

**Professional  
Services**

AN ISO 9001:2000 CERTIFIED COMPANY

3500 LUDINGTON STREET, SUITE 310  
ESCANABA, MICHIGAN 49829

CITY OF ALPENA, MICHIGAN

WATER AND WASTEWATER IMPROVEMENTS  
DIVISION C – WATER TREATMENT PLANT

CONTRACT NO.: 11315.00026

MDEQ SRF PROJECT NO.: 5266-01

MDEQ DWRF PROJECT NO.: 7200-01

ISSUED: JUNE 2007

GARY J. DANIELS

NAME OF THE LICENSEE

6201049144

REGISTRATION NUMBER



ALPENA

MICHIGAN

SARCO PRODUCTS • NEW HOPE, MINNESOTA  
RENDER BY PART NUMBER 6552

1/15  
SARCO PRODUCTS • NEW HOPE, MINNESOTA  
RENDER BY PART NUMBER 6552

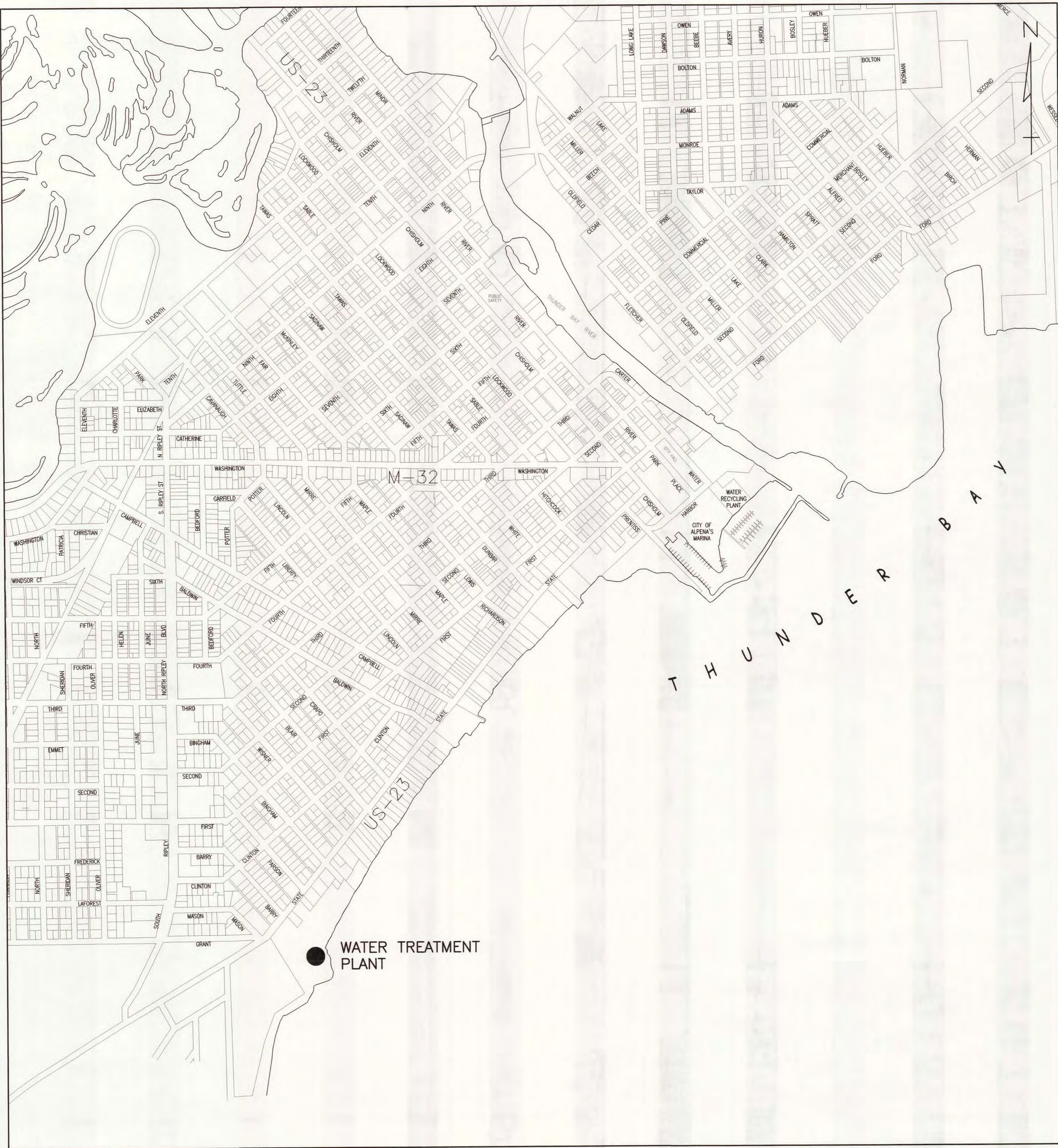
WATER AND WASTEWATER  
IMPROVEMENTS  
2007  
SARCO PRODUCTS • NEW HOPE, MINNESOTA  
RENDER BY PART NUMBER 6552

DRAWING NUMBER  
SARCO PRODUCTS • NEW HOPE, MINNESOTA  
RENDER BY PART NUMBER 6552

6/15/07 JK03

CADD PART: PROJECT\11315\00026\30\DWG\TITLE

SARGO PRODUCTS • NEW LAKE, MINNESOTA  
 MEMBER BY PART NUMBER 8500  
 SARGO PRODUCTS • NEW LAKE, MINNESOTA  
 MEMBER BY PART NUMBER 8500  
 SARGO PRODUCTS • NEW LAKE, MINNESOTA  
 MEMBER BY PART NUMBER 8500  
 SARGO PRODUCTS • NEW LAKE, MINNESOTA  
 MEMBER BY PART NUMBER 8500



LOCATION MAP

**LEGEND - SITE IMPROVEMENTS**

**MISCELLANEOUS SYMBOLS**

- |   |                          |   |                            |
|---|--------------------------|---|----------------------------|
| ⊞ | RIPRAP                   | ⋯ | HEDGE LINE                 |
| ⊞ | SIGN                     | ⋯ | TREE LINE                  |
| ⊞ | STUMP                    | ⋯ | EXISTING FENCE             |
| ⊞ | SWAMP                    | ⋯ | PROPOSED FENCE             |
| ⊞ | DECIDUOUS TREE           | ⋯ | GUARDRAIL                  |
| ⊞ | EVERGREEN TREE           | ⋯ | DRAINAGE CRS/EDGE OF WATER |
| ⊞ | MAIL BOX                 |   |                            |
| ⊞ | FOUND IRON               |   |                            |
| ⊞ | FOUND MONUMENT           |   |                            |
| ⊞ | QUARTER CORNER           |   |                            |
| ⊞ | SECTION CORNER           |   |                            |
| ⊞ | TEST HOLE OR SOIL BORING |   |                            |
| ⊞ | SPOT ELEVATION           |   |                            |
| ⊞ | SURVEY CONTROL POINT     |   |                            |
| ⊞ | GUARD POSTS              |   |                            |
| ⊞ | PARCEL NUMBER BOX        |   |                            |
| ⊞ | SURVEY STATIONING        |   |                            |

**UTILITIES SYMBOLS**

- |   |                          |
|---|--------------------------|
| ⊞ | UTILITY POLE             |
| ⊞ | LIGHT POLE               |
| ⊞ | POWER TOWER              |
| ⊞ | GAS VALVE                |
| ⊞ | DEADMAN FOR GUYWIRE      |
| ⊞ | RAILROAD SIGNAL          |
| ⊞ | ELECTRICAL HANDHOLE      |
| ⊞ | TELEPHONE PEDESTAL/RISER |
| ⊞ | POST                     |

**WATER & DRAINAGE SYMBOLS**

- |   |                               |
|---|-------------------------------|
| ⊞ | EXISTING CATCH BASIN          |
| ⊞ | PROPOSED CATCH BASIN          |
| ⊞ | EXISTING MANHOLE              |
| ⊞ | PROPOSED MANHOLE              |
| ⊞ | CULVERT OPENING, HEADWALL     |
| ⊞ | WATER SHUTOFF (SERVICE VALVE) |
| ⊞ | SEPTIC TANK                   |
| ⊞ | WELL                          |
| ⊞ | WATER METER                   |
| ⊞ | VALVE & BOX                   |
| ⊞ | FIRE HYDRANT ASSEMBLY         |

**STRUCTURES**

- |   |                           |
|---|---------------------------|
| ⊞ | PROPOSED BUILDING         |
| ⊞ | EXISTING BUILDING         |
| ⊞ | PROPOSED TANK/STRUCTURE   |
| ⊞ | EXISTING BURIED STRUCTURE |
| ⊞ | FUTURE STRUCTURE          |

**UTILITY PATTERNS**

- |   |                                 |
|---|---------------------------------|
| ⊞ | ELECTRICAL LINE                 |
| ⊞ | GAS LINE                        |
| ⊞ | OVERHEAD LINE                   |
| ⊞ | TELEPHONE LINE                  |
| ⊞ | WATER LINE                      |
| ⊞ | TV                              |
| ⊞ | FIBER OPTICS                    |
| ⊞ | PROPOSED UTILITY 35" AND UNDER  |
| ⊞ | EXISTING UTILITY 35" AND UNDER  |
| ⊞ | PROPOSED UTILITY 36" AND LARGER |
| ⊞ | EXISTING UTILITY 36" AND LARGER |

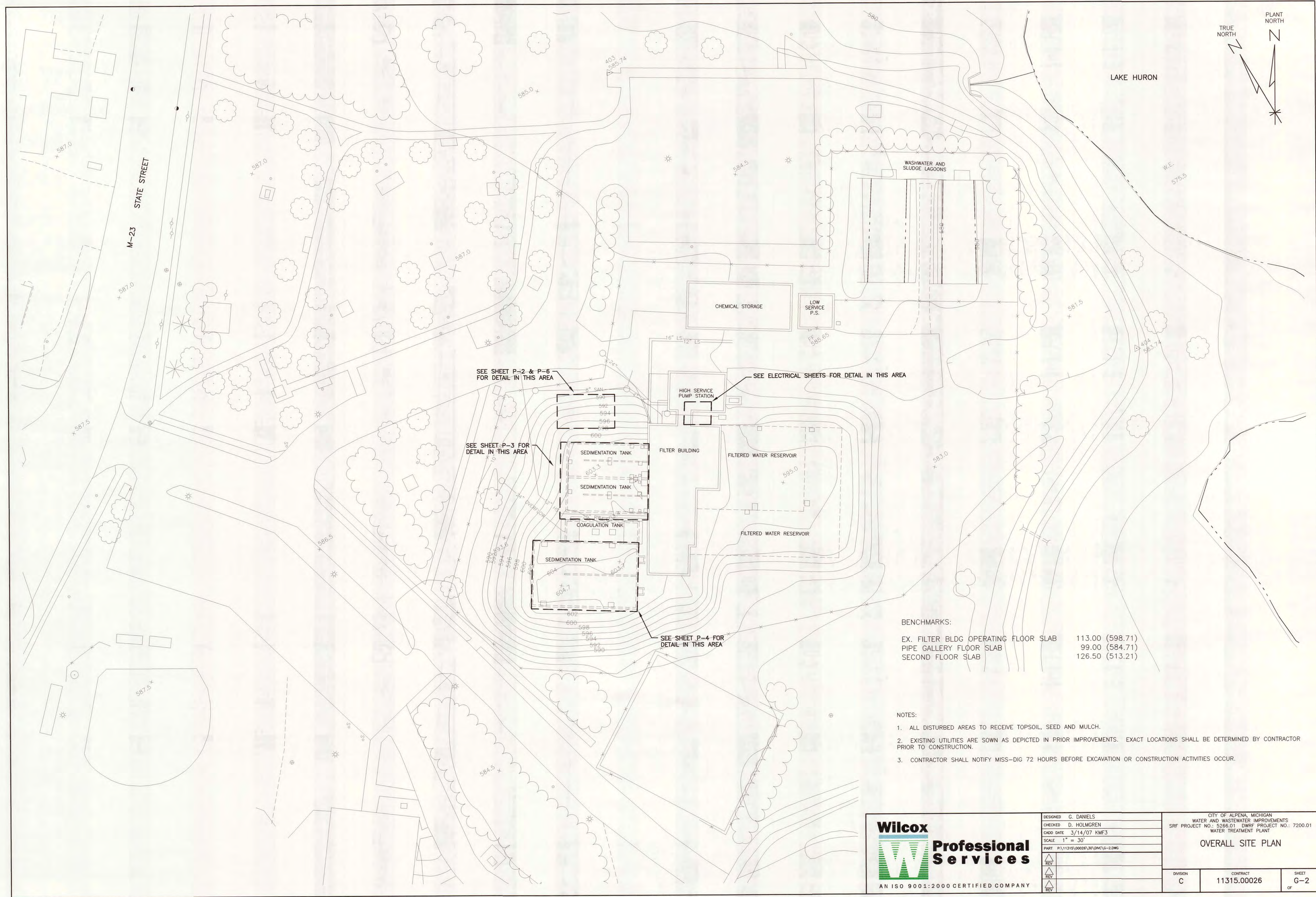
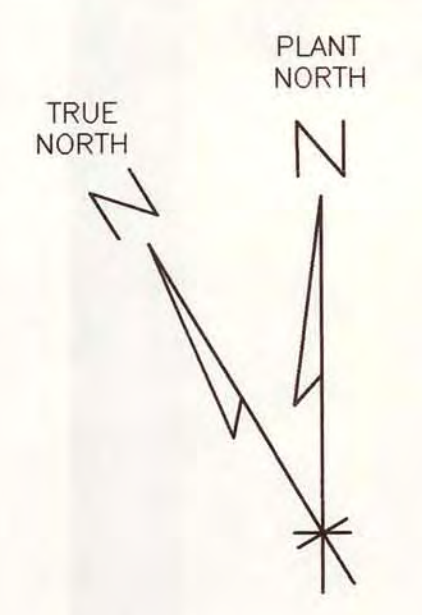
**SHEET INDEX**

SHEET NO.	DESCRIPTION
<b>GENERAL</b>	
G-1	INDEX, LEGEND AND LOCATION PLAN
G-2	OVERALL SITE PLAN
G-3	PROPOSED SITE PLAN
G-4	STANDARD DETAILS
<b>PIPING</b>	
P-1	LEGEND AND FLOW SCHEMATIC
P-2	YARD PIPING
P-3	NORTH SEDIMENTATION TANK - PIPING AND EQUIPMENT
P-4	SOUTH SEDIMENTATION TANK - PIPING AND EQUIPMENT
P-5	SEDIMENTATION TANKS - SECTIONS
P-6	SLUDGE COLLECTION EQUIPMENT CONTROL STRUCTURE
P-7	STANDARD DETAILS AND SCHEDULE
<b>ELECTRICAL</b>	
E-1	SEDIMENTATION TANKS ELECTRICAL
E-2	HIGH SERVICE PUMP STATION ELECTRICAL
E-3	ONE-LINE DIAGRAMS ELECTRICAL



DESIGNED	G. DANIELS
CHECKED	D. HOLMGREN
CADD DATE	6/17/07 KMF3
SCALE	NONE
PART	P:\11315\00026\30\OKC\INDEX.DWG
REV	
REV	
REV	

CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: 5256.01 DWRF PROJECT NO.: 7200.01 WATER TREATMENT PLANT		
<b>INDEX, LEGEND AND LOCATION PLAN</b>		
DIVISION	CONTRACT	SHEET
C	11315.00026	G-1
		OF



SEE SHEET P-2 & P-6 FOR DETAIL IN THIS AREA

SEE ELECTRICAL SHEETS FOR DETAIL IN THIS AREA

SEE SHEET P-3 FOR DETAIL IN THIS AREA

SEE SHEET P-4 FOR DETAIL IN THIS AREA

BENCHMARKS:

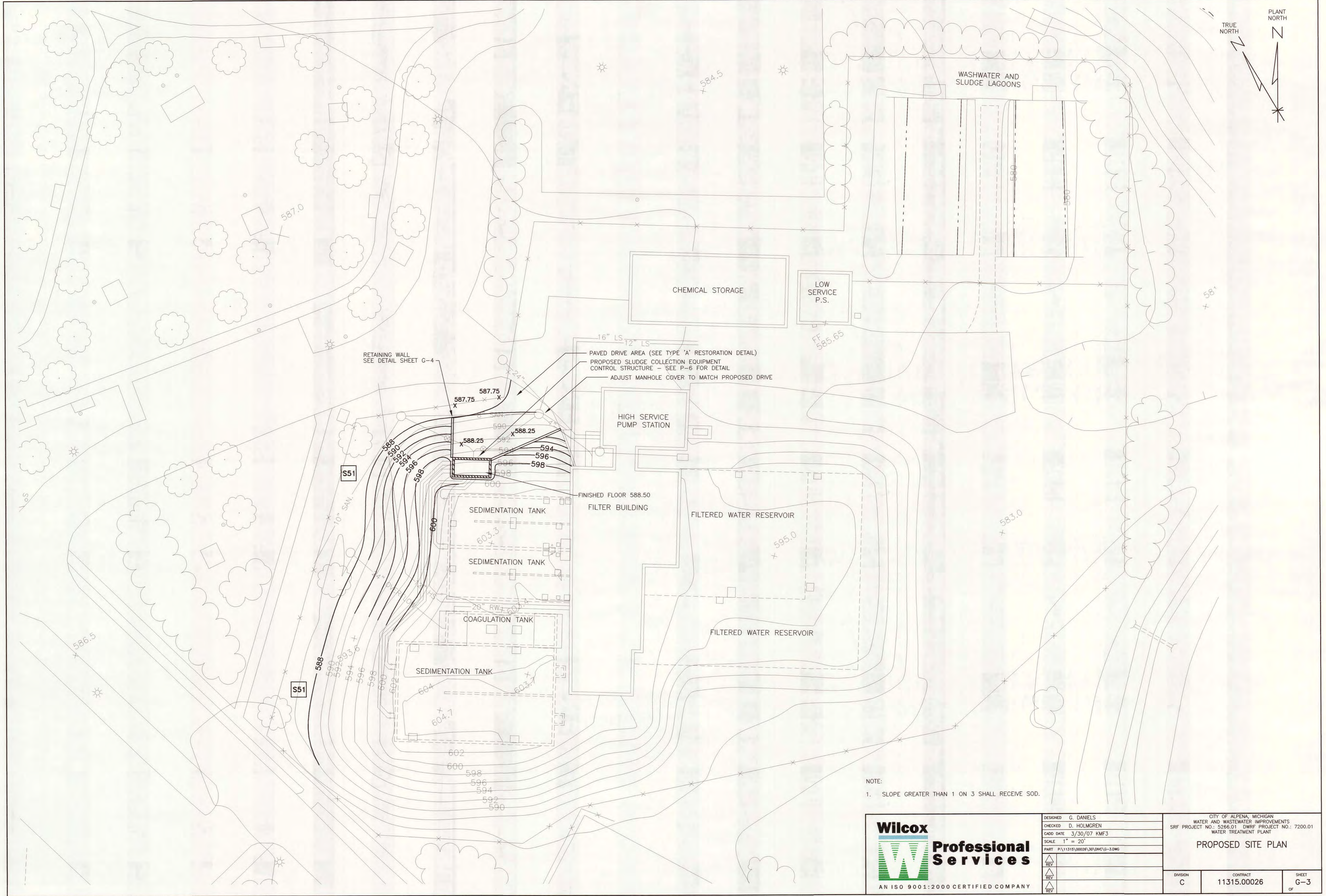
EX. FILTER BLDG OPERATING FLOOR SLAB	113.00 (598.71)
PIPE GALLERY FLOOR SLAB	99.00 (584.71)
SECOND FLOOR SLAB	126.50 (513.21)

- NOTES:
1. ALL DISTURBED AREAS TO RECEIVE TOPSOIL, SEED AND MULCH.
  2. EXISTING UTILITIES ARE SHOWN AS DEPICTED IN PRIOR IMPROVEMENTS. EXACT LOCATIONS SHALL BE DETERMINED BY CONTRACTOR PRIOR TO CONSTRUCTION.
  3. CONTRACTOR SHALL NOTIFY MISS-DIG 72 HOURS BEFORE EXCAVATION OR CONSTRUCTION ACTIVITIES OCCUR.

