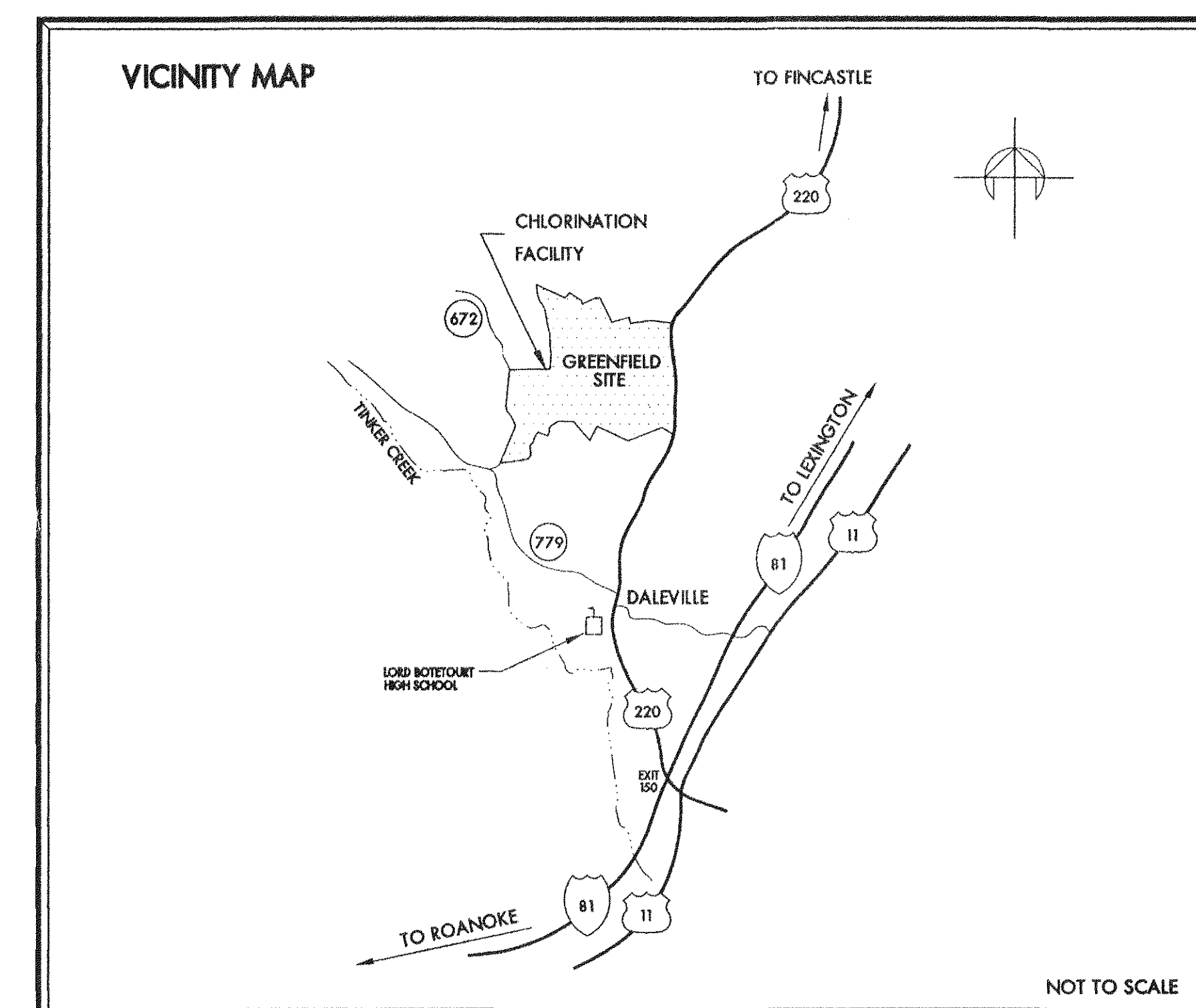
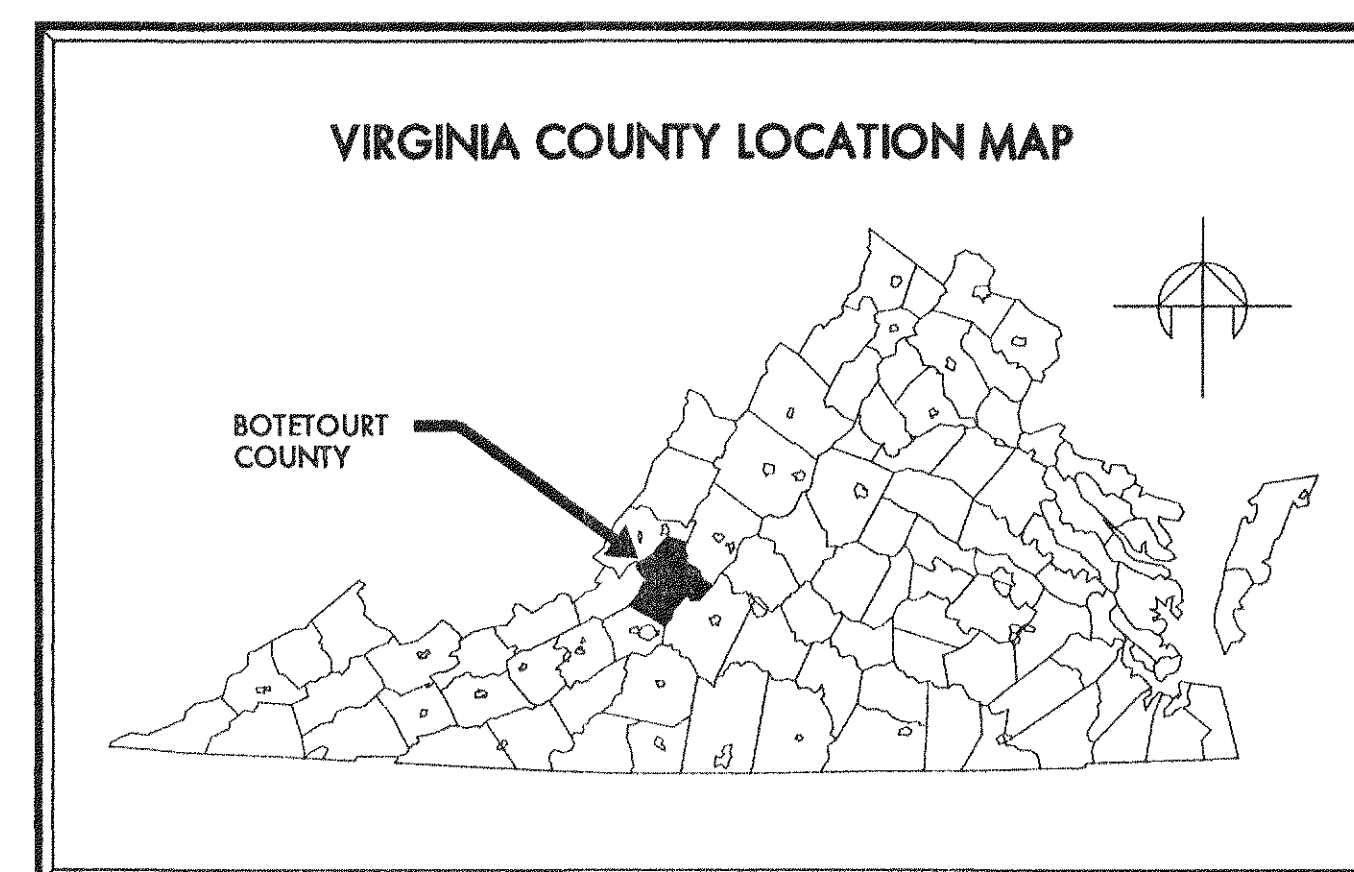


GREENFIELD CHLORINATION FACILITY

BOTETOURT COUNTY DEPARTMENT OF PUBLIC FACILITIES AND PROGRAMS

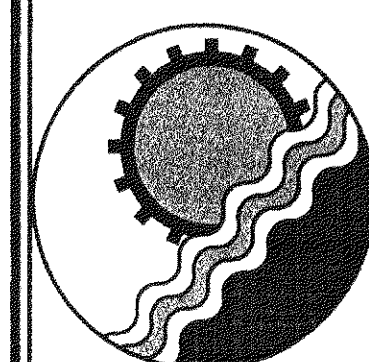
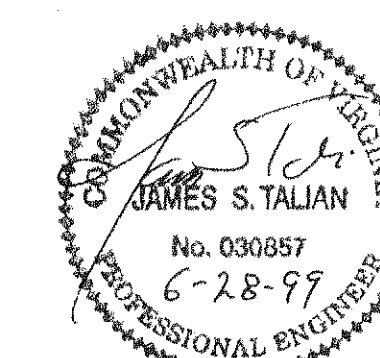
BOTETOURT COUNTY, VIRGINIA
JUNE 28, 1999

Greenfield (Official Contract Document)
PROJECT NAME: Chlorination Facility
DATE: 8-2-99
LOCATION: Greenfield
TOTAL # SHEETS: 20
A/E FIRM: ECI
OF SETS: 1



OFFICIAL CONTRACT DOCUMENTS

	Signature	Date
OWNER:	<i>Kenn E. Shaver</i> (Botetourt County)	8/2/99
ENGINEER:	<i>James S. Talian</i> (Engineering Concepts, Inc.)	8-2-99
CONTRACTOR:	<i>[Signature]</i> (Breakell, Inc.)	8/2/99



ENGINEERING CONCEPTS, INC.

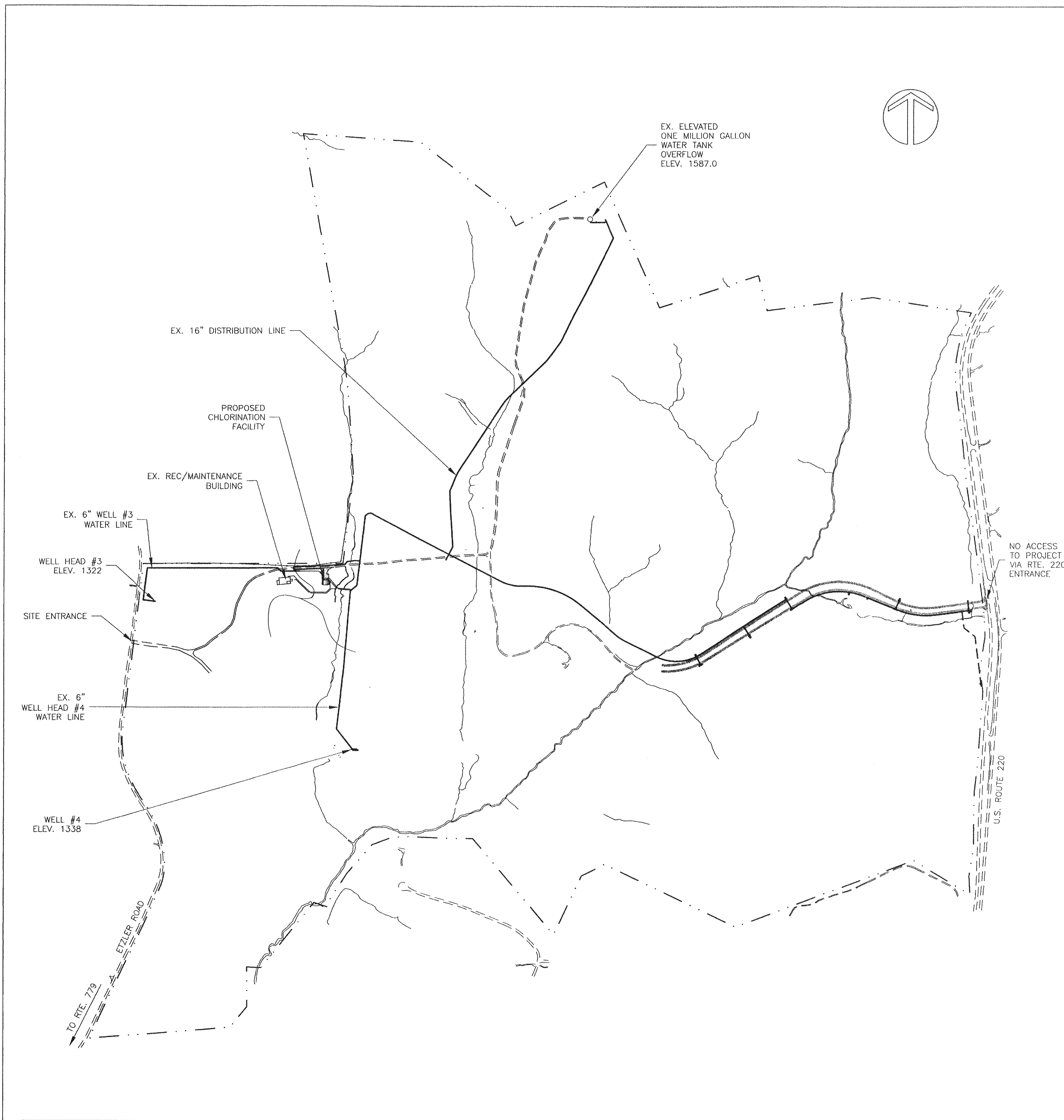
20 S. ROANOKE ST., PO BOX 619
FINCASTLE, VIRGINIA 24090
540.473.1253 FAX: 540.473.1254

ECI PROJECT # 97075

OWNER: BOTETOURT COUNTY

DEPARTMENT OF PUBLIC FACILITIES
30 WEST BACK ST., #4
FINCASTLE, VIRGINIA 24090
540.473.8316





DRAWING INDEX

1. GENERAL NOTES & KEY SHEET
2. SITE PLAN & E & S CONTROL
3. E & S CONTROL & SITE DETAILS
4. PLANTING PLAN
5. CHLORINE CONTACT & SCHOOL WATER LINES
6. WELLS 3 & 4 WATER LINE EXTENSION PLAN & PROFILE
7. WATER SYSTEM DETAILS
8. WELL DEVELOPMENT PLANS
9. SEWAGE FORCE MAIN PLAN & PROFILE & DETAILS
10. FOUNDATION & FLOOR PLAN, DOOR & FINISH SCHEDULE
11. INTERIOR PIPING PLAN
12. INTERIOR PIPING SECTION VIEWS
13. BUILDING ELEVATIONS
14. BUILDING DETAILS & MISC. DETAILS
15. BUILDING DETAILS & TYPICAL WALL SECTIONS
16. P & ID SCHEMATIC
17. PLUMBING
18. MECHANICAL
19. ELECTRICAL

SEQUENCING NOTE

CONTINUOUS WATER SERVICE MUST BE MAINTAINED TO BOTETOURT COUNTY RECREATION & MAINTENANCE BUILDING. BUILDING IS CURRENTLY SERVED BY SMALL PUMP IN WELL #3.

KEY CONTACTS

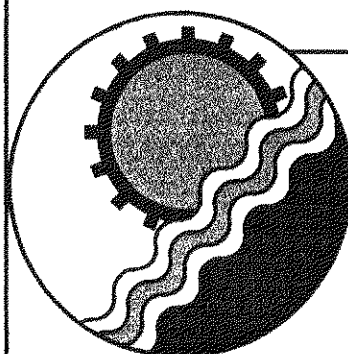
1. BOTETOURT COUNTY
ASSISTANT COUNTY ADMINISTRATOR: KURT HODGEN, 540-473-8316
COUNTY ENGINEER: KEVIN SHEARER, P.E., 540-473-8316
UTILITY SUPERVISOR: PAUL PEERY, 540-473-8316
ASSISTANT COUNTY ENGINEER: JAY KNIGHT, 540-473-8316
2. ENGINEERING CONCEPTS, INC.
PAUL NIEHOFF, E.I.T., 540-473-1253
WILLIAM JOHNSON, P.E., 540-473-1253
JIM TALIAN, P.E., 540-473-1253

ACCESS NOTE

ACCESS TO SITE SHALL BE FROM ETZLER ROAD ONLY. CONTRACTOR MAY NEED TO COORDINATE ACCESS TO SITE WITH PROPOSED VDOT PAVING ON ENTRANCE ROAD.

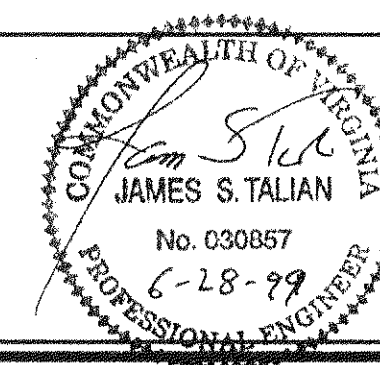
GENERAL NOTES

1. INFORMATION ON THESE DRAWINGS CONCERNING THE LOCATION AND ELEVATION OF EXISTING UTILITIES, STRUCTURES, AND OBSTRUCTIONS HAS BEEN PREPARED FROM THE MOST RELIABLE INFORMATION AVAILABLE TO THE ENGINEER. THE ACCURACY AND COMPLETENESS OF THIS INFORMATION ARE NOT GUARANTEED, HOWEVER, NOR DOES THE ENGINEER ACCEPT ANY RESPONSIBILITY WHATSOEVER FOR DEVIATIONS OF THE EXISTING UTILITIES, STRUCTURES, OTHER FACILITIES, AND OBSTRUCTIONS FROM THE LOCATIONS AND ELEVATIONS INDICATED OR FOR THE EXISTENCE OF UTILITIES, STRUCTURES, OTHER FACILITIES, AND OBSTRUCTIONS NOT INDICATED ON THESE DRAWINGS.
2. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION TO ELIMINATE ANY POSSIBILITY OF ANY DISTURBANCE OF OR DAMAGE TO PUBLIC AND PRIVATELY-OWNED UTILITIES, STRUCTURES, OTHER FACILITIES, AND OBSTRUCTION RESULTING FROM HIS ACTIVITIES. TO THIS END, CONTRACTOR SHALL, AT NO ADDITIONAL COST TO THE OWNER, TAKE ALL MEASURES NECESSARY TO PROVIDE, AND SHALL BE SOLELY RESPONSIBLE FOR, TEMPORARY SUPPORT AND SHORING, ADEQUATE PROTECTION, AND MAINTENANCE OF CONTINUOUS OPERATION OF ALL UNDERGROUND AND ABOVEGROUND WATER, SEWER, AND GAS MAINS AND SERVICE LINES; PETROLEUM LINES; TELEPHONE, TELEVISION, AND ELECTRICAL LINES, CABLES, AND POLES; EQUIPMENT CABLES AND CONDUITS; STORM SEWERS; BUILDINGS; TANKS; FENCES; AND ALL OTHER UTILITIES, STRUCTURES, FACILITIES, AND OBSTRUCTIONS, WHETHER OR NOT INDICATED ON THESE DRAWINGS. ALL DISTURBED OR DAMAGED UTILITIES, STRUCTURES, OTHER FACILITIES, AND OBSTRUCTIONS SHALL BE IMMEDIATELY REPAIRED, REPLACED, OR COMPENSATED FOR BY THE CONTRACTOR TO OWNER'S SATISFACTION, AND AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL BEAR SOLE RESPONSIBILITY FOR THE CHARACTER AND ACTUAL LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES, STRUCTURES, OTHER FACILITIES, AND OBSTRUCTIONS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL, AT NO ADDITIONAL COST TO THE OWNER, CONTACT THE OWNERS/OPERATORS OF ALL UTILITIES AND ARRANGE FOR THE VERIFICATION AND MARKING OF UTILITY LOCATIONS BY SAID OWNERS/OPERATORS. THE CONTRACTOR SHALL ASSIST THE UTILITY OWNERS/OPERATORS BY EVERY MEANS POSSIBLE TO DETERMINE THE LOCATION OF UTILITIES. THE CONTRACTOR SHALL BEAR SOLE RESPONSIBILITY FOR ALL DISTURBANCE OF ANY DAMAGE TO UTILITIES RESULTING FROM THE CONTRACTOR'S FAILURE TO ARRANGE FOR THE LOCATION OF UTILITIES BY THE OWNERS/OPERATORS OF THE UTILITIES. CONTACT MISS UTILITY (800) 552-7001.
4. SITE CONDITIONS MAY NECESSITATE SLIGHT DEVIATIONS IN ALIGNMENT, GRADE, AND/OR LOCATION OF NEW FACILITIES FROM THE ALIGNMENT, GRADE, AND/OR LOCATION INDICATED ON THESE DRAWINGS. THE CONTRACTOR SHALL CONSTRUCT THE NEW FACILITIES TO SUCH DEVIATIONS AS DIRECTED BY THE ENGINEER WITHOUT INCREASE IN THE CONTRACT PRICE.
5. THE CONTRACTOR SHALL MAINTAIN A CLEAR FLOW PATH TO AND THROUGH ALL SURFACE WATER AND STORM WATER DRAINAGE FACILITIES AT ALL TIMES.
6. THE CONTRACTOR SHALL GRADE, SEED, AND/OR SOD, AND MULCH THE ENTIRE AREA(S) DISTURBED BY CONSTRUCTION ACTIVITIES.
7. CONSTRUCTION AND START-UP OF ALL WORK SHALL NOT INTERFERE WITH THE OPERATION OF WATER AND SEWAGE FACILITIES. THE CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL WORK WITH THE OWNERS AS REQUIRED.
8. MINIMUM COVER ON ALL PIPE SHALL BE 3 FEET, UNLESS OTHERWISE SPECIFICALLY INDICATED ON THESE DRAWINGS. ALL PVC PIPE SHALL BE INSTALLED WITH COATED TRACER WIRE TO FACILITATE FUTURE LOCATION OF PIPE AFTER CONSTRUCTION IS COMPLETED.
9. WHERE IT IS NECESSARY TO DEFLECT PIPE EITHER HORIZONTALLY OR VERTICALLY, PIPE JOINT DEFLECTION OR BARREL BEND RADIUS SHALL NOT EXCEED 75% OF THE MANUFACTURER'S RECOMMENDED DEFLECTION ANGLE OR BEND RADIUS.
10. ALL PIPING SHALL BE PROPERLY SUPPORTED. ALL PIPING WHICH WILL BE PRESSURIZED DURING OPERATION SHALL BE PROPERLY RESTRAINED.
11. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE CURRENT BOCA AND/OR STATE AND LOCAL BUILDING CODES AND WITH CURRENT FEDERAL AND STATE OSHA REGULATIONS.
12. CONTRACTOR SHALL MAINTAIN THE CONSTRUCTION AREA IN A MANNER ACCEPTABLE TO OWNER AND SHALL BE RESPONSIBLE FOR REMEDIATING ANY DAMAGES RESULTING FROM FAILURE TO DO SO.
13. CONTRACTOR SHALL MAINTAIN LIMITS OF CONSTRUCTION WITHIN THE BOUNDARIES OF THE PROPERTY AS INDICATED ON THE SITE PLAN.
14. IDENTIFIED PROTECTED WETLAND MUST NOT HAVE ANY DISTURBANCE WITHIN 50 FEET OF THEIR BOUNDARY AS IDENTIFIED ON SITE PLAN.
15. CONTRACTOR SHALL MAINTAIN EXISTING GRAVEL ACCESS ROAD AT PRE-PROJECT CONDITIONS.



ENGINEERING CONCEPTS, INC.

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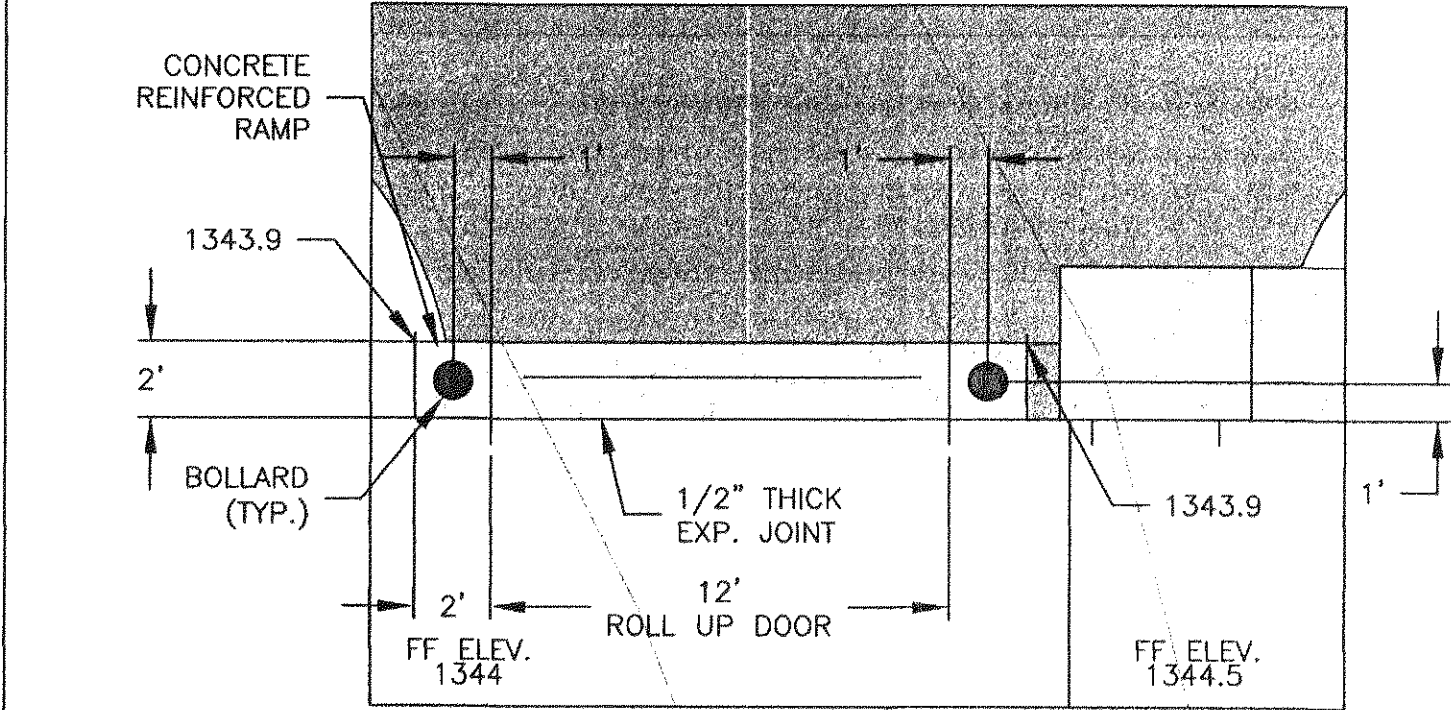
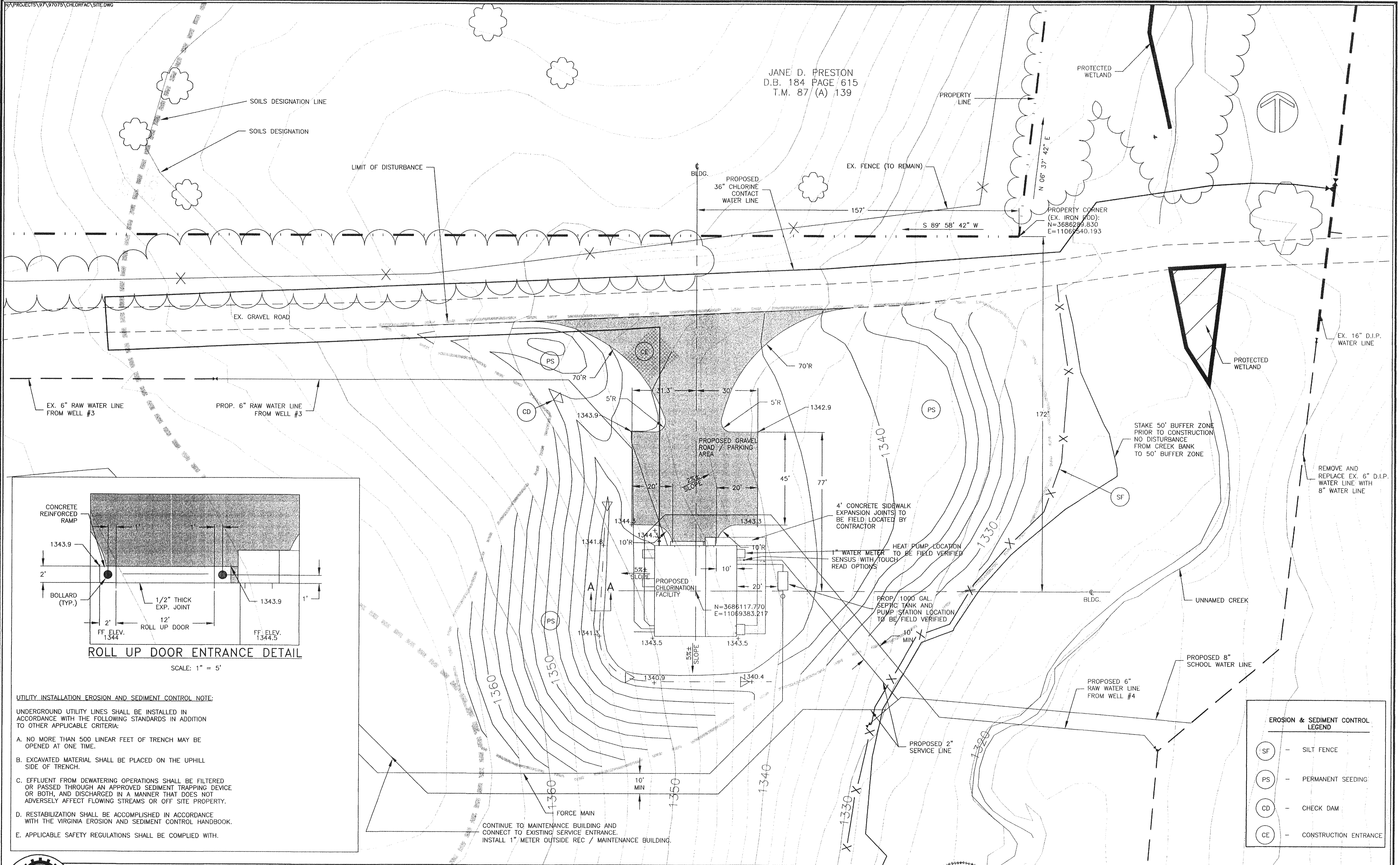


Drawn	PSN
Designed	PSN
Checked	JST
Approved	JST

**GREENFIELD
CHLORINATION FACILITY**

**GENERAL NOTES AND
KEYSHEET**

1"=500'
JUNE 1999
PROJECT: 97075
1 of 19



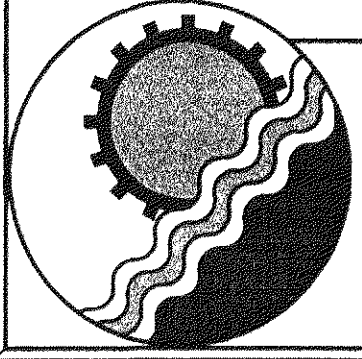
ROLL UP DOOR ENTRANCE DETAIL

SCALE: 1" = 5'

UTILITY INSTALLATION EROSION AND SEDIMENT CONTROL NOTE:

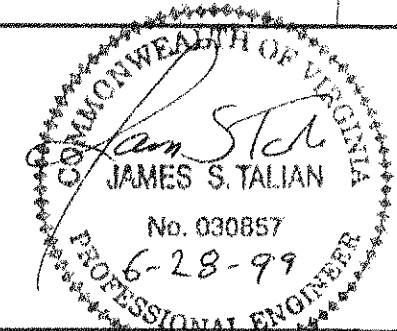
- UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:
- A. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
 - B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCH.
 - C. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF SITE PROPERTY.
 - D. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.
 - E. APPLICABLE SAFETY REGULATIONS SHALL BE COMPLIED WITH.

EROSION & SEDIMENT CONTROL LEGEND	
(SF)	- SILT FENCE
(PS)	- PERMANENT SEEDING
(CD)	- CHECK DAM
(CE)	- CONSTRUCTION ENTRANCE



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Designed	PSN
Checked	JST
Approved	JST

**GREENFIELD
CHLORINATION FACILITY**
**SITE PLAN &
EROSION & SEDIMENT CONTROL**

1"=20'
JUNE 1999
PROJECT: 97075
2 of 19

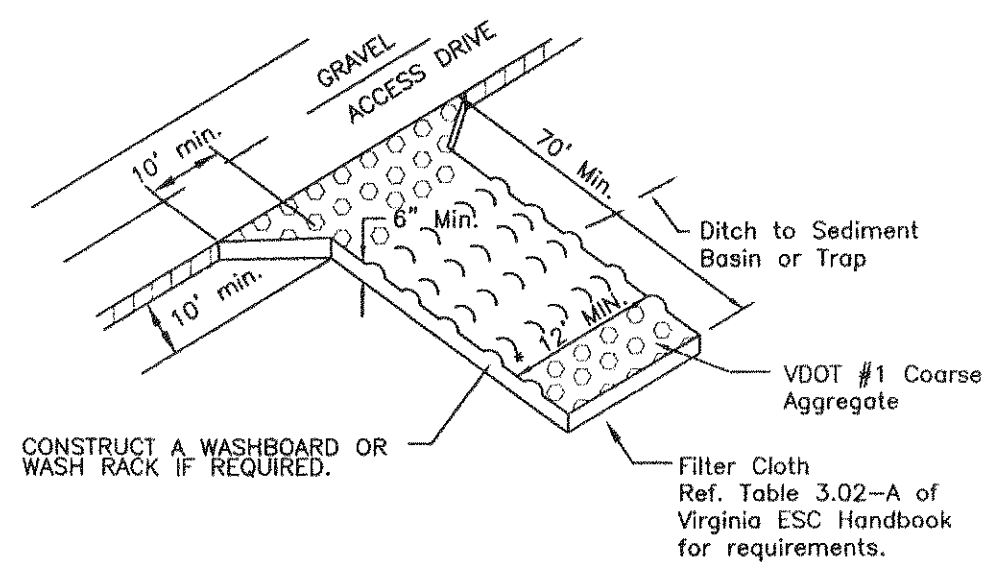
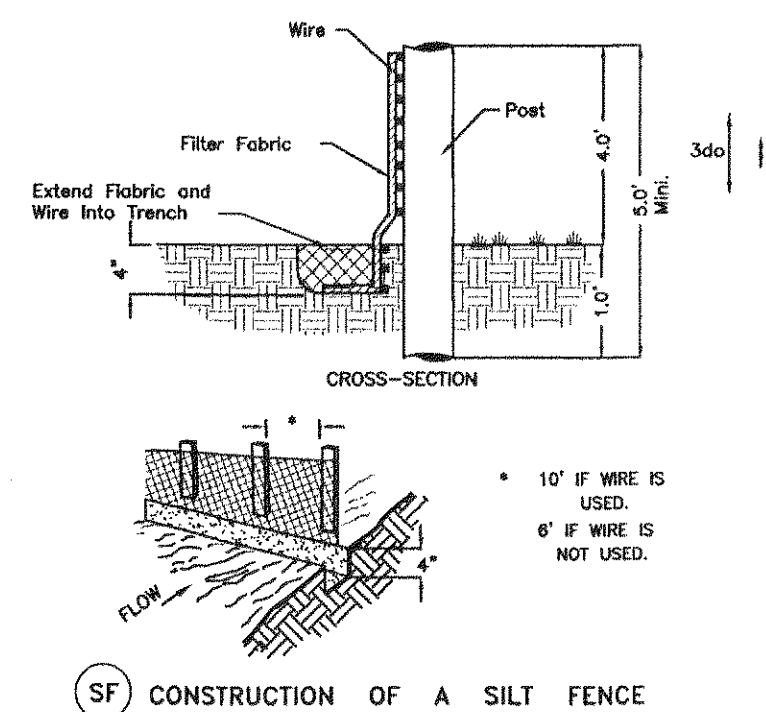
GENERAL NOTES

- ES-1 UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS VR 625-02-00 EROSION AND SEDIMENT CONTROL REGULATIONS.
- ES-2 THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRECONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.
- ES-3 ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.
- ES-4 A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
- ES-5 PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.
- ES-6 THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.
- ES-7 ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
- ES-8 DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
- ES-9 THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT, ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

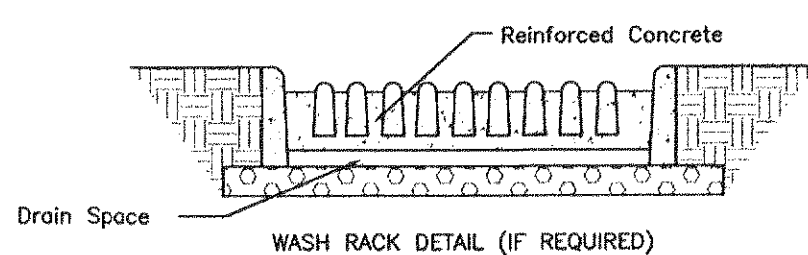
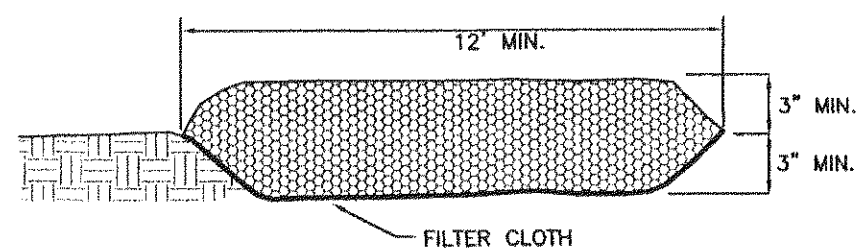
PS PERMANENT SEEDING MIXTURE

- TYPE A**
- 15 OCTOBER TO 1 FEBRUARY
K-31 FESCUE @ 5 LB / 1000 SF
BORZY WINTER RYE @ 1/2 LB / 1000 SF
- 1 FEBRUARY TO 1 JUNE
K-31 FESCUE @ 5 LB / 1000 SF
ANNUAL RYE @ 1/2 LB / 1000 SF
- 1 JUNE TO 1 SEPTEMBER
K-31 FESCUE @ 5 LB / 1000 SF
GERMAN MILLET @ 1/2 LB / 1000 SF
- 1 SEPTEMBER TO 15 OCTOBER
K-31 FESCUE @ 5 LB / 1000 SF
ANNUAL RYE @ 1/2 LB / 1000 SF
- TYPE B (SLOPES 3:1 OR STEEPER)**
- 15 MARCH TO 1 MAY
CROWN VETCH @ 1/2 LB / 1000 SF
PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF
RED TOP @ 1/8 LB / 1000 SF
- 15 AUGUST TO 1 OCTOBER
CROWN VETCH @ 1/2 LB / 1000 SF
PERENNIAL RYEGRASS @ 1/2 LB / 1000 SF
RED TOP @ 1/8 LB / 1000 SF
- LIME: 140 LB / 1000 SF PULVERIZED AGRICULTURAL LIMESTONE
- FERTILIZER: 5-20-10 @ 25 LB / 1000 SF
38-0-0 @ 7 LB / 1000 SF
- MULCH: SHALL BE USED OVER ALL SEEDED AREAS AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 1.75 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.
- SOIL CONDITIONING: INCORPORATION OF LIME AND FERTILIZER, SELECTION OF CERTIFIED SEED, MULCHING, MAINTENANCE OF NEW SEEDLINGS, AND RESEEDING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS CONTAINED WITHIN THE VIRGINIA SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION. ADDITIONAL SEEDING TO BE PERFORMED AS REQUIRED BY THE INSPECTOR.
- SEED APPLICATION: APPLY SEED UNIFORMLY WITH A CYCLONE SEEDER, DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER ON A FIRM, FRIABLE, SEEDBED. MAXIMUM SEEDING DEPTH SHALL BE 1/4 INCH.

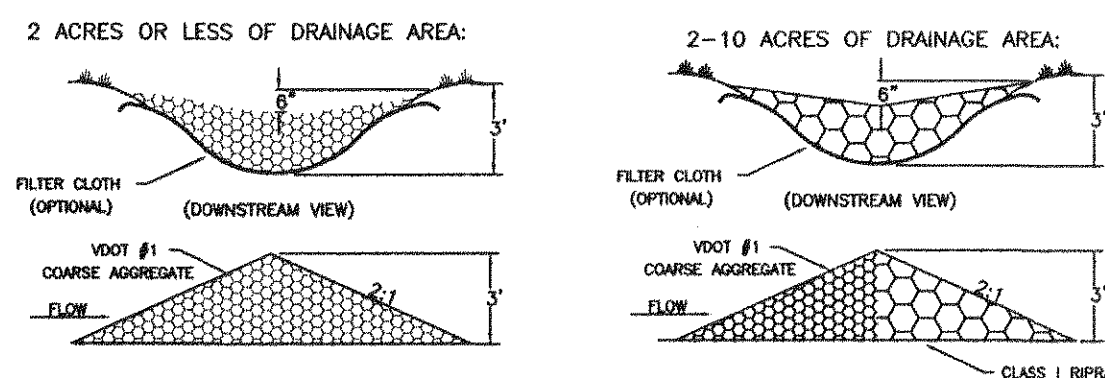
TOTAL DISTURBED AREA = 1.14 AC. = 49450 SQ. FT.



* MUST EXTEND FULL WIDTH OF INGRESS & EGRESS OPERATION.

