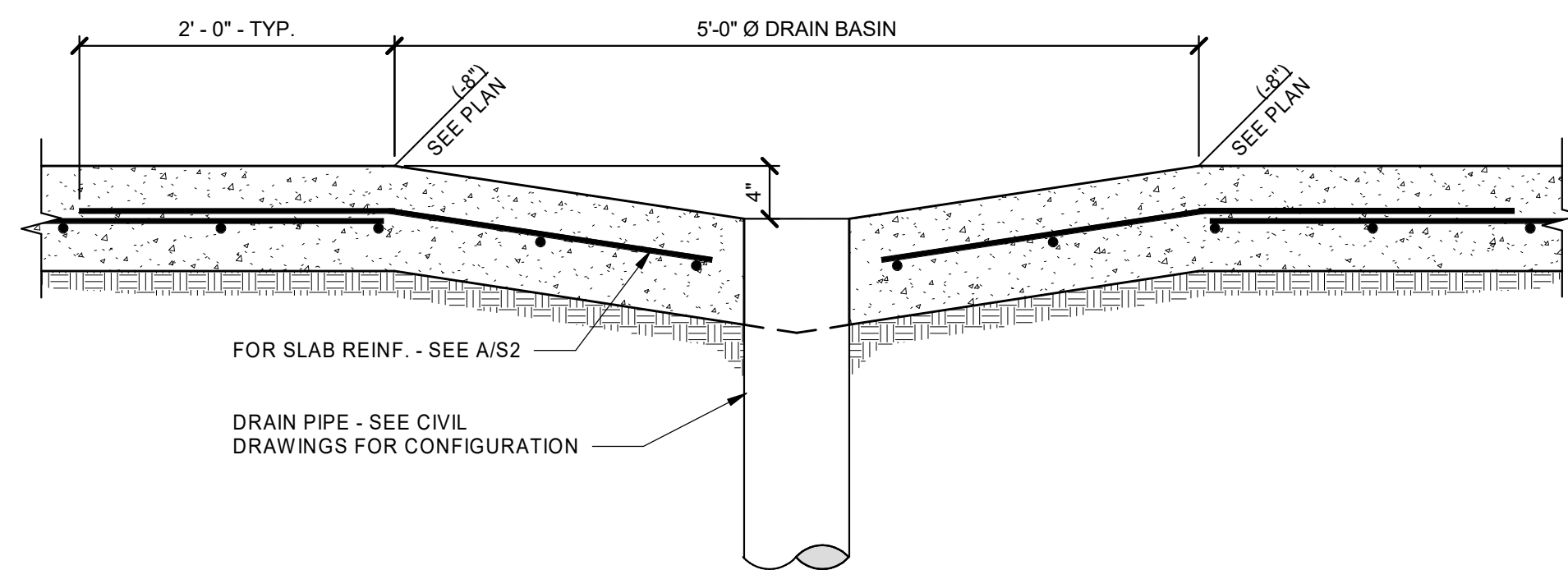


NOTE:  
FLOOR SLOPES 6" FROM OUTSIDE TO DRAIN AT CENTER. NUMBERS SHOWN IN ( ) ARE RELATIVE TOP OF SLAB ELEVATIONS

**FOOTING & FOUNDATION BASE SLAB PLAN**

SCALE : NONE

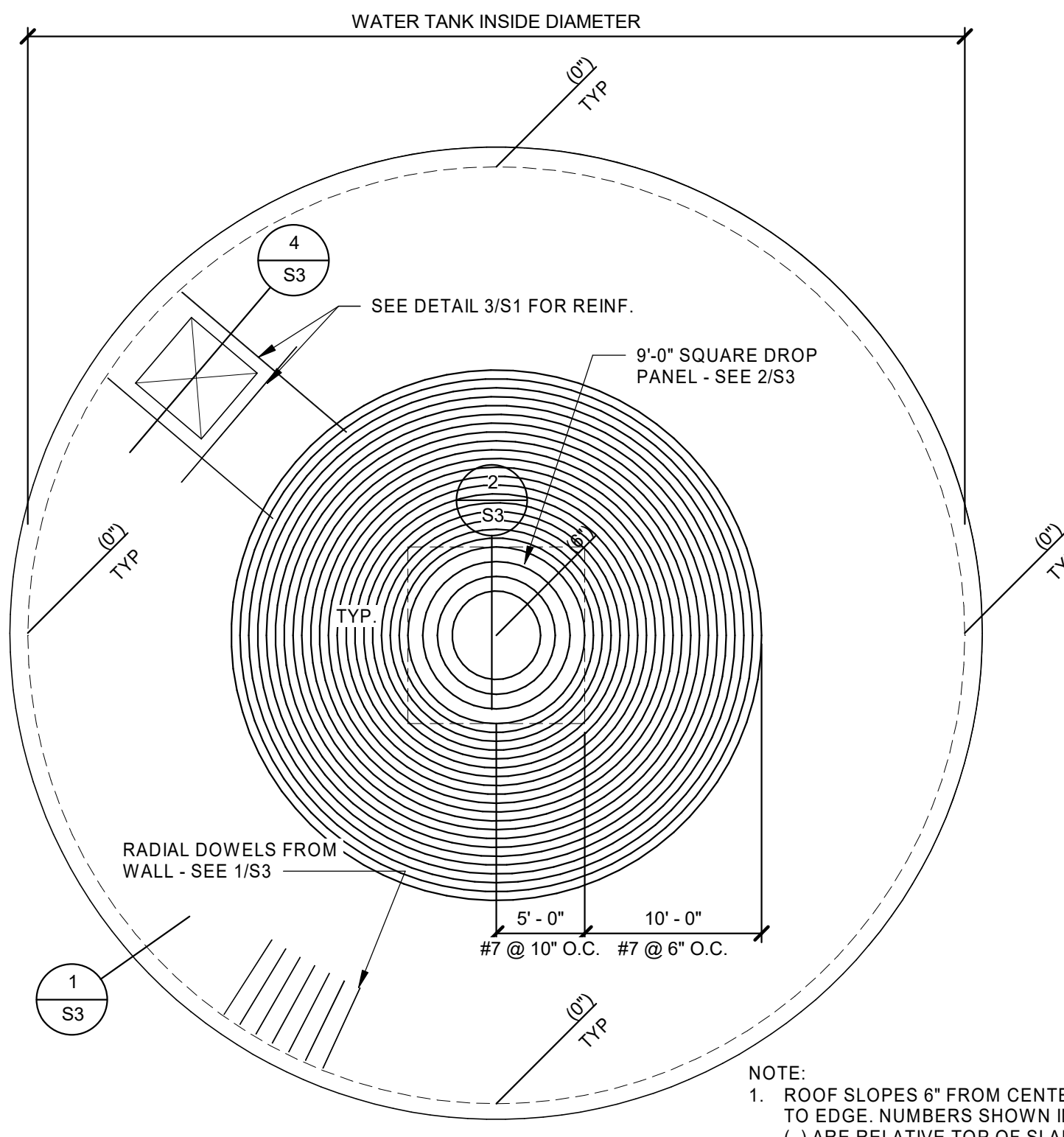
A  
S2



**DRAIN BASIN**

SCALE : NONE

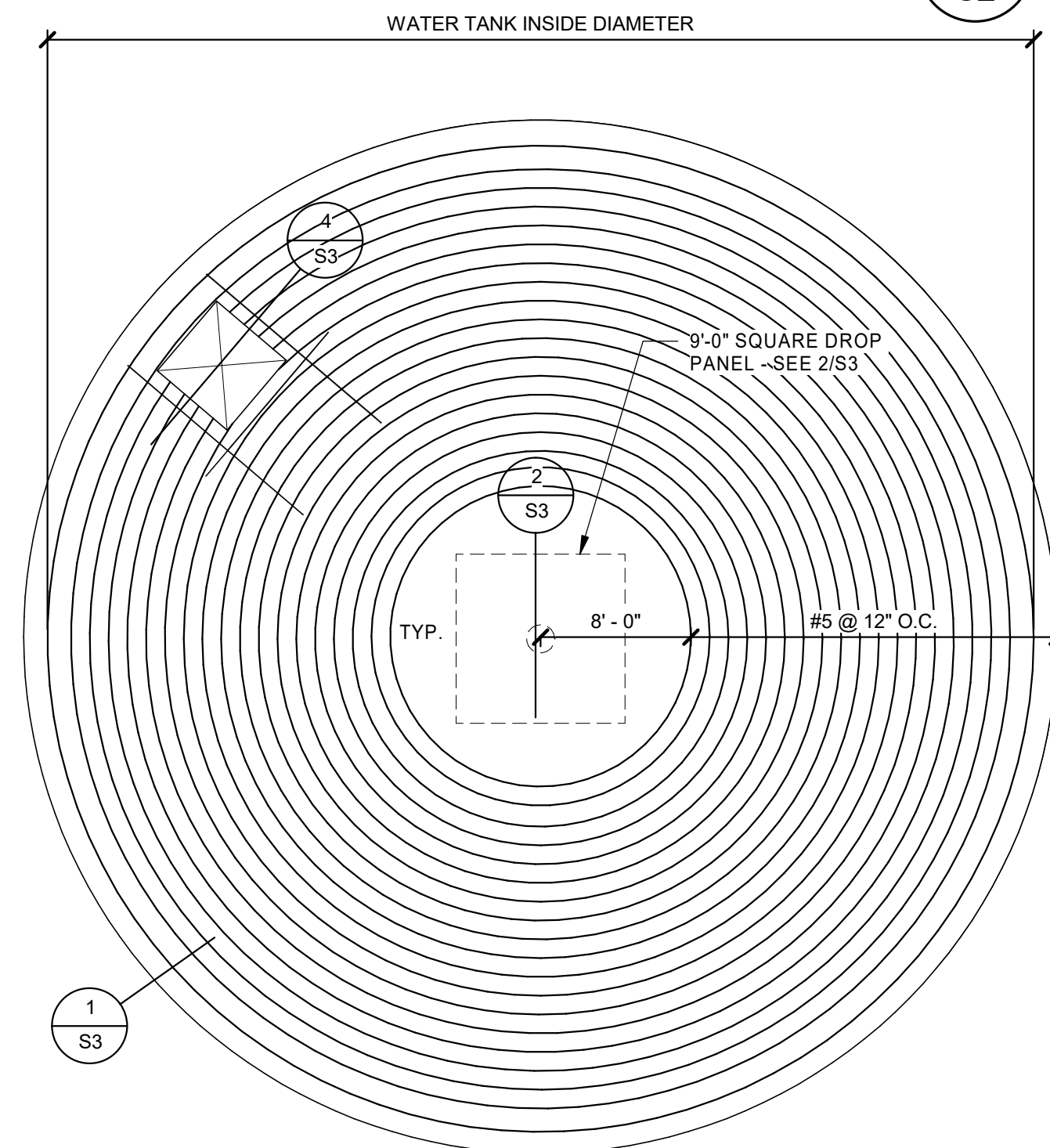
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S2



**TOP STEEL REINFORCING PLAN CIRCULAR (TANGENTIAL) STEEL - ROOF SLAB**

SCALE : NONE

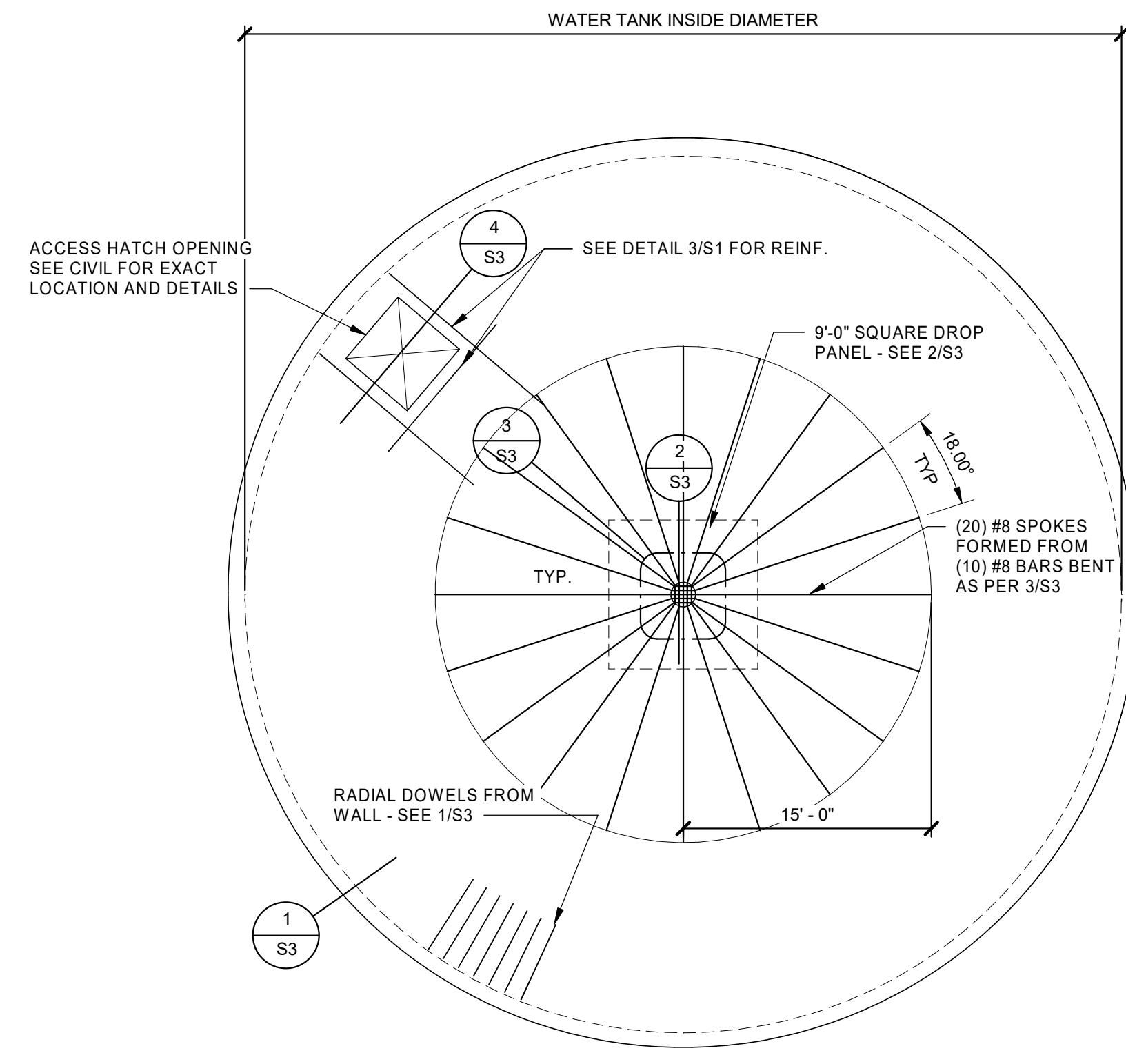
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S2



