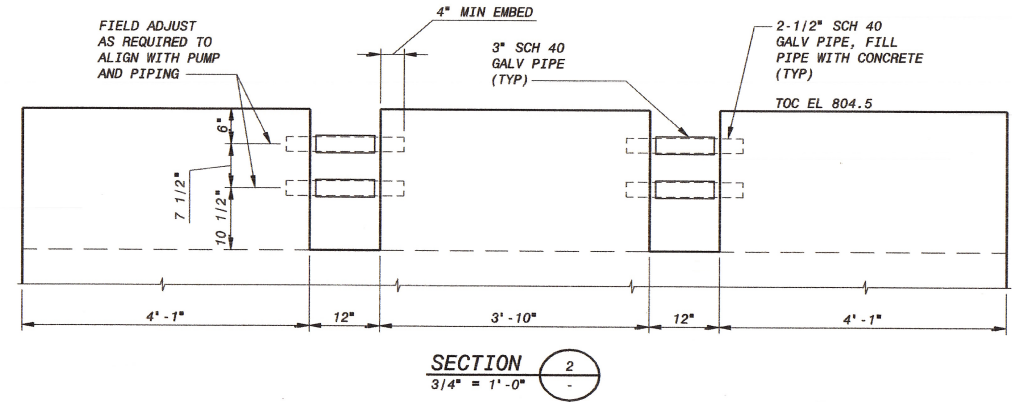
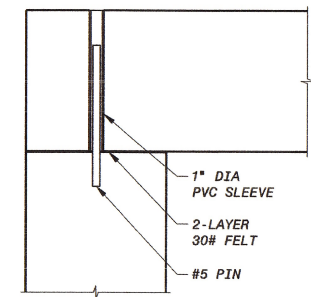


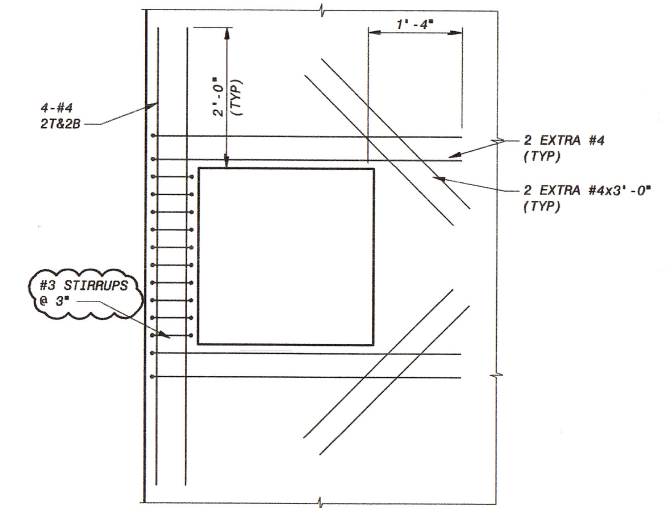
**RAW WATER INTAKE  
PUMP STATION VAULT**  
1/2" = 1'-0"



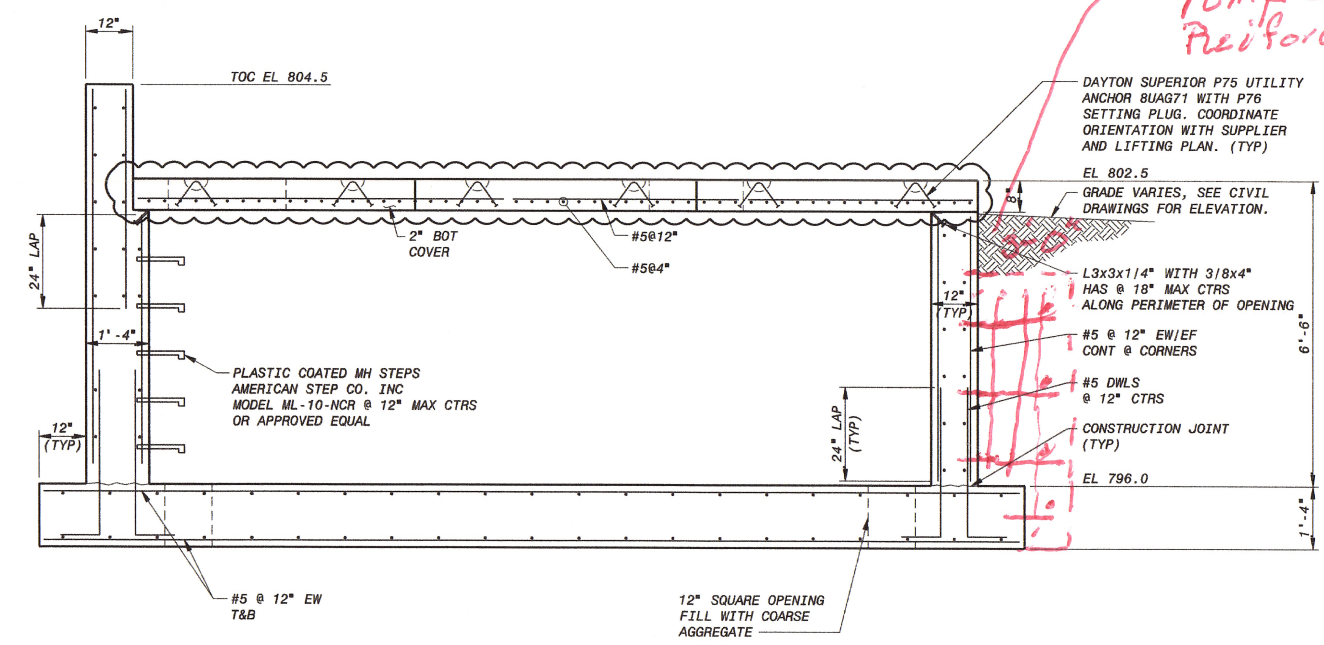
**SECTION 2**  
3/4" = 1'-0"