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DESIGNED	G. DANIELS
CHECKED	D. HOLMGREN
CADD DATE	3/14/07 KMF3
SCALE	1" = 30'
PART	PA\11315\00026\30\DWG\G-2.DWG
REV	
REV	
REV	
REV	

CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: 5266.01 DWRP PROJECT NO.: 7200.01 WATER TREATMENT PLANT		
<b>OVERALL SITE PLAN</b>		
DIVISION	CONTRACT	SHEET
C	11315.00026	G-2
		OF



RETAINING WALL  
SEE DETAIL SHEET G-4

PAVED DRIVE AREA (SEE TYPE 'A' RESTORATION DETAIL)  
PROPOSED SLUDGE COLLECTION EQUIPMENT  
CONTROL STRUCTURE - SEE P-6 FOR DETAIL  
ADJUST MANHOLE COVER TO MATCH PROPOSED DRIVE

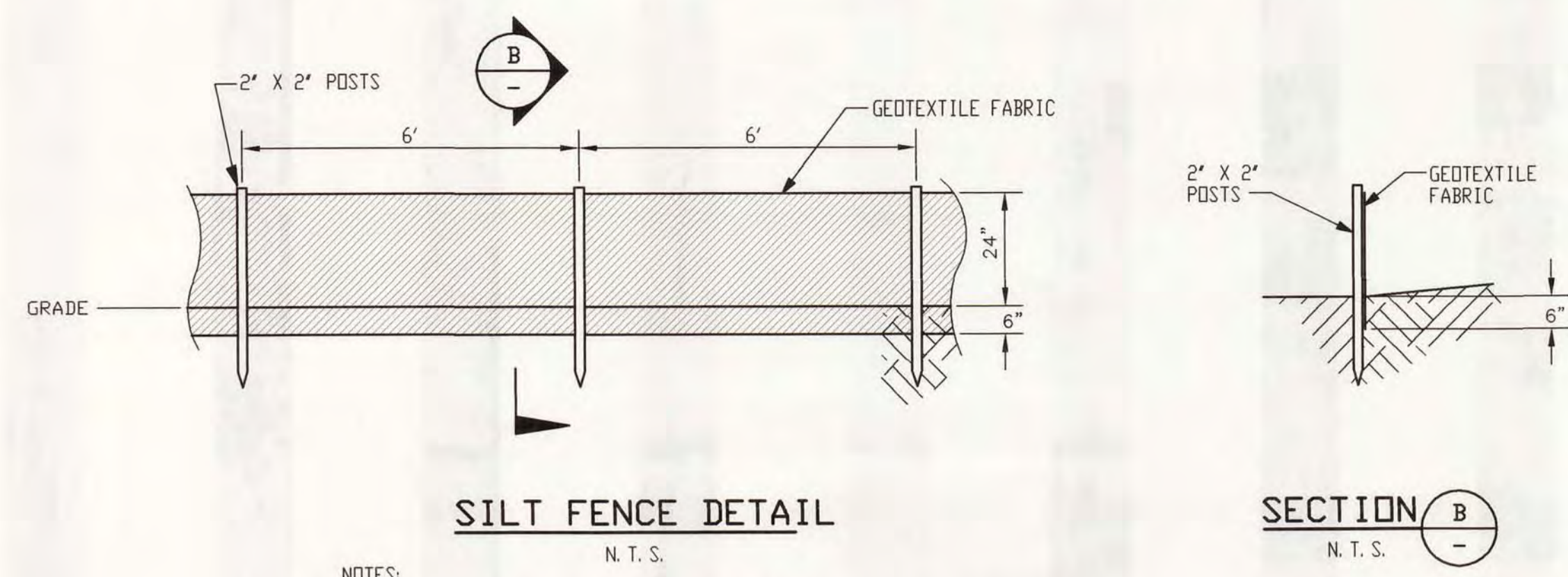
NOTE:  
1. SLOPE GREATER THAN 1 ON 3 SHALL RECEIVE SOD.

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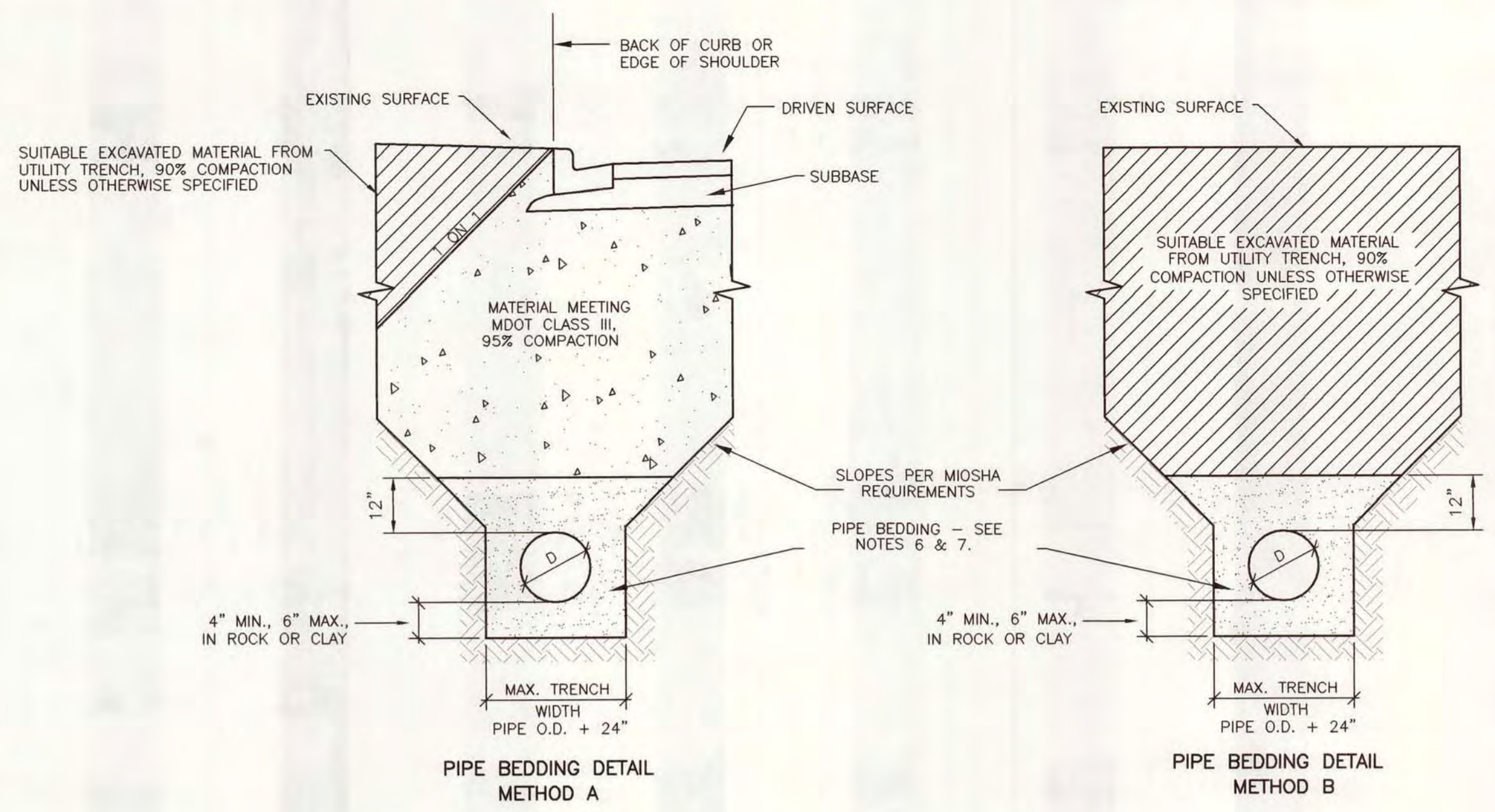
DESIGNED	G. DANIELS
CHECKED	D. HOLMGREN
ISSUE DATE	3/30/07 KMF3
SCALE	1" = 20'
PART	P:\11315\00026\30\DWG\G-3.DWG
REV	
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REV	

CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: 5266.01 DWRF PROJECT NO.: 7200.01 WATER TREATMENT PLANT		
PROPOSED SITE PLAN		
DIVISION	CONTRACT	SHEET
C	11315.00026	G-3
		OF

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
<b>EROSION CONTROLS</b>			
E6	MULCH		For use in areas subject to erosive surface flows or severe wind or on newly seeded areas.
E7	TEMPORARY SEEDING		Stabilization method utilized on construction sites where earth change has been initiated but not completed within a 2 week period.
E8	PERMANENT SEEDING		Stabilization method utilized on sites where earth change has been completed (final grading attained).
E9	MULCH BLANKETS		On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
E10	SOODING		On areas and slopes where immediate stabilization is required.
E12	RIPRAP		Use along shorelines, waterways, or where concentrated flows occur. Slows velocity, reduces sediment load, and reduces erosion.
E19	TEMPORARY DRAINAGEWAY / STREAM CROSSING		Use on construction sites where stream/drainageway crossings are required.
<b>EROSION / SEDIMENT CONTROLS</b>			
ES31	CHECK DAM		Used to reduce surface flow velocities within constructed and existing flow corridors.
ES33	FILTER ROLLS		In areas requiring immediate protection of slopes against surface erosion and gully formation and for perimeter sediment control.
<b>SEDIMENT CONTROLS</b>			
S51	SILT FENCE		Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
S56	SEDIMENT TRAP		In small drainage areas, along construction site perimeters, and above check dams or drain inlets.
S57	VEGETATED BUFFER/FILTER STRIP		Use along shorelines, waterways, or other sensitive areas. Slows velocity, reduces sediment load, and reduces erosion in areas of sheet flow.

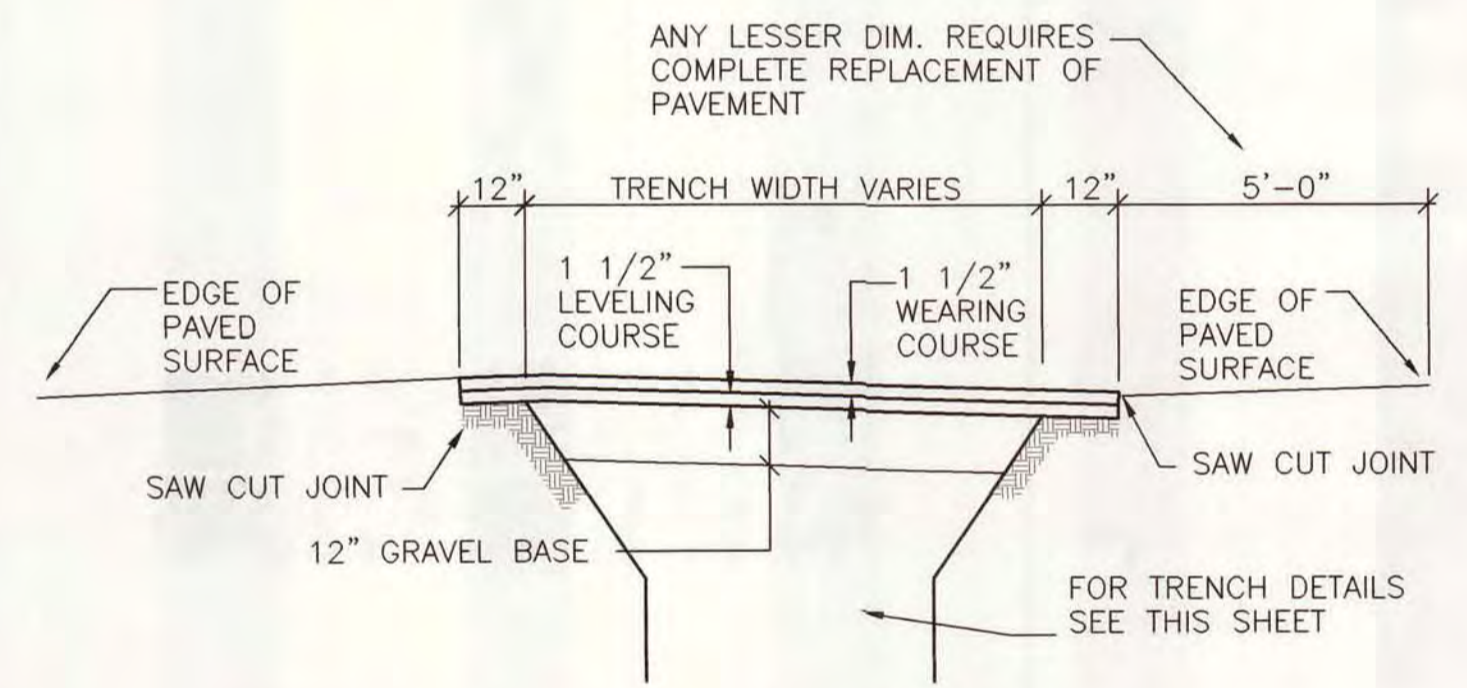


- NOTES:
- USE TERRATEX SILT BARRIER FENCE OR EQUAL.
  - PRIOR TO START OF CONSTRUCTION SLOPE PROTECTION AND EROSION CONTROL SHALL BE PERFORMED IN ACCORDANCE WITH THE "MICHIGAN SOIL EROSION AND SEDIMENTATION CONTROL GUIDEBOOK" AND "PUBLIC ACT NO. 347". THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY MEASURES REQUIRED TO PROPERLY CONTROL EROSION AND SEDIMENTATION AS MAY ARISE FROM CONDITIONS WHICH MAY DEVELOP DURING CONSTRUCTION. ALL COSTS RELATED TO EROSION OR SEDIMENTATION CONTROL MEASURES WHETHER SHOWN ON THE PLANS OR NOT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.



- NOTES:
- METHOD "A" IS FOR PIPE UNDER OR WITHIN THE INFLUENCE OF A DRIVEN SURFACE.
  - METHOD "B" IS FOR PIPE NOT UNDER OR WITH THE INFLUENCE OF A DRIVEN SURFACE.
  - BACKFILL MATERIALS AND METHODS SHALL CONFORM WITH THE SPECIFICATIONS.
  - COMPACTION PRESENTED AS STANDARD PROCTOR VALUES.
  - DRIVEN SURFACE IS A ROAD, DRIVEWAY, PARKING AREA OR SHOULDER.
  - BEDDING, 8" AND LARGER PIPE: MDOT 6A COARSE AGGREGATE OR MDOT CLASS I OR II GRANULAR MATERIAL EXCEPT WITH 100% PASSING 1-1/2" SIEVE.
  - BEDDING, 8" AND SMALLER PIPE: MDOT 3A4 OPEN GRADED AGGREGATE OR OTHER GRANULAR MATERIAL WITH 100% PASSING 1/2" SIEVE AND LESS THAN 5% PASSING A NO. 200 SIEVE.

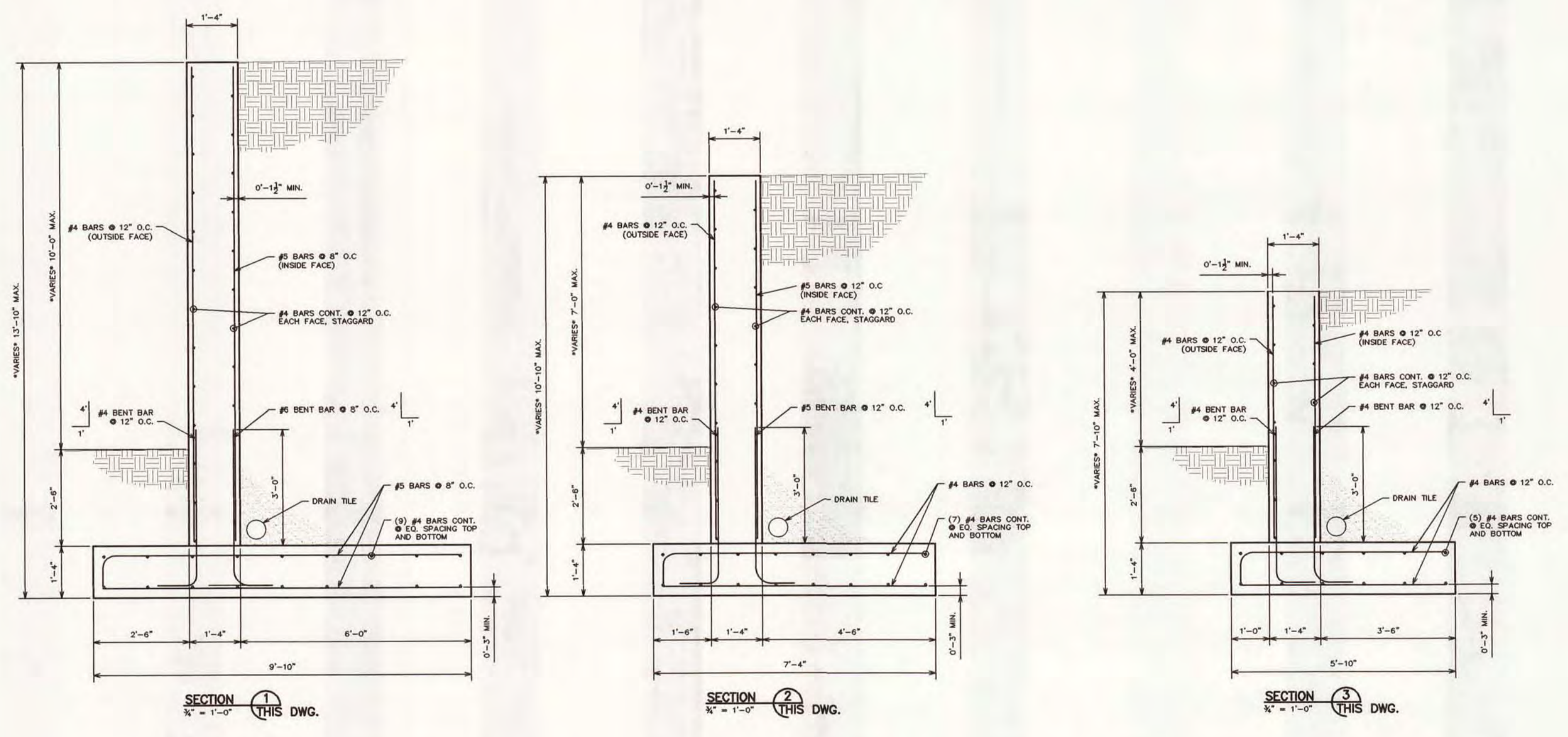
**TRENCH DETAILS**



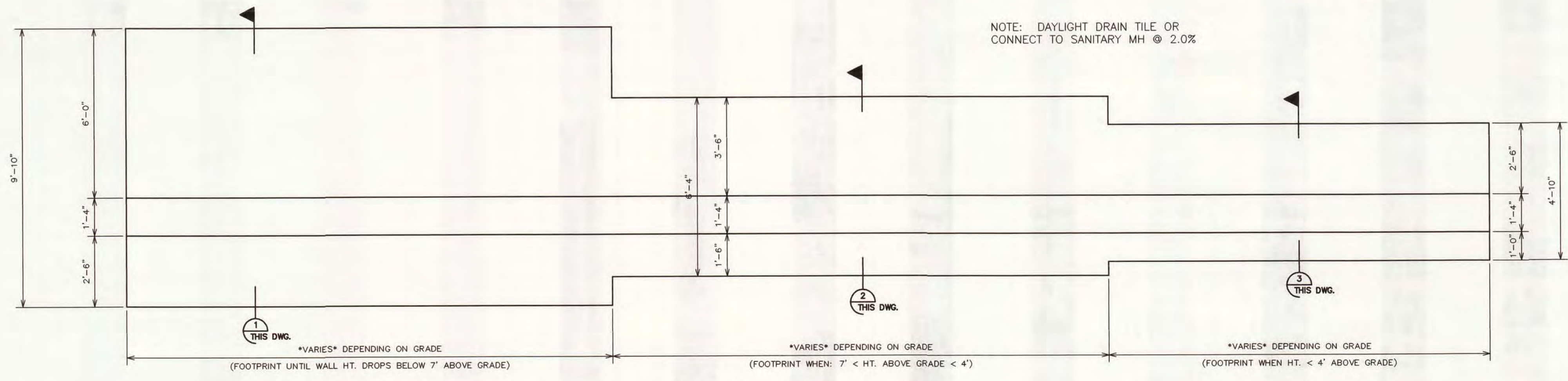
**TYPE A - SURFACE RESTORATION**

TYPICAL SURFACE RESTORATION CRITERIA *	
TYPE 'A' PAVEMENT **	FEW CROSS TRENCHES AND ONE LANE OR LESS MAIN TRENCH
6" SIDEWALK & RAMP	DRIVEWAY CROSSINGS, RAMPS AND ALL MDOT R.O.W.
4" SIDEWALK	CITY R.O.W.
6" CONCRETE DRIVEWAY	ALL EXISTING CONCRETE DRIVEWAYS (INCLUDES REINFORCING WIRE MESH)
TOPSOIL, SEED, FERTILIZER & MULCH	STREET R.O.W. (INCIDENTAL TO THE COST OF OTHER WORK ITEMS)

\* PAVEMENT REPLACEMENT SHALL BE OF THE TYPES NOTED ON THE PLAN SHEETS UNLESS ALTERED BY CHANGE ORDER.  
\*\* TYPE 'A' PAVEMENT SHALL INCLUDE FULL WIDTH ASPHALT REMOVAL AND REPLACEMENT WHERE NOTED ON THE DRAWINGS.