**BOTTOM STEEL REINFORCING PLAN CIRCULAR (TANGENTIAL) STEEL - ROOF SLAB**

SCALE : NONE

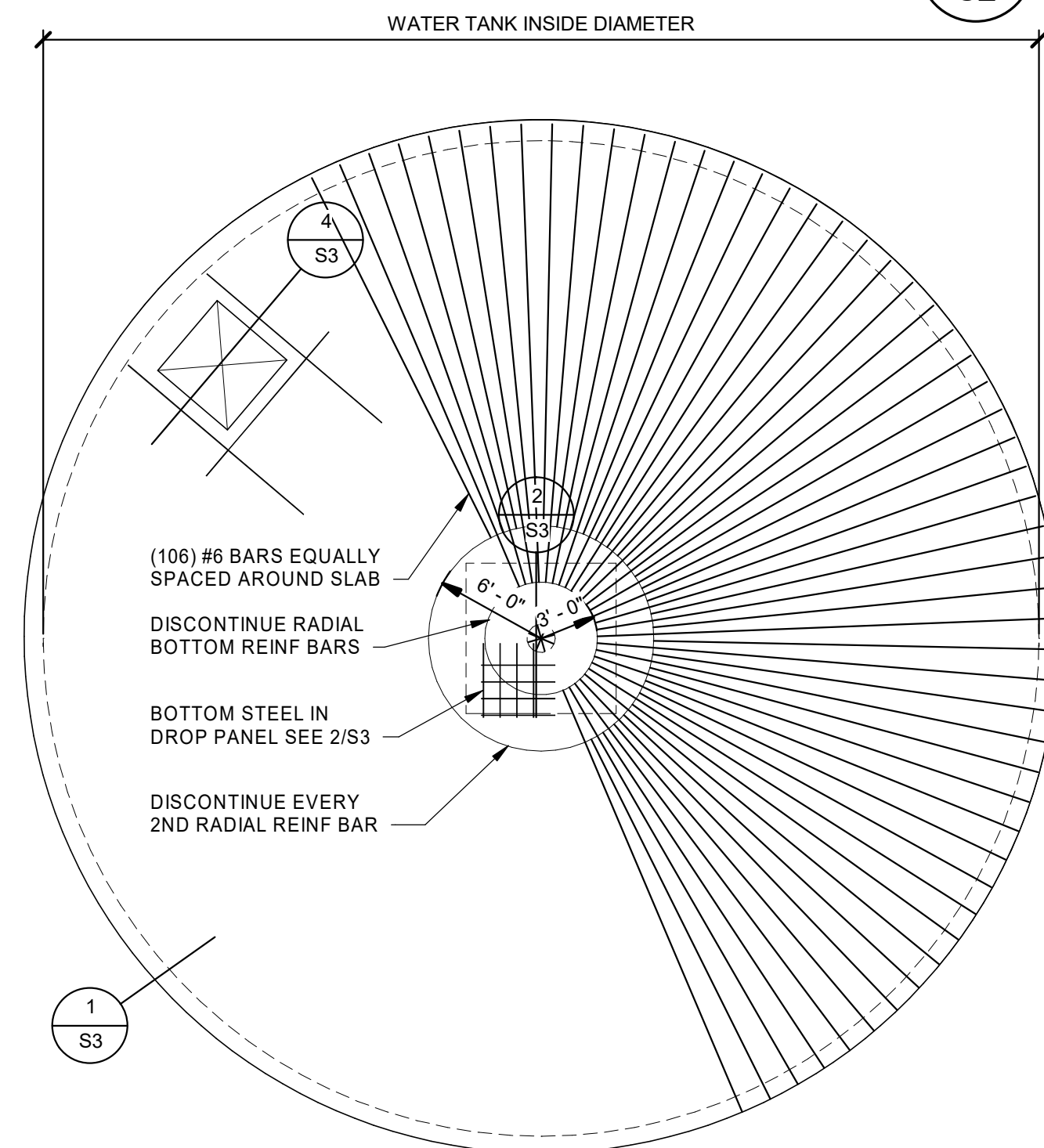
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S2



**TOP STEEL REINFORCING PLAN - (RADIAL STEEL) - ROOF SLAB**

SCALE : NONE

C  
S2



**BOTTOM STEEL REINFORCING PLAN - (RADIAL STEEL) - ROOF SLAB**

SCALE : NONE

E  
S2

Date	3/13/15
Engineer	ZCH
Drawn By	ZWT
Checked By	DLP
ARW Project No.	17092

REVISION	DESCRIPTION

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**STRUCTURAL PLANS**  
WELL #1 TANK AND PUMP STATION  
**3500 WEST 5500 SOUTH**  
**ROY, WEBER, UTAH**

**GARDNER ENGINEERING**  
CIVIL - LAND PLANNING  
MUNICIPAL - LAND SURVEYING

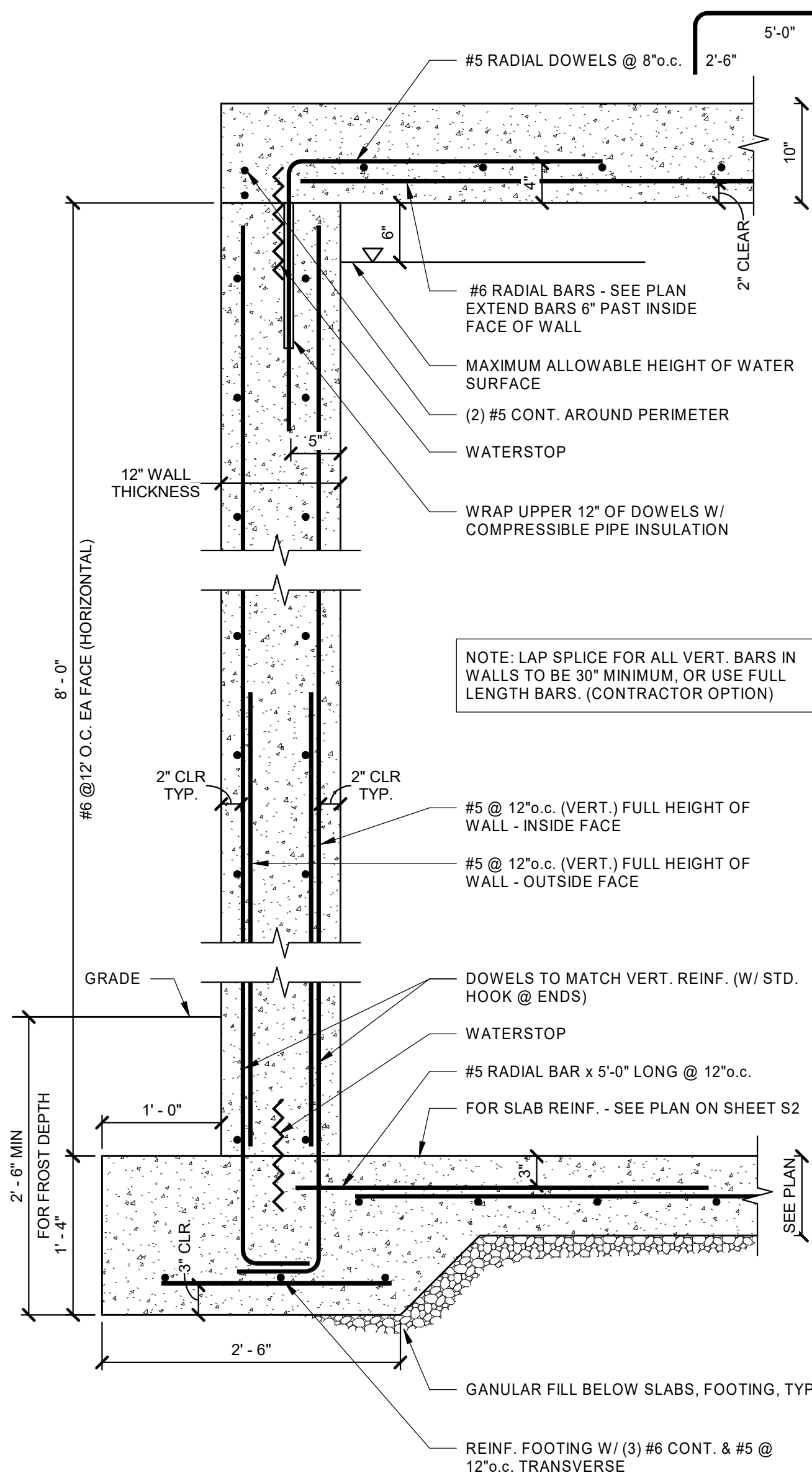
**ARW ENGINEERS**  
Structural consultants  
P.O. BOX 786, SODAS & RD 1766-4658

**S2**

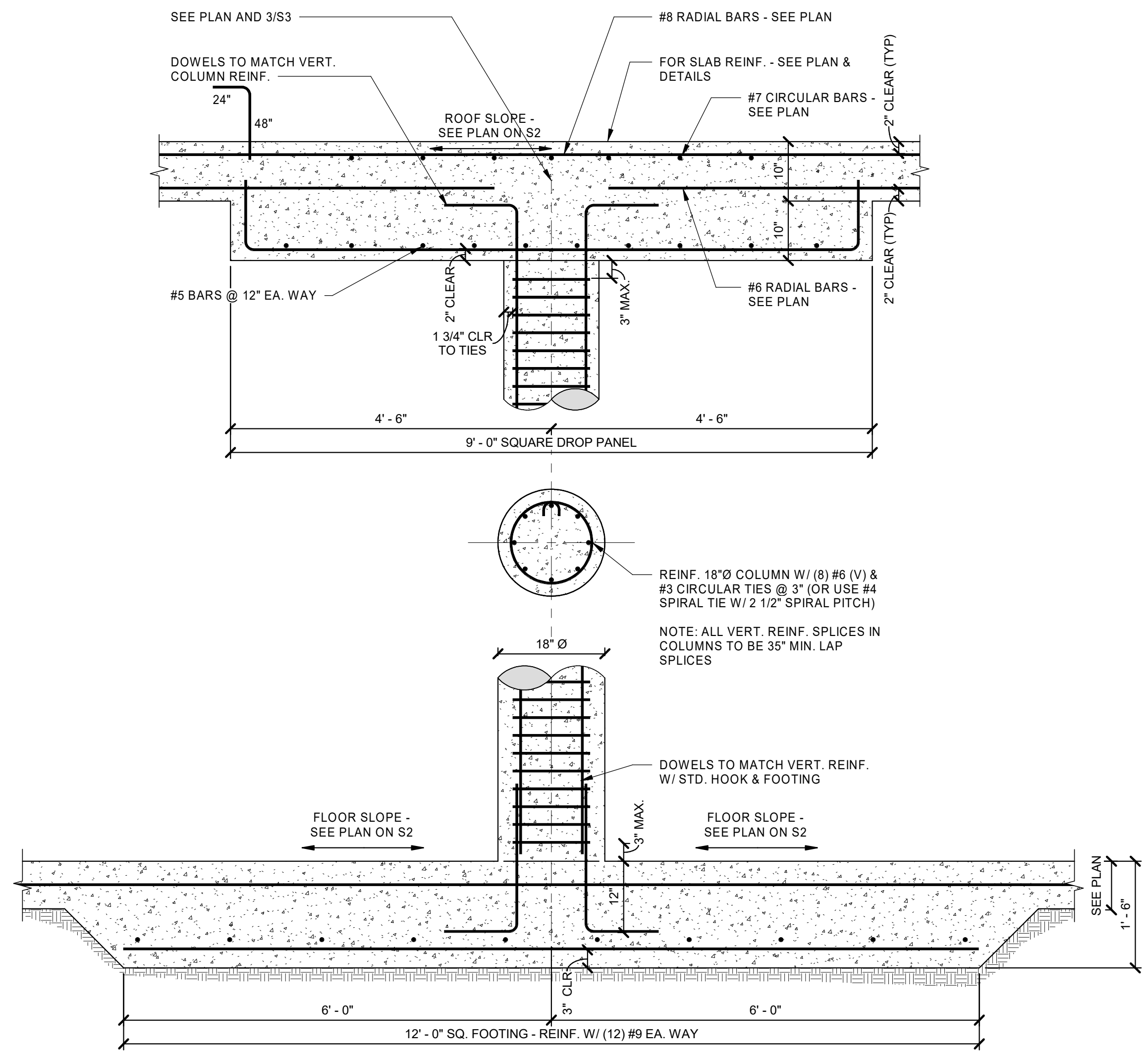
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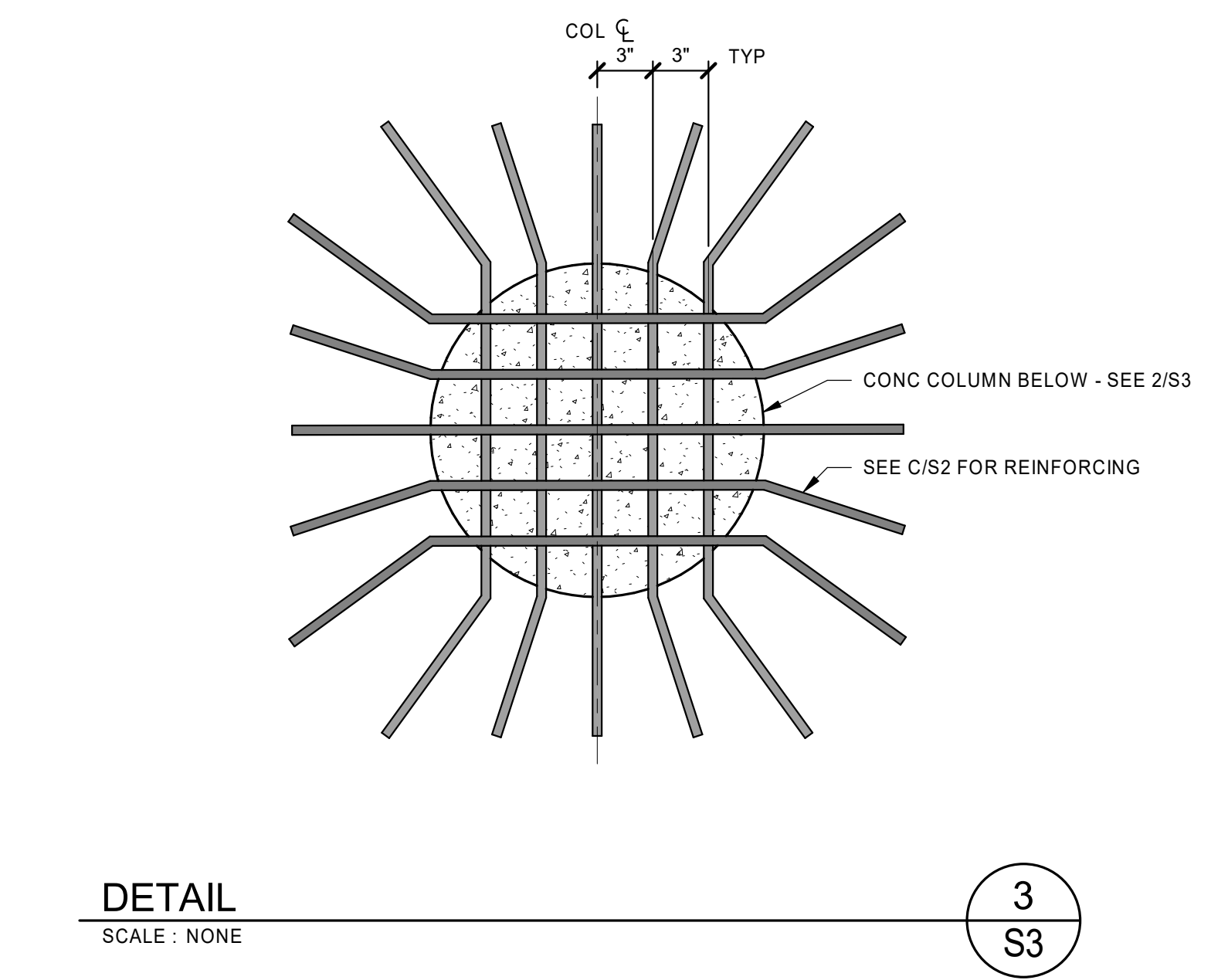
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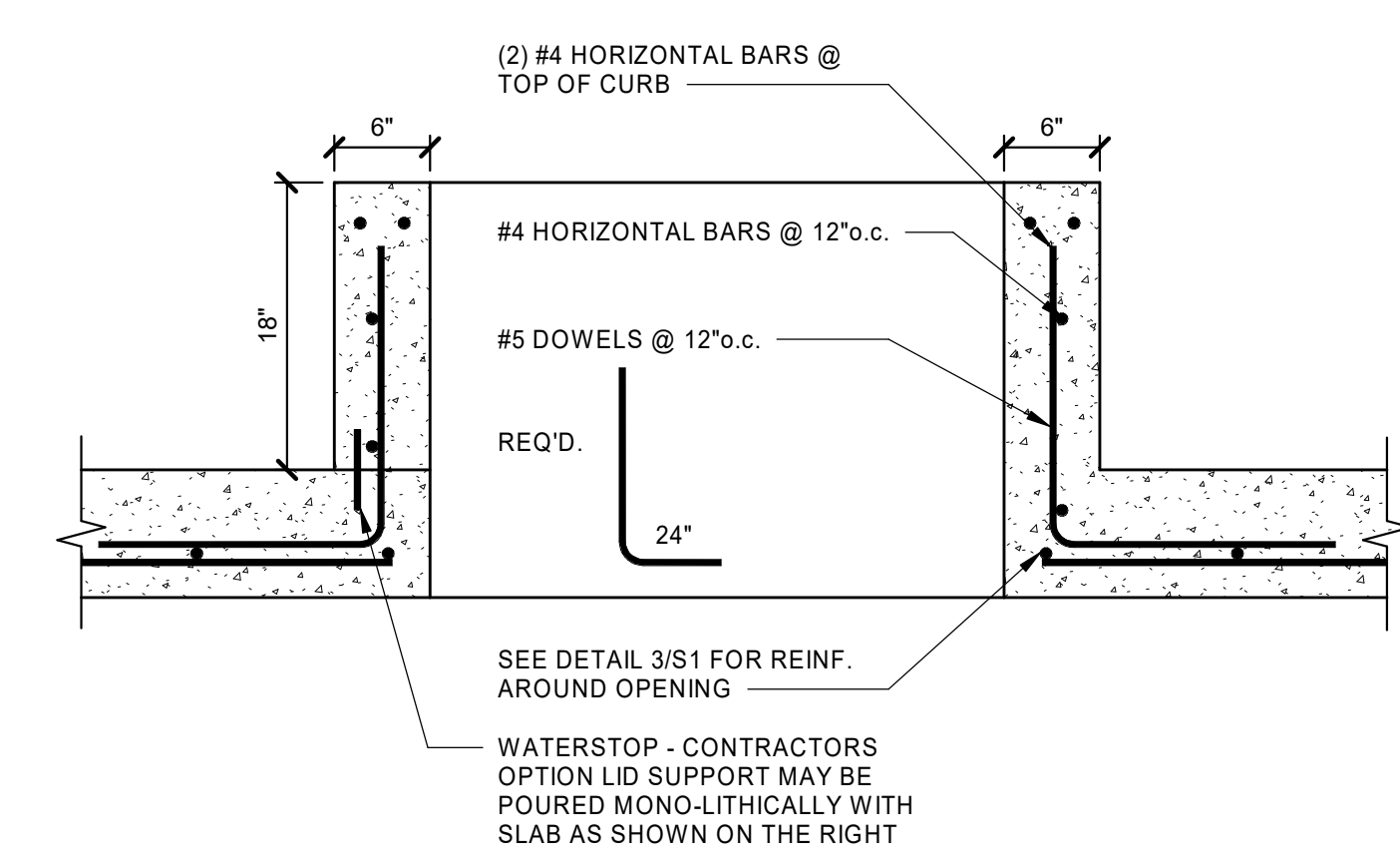
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S3  
SCALE: NONE