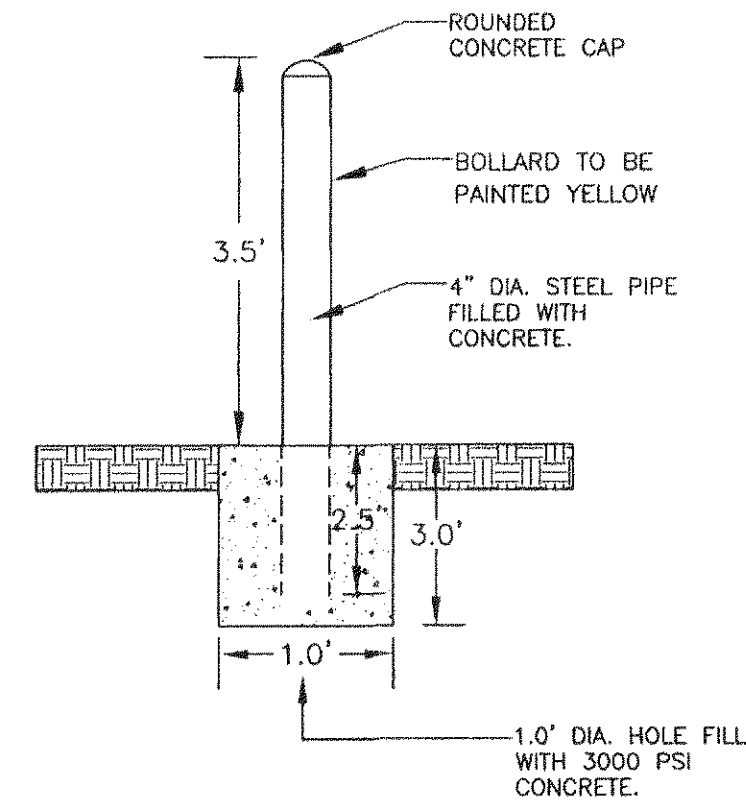


(CE) TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

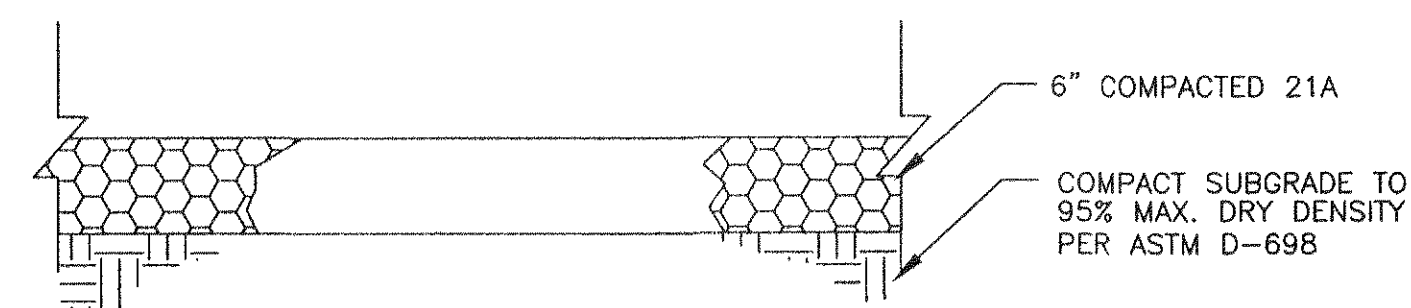


(CD) ROCK CHECK DAM

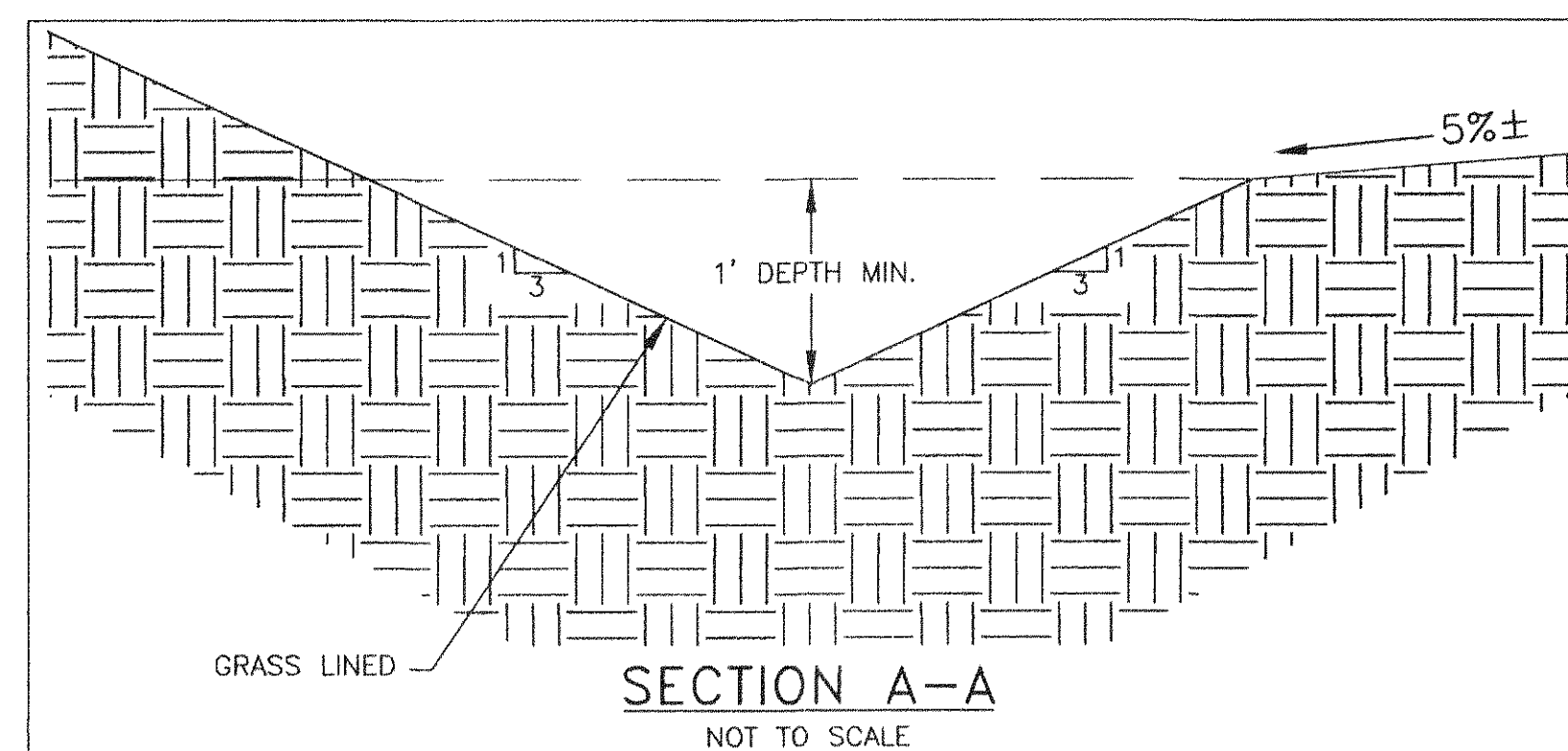
EROSION-SEDIMENTATION CONTROL COST ESTIMATE				
ALL COSTS GIVEN ARE COMPLETE IN PLACE				
DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CONSTRUCTION ENTRANCE	EA	1	\$ 100.00	\$ 100.00
SILT FENCE	LF	270	\$ 3.00	\$ 810.00
CHECK DAM	EA	4	\$ 100.00	\$ 400.00
PERMANENT SEEDING	AC.	0.9	\$1700.00	\$1530.00
SUB-TOTAL				\$2840.00
20% CONTINGENCY				\$ 568.00
TOTAL PROJECT COST				\$3408.00



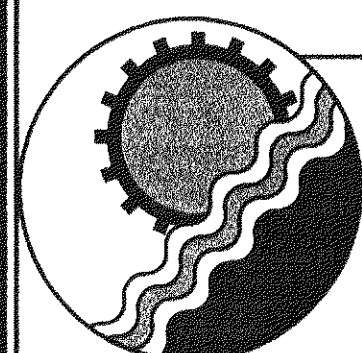
BOLLARD DETAIL
NOT TO SCALE



TYPICAL GRAVEL DRIVE SECTION
NOT TO SCALE



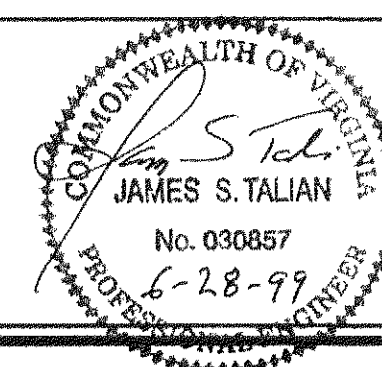
SECTION A-A
NOT TO SCALE



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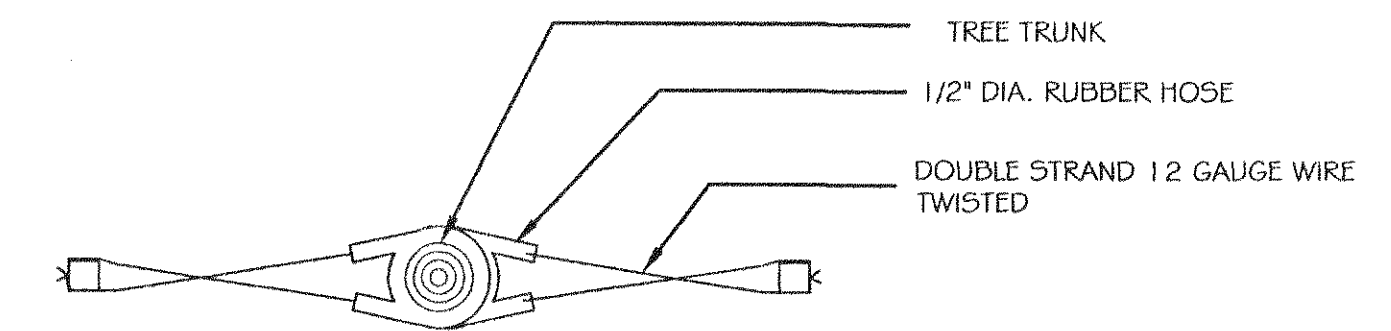
4656 BRAMBLETON AVE. SW
ROANOKE, VIRGINIA 24018
540.776.5715 FAX: 540.776.8543



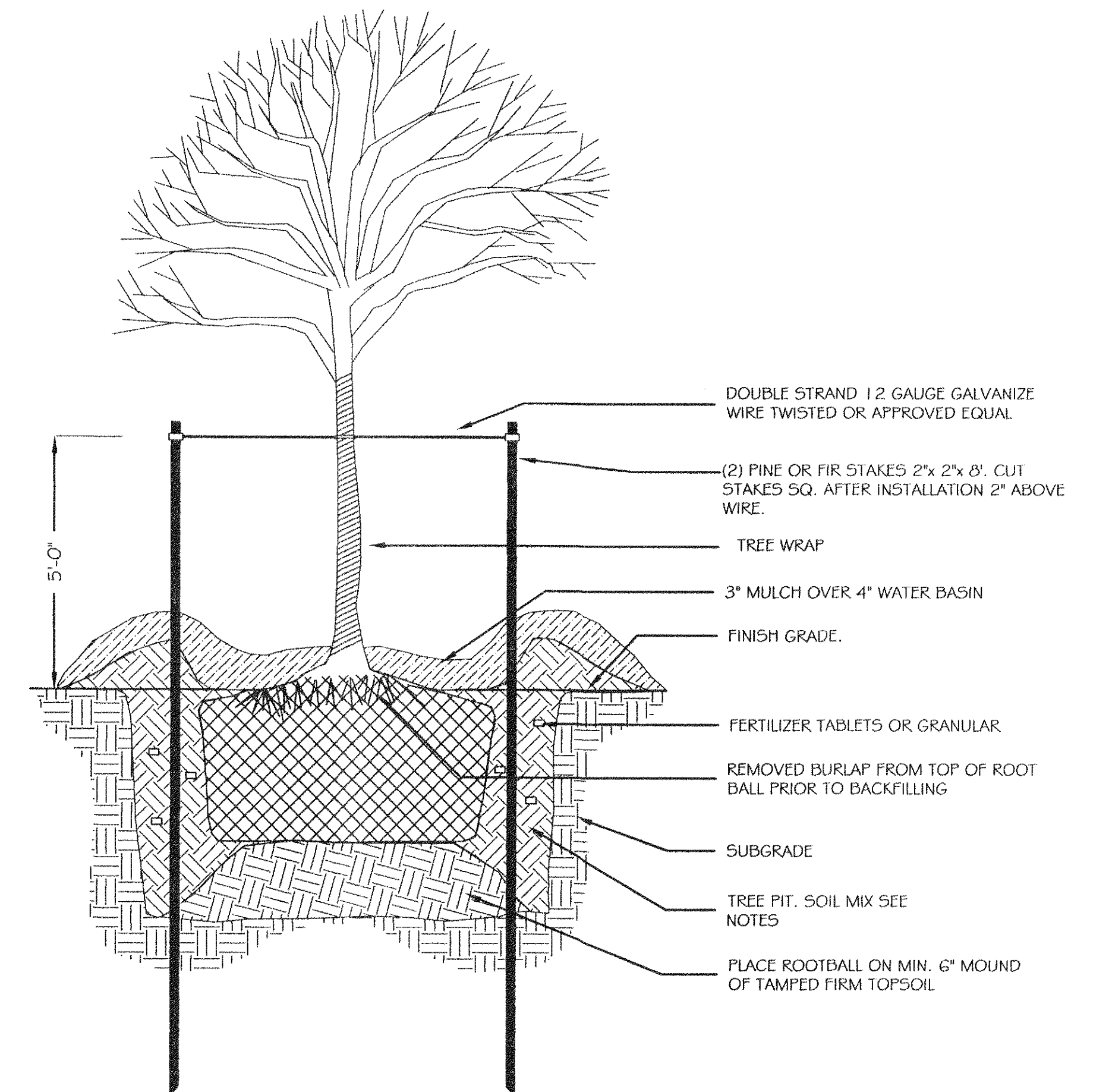
Drawn PSN
Designed PSN
Checked JST
Approved JST

**GREENFIELD
CHLORINATION FACILITY**
**EROSION AND SEDIMENT CONTROL
AND SITE DETAILS**

NTS
JUNE 1999
PROJECT: 97075
3 of 19



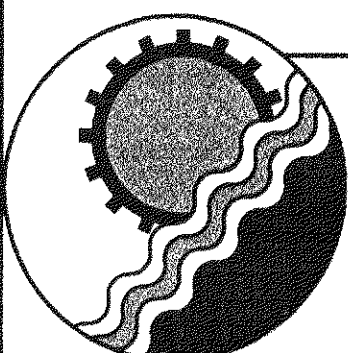
FOR ADDITIONAL DETAILED PLANTING INFO, SEE NOTES



TYPICAL TREE PLANTING- WOOD STAKING

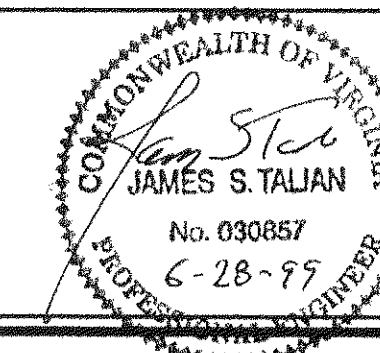
NOT TO SCALE

PLANT SCHEDULE:					
Qty.	Abrv.	Botanical Name	Common Name	size	Remarks
Trees					
3	CC	CERCIS CANADENSIS	EASTERN REDBUD	1-1/2" CAL.	B + B, MULTI-STEM
6	JV	JUNIPERUS VIRGINIANA	EASTER RED CEDAR	2" CAL.	B + B
3	OA	OXYDENDRUM ARBOREUM	SOURWOOD	4'-5' MIN. HT.	B + B, MULTI-STEM
1	QR	QUERCUS RUBRA	RED OAK	2" CAL.	B + B
2	PO	PLATANUS OCCIDENTALIS	SYCAMORE	2" CAL.	B + B
2	PN	PINUS NIGRA	AUSTRIAN PINE	2" CAL.	B + B
5	PS	PINUS STROBUS	EASTERN WHITE PINE	2" CAL.	B + B



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Drawn DJP
Designed DJP
Checked JCS
Approved WPJ / JST

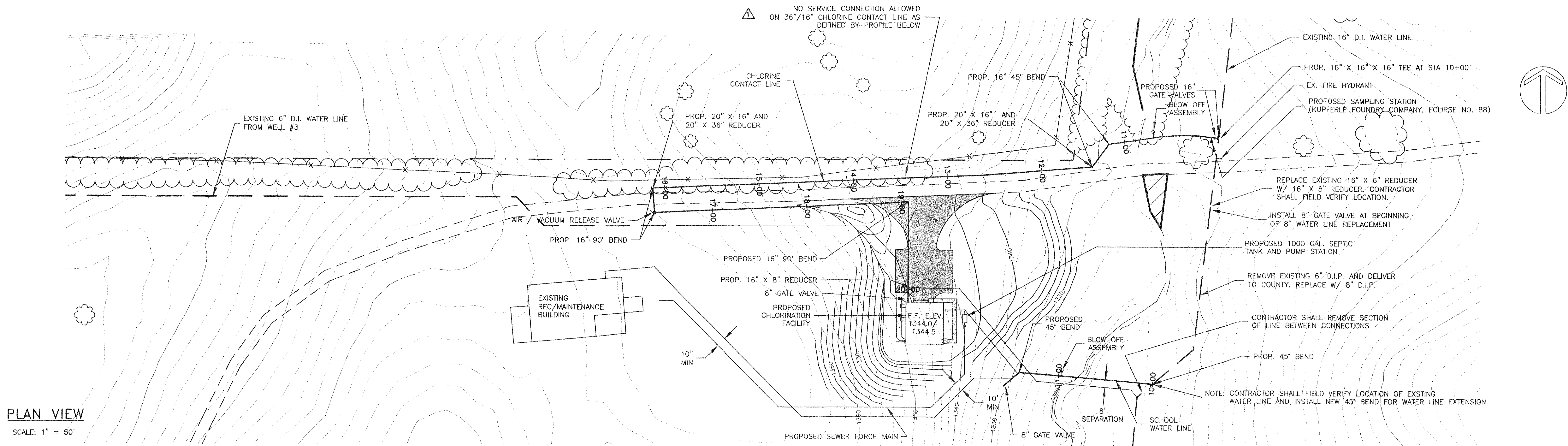
**GREENFIELD
CHLORINATION FACILITY
PLANTING PLAN**

1"=20'

JUNE 1999

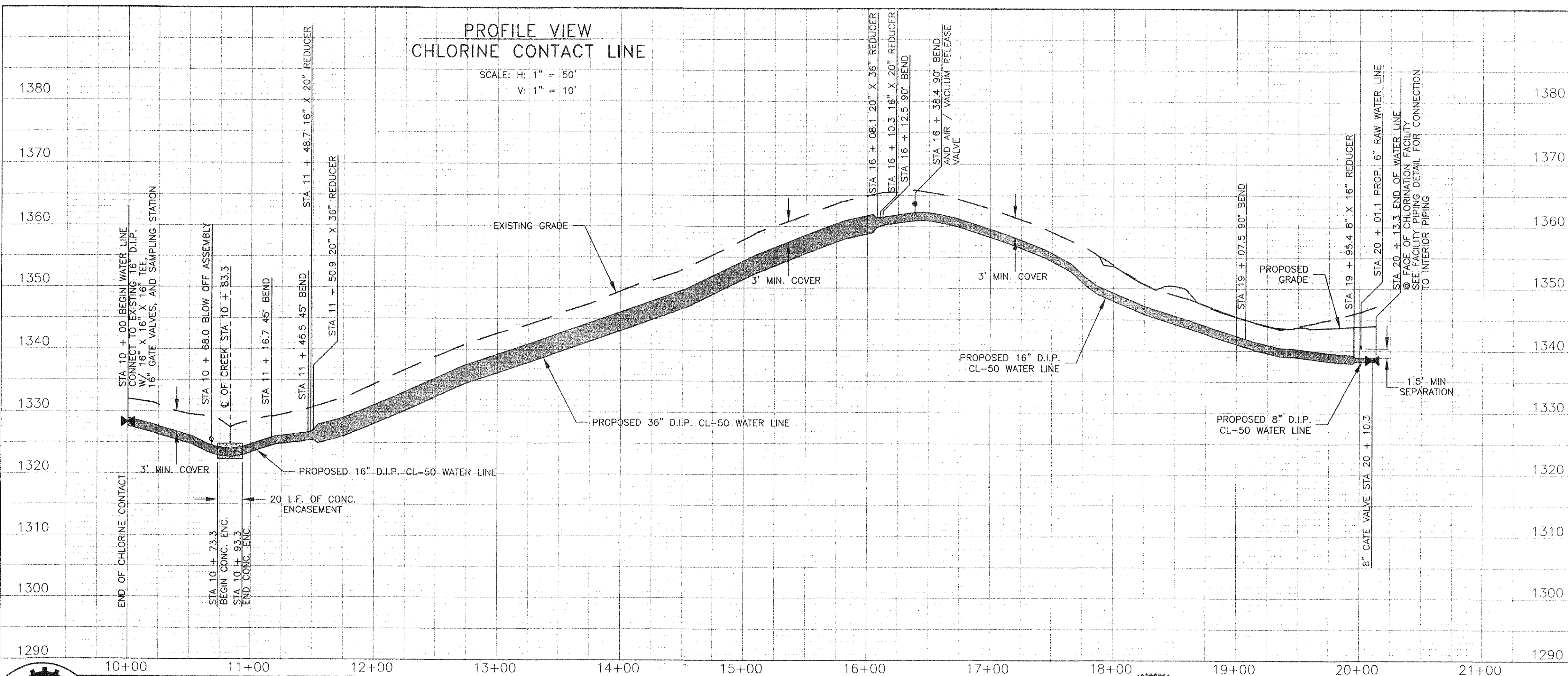
PROJECT: 97075

4 of 19



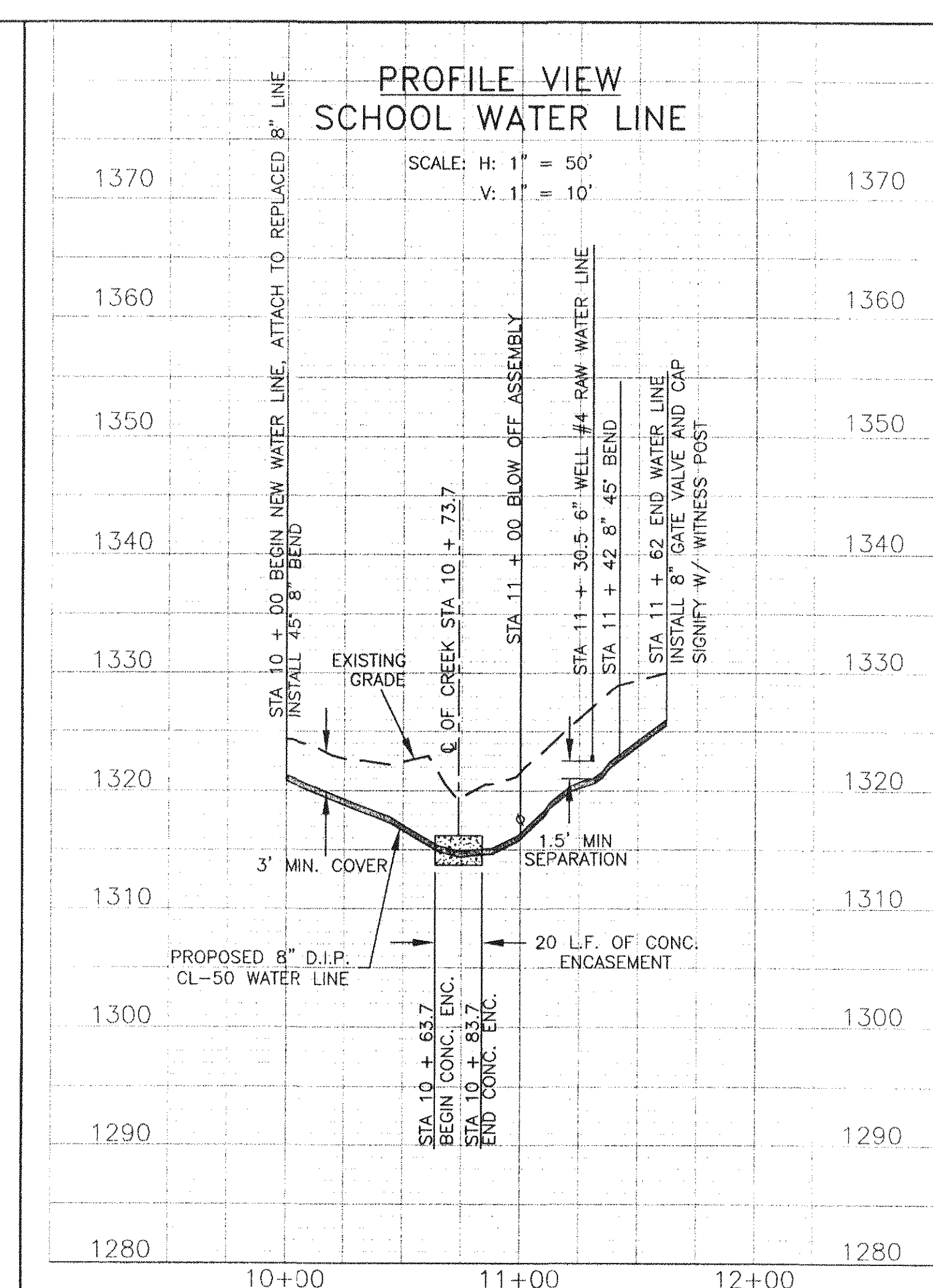
PLAN VIEW

SCALE: 1" = 50'



PROFILE VIEW
CHLORINE CONTACT LINE

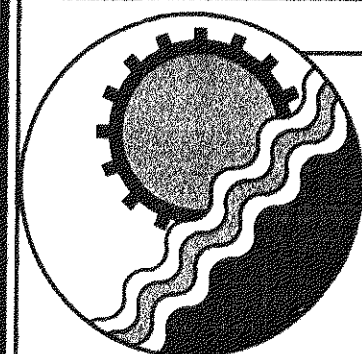
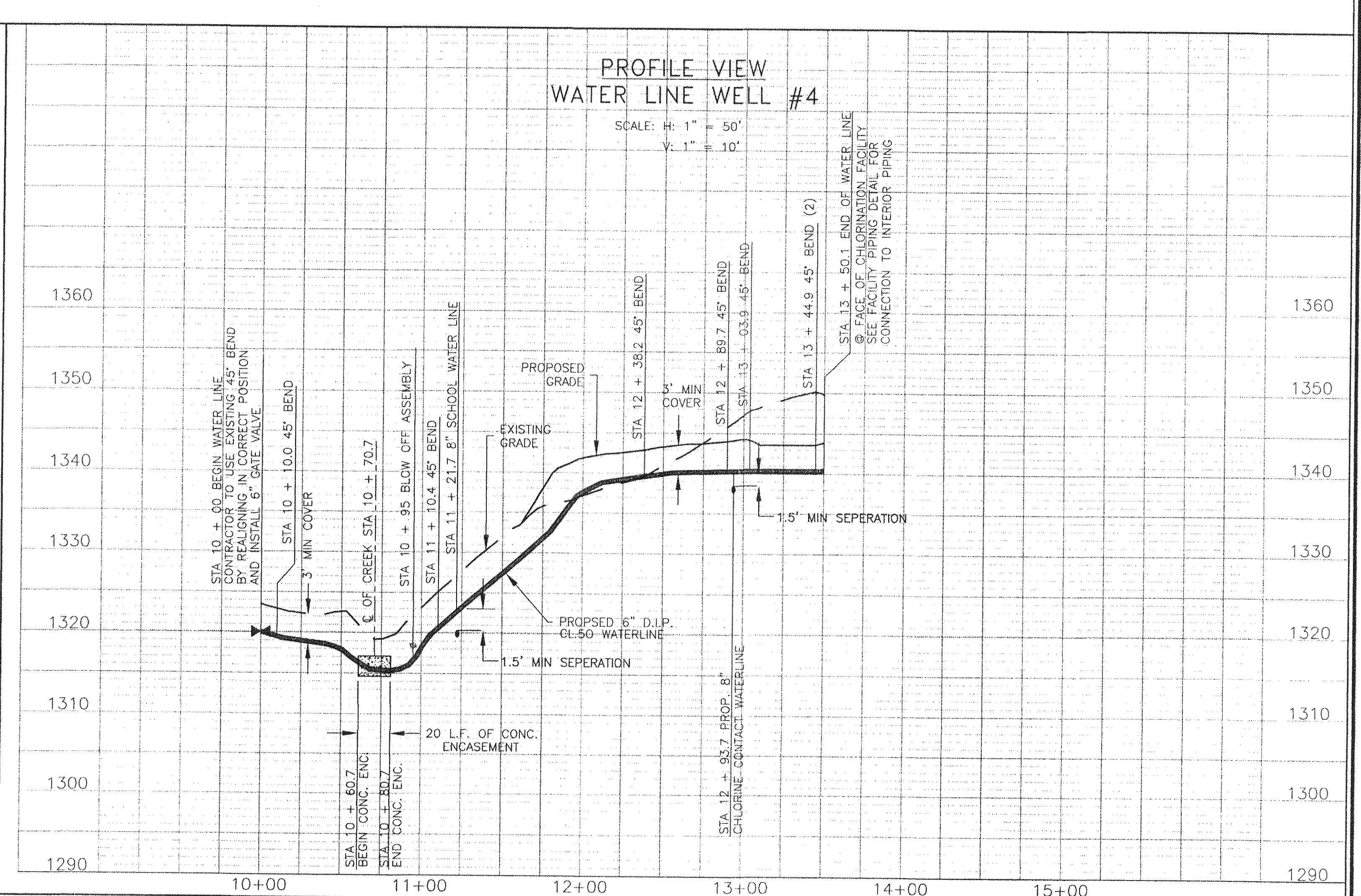
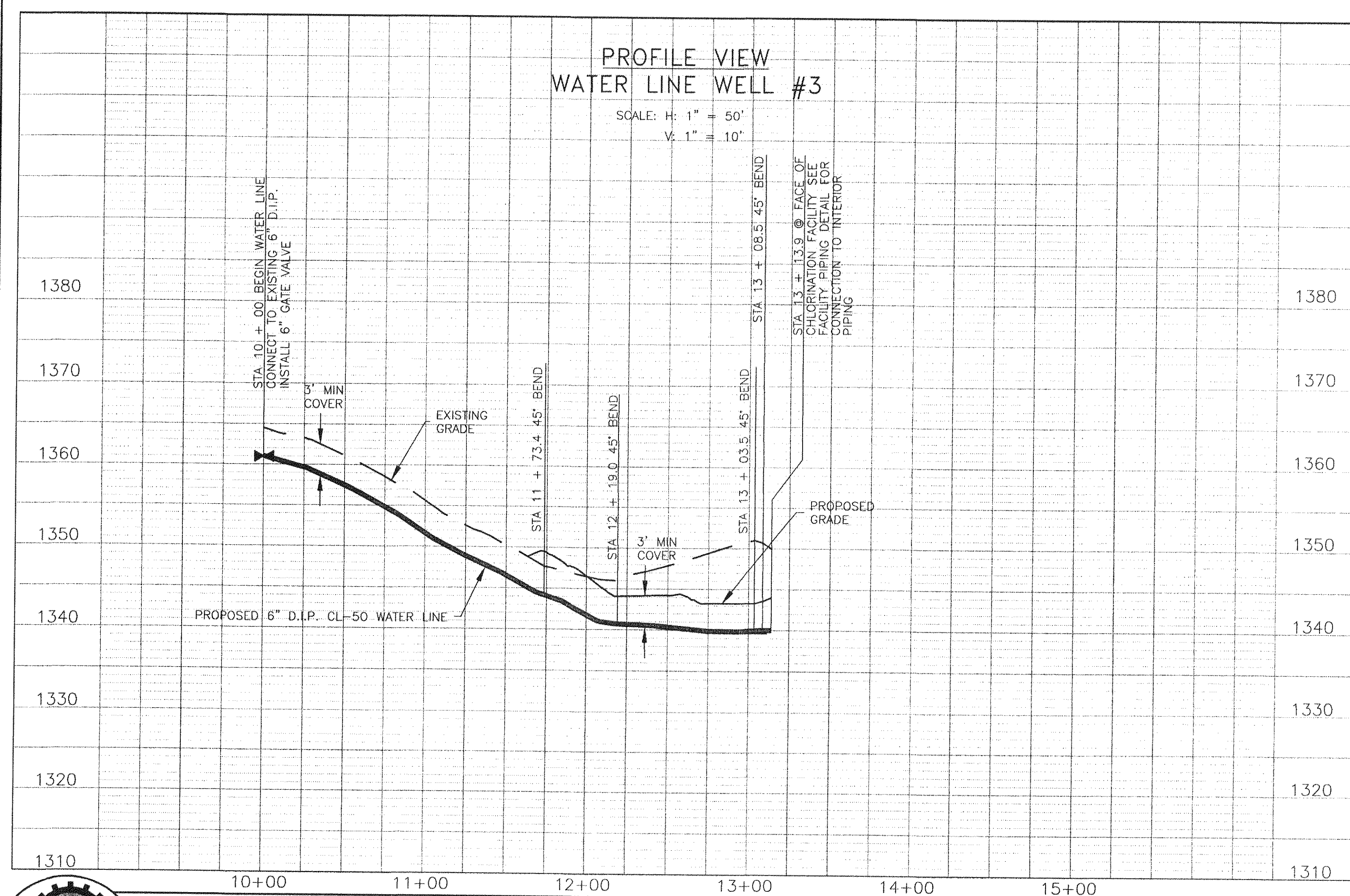
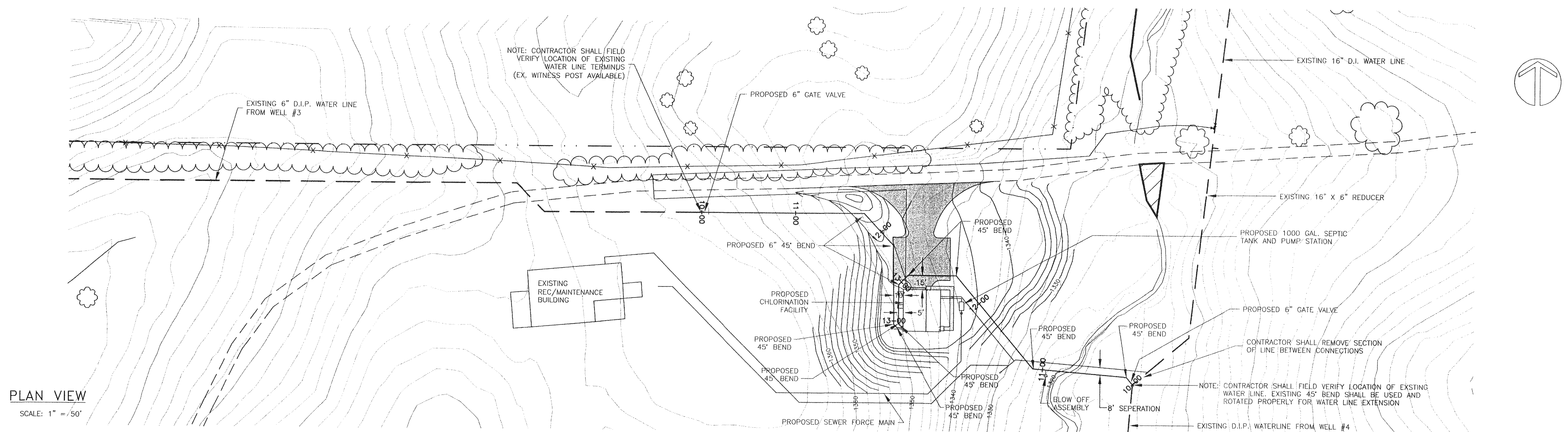
SCALE: H: 1" = 50'
V: 1" = 10'



PROFILE VIEW
SCHOOL WATER LINE

SCALE: H: 1" = 50'
V: 1" = 10'

No.	Revision	By	Appd.	Date	Drawn	PSN
1	NOTE ADDED	PSN	JST	7-16-99	Designed	PSN
					Checked	JST
					Approved	JST



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FINCASTLE, VIRGINIA 24090
540.473.1253 FAX: 540.473.1254

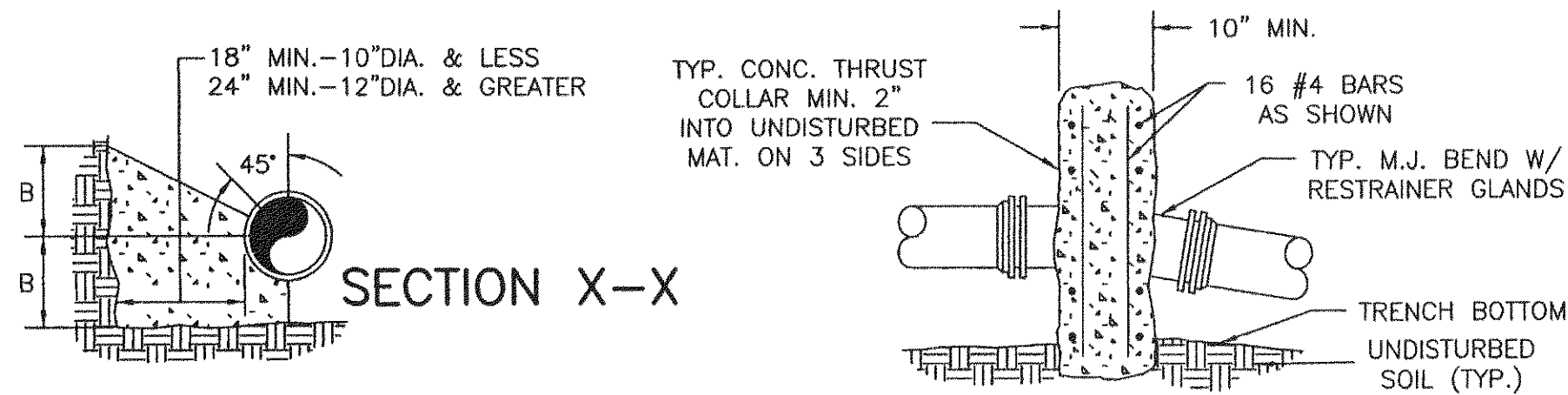
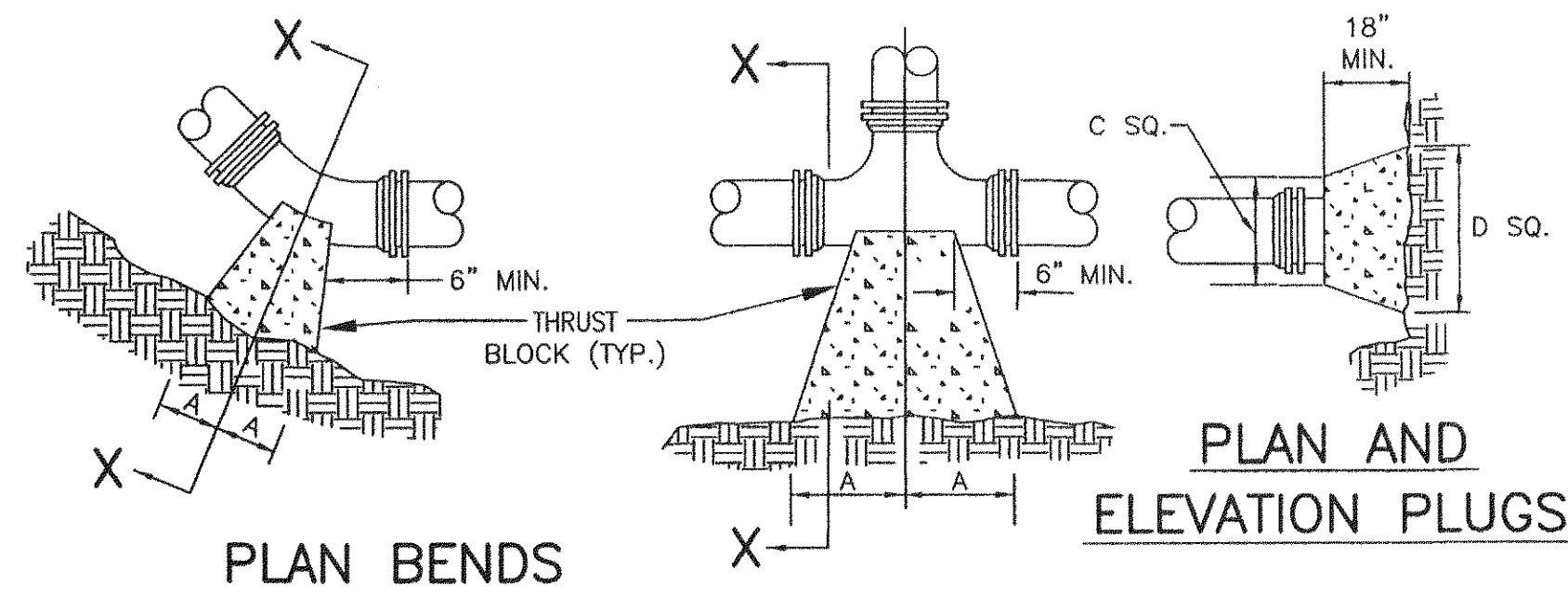
Drawn	PSN
Designed	PSN
Checked	JST
Approved	WPJ