**DETAIL B**  
NO SCALE

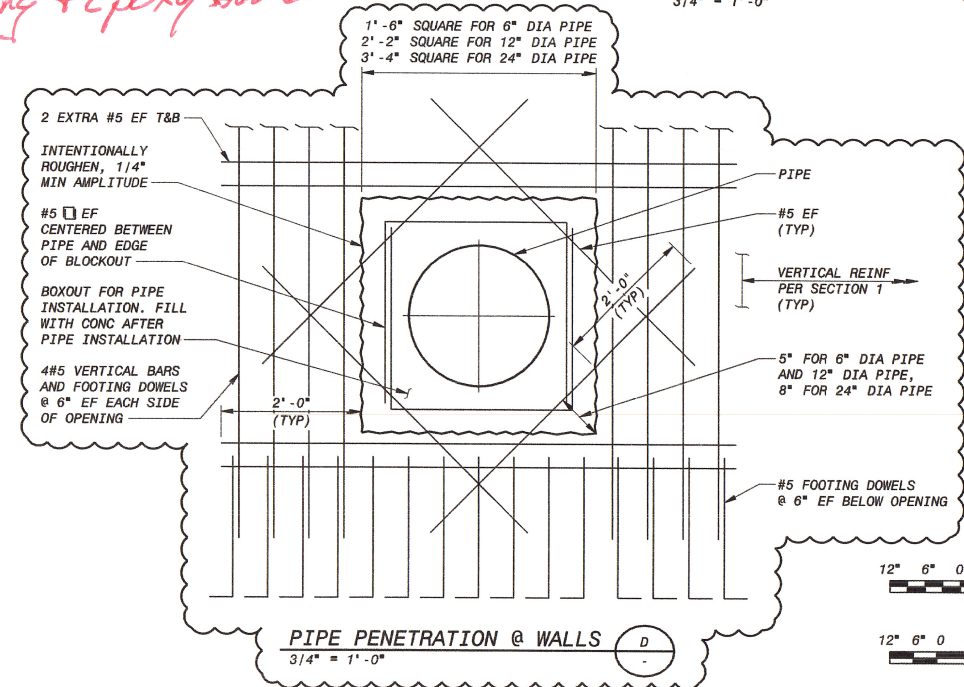


**EXTRA REINF AT MANHOLE C**  
3/4" = 1'-0"

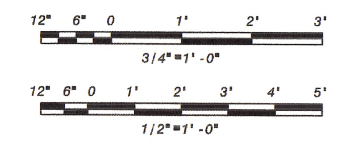


**SECTION 1**  
1/2" = 1'-0"

*Add Thickened Concrete  
Pump Can Collar w/ #5  
Reinforcing + Epoxy Dowel*



**PIPE PENETRATION @ WALLS D**  
3/4" = 1'-0"



**ISSUED FOR CONSTRUCTION**

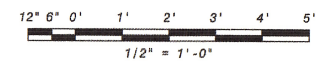
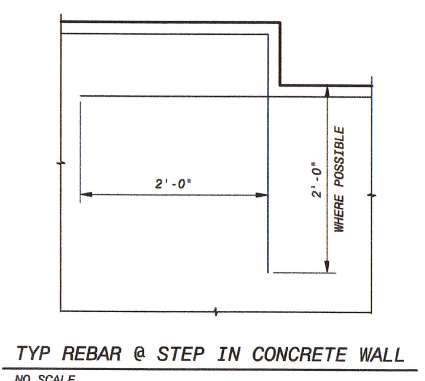
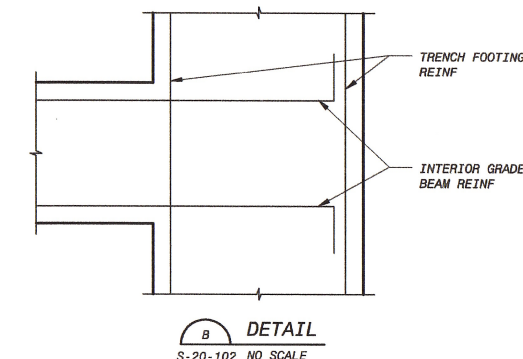
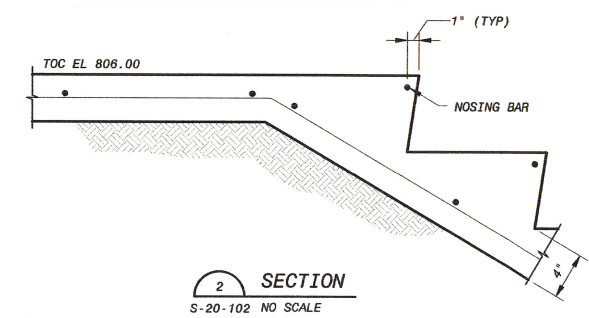
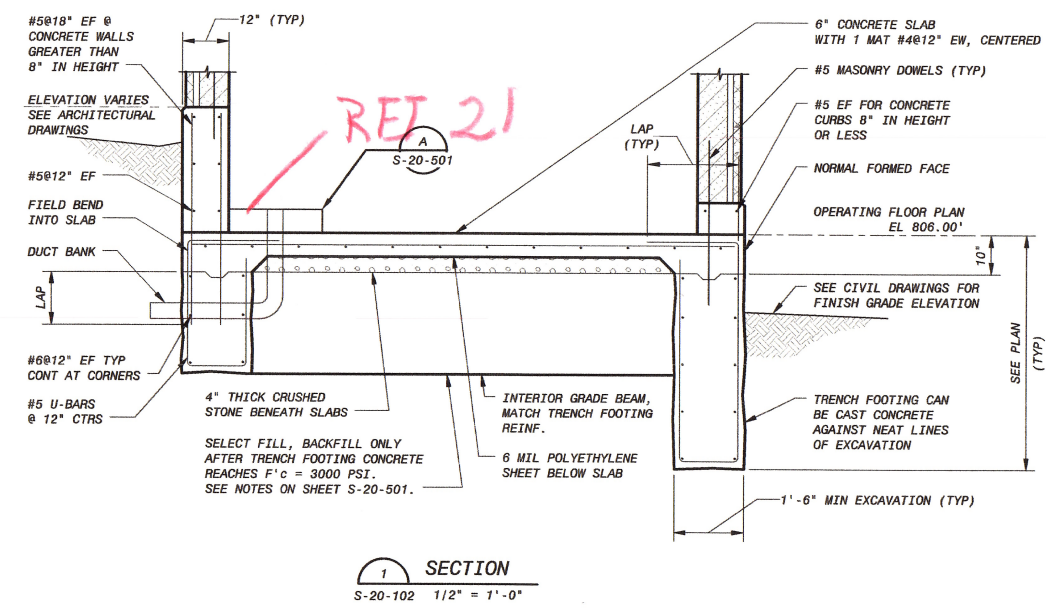
