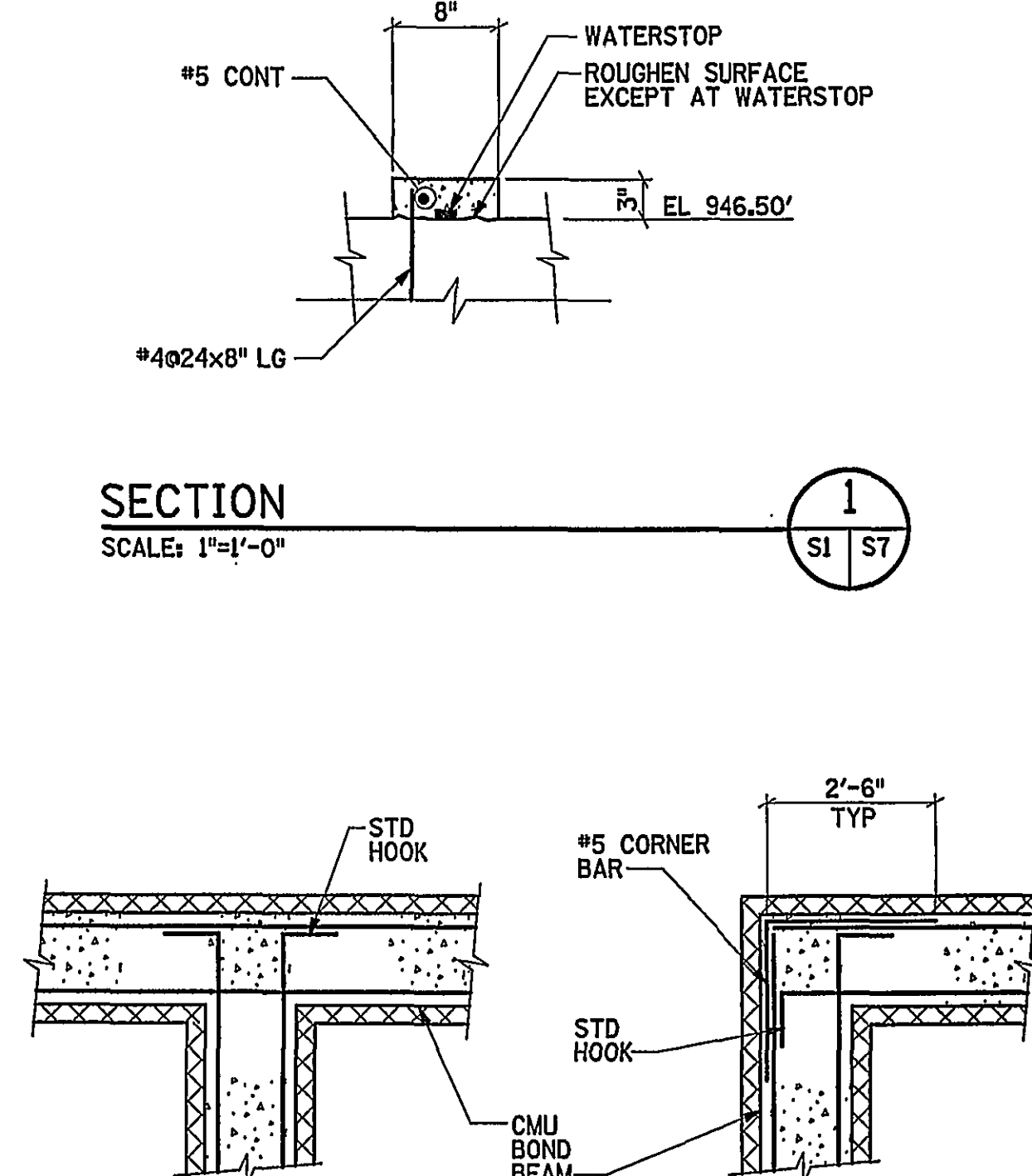