NOTE: DAYLIGHT DRAIN TILE OR CONNECT TO SANITARY MH @ 2.0%



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DESIGNED: G. DANIELS	CITY OF ALPENA, MICHIGAN
CHECKED: D. HOLMGREN	WATER AND WASTEWATER IMPROVEMENTS
CADD DATE: 3/30/07 KMF2	SRF PROJECT NO.: 5266.01 DWRF PROJECT NO.: 7200.01
SCALE: AS NOTED	WATER TREATMENT PLANT
PART: P:\11315\00026\30\DWG\C0-041	<b>STANDARD DETAILS</b>
REV: _____	DIVISION: C
REV: _____	CONTRACT: 11315.00026
REV: _____	SHEET: G-4
REV: _____	OF: _____

SACO PRODUCTS • NEW HOPE, MINNESOTA  
 DIVISION OF PAINT NUMBER 1000  
 IMPROVEMENTS 2007  
 SACO PRODUCTS • NEW HOPE, MINNESOTA  
 DIVISION OF PAINT NUMBER 1000

### VALVE DESIGNATIONS

SYMBOLS		MARK	TYPE
PIPEWORK DRAWINGS	FLOW DIAGRAMS		
		A	GATE VALVE
		NG	KNIFE GATE VALVE
		B	BUTTERFLY VALVE
		IB	INDUSTRIAL BUTTERFLY VALVE
		P	PLUG VALVE
		BV	BALL VALVE
		CC	CUSHION CHECK VALVE
		SC	SILENT CHECK VALVE
		RC	RADIAL CHECK VALVE

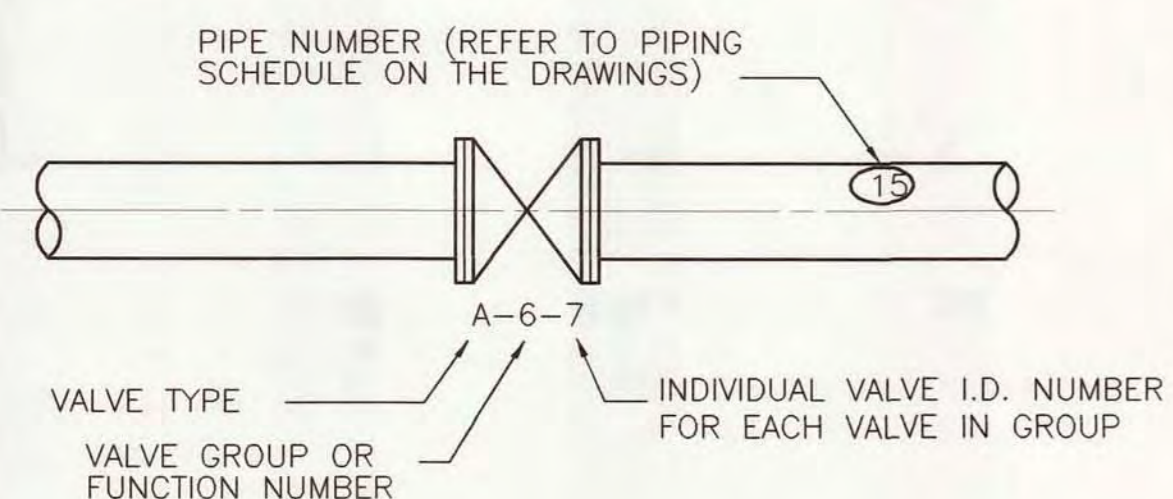
### JOINT DESIGNATIONS

SYMBOL	MARK	TYPE
	FJ	FLANGED JOINT
	MJ	MECHANICAL JOINT
	SJ	SCREWED JOINT
	BSL POJ	BELL AND SPIGOT LEAD JOINT PUSH ON JOINT
	BFC	BOLTED FLEXIBLE COUPLING
	BF	BLIND FLANGE
	AFC	ADAPTER FLANGE COUPLING

### SLEEVE DESIGNATIONS

SYMBOL	TYPE
	STEEL WALL SLEEVE
	FLANGE WALL PIPE
	MECHANICAL JOINT WALL PIPE

### VALVE & PIPE LEGEND



### LEGEND YARD PIPING SITE PLAN

	PROPOSED ABOVE GRADE STRUCTURE
	PROPOSED STRUCTURE (TANKS, ETC.)
	EXISTING ABOVE GRADE STRUCTURE
	EXISTING STRUCTURE (TANKS, ETC.)
	FUTURE STRUCTURE
	PROPOSED PIPING 30" AND SMALLER
	PROPOSED PIPING 36" AND LARGER
	EXISTING PIPING 30" AND SMALLER
	EXISTING PIPING 36" AND LARGER
	PROPOSED MANHOLE
	EXISTING MANHOLE
	PROPOSED VALVE BOX AND NUMBER
	EXISTING VALVE BOX
	PROPOSED VALVE MANHOLE AND NUMBER
	EXISTING VALVE MANHOLE
	PROPOSED FIRE HYDRANT ASSEMBLY
	EXISTING FIRE HYDRANT ASSEMBLY

### PIPING ABBREVIATION - LEGEND

HS	HIGH SERVICE
SL	SLUDGE

### PIPE JOINT - LEGEND

AFC	ADAPTER FLANGE COUPLING
BFC	BOLTED FLEXIBLE COUPLING
BSC	BELL AND SPIGOT CONCRETE
BSL	BELL AND SPIGOT LEAD
BSS	BELL AND SPIGOT STEEL
FJ	FLANGED JOINT
GC	GROOVED COUPLING
MJ	MECHANICAL JOINT
POJ	PUSH-ON JOINT
SJ	SCREWED JOINT
STJ	SOCKET TYPE JOINT
WJ	WELDED JOINT
FWJ	FIELD WELDED JOINT
CC	COMPATIBLE COUPLING

### VALVE OPERATOR SCHEDULE

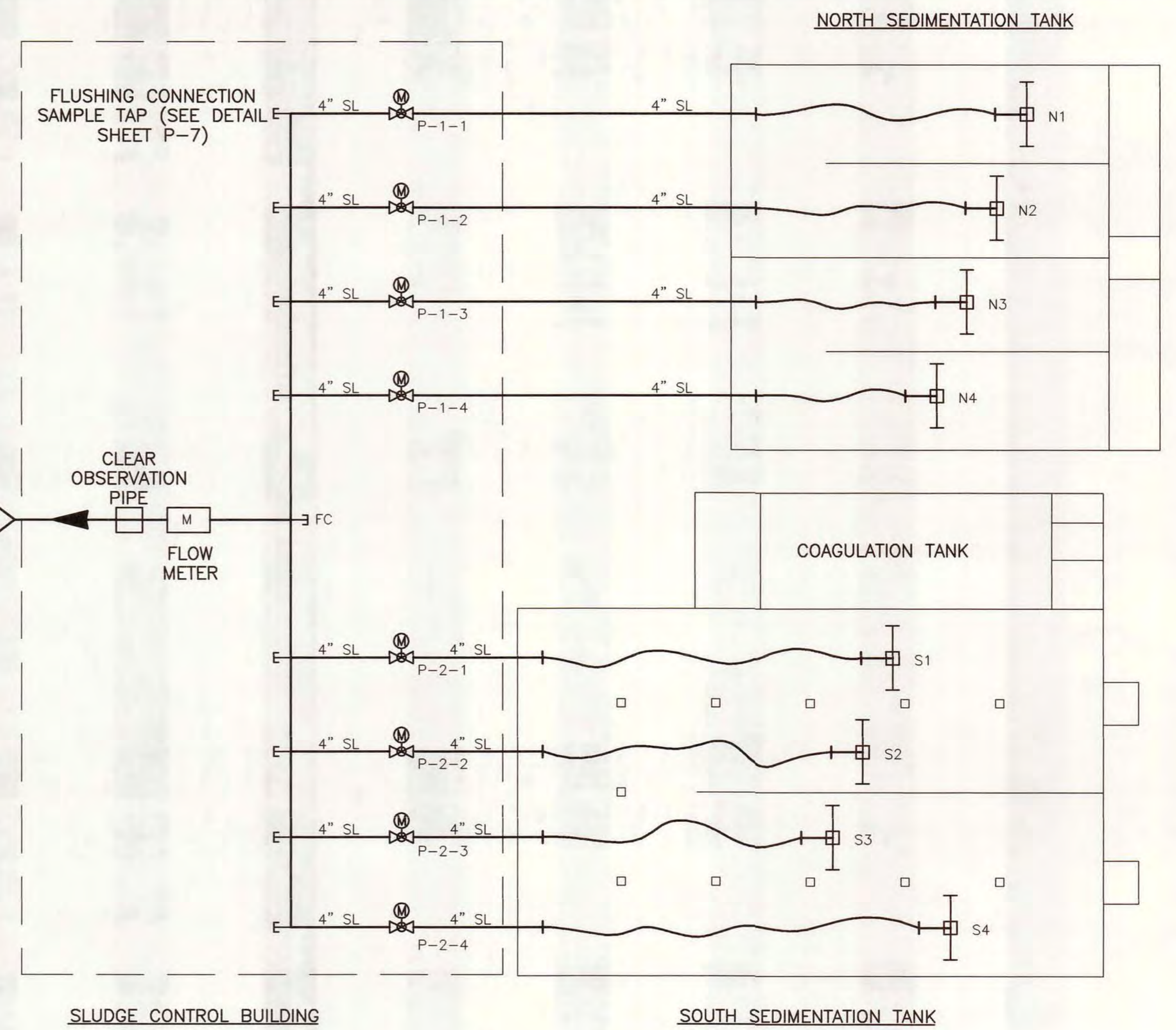
VALVE	JOINT
FJ	FLANGED JOINT
MJ	MECHANICAL JOINT
PJ	PUSH-ON JOINT
SJ	SCREWED JOINT
W	WAFER
WJ	WELDED JOINT

### OPERATORS (SCHEMATICS ONLY)

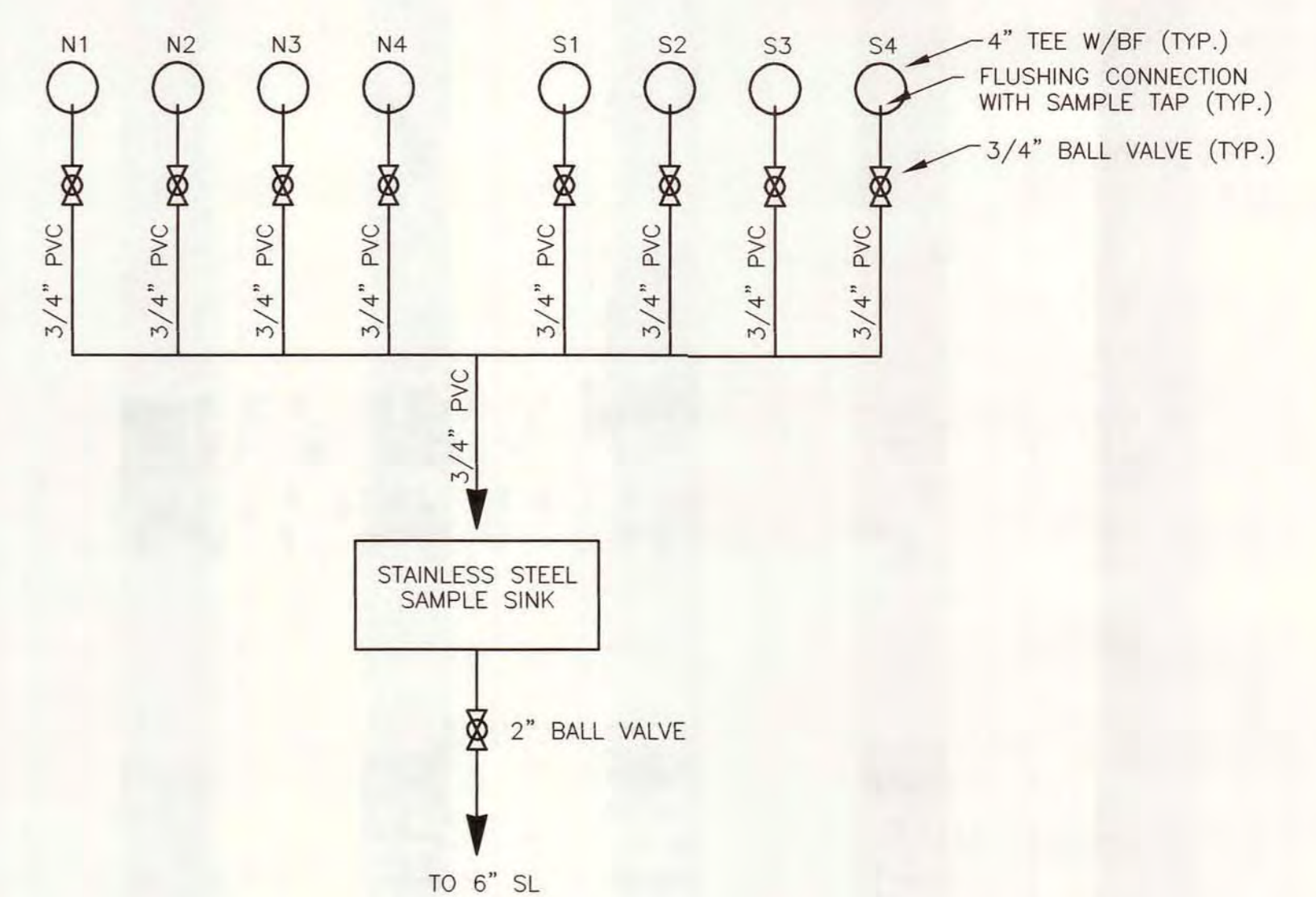
SYMBOL	TYPE
	PNEUMATIC
	ELECTRIC
	HYDRAULIC
<b>THROTTLING SERVICE</b>	
	PNEUMATIC
	ELECTRIC
	HYDRAULIC
<b>OPEN - SHUT SERVICE</b>	

### PIPING AND VALVES GENERAL NOTES

1. PIPING AND PIPING SUPPORTS TO BE INSTALLED IN COMPLIANCE WITH ANSI B31.1 AND ASME B31.1.
2. ALL GROUND BURIED PIPING SHALL BE INSTALLED WITH A MINIMUM 6'-0" OF COVER OVER THE TOP OF THE PIPE.
3. PLUG VALVES, BUTTERFLY VALVES, AND BALL VALVES TO BE INSTALLED WITH THE OPERATING STEM HORIZONTAL UNLESS NOTED OTHERWISE ON THE DRAWINGS OR IN THE SCHEDULE.
4. TAPS IN PROCESS PIPING SHALL BE DIRECTLY THREADED IN DUCTILE IRON PIPE FOR TAPS 1-INCH IN DIAMETER OR LESS. LARGER TAPS SHALL USE A SADDLE. TAPS SHALL BE INSTALLED AS FOLLOWS:
  - ON THE SIDE OF THE PIPE FOR SAMPLE TAPS.
  - ON THE TOP OF THE PIPE FOR PRESSURE TAPS.
  - ON THE SIDE OF THE PIPE UNLESS SHOWN OTHERWISE FOR CHEMICAL FEED TAPS.
5. ALL FERROUS PIPING SUPPORTS AND ANCHORAGE HARDWARE SHALL BE (HDG) HOT DIP GALVANIZED AFTER FABRICATION OR STAINLESS STEEL.



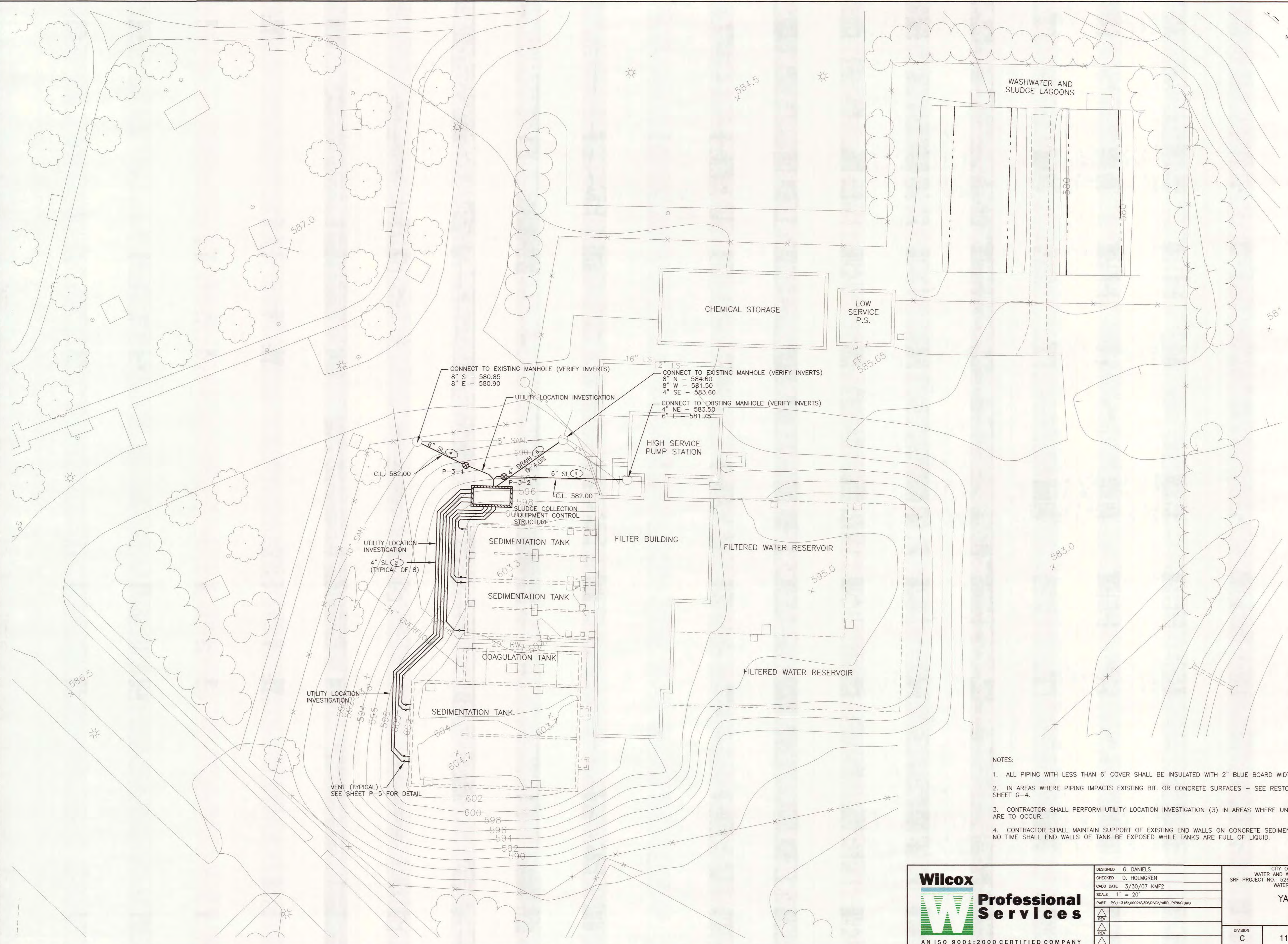
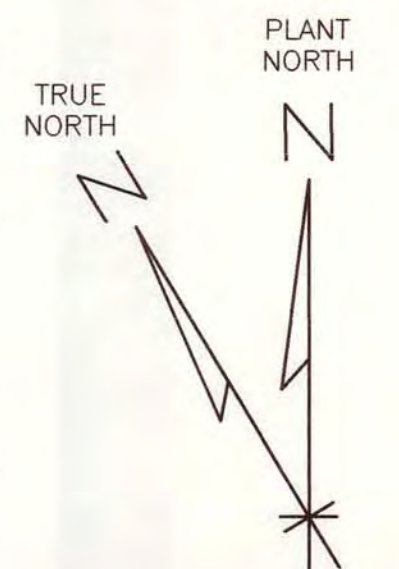
SLUDGE FLOW SCHEMATIC



SLUDGE SAMPLE SCHEMATIC

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DESIGNED	G. DANIELS	CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: 5266.01 DWRF PROJECT NO.: 7200.01 WATER TREATMENT PLANT <b>LEGEND AND FLOW SCHEMATIC</b>	
CHECKED	D. HOLMGREN		
CADD DATE	3/30/07 KMF3		
SCALE	AS NOTED		
PART	P\11315\00026\30\DWCF-P-1		
REV		DIVISION	C
REV		CONTRACT	11315.00026
REV		SHEET	P-1
REV		OF	



- NOTES:
1. ALL PIPING WITH LESS THAN 6' COVER SHALL BE INSULATED WITH 2" BLUE BOARD WIDTH OF TRENCH.
  2. IN AREAS WHERE PIPING IMPACTS EXISTING BIT. OR CONCRETE SURFACES - SEE RESTORATION DETAILS ON SHEET G-4.
  3. CONTRACTOR SHALL PERFORM UTILITY LOCATION INVESTIGATION (3) IN AREAS WHERE UNDERGROUND ACTIVITIES ARE TO OCCUR.
  4. CONTRACTOR SHALL MAINTAIN SUPPORT OF EXISTING END WALLS ON CONCRETE SEDIMENTATION TANKS. AT NO TIME SHALL END WALLS OF TANK BE EXPOSED WHILE TANKS ARE FULL OF LIQUID.