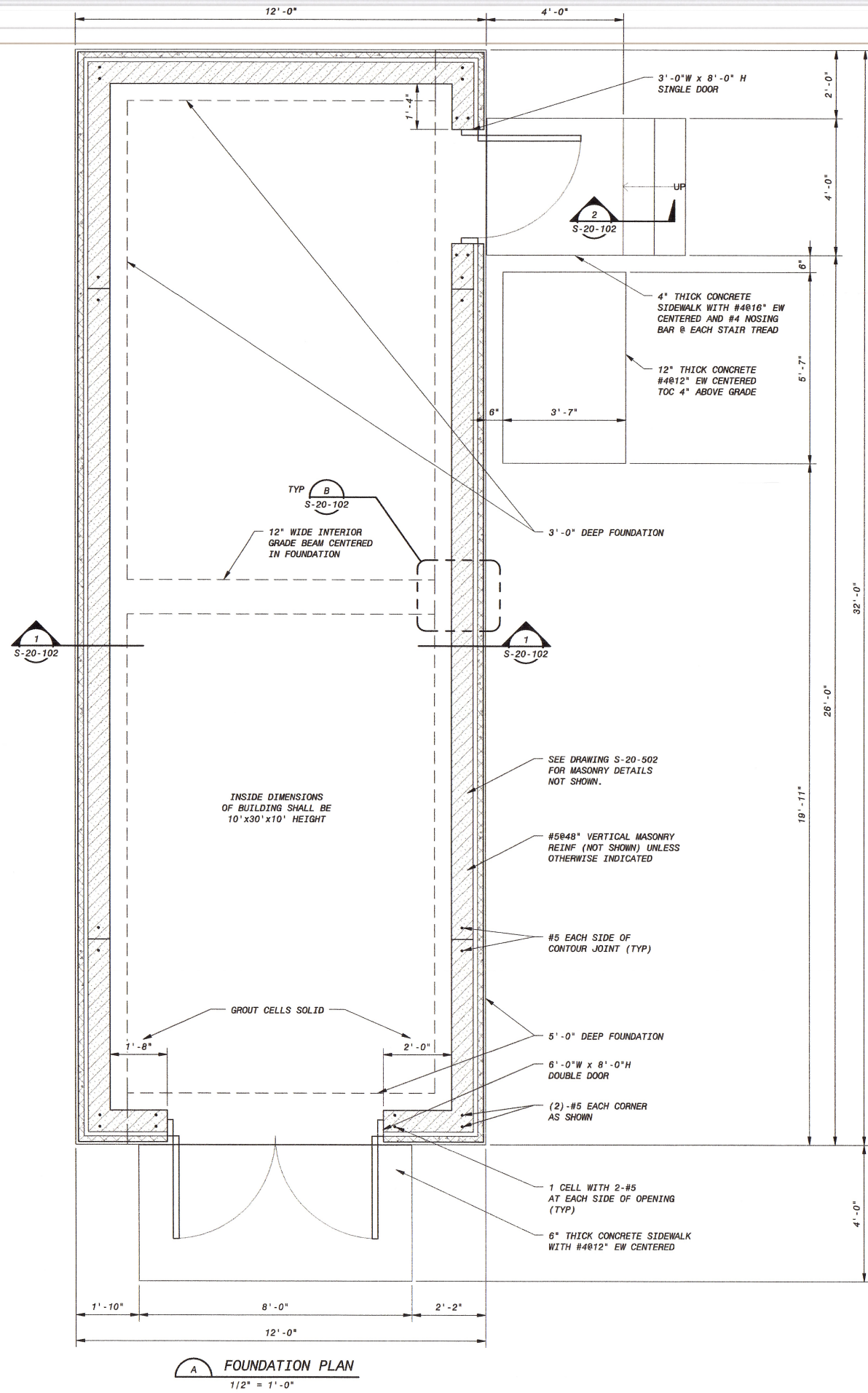
12/04/15	GENERAL REVISIONS	1	MOD	KC	PJD
10/21/15	ISSUED FOR CONSTRUCTION	0	IDE	KC	PJD
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	OK	APP.
50.3100	Structural Drawings				
SAVED: K0249353, 8/13/2015 2:16:08 PM					
PROJECT NO. 182262					
SHEET OF					
DESIGNED: WDB					
DETAILED: MAK					
CHECKED: KC					
APPROVED: PJD					
DATE: 10/21/15					
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE					
PROJECT NO. 182262					
S-20-101					
SHEET OF					