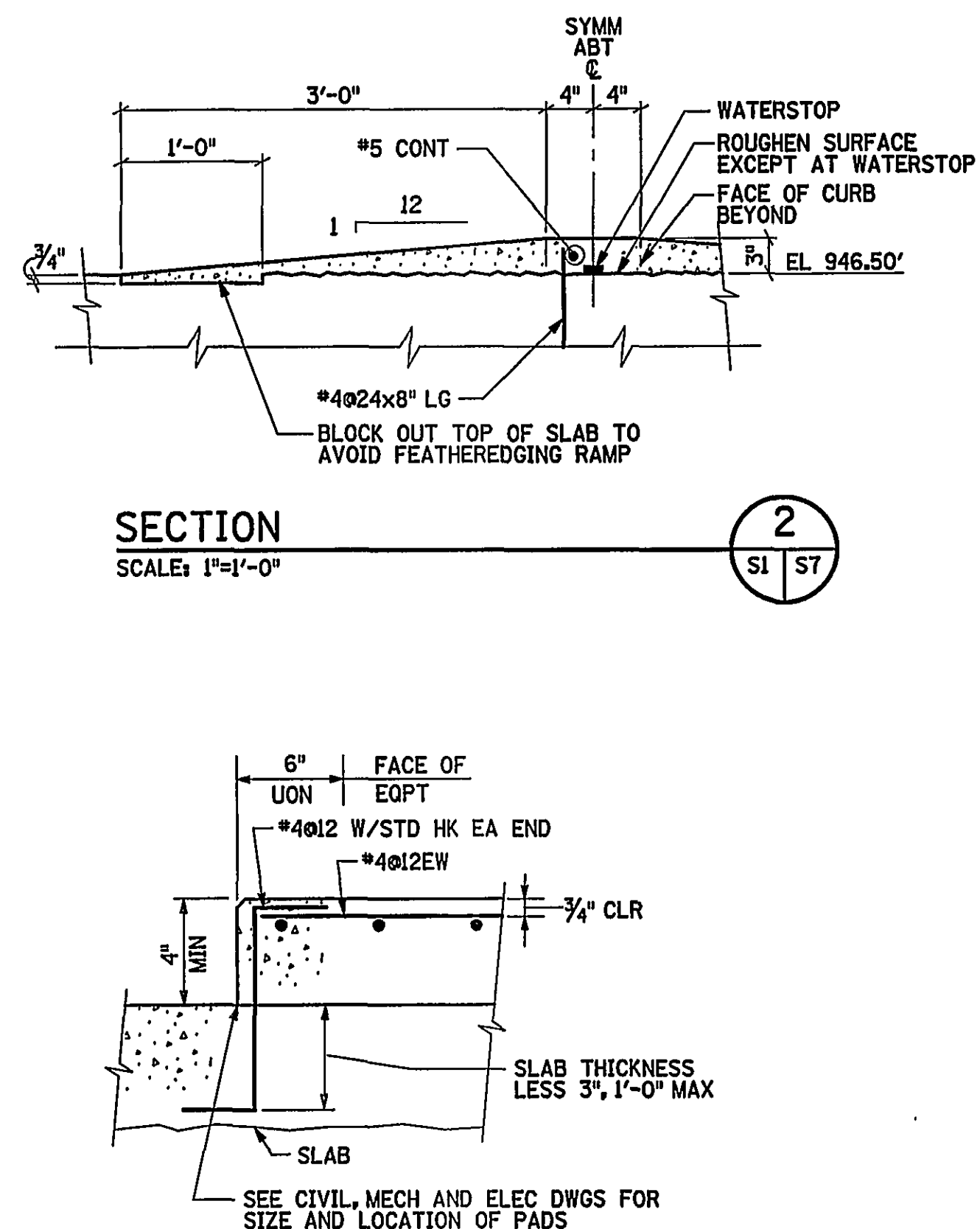