**TYPICAL INTERIOR COLUMN** 2  
S3  
SCALE: NONE



**DETAIL** 3  
S3  
SCALE: NONE



**CURB WALL SECTION** 4  
S3  
SCALE: NONE

REVISION	DATE	DESCRIPTION

Date	3/13/15
Engineer	ZCH
Drawn By	ZWT
Checked By	DLP
ARW Project No.	17022

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**DETAILS**  
WELL #1 TANK AND PUMP STATION  
**3500 WEST 5500 SOUTH**  
**ROY, WEBER, UTAH**

**GARDNER ENGINEERING**  
CIVIL - LAND PLANNING  
MUNICIPAL - LAND SURVEYING

**ENGINEERS**  
Structural consultants  
P.E. BOB WEBER, P.E. & BOB ROY, P.E.

S3



## STRUCTURAL NOTES

### A. GENERAL

- THE STRUCTURAL NOTES ARE INTENDED TO COMPLEMENT THE PROJECT SPECIFICATIONS WHICH ARE PART OF THE CONSTRUCTION DOCUMENTS. SPECIFIC NOTES AND DETAILS ON THE DRAWINGS SHALL GOVERN OVER THE STRUCTURAL NOTES AND TYPICAL DETAILS.
- THESE DRAWINGS (AND, WHERE APPLICABLE, ACCOMPANYING WRITTEN SPECIFICATIONS) ARE THE ONLY CONTRACT DOCUMENTS PROVIDED BY ARW ENGINEERS FOR THE PROJECT REPRESENTED HEREIN. NOTHING IN ANY DIGITAL MODEL OR DIGITAL FILE RELATED TO THIS PROJECT SHALL BE TAKEN TO SUPERSEDE ANY INFORMATION SHOWN IN THESE DRAWINGS (INCLUDING, BUT NOT LIMITED TO, DIMENSIONS, SIZES, ETC.).
- OTHER ARCHITECTURAL DRAWINGS ARE THE PRIME CONTRACT DRAWINGS. THE STRUCTURAL DRAWINGS ARE SUPPLEMENTARY TO AND MUST BE USED IN CONJUNCTION WITH THE ARCHITECTURAL DRAWINGS AND OTHER CONSULTANTS' DRAWINGS. ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND/OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND STRUCTURAL ENGINEER BEFORE PROCEEDING WITH ANY WORK INVOLVED. IN CASE OF CONFLICT, FOLLOW THE MOST STRINGENT REQUIREMENT AS DIRECTED BY THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.
- SEE SPECIFICATIONS FOR REQUIRED SUBMITTALS. SUBMITTALS SHALL BE MADE IN A TIMELY MANNER AS INDICATED IN SPECIFICATIONS. REVIEW OF SUBMITTALS BY ARW ENGINEERS IS FOR GENERAL COMPLIANCE ONLY AND IS NOT INTENDED AS APPROVAL. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL SIZES, DIMENSIONS, AND ELEVATIONS ON SUBMITTALS AS RELATED TO DESIGN DOCUMENTS. PREPARATION OF SHOP DRAWINGS FOR STRUCTURAL ELEMENTS WILL REQUIRE INFORMATION (I.E. DIMENSIONS, ETC.) FOUND IN THE ARCHITECTURAL, STRUCTURAL, AND OTHER CONSULTANTS' DRAWINGS.
- THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE. IF ACTUAL CONDITIONS DIFFER FROM THOSE SHOWN ON CONTRACT DOCUMENTS, CONTRACTOR SHALL NOTIFY ARCHITECT PRIOR TO FABRICATION OR CONSTRUCTION OF ANY AFFECTED ELEMENTS.
- THE CONTRACTOR SHALL COORDINATE AND VERIFY ALL LOCATIONS AND SIZES OF MECHANICAL EQUIPMENT OR OTHER EQUIPMENT BEFORE FABRICATING AND ERECTING STRUCTURAL ELEMENTS. SIZES AND LOCATIONS THAT DIFFER FROM THOSE SHOWN ON THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE ARCHITECT.
- THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST TO THE ARCHITECT FOR ARCHITECT AND/OR ENGINEER APPROVAL BEFORE PROCEEDING WITH ANY CHANGES, MODIFICATIONS, OR SUBSTITUTIONS.
- OBSERVATION VISITS TO THE SITE BY ARW ENGINEERS FIELD REPRESENTATIVES SHALL NEITHER BE CONSTRUED AS INSPECTION NOR APPROVAL OF CONSTRUCTION.
- DURING AND AFTER CONSTRUCTION, BUILDER AND/OR OWNER SHALL KEEP LOADS ON STRUCTURE WITHIN THE LIMITS OF DESIGN LOADS AS NOTED IN THESE DOCUMENTS.
- TYPICAL OR SIMILAR DETAILS AND SECTIONS SHALL APPLY WHERE SPECIFIC DETAILS ARE NOT SHOWN. TYPICAL OR SIMILAR DETAILS REFER TO THE CONDITION ADDRESSED AND ARE NOT NECESSARILY DETAILS LABELED "TYPICAL" OR "SIMILAR" IN THE PLANS AND DOCUMENTS.
- DRAWINGS AND DETAILS HAVE BEEN PREPARED WITH THE INTENT TO VISUALLY REPRESENT INFORMATION PROVIDED IN SCALED FORM; HOWEVER CONTRACTOR/SUPPLIERS SHOULD NOT SCALE PLANS OR DETAILS FOR DIMENSIONAL INFORMATION.
- THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY SHORING AND BRACING FOR ALL STRUCTURAL ELEMENTS UNTIL THE ENTIRE STRUCTURAL SYSTEM IS COMPLETED. DESIGN OF ALL SHORING AND BRACING IS BY OTHERS AT NO ADDITIONAL COST TO THE OWNER.
- ENGINEER SHALL NOT BE RESPONSIBLE FOR ACTIVITIES UNDER CONTROL OF THE CONTRACTOR SUCH AS CONSTRUCTION SITE SAFETY, MEANS, METHODS AND SEQUENCING OF CONSTRUCTION. ENGINEER SHALL NOT BE RESPONSIBLE FOR FABRICATION, ERECTION AND CONSTRUCTION REQUIREMENTS AS PRESCRIBED BY OSHA OR OTHER REGULATORY AGENCIES REGARDLESS OF INDICATIONS IN THESE DOCUMENTS.
- NOTICE OF COPYRIGHT: THESE STRUCTURAL DRAWINGS ARE HEREBY COPYRIGHTED BY ARW ENGINEERS. ALL RIGHTS RESERVED. THESE DOCUMENTS DEFINE A STRUCTURE AND ARE INSTRUMENTS OF SERVICE. FOR ONE USE ONLY. REPRODUCTION AND DISTRIBUTION OF THESE DRAWINGS IS ONLY ALLOWED AS REQUIRED FOR REGULATORY AGENCIES AND FOR CONVEYANCE OF INFORMATION TO PARTIES INVOLVED IN THE CONSTRUCTION OF THIS PROJECT. THESE DOCUMENTS SHALL NOT BE REPRODUCED OR COPIED, IN PART OR WHOLE BY ANY PARTY FOR USE IN PREPARATION OF SHOP DRAWINGS OR OTHER SUBMITTALS.

### B. STATEMENT OF SPECIAL INSPECTIONS AND SPECIAL INSPECTIONS

- ITEMS REQUIRING SPECIAL INSPECTION ARE IDENTIFIED IN THE SPECIAL INSPECTION SCHEDULE.
- SPECIAL INSPECTIONS AND TESTING ARE TO BE PROVIDED AS REQUIRED BY IBC SECTIONS 1704 THROUGH 1705 AND OTHER APPLICABLE SECTIONS OF THE IBC. THE TYPE AND FREQUENCY OF TESTING AND SPECIAL INSPECTIONS SHALL BE AS NOTED IN THE SPECIAL INSPECTION SCHEDULE, JOB SPECIFICATIONS, AND ACCORDANCE WITH IBC SECTION 110 AND CHAPTER 17. CONTRACTOR SHALL COORDINATE AND COOPERATE WITH REQUIRED INSPECTIONS.
- ALL TESTING AND SPECIAL INSPECTION SHALL BE PROVIDED BY A QUALIFIED INDEPENDENT SPECIAL INSPECTION AGENCY IN ACCORDANCE WITH IBC 1704 AND AS OUTLINED IN THE JOB SPECIFICATIONS. REPORTS OF FINDINGS OR DISCREPANCIES SHALL BE NOTED AND FORWARDED TO THE CONTRACTOR, ARCHITECT, ENGINEERS, AND BUILDING OFFICIAL IN A TIMELY MANNER.
- STRUCTURAL OBSERVATION VISITS SHALL BE PERFORMED BY A REPRESENTATIVE FROM ARW ENGINEERS IN ACCORDANCE WITH THE CONTRACT AS NEEDED TO OBSERVE THE CONSTRUCTION OF CRITICAL BUILDING ELEMENTS (I.E. FOOTINGS, BRACED FRAMES, MOMENT FRAMES, DRAG STRUTS AND THEIR CONNECTIONS, COLLECTORS, AND ROOF AND FLOOR DIAPHRAGMS). STRUCTURAL OBSERVATION REPORTS FOR EACH VISIT SHALL BE SENT DIRECTLY TO THE ARCHITECT FOR DISTRIBUTION TO THE CONTRACTOR AND BUILDING OFFICIAL. STRUCTURAL OBSERVATION VISITS SHALL NEITHER BE CONSTRUED AS SPECIAL INSPECTION NOR APPROVAL OF COMPLETED CONSTRUCTION.