**Wilcox**  
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DESIGNED	G. DANIELS
CHECKED	D. HOLMGREN
CADD DATE	3/30/07 KMF2
SCALE	1" = 20'
PART	P:\11315\00026\30\DWG\YARD-PPING.DWG
REV	
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CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: 5266.01 DWRP PROJECT NO.: 7200.01 WATER TREATMENT PLANT		
<b>YARD PIPING</b>		
DIVISION	CONTRACT	SHEET
C	11315.00026	P-2
		OF

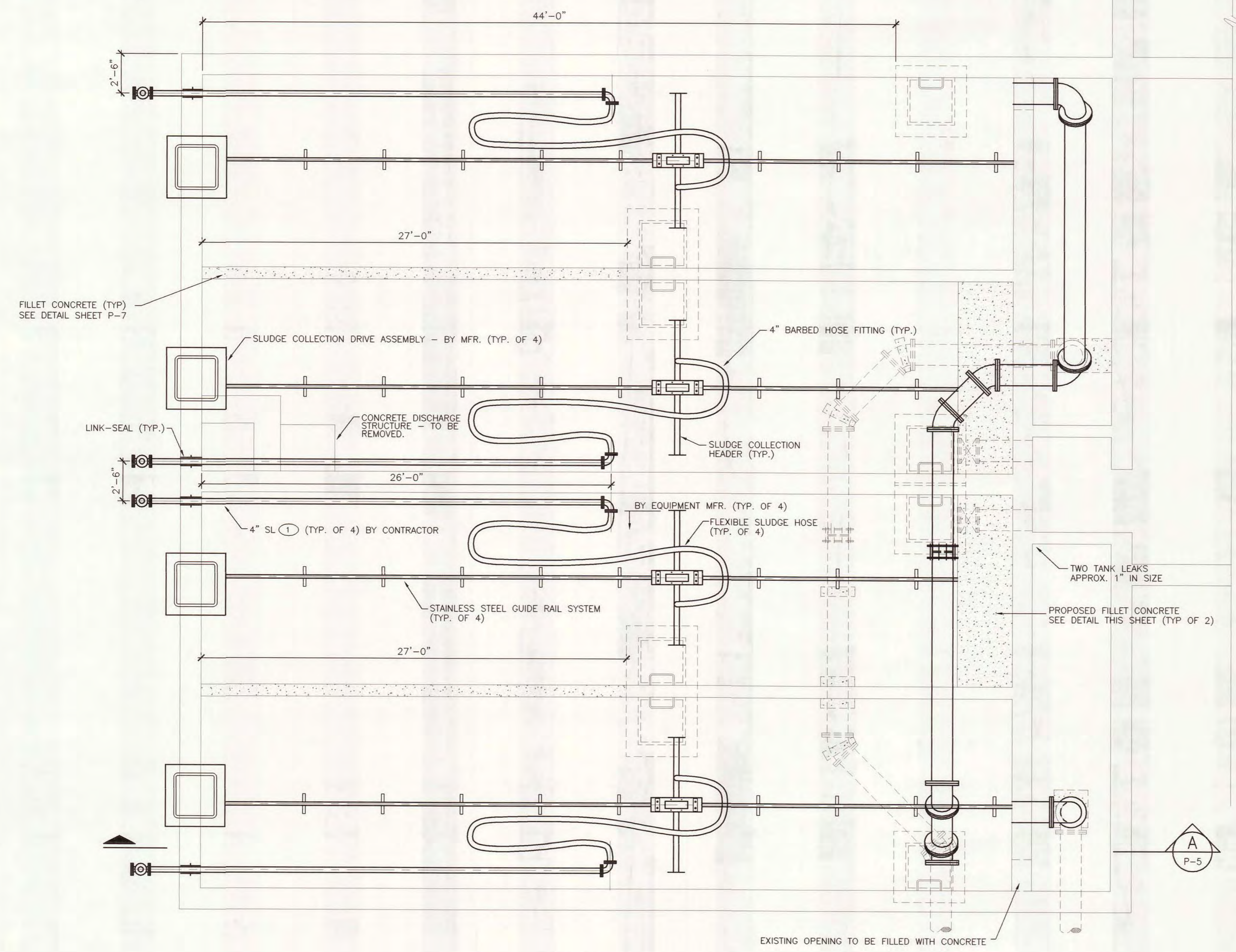
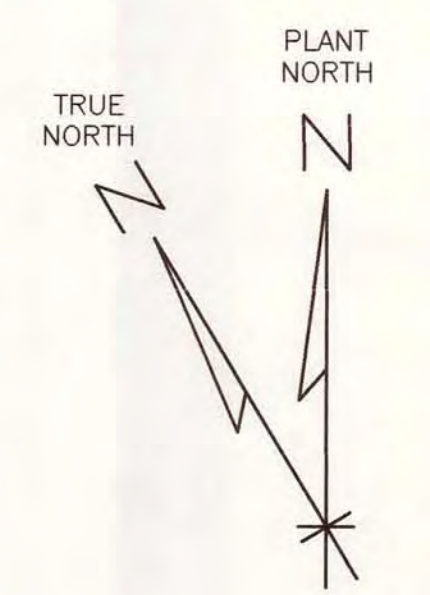
DRAWING NUMBER  
7/15

DRAWING NUMBER  
7/15

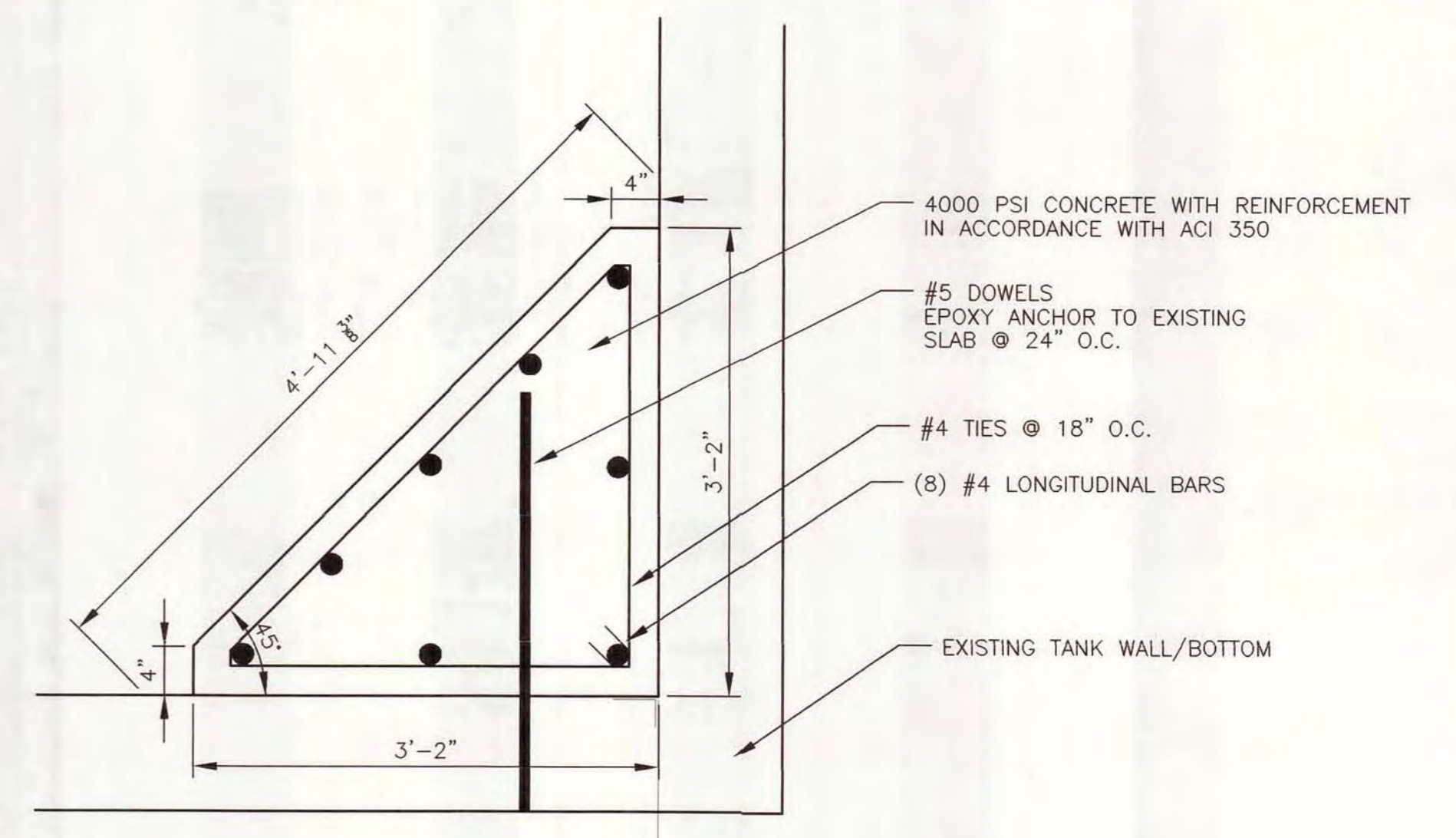
DRAWING NUMBER  
WATER AND WASTEWATER IMPROVEMENTS  
2007

DRAWING NUMBER

SACO PRODUCTS • NEW HOPE, MINNESOTA  
 DESIGNED BY PART NUMBER 6552



**NORTH  
SEDIMENTATION TANKS**  
SCALE: 1/4"=1'-0"



**FILLET CONCRETE DETAIL**  
NO SCALE

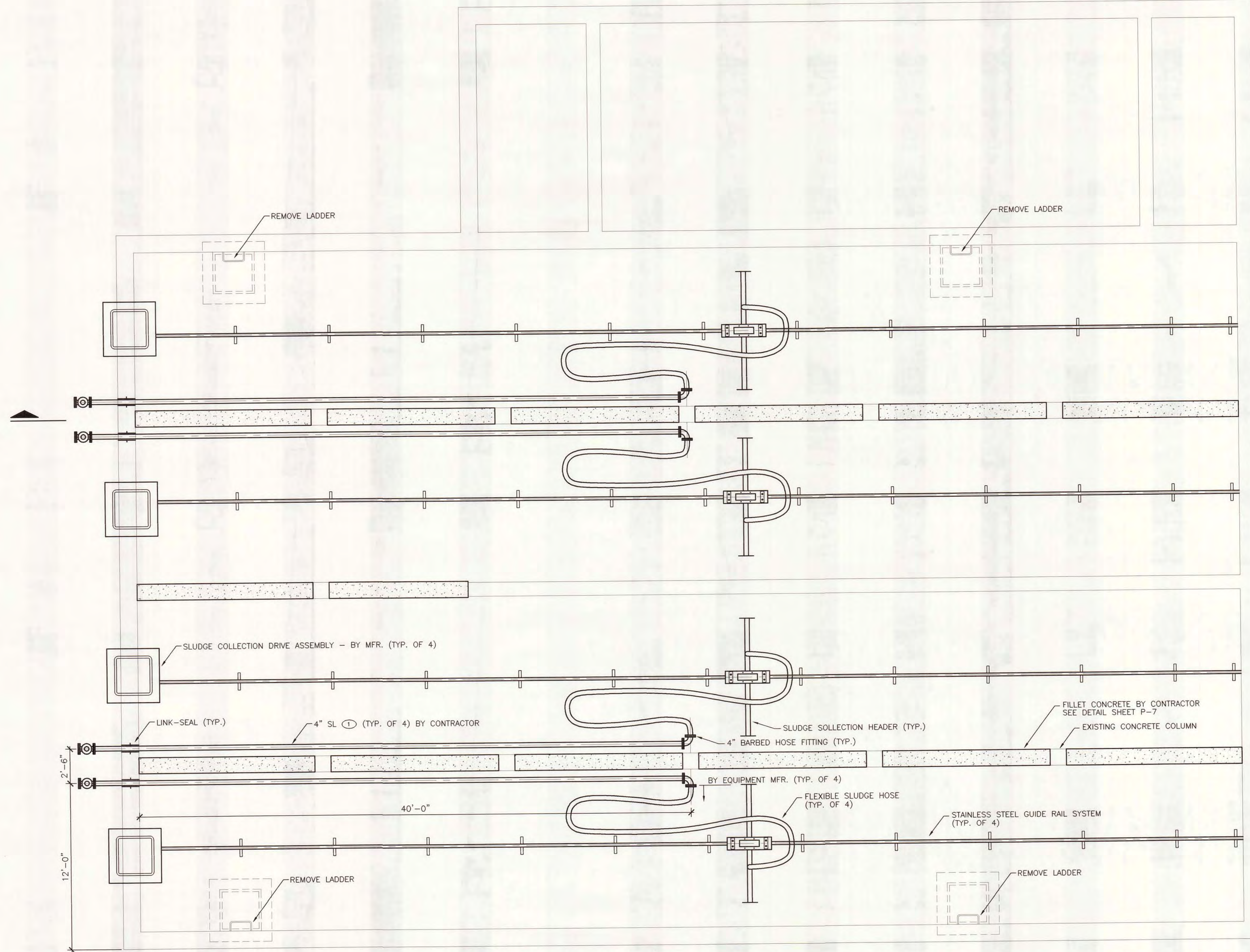
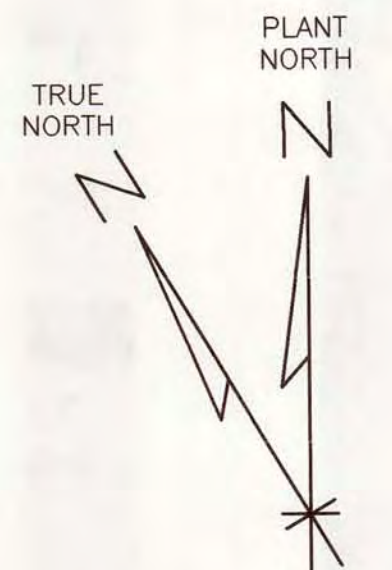
- NOTES:
1. CONTRACTOR SHALL AT NO TIME HAVE MORE THAN ONE SEDIMENTATION TANK OUT OF SERVICE. THIS INCLUDES THE SOUTH TANK.
  2. EXISTING 16" PIPING, CONCRETE, AND CONCRETE SUPPORTS LOCATED INSIDE OF THE TANK SHALL BE REMOVED AND DISPOSED OF BY CONTRACTOR.
  3. CONNECTIONS TO EXISTING PIPING SHALL BE MADE WITH SERIES 2100 MEGA-FLANGE FITTINGS BY EBBA IRON.
  4. ALL PENETRATIONS SHALL BE CORED, SLEEVED, AND DOUBLE LINK SEALED.
  5. ALL ABANDONED PENETRATIONS SHALL BE FILLED WITH CONCRETE.
  6. TWO IDENTIFIED LEAKS SHALL BE REPAIRED. LOOSE CONCRETE SHALL BE REMOVED AND THE VOID INJECTED WITH FLEXIBLE EPOXY RESIN.
  7. IF NECESSARY, LADDERS SHALL BE MODIFIED TO ALLOW FOR PROPER OPERATION OF COLLECTION HEADERS AND RE-ATTACHED WITH STAINLESS STEEL HARDWARE.

**Wilcox**  
**Professional Services**  
AN ISO 9001:2000 CERTIFIED COMPANY

DESIGNED	G. DANIELS
CHECKED	D. HOLMGREN
CADD DATE	5/29/07 KMF3
SCALE	AS NOTED
PART	P:\11315\00026\30\DWG\usedtank
REV	
REV	
REV	

CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: 5266.01 DWRF PROJECT NO.: 7200.01 WATER TREATMENT PLANT		
<b>NORTH SEDIMENTATION TANKS PIPING AND EQUIPMENT</b>		
DIVISION	CONTRACT	SHEET
C	11315.00026	P-3
		OF





**SOUTH  
SEDIMENTATION TANK**  
SCALE: 1/4"=1'-0"

- NOTES:
1. CONTRACTOR SHALL AT NO TIME HAVE MORE THAN ONE SEDIMENTATION TANK OUT OF SERVICE. THIS INCLUDES THE NORTH TANKS.
  2. IF NECESSARY, LADDERS SHALL BE MODIFIED TO ALLOW FOR PROPER OPERATION OF COLLECTION HEADERS AND RE-ATTACHED WITH STAINLESS STEEL HARDWARE.