GREENFIELD CHLORINATION FACILITY	
WELLS 3&4 WATER LINE EXTENSION PLAN & PROFILE	

$$H:1''=50' \quad V:1''=10'$$

JUNE 1999
PROJECT: 97075

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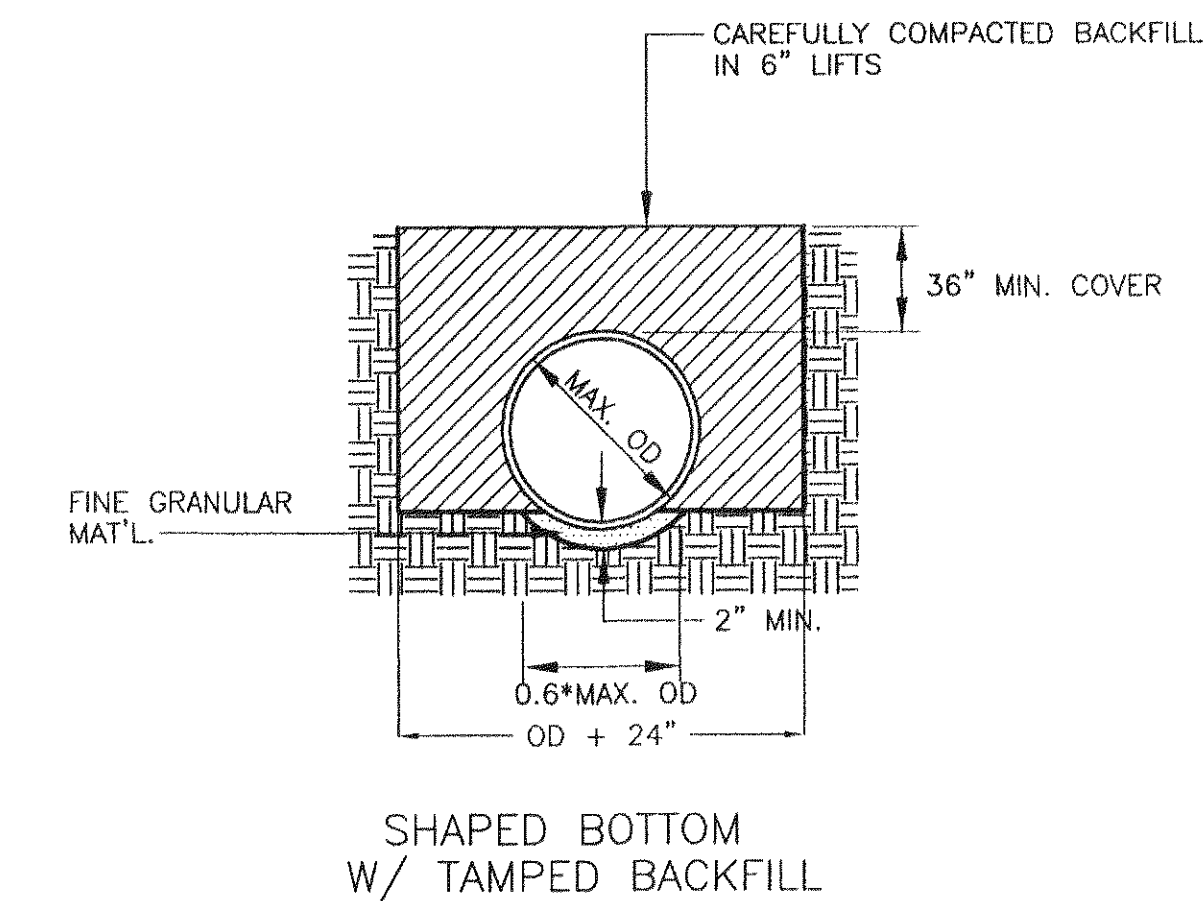
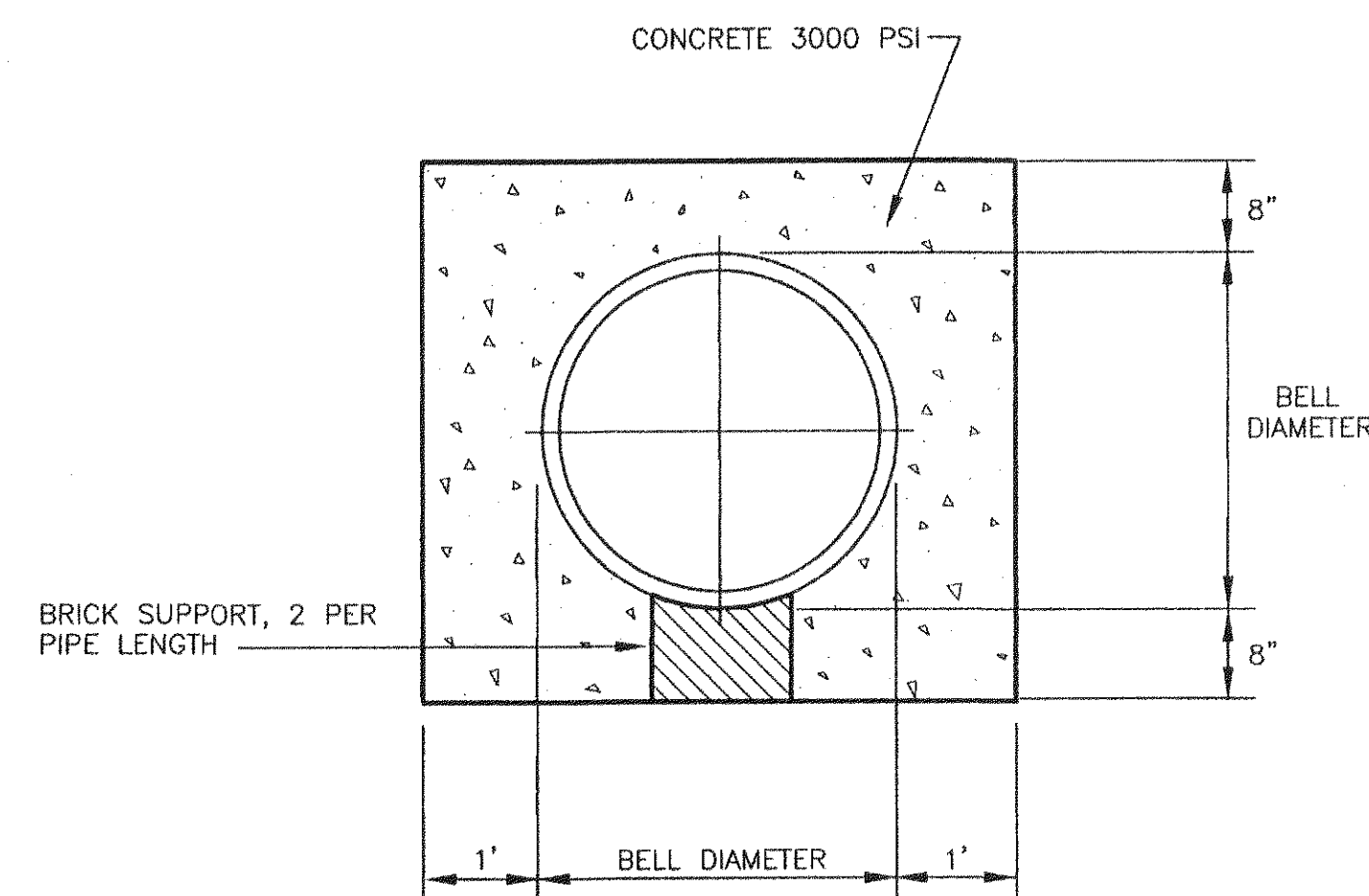
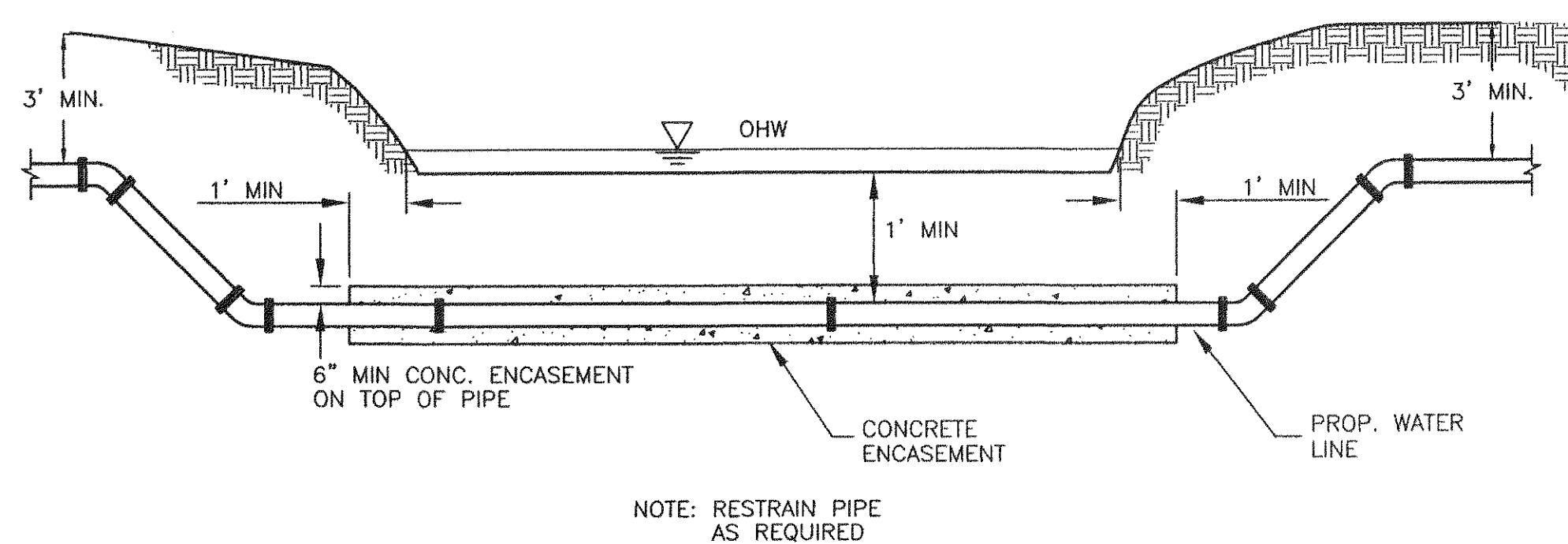
BENDS AND TEES

- NOTES:
- FOR VERT. BEND DOWN IN EXCESS OF 11 1/4" BEND, ANCHORAGE SHALL BE DESIGNED BY ENGINEER.
 - FOR VERT. BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZ. BEND.
 - GLANDS & BOLTS SHALL BE PROTECTED FROM CONC. BY PLASTIC SHEETING WHEN POURING THRUST BLOCKS.
 - ALL THRUST BLOCK & SUPPORT CONC. SHALL BE 3000 PSI READY MIX CONC.
 - THRUST BLOCKS WITH "B" DIMENSION GREATER THAN 30" SHALL HAVE THE RESTRAINED PIPE INSTALLED WITH A MINIMUM OF 4' OF COVER.

PRESSURE = 200 psi
BEARING = 2000 psf
FACTOR OF SAFETY = 1.5

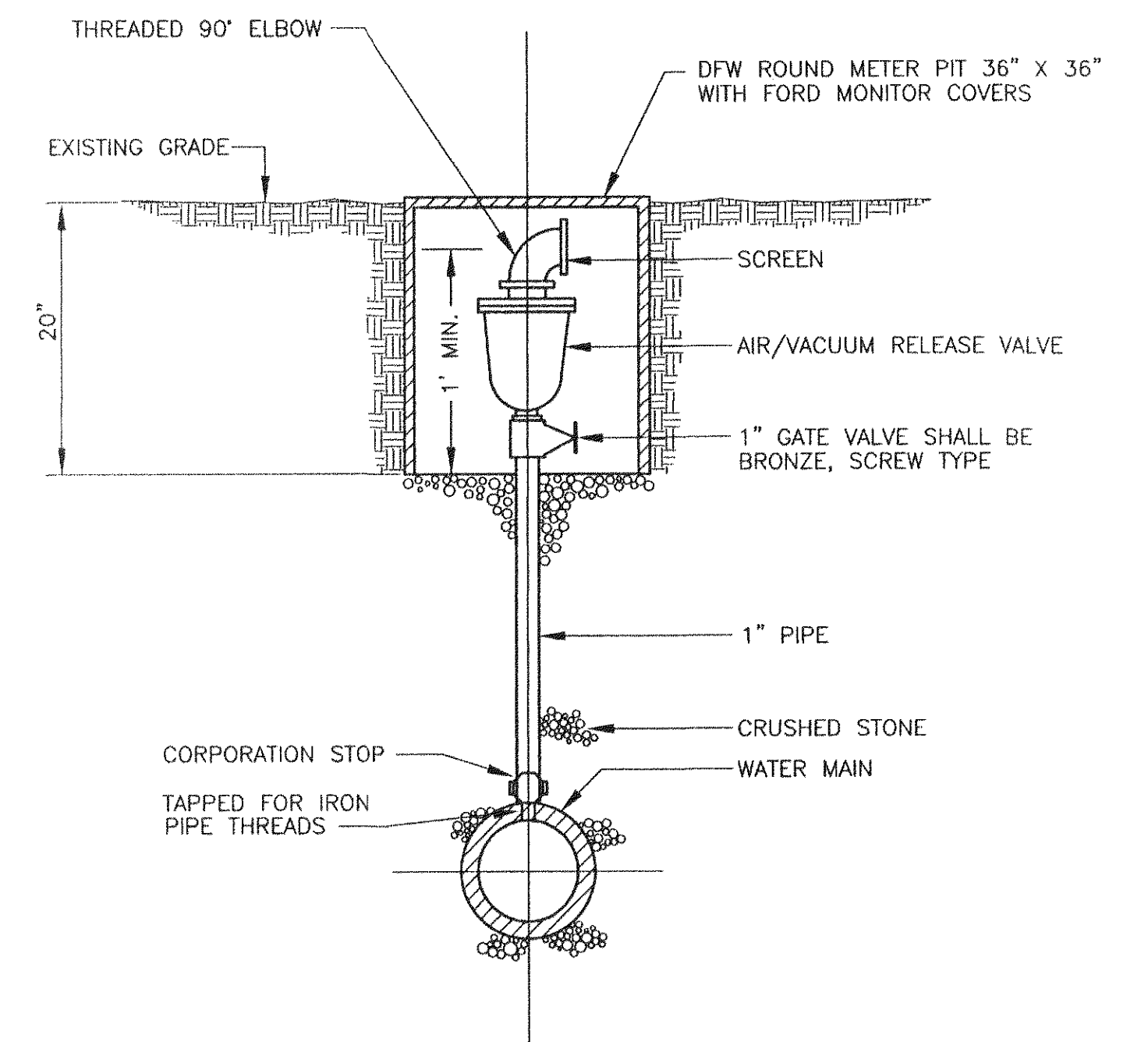
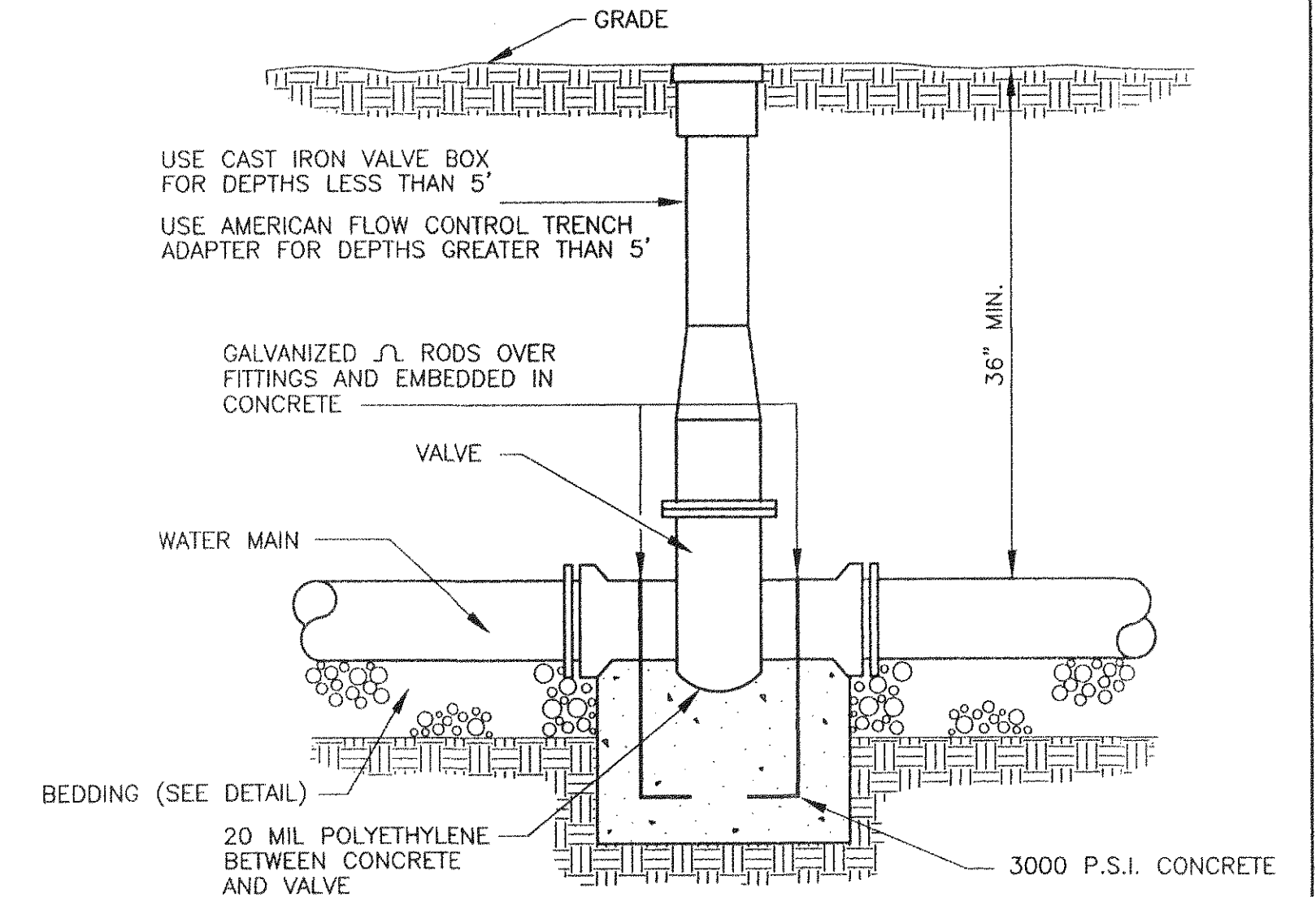
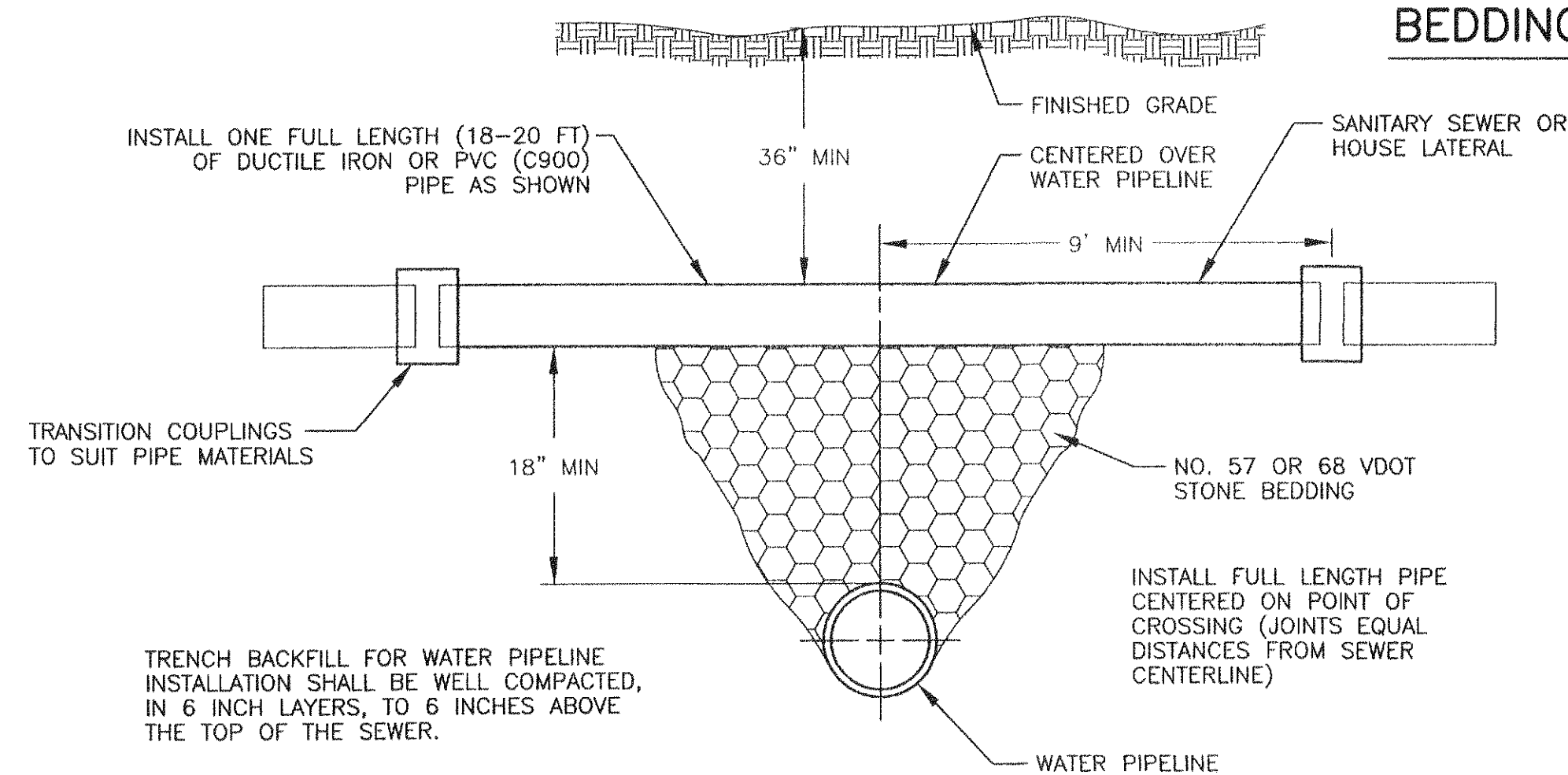
PIPE SIZE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE	PLUG
4"	A	B	A	B	A	B
6"	8"	12"	8"	8"	6"	6"
8"	18"	12"	8"	8"	6"	6"
10"	18"	13"	10"	10"	8"	8"
12"	20"	16"	12"	14"	8"	12"
14"	20"	16"	12"	14"	8"	12"
16"	26"	20"	16"	18"	11"	13"
18"	26"	20"	16"	18"	11"	13"
20"	32"	26"	20"	22"	14"	16"
24"	42"	32"	26"	30"	18"	20"
30"	42"	32"	26"	30"	18"	20"

THRUST BLOCK CONSTRUCTION

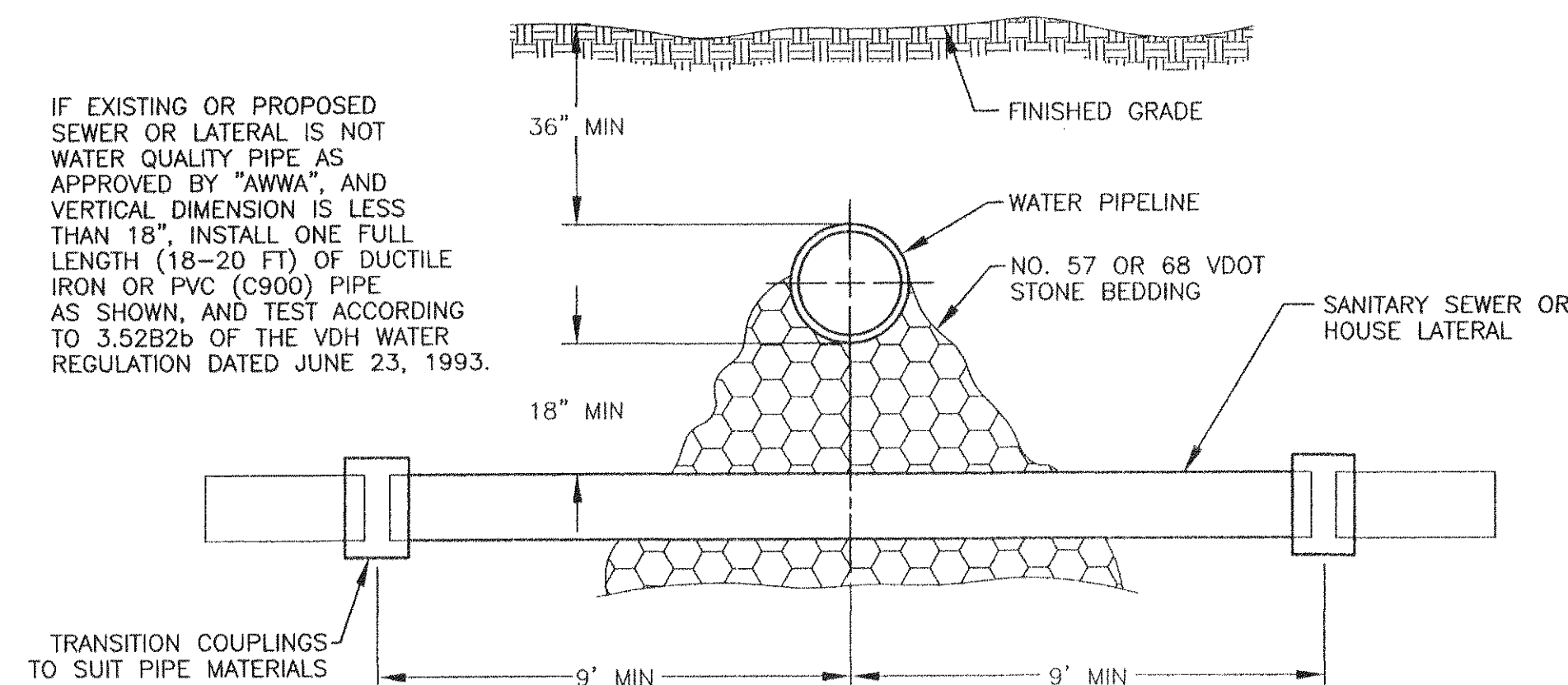
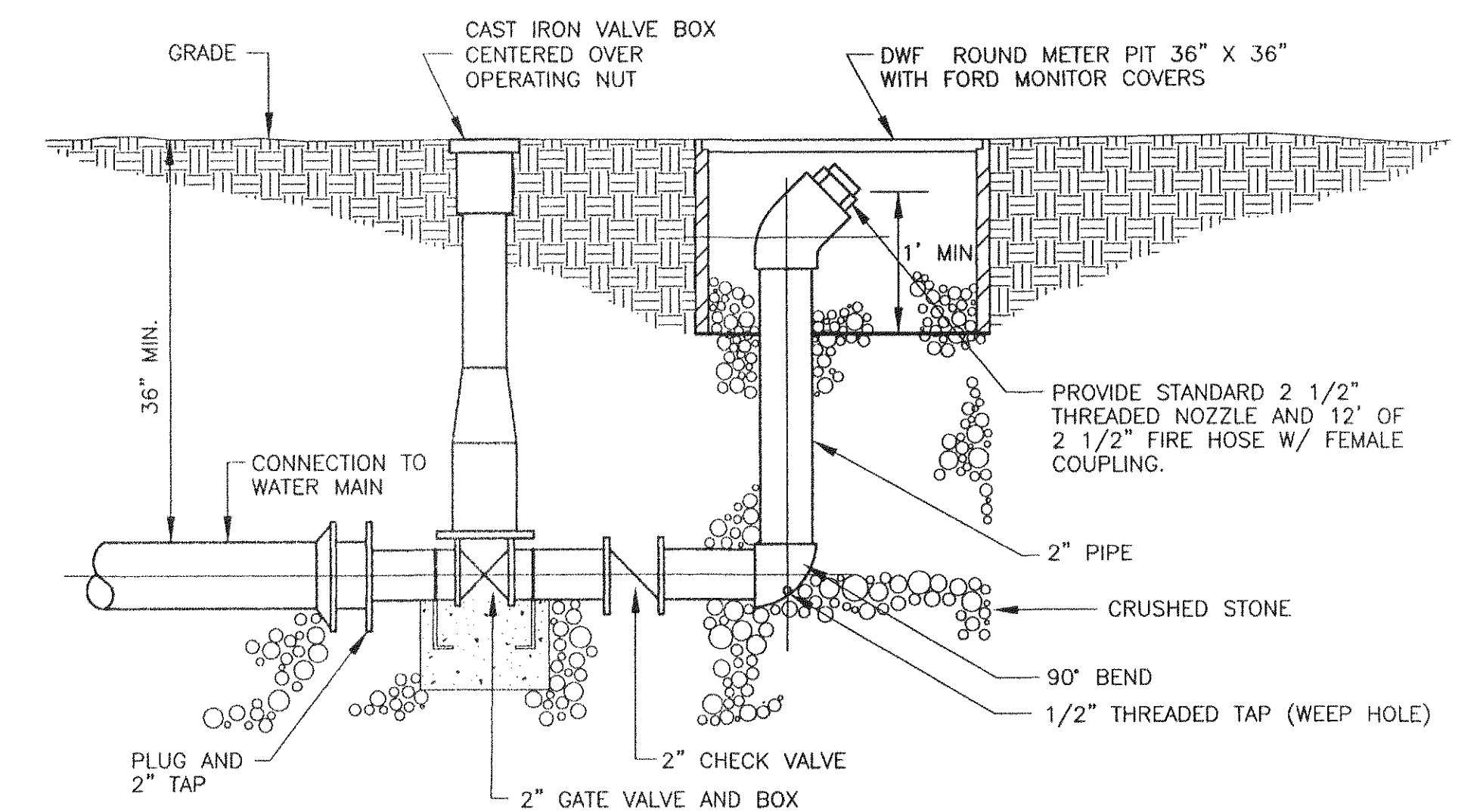


- NOTES:
- WHERE THE TRENCH BOTTOM IS IN ROCK, IT SHALL BE EXCAVATED TO A MINIMUM OF 8" BELOW THE BOTTOM OF THE PIPE AND BACKFILLED WITH SUITABLE BEDDING MATERIAL.
 - WHERE PIPE FOUNDATIONS ARE YIELDING, PIPE SHALL BE BEDDED ON A MINIMUM OF 8" SUITABLE BEDDING MATERIAL.
 - SHAPE TRENCH BOTTOM FOR PIPE BARREL, JOINTS, AND FITTINGS TO PROVIDE CONTINUOUS SUPPORT AND NO POINT LOADING OF PIPE, JOINTS, AND FITTINGS.
 - FOR PIPE LESS THAN 12" DIA., TRENCH WIDTH MAY BE 36"
 - ALL WATER LINE SHALL HAVE DETECTION TAPE APPROXIMATELY 18" ABOVE PIPE.

BEDDING DETAIL - WATER

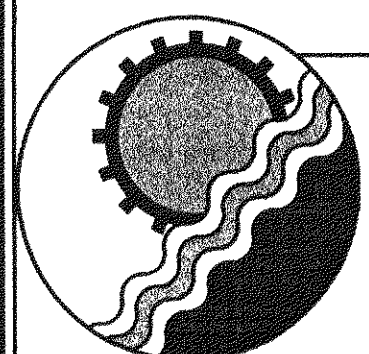


AUTOMATIC AIR/VACUUM RELEASE VALVE



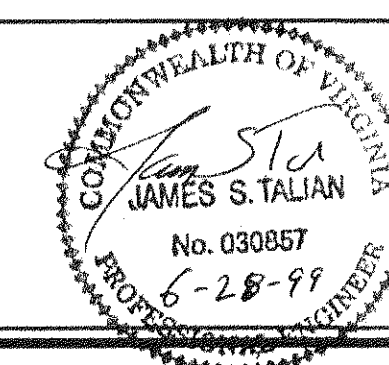
WATER PIPELINE CROSSING SANITARY SEWER OR "HOUSE" LATERAL

NOT TO SCALE



ENGINEERING CONCEPTS, INC.

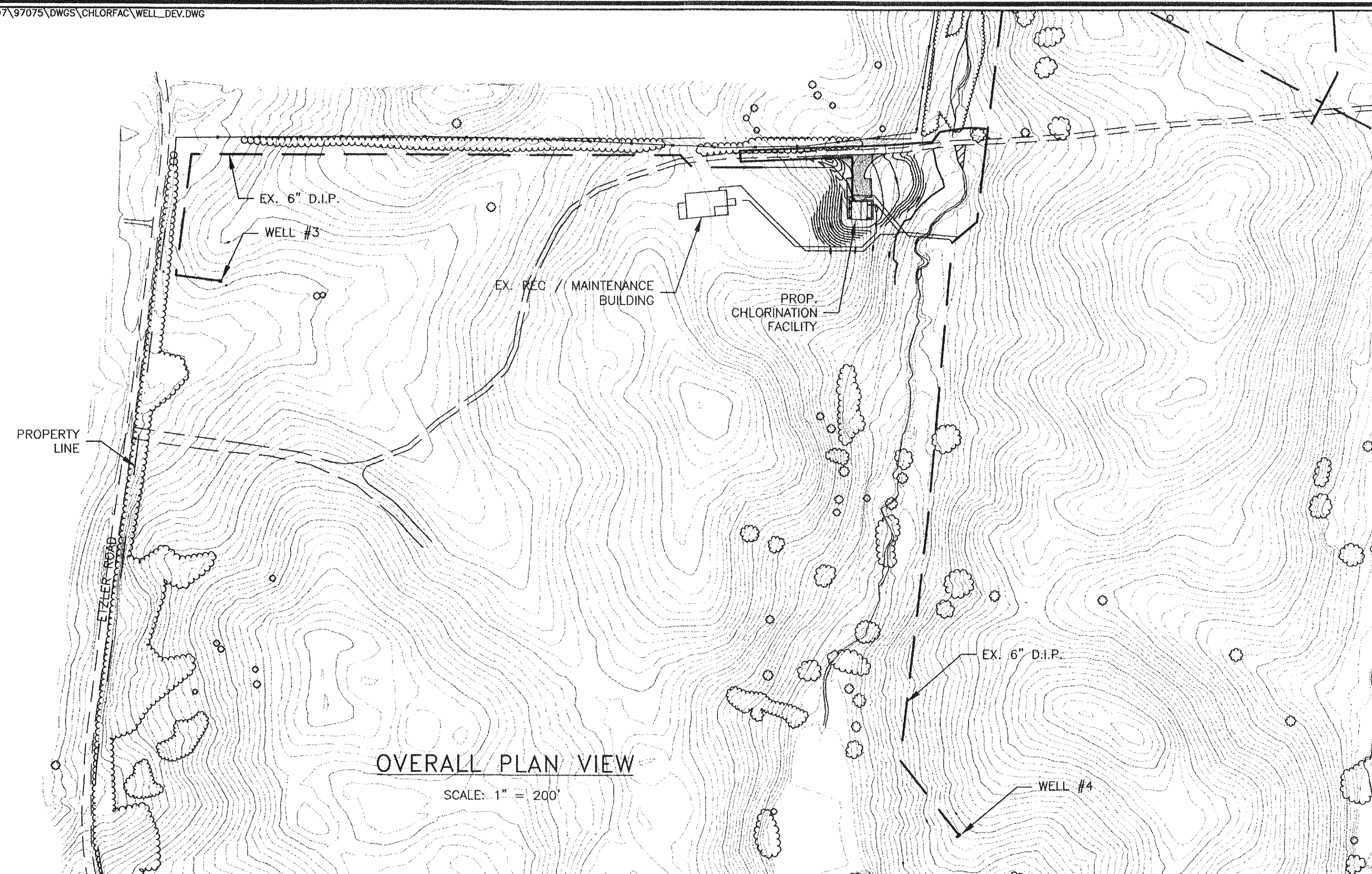
20 S. ROANOKE ST., PO BOX 619
FINCASTLE, VIRGINIA 24090
540.473.1253 FAX: 540.473.1254



Drawn PSN
Designed PSN
Checked JST
Approved JST

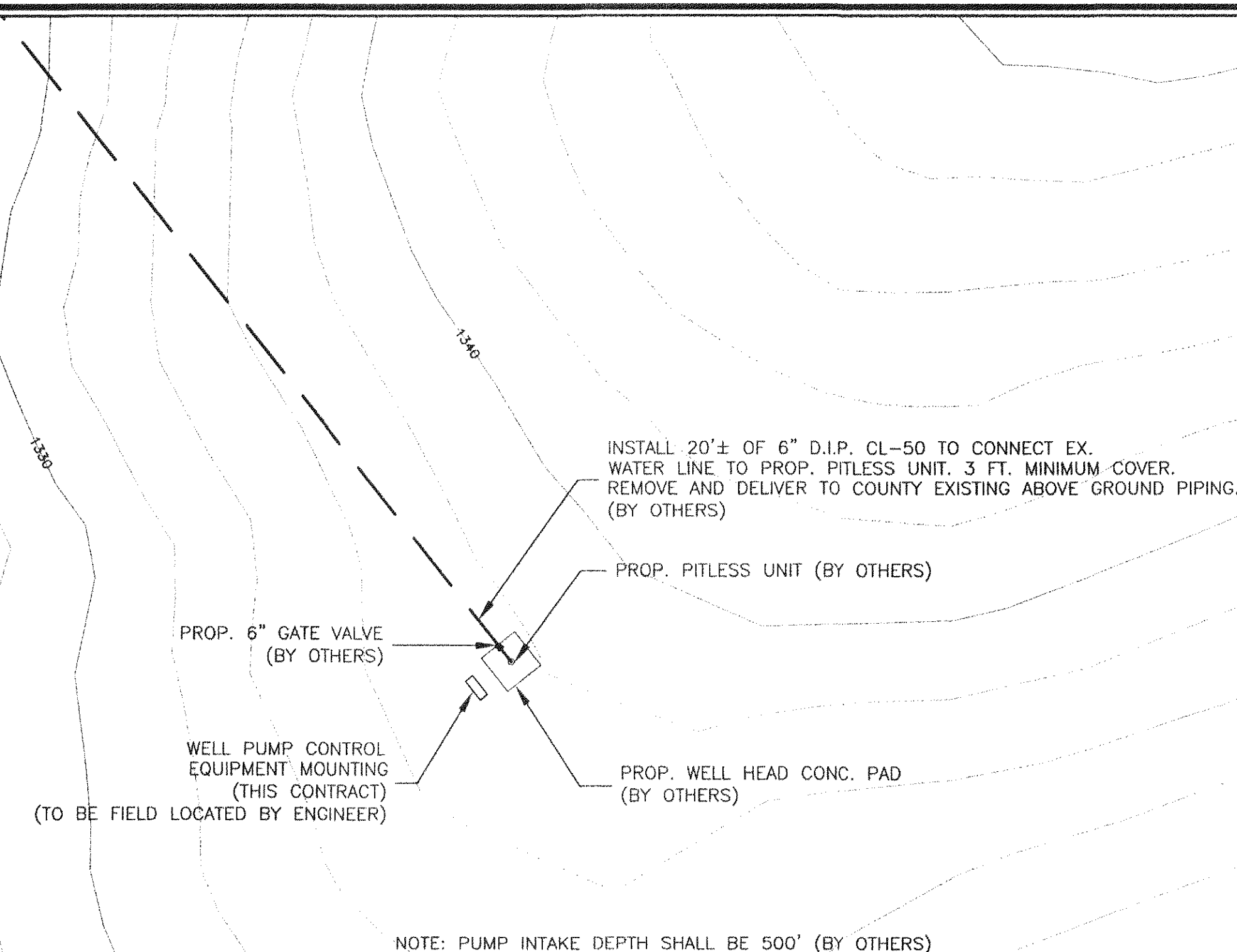
GREENFIELD CHLORINATION FACILITY
WATER SYSTEM DETAILS

SCALE: NONE
JUNE 1999
PROJECT: 97075
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OVERALL PLAN VIEW

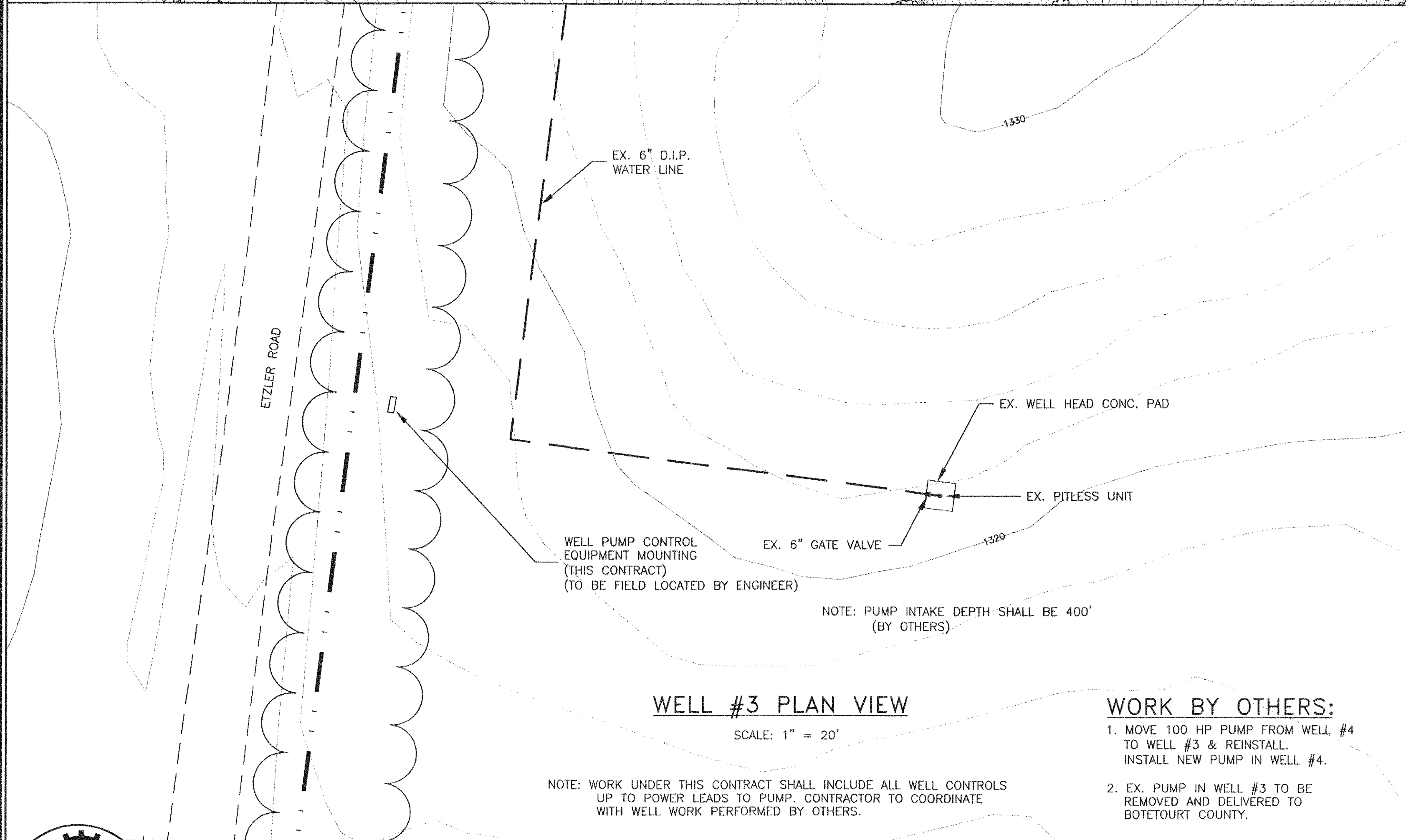
SCALE: 1" = 200'



WELL #4 PLAN VIEW

SCALE: 1" = 20'

NOTE: WORK UNDER THIS CONTRACT SHALL INCLUDE ALL WELL CONTROLS UP TO POWER LEADS TO PUMP. CONTRACTOR TO COORDINATE WITH WELL WORK PERFORMED BY OTHERS.