### C. BASIS OF DESIGN

- GOVERNING BUILDING CODE: INTERNATIONAL BUILDING CODE (IBC) 2015  
RISK CATEGORY: II
- ROOF LOADS
  - FLAT OF SNOW LOAD, PF: 30 PSF
  - GROUND SNOW LOAD, PG: 43 PSF
  - SNOW EXPOSURE FACTOR, CE: 1.0
  - SNOW LOAD IMPORTANCE FACTOR, IS: 1.0
  - THERMAL FACTOR, CT: 1.2
  - DEAD LOAD = 15 PSF
- WIND DESIGN
  - BASIC WIND SPEED (3 SECOND GUST): 115 MPH
  - WIND EXPOSURE: C
- SEISMIC DESIGN:
  - SEISMIC IMPORTANCE FACTOR, IE: 1.0
  - SITE CLASS: D
  - MAPPED SPECTRAL RESPONSE ACCELERATIONS:  $SS = 1.204$ ,  $S1 = 0.401$
  - SPECTRAL RESPONSE COEFFICIENTS:  $SDS = 0.817$ ,  $SD1 = 0.427$
  - SEISMIC DESIGN CATEGORY: D
  - BASIC SEISMIC-FORCE-RESISTING SYSTEM: MASONRY SHEAR WALLS
  - DESIGN BASE SHEAR:  $VN-S = CS \times W$ ,  $VE-W = CS \times W$
  - SEISMIC RESPONSE COEFFICIENT,  $CS$ : 0.16
  - RESPONSE MODIFICATION FACTOR,  $R$ : 5.0
  - ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE

### D. FOUNDATION

- DESIGN SOIL PRESSURE: 2000 PSF
- SOILS REPORT BY: CMT ENGINEERING LABS  
REPORT #: 9406  
DATED: MARCH 7, 2017
- SOIL PREPARATION UNDER FOOTINGS AND SLABS ON GRADE SHALL BE IN ACCORDANCE W/ THE SOILS REPORT
- UNLESS NOTED OTHERWISE, ALL CONCRETE SLABS ON EARTH SHALL BEAR ON STRUCTURAL FILL COMPACTED TO 90% OF MODIFIED PROCTOR DENSITY (ASTM D-1557).
- TOP OF FOOTING ELEVATIONS SHOWN ON THE FOOTING AND FOUNDATION PLAN ARE BASED ON PRELIMINARY GRADING INFORMATION AND MUST BE VERIFIED PRIOR TO CONSTRUCTION. STEPS WHERE SHOWN ARE AT APPROXIMATE LOCATIONS. ALL EXTERIOR FOOTINGS MUST BEAR A MINIMUM OF 30 INCHES BELOW LOWEST ADJACENT FINAL GRADE.
- ALL WALLS (EXCEPT CANTILEVERED RETAINING WALLS) SHALL BE ADEQUATELY BRACED AGAINST LATERAL MOVEMENT PRIOR TO BACKFILLING. DESIGN AND ERECTION OF BRACING/SHORING IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. BRACING SHALL REMAIN IN PLACE UNTIL SUPPORTING STRUCTURAL ELEMENTS ARE IN PLACE AND HAVE ATTAINED FULL STRENGTH.
- UNLESS NOTED OTHERWISE, ALL FOOTINGS SHALL HAVE VERTICAL FACES FORMED WITH STANDARD FORMING MATERIALS (WOOD, METAL, ETC.). WITH PRIOR APPROVAL OF ARCHITECT AND ENGINEER, CONCRETE FOR FOOTINGS CAN BE PLACED IN EXCAVATED "SOIL" FORMS PROVIDED THAT THE DIMENSIONS ARE INCREASED 3" ON EACH SIDE.

### E. CONCRETE

- ALL CONCRETE MIX DESIGNS SHALL COMPLY WITH THE PROJECT SPECIFICATIONS AND THE REQUIREMENTS LISTED BELOW.
  - FOOTINGS, GRADE BEAMS, FOUNDATION WALLS:
    - WHERE THE TOP OF THE ELEMENT IS EXPOSED OR LOCATED WITHIN 30" OF THE LOWEST ADJACENT GRADE (EXPOSURE CATEGORY F1):
      - 28 DAY COMPRESSIVE STRENGTH: 4500 PSI
      - MAXIMUM W/C RATIO: 0.45
      - MAXIMUM AGGREGATE SIZE: 1"
      - AIR CONTENT: 6%
    - WHERE THE TOP OF THE ELEMENT IS NOT EXPOSED OR LOCATED WITHIN 30" OF THE LOWEST ADJACENT GRADE (EXPOSURE CATEGORY FO):
      - 28 DAY COMPRESSIVE STRENGTH: 2500 PSI
  - INTERIOR SLABS ON GRADE (EXPOSURE CATEGORY FO):
    - 28 DAY COMPRESSIVE STRENGTH: 3000 PSI
  - EXTERIOR SLABS (DOCKS, ETC.) (EXPOSURE CATEGORY F1):
    - 28 DAY COMPRESSIVE STRENGTH: 4500 PSI
    - MAXIMUM W/C RATIO: 0.45
    - MAXIMUM AGGREGATE SIZE: 1"
    - MINIMUM AIR CONTENT: 6%
- WATER USED IN MIXING CONCRETE SHALL CONFORM TO ASTM C1602.
- NO PIPES, DUCTS, SLEEVES, ETC. SHALL BE PLACED IN STRUCTURAL CONCRETE UNLESS SPECIFICALLY DETAILED OR APPROVED BY THE STRUCTURAL ENGINEER. NO ALUMINUM PRODUCTS SHALL BE EMBEDDED IN CONCRETE. PENETRATIONS THRU STRUCTURAL CONCRETE ELEMENTS MUST BE APPROVED BY THE ENGINEER AND SHALL BE BUILT INTO THE ELEMENT PRIOR TO CONCRETE PLACEMENT.
- REFER TO ARCHITECTURAL DRAWINGS FOR MOLDS, GROOVES, ORNAMENTS, ETC. TO BE CAST IN TO CONCRETE, AND FOR EXTENT AND LOCATION OF DEPRESSIONS, CURBS, RAMPS, ETC.
- UNLESS NOTED OTHERWISE, MINIMUM REINFORCING IN ALL CONCRETE FOUNDATION WALLS SHALL BE AS FOLLOWS:
 

TOP & THICKNESS	BOTTOM BARS	VERTICAL	HORIZONTAL
8"	(2) #5	#4 AT 18" O.C.	#4 AT 12" O.C.
- UNLESS NOTED OTHERWISE, CONCRETE SLABS ON EARTH SHALL BE REINFORCED AS FOLLOWS:
 

6" THICK - #4 AT 15" O.C. EACH WAY
------------------------------------
- REINFORCING SHALL BE CONTINUOUSLY SUPPORTED AT 36" O.C. MAXIMUM SPACING.
- UNLESS NOTED OTHERWISE, FOR OPENINGS LARGER THAN 12" IN ANY DIRECTION IN CONCRETE WALLS ADD (2) #5 BARS ALL SIDES TO REGULAR WALL REINFORCING AND EXTEND 24" EACH WAY BEYOND OPENING. WHERE 24" IS NOT AVAILABLE, EXTEND BARS AS FAR AS POSSIBLE AND TERMINATE WITH A STANDARD HOOK.
- CONSTRUCTION JOINTS NOT SHOWN ON THE PLANS SHALL BE MADE AND LOCATED SO AS TO NOT IMPAIR THE STRENGTH OF THE STRUCTURE AND AS APPROVED BY THE STRUCTURAL ENGINEER. PROVIDE 2 X 4 (SHAPED) KEYWAY IN ALL VERTICAL AND HORIZONTAL JOINTS UNLESS NOTED OR DETAILED OTHERWISE. ALL STEEL REINFORCING SHALL BE CONTINUOUS THROUGH COLD JOINTS UNLESS NOTED OTHERWISE. SEE TYPICAL DETAILS FOR COLD/CONSTRUCTION JOINTS FOR SLABS ON GRADE.
- FOOTINGS HAVE BEEN DESIGNED USING A 28-DAY COMPRESSIVE STRENGTH OF 2500 PSI. SPECIAL INSPECTIONS ARE NOT REQUIRED.

### F. ANCHOR BOLTS/EMBEDDED BOLTS

- ALL ANCHOR BOLTS SHALL HAVE ASTM A-563 HEAVY HEX NUT AND ASTM F-436 WASHERS AT STANDARD OR OVERSIZED HOLES PER AISC SPECIFICATION TABLE J3.3. WHERE HOLE SIZES DO NOT COMPLY WITH THE LIMITATIONS FOR OVERSIZED HOLES THE STRUCTURAL ENGINEER SHALL BE NOTIFIED TO DETERMINE STEEL PLATE WASHER REQUIREMENTS. ANCHOR BOLTS SHALL COMPLY WITH THE FOLLOWING:
  - AT BRACED FRAMES & MOMENT RESISTING FRAMES - ASTM F1554 GRADE 105 HEADED BOLTS. (ASTM A449 THREADED ROD MAY BE USED WITH DOUBLE NUT AND WASHER.)
  - AT WOOD STUD WALLS - ASTM A-307 GRADE HEADED BOLTS. ANCHOR BOLTS IN TREATED LUMBER SHALL BE GALVANIZED OR STAINLESS STEEL. SEE TIMBER NOTES FOR MORE INFORMATION.
  - AT ALL OTHER ANCHOR BOLTS (UNLESS NOTED OTHERWISE) - ASTM F1554 GRADE 36 HEADED BOLTS. (ASTM A36 THREADED ROD MAY BE USED WITH DOUBLE NUT AND WASHER.)
- EMBEDDED BOLTS IN MASONRY SHALL BE (UNLESS NOTED OTHERWISE) ASTM A-307 GRADE HEADED BOLTS.
- SEE TYPICAL ANCHOR BOLT DETAIL FOR DEFINITIONS OF EMBEDMENT LENGTH, ETC.
- FURNISH TEMPLATES AND OTHER DEVICES AS NECESSARY FOR PRESETTING ALL BOLTS PRIOR TO PLACING CONCRETE AND/OR GROUT.
- IF THREADED RODS ARE USED AS PERMITTED ABOVE, THEY SHALL BE CLEAR OF SOIL AND DIRT.

### G. ADHESIVE/MECHANICAL ANCHORS

- ALL ADHESIVE/MECHANICAL ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH AN APPROVED INDEPENDENT EVALUATION REPORT (ICC, IAPMO, OR APPROVED EQUIV), AS INDICATED BELOW, AND IN ACCORDANCE WITH ALL MANUFACTURER'S REQUIREMENTS.
- ADHESIVE ANCHORS SHALL BE INSTALLED IN CONCRETE HAVING A MINIMUM AGE OF 21 DAYS AT TIME OF ANCHOR INSTALLATION.
- UNLESS NOTED OTHERWISE, ALL ADHESIVE ANCHORS INTO CONCRETE SHALL BE:
  - HILTI HIT-RE 500-SD (ESR-2322), OR HILTI HIT-HY 200 (ESR-3187).
  - SIMPSON SET XP EPOXY (ESR-2508)
- UNLESS NOTED OTHERWISE, ALL ADHESIVE ANCHORS INTO MASONRY SHALL BE:
  - HILTI HIT-HY-150 MAX (ESR-1967), OR HILTI HIT-HY-70 (ESR-2692).
  - SIMPSON SET ADHESIVE (APMO ER-0265).
- UNLESS NOTED OTHERWISE, ALL MECHANICAL ANCHORS INTO CONCRETE SHALL BE:
  - HILTI KWIK BOLT TZ (ESR-1917).
  - POWERS WEDGE BOLT (ESR-2526).
  - SIMPSON STRONG-BOLT 2 (ESR-3037).
- UNLESS NOTED OTHERWISE, ALL MECHANICAL ANCHORS INTO MASONRY SHALL BE:
  - HILTI KWIK HUS-EZ (ESR-3056)
  - SIMPSON STRONG BOLT 2 WEDGE ANCHOR (IAPMO ER-0240)
- ALL MASONRY CELLS WITHIN 8" OF THE ANCHOR SHALL BE SOLID GROUTED.
- THE TESTING LABORATORY WILL PERFORM VISUAL INSPECTION OF ANCHORS AND DOWELS AS SPECIFIED IN THE SPECIAL INSPECTION SCHEDULE AND THE APPROVED INDEPENDENT EVALUATION REPORT. TENSION TESTING CAN BE REQUIRED AT THE DIRECTION OF THE STRUCTURAL ENGINEER OF RECORD OR THE SPECIAL INSPECTOR.
- IF REINFORCEMENT IS ENCOUNTERED DURING DRILLING, ABANDON THAT HOLE AND SHIFT THE ANCHOR LOCATION TO AVOID THE REINFORCEMENT. PROVIDE A MINIMUM SPACE OF (2) ANCHOR HOLE DIAMETERS OR 1 INCH, WHICH EVER IS LARGER, OF SOUND CONCRETE/MASONRY BETWEEN THE ANCHOR AND THE ABANDONED HOLE. FILL THE ABANDONED HOLE WITH NON-SHRINK GROUT. AT CONTRACTORS OPTION, LOCATE EXISTING REINFORCING PRIOR TO DRILLING/CORING. IF THE ANCHOR OR DOWEL CANNOT BE SHIFTED AS NOTED ABOVE, THE ENGINEER WILL DETERMINE A NEW LOCATION.
- LOCATE REINFORCEMENT AND CONFIRM FINAL ANCHOR LOCATIONS PRIOR TO FABRICATING PLATES, MEMBERS, OR OTHER STEEL ASSEMBLIES ATTACHED WITH MECHANICAL ANCHORS

### H. REINFORCING STEEL

- REINFORCING BAR STRENGTH REQUIREMENTS:
  - ALL REINFORCING BARS SHALL CONFORM TO ASTM STANDARD A-615 GRADE 60 AND ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM STANDARD A-185 AND SHALL BE SUPPLIED IN FLAT SHEETS. ADEQUATELY TIE AND SUPPORT ALL REINFORCING STEEL AS SPECIFIED BY ACI 117, TO MAINTAIN EXACT REQUIRED POSITION.
  - STEEL DISCONTINUOUS FIBER REINFORCEMENT SHALL BE DEFORMED AND CONFORM TO ASTM A820 AND SHALL HAVE A LENGTH TO DIAMETER RATIO NOT SMALLER THAN 50 AND NOT GREATER THAN 100.
  - HEADED DEFORMED BARS SHALL CONFORM TO ASTM A970. OBSTRUCTIONS OR INTERRUPTIONS OF THE BAR DEFORMATIONS, IF ANY, SHALL NOT EXTEND MORE THAN 2 BAR DIAMETERS FROM THE BEARING FACE OF THE HEAD.
  - ALL FIELD BENT DOWELS SHALL BE GRADE 40 WITH SPACING INDICATED REDUCED BY 1/3.
- UNLESS NOTED OTHERWISE, REINFORCEMENT SHALL HAVE THE FOLLOWING CONCRETE COVERAGE:
  - CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH ..... 3"
  - EXPOSED TO EARTH OR WEATHER:
    - #6 & LARGER ..... 2"
    - #5 & SMALLER ..... 1-1/2"
  - NOTE: REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE OR EARTH:
    - SLABS, WALLS, JOISTS, #11 & SMALLER ..... 3/4"
    - BEAMS, COLUMNS: MAIN REINFORCING OR TIES ..... 1-1/2"
  - SLAB ON GRADE:
    - PLACE REINFORCING AT CENTER OF SLAB UNLESS INDICATED OTHERWISE.
- EXCEPT WHERE NOTED ON PLANS OR DETAILS CONTINUOUS REINFORCEMENT SHALL BE SPLICED AT POINTS OF MINIMUM STRESS BY LAPPING PER THE REBAR LAP SCHEDULE.
- ALL VERTICAL REINFORCING IN STRUCTURAL ELEMENTS ABOVE SHALL BE SPLICED WITH MATCHING DOWELS EMBEDDED WITHIN THE FOOTINGS OR STRUCTURE BELOW. SPLICE LENGTHS SHALL COMPLY WITH REBAR LAP SCHEDULE. DOWELS INTO FOOTINGS SHALL TERMINATE WITH A STANDARD HOOK, AND SHALL EXTEND TO WITHIN 4" OF THE BOTTOM OF THE FOOTING, BUT NEED NOT EXTEND MORE THAN 20" INTO FOOTING. FOR MASONRY CONSTRUCTION SEE STRUCTURAL NOTE I.6.A.
- DO NOT WELD REINFORCING EXCEPT AS NOTED ON PLANS, WHERE REINFORCING IS WELDED, USE ASTM A-706 REINFORCING.
- REINFORCING BARS, TIES, AND TENDONS SHALL BE SUPPORTED BY NYLON CONES, PLASTIC-COATED TIE-WIRES, OR PLASTIC-COATED CHAIRS. REINFORCING IN FOOTINGS IS PERMITTED TO BE SUPPORTED ON CONCRETE DOBIES.
- UNLESS NOTED OTHERWISE, HOOKS, STIRRUPS, TIES, AND OTHER BENDS IN REINFORCING STEEL SHALL MEET THE STANDARDS SET FORTH IN ACI 318-19R-11. UNLESS OTHERWISE PERMITTED BY THE ENGINEER, ALL REINFORCEMENT SHALL BE BENT COLD. REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT, EXCEPT AS SHOWN ON THESE DRAWINGS OR OTHERWISE PERMITTED BY THE ENGINEER. UNLESS SPECIFICALLY NOTED AND/OR DETAILED IN THE STRUCTURAL DRAWINGS CONDUIT SHALL NOT BE IN CONTACT WITH REINFORCING STEEL.