DESIGNED	G. DANIELS
CHECKED	D. HOLMGREN
CADD DATE	5/29/07 JKD4
SCALE	AS NOTED
PART	P:\11315\00026\30\DWG\SeedTank
REV	
REV	
REV	
REV	

CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: 5266.01 DWRP PROJECT NO.: 7200.01 WATER TREATMENT PLANT		
<b>SOUTH SEDIMENTATION TANK PIPING AND EQUIPMENT</b>		
DIVISION	CONTRACT	SHEET
C	11315.00026	P-4
		OF

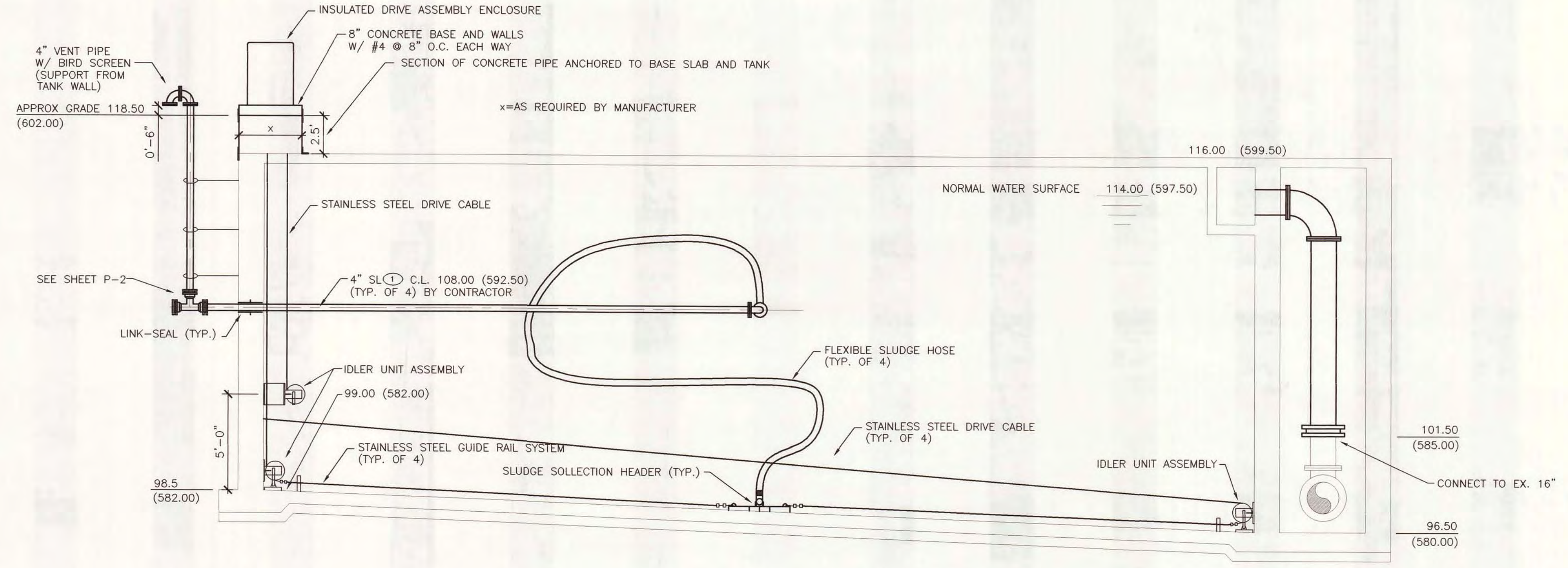


DRAWING NUMBER  
SAFCO PRODUCTS • NEW HOPE, MINNESOTA  
REORDER BY PART NUMBER 8552

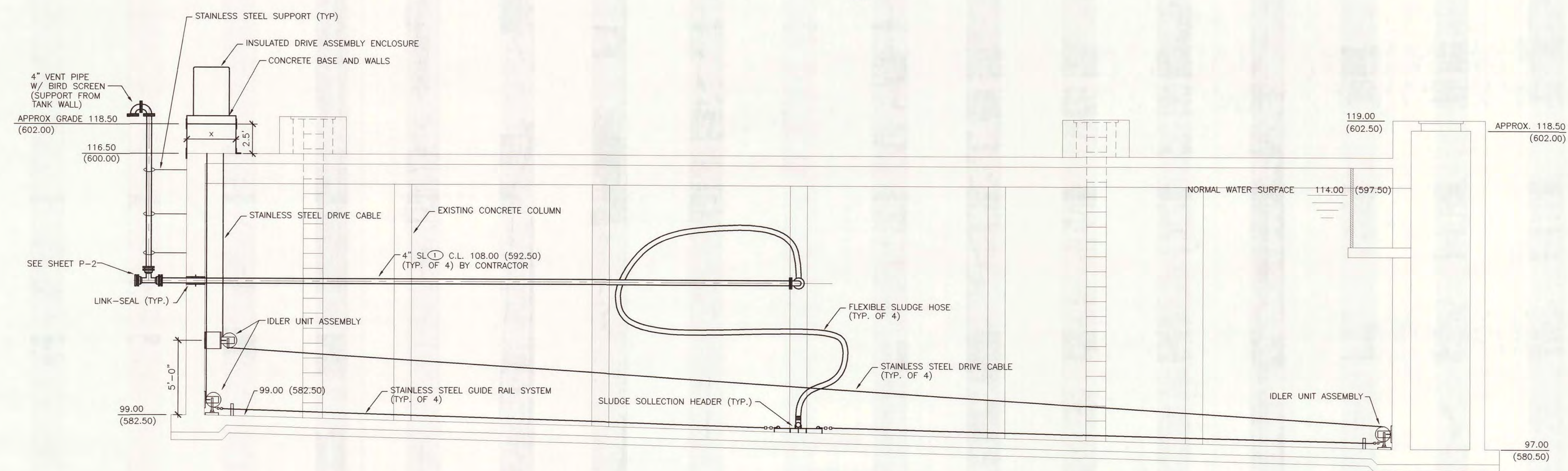
DRAWING NUMBER  
9/15  
SAFCO PRODUCTS • NEW HOPE, MINNESOTA  
REORDER BY PART NUMBER 8552

DRAWING NUMBER  
WATER AND WASTEWATER  
IMPROVEMENTS  
2007  
SAFCO PRODUCTS • NEW HOPE, MINNESOTA  
REORDER BY PART NUMBER 8552

DRAWING NUMBER  
SAFCO PRODUCTS • NEW HOPE, MINNESOTA  
REORDER BY PART NUMBER 8552



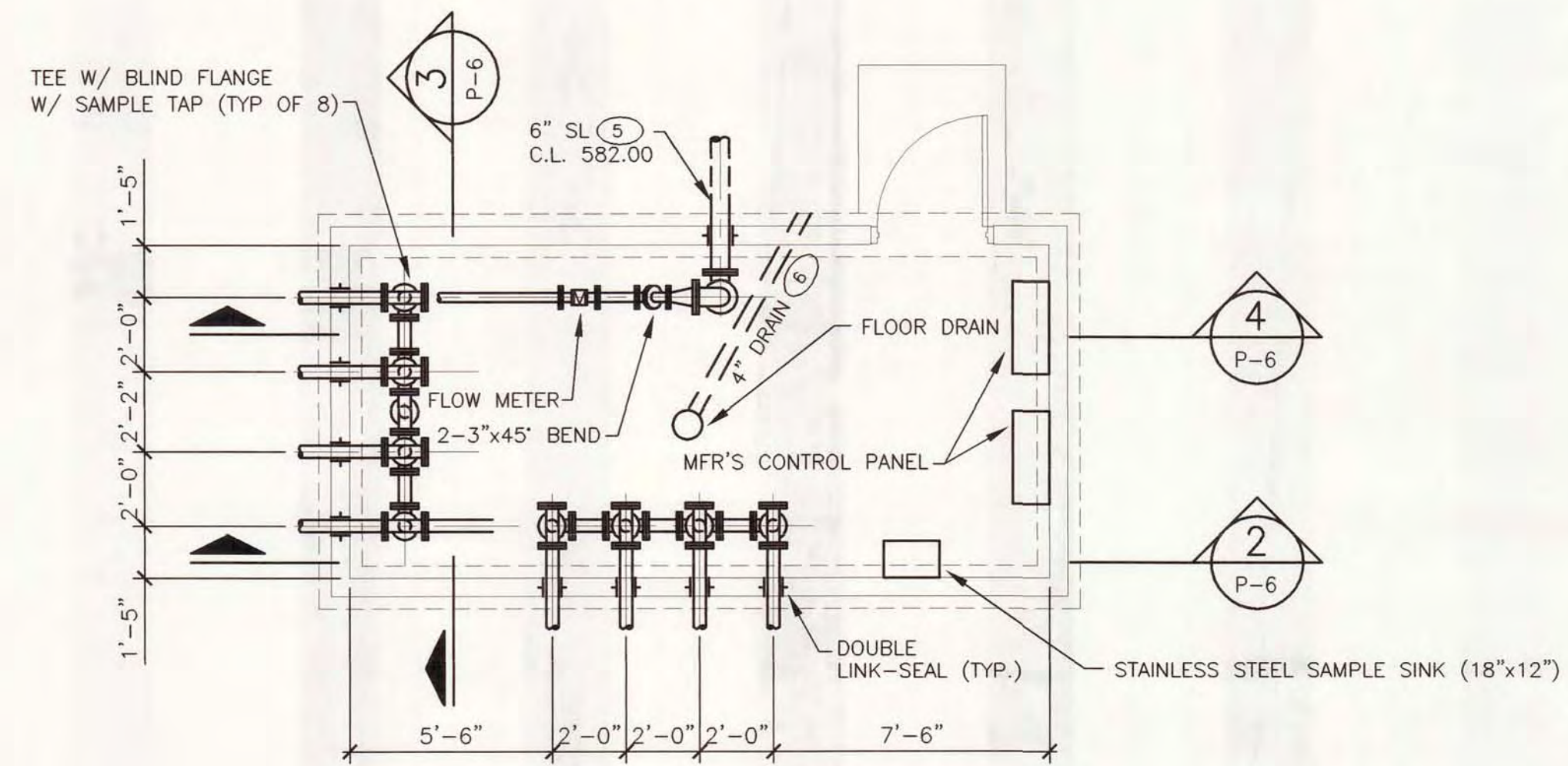
SECTION A  
 SCALE: 1/4"=1'-0"  
 P-3



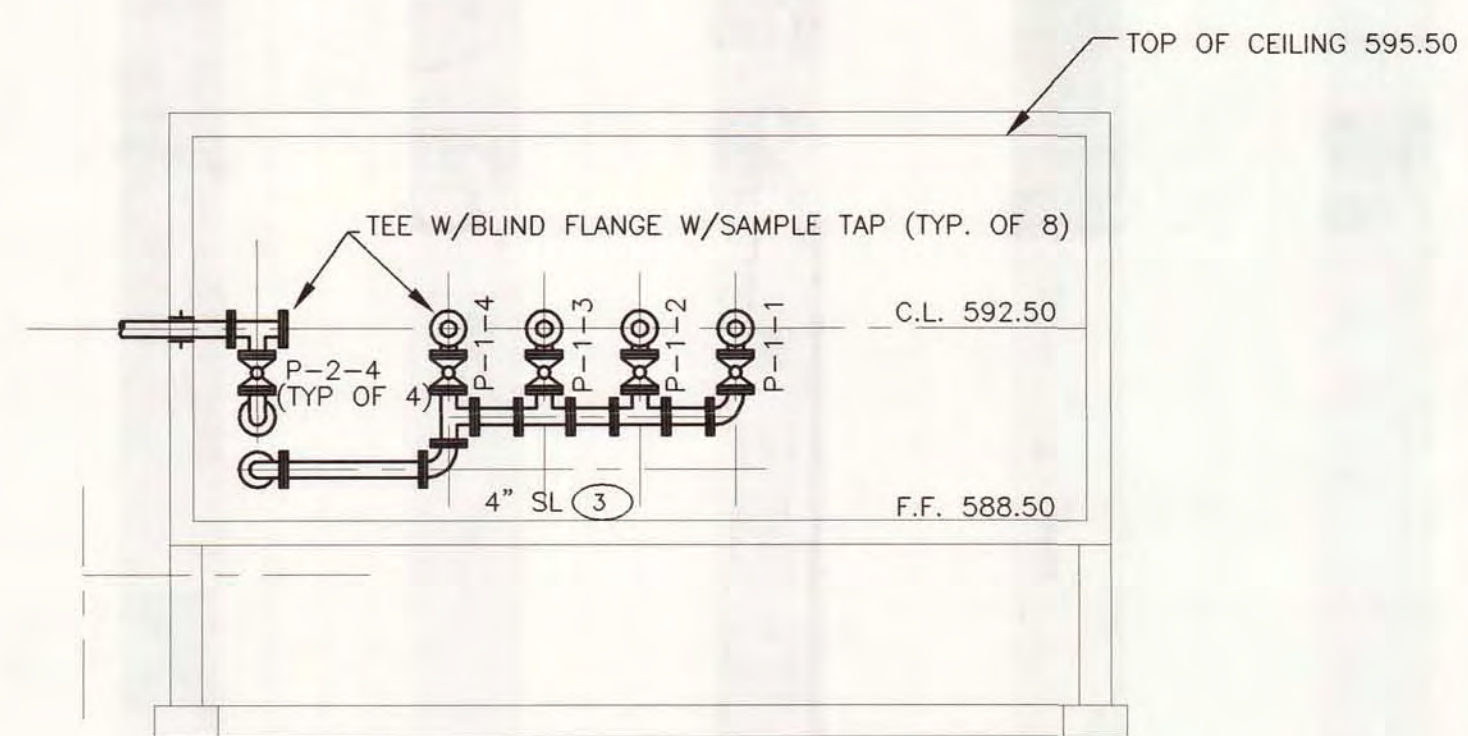
SECTION B  
 SCALE: 1/4"=1'-0"  
 P-4

NOTES:  
 1. WHERE EXISTING LADDERS ARE IN CONFLICT WITH SLUDGE COLLECTION EQUIPMENT THEY SHALL BE CUT TO AVOID CONFLICT AND RE-ATTACHED TO WALL WITH SS ANCHORS.

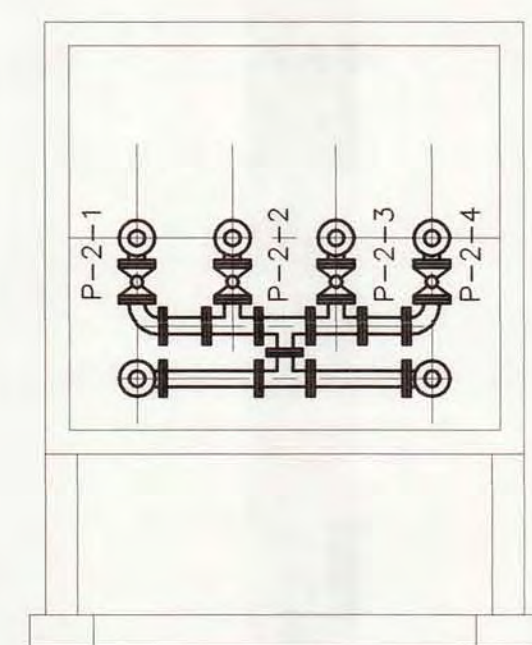
<p>AN ISO 9001:2000 CERTIFIED COMPANY</p>	DESIGNED G. DANIELS CHECKED D. HOLMGREN CADD DATE 3/30/07 KMF2 SCALE AS NOTED PART P:\11315\0002\30\DWG\SECTION-1	CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: 5266.01 DWRP PROJECT NO.: 7200.01 WATER TREATMENT PLANT	
	DIVISION C	CONTRACT 11315.00026	SHEET P-5 OF
	SEDIMENTATION TANKS SECTIONS		
	REVISIONS		



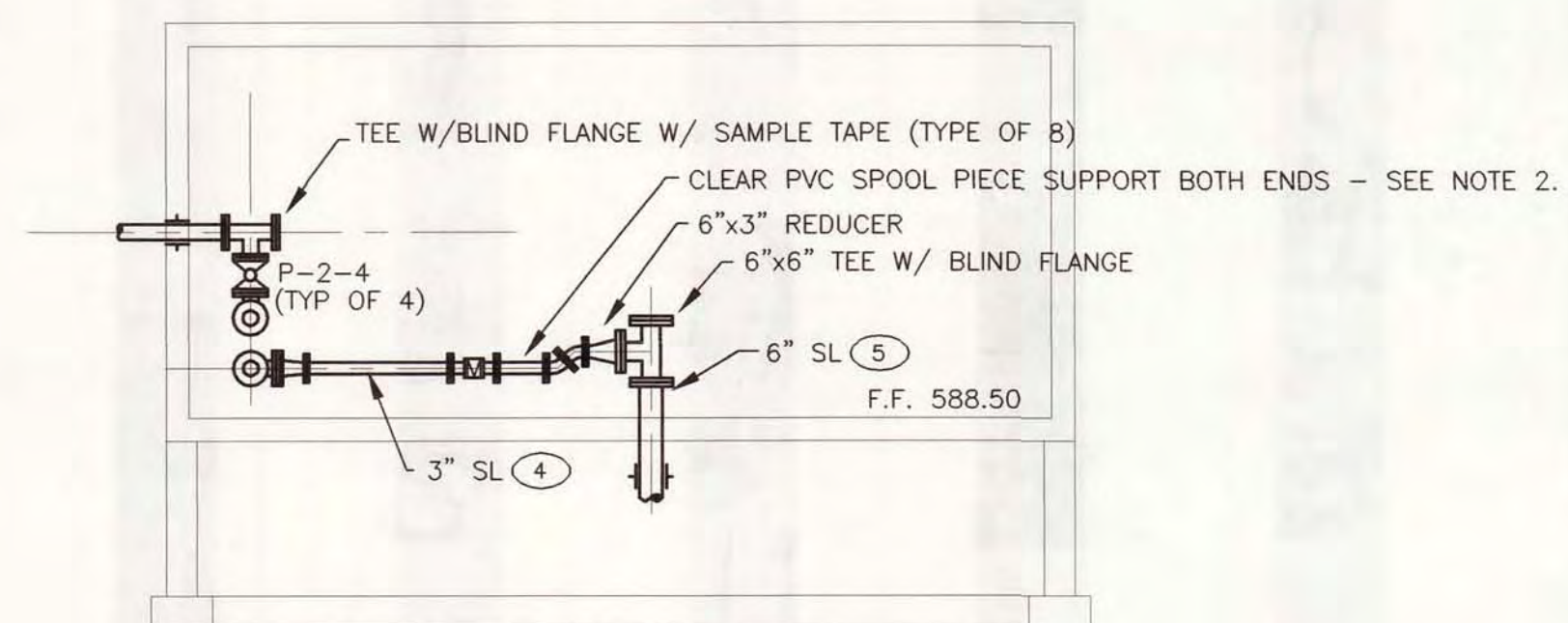
**SLUDGE COLLECTION EQUIPMENT CONTROL STRUCTURE-PIPING**  
SCALE: 1/4"=1'-0"



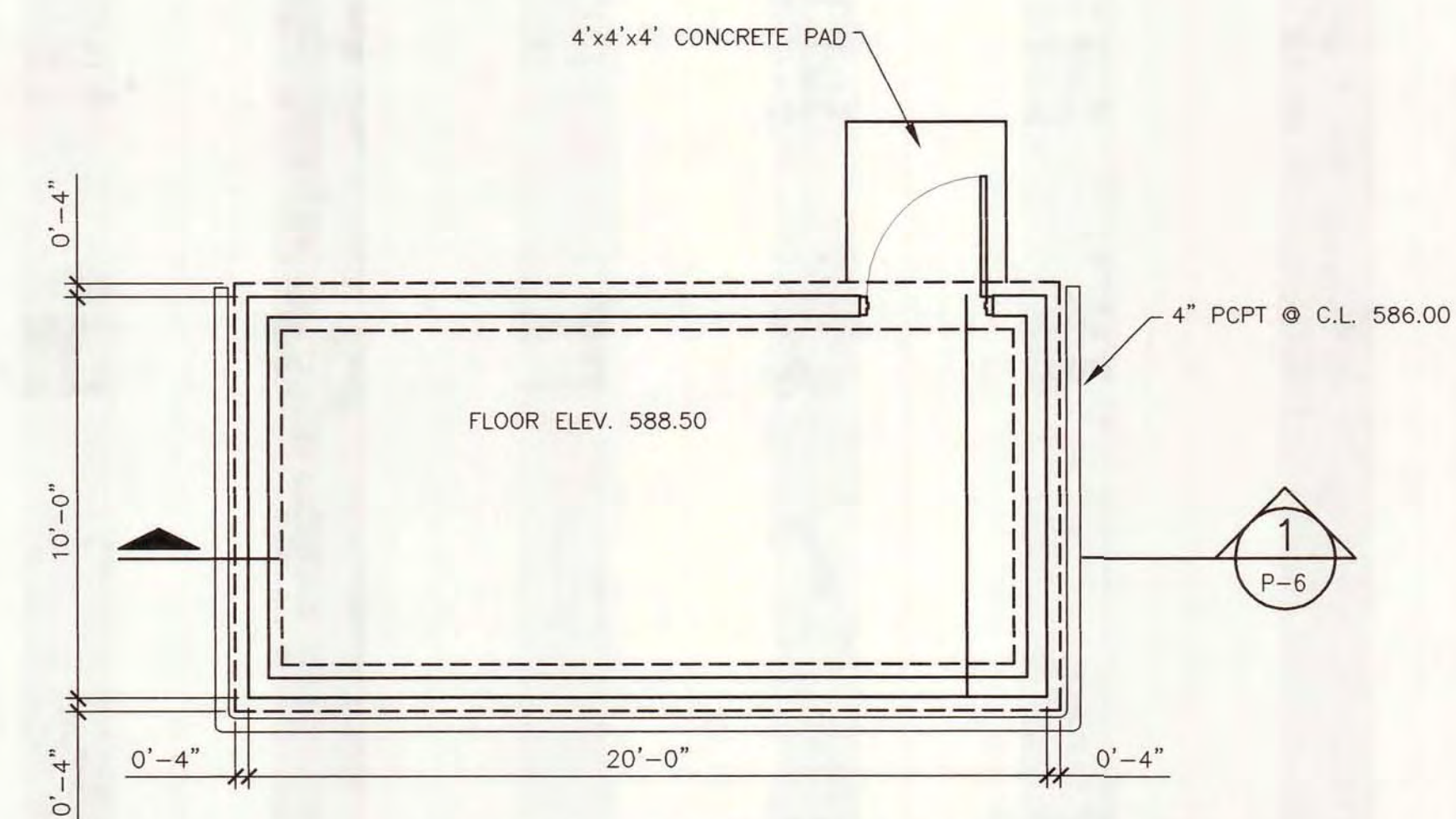
**SECTION 2**  
SCALE: 1/4"=1'-0"