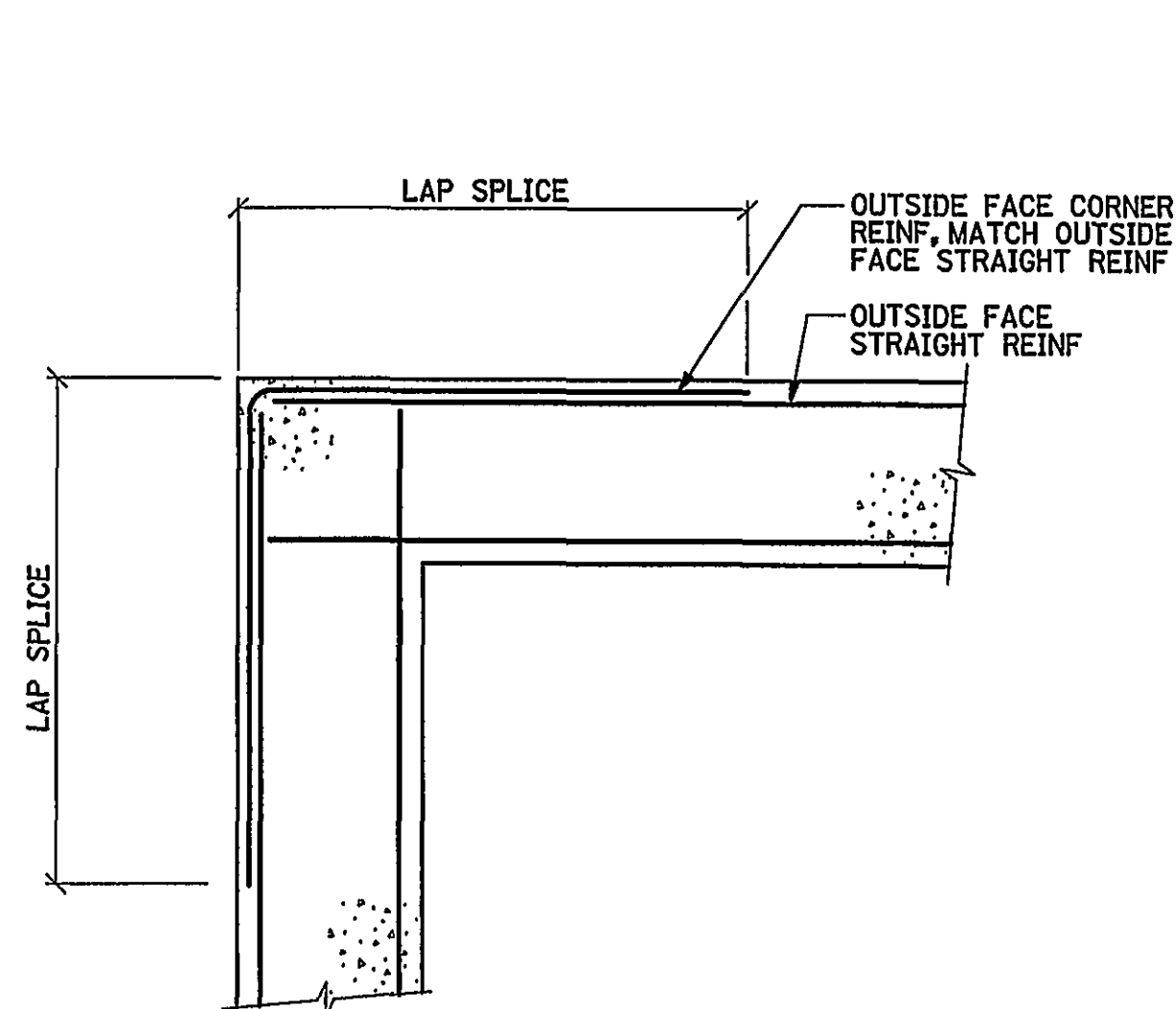
UNDERGROUND TANK FOUNDATION
SCALE: 1/2"=1'-0"