### I. MASONRY

- ALL HOLLOW MASONRY UNITS SHALL CONFORM TO ASTM C-90.
  - FM (HOLLOW, FACTORED) 1,500 PSI
  - MINIMUM UNIT STRENGTH (G) 1,900 PSI (TESTED IN ACCORDANCE WITH ASTM C-140)
  - ACCEPTABLE RANGE OF UNIT WEIGHT: 105 PCF TO 125 PCF
- ALL GROUT (SITE MIXED OR PRE-MIXED) SHALL CONFORM TO ASTM C-476 OR SECTION 2.2A OF TMS 602-11/ACI 530-1-11/ASCE 6-11. GROUT SHALL BE PLACED WITH SUFFICIENT WATER FOR POURING WITHOUT SEGREGATION. DO NOT USE MORTAR FOR GROUT. MECHANICALLY VIBRATE ALL GROUT.
- GROUT STOPS SHALL BE AN APPROVED PRODUCT DESIGNED AND MANUFACTURED FOR USE AS A GROUT STOP. GROUT STOP SUBMITTALS SHALL BE SUBMITTED TO THE ARCHITECT AND ENGINEER FOR REVIEW.
- OTHER GROUT (EXCEPT FOR GROUT AS SHOWN ON ARCHITECTURAL DRAWINGS) IS NOT PERMITTED.
- MORTAR SHALL BE TYPE S AND SHALL CONFORM TO ASTM C 270.
- ALL MASONRY WORK SHALL CONFORM TO CHAPTER 21 OF THE IBC.
- UNLESS NOTED OTHERWISE, MINIMUM REINFORCING IN ALL MASONRY WALLS SHALL BE AS FOLLOWS:
  - VERTICAL: # 5 BARS IN CELLS ADJACENT TO ALL OPENINGS, AT CORNERS AND AT A MAXIMUM SPACING OF 32" THROUGHOUT THE WALL. ALL VERTICAL REINFORCEMENT INCLUDING, BUT NOT LIMITED TO JAMBS, COLUMNS, AND WALL REINFORCING SHALL BE DOWELED INTO AND THROUGH THE FOUNDATION WALL AND INTO THE FOOTING BELOW UNLESS SPECIFICALLY DETAILED OTHERWISE.
  - HORIZONTAL: (2) #4 BARS IN 8" DEEP "H" BLOCK BOND BEAM UNITS AT 48" O.C. AND AT FLOORS, ROOF AND TOP OF WALL. BOND BEAMS AT ROOF WILL SLOPE TO MATCH SLOPING ROOF.
- ALL BLOCK CELLS CONTAINING REINFORCING, BOLTS, OR ANCHORS SHALL BE GROUTED SOLID.
- PROVIDE (1) #5 (MINIMUM), IN GROUTED SPACE, ON ALL SIDES AND ADJACENT TO EVERY OPENING WHICH EXCEEDS 24" IN EITHER DIRECTION. HORIZONTAL BARS SHALL EXTEND 24" BEYOND THE CORNERS OF THE OPENING AND VERTICAL BARS SHALL EXTEND TO TOP OF WALL. VERTICAL REINFORCING SHALL BE PROVIDED AT ENDS, CORNERS AND EACH SIDE OF CONTROL JOINTS. SEE TYPICAL DETAILS FOR OPENINGS WHICH EXCEED 32" IN EITHER DIRECTION.
- SOLID GROUTING OF MASONRY IS UNACCEPTABLE EXCEPT AS SPECIFICALLY NOTED ON PLANS AND SCHEDULES.
- WHERE WALLS ARE NOT GROUTED SOLID, EACH GROUT POUR SHALL TERMINATE FLUSH WITH THE TOP OF THE UPPER MOST UNIT.
- WHERE WALLS ARE GROUTED SOLID, EACH GROUT POUR SHALL TERMINATE 1-1/2" BELOW TOP OF UNIT.
- GROUT POURS SHALL NOT EXCEED 5'-0" UNLESS HIGH LIFT GROUTING PROCEDURES ARE FOLLOWED.
- THE USE OF HIGH LIFT GROUTING PROCEDURES REQUIRE THE APPROVAL OF THE ARCHITECT AND ENGINEER AND SHALL NOT EXCEED THE MAXIMUM HEIGHTS GIVEN IN TABLE 1.20.1 OF TMS 602-11/ACI 530-1/ASCE 6-11. GROUT REMOVAL FROM CELLS SHALL BE AS PRESCRIBED BY THE ARCHITECT AND ENGINEER. SHALL BE REQUIRED WHERE REQUESTED GROUTING PROCEDURES DO NOT MEET THE LIMITS OF TABLE 1.20.1. ADDITIONALLY, ALL HIGH LIFT GROUTING SHALL REQUIRE SPECIAL INSPECTION PROCEDURES NEEDED TO VERIFY GROUT PLACEMENT DURING CONSTRUCTION. DURING THE SUBMITTAL FOR APPROVAL PROCESS, SUBMITTAL SHALL INCLUDE, BUT NOT BE LIMITED TO: STATEMENT OF PROCEDURE FOR MECHANICAL VIBRATION OF HIGH LIFT GROUT; NEW MIX DESIGNS FOR HIGH SLUMP, HIGH LIFT GROUT; FOR SELF-CONSOLIDATING GROUT; SUBMIT MIX DESIGNS, SLUMP FLOW RATES, VISUAL STABILITY INDEX (VSI), AND QUANTITIES OF ADMIXTURES.
- ALL MASONRY BEAMS SHALL BE BUILT INTEGRAL WITH SUPPORT. NO TOOTHING OR DOWELING PERMITTED. UNITS WITH ONE END OPEN SHALL BE USED FOR ALL MASONRY BEAMS.
- ALL VERTICAL REINFORCING SHALL BE SECURED IN PLACE PRIOR TO GROUTING USING WIRE POSITIONERS OR OTHER ACCEPTABLE DEVICES. REINFORCING SHALL BE SECURED AT BAR-SPLICE LOCATIONS AND AT A SPACING NOT MORE THAN 120 BAR DIAMETERS.
- UNLESS NOTED OTHERWISE, MASONRY WALLS SHALL BE CONSTRUCTED UTILIZING COMMON RUNNING-BOND WITH FULLY MORTARED BED JOINTS AROUND GROUTED CELLS.
- ELECTRICAL CONDUIT SHALL NOT BE PLACED IN CELLS THAT CONTAIN REBAR. CONDUIT IS ALLOWED TO PASS THROUGH REINFORCED CELLS WHEN IT OCCURS PERPENDICULAR TO THE REBAR. CONDUIT SHALL NOT CONTACT REBAR AS IT PASSES. THERE SHALL BE 1" CLEAR BETWEEN CONDUIT AND REBAR.

### J. TIMBER

- WOOD GRADES (UNLESS NOTED OTHERWISE)
  - ALL FRAMING (UNLESS SHALL BE DOUGLAS FIR/LARCH CLEARLY MARKED WITH A STAMP BY WWPA) SHALL BE GRADE 1 AND SHALL BE GRADED AS FOLLOWS:
    - HORIZONTAL MEMBERS: JOISTS & RAFTERS; NO. 2 BEAMS & STRINGERS; NO. 2.
    - VERTICAL MEMBERS: POST & TRIMMERS; NO. 1, STUDS; NO. 2.
- SHEATHING SHALL BE APA RATED SHEATHING, EXPOSURE I, EXTERIOR GLUE AND PANEL INDEX RATING AS NOTED BELOW UNLESS NOTED OTHERWISE:
 

LOCATION	THICKNESS	PANEL INDEX
WALLS:	15/32"	240
ROOFS:	19/32"	321/32"
- INDIVIDUAL PIECES OF SHEATHING AT ROOF AND SHEAR WALLS SHALL NOT BE SMALLER THAN 24" IN EITHER DIRECTION AND SHALL SPAN A MINIMUM OF TWO FRAMING SPACES, UNO.
  - CONNECTIONS, FASTENERS, AND ADHESIVE
    - ALL BOLTS THRU WOOD SHALL BE ASTM A307 AND SHALL HAVE HARDENED WASHERS UNDER ASTM A563 HEAVY HEX NUT AND BOLT HEADS.
    - UNLESS NOTED OTHERWISE, COMMON NAILS SHALL BE USED TO FASTEN ALL PLYWOOD SHEATHING TO SUPPORTING TRUSSES, JOISTS, LEDGERS OR BLOCKING AS FOLLOWS:
      - BOUNDARY NAILING "BN": 4" O.C. AT ALL ROOF SHEATHING INTO BEARING WALLS, SHEAR WALLS, AND BLOCKING.
      - PANEL EDGE NAILING "EN": 6" O.C. AT ALL OTHER PLYWOOD PANEL EDGES.
      - PANEL FIELD NAILING "FN": 12" O.C. AT INTERIOR SUPPORTS IN FIELD OF PANEL.
  - NAILS SHALL BE GALVANIZED OR STAINLESS STEEL AT EXPOSED LOCATIONS OR IN TREATED WOOD (SEE NOTE BELOW FOR FASTENERS CONNECTED TO OR IN CONTACT WITH TREATED WOOD). THE HEAD OF ALL NAILS SHALL BE DRIVEN FLUSH WITH THE SURFACE OF THE SHEATHING.
  - ALL WALL SHEATHING SHALL BE FASTENED TO THE WALL FRAMING WITH 10D NAILS @ 6" O.C.
- ALL NAILS SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:
 

NAIL SIZE	SHANK DIAMETER	MIN. PENETRATION INTO SUPPORT MEMBER
8D	0.113"	1.25"
10D	0.131"	1.50"
12D	0.148"	1.63"
14D	0.162"	1.75"

- ALL WOOD TRUSSED RAFTERS SHALL BE FABRICATED IN COMPLIANCE WITH THE RESEARCH COMMITTEE RECOMMENDATIONS OF THE ICC FOR THE CONNECTOR PLATES USED. SUBMIT DESIGN CALCULATIONS WITH ENGINEERS SEAL FOR REVIEW WITH SHOP DRAWINGS. PROVIDE CALCULATIONS AND DETAILS FOR ALL TRUSS TO TRUSS CONNECTIONS INCLUDING CONNECTION HARDWARE. ALL NECESSARY TRUSS BRIDGING AND CONNECTION DESIGN OF TRUSS BRIDGING SHALL BE PROVIDED BY THE TRUSS DESIGNER AND SHALL BE INCLUDED IN THE DESIGN CALCULATIONS FOR REVIEW.
- INSTALLATION OF ALL METAL-PLATE-CONNECTED WOOD TRUSSES SHALL COMPLY WITH THE FOLLOWING STANDARDS:
  - ANSI/TPI 1 "NATIONAL DESIGN STANDARD FOR METAL-PLATE-CONNECTED WOOD TRUSSES".
  - TPI HIB "COMMENTARY AND RECOMMENDATIONS FOR HANDLING INSTALLING & BRACING METAL-PLATE-CONNECTED WOOD TRUSSES".
  - TPI DSB "RECOMMENDED DESIGN SPECIFICATION FOR TEMPORARY BRACING OF METAL-PLATE-CONNECTED WOOD TRUSSES".
- UNLESS NOTED OTHERWISE, ALL ROOF SHEATHING AND WALL SHEATHING AT SHEAR WALLS SHALL HAVE SOLID BLOCKING AT ALL PANEL EDGES.
- PROVIDE SOLID 2" (NOMINAL) FULL DEPTH BLOCKING AT ENDS AND SUPPORT LOCATIONS FOR ALL JOISTS AND RAFTERS. BLOCKING SHALL BE ATTACHED TO SUPPORT FRAMING WITH A MINIMUM OF (1) SIMPSON A35 FRAMING ANCHOR BOLTS PER PANEL EDGE UNLESS NOTED OTHERWISE.
- UNLESS NOTED OTHERWISE, ALL BEARING WALLS SHALL BE 2X6 STUDS SPACED AT 16" O.C. BLOCK ALL NON-SHEATHED BEARING WALLS AT 4'-0" O.C.
- VERIFY THE STUD SPACING WITH THE ANCHOR BOLT LAY-OUT. WHERE STUDS INTERFERE WITH ANCHOR BOLTS, PROVIDE AN ADDITIONAL FULL-HEIGHT STUD TO ENSURE THAT THE FULL CROSS-SECTIONAL AREA OF THE STUD IS IN CONTACT WITH THE SILL PLATE.
- EXTERIOR WALLS SHALL HAVE MINIMUM 2X TOP PLATES SPLICED WITH A MINIMUM OF 32" OF OVERLAP AND SHALL BE CONNECTED WITH A MINIMUM OF (12) 16D NAILS.
- EXCEPT WHERE NOTED OTHERWISE, THE NUMBER AND SIZE OF NAILS CONNECTING WOOD MEMBERS SHALL NOT BE LESS THAN THAT SET FORTH IN IBC TABLE 2304.9.1. CONNECTIONS FOR MULTIPLE PIECES OF ENGINEERED LUMBER PIECES SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
- UNLESS NOTED OTHERWISE, ALL HORIZONTAL FRAMING MEMBERS SHALL BE INSTALLED WITH THE NATURAL CROWN UP.

### T. DEFERRED SUBMITTALS

- DEFERRED SUBMITTALS ARE COMPLETE PACKAGES TO BE SUBMITTED FOR REVIEW THAT INCLUDE DRAWINGS AND CALCULATIONS FOR ALL ELEMENTS AND CONNECTIONS OF ITEMS LISTED BELOW. DEFERRED SUBMITTALS SHALL BEAR THE STAMP AND SIGNATURE OF THE DESIGN PROFESSIONAL RESPONSIBLE FOR THE DESIGN.
- DEFERRED SUBMITTAL COMPONENTS SHALL NOT BE INSTALLED UNTIL APPROVED BY THE BUILDING OFFICIAL.
- DEFERRED SUBMITTALS SHALL INCLUDE, BUT ARE NOT LIMITED TO:
  - PRE-MANUFACTURED WOOD TRUSSES, BLOCKING, BRIDGING, BRIDGING CONNECTIONS, TRUSS HANGERS, AND RELATED COMPONENTS.