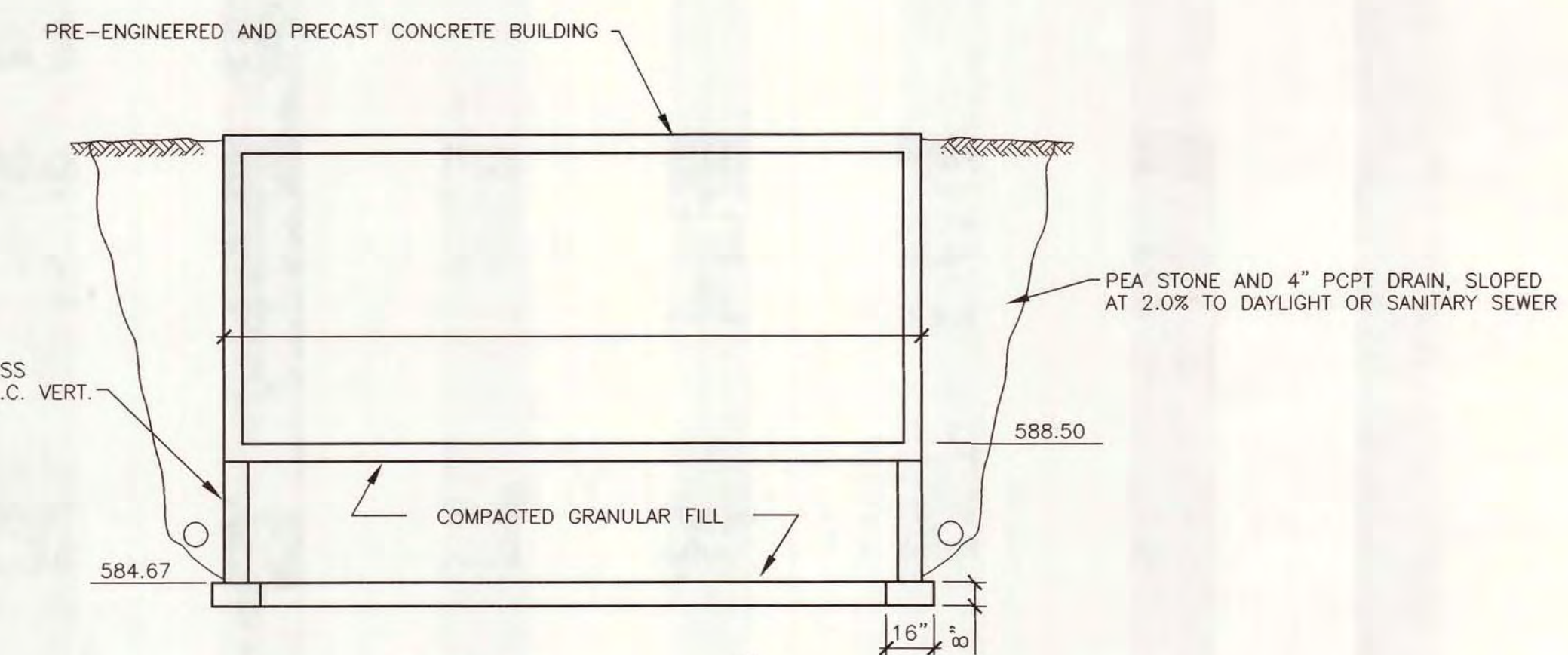
**SECTION 3**  
SCALE: 1/4"=1'-0"



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



**SLUDGE COLLECTION EQUIPMENT CONTROL STRUCTURE**  
SCALE: 1/4"=1'-0"



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

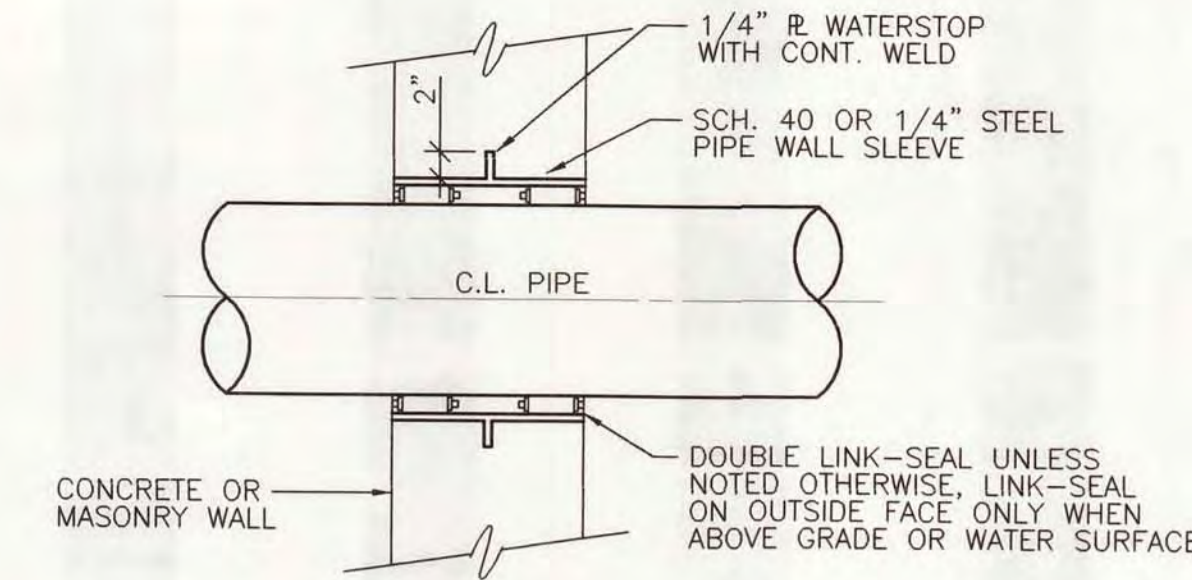
- NOTES:
- SEE SHEET P-1 AND P-7 FOR SLUDGE SAMPLING DETAILS.
  - PROVIDE SCHEDULE 80 CLEAR PVC SPOOL PIECE DOWNSTREAM OF FLOW METER. PROVIDE SPARE DIP SPOOL PIECE.

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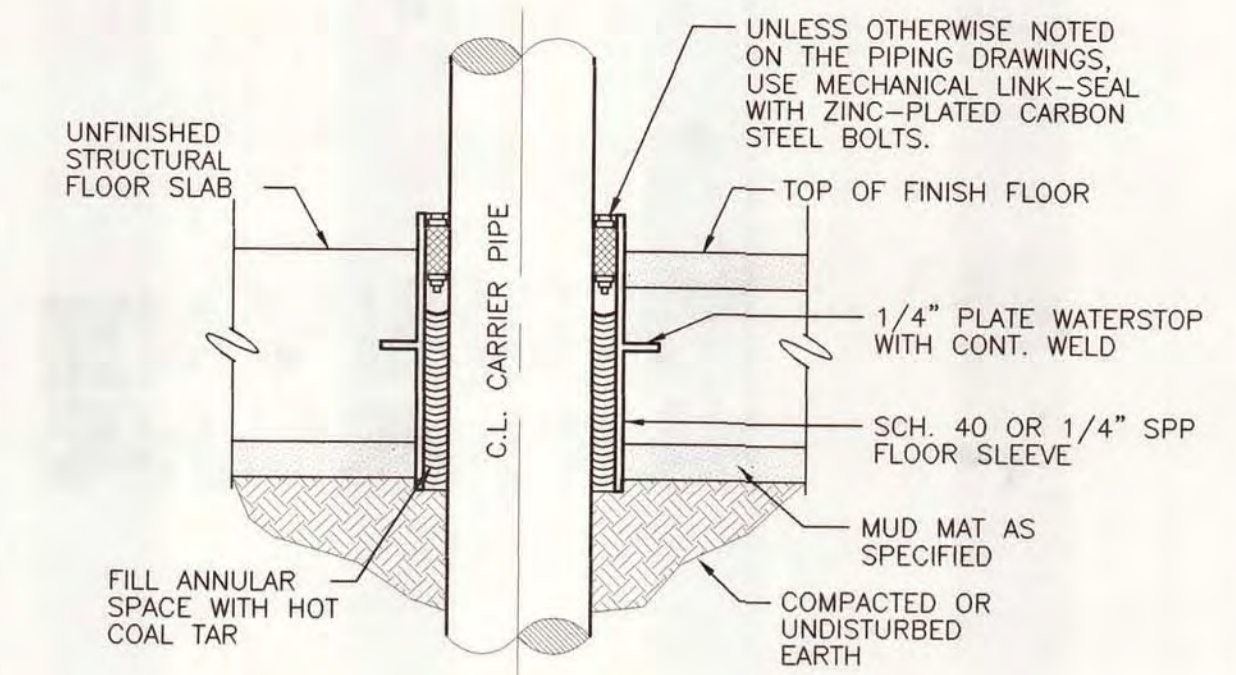
DESIGNED G. DANIELS	CITY OF ALPENA, MICHIGAN	
CHECKED D. HOLMGREN	WATER AND WASTEWATER IMPROVEMENTS	
DATE 3/30/07	SRF PROJECT NO.: 5266.01	DWRF PROJECT NO.: 7200.01
SCALE AS NOTED	WATER TREATMENT PLANT	
PART P:\PROJECTS\11315\00026\30\DWG\CONTROL-1	<b>SLUDGE COLLECTION EQUIPMENT CONTROL STRUCTURE</b>	
REV	DIVISION C	SHEET P-6
REV	CONTRACT 11315.00026	OF

PIPE SCHEDULE								
MARK	LOCATION	SERVICE	SIZE (INCHES)	MATERIAL	JOINT	EXPOSED OR BURIED	TEST PRESSURE	REMARKS
1	SEDIMENTATION TANKS	SL	4	DIP	FL	EXPOSED	75 PSI	CL. 350
2	YARD	SL	4	DIP	MJ	BURIED	125 PSI	CL. 350
3	SLUDGE CONTROL STRUCTURE	SL	4	DIP	FL	EXPOSED	75 PSI	CL. 350
4	YARD	SL	3	DIP	FL	EXPOSED	75 PSI	CL. 350
5	YARD	SL	6	DIP	MJ	BURIED	125 PSI	CL. 350
6	YARD	DRAIN	4	SDR 26 PVC	PJ	BURIED	5 PSI	-
7	-	-	-	-	-	-	-	-

VALVE SCHEDULE									
MARK	LOCATION	SERVICE	SIZE (IN.)	QUANTITY	JOINT	OPERATOR	ACCESSORIES	REMARKS	
P-1-1 THRU 4	SLUDGE CONTROL STRUCTURE	SL	4	4	FJ	M	-	OPEN/SHUT SERVICE, FC, 120V SERVICE	
P-2-1 THRU 4	SLUDGE CONTROL STRUCTURE	SL	4	4	FJ	M	-	OPEN/SHUT SERVICE, FC, 120V SERVICE	
P-3-1 & P-3-2	SLUDGE COLLECTION MANHOLE	SL	6	2	MJ	WN	VB, ES	-	
P-	-	-	-	-	-	-	-	-	-
P-	-	-	-	-	-	-	-	-	-
P-	-	-	-	-	-	-	-	-	-
P-	-	-	-	-	-	-	-	-	-
P-	-	-	-	-	-	-	-	-	-
P-	-	-	-	-	-	-	-	-	-
P-	-	-	-	-	-	-	-	-	-
P-	-	-	-	-	-	-	-	-	-
P-	-	-	-	-	-	-	-	-	-



TYPICAL PIPE PENETRATION IN EXTERIOR WALL OR TANK WALL  
NO SCALE



TYPICAL PIPE SLEEVE THROUGH BASE FLOOR SLAB FOR PIPING 4" DIA. AND LARGER  
NO SCALE

PIPE RESTRAINT SCHEDULE  
GROUND BURIED PRESSURE PIPE - DUCTILE IRON AND PVC PIPE

PIPE DIAMETER	TEES, 90° BENDS	45° BENDS	22-1/2° BENDS	11-1/4° BENDS	DEAD ENDS	REDUCERS (ONE SIZE REDUCTION)*	REDUCERS (TWO SIZE REDUCTION)*
4	11	5	2	1	28	--	--
6	16	7	3	2	41	21	--
8	21	9	4	2	52	21	49
12	30	12	6	3	75	40	81
16	38	16	8	4	97	41	96
20	46	19	9	5	118	42	94
24	54	22	11	5	139	42	92
30	65	27	13	6	169	59	117
36	75	31	15	7	197	59	132

LENGTHS OF PIPE RESTRAINT ARE GIVEN IN FEET.

IF REQUIRED PIPE DIAMETER IS NOT LISTED IN THIS TABLE, THE NEXT LARGEST PIPE DIAMETER SHALL BE USED.

THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE PLUS WATER HAMMER. FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY.

THE VALUES PROVIDED OF RESTRAINT LENGTH ARE IN EACH DIRECTION FROM THE POINT OF DEFLECTION OR TERMINATION EXCEPT FOR TEES, AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE STEM.

IF THE RODS ARE USED, USE FOUR RODS MINIMUM AND ADD 1/8-INCH TO BAR DIAMETER AS CORROSION ALLOWANCE.

\* SIZE REDUCTION IS BASED UPON THE PIPE DIAMETER SHOWN IN THIS TABLE.

BASED UPON:  
INTERNAL PRESSURE: 180  
PIPE DEPTH: 5  
BEDDING CLASS: TYPE 4  
SOIL TYPE: GOOD SAND  
SAFETY FACTOR: 2

GENERAL PIPEWORK SCHEDULE KEY

THE FOLLOWING PIPE SCHEDULE GIVES THE DESIGNATION FOR EACH PIPE LINE, PIPE SIZE, JOINT MATERIAL, SERVICE AND OTHER PERTINENT DATA. THE KEY OF SYMBOLS FOR THE SCHEDULE IS AS FOLLOWS:  
PIPE MATERIAL

PROCESS PIPING

- BSP BLACK STEEL PIPE
- CSIP CHROME SILICON IRON PIPE
- DIP DUCTILE IRON PIPE
- FRP FIBERGLASS REINFORCED PIPE
- GSP GALVANIZED STEEL PIPE
- HDP HIGH DENSITY POLYETHYLENE
- PVC PLASTIC PIPE
- PCCP PRESTRESSED CONCRETE CYLINDER PIPE
- RCPP REINFORCED CONCRETE PRESSURE PIPE
- SSP STAINLESS STEEL PIPE
- SPP STEEL PLATE PIPE

PIPE JOINTS

- AFC ADAPTER FLANGE COUPLING
- BFC BOLTED FLEXIBLE COUPLING
- BSC BELL AND SPIGOT CONCRETE
- BSL BELL AND SPIGOT LEAD
- BSS BELL AND SPIGOT STEEL
- FJ FLANGED JOINT
- GC GROOVED COUPLING
- MJ MECHANICAL JOINT
- POJ PUSH-ON JOINT
- SJ SCREWED JOINT
- STJ SOCKET TYPE JOINT
- WJ WELDED JOINT
- FWJ FIELD WELDED JOINT
- CC COMPATIBLE COUPLING

VALVE JOINT

- BSL BELL AND SPIGOT LEAD
- FJ FLANGED JOINT
- GC GROOVED COUPLING
- MJ MECHANICAL JOINT
- PJ PUSH-ON JOINT
- SJ SCREWED JOINT
- WJ WELDED JOINT

OPERATOR

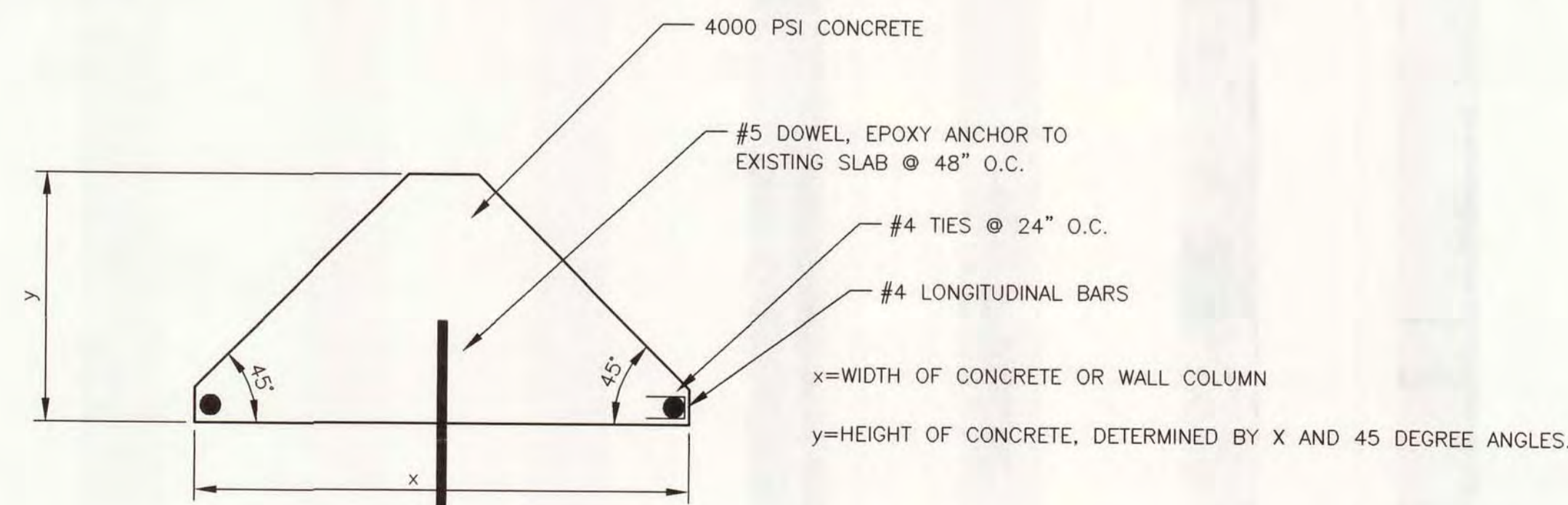
- BG BEVEL GEAR
- C CRANK/HANDLES
- CL CHAIN LEVER (LENGTH)
- CW CHAIN WHEEL (LENGTH)
- H HANDWHEEL
- HD HYDRAULIC OIL
- HW HYDRAULIC WATER
- IL INFINITE LEVER
- L LEVER
- M MOTOR
- P POSITIONER
- PL POSITION LEVEL
- PDC PNEUMATIC CYLINDER
- PDD PNEUMATIC DIAPHRAGM
- V WRENCH HEAD
- WN WRENCH NUT

ACCESSORIES

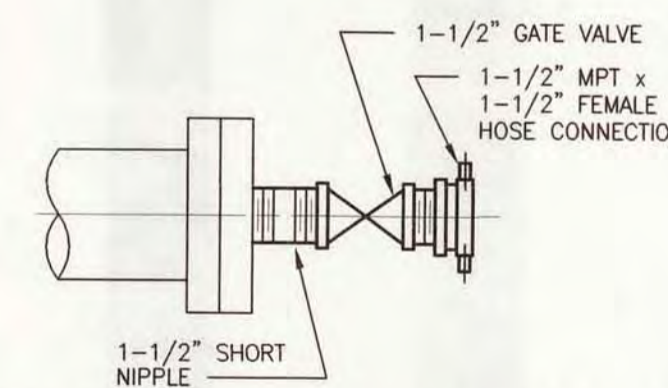
- BS BENCH STANDS
- CP CONTROL PACKAGE
- EB EXTENSION BONNET (LENGTH)
- ES EXTENSION STEM SHAFT (LENGTH)
- FB FLOOR BOX (LENGTH)
- FS FLOOR STAND
- LS LIMIT SWITCH
- MS MANUAL SCREW
- DAS OIL ACCUMULATOR SYSTEM
- PA PILOT ASSEMBLY
- PI POSITION INDICATOR
- PO PORTABLE OPERATOR
- RP1 REMOTE POSITION INDICATOR
- SC STEM COVER
- SG STEM GUIDE
- THW \*T HANDLE WRENCH
- VB VALVE BOX (LENGTH)
- WB WALL BRACKET
- WG WDRM GEAR