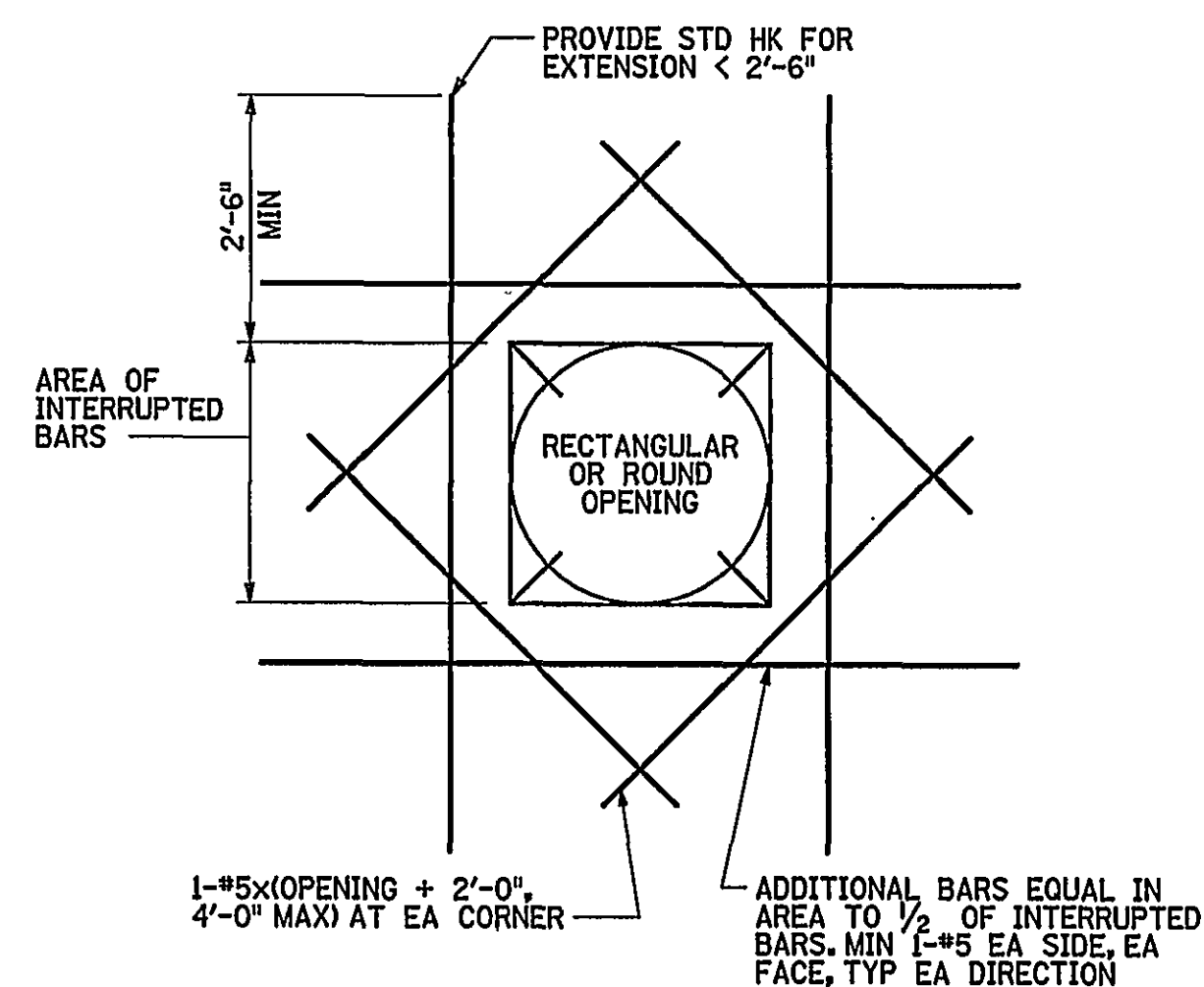
BOND BEAM CORNER DETAIL
SCALE: 1"=1'-0"