SCALE:	AS NOTED
DATE:	4/18/2017
DESIGN:	AJH
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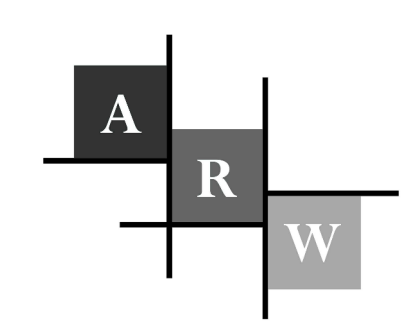
REVISONS	DESCRIPTION
DATE	

DWG. X:\DRAWINGS\2017\17022 - Hooper Well #1 Tank\17022 - Water Tank Wall House - 2017.rvt

STRUCTURAL NOTES

HOOPER WELL #1 TANK  
LIBERTY PIPELINE COMPANY  
HOOPER, WEBER, UTAH

STRUCTURAL SHEET INDEX	
SHEET NUMBER	SHEET NAME
S0.1	STRUCTURAL NOTES
S0.2	SCHEDULES
S0.3	SCHEDULES
S1.1	FOOTING AND ROOF FRAMING PLAN
S2.1	DETAILS



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S0.1



SPECIAL INSPECTION SCHEDULE <sup>1, 2</sup>				
ESTABLISHED PER 2015 IBC SECTION 110 AND CHAPTER 17				
ITEM	CONTINUOUS <sup>3</sup>	PERIODIC <sup>3</sup>	REFERENCE	COMMENTS
<b>CONCRETE CONSTRUCTION (IBC 1705.3)</b>				
REINFORCING STEEL PLACEMENT		●	SEE IBC TABLE 1705.3 - REF. NOTE C1	C1. SPECIAL INSPECTION IS NOT REQUIRED FOR CONC. ISOLATED SPREAD FOOTINGS, CONTINUOUS FOOTINGS, NON-STRUCTURAL SLABS.
WELDING OF REINFORCING STEEL	●	●	REFERENCE NOTE C2	C2. PERIODIC SPECIAL INSPECTION IS ALLOWED FOR VERIFICATION OF THE WELDABILITY OF REINFORCING STEEL RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, BOUNDARY ELEMENTS OF SPECIAL REINFORCED CONCRETE SHEAR WALLS, AND SHEAR REINFORCEMENT. PERIODIC SPECIAL INSPECTION IS ALLOWED FOR WELDING OF OTHER ASTM A 706 REINFORCING STEEL NOT INCLUDED IN THE CONTINUOUS SPECIAL INSPECTION REQUIREMENTS NOTED ABOVE.
EMBEDDED BOLTS & PLATES	●			
VERIFYING REQUIRED DESIGN MIX		●		C3. PERFORM AIR, SLUMP AND TEMP. TESTS WHEN CONCRETE SAMPLES ARE CAST.
CONCRETE PLACEMENT / SAMPLING	●		REFERENCE NOTE C3	C4. PERIODIC SPECIAL INSPECTION IS REQUIRED FOR VERIFICATION OF IN-SITU CONCRETE STRENGTH FOR POST-TENSIONED CONCRETE PRIOR TO TENSIONING TENDONS OR REMOVING SHORING OR FORMS.
CURING TEMPERATURE / TECHNIQUES		●		C5. EPOXY AND EXPANSION ANCHORS INTO MASONRY OR CONCRETE MAY BE USED ONLY WHEN APPROVED BY ARCHITECT, AND/OR ENGINEER USING AN APPROVED PRODUCT WITH CURRENT PUBLISHED ICC RESEARCH REPORT NUMBERS. COORDINATE CONTINUOUS/PERIODIC SPECIAL INSPECTION REQUIREMENTS WITH ICC REPORT.
PRESTRESSED CONCRETE				
APPLICATION OF PRESTRESSING FORCES	●			
GROUTING BONDED TENDONS	●			IN SEISMIC-FORCE-RESISTING SYSTEM
ERECTION OF PRECAST MEMBERS		●		
VERIFICATION OF IN-SITU STRENGTH		●	REFERENCE NOTE C4	
EPOXY / EXPANSION ANCHOR PLACEMENT	●	●	REFERENCE NOTE C5	
<b>MASONRY CONSTRUCTION (IBC 1705.4)</b>				
SEE TMS 402/ACI 550 TABLE 1:19.2 (NON-ESSENTIAL)				
AS MASONRY CONSTRUCTION BEGINS, VERIFY:				
SITE PREPARED MORTAR		●		
MORTAR JOINTS		●		
REINFORCEMENT / CONNECTORS		●		
PRE-STRESSING TECHNIQUES		●		
GRADE & SIZE OF TENDONS & ANCHORAGES		●		
INSPECTION SHALL VERIFY:				
SIZE & LOCATION OF STRUCTURAL ELEMENTS		●		
TYPE, SIZE, & LOCATION OF ANCHORS		●	REFERENCE NOTE M2	
SIZE, GRADE & TYPE OF REINFORCEMENT		●		
WELDING OF REINFORCING BARS	●		REFERENCE NOTE M1	
HOT OR COLD WEATHER PROTECTION		●		
MEASUREMENT OF PRE-STRESSING FORCE		●	REFERENCE NOTE M2	
PRIOR TO GROUTING, VERIFY:				
CLEAN GROUT SPACE		●	REFERENCE NOTE M2	
PLACEMENT OF REINFORCEMENT CONNECTORS, TENDONS AND ANCHORS.		●		
PROPORTIONS OF SITE PREPARED GROUT		●		
CONSTRUCTION OF MORTAR JOINTS		●		
GROUT PLACEMENT	●			
GROUTING OF PRE-STRESSING BONDED TENDONS	●			
PREPARATION OF TEST SPECIMENS / PRISMS	●			
COMPLIANCE W/ CONST. DOCS. / SUBMITTALS		●		
EPOXY / EXPANSION ANCHOR PLACEMENT	●	●	REFERENCE NOTE M3	
VERIFICATION OF $f_m$ AND $f_{a,c}$		●		
SELF CONSOLIDATING GROUT:				
VERIFY SLUMP FLOW AND VSI	●			

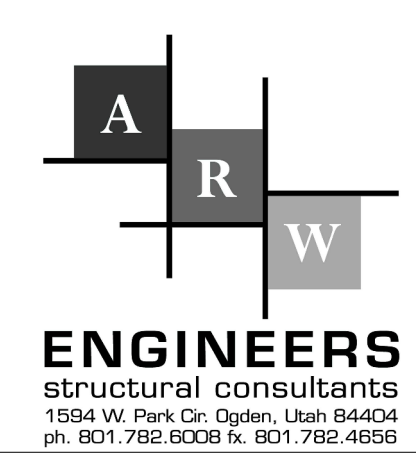
**GENERAL SPECIAL INSPECTION NOTES :**

- THE ITEMS MARKED WITH A "●" IN THE SPECIAL INSPECTION SCHEDULE SHALL BE INSPECTED IN ACCORDANCE WITH IBC CHAPTER 17 BY A CERTIFIED SPECIAL INSPECTOR FROM AN ESTABLISHED TESTING AGENCY. FOR MATERIAL SAMPLING AND TESTING REQUIREMENTS, REFER TO THE MATERIAL SAMPLING AND TESTING SECTION, THE PROJECT SPECIFICATIONS, AND THE SPECIFIC GENERAL NOTES SECTIONS. THE TESTING AGENCY SHALL SEND COPIES OF ALL STRUCTURAL TESTING AND INSPECTION REPORTS DIRECTLY TO THE ARCHITECT, ENGINEER, CONTRACTOR, AND BUILDING OFFICIAL. ANY ITEMS WHICH FAIL TO COMPLY WITH THE APPROVED CONSTRUCTION DOCUMENTS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF DISCREPANCIES ARE NOT CORRECTED, THEY SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL, ARCHITECT, AND ENGINEER PRIOR TO COMPLETION OF THAT PHASE OF WORK. SPECIAL INSPECTION TESTING REQUIREMENTS APPLY EQUALLY TO ALL BIDDER DESIGNED COMPONENTS.
- ANY CONSTRUCTION OR MATERIAL THAT HAS FAILED INSPECTION SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT.
- CONTINUOUS SPECIAL INSPECTION MEANS THE FULL-TIME OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED. PERIODIC SPECIAL INSPECTION MEANS THE PART-TIME OR INTERMITTENT OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK HAS BEEN OR IS BEING PERFORMED AND AT THE COMPLETION OF THE WORK. (IBC SECTION 1702)

LEGEND OF SYMBOLS AND ABBREVIATIONS	
AB = ANCHOR BOLT	FOOTING MARK
ABV = ABOVE	TOP OF FOOTING ELEV.
ARCH = ARCHITECT	SECTION MARK
BLW = BELOW	SHEET NUMBER
BN = BOUNDARY NAILING	TOP OF FOUNDATION WALL OR COLUMN PIER ELEV.
BRB = BUCKLING RESTRAINED BRACE	MASONRY WALL
BRBF = BUCKLING RESTRAINED BRACE FRAME	DEPRESS FDN./WALL AND POUR FLOOR SLAB OVER AT MASONRY FOUNDATION WALL
CJP = COMPLETE JOINT PENETRATION	MASONRY BEAM
CMU = CONCRETE MASONRY UNIT	ELEVATION
COL = COLUMN	ITEMS, DETAILS, & SYSTEMS WHICH ARE PART OF THE LATERAL FORCE RESISTING SYSTEM.
CONC = CONCRETE	FOOTING STEP
CP = CONCRETE PIER	
DC = DEMAND CRITICAL	
DIA / Ø = DIAMETER	
DBA = DEFORMED BAR ANCHOR	
DBE = DECK BEARING ELEVATION	
ELEV = ELEVATION	
EN = EDGE NAILING	
EOD = EDGE OF DECK	
FDN = FOUNDATION	
FTG = FOOTING	
FFE = FINISHED FLOOR ELEVATION	
GB = CONCRETE GRADE BEAM	
HSA = HEADED STUD ANCHOR	
JBE = JOIST BEARING ELEVATION	
KB = KICKER BRACE	
MAX = MAXIMUM	
MB = MASONRY BEAM	
MC = MASONRY COLUMN	
MECH = MECHANICAL	
MEZZ = MEZZANINE	
MIN = MINIMUM	
MJ = MASONRY JAMB	
MW = MASONRY WALL	
NS, FS = NEAR SIDE, FAR SIDE	
OAE = OR APPROVED EQUAL	
OPP = OPPOSITE	
PAF = POWDER ACTUATED FASTENER	
PL = PLATE	
REINF = REINFORCING	
REQ = REQUIRED	
SIM = SIMILAR	
SSH = STEEL STUD HEADER	
SSJ = STEEL STUD JAMB	
SSS = STEEL STUD SILL	
SSW = STEEL STUD WALL	
TOP = TOP OF FOOTING	
TOB = TOP OF BEAM ELEVATION	
TOM = TOP OF MASONRY ELEVATION	
TOC = TOP OF CONCRETE SLAB	
TOG = TOP OF GIRDER ELEVATION	
TOS = TOP OF STEEL ELEVATION	
TYP = TYPICAL	
UNQ = UNLESS NOTED OTHERWISE	
AFF = ABOVE FINISHED FLOOR	

STANDARD HOOK & BEND SCHEDULE					
$4 d_b$ OR 2 1/2" MIN.		$D = 6d_b$ FOR #3 THROUGH #8 $D = 8d_b$ FOR #9 THROUGH #11			
BAR SIZE	DIMENSION OF STANDARD 180-DEG HOOKS, ALL GRADES			DIMENSION OF STANDARD 90-DEG HOOKS, ALL GRADES	
	A or G	J	D	A or G	D
#3	5"	3"	2 1/4"	6"	2 1/4"
#4	6"	4"	3"	8"	3"
#5	7"	5"	3 3/4"	10"	3 3/4"
#6	8"	6"	4 1/2"	1'-0"	4 1/2"
#7	10"	7"	5 1/4"	1'-2"	5 1/4"
#8	11"	8"	6"	1'-4"	6"
#9	1'-3"	11 3/4"	9 1/2"	1'-7"	9 1/2"
#10	1'-5"	1'-1 1/4"	10 3/4"	1'-10"	10 3/4"
#11	1'-7"	1'-2 3/4"	12"	2'-0"	12"

SCALE: AS NOTED	DATE: 4/18/2017	DESIGN: AJH	DRAWN: ZMT	CHECKED: DLP
REVISONS	DESCRIPTION	DATE		
<b>SCHEDULES</b> <b>HOOPER WELL #1 TANK</b> <b>LIBERTY PIPELINE COMPANY</b> <b>HOOPER, WEBER, UTAH</b>				
<b>CIVIL-LAND PLANNING</b> <b>MUNICIPAL-LAND SURVEYING</b>				
<b>5150 SOUTH 375 EAST OGDEN, UT</b> <b>OFFICE: 801.476.0202 FAX: 801.476.0066</b>				



**S0.2**



### 2015 IBC MASONRY REBAR LAP SPLICE SCHEDULE

FOR MASONRY APPLICATIONS (ACI 530 - 11)

CASE #1 = SINGLE BAR, CENTERED IN CELL

CASE #2 = WHEN REINFORCING BAR IS PLACED ADJACENT TO FACE SHELL

BAR LOCATION	MASONRY REINFORCING & SPLICE LENGTHS (IN) (f'm = 1500psi)									
	BAR SIZE					BAR SIZE				
	#3	#4	#5	#6	#7	#3	#4	#5	#6	#7
BEAM / WALL HORIZONTAL	20"	26"	32"	39"	45"					
WALL VERTICAL COLUMN AND JAMB	12"	16"	14"	29"	22"	45"	43"	54"	59"	63"