WELL #3 PLAN VIEW

SCALE: 1" = 20'

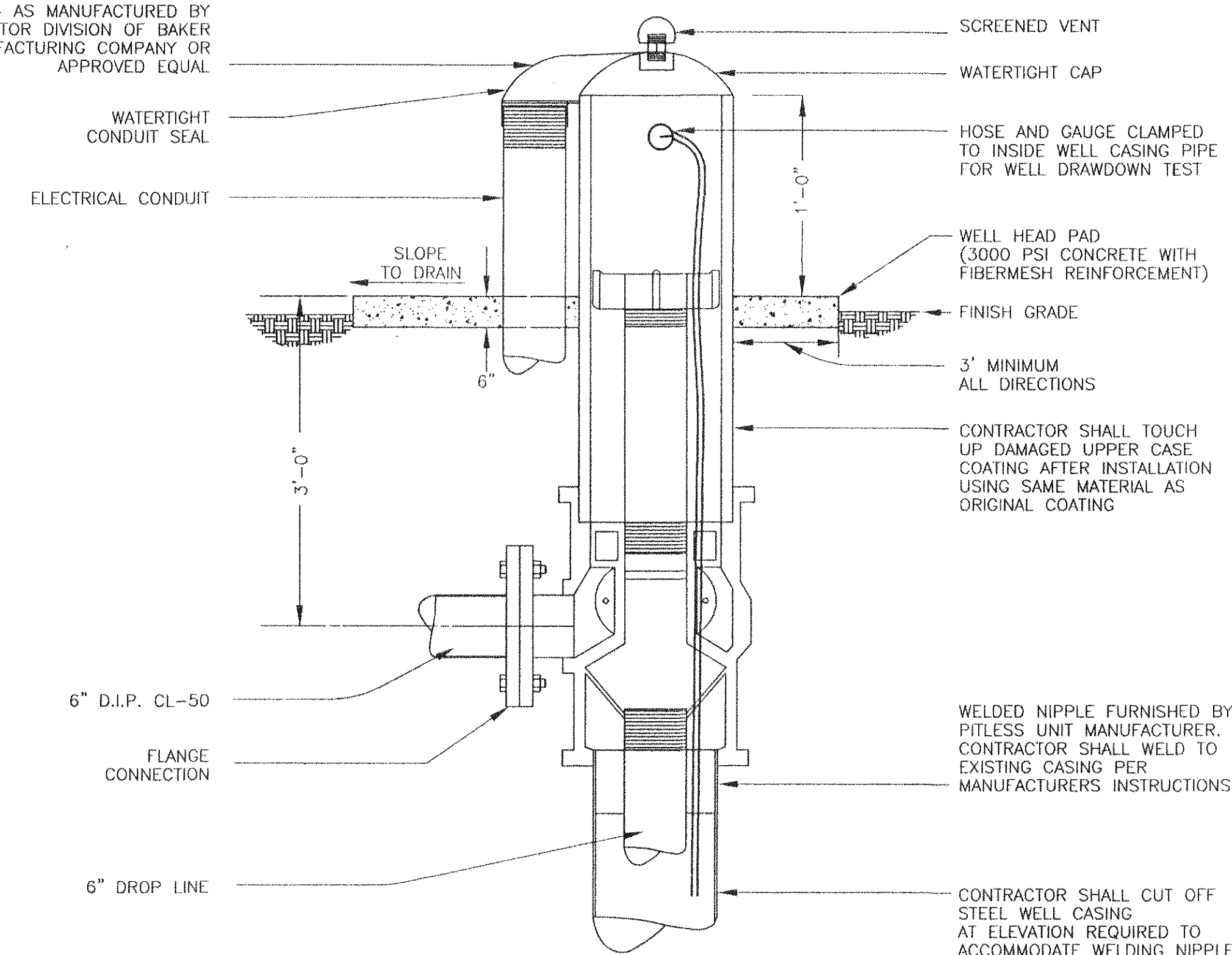
NOTE: WORK UNDER THIS CONTRACT SHALL INCLUDE ALL WELL CONTROLS UP TO POWER LEADS TO PUMP. CONTRACTOR TO COORDINATE WITH WELL WORK PERFORMED BY OTHERS.

WORK BY OTHERS:

1. MOVE 100 HP PUMP FROM WELL #4 TO WELL #3 & REINSTALL. INSTALL NEW PUMP IN WELL #4.
2. EX. PUMP IN WELL #3 TO BE REMOVED AND DELIVERED TO BOTETOURT COUNTY.

NOTE: EX. WELL #3 PITLESS UNIT MODEL NUMBER IS 3PS1012WBWE06T6

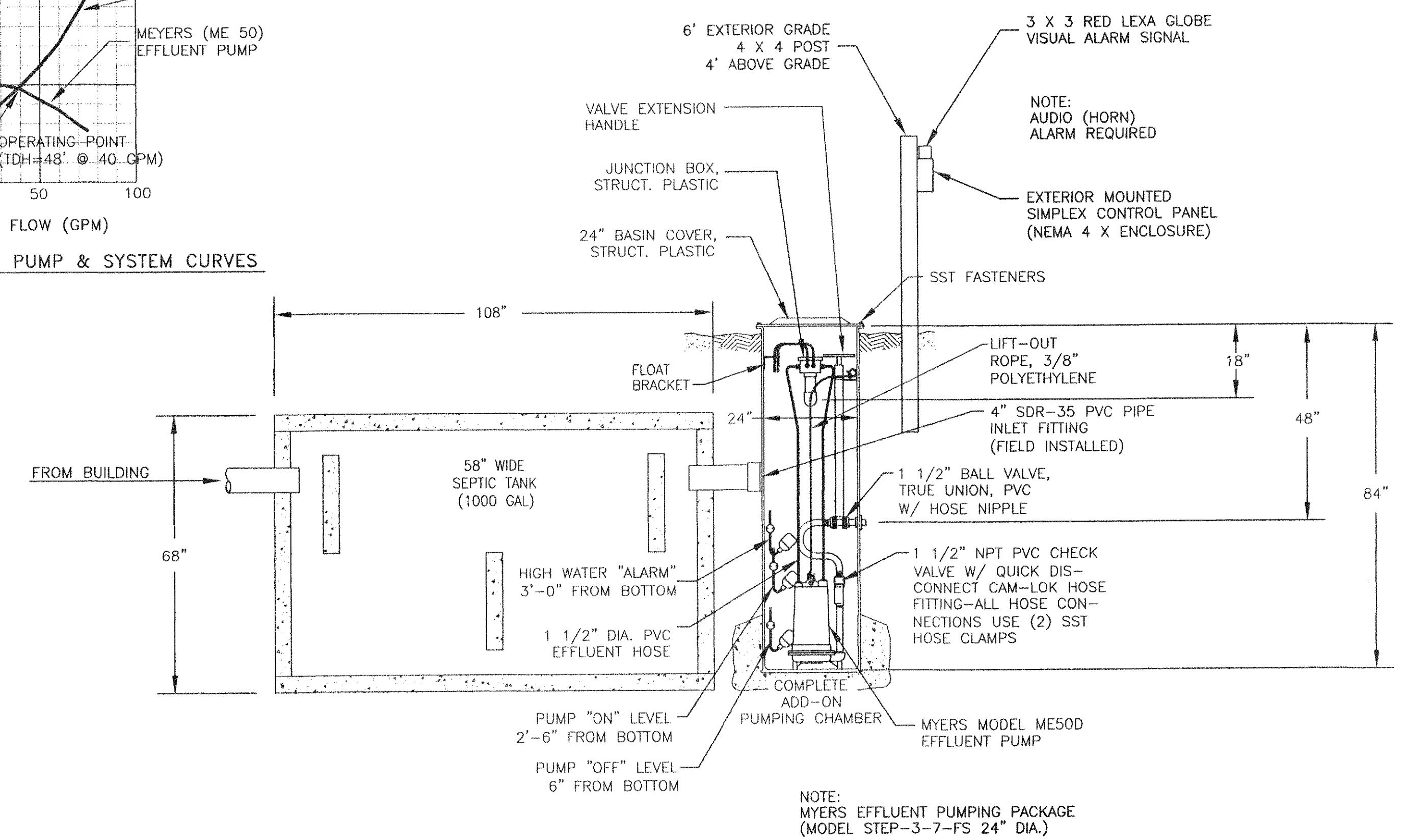
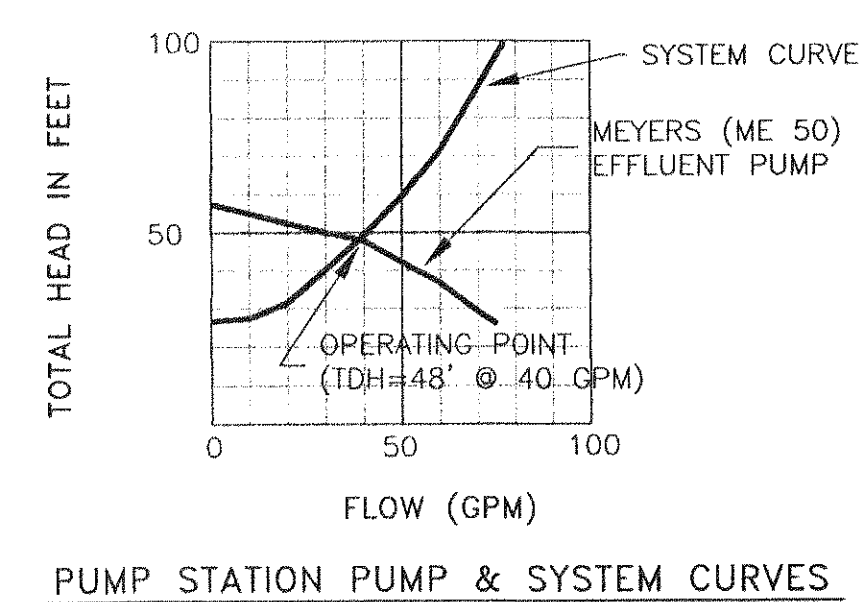
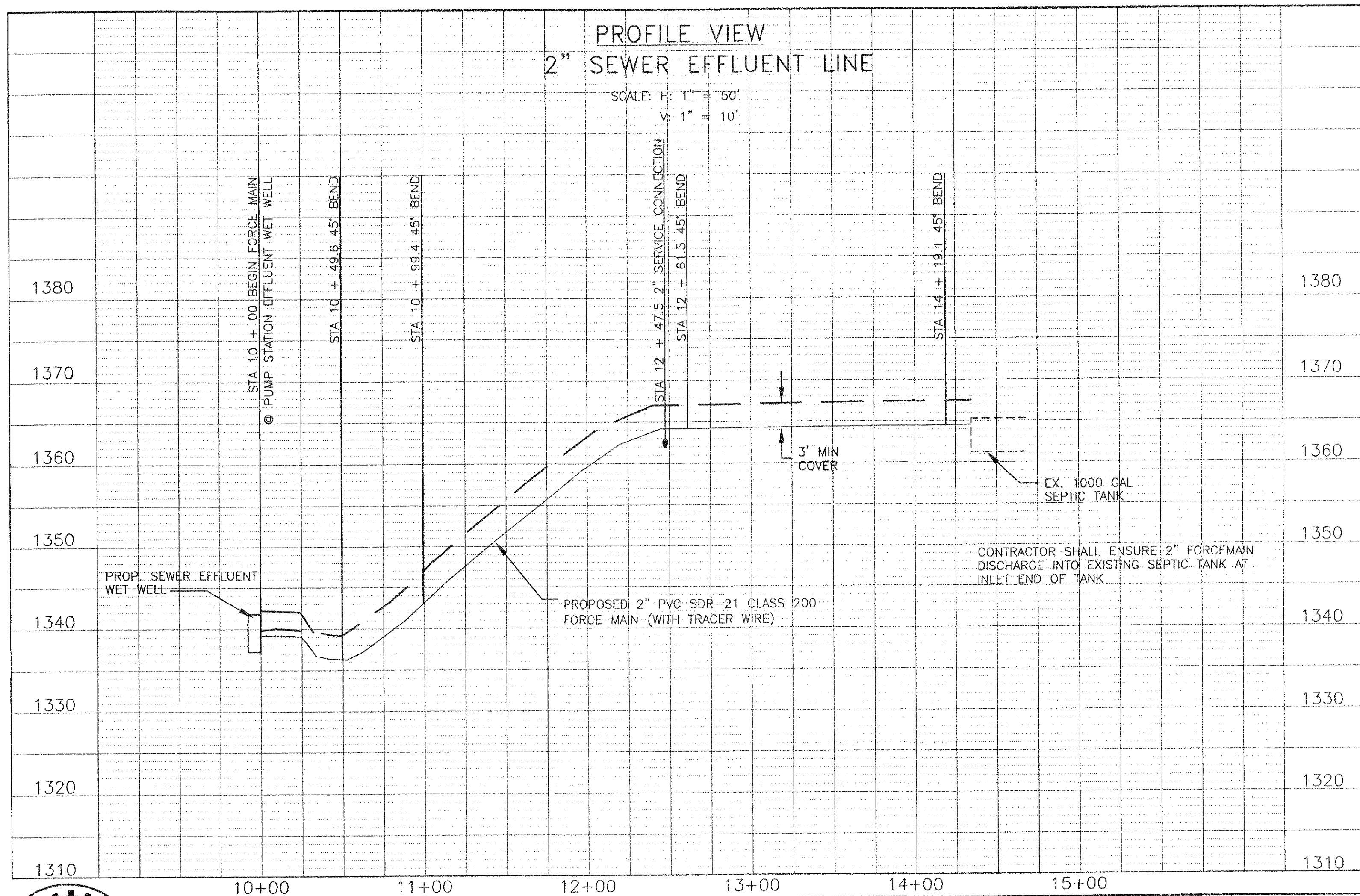
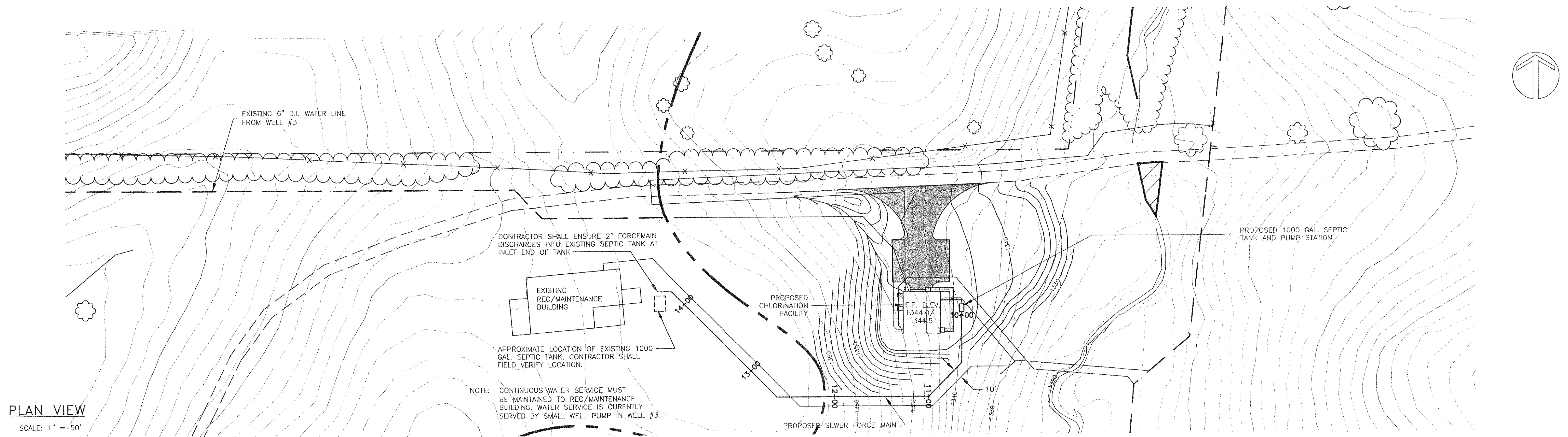
MODEL 3PS-1014WB-W-E16-F6*S FOR WELL #4 AS MANUFACTURED BY MONITOR DIVISION OF BAKER MANUFACTURING COMPANY OR APPROVED EQUAL



PITLESS UNIT

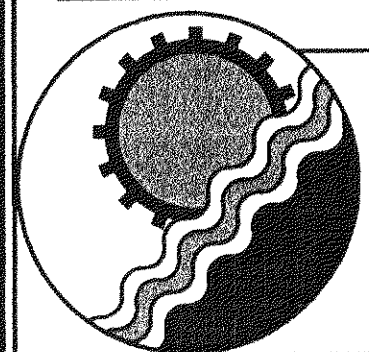
NOT TO SCALE (BY OTHERS)

No.	Revision	By	Appd.	Date	Drawn	PSN
1	NOTE ADDED	PSN	JST	7-16-99	Designed	PSN
					Checked	JST
					Approved	JST



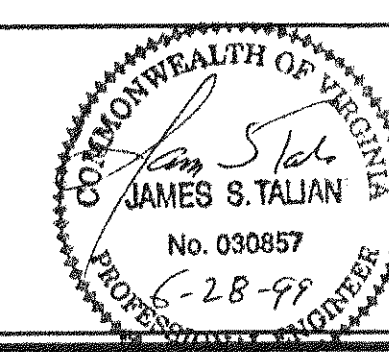
SEWER EFFLUENT PUMP STATION DETAIL

NOT TO SCALE



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Drawn	PSN
Designed	PSN
Checked	JST
Approved	JST

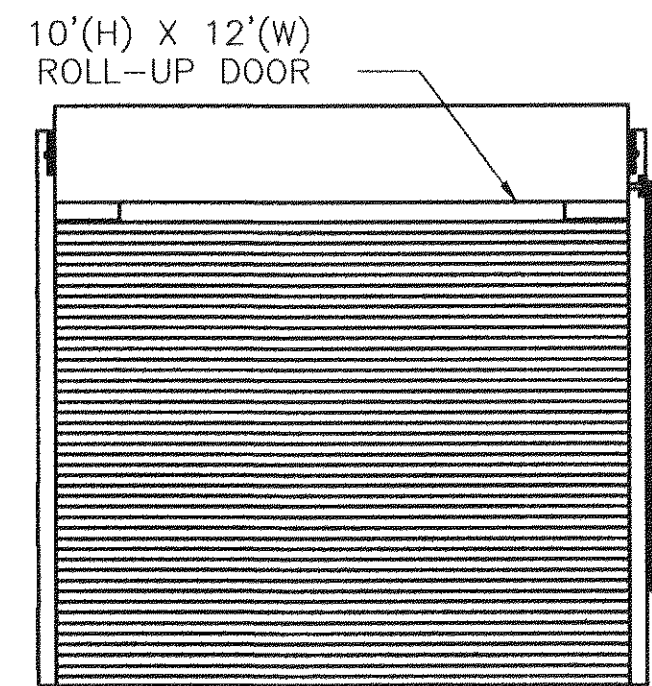
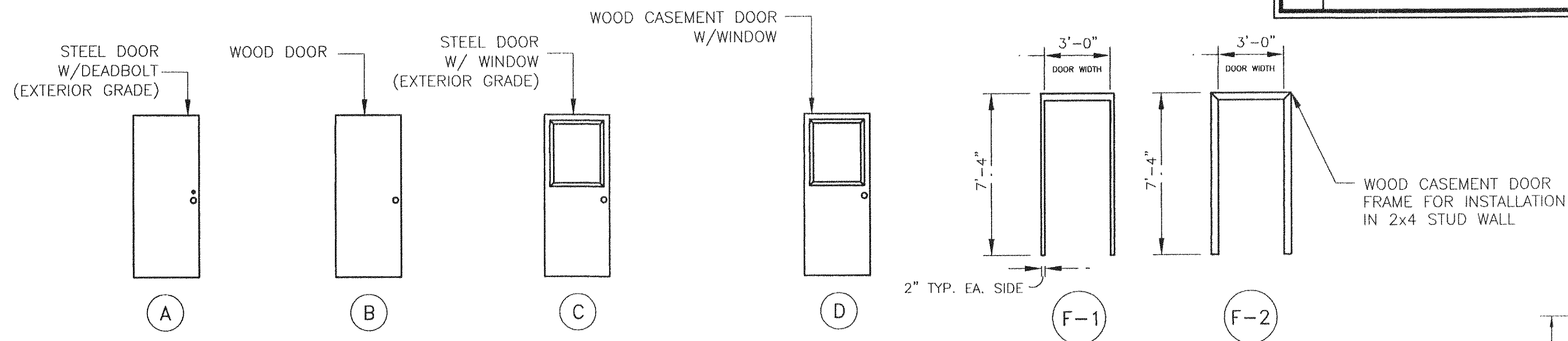
GREENFIELD
CHLORINATION FACILITY

SEWAGE FORCE MAIN
PLAN, PROFILE & DETAILS

AS SHOWN
JUNE 1999
PROJECT: 97075
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DOOR SCHEDULE # DOOR DESIGNATION									
DOOR				FRAME					
TYPE	SIZE	MAT'L	FINISH	MAT'L	FINISH	HEAD DET.	JAMB DET.	FRAME	REMARKS
A	3'-0" x 7'-0" x 1 3/4"	STEEL	PAINT	STEEL	PAINT	SHT.15	SHT.14	F-1	PROVIDE DEAD BOLT LOCK
B	3'-0" x 7'-0" x 1 3/4"	WOOD	POLYURETHANE	WOOD	POLYURETHANE	SHT.15	SHT.15	F-1	FINISH 2 COATS MINIMUM
C	3'-0" x 7'-0" x 1 3/4"	STEEL	PAINT	STEEL	PAINT	SHT.15	SHT.15	F-1	EXTERIOR GRADE/RATING
D	3'-0" x 7'-0" x 1 3/4"	WOOD	POLYURETHANE	WOOD	POLYURETHANE	SHT.15	SHT.15	F-2	FINISH 2 COATS MINIMUM
E	10'-0"(H) X 12'-0"(W) X 5/8"	STEEL	PAINT	STEEL	PAINT	SHT.14	SHT.14	-	OVERHEAD DOOR MODEL #625 WITH MOTOR OPERATION RADIO CONTROL WITH THREE (3) TRANSMITTERS

FINISH SCHEDULE # ROOM DESIGNATION									
No.	ROOM DESCRIPTION	FLOOR MAT'L	BASE MAT'L	WALL MAT'L	WALL FINISH	CEILING MAT'L	CEILING FINISH	CEILING HEIGHT	REMARKS
1	ELECTRICAL ROOM, CMU WALLS	COMMERCIAL TILE	-	CMU	EPOXY-WHITE	5/8" MARINE GRADE PLYWOOD W/ WOOD TRIM	PAINT	11'-6"	
1	ELECTRICAL ROOM, STUD WALLS	COMMERCIAL TILE	-	2" X 4" STUD, DRYWALL	PAINT, SEMI-GLOSS WHITE	5/8" MARINE GRADE PLYWOOD W/ WOOD TRIM	PAINT	11'-6"	
2	RESTROOM, CMU WALLS	COMMERCIAL TILE	-	CMU	EPOXY-WHITE	ACOUSTICAL TILE DROP CEILING	-	10'-0"	
2	RESTROOM, STUD WALLS	COMMERCIAL TILE	-	2" X 4" STUD, DRYWALL	PAINT, SEMI-GLOSS WHITE	ACOUSTICAL TILE DROP CEILING	-	10'-0"	
3	HALLWAY	COMMERCIAL TILE	-	2" X 4" STUD, DRYWALL	PAINT, SEMI-GLOSS WHITE	ACOUSTICAL TILE DROP CEILING	-	10'-0"	
4	LAB/OPERATIONS ROOM, CMU WALLS	COMMERCIAL TILE	-	CMU	EPOXY-WHITE	ACOUSTICAL TILE DROP CEILING	-	10'-0"	
4	LAB/OPERATIONS ROOM, STUD WALLS	COMMERCIAL TILE	-	2" X 4" STUD, DRYWALL	PAINT, SEMI-GLOSS WHITE	ACOUSTICAL TILE DROP CEILING	-	10'-0"	
5	UNLOADING/LOADING - PUMP ROOM, CMU WALLS	SEALED CONC.	-	CMU	EPOXY-WHITE	5/8" MARINE GRADE PLYWOOD W/ WOOD TRIM	PAINT	12'-0"	
5	UNLOADING/LOADING - PUMP ROOM, STUD WALLS	SEALED CONC.	-	2" X 6" STUD, DRYWALL	EPOXY-WHITE	5/8" MARINE GRADE PLYWOOD W/ WOOD TRIM	PAINT	12'-0"	



DOOR SCHEDULE

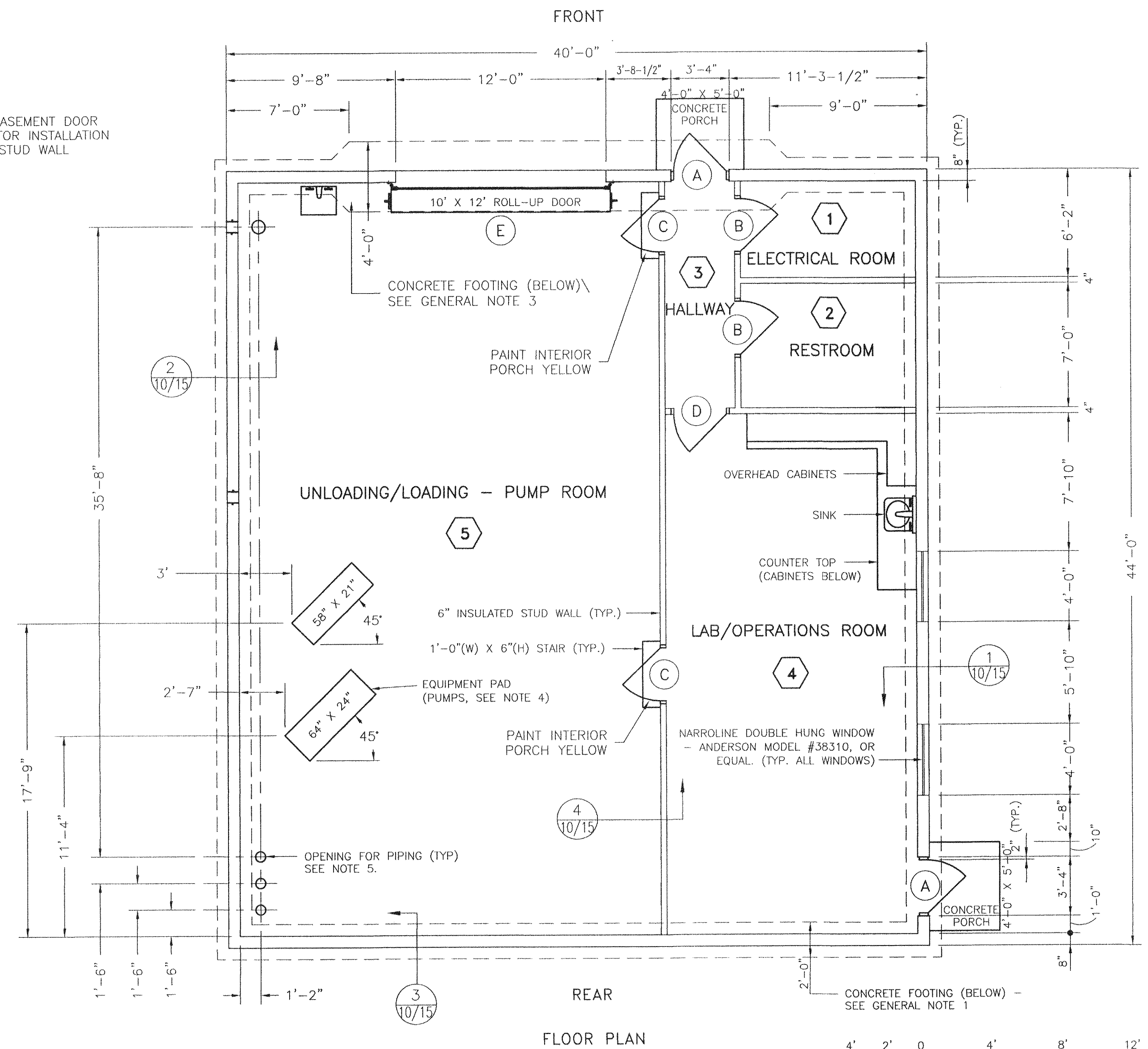
GENERAL NOTES:

1. TYPICAL WALL FOOTING SHALL BE 1'-0" X 2'-0" X CONTINUOUS WITH 2- No 5's REINFORCING. SEE WALL SECTION DETAIL.
2. PROVIDE 2 #5 VERTICAL REINFORCING IN FULLY GROUTED CELLS AT THE DOORS.
3. PROVIDE 1'-0" X 4'-0" FOOTING WITH 4 - #5's.
4. PUMP PADS - SEE DETAIL SHEET FOR ACTUAL SIZE & REINFORCING FOR THESE PADS. CONTRACTOR SHALL CONFIRM POSITION & SIZE OF PAD BASED ON PUMP SELECTION.
5. PIPE PENETRATION LOCATIONS TO BE FIELD VERIFIED BY THE CONTRACTOR.

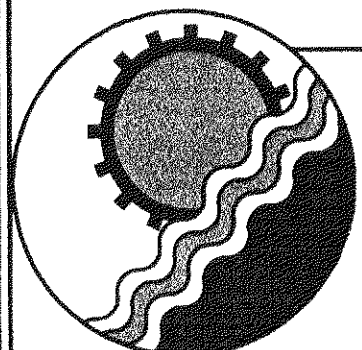
EQUIPMENT SCHEDULE	
ITEM DESCRIPTION	
PORTABLE CHLORINE ANALYZER	HACH DR 700 (46000-14)
PORTABLE TURBIDIMETER	HACH 2100P (46500-00)
BATTERY ELIMINATOR	(46079-00)
PH METER	ORION 230A KIT E58800-50
	ADAPTER E58819-50
19 CU. FT. REFRIGERATOR, FREEZER	SEARS OR EQUAL
FISHER 4.0 BUFFER SOLUTION	SB101-500
FISHER 7.0 BUFFER SOLUTION	SB107-500
FISHER 10.0 BUFFER SOLUTION	SB115-500
FISHER WASH BOTTLES	03-409-22A (6)
2 LITER SAMPLE CONTAINERS	NALGENE 11-815-11A (6)
250 ml SAMPLE CONTAINERS	NALGENE 02-893-4C (24)
1000 ml BEAKERS	FISHER 02-540P (6)
600 ml BEAKERS	FISHER 02-540M (6)
100 ml BEAKERS	FISHER 02-540H (12)
50 ml BEAKERS	FISHER 02-540G (12)
EYE WASH STATION	NORTH MODEL 12-60-42
	DUAL EYEWASH STATION (4)
FIRE EXTINGUISHER	LAB SFTY. SUPPLY, P1123 (4)
FIRST AID KIT	JOHNSON & JOHNSON, B3244 (2)
STOOL	HAMILTON 950M478 (2)
OFFICE DESK DOUBLE PEDESTAL	McMASTER CARR #9079T13 (2)
OFFICE CHAIR EXECUTIVE SWIVEL/TILT	McMASTER CARR #4861T11 (2)
MOBILE HYDRAULIC FLOOR CRANE	HUSKY-MASTER #HM-2000
55 GALLON DRUM HAND TRUCK	WESCO MANUFACTURING, MODEL 40 BT (1)

EQUIPMENT NOTE:

1. SOLID WOOD LAB CABINETS TO BE MERILLAT OR EQ. 15'-6" L.F. OF UNDER COUNTER CABINETS 10'-6" L.F. OF OVER COUNTER CABINETS