REMARKS

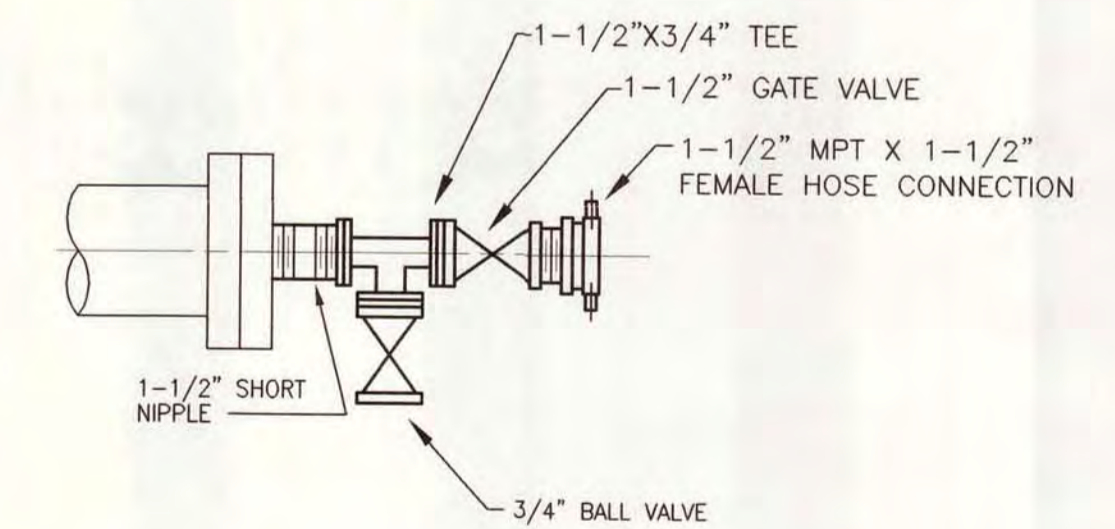
- CL CLASS
- FC FAIL CLOSE
- FO FAIL OPEN
- GB GROUND BURIED
- NDNRISNG STEM
- DS OPEN SHUT
- RS RISING STEM
- TH THROTTLING



FILLET CONCRETE DETAIL  
NO SCALE



TYPICAL FLUSHING CONNECTION (F.C.)  
NO SCALE



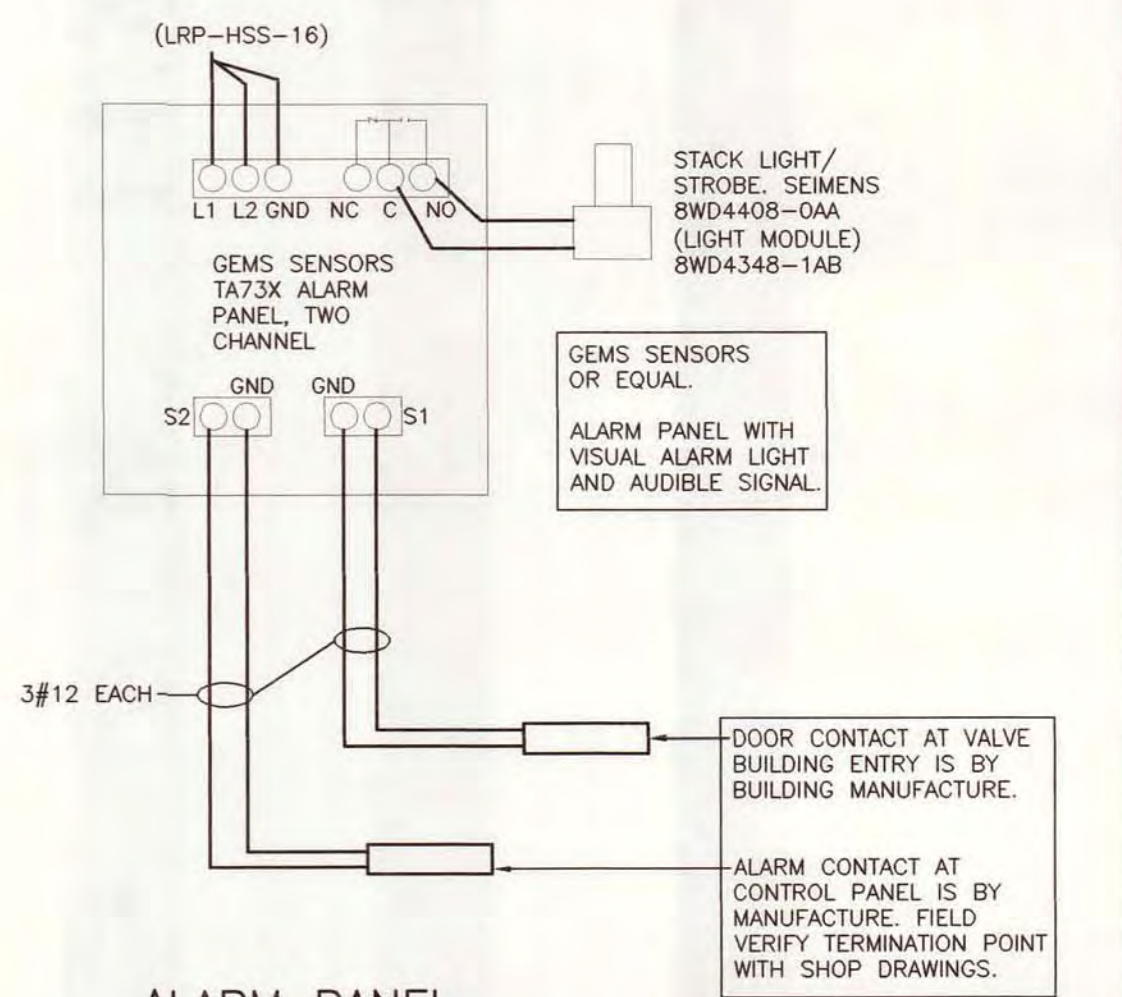
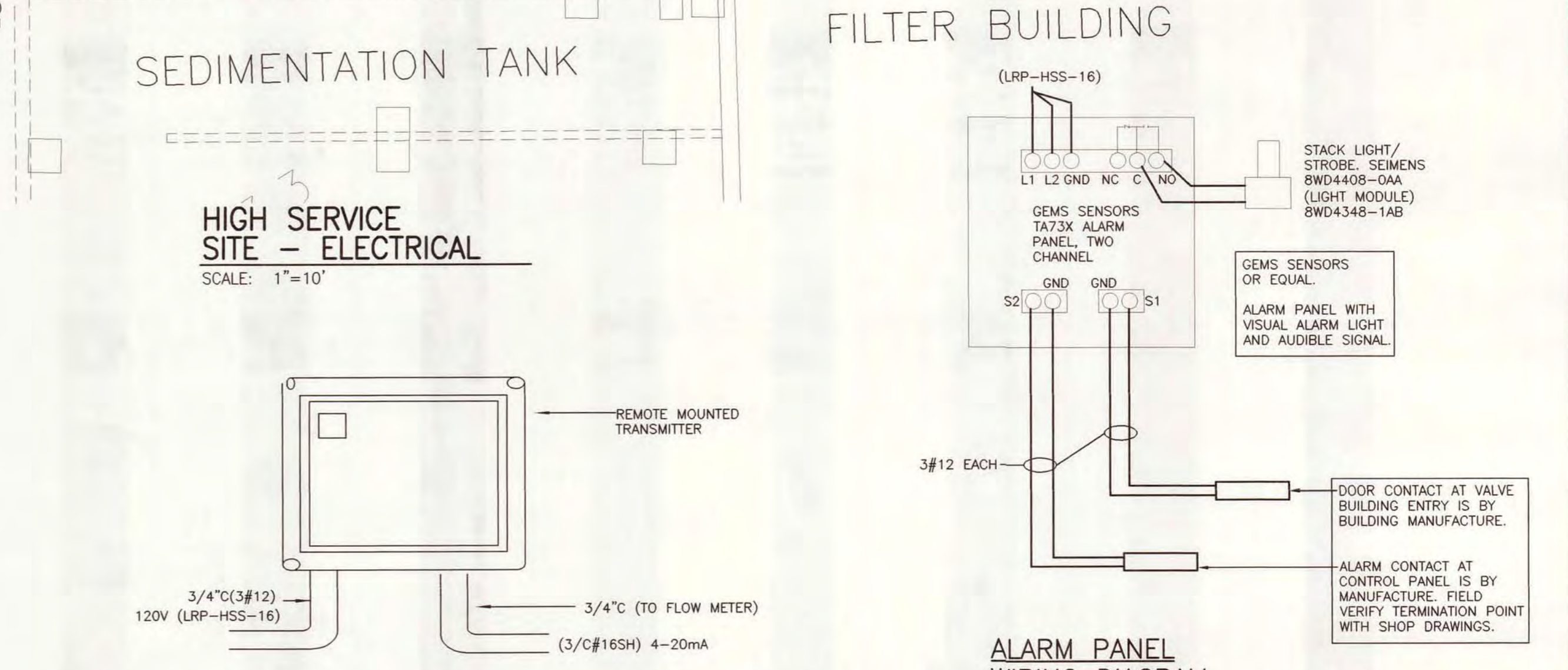
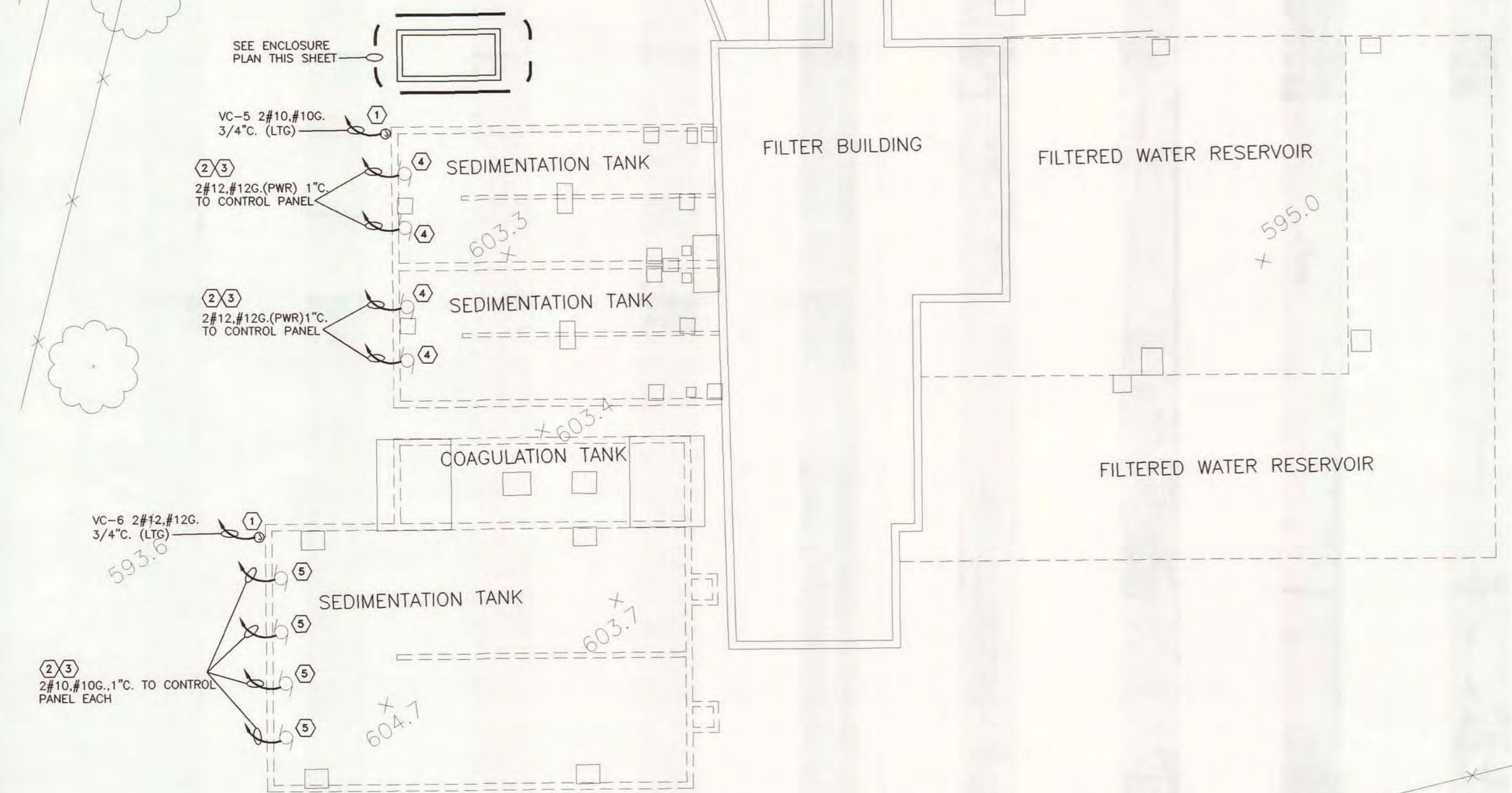
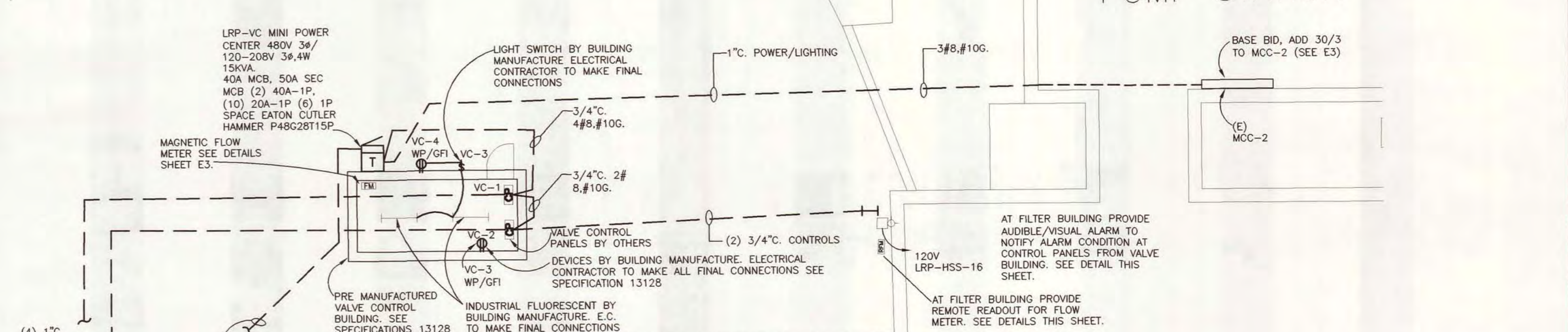
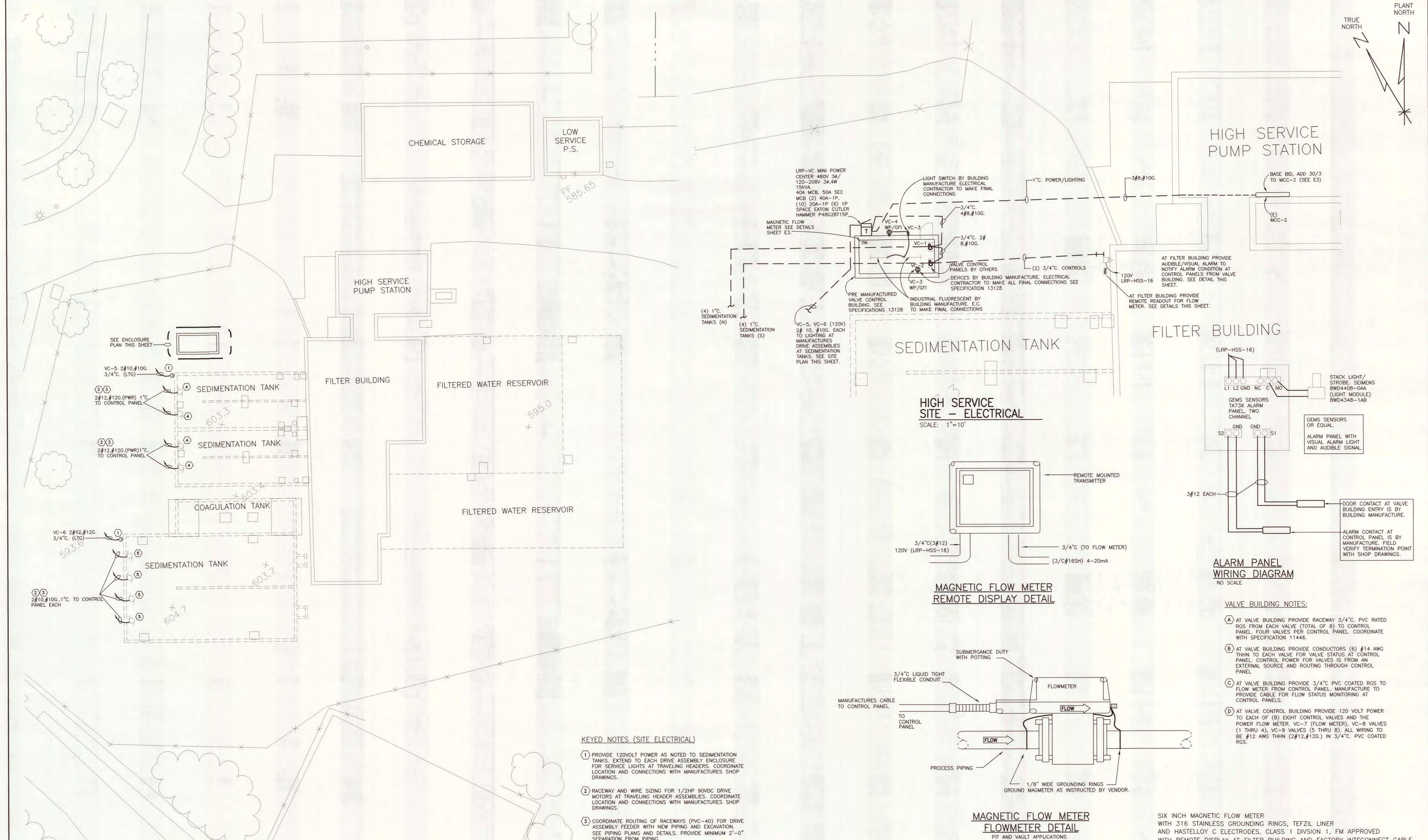
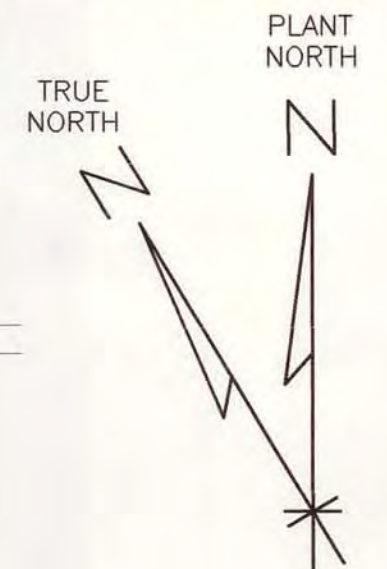
TYPICAL FLUSHING CONNECTION WITH SAMPLE TAP  
NO SCALE

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DESIGNED	G. DANIELS
CHECKED	D. HOLMGREN
CADD DATE	3/30/07 KMF3
SCALE	AS NOTED
PART	P:\11315\00026\30\DWG\PS-04
REV	
REV	
REV	
REV	

CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: S265.01 DWRF PROJECT NO.: 7200.01 WATER TREATMENT PLANT		
STANDARD DETAILS AND SCHEDULE		
DIVISION	CONTRACT	SHEET
C	11315.00026	P-7
		OF

S&PDC PRODUCTS - NEW LUCE, MINNESOTA  
 REVISION BY PART NUMBER 0002  
 S&PDC PRODUCTS - NEW LUCE, MINNESOTA  
 REVISION BY PART NUMBER 0002  
 S&PDC PRODUCTS - NEW LUCE, MINNESOTA  
 REVISION BY PART NUMBER 0002  
 S&PDC PRODUCTS - NEW LUCE, MINNESOTA  
 REVISION BY PART NUMBER 0002