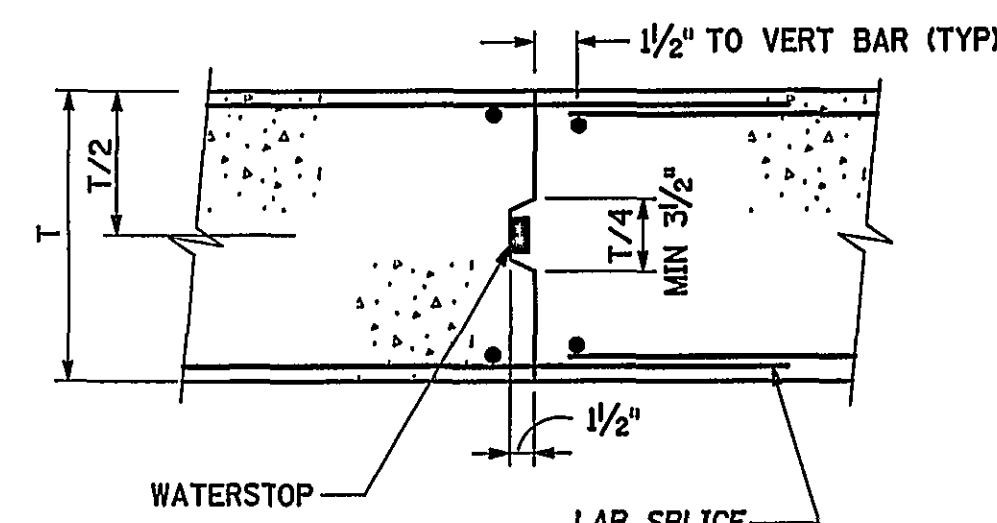
TYPICAL EQUIPMENT PAD
NOT TO SCALE



NOTE: VERTICAL REINFORCING NOT SHOWN FOR CLARITY.



NOTE: BARS INDICATED ARE NOT REQUIRED AT OPENINGS OF 10" OR LESS.



TYPICAL WALL CONSTRUCTION JOINT
NOT TO SCALE

STRUCTURAL GENERAL NOTES:

1. MATERIAL DESIGN STRENGTHS:

CAST-IN-PLACE CONCRETE.....f'c = 4,000 PSI
REINFORCED MASONRY.....f'm = 1,500 PSI
REINFORCING STEEL, DEFORMED.....fy = 60,000 PSI
WELDED WIRE FABRIC.....fy = 60,000 PSI
STRUCTURAL STEEL
WIDE FLANGES.....FY = 50,000 PSI
OTHER SHAPES.....FY = 36,000 PSI
STEEL PIPE.....FY = 35,000 PSI
STEEL TUBE.....FY = 46,000 PSI
TIMBER PILE CAPACITY.....20 TONS

2. DESIGN CODES:

ACI 318-95 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
AISC "LOAD AND RESISTANCE FACTOR DESIGN SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", DECEMBER 1, 1993
VIRGINIA UNIFORM STATEWIDE BUILDING CODE (BOCA 1996)

3. DESIGN LOADS:

LIVE LOADS:

ROOF (SNOW LOAD).....23 PSF
FIRST FLOOR OPERATING FLOOR.....500 PSF
FIRST FLOOR OFFICE AREAS.....200 PSF
SECOND FLOOR AND MEZZANINE.....100 PSF
STAIRS.....100 PSF

WIND LOAD CRITERIA:

BASIC WIND VELOCITY.....70 MPH
WIND EXPOSURE CONDITION.....C
WIND IMPORTANCE FACTOR.....1.0

SNOW LOAD CRITERIA:

GROUND SNOW LOAD.....25 PSF
SNOW EXPOSURE FACTOR.....0.9
SNOW IMPORTANCE FACTOR.....1.0
FLAT ROOF SNOW LOAD.....23 PSF

SEISMIC LOAD CRITERIA:

EFFECTIVE PEAK ACCELERATION, Ag.....0.10
VELOCITY RELATED ACCELERATION, Av.....0.10
SEISMIC HAZARD EXPOSURE GROUP.....II
SEISMIC PERFORMANCE CATEGORY.....C
SOIL PROFILE TYPE.....S1
BASIC STRUCTURAL SYSTEM: REINFORCED MASONRY SHEAR WALLS
SEISMIC RESISTING SYSTEM: REINFORCED MASONRY SHEAR WALLS
RESPONSE MODIFICATION FACTOR, R.....3.5
DEFLECTION AMPLIFICATION FACTOR, Cd.....3.0
ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE PROCEDURE

4. TIMBER PILES SHALL CONFORM TO ASTM D25 AND SHALL HAVE A MINIMUM TIP DIAMETER OF 6 INCHES. PILES SHALL BE DRIVEN TO OBTAIN A MINIMUM WORKING CAPACITY OF 20 TONS. PROVIDE LOAD TESTS FOR TWO PILES. SEE SPECIFICATION SECTION 02462.