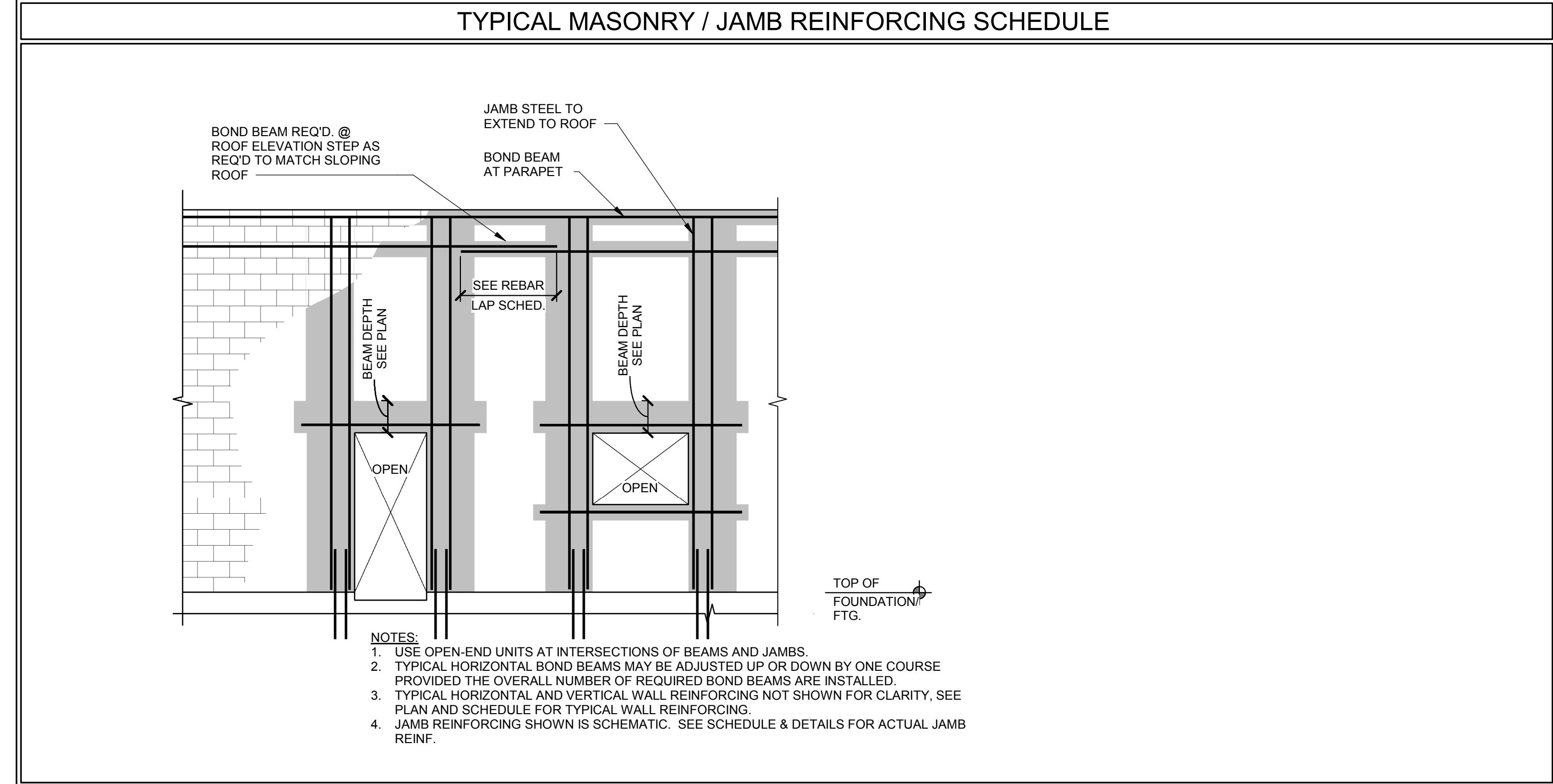
BAR LOCATION	MASONRY REINFORCING & SPLICE LENGTHS (IN) (f'm = 2000psi)									
	BAR SIZE					BAR SIZE				
	#3	#4	#5	#6	#7	#3	#4	#5	#6	#7
BEAM / WALL HORIZONTAL	20"	26"	32"	39"	45"					
WALL VERTICAL COLUMN AND JAMB	12"	14"	12"	25"	19"	40"	37"	54"	51"	63"

BAR LOCATION	MASONRY REINFORCING & SPLICE LENGTHS (IN) (f'm = 2500psi)									
	BAR SIZE					BAR SIZE				
	#3	#4	#5	#6	#7	#3	#4	#5	#6	#7
BEAM / WALL HORIZONTAL	20"	26"	32"	39"	45"					
WALL VERTICAL COLUMN AND JAMB	12"	12"	22"	17"	36"	33"	54"	46"	63"	

**NOTES:**

- MECHANICAL COUPLERS MAY BE USED IN LIEU OF LAP SPLICES SHOWN. SEE STRUCTURAL NOTES FOR MINIMUM COUPLER CAPACITY. WHERE MECHANICAL COUPLERS ARE USED, STAGGER ADJACENT SPLICES A MINIMUM OF 24" AS INDICATED ABOVE.
- DEVELOPMENT LENGTHS SHALL BE INCREASED BY 50% WHERE EPOXY COATED REBAR IS USED.
- WHEN SPLICING BARS OF DIFFERENT SIZES, USE LAP SPLICE LENGTH OF LARGER BARS UNO.
- ALL REBAR #8 AND LARGER IN MASONRY SHALL BE SPLICED USING MECHANICAL SPLICES. SEE STRUCTURAL NOTES FOR MINIMUM COUPLER CAPACITY.



#### MASONRY BEAM SCHEDULE

MARK	NOMINAL THICKNESS	BOTTOM REINF.	TOP REINF.	VERTICAL REINF.	MIN. GROUT DEPTH	OPENING SIZE	COMMENTS
MB-1	8"	(2) #5	(2) #5	#3 @ 24" O.C.	16"	UP TO 8'-8"	TYP UNO

#### MASONRY JAMB SCHEDULE

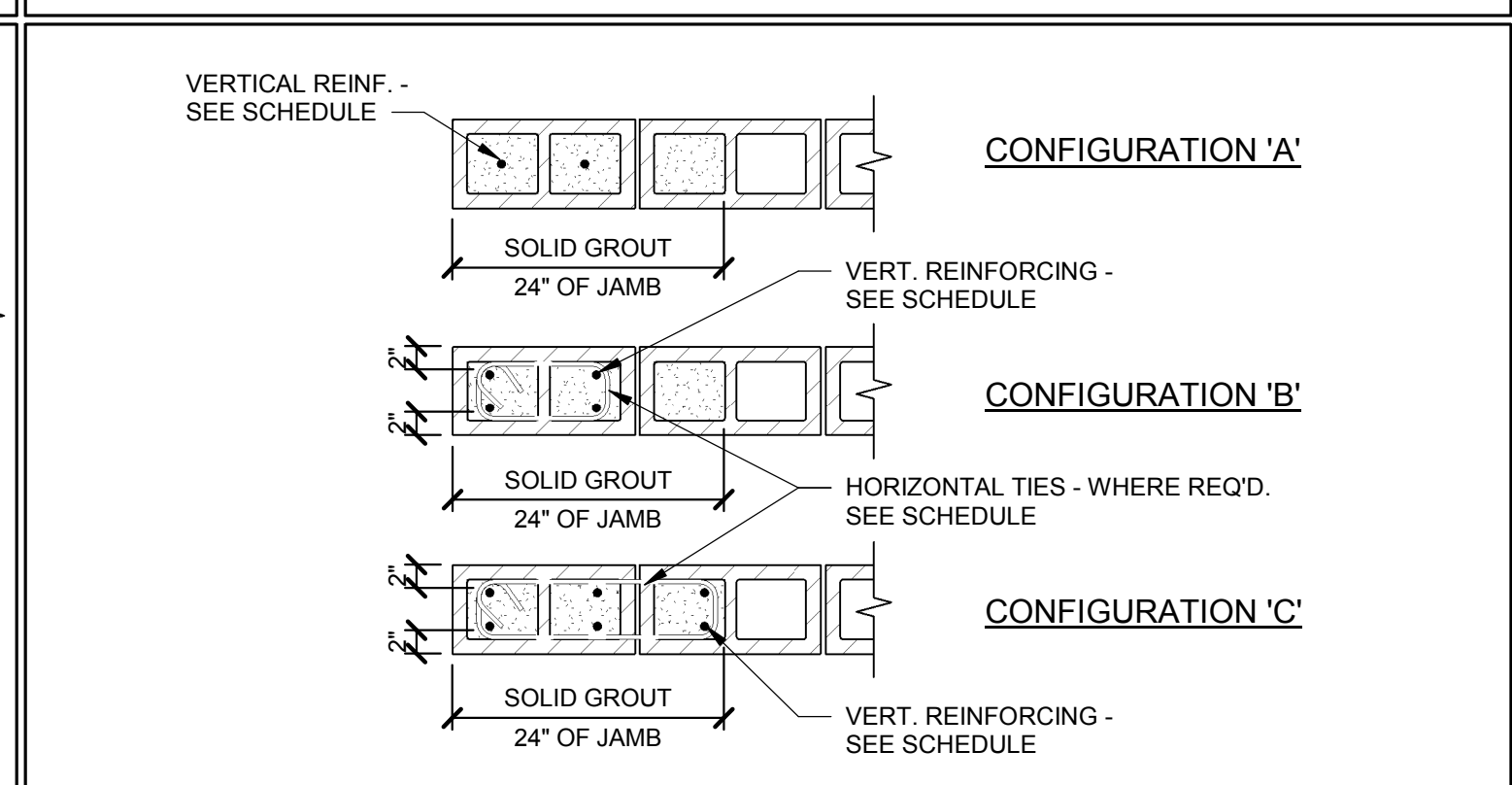
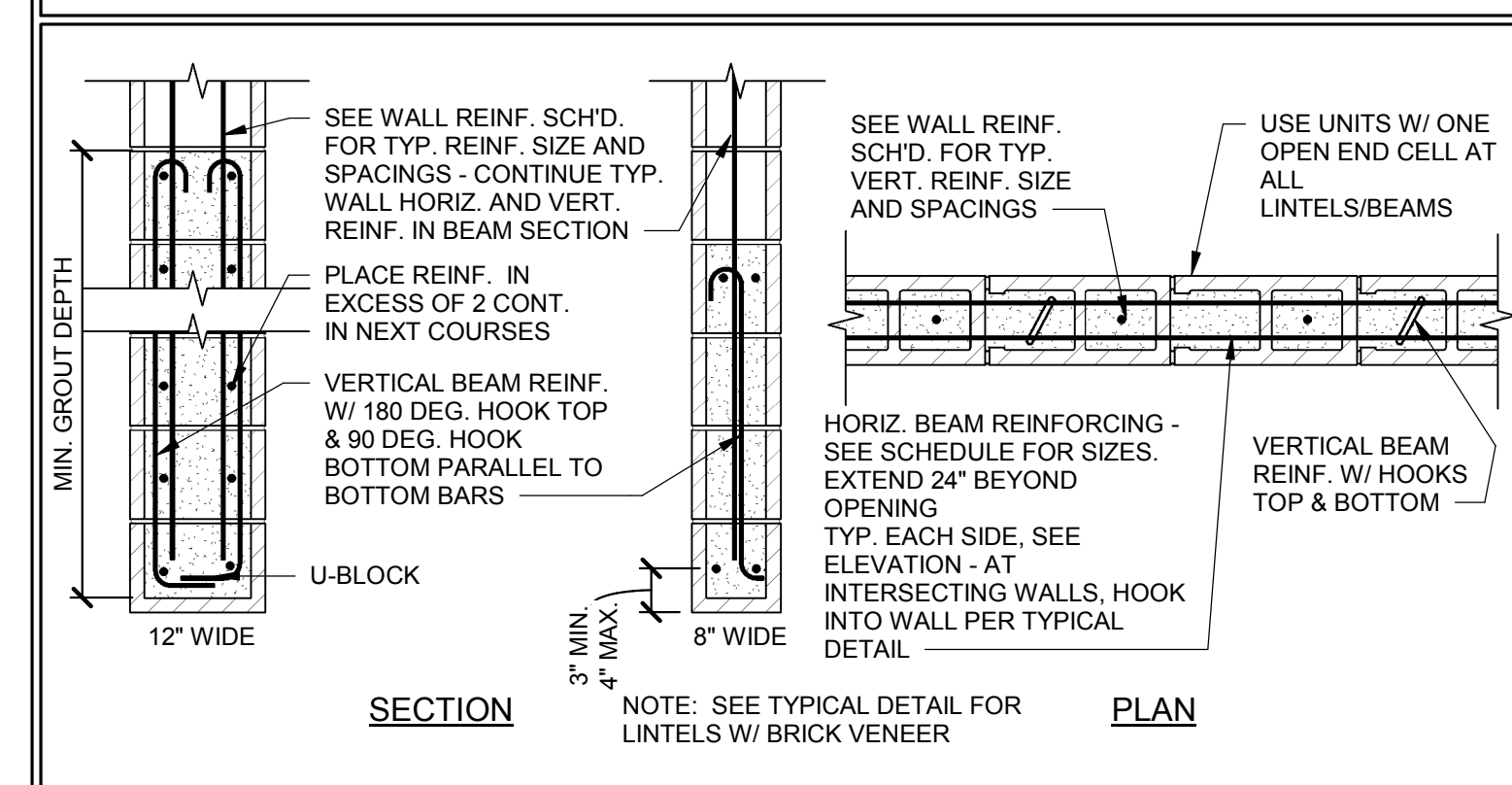
MARK	NOMINAL THICKNESS	VERTICAL REINF.	TIES	CONFIG.	OPENING SIZE	COMMENTS
MJ-1	8"	(2) #5	---	A	UP TO 8'-8"	

**NOTES:**

- WHERE SPECIFIC BEAMS ARE NOT NOTED ON THE PLANS - REFER TO OPENING SIZE FOR REQUIRED BEAM DEPTH AND REINFORCING.
- FIRST VERTICAL BAR TO BE WITHIN 8" OF END OF BEAM.
- SEE TYPICAL ELEVATION - VIEW OF BEAM.
- VERTICAL REINFORCING SHALL HAVE HOOKS TOP AND BOTTOM.

**NOTES:**

- WHERE SPECIFIC JAMBS ARE NOT NOTED ON THE PLANS - REFER TO OPENING SIZE FOR REQUIRED REINFORCING AND CONFIGURATION.
- ALL VERT. REINFORCING SHALL HAVE MATCHING DOWELS CAST INTO FOUNDATIONS.
- HORIZONTAL REINFORCING NOT SHOWN.
- JAMBS TO BE GROUTED SOLID.



#### MASONRY WALL SCHEDULE

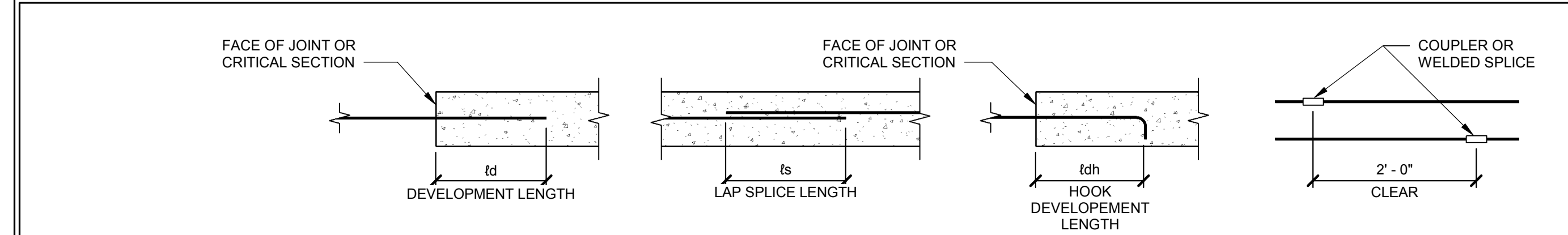
MARK	THICK	VERT. REINF.		HORIZ. REINF.		BOND BEAM REINF.		COMMENTS	
		SIZE	SPACE	NO.	SPACE	@ ROOF	@ ELEVATED FLOOR		
MW-1	8"	#5	32"o.c.	(2)	#4	48"	(2) #5	---	ALL WALLS U.N.O.