**BEDFORD REGIONAL WATER AUTHORITY**  
SMITH MOUNTAIN LAKE WTP &  
RAW WATER PUMP STATION / INTAKE

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Virginia Beach, VA

**STRUCTURAL**  
RAW WATER INTAKE PUMP STATION VAULT  
PLAN, SECTIONS AND DETAIL

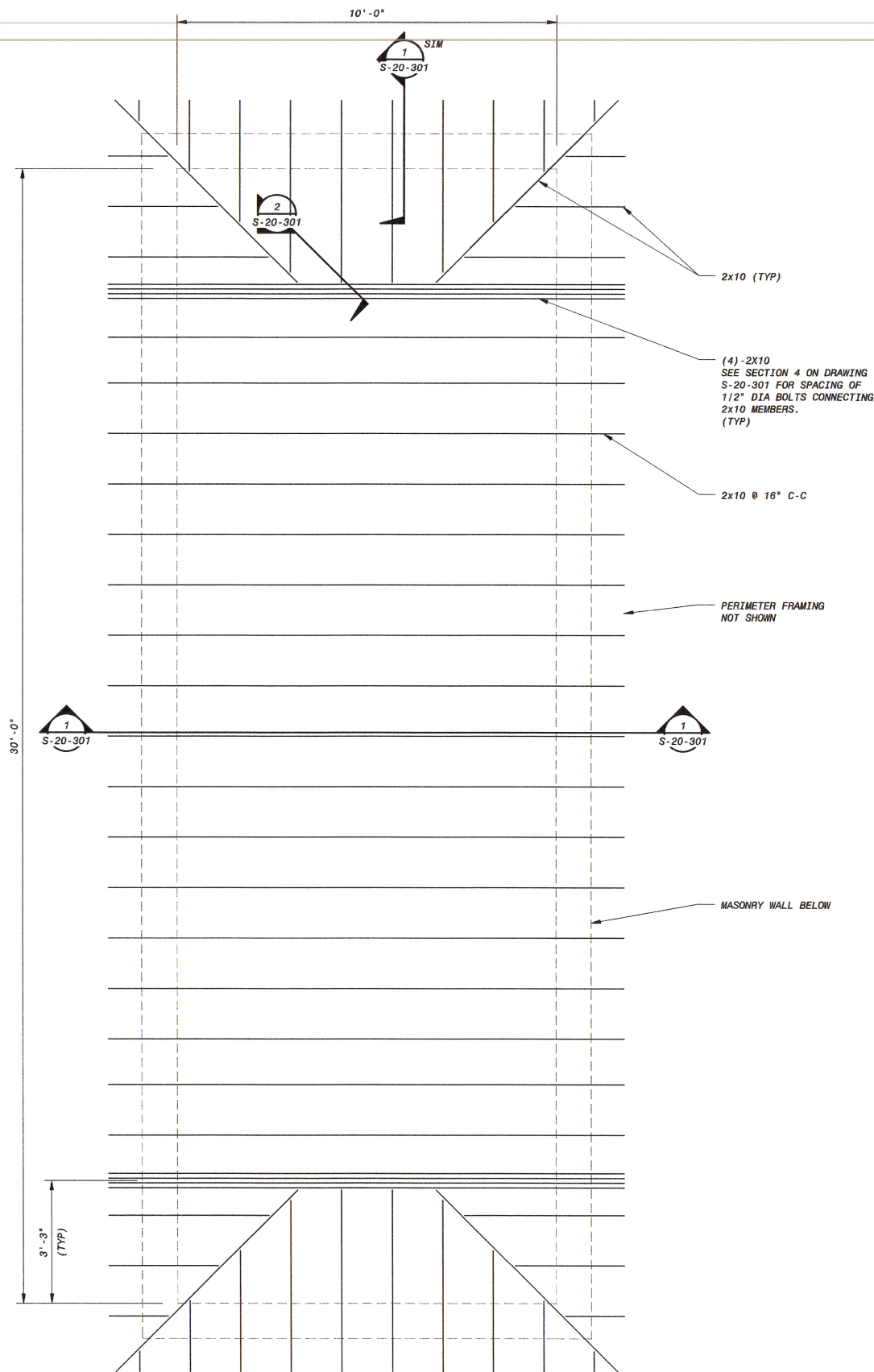




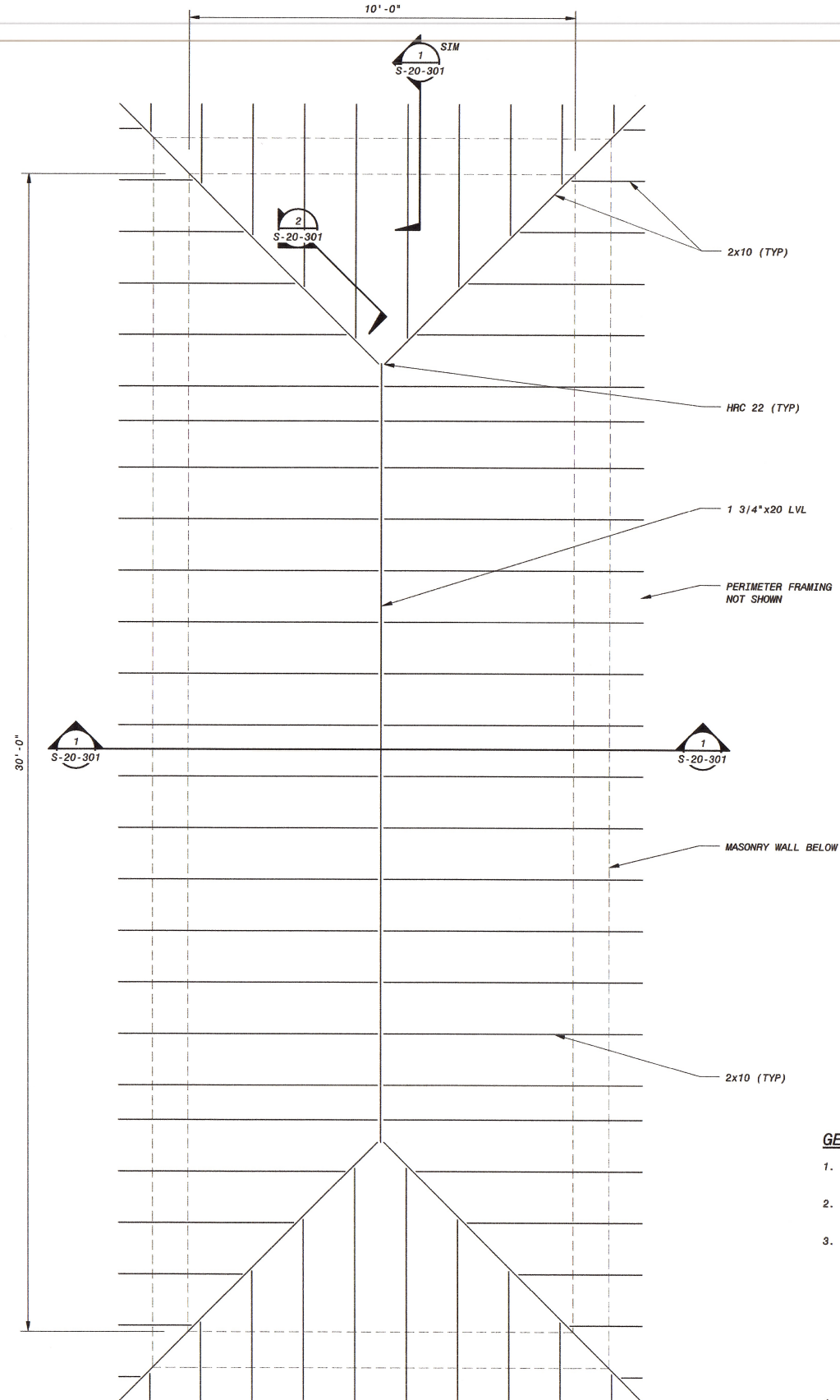
ISSUED FOR CONSTRUCTION

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BEDFORD REGIONAL WATER AUTHORITY SMITH MOUNTAIN LAKE WTP & RAW WATER PUMPING STATION / INTAKE STRUCTURAL ELECTRICAL BUILDING FOUNDATION PLAN, SECTIONS AND DETAIL	
DESIGNED: WDB DETAILED: MAK CHECKED: KC APPROVED: PJD DATE: 12/04/15	PROJECT NO. 182262 SHEET OF -





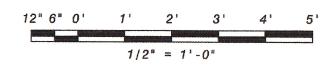
LOWER ROOF PLAN  
1/2" = 1'-0"



UPPER ROOF PLAN  
1/2" = 1'-0"

**GENERAL STRUCTURAL NOTES:**

1. ALL WOOD FRAMING IS SOUTHERN PINE SELECT STRUCTURAL UNLESS NOTED OTHERWISE.
2. ALL MANUFACTURED CONNECTIONS ARE SIMPSON STRONG-TIE OR EQUAL AT CONTRACTOR'S OPTION.
3. ALL WOOD FRAMING SHALL BE FIRE RETARDANT IMPREGNATED. FIRE RETARDANT WOOD SHALL MEET THE FLAME SPREAD REQUIREMENT OF 25 OR LESS, AS DETERMINED BY UNDERWRITERS LABORATORIES IN THE EXTENDED 30 MINUTE DURATION OF ASTM E-84, "STANDARD TEST METHOD FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS." EACH PIECE OF TREATED WOOD BEARS THE UNDERWRITERS LABORATORIES CLASSIFICATION MARK IDENTIFYING IT AS BEING PRODUCED UNDER ITS CLASSIFICATION AND FOLLOW UP SERVICES. THE FIRE-RETARDANT-TREATED WOOD ICC-ESR REPORT SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO PURCHASE OF WOOD.