5. WHERE REINFORCEMENT SPLICES ARE INDICATED, SPLICE LENGTHS SHALL BE AS FOLLOWS UNLESS OTHERWISE DETAILED:

BAR SIZE	TOP BARS	OTHER BARS
#3	18"	16"
#4	24"	19"
#5	30"	23"
#6	36"	28"
#7	42"	33"
#8	48"	37"
#9	54"	42"
#10	60"	48"
#11	66"	54"

TOP BARS INCLUDE ALL HORIZONTAL REINFORCING

6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR ALL REINFORCEMENT, UNLESS OTHERWISE NOTED:

- CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.....3"
- CONCRETE EXPOSED TO EARTH OR WEATHER:
 - #6 THROUGH #18 BARS.....2"
 - #5 BAR AND SMALLER.....1 1/2"
- CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - SLABS, WALLS, AND JOISTS.....3/4"
 - BEAMS AND COLUMNS.....1 1/2"

7. PRECAST PRESTRESSED MEMBERS SHALL BE DESIGNED BY THE STRUCTURAL PRECAST CONCRETE SUPPLIER FOR A SUPERIMPOSED LOAD OF 110 PSF AND FOR A DIAPHRAGM SHEAR OF 300 LB/FT.

8. ALL CONCRETE BLOCK SHALL BE LIGHTWEIGHT AGGREGATE (115 PCF MAXIMUM).

9. GROUT FOR REINFORCED MASONRY SHALL CONFORM TO ASTM C476.

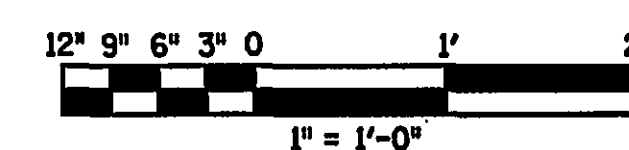
10. PLACE GROUT AROUND REINFORCING DURING CONSTRUCTION OF MASONRY. DO NOT PUSH REINFORCING DOWN INTO PREVIOUSLY PLACED GROUT FILL. SET BOLTS SIMILARLY.

11. BARS IN MASONRY WALLS MAY BE SPLICED WITH A MINIMUM LAP OF 48 TIMES THE BAR DIAMETER, UNLESS OTHERWISE NOTED. SPLICED REINFORCING BARS SHALL OCCUPY THE SAME CELL AND SHALL BE TIED TOGETHER.

12. PROVIDE CLEANOUT OPENINGS AT THE BOTTOM OF EACH GROUT LIFT.

13. VERTICAL REINFORCEMENT IN MASONRY WALLS SHALL BE SUPPORTED AND SECURED AGAINST DISPLACEMENT AT 4 FOOT MAXIMUM INTERVALS.

IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.



REV.	DATE	BY	APP.	DESCRIPTION
5-01-03	JLW	MKJ		RECORD DRAWING

RECORD DRAWING

DATE: MAY 1, 2003

Wiley & Wilson
ARCHITECTS ENGINEERS PLANNERS
An Employee-Owned Company

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IN ASSOCIATION WITH

HDR

HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
NORFOLK, VIRGINIA 23502
757-222-1500

DESIGNED	DRAWN	PROJECT
JEH	JDJ	CRYSTAL SPRING
CHECKED	REVIEWED	
NST	VKA	WATER TREATMENT PLANT
COMM. NO.		REFERENCE
200171.01		CITY OF ROANOKE, VIRGINIA
CADD NO.		TITLE
200171S08.DGN		STRUCTURAL
DATE	DWG. NO.	SHEET NO.
AUG 26, 2001	S-7	28 OF 72
		REV. 0