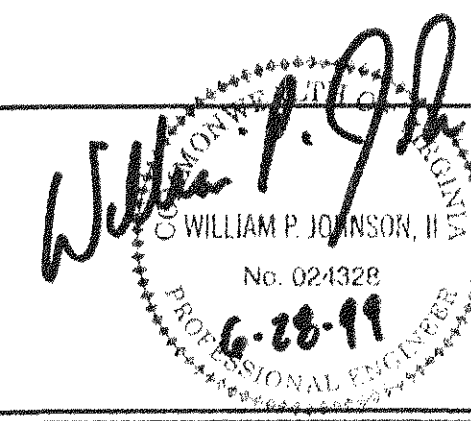


FLOOR PLAN

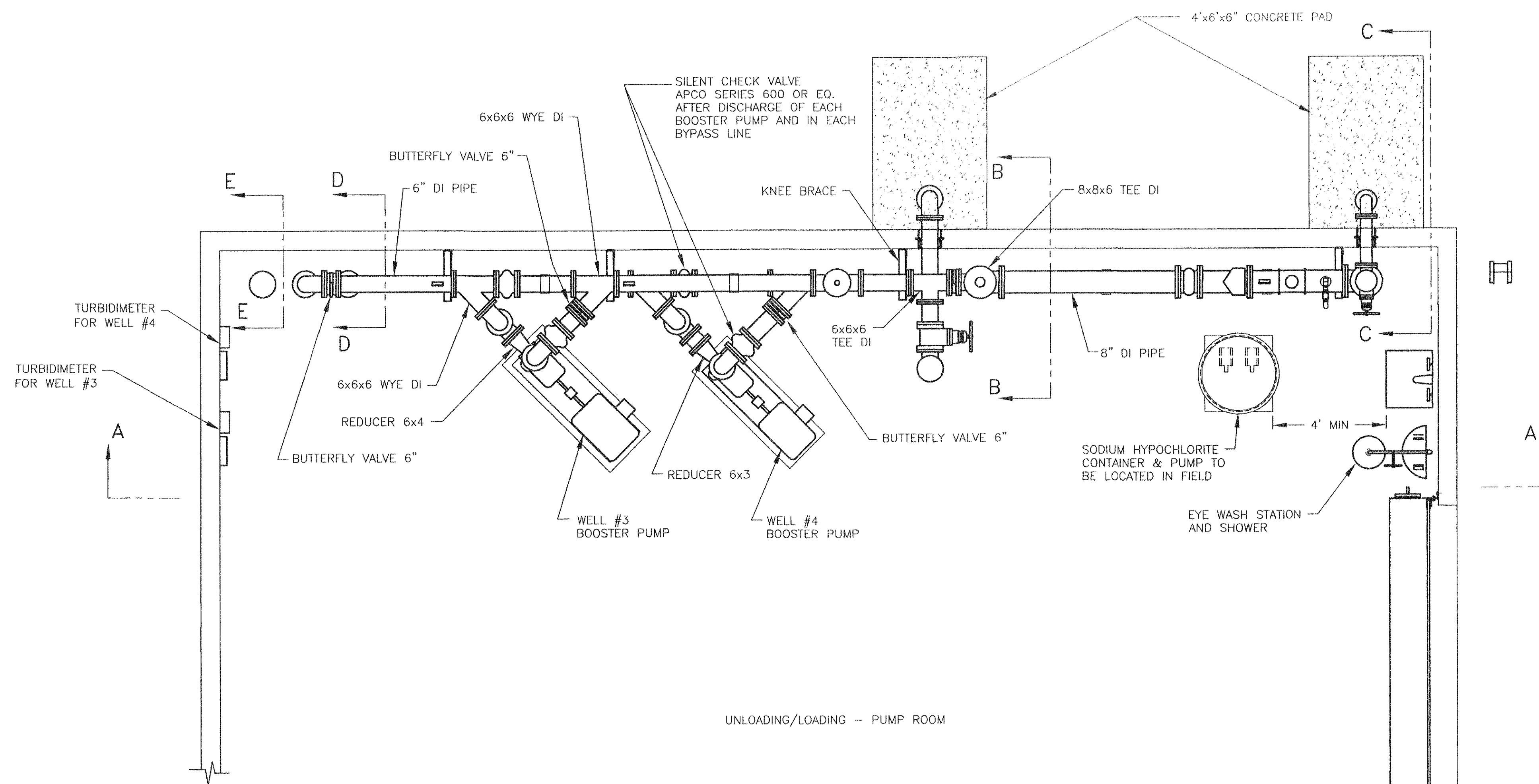


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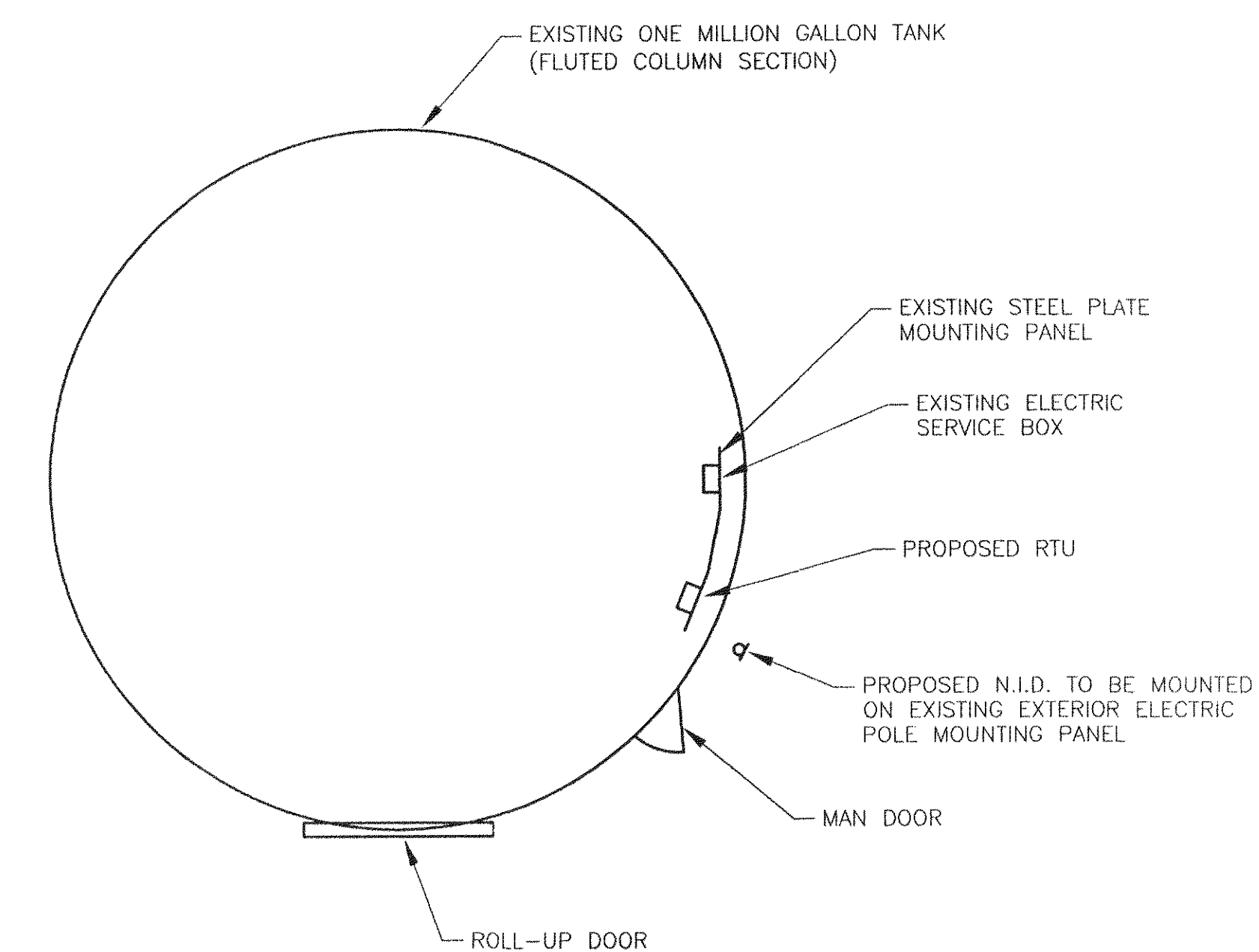
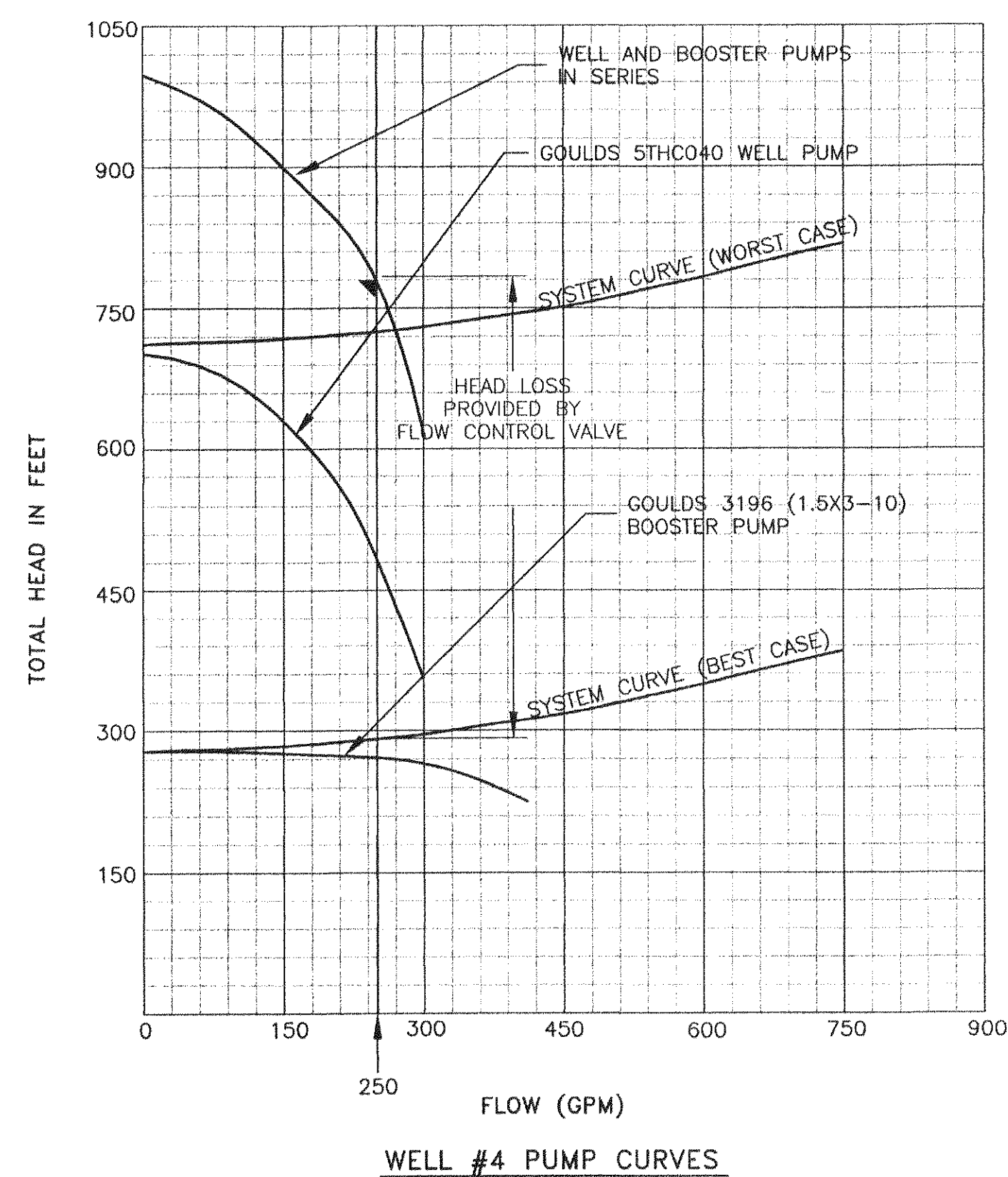
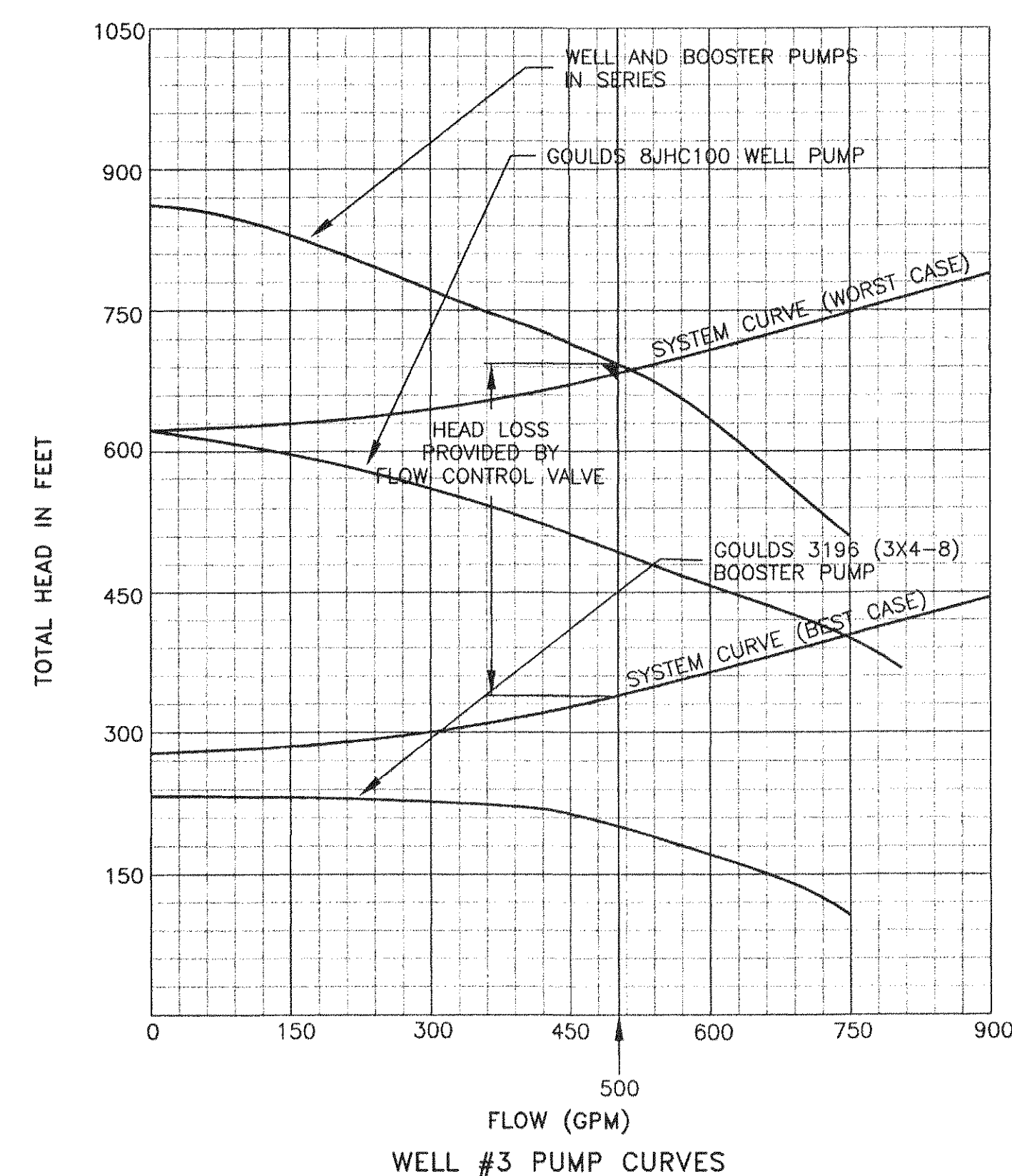
Drawn PSN, DJP	GREENFIELD CHLORINATION FACILITY FOUNDATION & FLOOR PLAN DOOR & FINISH SCHEDULE	1/4" = 1'
Designed PSN, DJP		JUNE 1999
Checked JST		PROJECT: 97075
Approved WPJ		10 of 19



PLAN VIEW

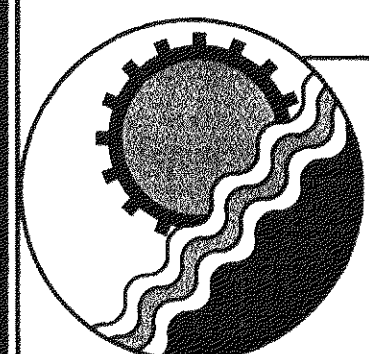
NOTE:

- BUTTERFLY VALVES TO BE KEYSTONE VALVE FIGURE 990, OR APPROVED EQUAL, RESILIENT SEATED WAFER TYPE, FOR INSTALLATION BETWEEN ANSI 150 # FLANGES. CAST IRON SPLIT BODY (ASTM A-126, CLASS B). VALVE SHALL HAVE AN INTEGRALLY CAST TOP PLATE FOR DIRECT FLUSH-MOUNTING OF MANUAL OR POWER ACTUATORS WITHOUT USE OF BRACKETS OR ADAPTERS.
DISC & STEM: ONE-PIECE, 316SS
PRESSURE RATING: 150 PSI (SIZES 1" - 12")
SEAT: EPDM FOOD GRADE
MANUALLY OPERATED VALVES TO HAVE STEEL HANDLE FOR DIRECT MOUNTING ON TOP OF VALVE STEM, WITH SPRING LOADED LEVER AND GRADUATED NOTCH PLATE.
- EXPANSION JOINTS TO BE PROCO 240 AV/EE WITH CONTROL UNIT, OR APPROVED EQUAL
- ALL PRESSURE INDICATORS TO BE DUAL CALIBRATED IN PSI AND FT. OF W.C. DIAL FACES TO BE 4" OR 4.5" DIAMETER. GAUGES TO BE BOURDON TUBE TYPE, PULSATION DAMPENED, WITH WATERTIGHT FIBERGLASS REINFORCED POLYAMID B CASE OR BRASS CASE. LENS TO BE LAMINATED SAFETY GLASS. ACCURACY TO BE 0.5% OF FULL SCALE OR BETTER. GAUGES TO BE McDANIEL MODEL N OR APPROVED EQUAL. PRESSURE RANGE TO BE 0 - 160 PSI.



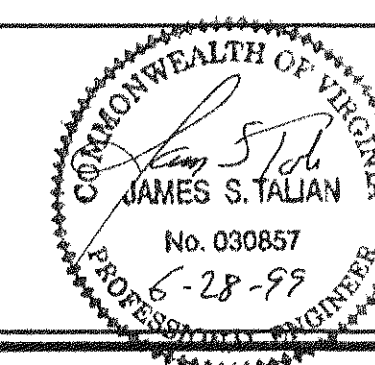
RTU MOUNTING AT TANK

NOT TO SCALE



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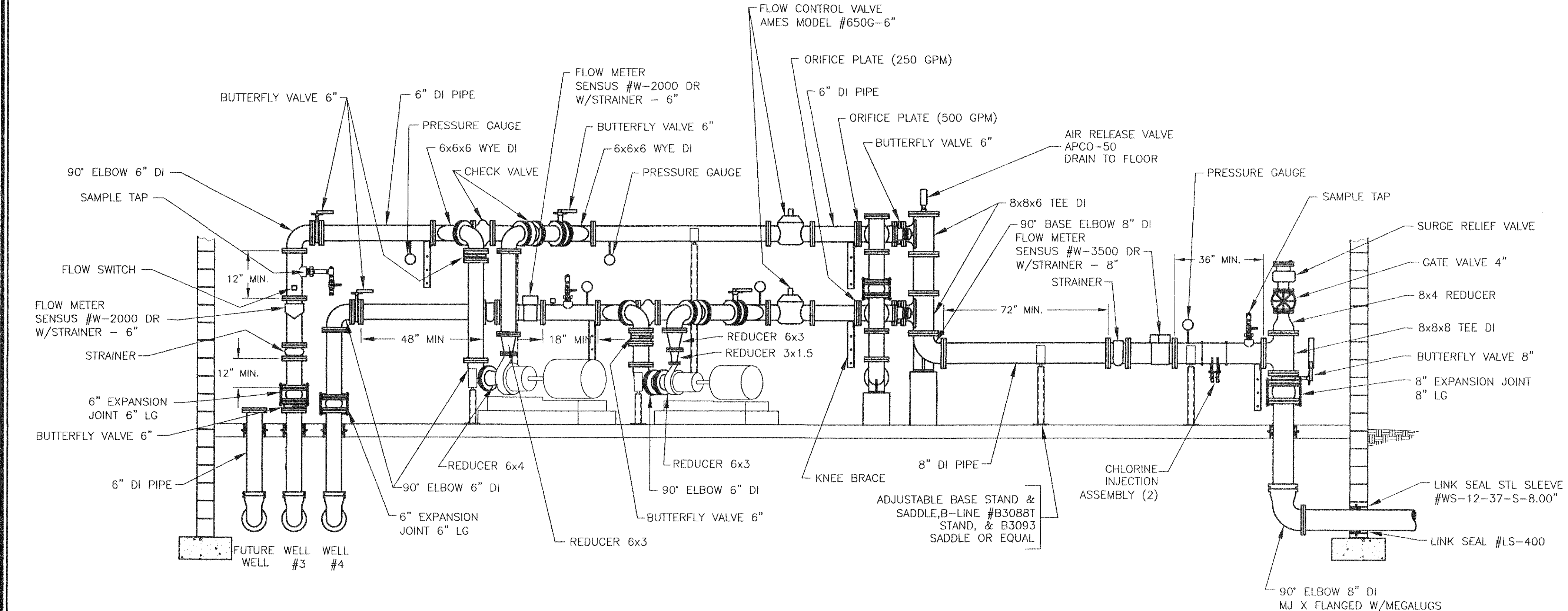


Drawn	JHG
Designed	PSN
Checked	JST
Approved	WPJ

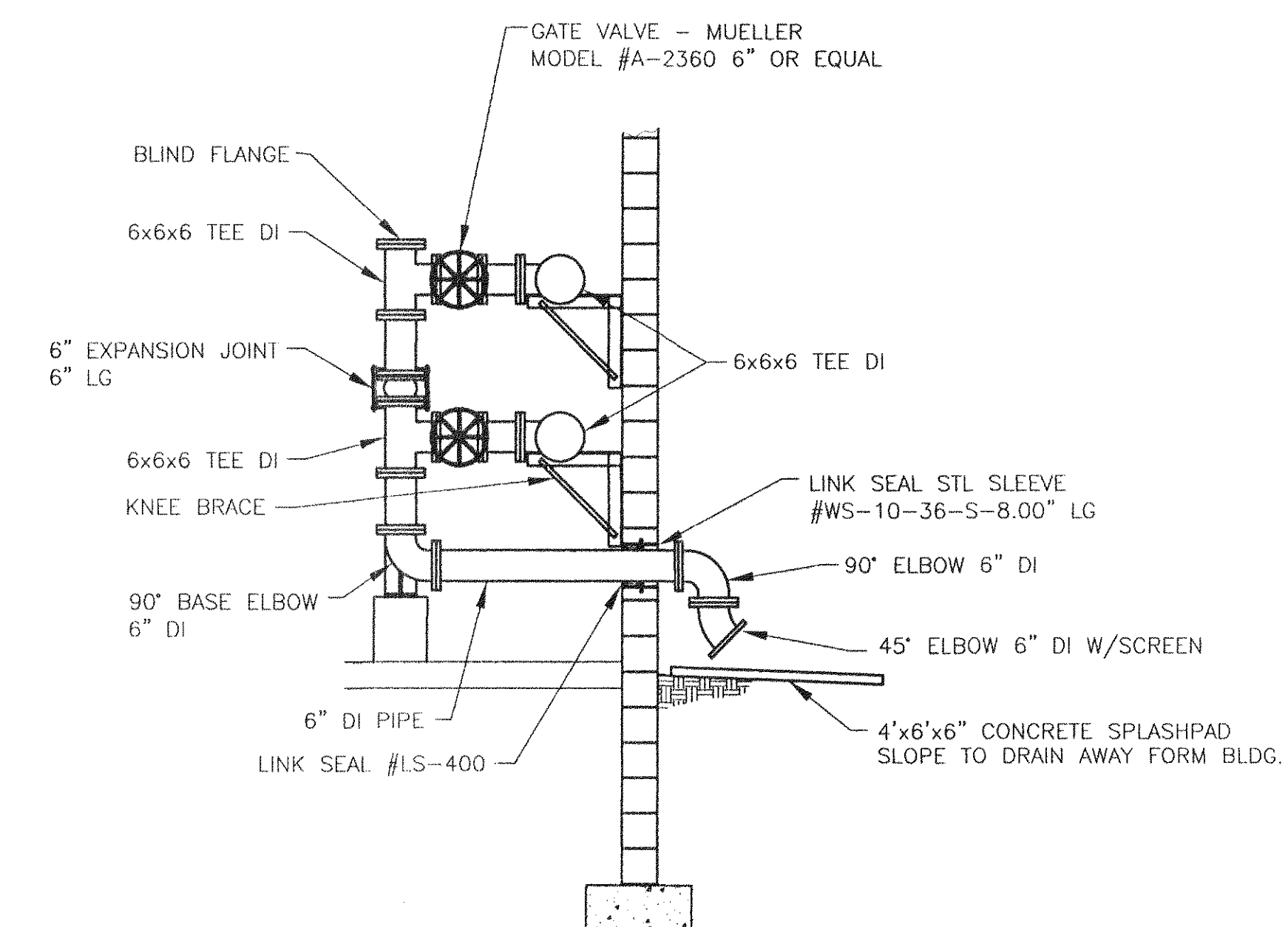
**GREENFIELD
CHLORINATION FACILITY**

**INTERIOR PIPING PLAN
AND PUMP & SYSTEM CURVES**

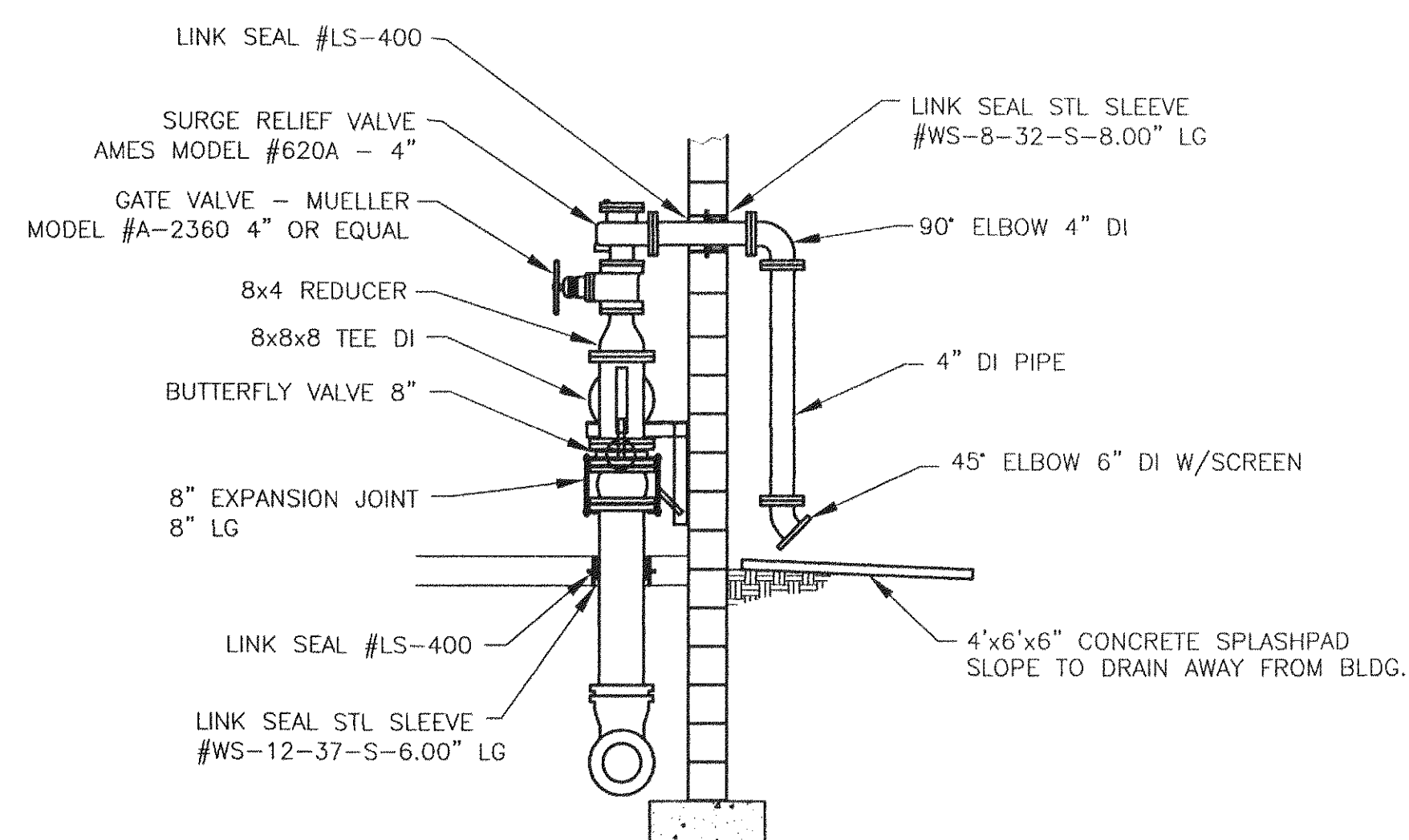
3/8" = 1'
JUNE 1999
PROJECT: 97075
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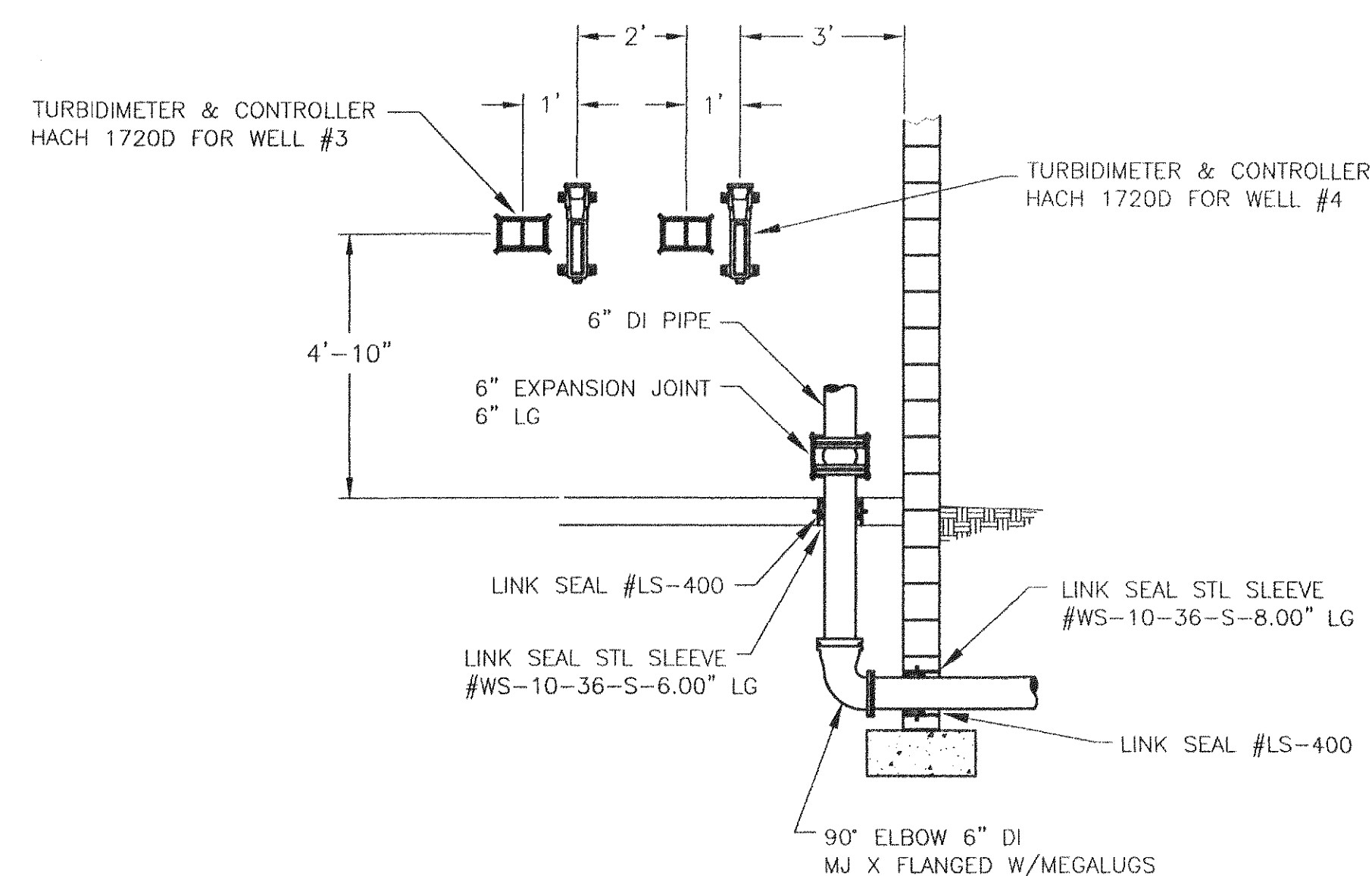
SECTION A-A



SECTION B-B

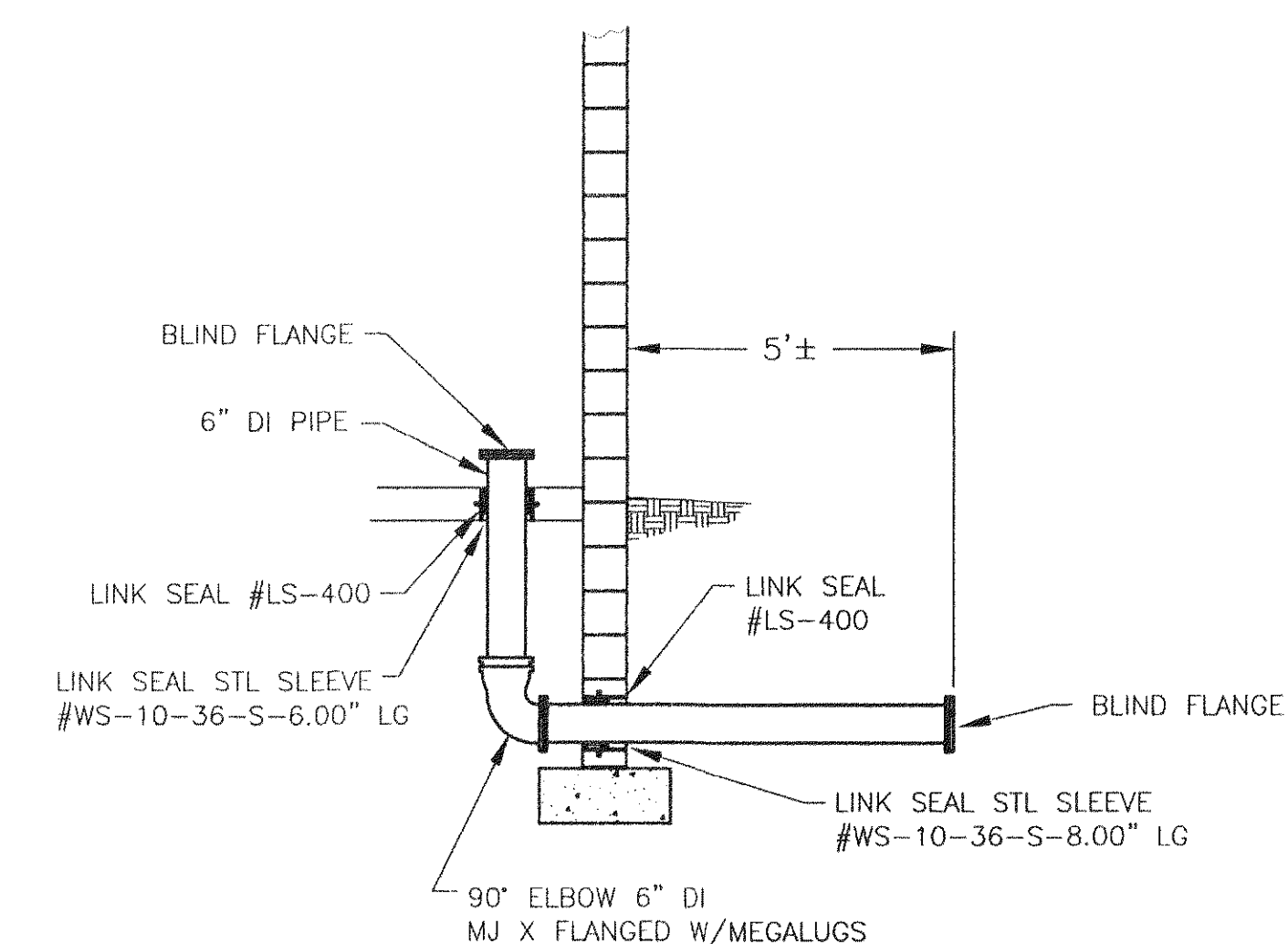


SECTION C-C



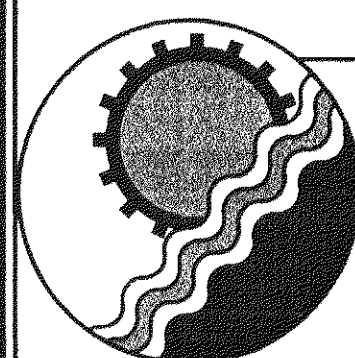
SECTION D-D

TYPICAL PIPING TIE-IN FOR
WELL #3 & #4 WATER LINES



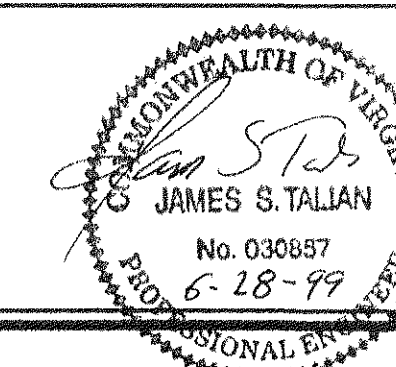
SECTION E-E

TYPICAL PIPING TIE-IN FOR
FUTURE WELL WATER LINE



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Drawn	JHG
Designed	PSN
Checked	JST
Approved	WP-I

GREENFIELD
CHLORINATION FACILITY

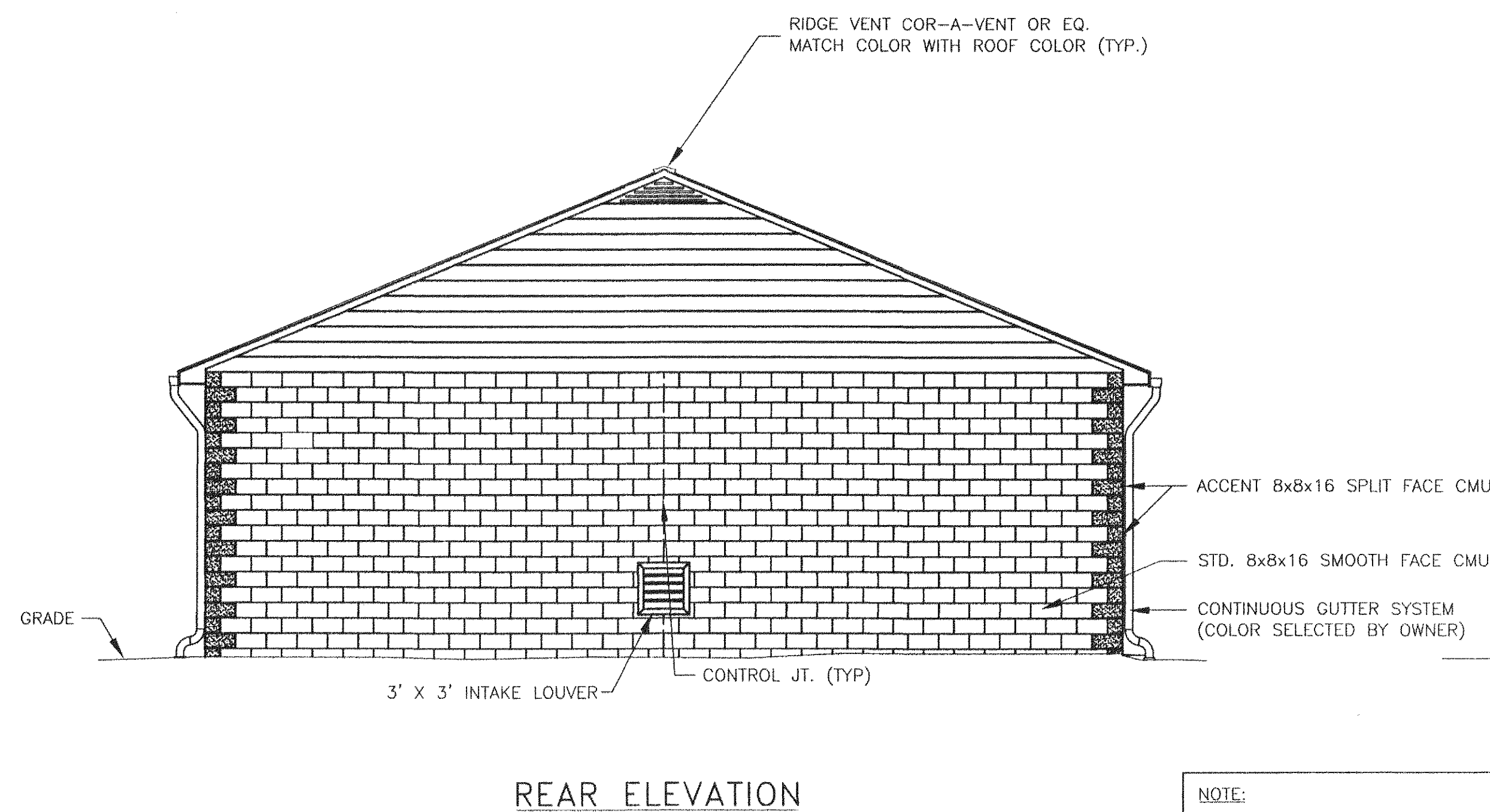
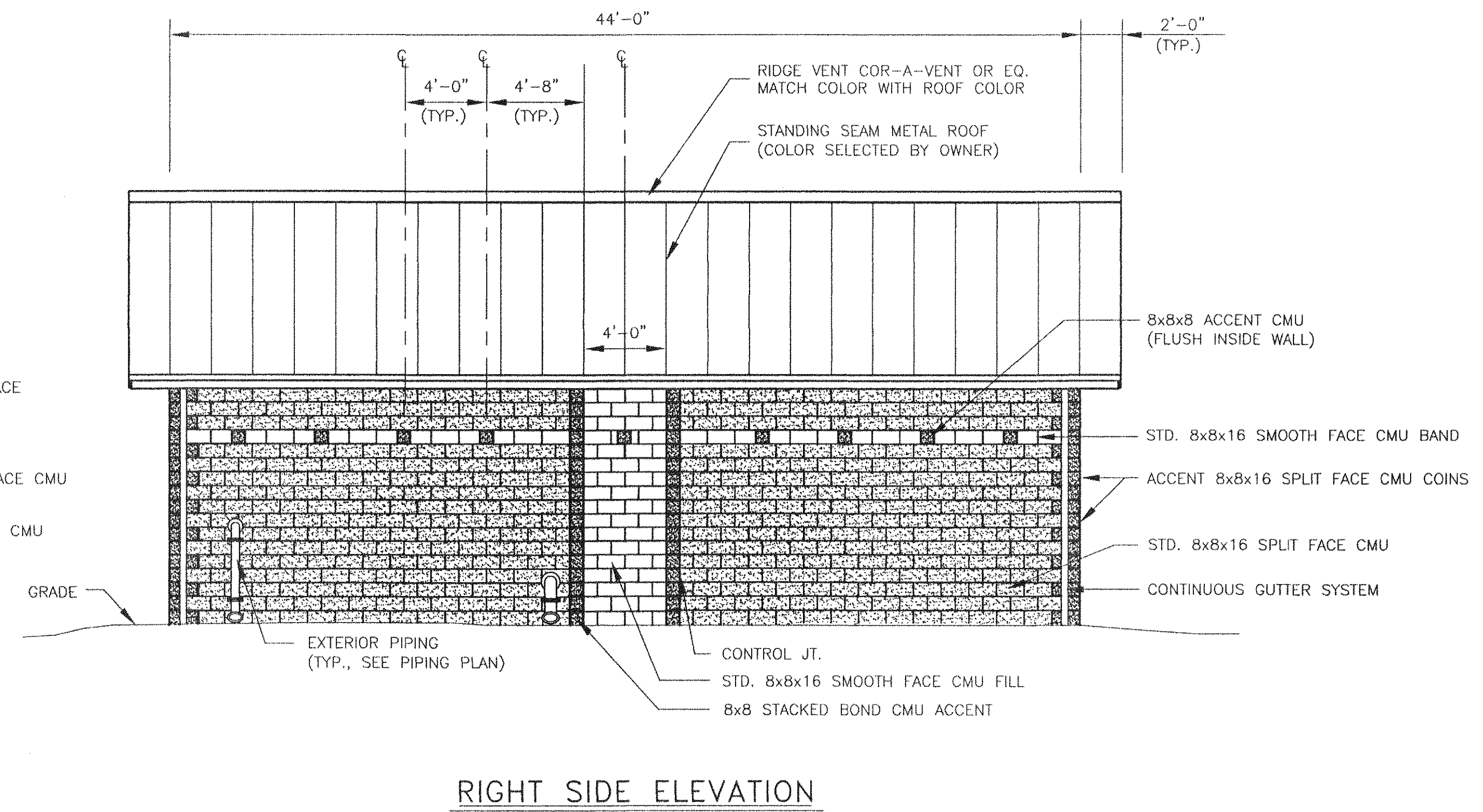
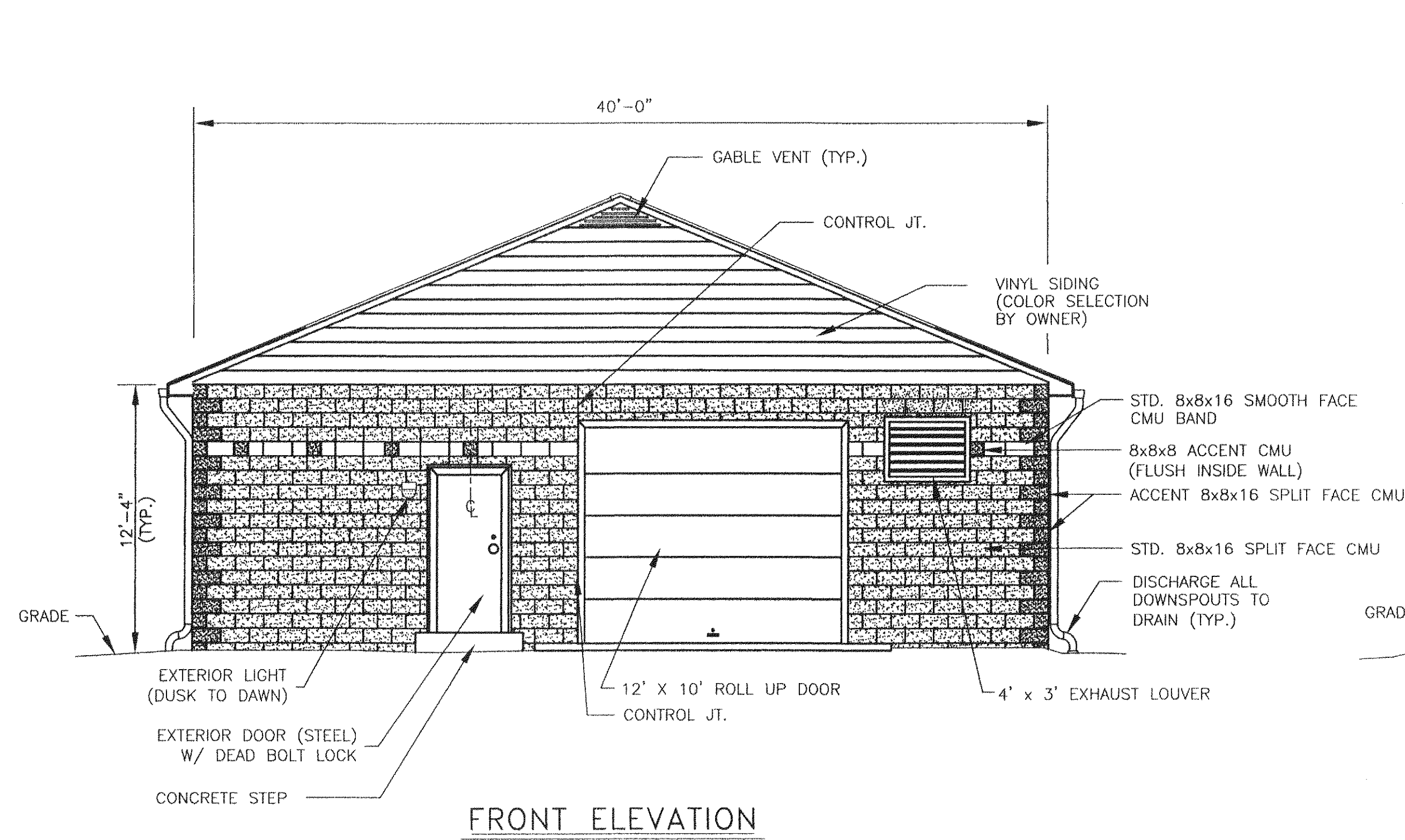
INTERIOR PIPING
SECTION VIEWS