4. PLYWOOD SHALL BE 3/4" APA RATED SHEETING AND SHALL BE LAYED OUT PER IBC 2012 CASE 1.
5. LVL'S SHALL BE GRADE 2.0E AS MANUFACTURED BY TRUS JOIST OR APPROVED EQUAL.



**ISSUED FOR CONSTRUCTION**

ISSUED FOR CONSTRUCTION DATE: 12/04/15 PW: C:\p\working\182262\182262.dwg SW: BUILDING.rvt USER: 12/13/2015 3:07:18 PM PLOTTED: 12/13/2015 3:07:18 PM USER: 12/13/2015 3:07:18 PM DWG VER: 12/13/2015 3:07:18 PM XREF1: 12/13/2015 3:07:18 PM XREF2: 12/13/2015 3:07:18 PM XREF3: 12/13/2015 3:07:18 PM XREF4: 12/13/2015 3:07:18 PM		PROJECT NO. <b>182262</b>
PROJECT NO. <b>182262</b>		PROJECT NO. <b>182262</b>
SHEET <b>S-20-103</b>		SHEET <b>S-20-103</b>
OF -		OF -

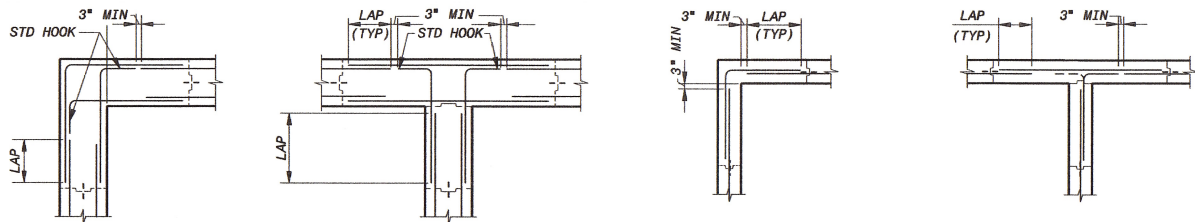
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**BEDFORD REGIONAL WATER AUTHORITY**  
**SMITH MOUNTAIN LAKE WTP &**  
**RAW WATER PUMPING STATION / INTAKE**  
**STRUCTURAL**  
**ELECTRICAL BUILDING**  
**ROOF FRAMING PLANS**





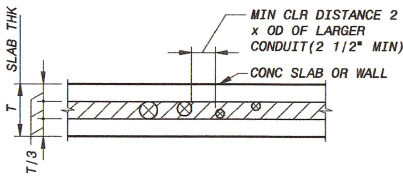




MAIN REINFORCEMENT FOR ALL STRUCTURES

TYPICAL HORIZONTAL CORNER REINFORCING DETAILS

- NOTES:
1. VERTICAL REINFORCING NOT SHOWN.
  2. THESE DETAILS SHALL BE APPLICABLE TO ALL WALL CORNERS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

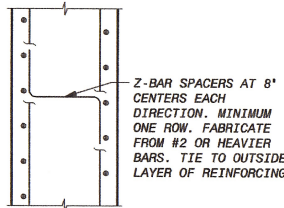


- NOTES:
1. PLACE CONDUIT ONLY IN SHADED AREA.
  2. FOR CONDUIT REQUIREMENTS SEE THE ELECTRICAL DRAWINGS AND SPECIFICATIONS.