**NOTES:**

- FOR ANY CMU WALLS NOT SPECIFICALLY CALLED OUT IN PLANS, USE MW1
- VERT. REINFORCING TO BE @ CL. OF WALL UNLESS OTHERWISE NOTED.
- SOLID GROUTING OF WALLS IS UNACCEPTABLE EXCEPT WHERE SPECIFICALLY NOTED. SEE STRUCTURAL NOTES FOR ADDITIONAL INFORMATION.
- A BOND BEAM SHALL BE LOCATED IN THE FIRST COURSE ABOVE THE FOUNDATION IF VERTICAL DOWELS HAVE BEEN BENT TO ALIGN WITH VERTICAL CELLS, WHETHER OR NOT MASONRY WEBS HAVE BEEN CUT

### 2015 IBC CONC. REBAR LAP SPLICE SCHEDULE

FOR CONCRETE APPLICATIONS (ACI 318 - 14)



BAR LOCATION	CONCRETE		CONCRETE REINFORCING & SPLICE LENGTHS (IN)																								COMMENTS
	TYPE	STRENGTH	BAR SIZE												BAR SIZE												
			#3	#4	#5	#6	#7	#8	#9	#10	#11	#3	#4	#5	#6	#7	#8	#9	#10	#11							
VERT. WALL BARS, FILL ON METAL DECK	NWC	2500 PSI	17	22	8	22	29	8	28	36	10	33	43	12	48	62	13	55	72	15	62	17	69	19	76	30	
HORIZ. WALL BARS, FOOTING TOP BARS	NWC	2500 PSI	17	22	8	22	29	8	28	36	10	33	43	12	48	62	13	55	72	15	62	17	69	19	76	30	
BEAM BOTTOM BARS, COLUMN BARS	NWC	2500 PSI	17	22	8	22	29	11	28	36	14	33	43	16	48	62	19	55	72	22	62	25	69	27	76	30	
FOOTING BOTTOM BARS	NWC	2500 PSI	12	16	8	14	18	8	17	22	10	20	26	12	29	38	13	33	43	15	37	17	42	19	46	30	
BEAM TOP BARS	NWC	2500 PSI	22	29	8	29	38	11	36	47	14	43	56	16	63	82	19	72	94	22	81	25	90	27	98	30	
SLAB ON GRADE	NWC	2500 PSI	12	16	8	14	18	8	17	22	10	20	26	12	32	42	13	42	55	15	53	17	69	19	76	30	

BAR LOCATION	CONCRETE		CONCRETE REINFORCING & SPLICE LENGTHS (IN)																								COMMENTS
	TYPE	STRENGTH	BAR SIZE												BAR SIZE												
			#3	#4	#5	#6	#7	#8	#9	#10	#11	#3	#4	#5	#6	#7	#8	#9	#10	#11							
VERT. WALL BARS, FILL ON METAL DECK	NWC	4500 PSI	14	18	7	18	23	6	23	30	8	27	35	9	40	52	11	45	59	13	51	14	56	16	62	25	
HORIZ. WALL BARS, FOOTING TOP BARS	NWC	4500 PSI	14	18	7	18	23	6	23	30	8	27	35	9	40	52	11	45	59	13	51	14	56	16	62	25	
BEAM BOTTOM BARS, COLUMN BARS	NWC	4500 PSI	14	18	7	18	23	9	23	30	11	27	35	13	40	52	16	45	59	18	51	20	56	22	62	25	
FOOTING BOTTOM BARS	NWC	4500 PSI	12	16	7	12	16	6	14	18	8	17	22	9	24	31	11	27	35	13	31	14	34	16	37	25	
BEAM TOP BARS	NWC	4500 PSI	18	23	7	24	31	9	30	39	11	35	46	13	51	66	16	59	77	18	66	20	73	22	80	25	
SLAB ON GRADE	NWC	4500 PSI	12	16	7	12	16	6	14	18	8	17	22	9	27	35	11	34	44	13	44	14	56	16	62	25	

**NOTES:**

- MECHANICAL COUPLERS MAY BE USED IN LIEU OF LAP SPLICES SHOWN. SEE STRUCTURAL NOTES FOR MINIMUM COUPLER CAPACITY. WHERE MECHANICAL COUPLERS ARE USED, STAGGER ADJACENT SPLICES A MINIMUM OF 24" AS INDICATED ABOVE.
- DEVELOPMENT LENGTHS SHALL BE INCREASED BY 50% FOR STRAIGHT BAR DEVELOPMENT AND 20% FOR HOOKED BARS WHERE EPOXY COATING IS USED.
- WHEN SPLICING BARS OF DIFFERENT SIZES, USE LAP SPLICE LENGTH OF LARGER BARS UNO.
- SPLICE BARS LARGER THAN #11 USING MECHANICAL COUPLERS.

SCALE:	AS NOTED
DATE:	4/19/2017
DESIGN:	AJH
DRAWN:	ZMT
CHECKED:	DLP

REVISIONS	DESCRIPTION
DATE	

DWG. NO. DRAWINGS 2017171022 - Hooper Well #1 Tank Wall House - 2017.rvt

SCHEDULES

HOOPER WELL #1 TANK  
LIBERTY PIPELINE COMPANY  
HOOPER, WEBER, UTAH

**GARDNER ENGINEERING**

CIVIL - LAND PLANNING  
MUNICIPAL - LAND SURVEYING

5150 SOUTH 375 EAST OGDEN, UT  
OFFICE: 801.476.0202 FAX: 801.476.0066

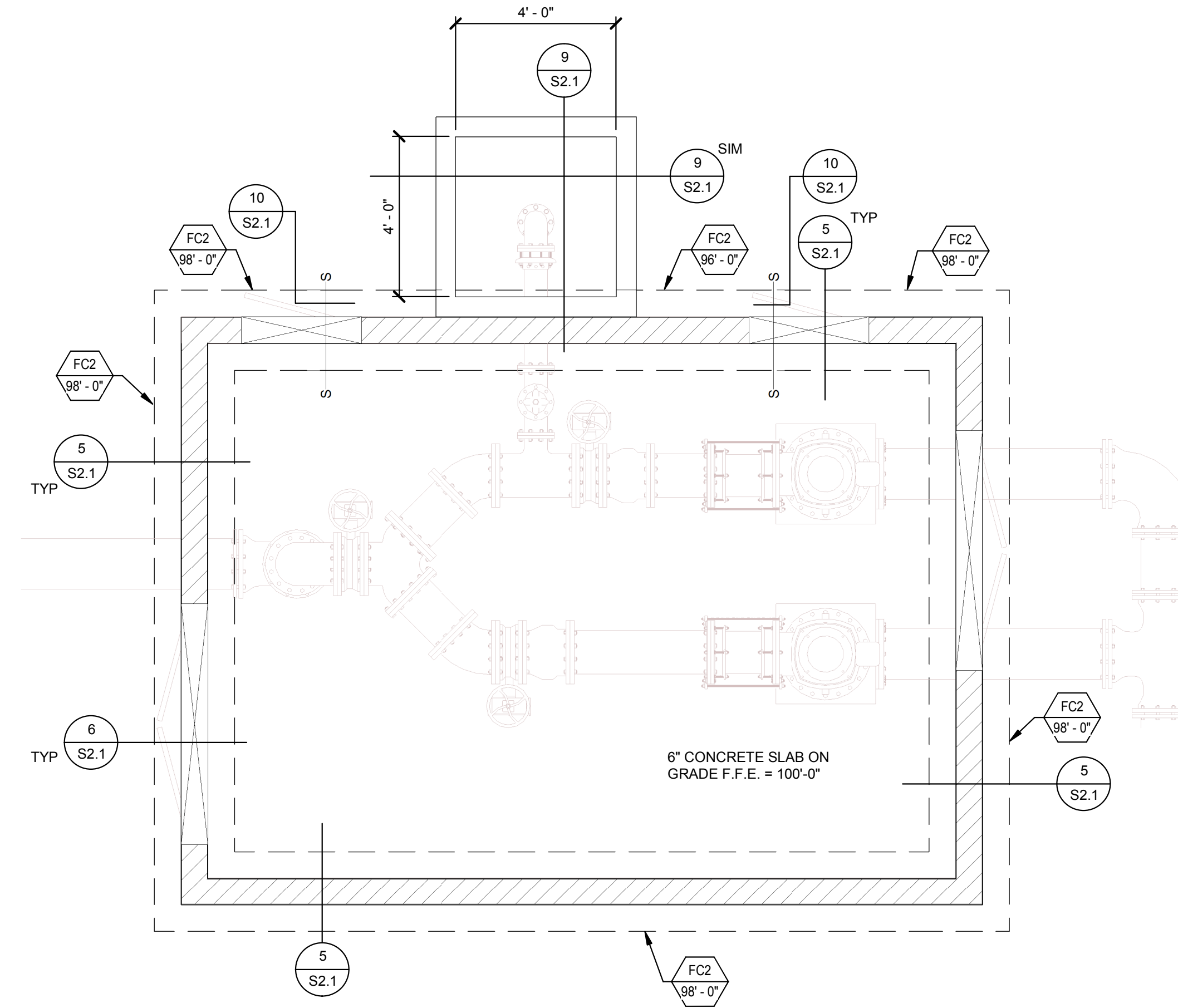
**ARW**

**ENGINEERS**  
structural consultants

1594 W. Park Dr. Ogden, Utah 84403  
ph: 801.795.8335 fx: 801.795.4650

S0.3

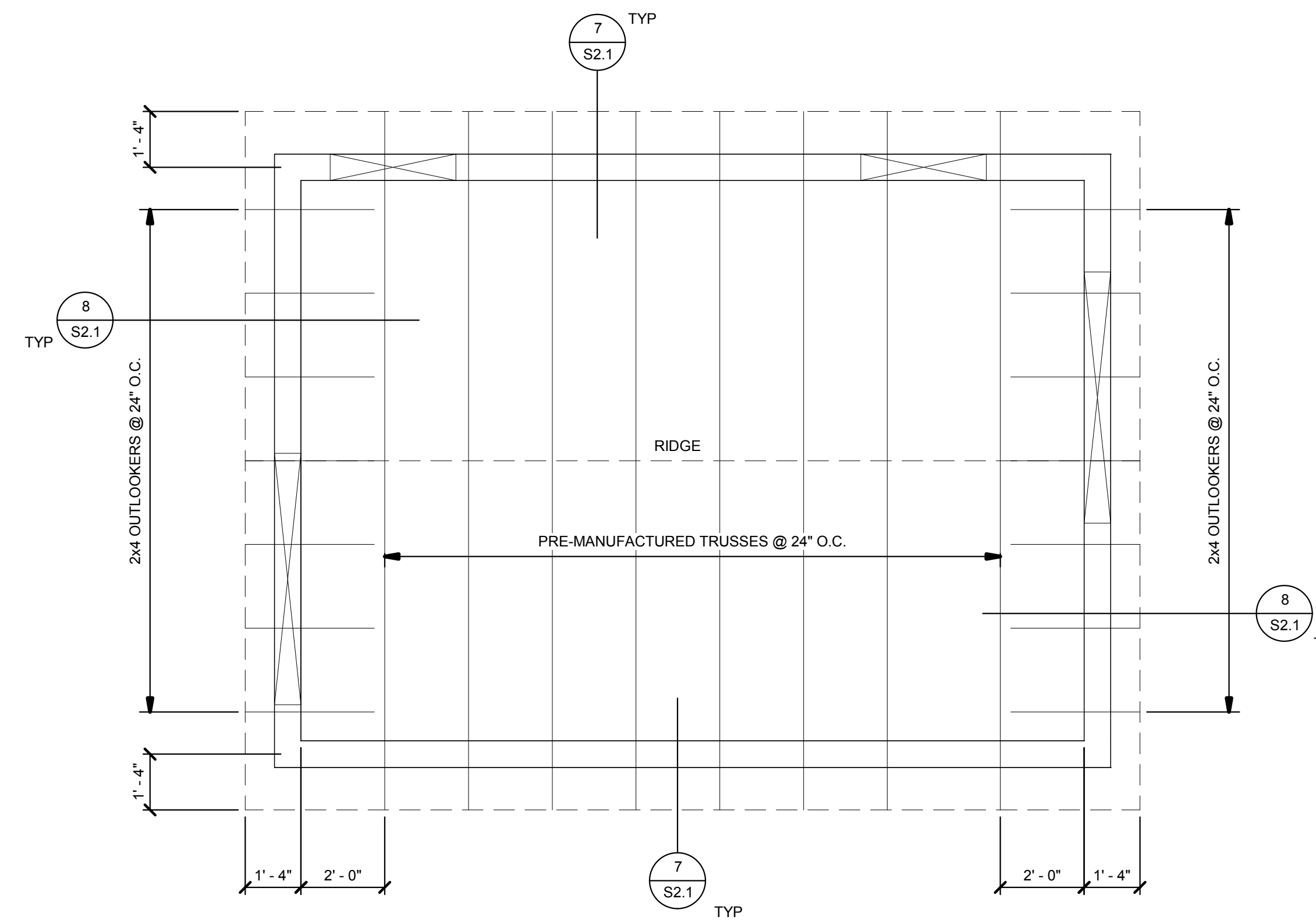




FOOTING AND FOUNDATION PLAN

SCALE: 3/8" = 1'-0"

1  
S1.1



ROOF FRAMING PLAN

SCALE: 3/8" = 1'-0"

2  
S1.1

FOOTING AND FOUNDATION NOTES

- SEE SHEET S0.1 FOR GENERAL STRUCTURAL NOTES.
- ALL FOOTINGS SHALL BE PLACED ON SOIL WHICH HAS BEEN PREPARED FOR THE BEARING PRESSURE SHOWN IN THE STRUCTURAL NOTES.
- VERIFY ALL DIMENSIONS WITH DRAWINGS AND NOTIFY ENGINEER OF ANY DISCREPANCIES FOUND.
- SOLID GROUT ALL MASONRY COURSES BELOW FINISHED FLOOR OR EXTERIOR GRADE (WHICHEVER IS HIGHER).
- PROVIDE DOWELS IN FOOTINGS/FOUNDATIONS TO MATCH VERTICAL WALL REINFORCING U.N.O.
- SEE SHEET S2.1 FOR TYPICAL FOOTINGS AND FOUNDATION DETAILS.
- ALL EXTERIOR WALL FOOTINGS TO BEAR A MINIMUM DIMENSION BELOW EXTERIOR GRADE AS NOTED IN GENERAL STRUCTURAL NOTES.
- FOUNDATION WALLS ARE DESIGNED AND DETAILED FOR THE COMPLETED CONDITION. CONTRACTOR IS RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION AND BACKFILLING TO PRODUCE PLUMB AND TRUE FINISHED WALLS.
- ALL ANCHORS, HOLD-DOWNS, ANCHOR BOLTS, DOWELS, EMBEDDED ITEMS, ETC. SHALL BE HELD IN PLACE PRIOR TO AND DURING CONCRETE AND/OR GROUT PLACEMENT.
- COORDINATE ALL FOOTING DEPTHS (INTERIOR AND EXTERIOR) WITH DRAINS, CONDUITS, PIPES, ETC. THAT MAY INTERFERE WITH FOOTINGS.

CONCRETE SLAB NOTES

- SLAB ON GRADE SHALL BE 6" THICK CONCRETE U.N.O. SLAB SHALL BE UNDERLAIN BY FREE DRAINING MATERIAL.

REVISIONS	DESCRIPTION
DATE	

FOOTING AND ROOF FRAMING PLAN  
 HOOPER WELL #1 TANK  
 LIBERTY PIPELINE COMPANY  
 HOOPER, WEBER, UTAH

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S1.1