 $3/8'' = 1'$

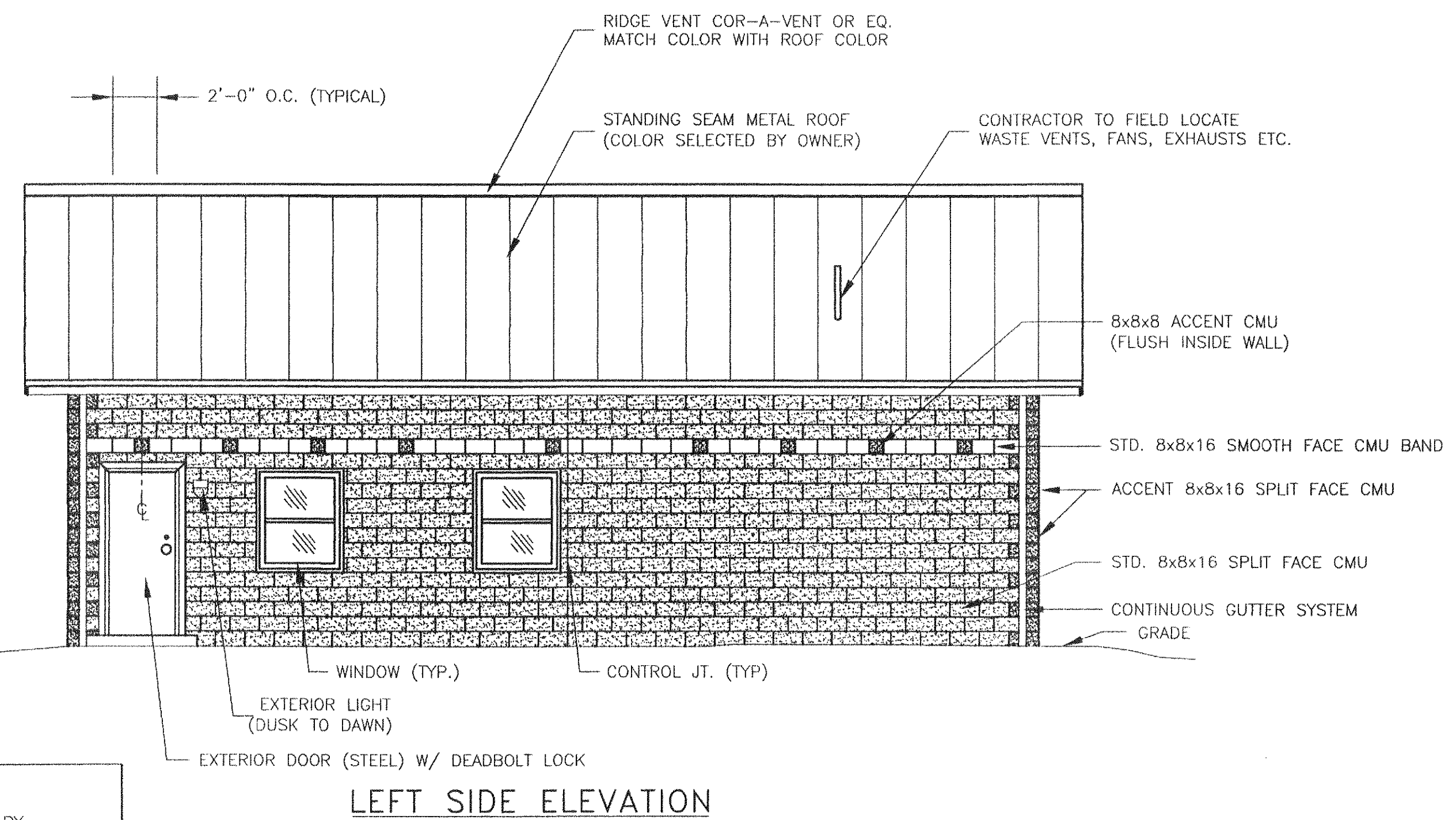
JUNE 1999

PROJECT: 97075

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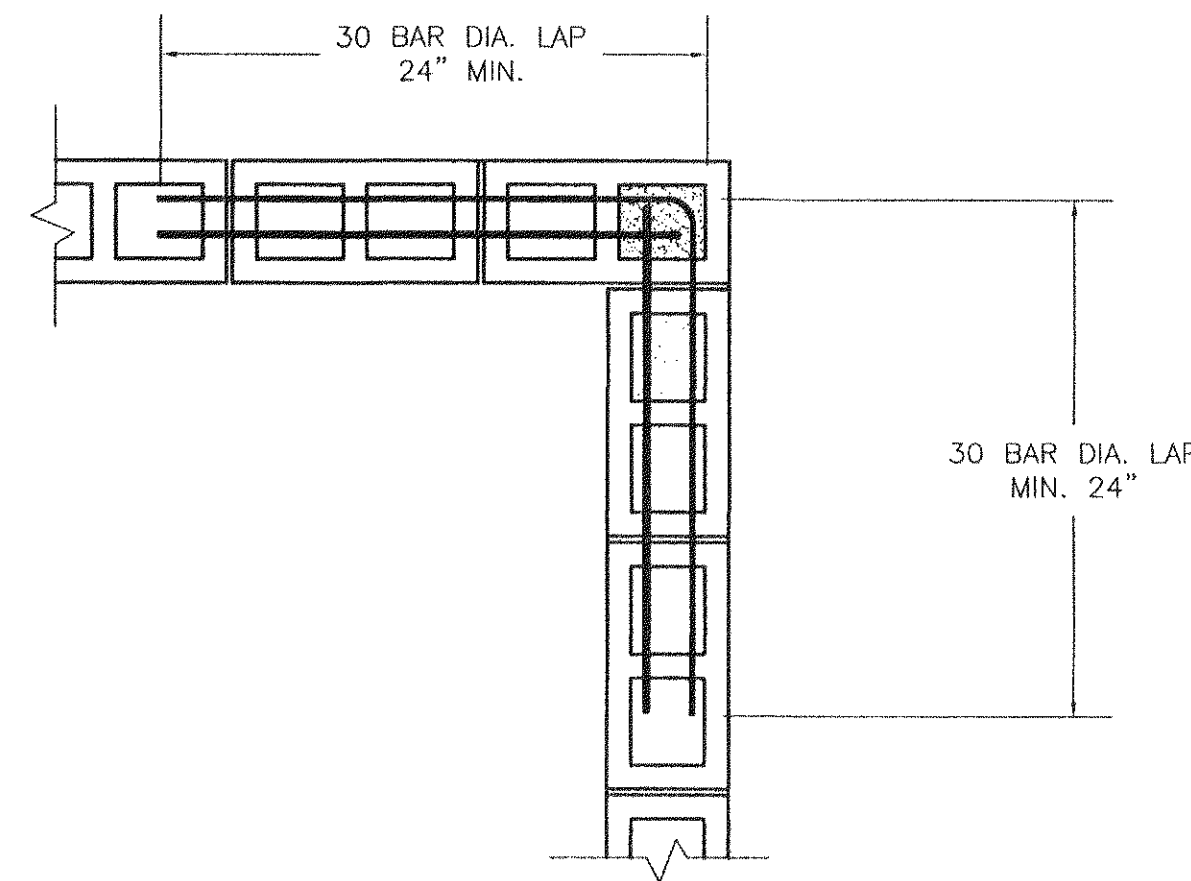


- NOTE:
1. ALL CMU COLORS TO BE SELECTED BY THE OWNER PRIOR TO CONSTRUCTION.
 2. ALL CMU SHALL BE SEALED WITH TWO COATS SEALANT.
 3. ALL GUTTER AND TRIM COLOR TO MATCH VINYL SIDING (TO BE SELECTED BY OWNER).



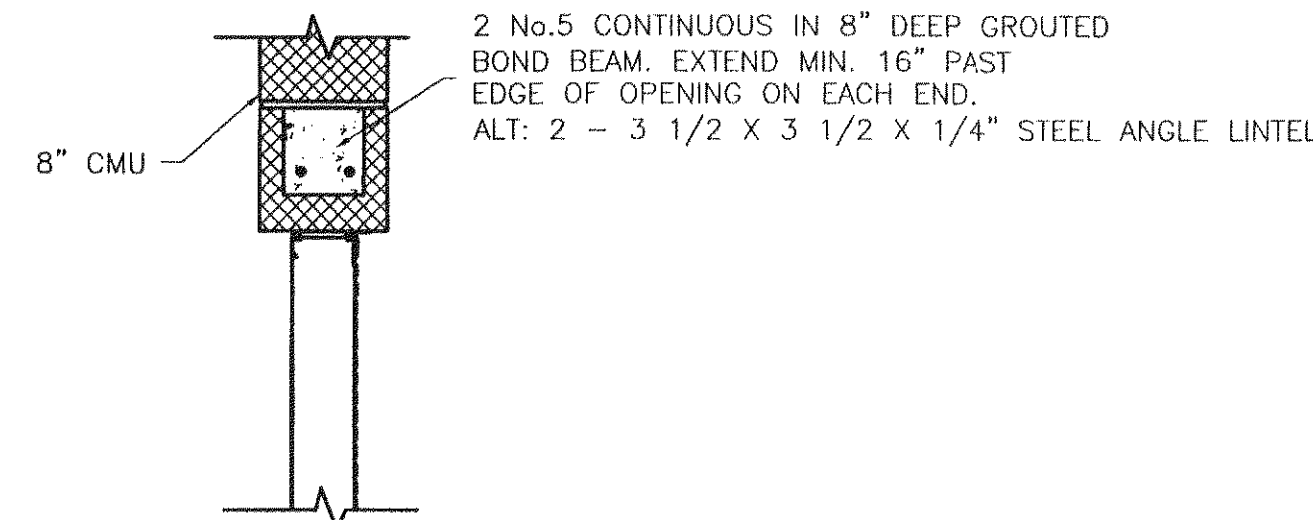
5' 2.5' 0 5' 10' 15'

SCALE: 1" = 5'-0"



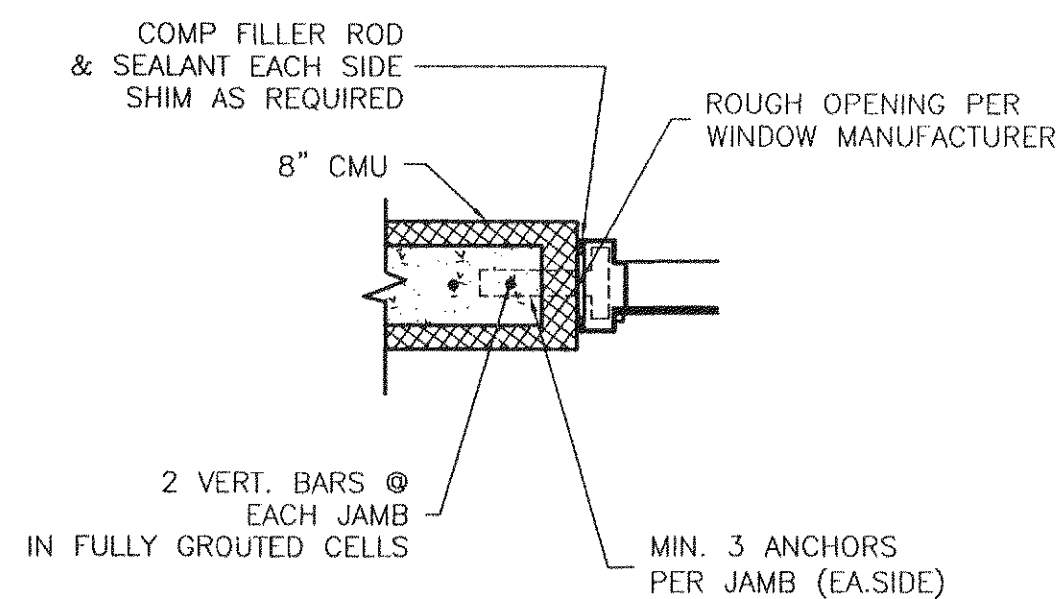
**CORNER CMU/BOND
BEAM FILLED CELL**

SCALE: 1" = 1'-0"



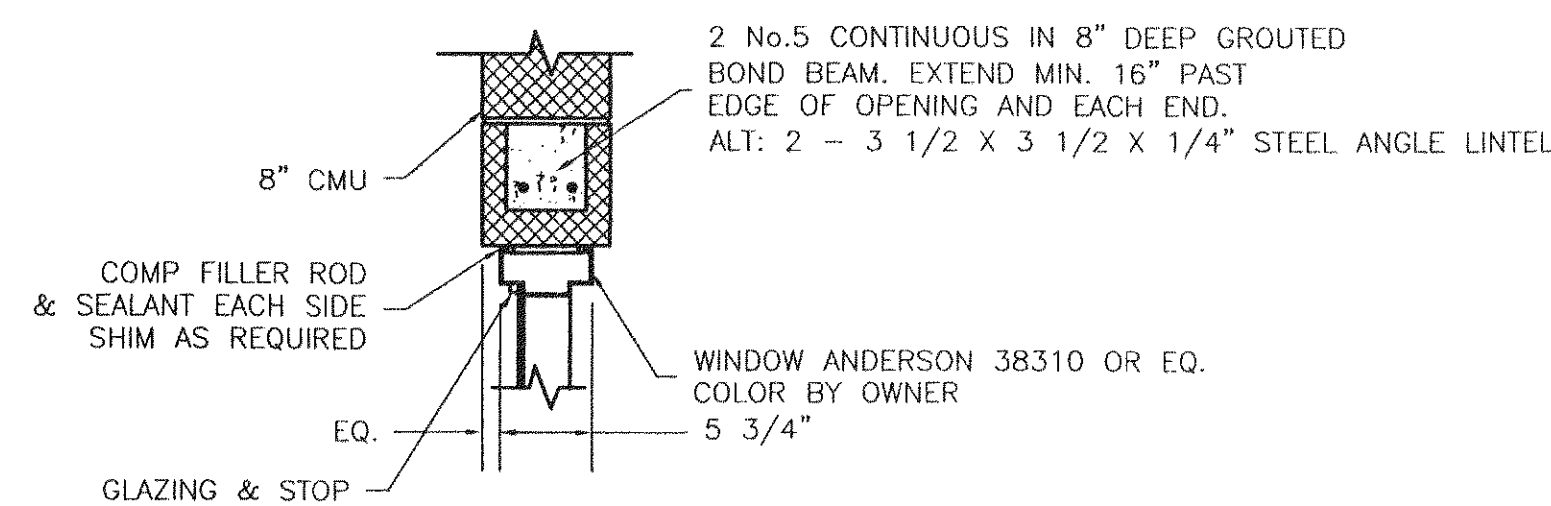
LOUVER HEAD

SCALE: 1" = 1'-0"



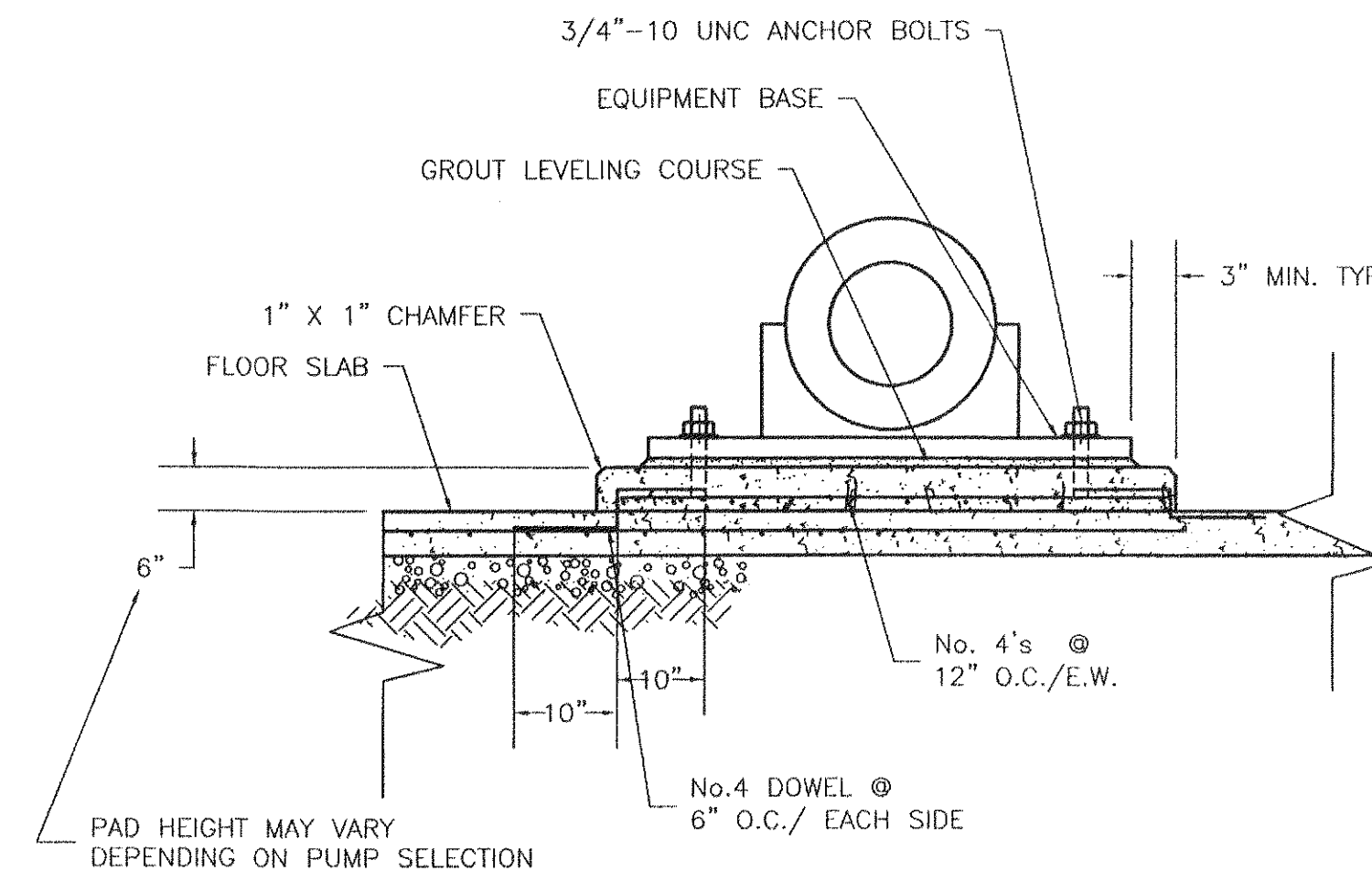
WINDOW JAMB

SCALE: 1" = 1'-0"



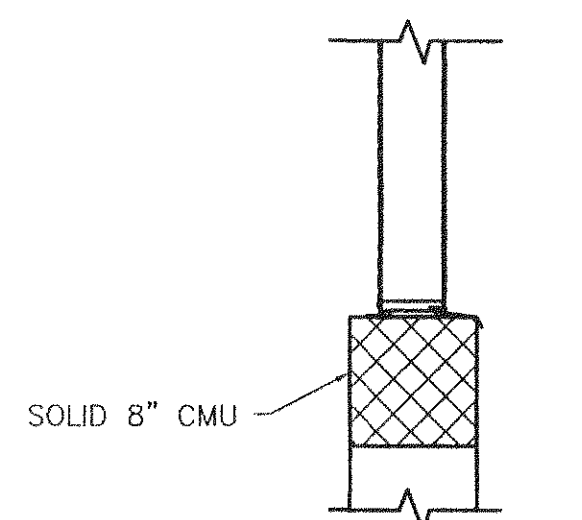
WINDOW HEAD

SCALE: 1" = 1'-0"



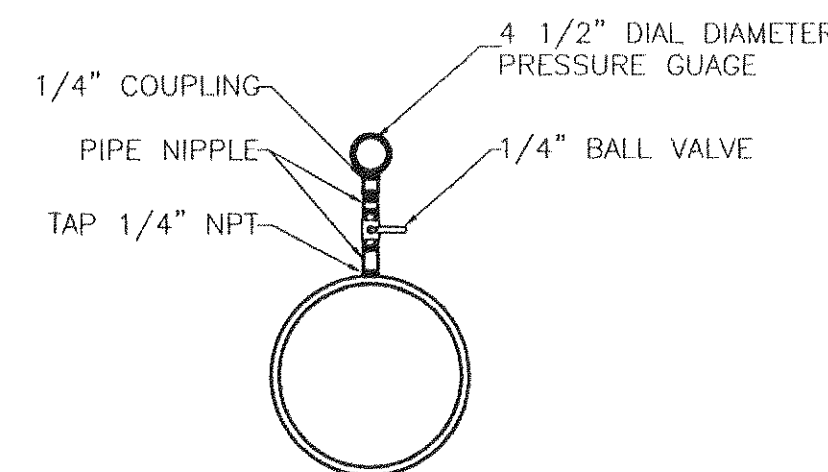
EQUIPMENT PAD (PUMPS)

SCALE: 1/2" = 1'-0"



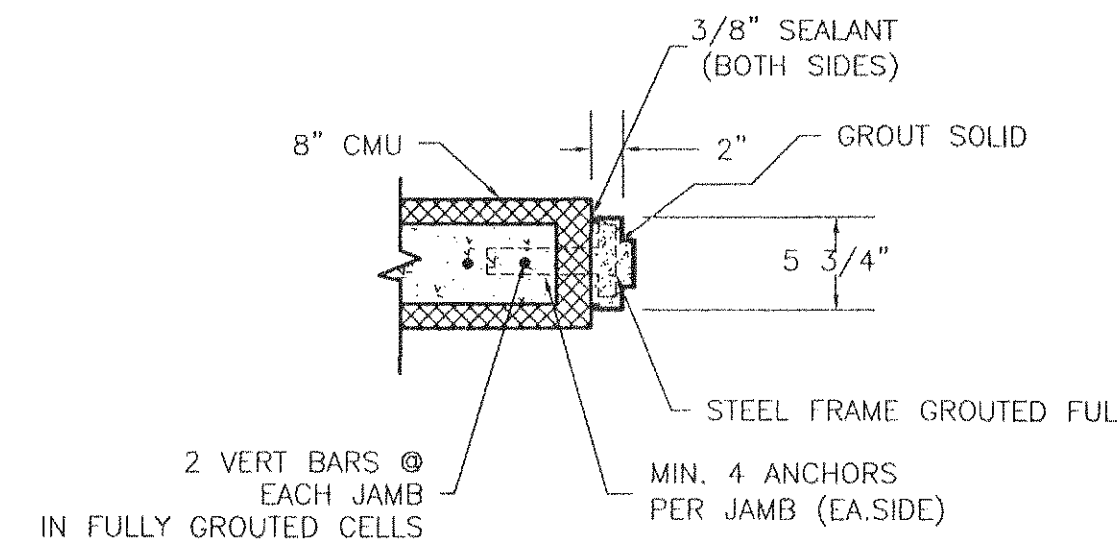
LOUVER SILL

SCALE: 1" = 1'-0"



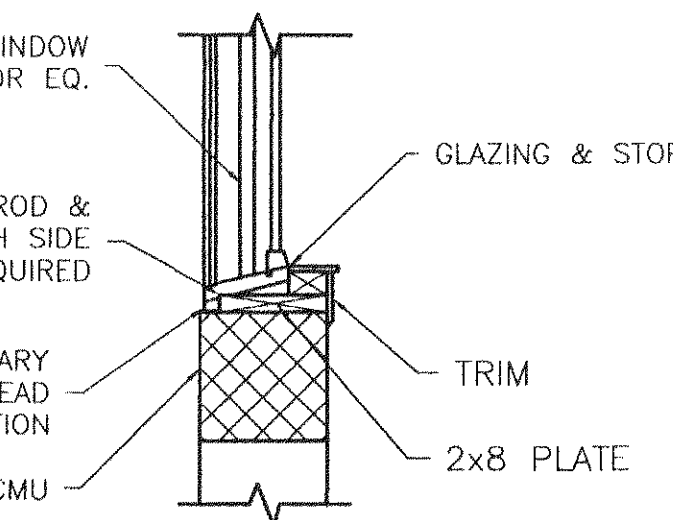
PRESSURE GAUGE DETAIL

NTS



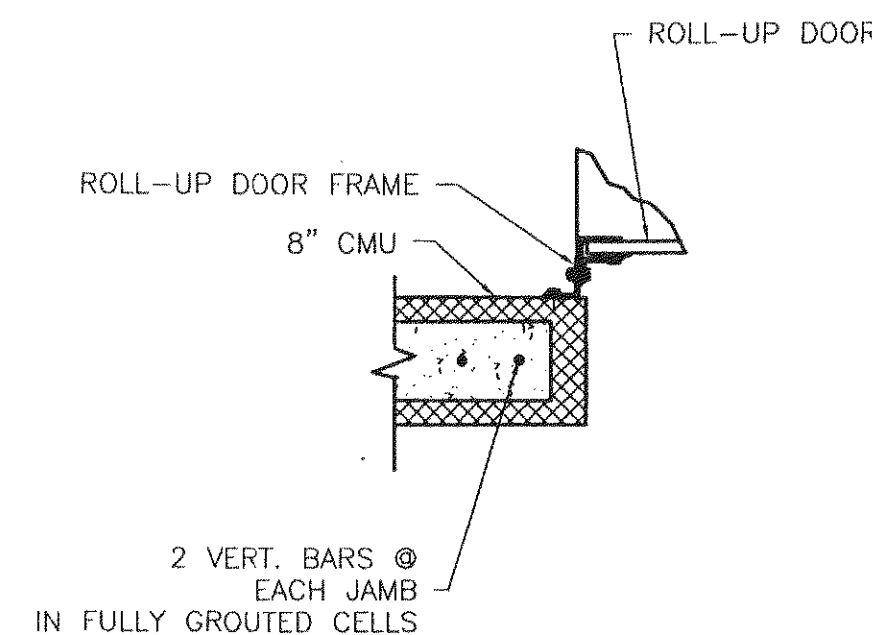
**EXTERIOR DOOR FRAME JAMB
STEEL CASMENT**

SCALE: 1" = 1'-0"



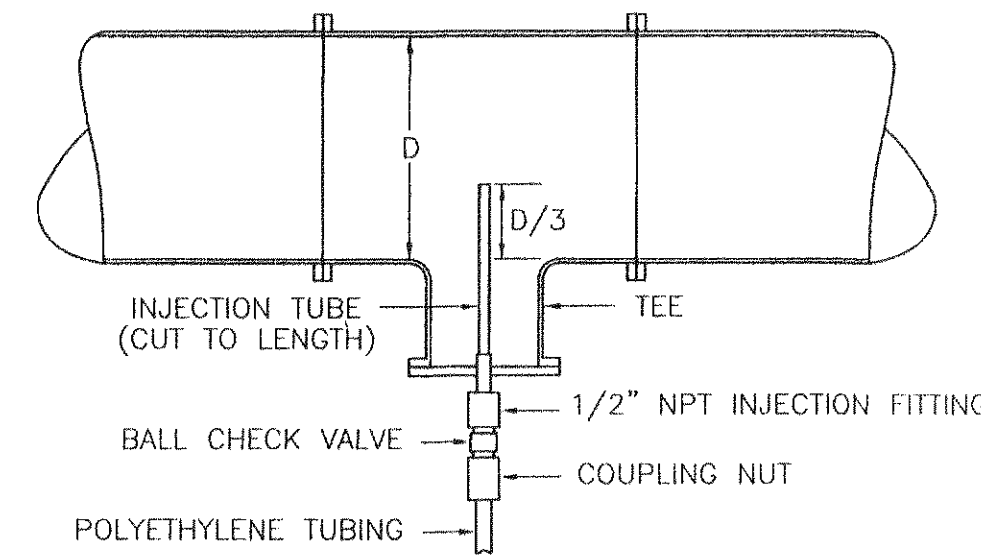
WINDOW SILL

SCALE: 1" = 1'-0"



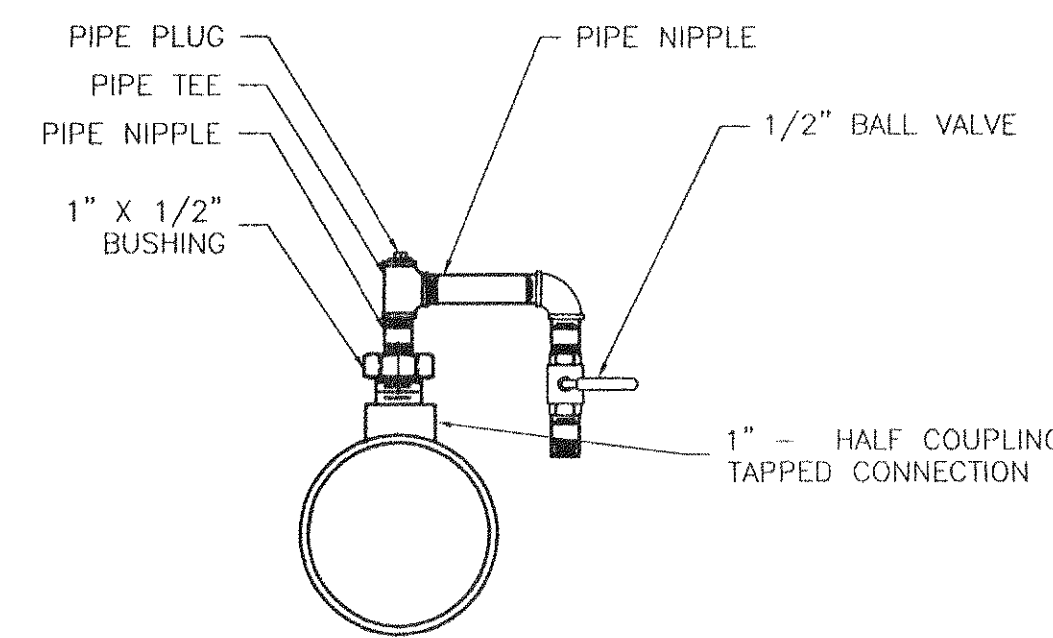
ROLL-UP DOOR FRAME JAMB

SCALE: 1" = 1'-0"



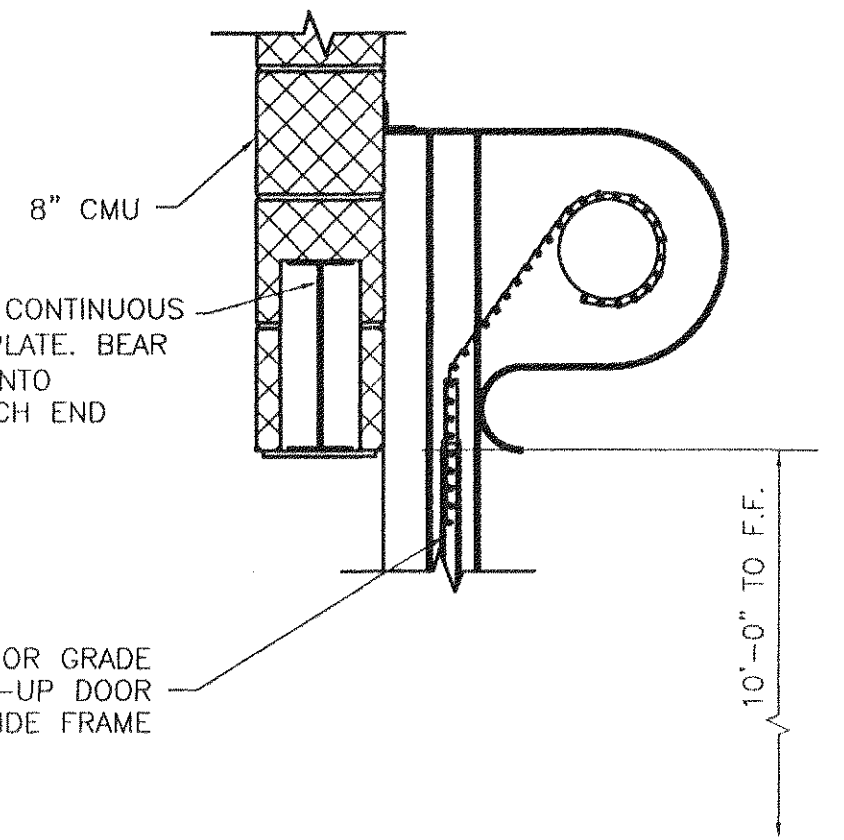
INJECTION ASSEMBLY DETAIL

NTS



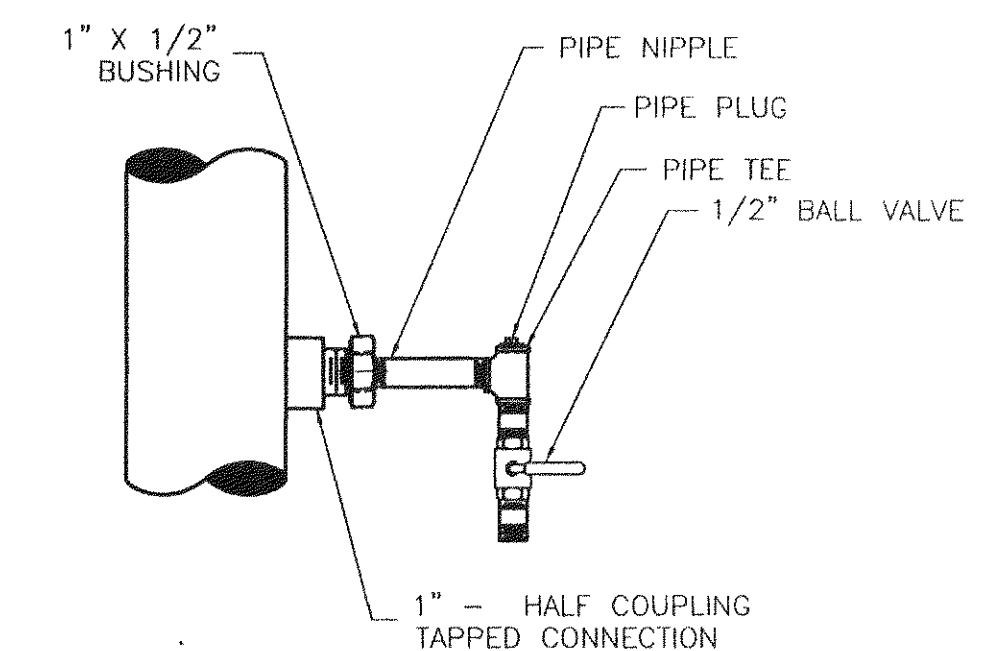
**SAMPLE TAP
HORIZONTAL PIPE SECTION**

NTS



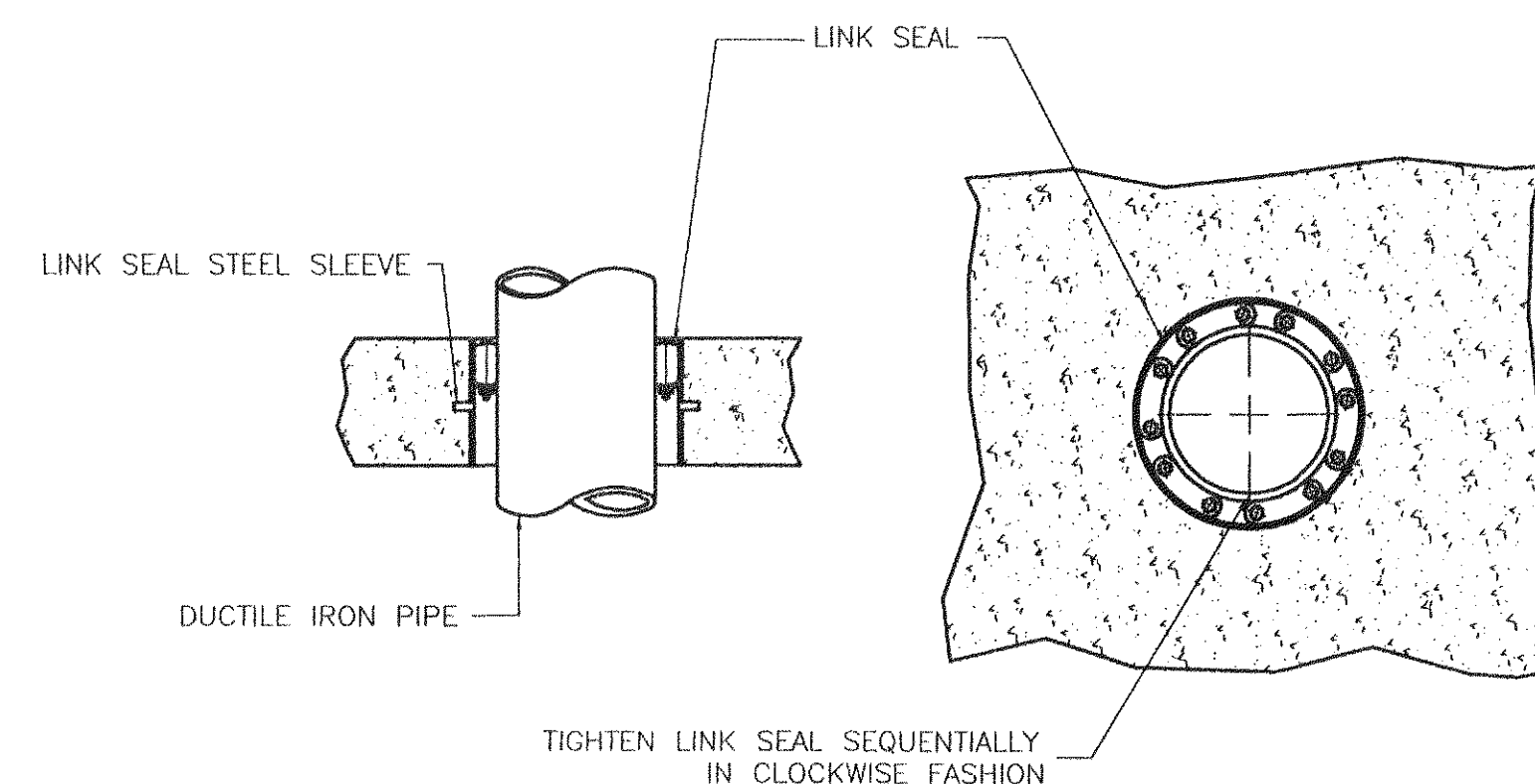
ROLL-UP DOOR FRAME HEAD

SCALE: 1" = 1'-0"



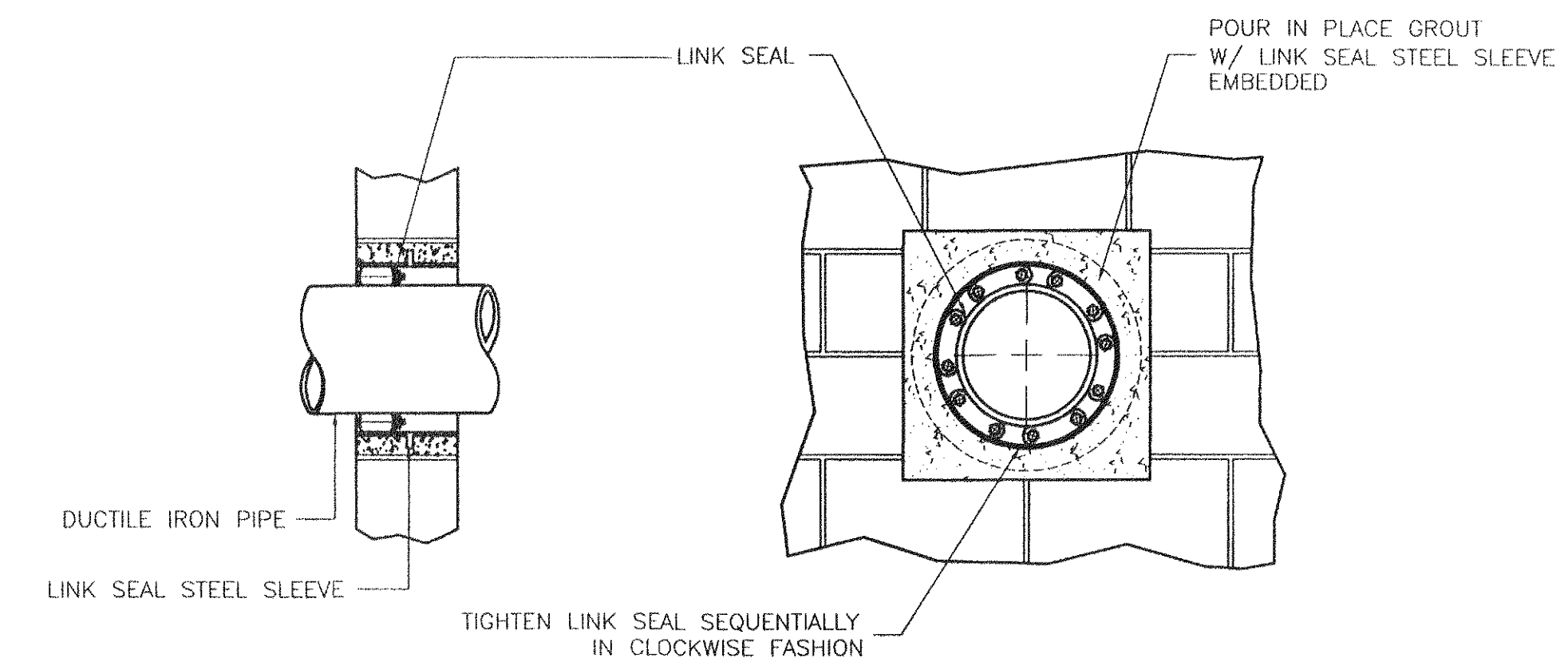
**SAMPLE TAP
VERTICAL PIPE SECTION**

NTS



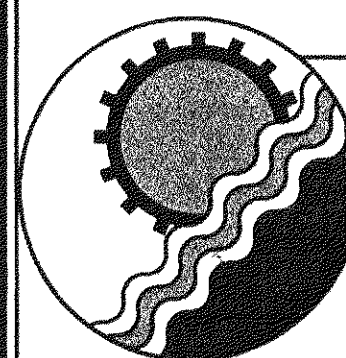
TYPICAL FLOOR PENETRATION

NTS



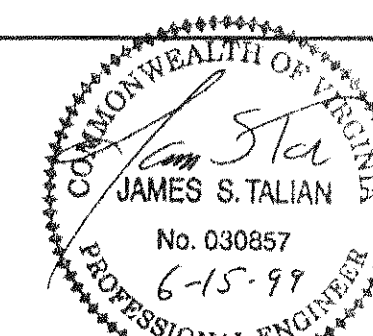
TYPICAL WALL PENETRATION

NTS



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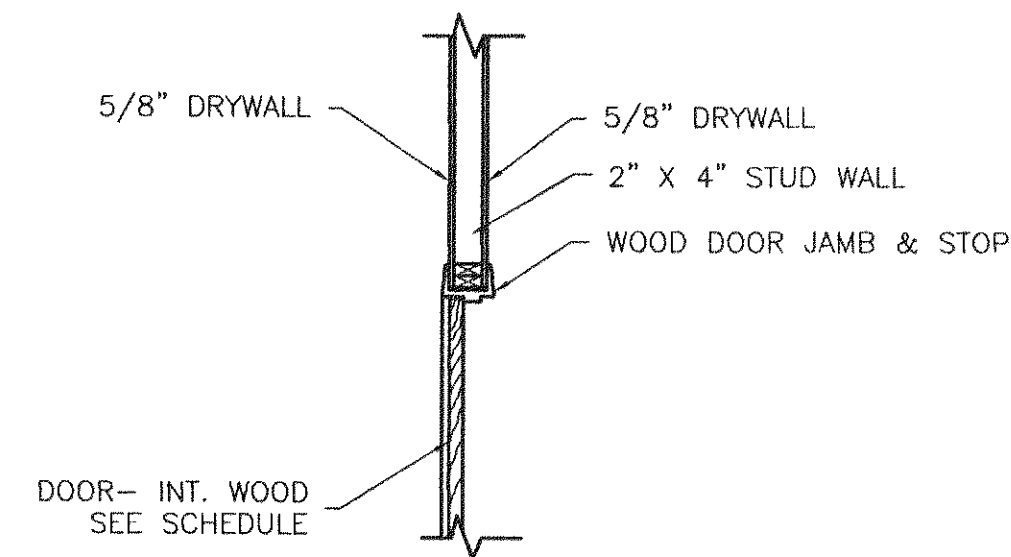
20 S. ROANOKE ST., PO BOX 619
FINCASTLE, VIRGINIA 24090
540.473.1253 FAX: 540.473.1254