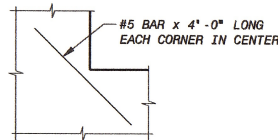
CONDUIT PLACING DETAIL

NO SCALE

NOTES
1. DETAILS ON THIS DRAWING APPLY TO ALL DRAWINGS UNLESS OTHERWISE NOTED.



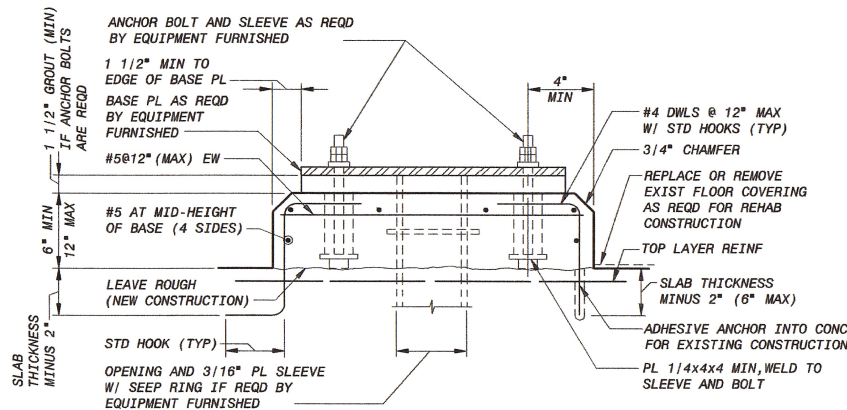
SPACERS FOR WALL REINFORCEMENT



TYPICAL EXTRA REINFORCING

AT ISOLATED RE-ENTRANT CORNERS

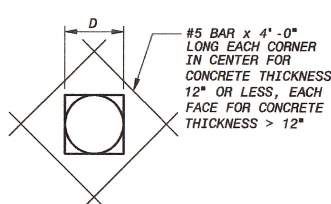
(TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS)



NOTE:  
WILSON ANCHOR SLEEVES MAY BE  
SUBSTITUTED FOR STEEL PIPE SLEEVES

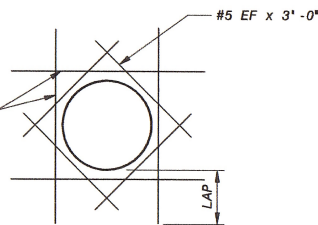
EQUIPMENT DETAIL

NO SCALE



FOR OPENINGS  
12" <= D <= 21"

EXTRA BARS EQUAL IN TOTAL  
AREA TO REGULAR REINFORCING  
CUT BY OPENING. PLACE ONE  
HALF TOTAL AREA TO EACH SIDE  
OF OPENING AND IN THE SAME  
TRANSVERSE POSITION AS REGULAR  
REINFORCING



FOR CIRCULAR OPENINGS  
21" < D <= 54"

REINFORCING AT OPENINGS 12" TO <= 54"

(TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS)

GENERAL STRUCTURAL NOTES:

1. THE APPLICABLE BUILDING CODE IS THE 2012 VIRGINIA CONSTRUCTION CODE.
2. EARTHWORK SHALL BE IN ACCORDANCE WITH THE BLACK & VEATCH GEOTECHNICAL MEMORANDUM AND SPEC SECTION 312316.16. OVEREXCAVATION BELOW FOUNDATIONS SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL MEMORANDUM.
3. CONCRETE WORK SHALL BE IN ACCORDANCE WITH SPEC SECTION 033000, UNLESS NOTED OTHERWISE.
4. THE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 4,500 PSI, WITH MAX W/C RATIO OF 0.45 AND AIR ENTRAINMENT OF 6% +/- 1.5%.
5. REINFORCING SHALL BE GRADE 60, DEFORMED, ASTM A615.
6. EXPANSION ANCHORS IN CONCRETE: PRODUCTS SHALL BE SINGLE COMPONENT ANCHORS TESTED IN ACCORDANCE WITH ICC AC193, AND SHALL HAVE AN ICC ES REPORT IN COMPLIANCE WITH THE APPLICABLE BUILDING CODE. THE ANCHORS SHALL BE APPROVED FOR USE IN CRACKED CONCRETE, AND FOR RESISTING SEISMIC FORCES. HILTI "KWIK-BOLT T2", POWERS FASTENERS "POWER-STUD+SD2", SIMPSON "STRONG-BOLT 2".
7. ADHESIVE ANCHORS IN CONCRETE: PRODUCTS SHALL BE TESTED IN ACCORDANCE WITH ICC AC308, AND SHALL HAVE AN ICC ES REPORT IN COMPLIANCE WITH THE APPLICABLE BUILDING CODE. THE ANCHORS SHALL BE APPROVED FOR USE IN CRACKED CONCRETE, AND FOR RESISTING SEISMIC FORCES. HILTI "HIT-HY 200", POWERS FASTENERS "PE1000+", SIMPSON "SET-XP".
8. NOT USED
9. THE REMOVABLE CONCRETE VAULT PANELS ARE DESIGNED FOR A LIVE LOAD OF 150 PSF. ELECTRICAL BUILDING FLOOR SLAB IS DESIGNED FOR A LIVE LOAD OF 250 PSF.
10. SEISMIC LOADS: RISK CATEGORY IV, SITE CLASS D, Ss=0.172G, S1=0.073G, Sds=0.183G, Sd1=0.118G
11. GROUND SNOW LOAD = 25 POUNDS PER SQUARE FOOT.
12. DESIGN WIND SPEED = 120 MPH (LRFD), EXPOSURE CATEGORY C