Drawn	PSN
Designed	PSN
Checked	JST
Approved	WPJ

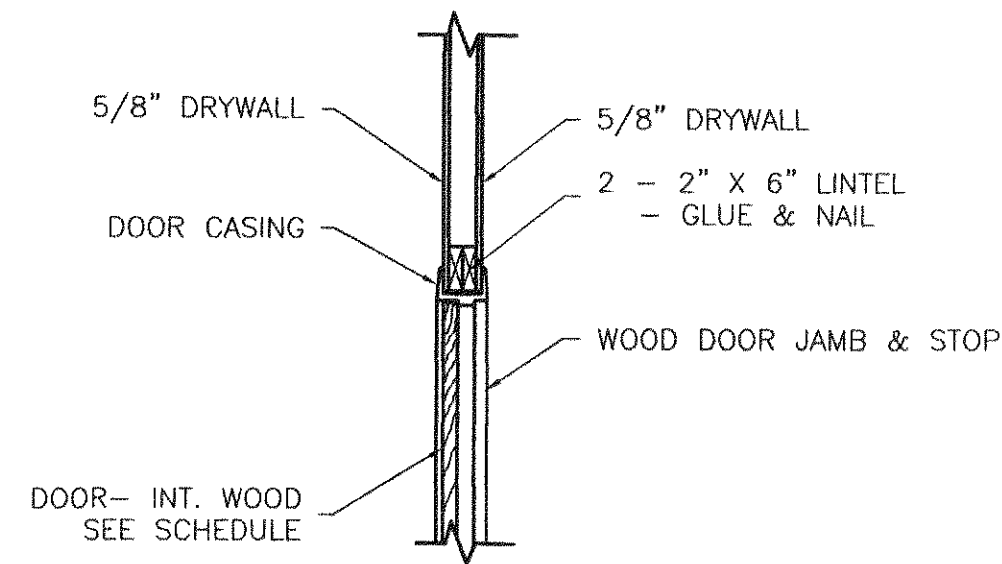
**GREENFIELD
CHLORINATION FACILITY
BUILDING DETAILS AND
MISC. DETAILS**

1/2" = 1'
JUNE 1999
PROJECT: 97075
14 of 19



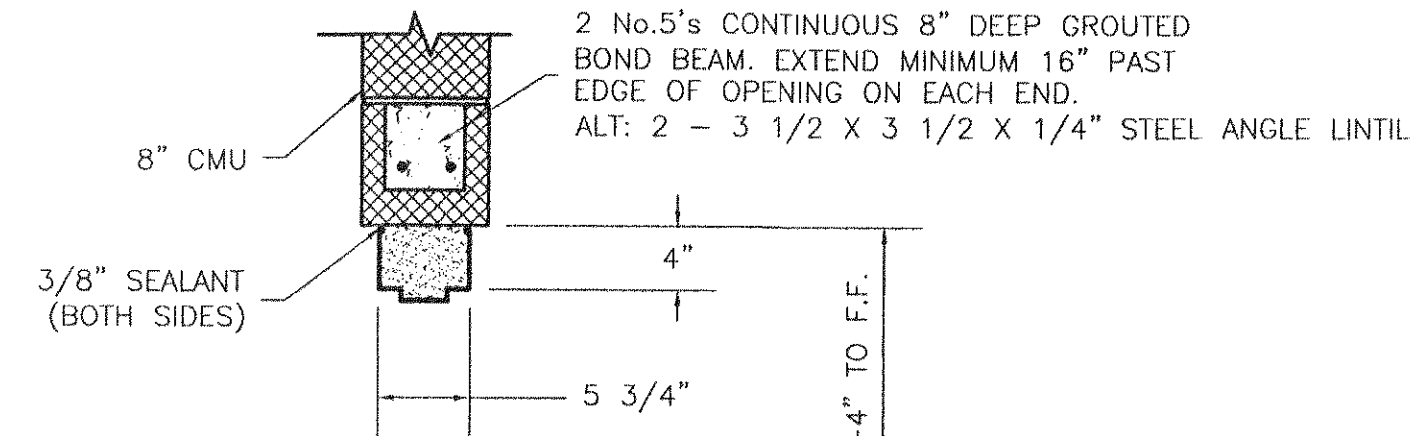
INTERIOR DOOR FRAME JAMB
WOOD CASEMENT

SCALE: 1/2" = 1'-0"



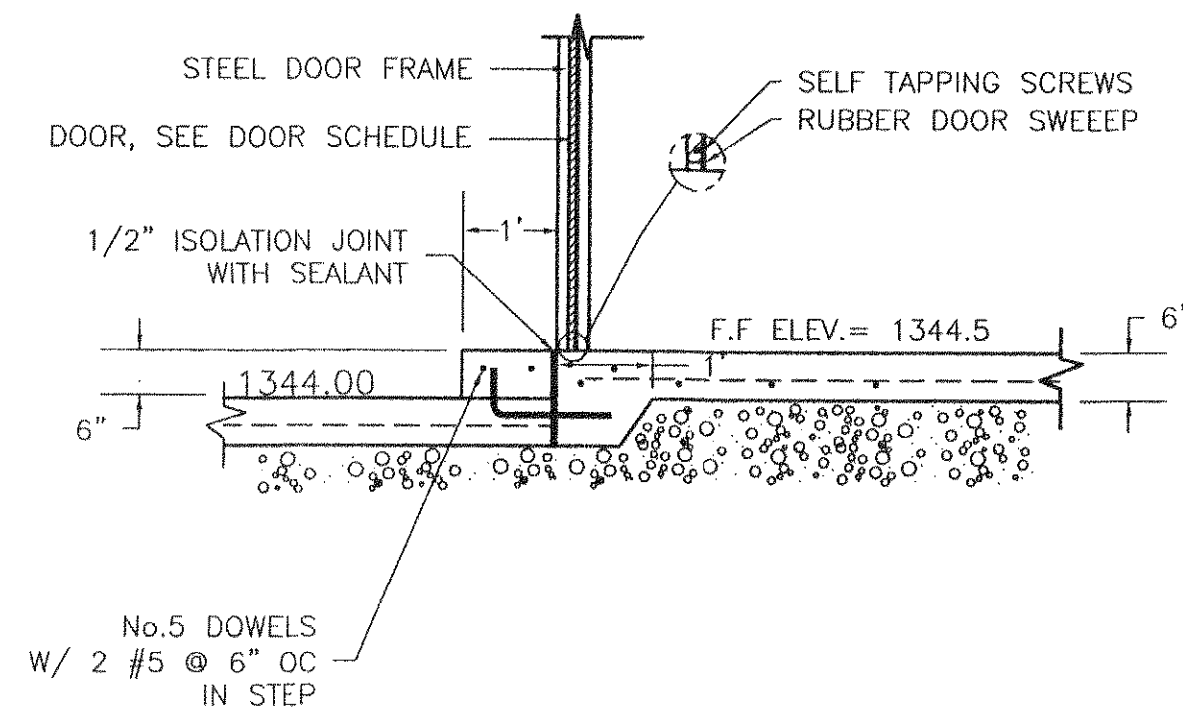
INTERIOR DOOR FRAME HEAD
WOOD CASEMENT

SCALE: 1/2" = 1'-0"



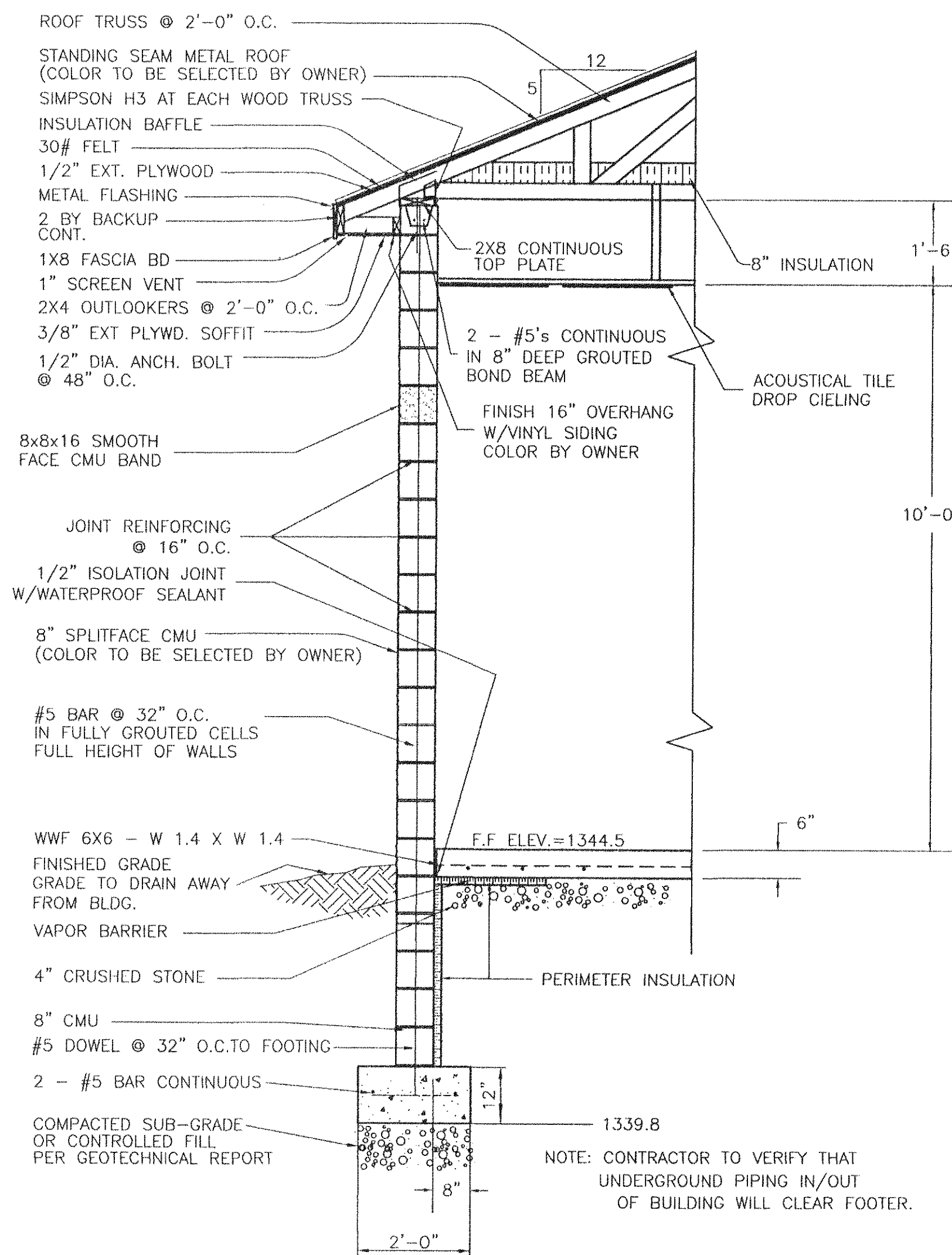
EXTERIOR DOOR FRAME HEAD
STEEL CASEMENT

SCALE: 1"=1'-0"



INNER DOOR THRESHOLD SECTION
BETWEEN OPERATIONS, HALLWAY
& LOADING/UNLOADING - PUMP AREA

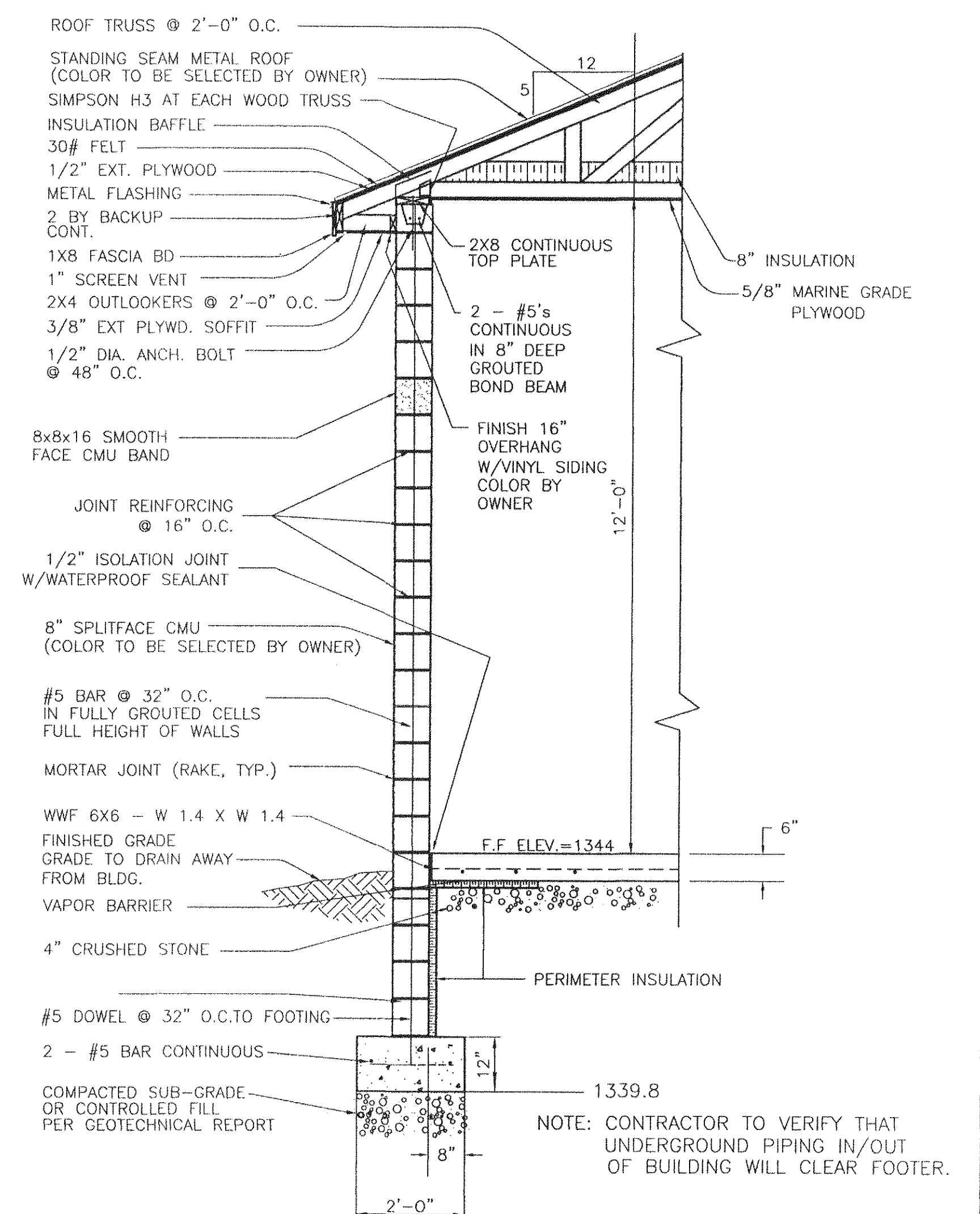
SCALE: 1/2"=1'-0"



TYPICAL WALL SECTION
OPERATIONS, LAB, ELECTRICAL & BATHROOM

SCALE: 1/2"=1'-0"

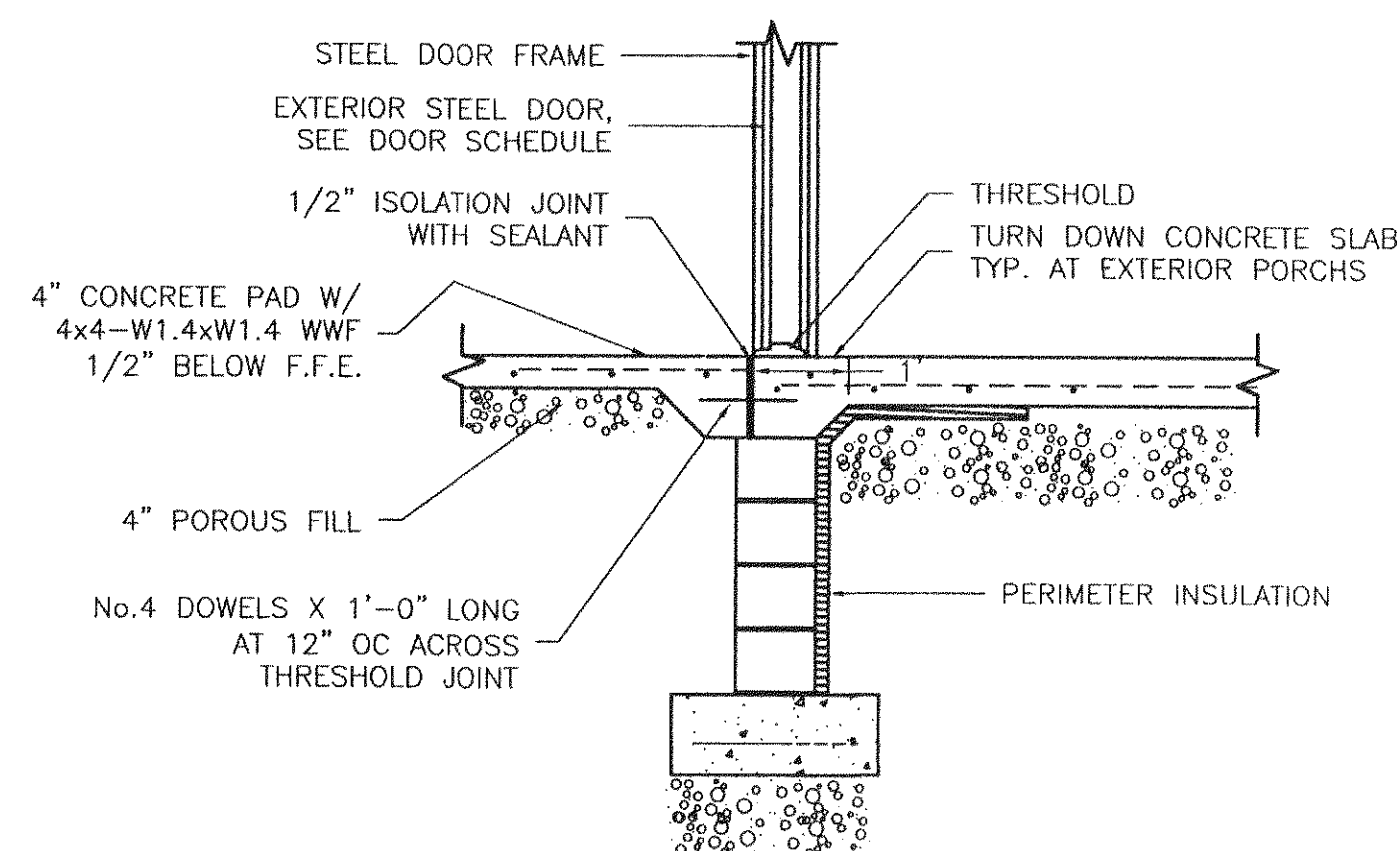
NOTE: CONTRACTOR SHALL PROVIDE EXPANSION JOINTS IN
CMU WALLS AS REQUIRED TO PREVENT CRACKING.



TYPICAL WALL SECTION
LOADING/UNLOADING - PUMP AREA

SCALE: 1/2"=1'-0"

NOTE: CONTRACTOR SHALL PROVIDE EXPANSION JOINTS IN
CMU WALLS AS REQUIRED TO PREVENT CRACKING.

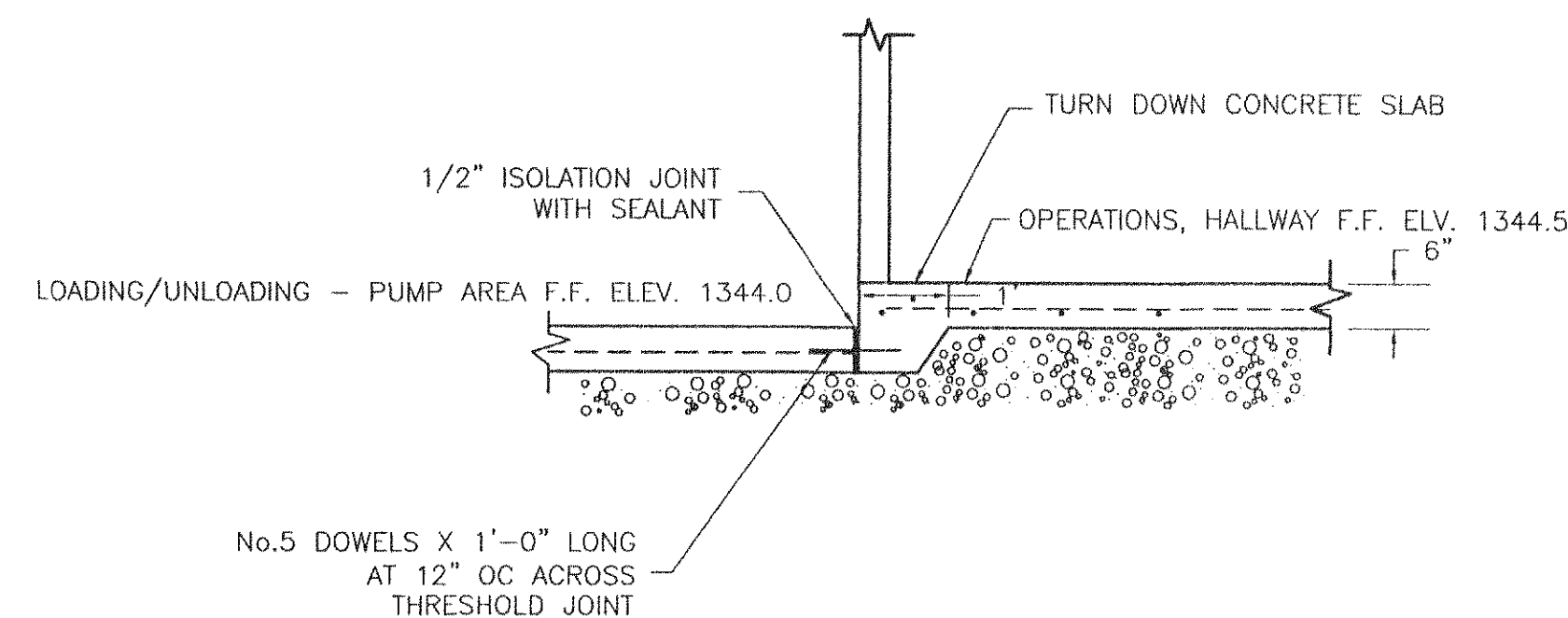


EXTERIOR DOOR THRESHOLD SECTION

SCALE: 1/2"=1'-0"

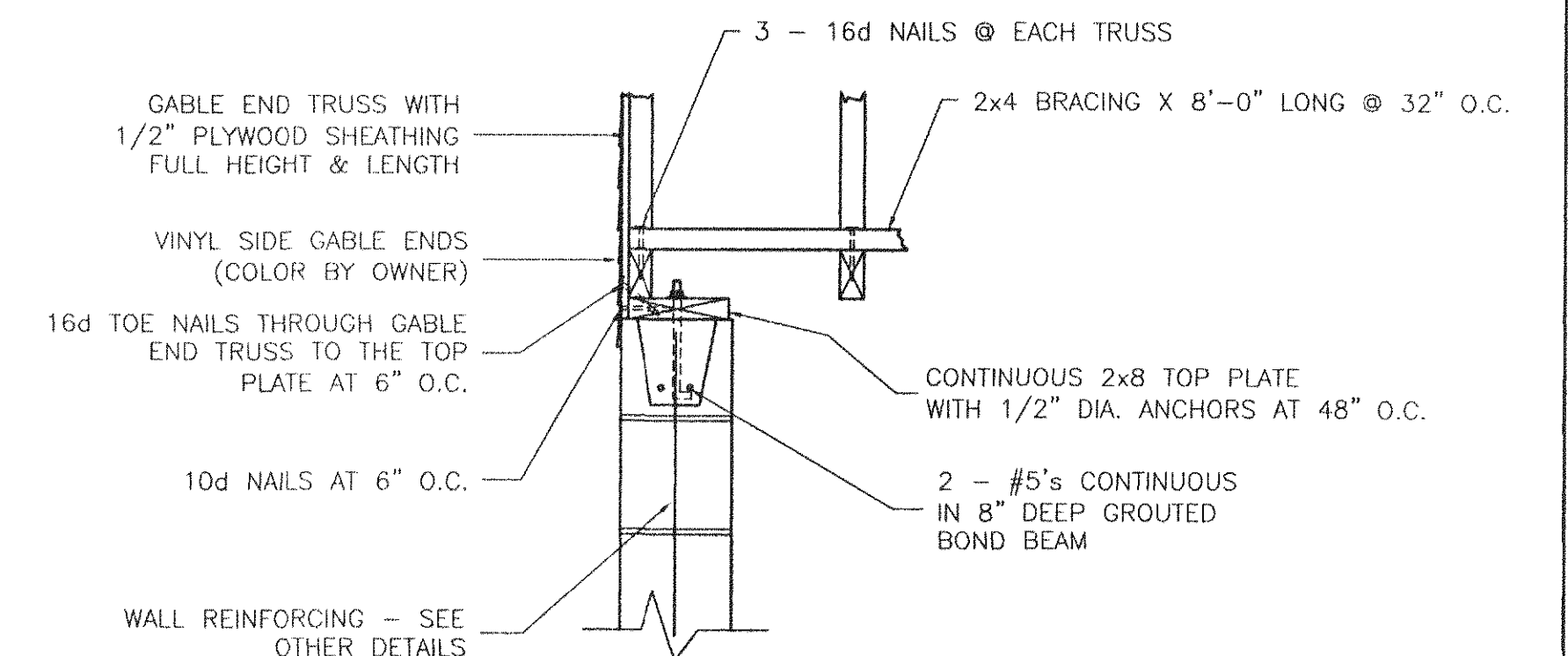
NOTE:

- ANCHOR BOLTS SHALL BE RAMSET/REDHEAD TRUBOLT WEDGE ANCHORS.
THE ENTIRE ANCHOR SHALL BE MANUFACTURED FROM 300 SERIES STAINLESS
STEEL AND MEET THE PHYSICAL REQUIREMENTS OF FEDERAL SPECIFICATIONS
FF-S-325 GROUP II, TYPE 4, CLASS 1. FOLLOW MANUFACTURERS INSTRUCTIONS
FOR INSTALLATION, INCLUDING MINIMUM EMBEDMENT, CENTER, AND EDGE DISTANCE.



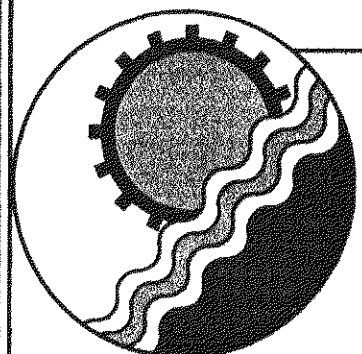
WALL SECTION
BETWEEN OPERATIONS, HALLWAY
& LOADING/UNLOADING - PUMP AREA

SCALE: 1/2"=1'-0"



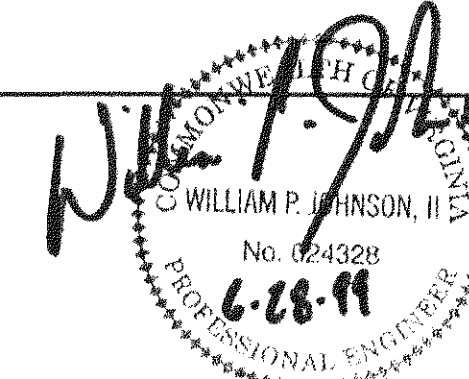
BRACING AT GABLE
END WALLS

SCALE: 1"=1'-0"



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Drawn
PSN/SCG
Designed
PSN
Checked
JST/WPJ
Approved
JST

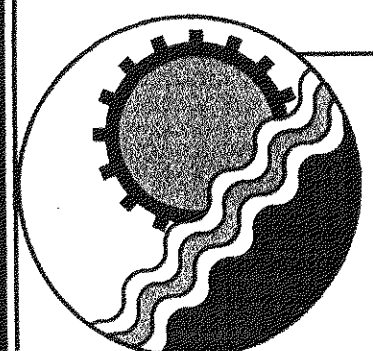
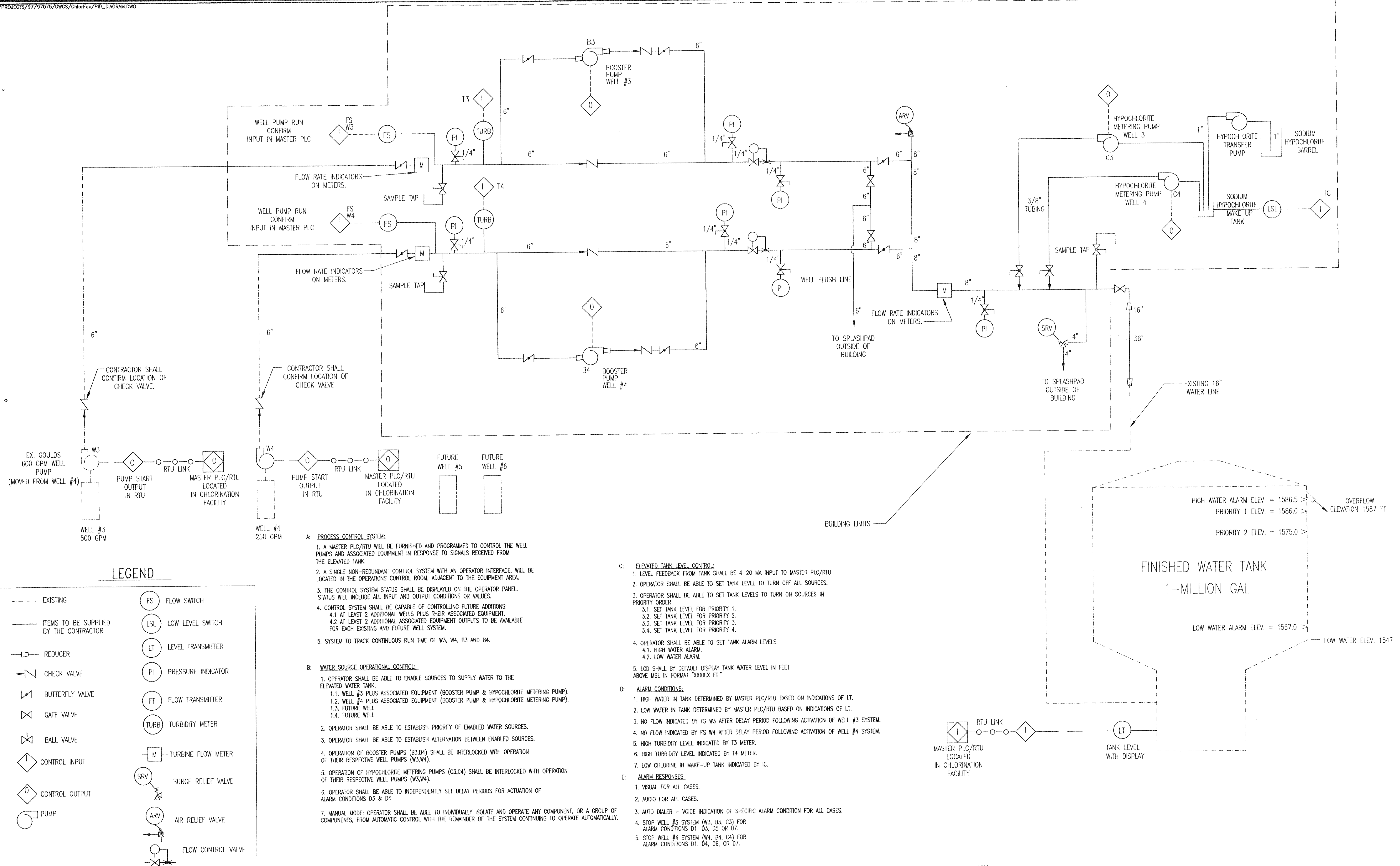
GREENFIELD
CHLORINATION FACILITY
BUILDING DETAILS AND
TYPICAL WALL SECTIONS

AS SHOWN

JUNE 99

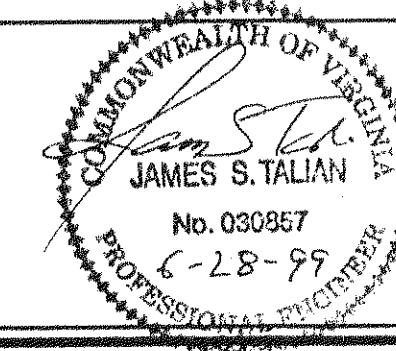
PROJECT: 97075

15 of 19



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Drawn	PSN
Designed	PSN
Checked	JST
Approved	JST

**GREENFIELD
CHLORINATION FACILITY**
P & ID SCHEMATIC

NO SCALE
JUNE 1999
PROJECT: 97075
16 of 19

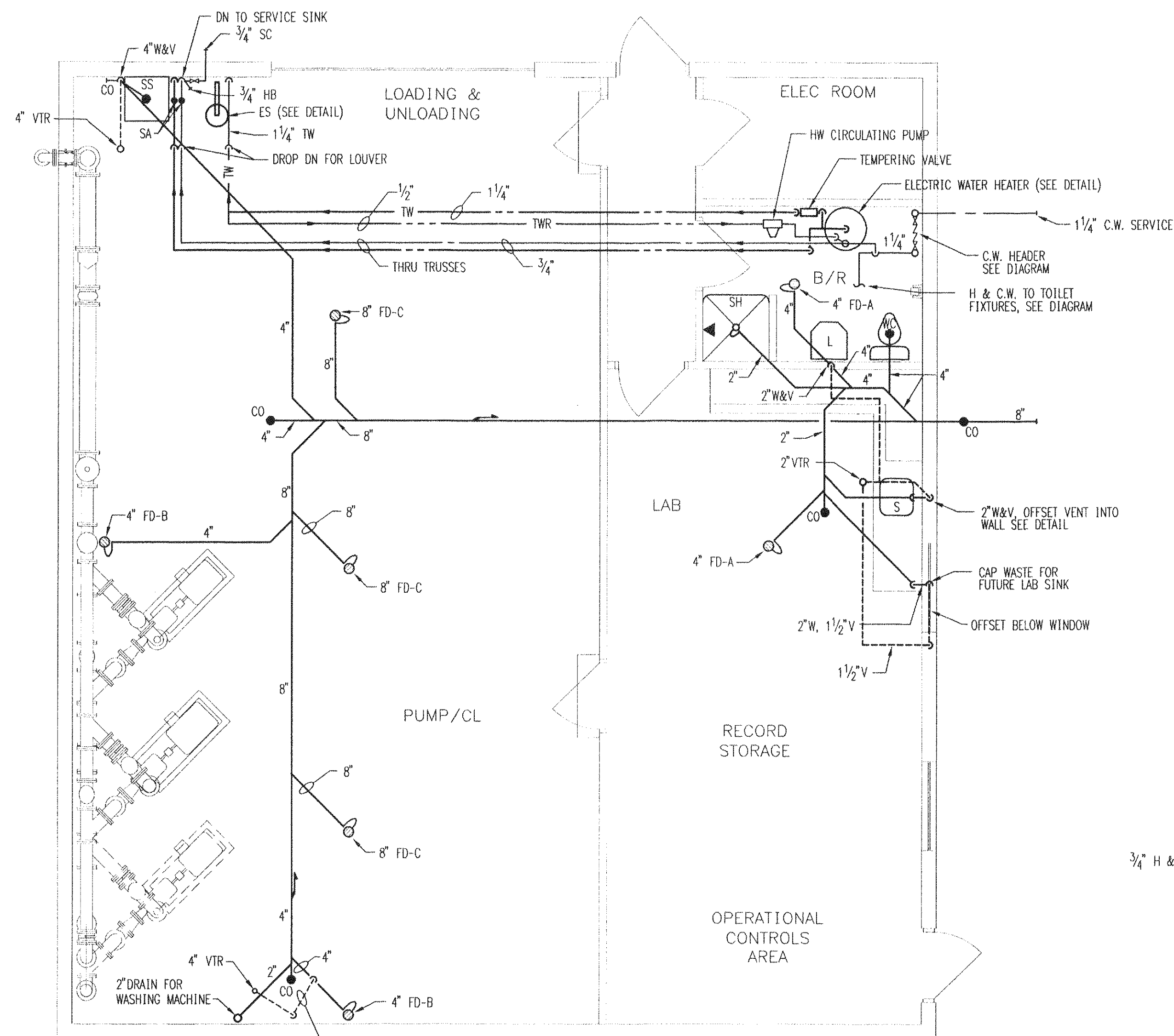
GENERAL PLUMBING NOTES

- SEE PLOT/SITE PLAN FOR THE EXTENT OF ALL PIPING LEAVING AND ENTERING BUILDING.
- SANITARY PIPING TO BE CAST IRON OR SCHEDULE 40 PVC TO AT LEAST 5'-0" BEYOND BUILDING WALL UNLESS INDICATED OTHERWISE.
- MAKE PROPER H & CW, W, V, ETC. PIPING CONNECTIONS TO ALL FIXTURES AND EQUIPMENT EVEN THOUGH ALL BRANCH MAINS, ELBOWS AND CONNECTIONS ARE NOT SHOWN.
- CHECK WITH ARCHITECTURAL WORKING DRAWINGS BEFORE ROUGHING-IN PLUMBING FIXTURES.
- SLOPES AND INVERT ELEVATIONS OF SEWERS, MANHOLES, SEPTIC TANKS, ETC., SHALL BE ESTABLISHED AND VERIFIED BY PLUMBING CONTRACTOR BEFORE ANY PIPING IS INSTALLED IN ORDER THAT PROPER SLOPES WILL BE MAINTAINED AND NECESSARY INVERT ELEVATIONS OBTAINED.
- COORDINATE THE LOCATION OF ALL PIPING WITH LIGHTING FIXTURES, DUCT, GRILLES, HEATING, PIPING, ETC..
- MAKE 1/2" CONNECTIONS TO TANK TYPE WC'S, 1/2"H & CW TO LAVS AND SHOWERS, 1/2"CW TO EWC'S AND 3/4"H & CW TO SERVICE SINKS.
- ALL CUTOFF VALVES, SHOCK ABSORBERS, ETC. SHALL BE ACCESSIBLE THROUGH AN ACCESS DOOR OR THROUGH LAY-IN CEILING. PROVIDE ACCESS DOOR WHERE REQUIRED.
- FURNISH DEEP SEAL P-TRAPS, ON ALL FLOOR DRAINS NOT EQUIPPED WITH A TRAP PRIMER.
- ALL VENTS THRU THE ROOF SHALL BE A MINIMUM OF 20'-0" AWAY FROM AC UNITS OR OTHER FRESH AIR INTAKES.