LENGTH OF LAPPED SPLICES FOR REINFORCEMENT (INCHES) (f'c=4000 PSI) (UNLESS NOTED OTHERWISE ON THE DRAWINGS)						CONCRETE COVER FOR REINFORCEMENT	
BAR SIZE	BEAMS & COLUMNS		WALLS & SLABS		BAR SIZE	LOCATION	MINIMUM COVER
	*TOP BARS	OTHERS	*TOP BARS	OTHERS		UNFORMED SURFACES ADJACENT TO EXCAVATION	3"
						SURFACES INSIDE OF OZONE CONTACTORS EXPOSED TO OZONE IN WATER OR AIR	3"
3	16	16	16	16	3	FORMED OR TOP SURFACES EXPOSED TO WEATHER OR SATURATED AIR, SUBMERGED OR IN CONTACT WITH EARTH, INCLUDING STIRRUPS, TIES OR SPIRALS	2"
4	19	16	19	16	4	OTHER LOCATIONS:	
5	24	18	24	18	5	BARS IN BEAMS OR GIRDERS, INCLUDING STIRRUPS AND COLUMN SPIRALS OR TIES	1 1/2"
6	33	26	29	22	6	SLABS, WALLS AND JOISTS	
7	55	42	48	37	7	#6 AND LARGER	1 1/2"
8	69	53	60	46	8	#5 AND SMALLER	1"
9	84	65	74	57	9	NOTE: TOLERANCES FOR CONCRETE COVER AND THE FABRICATION AND PLACING OF REINFORCEMENT SHALL CONFORM TO ACI 117.	
10	103	79	91	70	10		
11	122	94	108	83	11		

\* TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR. HORIZONTAL BARS IN WALLS ARE TO BE PROVIDED WITH LAP LENGTHS AS REQUIRED FOR TOP BARS. VERTICAL BARS MAY BE CONSIDERED AS OTHER BARS



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BEDFORD REGIONAL WATER AUTHORITY  
SMITH MOUNTAIN LAKE WTP &  
RAW WATER PUMPING STATION / INTAKE

STRUCTURAL  
DETAILS

DESIGNED: WDB  
DETAILED: MAK  
CHECKED: KC  
APPROVED: PJD  
DATE: 10/21/15

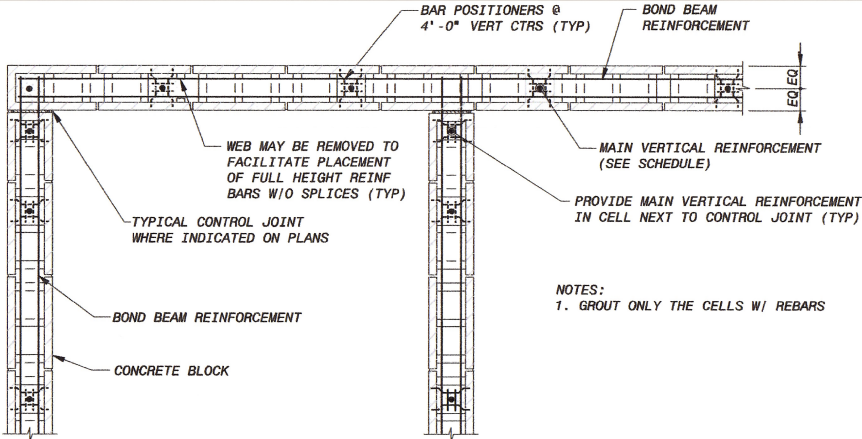
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IF THIS BAR DOES NOT  
MEASURE 1" THEN DRAWING IS  
NOT TO FULL SCALE

PROJECT NO.  
182262

S-20-501  
SHEET  
OF

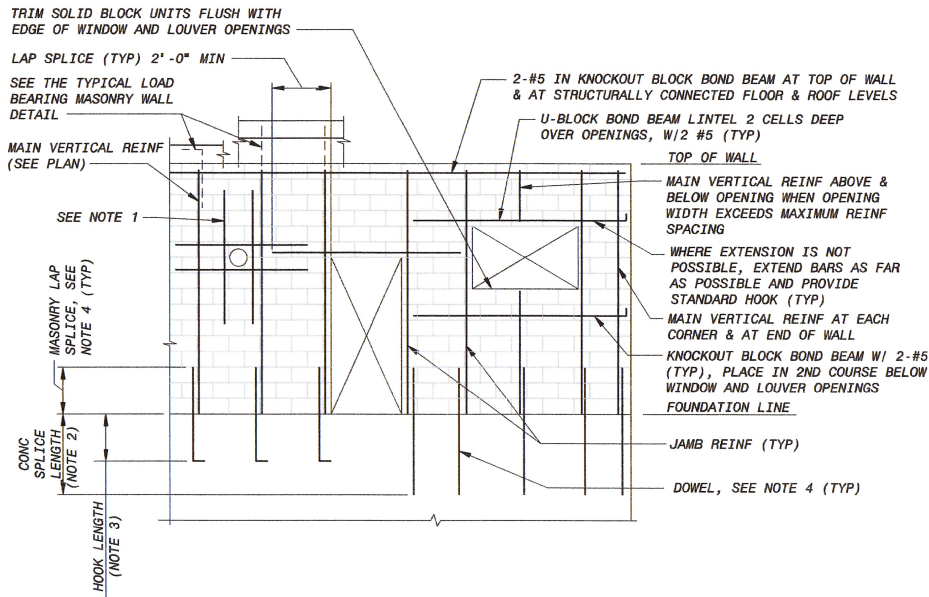
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TYPICAL REINFORCING WITH CORNER CONTROL JOINTS  
SINGLE CURTAIN VERTICAL REINFORCEMENT SHOWN.  
DOUBLE CURTAIN SIMILAR EXCEPT BARS POSITIONED  
EACH FACE, SEE ADJACENT DETAIL.

TYPICAL MASONRY REINFORCING PLANS  
3/4" = 1'-0"

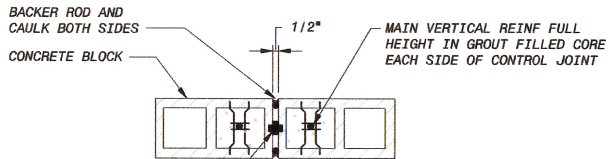


- NOTE:
1. EXTEND JAMB BARS FULL WALL HEIGHT.
  2. SEE STANDARD CONCRETE REINFORCING DETAILS FOR SPLICE LENGTH IN CONCRETE.
  3. MINIMUM HOOK EMBEDMENT SHALL BE 10" FOR #6 AND SMALLER BARS, 12" FOR #7 BARS AND 14" FOR #8 BARS.
  4. AT EACH VERTICALLY REINFORCED CELL, PROVIDE A SINGLE DOWEL CENTERED IN THE CMU WALL, UNO. LAP SPLICE LENGTH FOR DOWEL SHALL BE BASED ON A SINGLE REINF WALL, EVEN IF JAMB OR MAIN VERTICAL REINF IS DOUBLE CURTAIN. DOWEL BAR SIZE SHALL MATCH SIZE OF JAMB OR MAIN VERTICAL REINF.

TYPICAL MASONRY REINFORCING ELEVATION  
NO SCALE

BAR SIZE	8" CMU		12" CMU	
	SINGLE REINF	DOUBLE REINF	SINGLE REINF	DOUBLE REINF
4	21	26	21	22
5	26	41	26	34
6	47	(85)	43	(71)
7	64	(120)	50	(99)
8	(92)	(173)	61	(142)

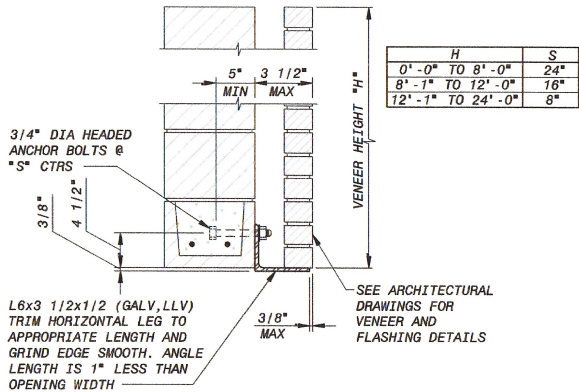
1. NON-CONTACT LAP SPLICES SHALL NOT BE USED.
2. ( ) BRACKETED SPLICE LENGTHS NOT RECOMMENDED. USE MECHANICAL CONNECTORS OR A FULL HEIGHT REINF BAR.



SASH BLOCK TYPE

- NOTES:
1. LADDER TYPE JOINT REINFORCEMENT IS DISCONTINUOUS AT CONTROL JOINT. BOND BEAM REINFORCEMENT IS CONTINUOUS THROUGH CONTROL JOINT.
  2. CONTROL JOINT IS CONTINUOUS FULL WALL HEIGHT.

TYPICAL CONCRETE MASONRY CONTROL JOINT A  
NO SCALE



VENEER SUPPORT AT OPENING B  
NO SCALE

GENERAL MASONRY NOTES

1. MASONRY WORK SHALL BE IN ACCORDANCE WITH SPEC SECTION 042200 UNLESS NOTED OTHERWISE.
2. CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90. THE TOTAL MASONRY ASSEMBLAGE SHALL HAVE A COMPRESSIVE STRENGTH EQUAL TO 2000 PSI AT 28 DAYS. THE COMPRESSIVE STRENGTH OF MASONRY SHALL BE DETERMINED BY THE UNIT STRENGTH METHOD SPECIFIED IN ACI 530.1.
3. MASONRY MORTAR SHALL CONFORM TO ASTM C270, TYPE S.
4. ALL BOND BEAMS AND ANY BLOCK CELLS CONTAINING REINFORCING STEEL, ANCHORS OR OTHER EMBEDMENTS SHALL BE FILLED WITH GROUT MEETING THE REQUIREMENTS OF ASTM C476. WALLS SHALL BE FULLY GROUTED WHEN INDICATED ON THE DRAWINGS.
5. BOND BEAM REINF SHALL BE CONTINUOUS AT CORNERS, INTERSECTIONS, AND CONTROL JOINTS.
6. DOOR, WINDOW AND LOUVER OPENING DIMENSIONS SHOWN ARE NOMINAL DIMENSIONS. SEE ARCHITECTURAL DRAWINGS FOR ACTUAL ROUGH OPENING DIMENSIONS.



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STRUCTURAL  
MASONRY DETAILS

DESIGNED: WDB  
DETAILED: MAK  
CHECKED: KC  
APPROVED: PJD  
DATE: 12/04/15

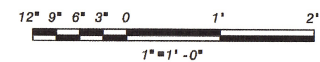
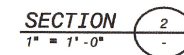
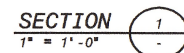
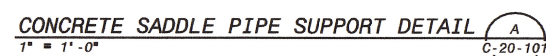
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NOT TO FULL SCALE

PROJECT NO.  
182262

S-20-502  
SHEET  
OF

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BEDFORD REGIONAL WATER AUTHORITY  
SMITH MOUNTAIN LAKE WTP &  
RAW WATER PUMPING STATION / INTAKE

---

STRUCTURAL  
BALLAST BLOCK  
DETAIL

DESIGNED: WDB  
 DETAILED: MAK  
 CHECKED: JKC  
 APPROVED: PJD  
 DATE: 01/08/16

0 1/2 1

IF THIS BAR DOES NOT  
MEASURE 1" THEN DRAWING IS  
NOT TO FULL SCALE

PROJECT NO.  
182262

**S-20-503**  
SHEET  
OF