PLUMBING LEGEND SYMBOLS AND ABBREVIATIONS

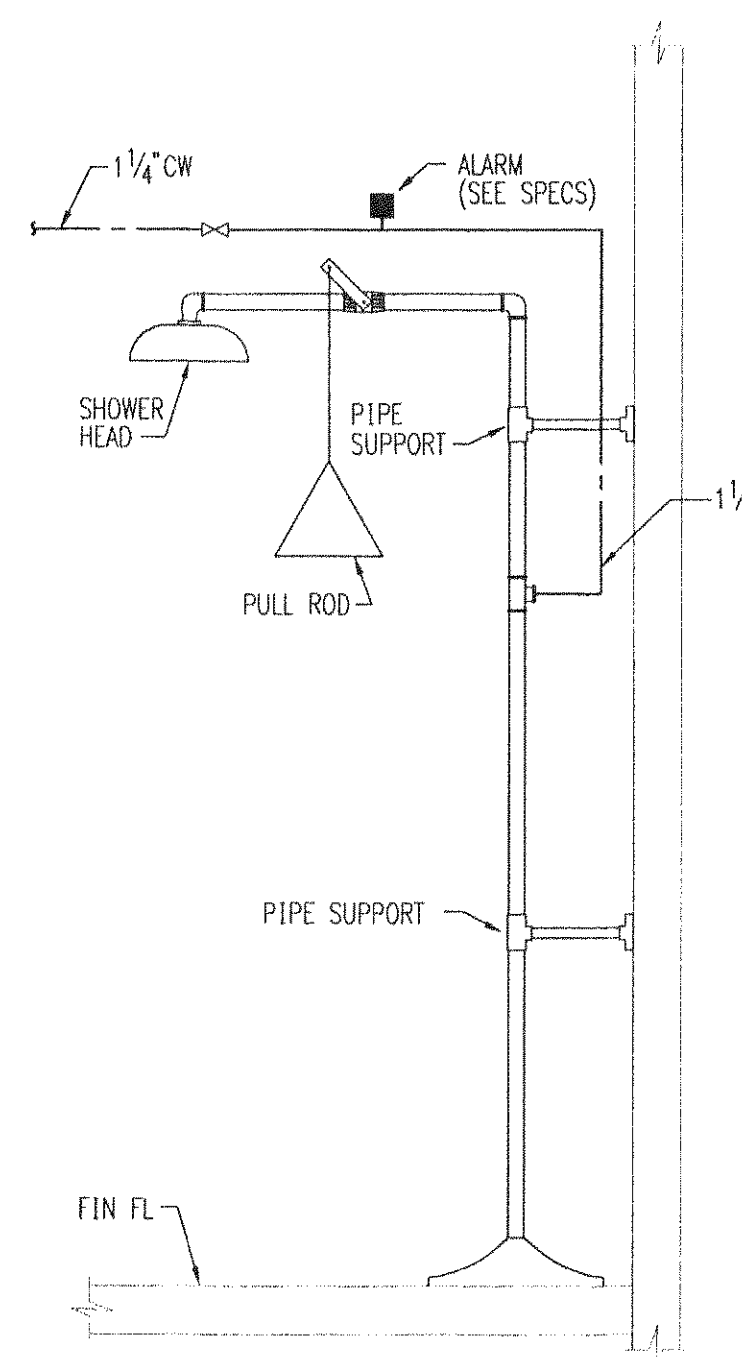
COLD WATER	
HOT WATER	
SANITARY SOIL & WASTE	
SANITARY VENT	
DIRECTION OF SLOPE DOWN	
DIRECTION OF FLOW	
CUTOFF VALVE (IN PLAN)	
CUTOFF VALVE (IN VERTICAL)	
SHOCK ABSORBER	
STRAINER	
TEPID WATER	
TEPID WATER RETURN	
BEL - BELOW	P & T - PRESSURE & TEMPERATURE
CO - CLEAN-OUT	RELIEF VALVE
CV - CUTOFF VALVE	
CW - COLD WATER	SA - SHOCK ABSORBER
EWC - ELECTRIC WATER COOLER	SAN - SANITARY
FD - FLOOR DRAIN	SC - SILL COCK
HB - HOSE BIBB	TW - TEPID WATER
HW - HOT WATER	V - VENT
L - LAVATORY	VTR - VENT-THRU-ROOF
PRV - PRESSURE REDUCING VALVE	W - WASTE
	WC - WATER CLOSET

NAME	DESCRIPTION	MOUNTING HEIGHT
WC	VITREOUS CHINA, FLOOR MOUNTED WATER CLOSET, FLUSH VALVE, 1.6 GAL. PER FLUSH	16 1/2" FLOOR TO RIM
L	20"x18" VITREOUS CHINA LAVATORY	29" FLOOR TO BOTTOM OF APRON
SH	36"x36" SHOWER WITH BALANCED PRESSURE CONTROL VALVE	72" TO 9" OF SHOWER ARM MOUNTED 2'-0" ABV FIN GRADE
SC	FREEZE-PROOF SILLCOCK	MOUNTED 2'-4" FLOOR TO RIM
SS	SERVICE SINK	COUNTER MOUNTED



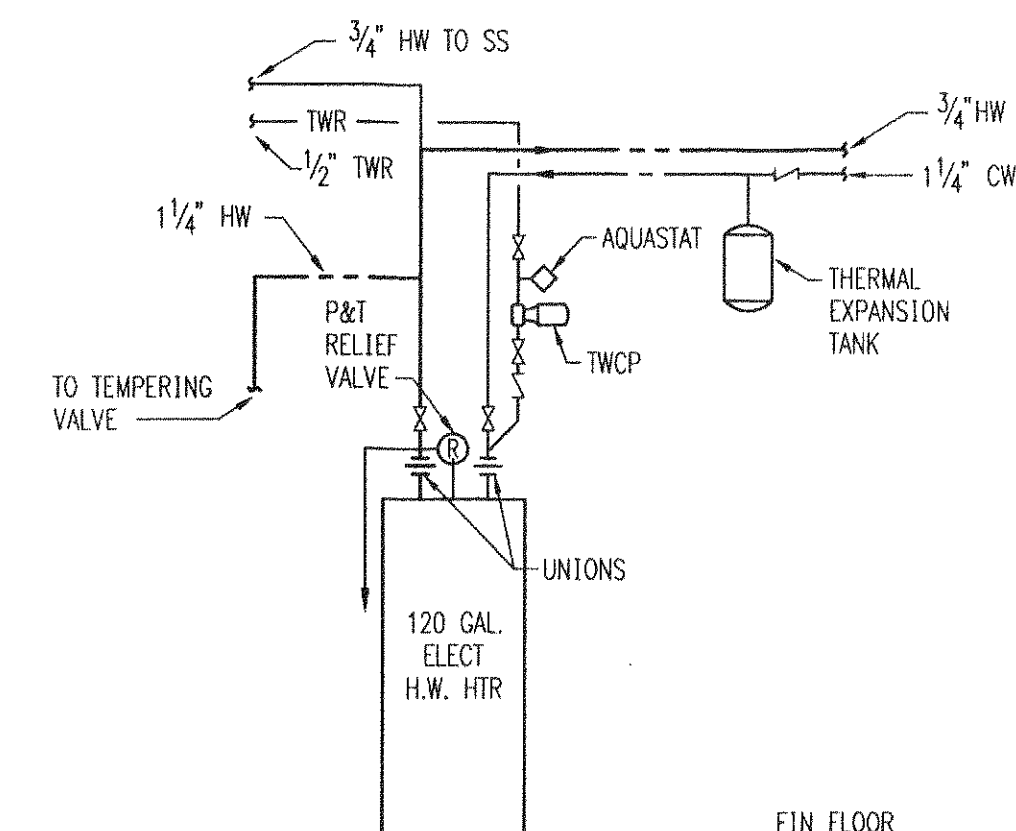
FLOOR PLAN - PLUMBING

SCALE: 1/4" = 1'-0"



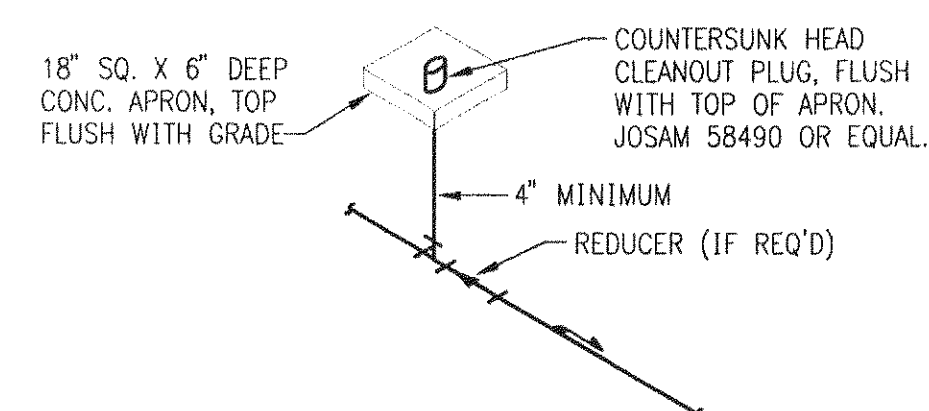
CONNECTIONS AT EMERGENCY SHOWER

NO SCALE



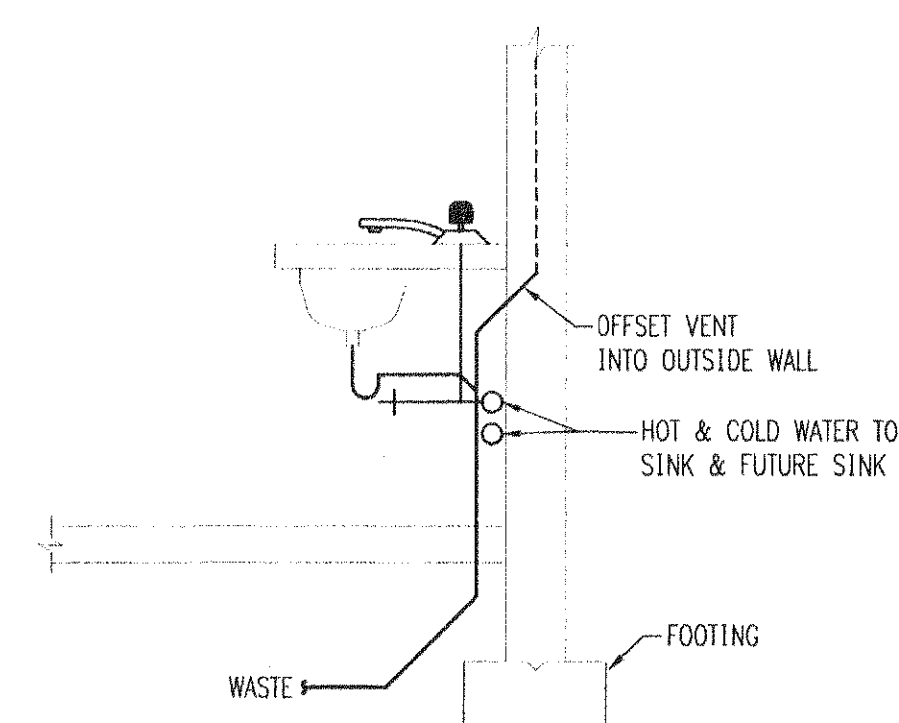
DETAIL OF CONNECTIONS TO ELECTRIC WATER HEATER

SCHEMATIC



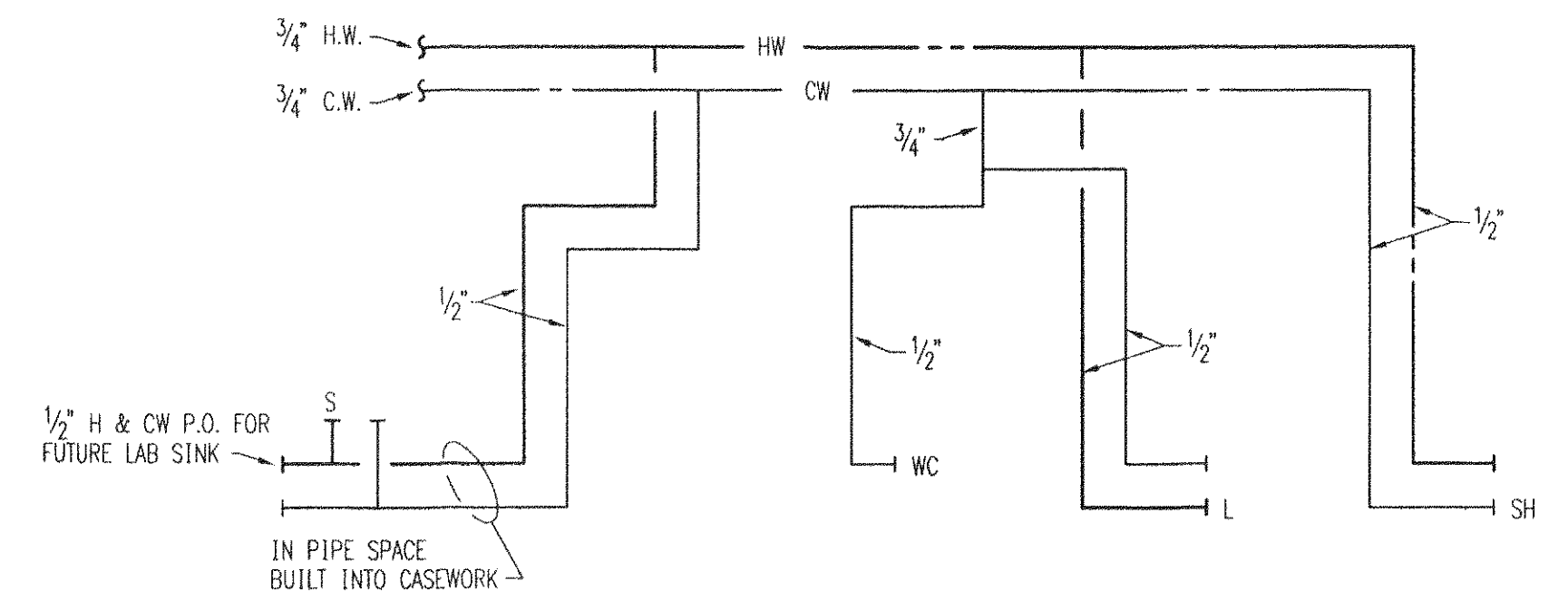
DETAIL OF CLEANOUTS IN OUTSIDE SANITARY SEWER

NO SCALE



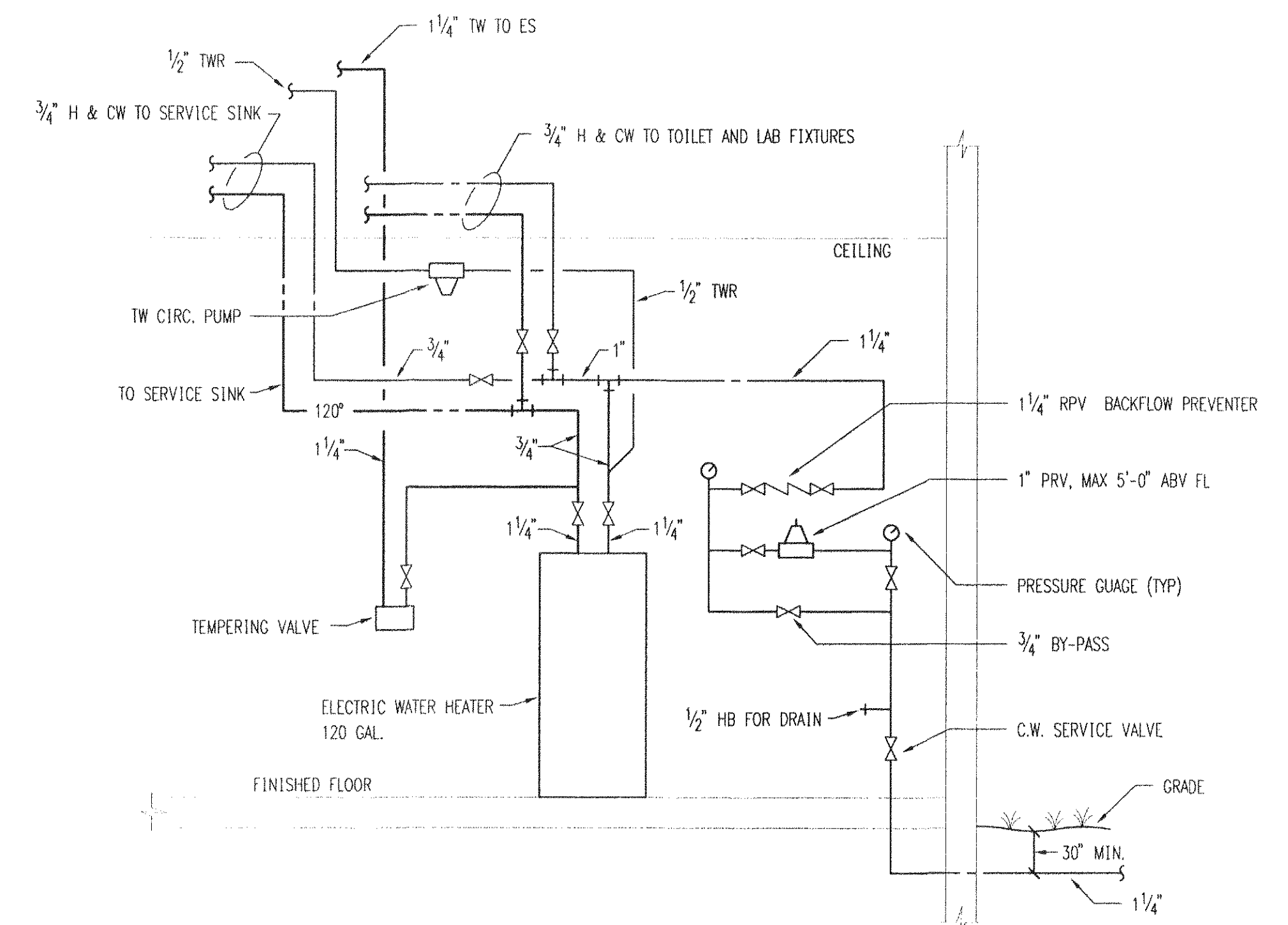
TYPICAL PLUMBING CONNECTIONS TO LABORATORY EQUIPMENT

SCHEMATIC



HOT AND COLD WATER DIAGRAM

SCHEMATIC



C.W. HEADER CONNECTION DIAGRAM

SCHEMATIC

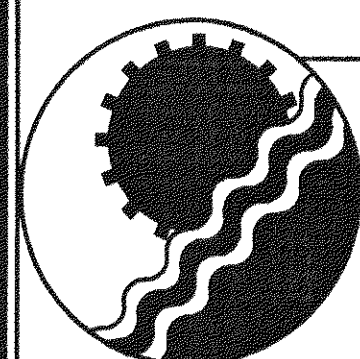


WHITESCARVER, HURD & OBENCHAIN, INC.

CONSULTING ENGINEERS
4932 FRONTAGE ROAD NW
ROANOKE, VIRGINIA 24019
540/265-4444
A C E C

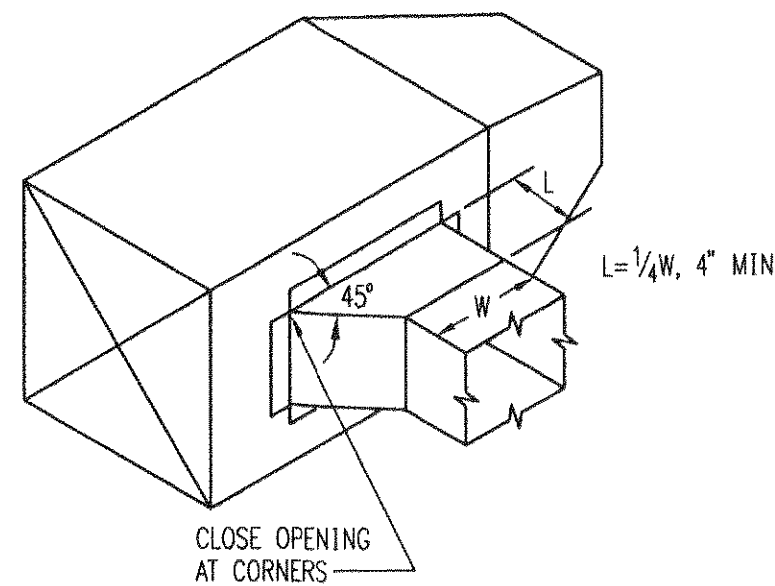
DES: RJG DRF: SDR CHK: RJG COMM: 99110

Drawn	SDR	GREENFIELD CHLORINATION FACILITY PLUMBING	SEE PLAN
Designed	RJG		JUNE 1999
Checked	RJG		PROJECT: 97075
Approved	JBO		17 of 19

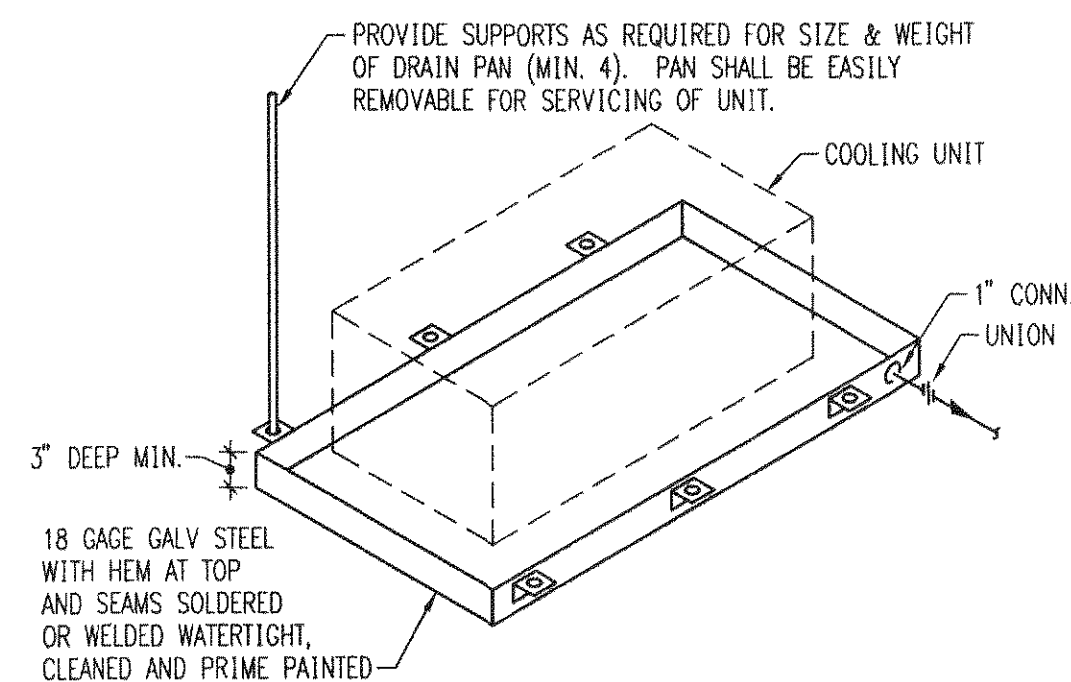


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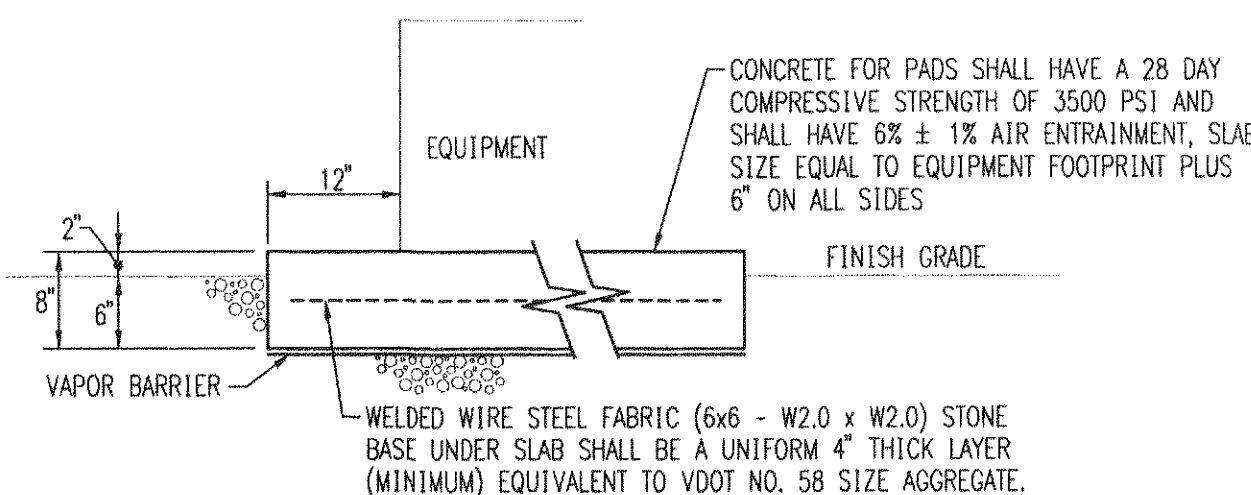


BRANCH CONNECTIONS DETAIL
FOR SUPPLY DUCT (TYP)
SCHEMATIC

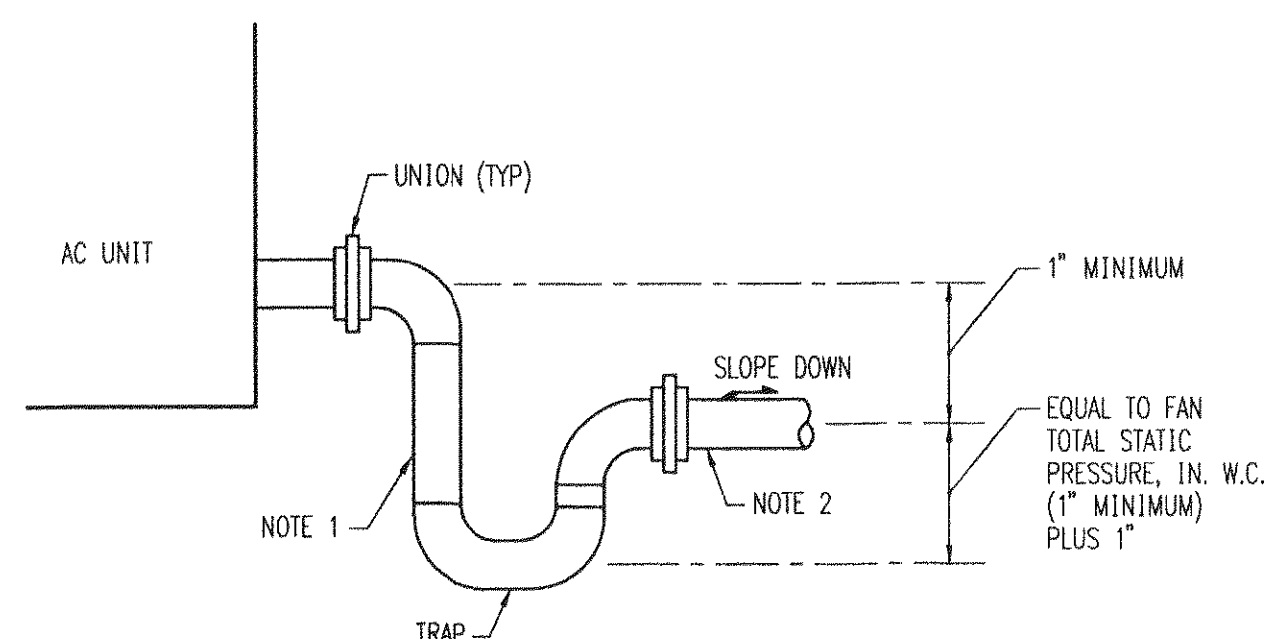


- NOTES:
1. DRAIN PAN SHALL BE REINFORCED WITH GALVANIZED STEEL ANGLES TO PREVENT SAGGING OR FLEXING WHEN FULL OF WATER.
2. PAN SHALL EXTEND A MINIMUM 3" BEYOND SIDES OF COOLING UNIT.

AUXILIARY DRAIN PAN
NO SCALE

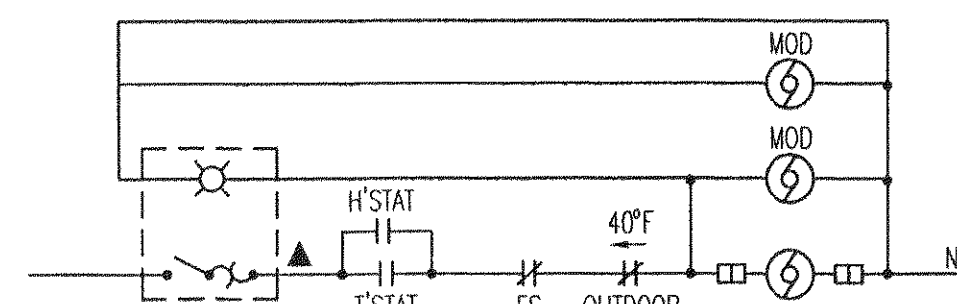


TYPICAL OUTDOOR EQUIPMENT PAD
NO SCALE



- NOTES:
1. DRAIN LINE SHALL BE FULL SIZE OF AC UNIT CONNECTION.
2. EXTEND TO NEAREST FLOOR DRAIN UNLESS NOTED OTHERWISE.

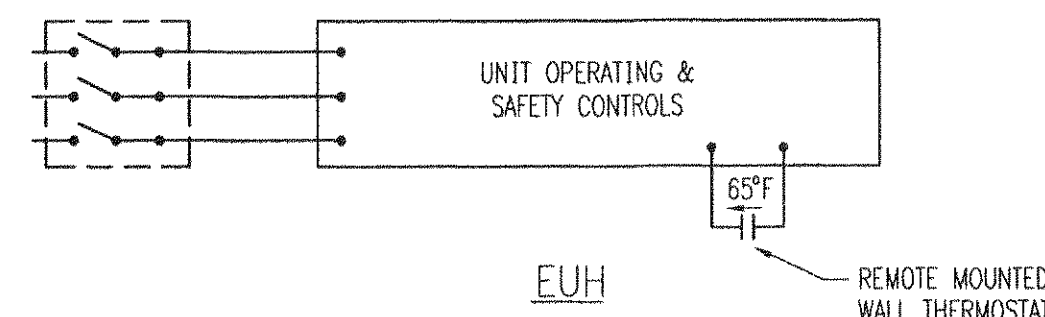
COOLING COIL CONDENSATE DRAIN
NO SCALE



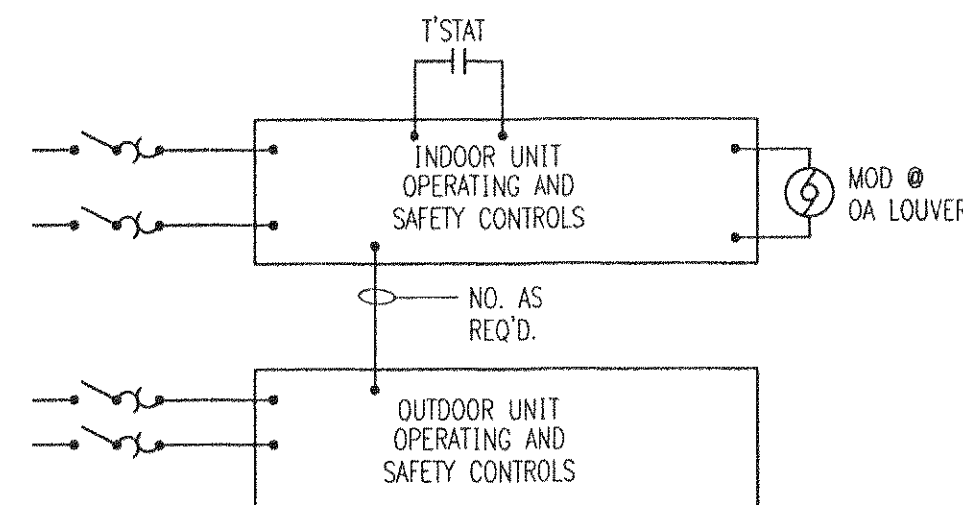
EXHAUST FAN



CEILING EXHAUST FAN



ELECTRIC UNIT HEATERS



SPLIT SYSTEM HEAT PUMP

CONTROL LEGEND

HOLDING COILS	COMBINATION FUSIBLE MOTOR STARTER RELAY	(S)
MOTOR		(M)
MOTOR PROTECTIVE SWITCH		(PS)
DISCONNECT SWITCH (FUSED)		(DS)
DISCONNECT		(D)
PILOT LIGHT		(PL)
T'STAT OR RELAY		(T)
SET POINT-CLOSE BELOW 65°F		(65°F)
SET POINT-CLOSE ABOVE 65°F		(65°F)
ELECTRICAL WIRING, ABOVE 100 VOLT		(PW)
TWIST SHIELDED PAIR, 24 VOLT		(TW)
CURRENT RELAY	CTR	
FIRESTAT	FS	
START-STOP	S/S	

ALL ITEMS SHOWN ON CONTROL DIAGRAMS AND WIRING 100 VOLTS OR LESS SHALL BE INCLUDED AS A PART OF SECTION 15900 EXCEPT POWER WIRING OVER 100 VOLTS. ITEMS MARKED ▲ OR ITEMS SPECIFIED TO BE FURNISHED WITH EQUIPMENT. WIRING OVER 100 VOLTS AND ITEMS MARKED ▲ SHALL BE FURNISHED AS A PART OF DIVISION 16. ALL OVERLOADS, HOA SWITCHES, AUXILIARY CONTACTS AND PILOT LIGHTS SHALL BE INTEGRAL WITH THE MOTOR STARTERS UNLESS SHOWN OTHERWISE.

ALL WIRING SHOWN ON ELECTRIC SEQUENCE CONTROLS SHALL BE OVER 100 VOLTS UNLESS NOTED OTHERWISE. RELAYS FROM THE CONTROL SYSTEM SHALL BE LOCATED ADJACENT TO THE CONTROLLED DEVICE (MOTOR OR MOTOR STARTER), AND MAY BE LOCATED WITHIN STARTER HOUSINGS WHERE SPACE IS AVAILABLE AND WHERE APPROVED BY NEC.

CONTROL ITEMS MARKED THUS "VENTILATION-ON-OFF" SHALL HAVE PLATE ENGRAVED WITH THE WORDING CONTAINED WITHIN THE QUOTE "... MARKS PLUS EQUIPMENT IDENTIFICATION.

MARK	CAP. CFM	S.P. IN. H ₂ O	MAX. TIP SPEED-FPM	H.P.	MODEL NO.	LOCATION
F-1	90	0.1	1500 *	40 **	SP-6	TOILET
F-2	2800	0.15	4750	1/4	SBE-1H20	PUMP ROOM

* LISTED FAN SPEED, RPM
** LISTED WATTS (INPUT)

LEGEND

ELECTRIC THERMOSTAT	(T)
HUMIDISTAT	(H)
DIRECTION OF SLOPE DOWN	(S)
ANCHOR	(A)
ACOUSTIC LINED DUCT	(AL)
DUCT TRANSITION	(DT)
FLEXIBLE DUCT CONNECTION	(FD)
NEW WORK	(NW)

STANDARD ABBREVIATIONS

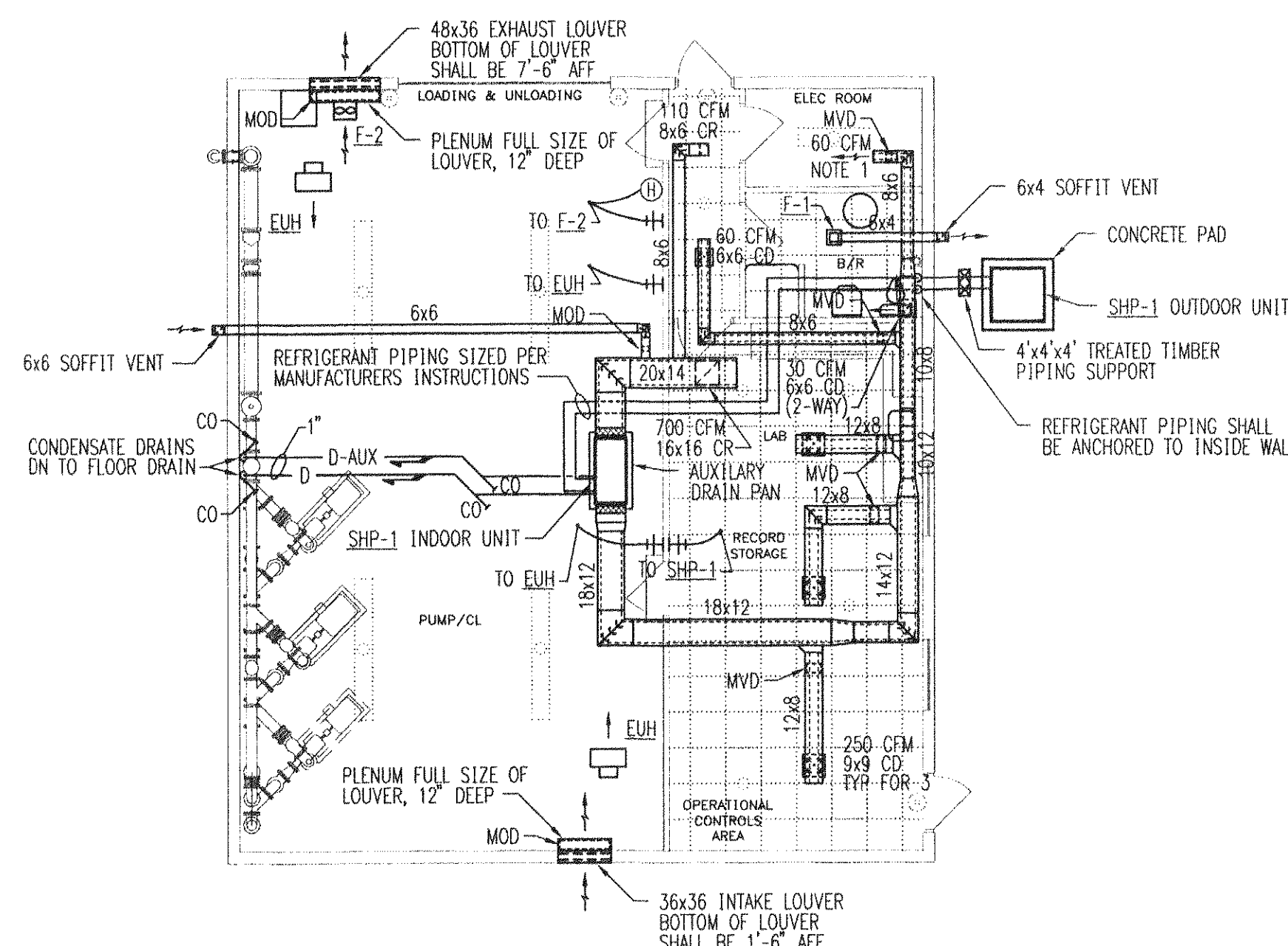
ABOVE FINISHED FLOOR	AFF	MANUAL VOLUME DAMPER	MVD
CEILING DIFFUSER	CD	MOTOR OPERATED DAMPER	MOD
CEILING REGISTER	CR	OUTSIDE AIR	OA
CLEANOUT	CO		

MARK	CFM	HEATING CAPACITY KW	HEATING CAPACITY MBH	MOTOR HP	MODEL NO.
EUH	400	5.0	17.1	1/125	5105

SPLIT SYSTEM HEAT PUMP SYSTEMS: TRANE

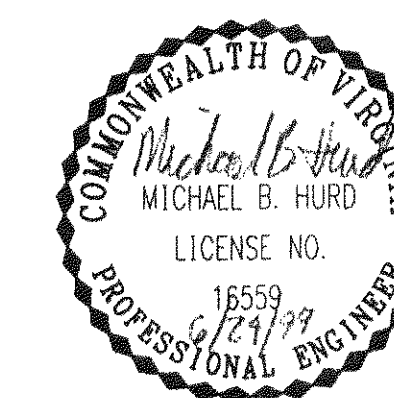
MARK	SHF-1
INDOOR UNIT	
MODEL NO.	TWE 036
SUPPLY FAN	
TOTAL AIR, CFM	900
OUTSIDE AIR, CFM	80
*EXT. S.P., IN. H ₂ O	0.7
FAN HORSEPOWER	1/2
COOLING COIL	
TOTAL CAP., MBH	24.6
ENT. AIR, °DB	76.8
*WB	64.0
LEAV. AIR, °DB	58.3
*WB	60.0
HEATING COIL	
TOTAL CAP., MBH	23.0
ENT. AIR, °DB	63.8
KW	2.12
FILTERS	
TYPE	THROWAWAY
EFFICIENCY	30%
OUTDOOR UNIT	
MODEL NO.	TWN 024
COND. FANS, NO. - HP	1 @ 1/6
COMP. MOTOR, KW	2
OAT, °F DB	95
MAX SUCTION TEMP @ COMP, °F	45

*INCLUDES .25" H₂O S.P. LOSS THRU FILTERS.



FLOOR PLAN - MECHANICAL
SCALE: 1/8" = 1'-0"

- NOTES:
1. OPEN END DUCT, COVER WITH 1/2" WIRE MESH.

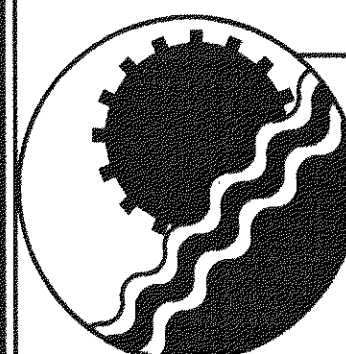


WHITESCARVER, HURD & OBENCHAIN, INC.

CONSULTING ENGINEERS
4932 FRONTAGE ROAD NW
ROANOKE, VIRGINIA 24019
540/265-4444
A C E C

DES: EEC DRF: SDR CHK: BGH COMM: 99110

Drawn	SDR	GREENFIELD CHLORINATION FACILITY	SEE PLAN
Designed	EEC		JUNE 1999
Checked	BGH	MECHANICAL	PROJECT: 97075
Approved	JBO		18 of 19



ENGINEERING CONCEPTS, INC.

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