**KEYED NOTES (SITE ELECTRICAL)**

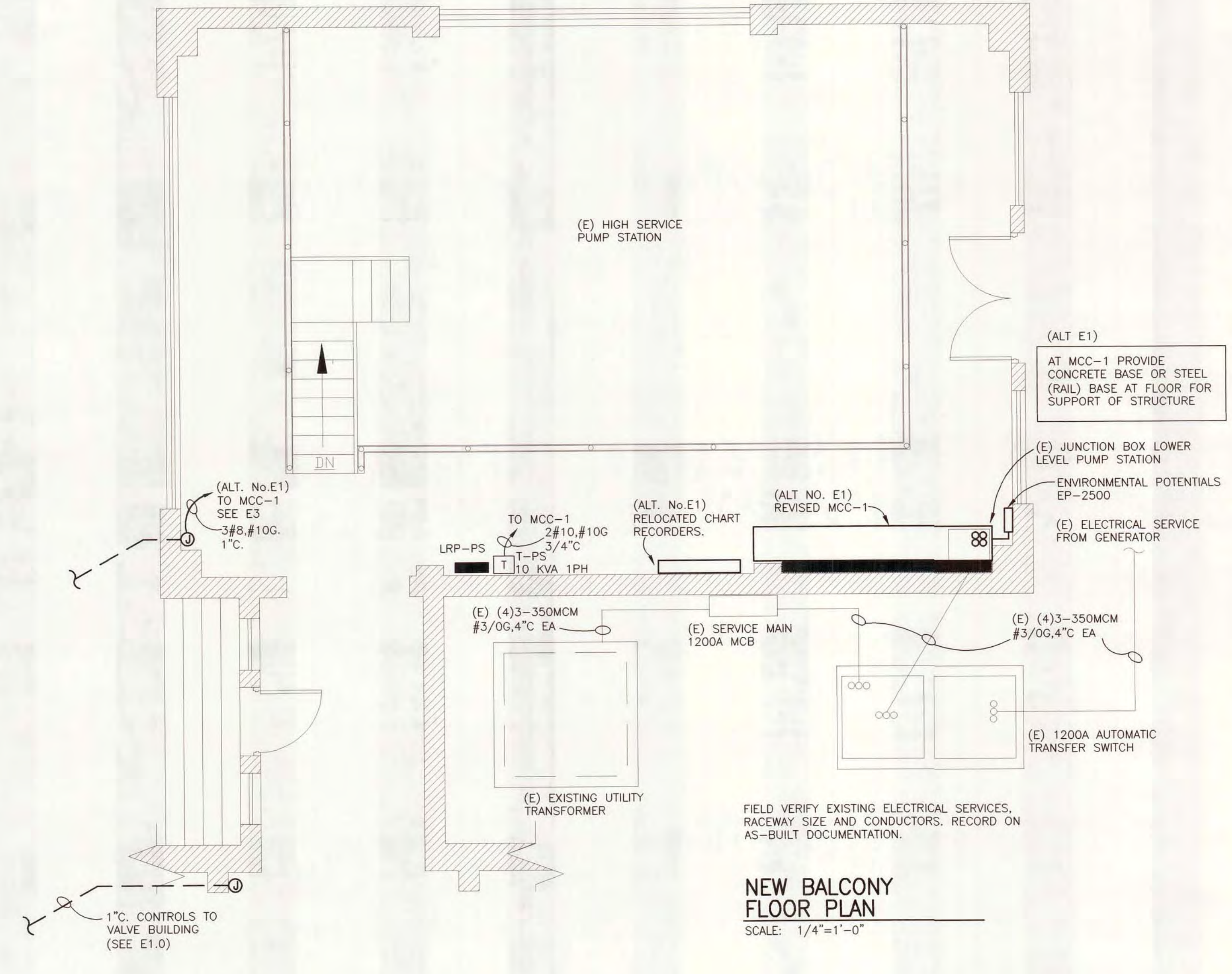
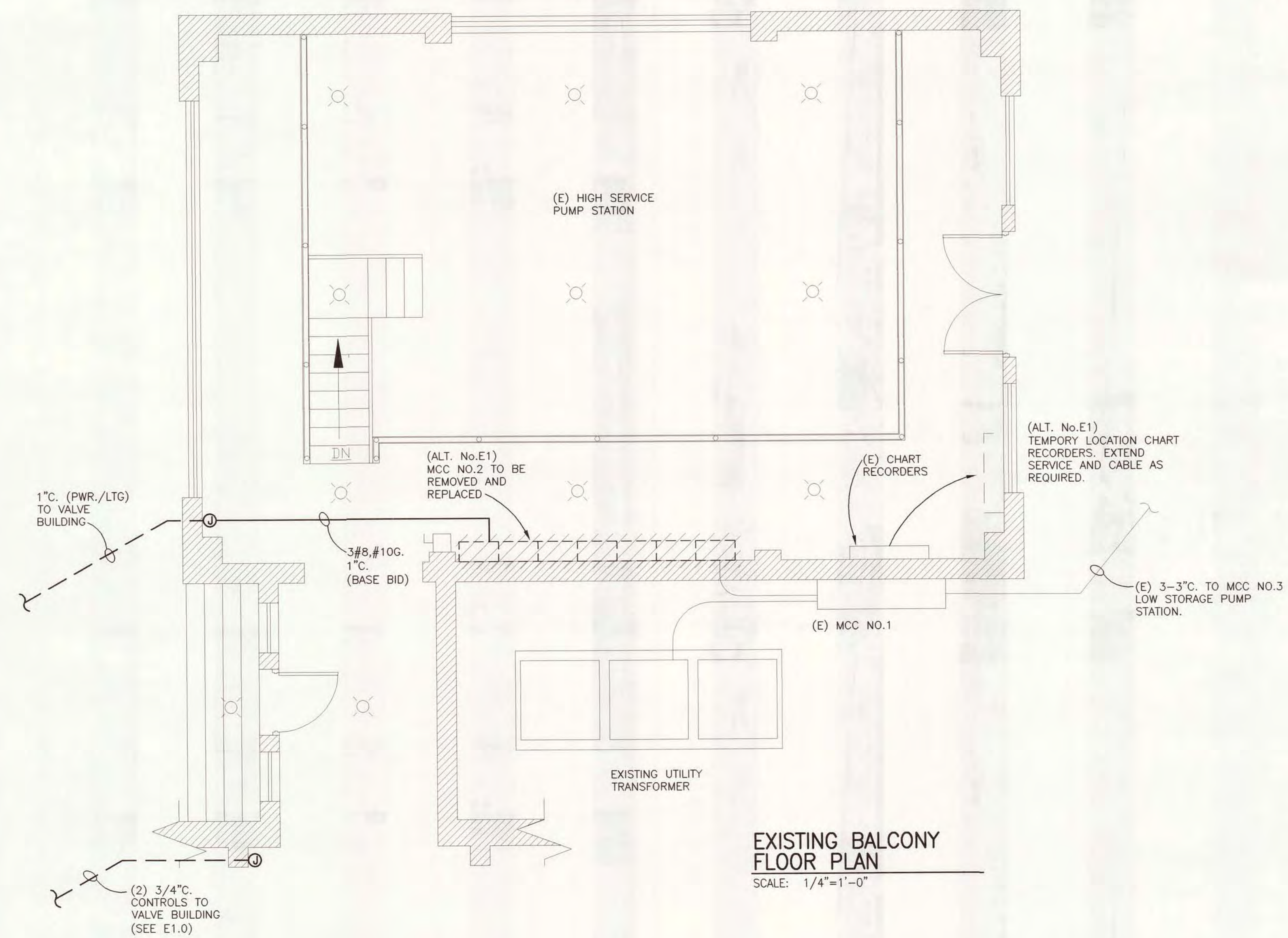
- 1) PROVIDE 120VOLT POWER AS NOTED TO SEDIMENTATION TANKS. EXTEND TO EACH DRIVE ASSEMBLY ENCLOSURE FOR SERVICE LIGHTS AT TRAVELING HEADERS. COORDINATE LOCATION AND CONNECTIONS WITH MANUFACTURERS SHOP DRAWINGS.
- 2) RACEWAY AND WIRE SIZING FOR 1/2HP 90VDC DRIVE MOTORS AT TRAVELING HEADER ASSEMBLIES. COORDINATE LOCATION AND CONNECTIONS WITH MANUFACTURERS SHOP DRAWINGS.
- 3) COORDINATE ROUTING OF RACEWAYS (PVC-40) FOR DRIVE ASSEMBLY FEEDER WITH NEW PIPING AND EXCAVATION. SEE PIPING PLANS AND DETAILS. PROVIDE MINIMUM 2'-0" SEPARATION FROM PIPING.
- 4) AT NORTH SEDIMENTATION TANK DRIVE ASSEMBLIES (4 TOTAL), PROVIDE (6#12) THHN CONTROL WIRE EACH BACK TO CONTROL PANEL COMBINE CONTROL WIRE IN A SINGLE RACEWAY 1" (PVC-40). FOR EACH MOTOR.
- 5) AT SOUTH SEDIMENTATION TANK DRIVE ASSEMBLIES (4 TOTAL), PROVIDE (6#12) THHN CONTROL WIRE EACH BACK TO CONTROL PANEL COMBINE CONTROL WIRE IN A SINGLE RACEWAY 1" (PVC-40). FOR

- VALVE BUILDING NOTES:**
- A) AT VALVE BUILDING PROVIDE RACEWAY 3/4" PVC RATED RGS FROM EACH VALVE (TOTAL OF 8) TO CONTROL PANEL. FOUR VALVES PER CONTROL PANEL. COORDINATE WITH SPECIFICATION 11446.
  - B) AT VALVE BUILDING PROVIDE CONDUCTORS (6) #14 AWG THHN TO EACH VALVE FOR VALVE STATUS AT CONTROL PANEL. CONTROL POWER FOR VALVES IS FROM AN EXTERNAL SOURCE AND ROUTING THROUGH CONTROL PANEL.
  - C) AT VALVE BUILDING PROVIDE 3/4" PVC COATED RGS TO FLOW METER FROM CONTROL PANEL. MANUFACTURE TO PROVIDE CABLE FOR FLOW STATUS MONITORING AT CONTROL PANELS.
  - D) AT VALVE CONTROL BUILDING PROVIDE 120 VOLT POWER TO EACH OF (8) EIGHT CONTROL VALVES AND THE POWER FLOW METER. VC-7 (FLOW METER), VC-8 VALVES (1 THRU 4), VC-9 VALVES (5 THRU 8). ALL WIRING TO BE #12 AWG THHN (2#12, #12G) IN 3/4" PVC COATED RGS.

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DESIGNED M. HAWKINS	CITY OF ALPENA, MICHIGAN	
CHECKED D. HOLMGREN	WATER AND WASTEWATER IMPROVEMENTS	
CADD DATE 4/13/07 JAH	DWRP PROJECT NO.: 5268-01 DWRP PROJECT NO.: 7200-01	
SCALE AS NOTED	WASTE TREATMENT PLANT	
PART PROJECT/11315/00026/30/DWC/E-1	SEDIMENTATION TANKS ELECTRICAL	
REV	DIVISION C	CONTRACT 11315.00026
REV		SHEET E-1
REV		OF

DRAWING NUMBER 14/15  
 WATER AND WASTEWATER IMPROVEMENTS 2007  
 SACO PRODUCTS • NEW HOPE, MINNESOTA  
 DESIGNED BY PART NUMBER 0002

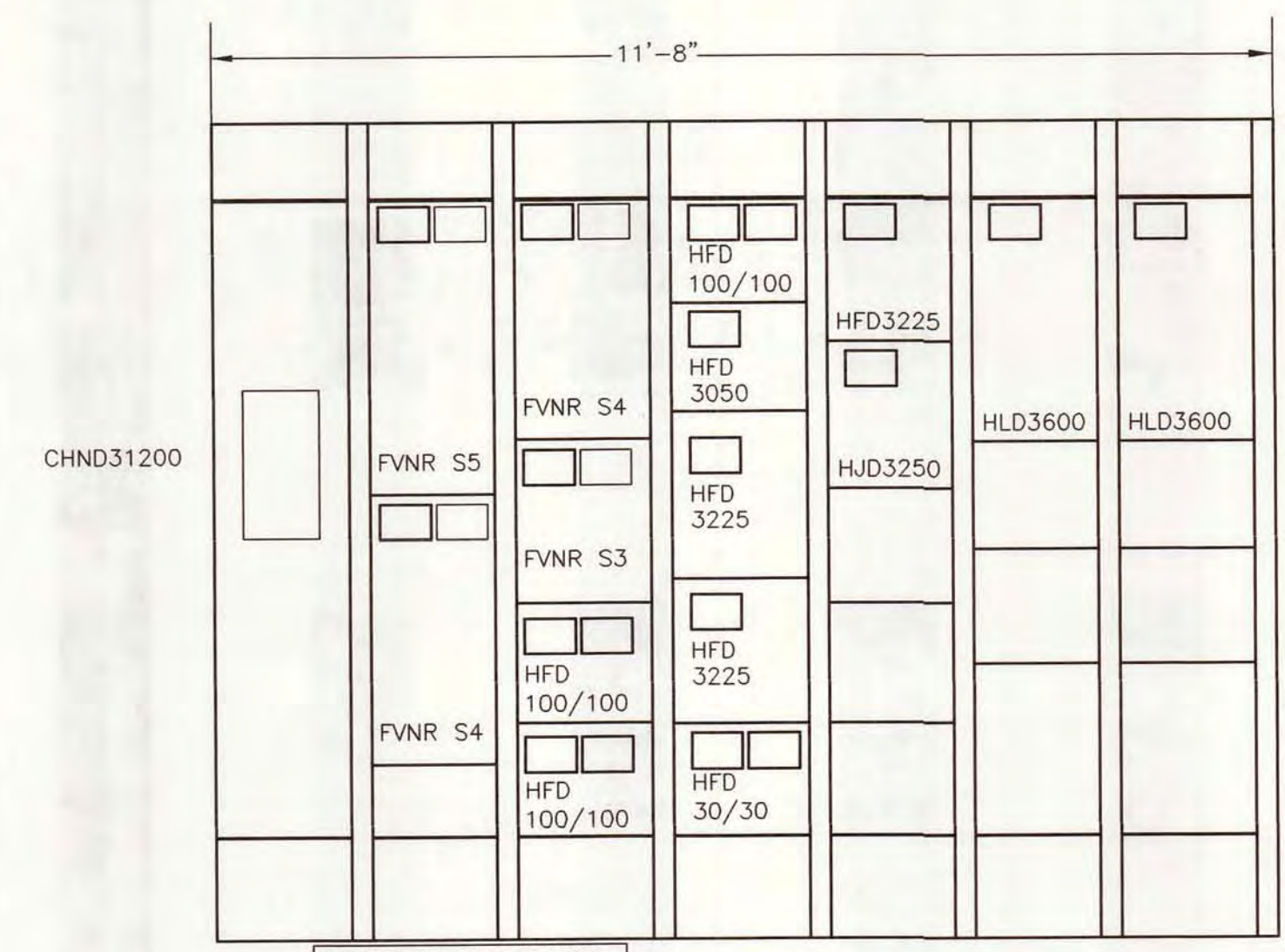


**EXISTING BALCONY FLOOR PLAN**  
SCALE: 1/4"=1'-0"

**NEW BALCONY FLOOR PLAN**  
SCALE: 1/4"=1'-0"

**MCC-1 INSTALLATION NOTES:**

- 1.) INSTALLATION OF NEW MCC-1 SHALL BE COORDINATED WITH OWNER/PLANT OPERATORS. NEW MCC SHALL BE INSTALLED AND SERVICE CONNECTED PRIOR TO REMOVAL OF ORIGINAL MCC. BOTH UNITS SHALL REMAIN OPERATIONAL DURING THE TRANSFER OF LOADS TO THE NEW MCC-1. SEE SHEET E3.
- 2.) ELECTRICAL SERVICE SHUT DOWN SHALL BE COORDINATED WITH PLANT OPERATORS AND WILL BE LIMITED TO OFF PEAK HOURS WHEN PRESSURE/PUMPING CAPACITY ARE AT MINIMUM LEVELS. THIS WILL REQUIRE OFF HOURS (NON STANDARD) SHIFT WORK. COORDINATE WITH OWNER ON AVAILABLE TIME FRAMES.
- 3.) CONTRACTOR SHALL FOLLOW ALL OWNERS/PLANT OPERATORS LOCK-OUT, TAG OUT PROCEDURES DURING SERVICE OUTAGE AND TRANSFERRING OF LOADS TO NEW MCC.
- 4.) TEMPORARY POWER (GENERATOR) SOURCE WILL BE REQUIRED FOR LIMITED PERIODS OF TIME DURING THE TRANSFER OF ELECTRICAL LOADS (LRP-PS). ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY POWER SOURCE TO SUPPORT PUMPING STATION AND FILTER BUILDING LIGHTING AND RECEPTACLE LOADS AS REQUIRED. COORDINATE WITH PLANT OPERATORS.

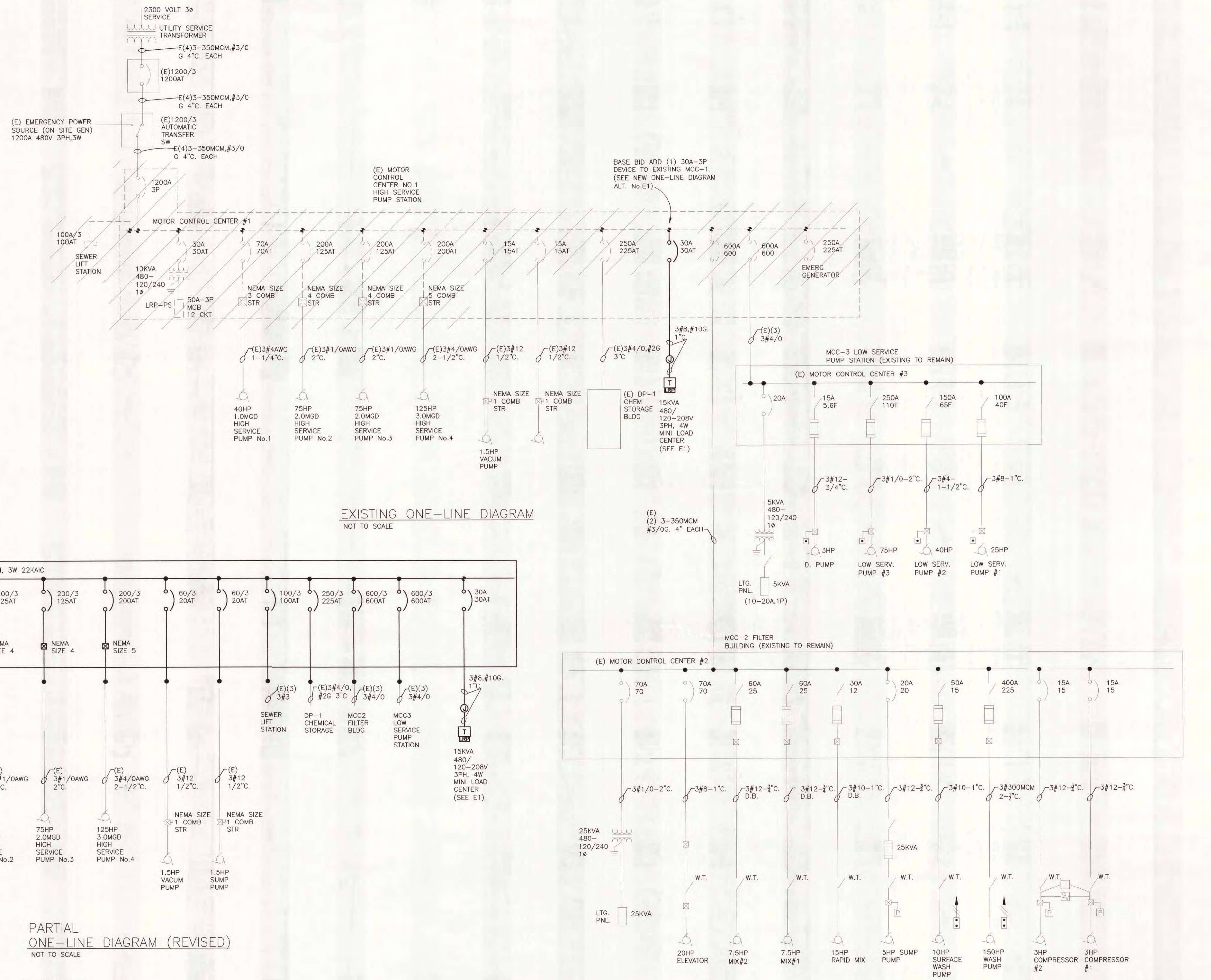


LIGHTER LINEWEIGHTS INDICATE EXISTING TO REMAIN.  
 DARKER LINEWEIGHTS INDICATES NEW WORK.  
 COORDINATE WITH FIELD CONDITIONS



DESIGNED	M. HAWKINS	CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRP PROJECT NO.: 5286.01 DWRP PROJECT NO.: 7200.01 WASTE TREATMENT PLANT <b>HIGH SERVICE PUMP STATION ELECTRICAL</b>					
CHECKED	D. HOLMGREN						
DATE	4/13/07 JAH						
SCALE	AS NOTED						
PART	PROJECT\11315\00026\30\DWG\E-2						
REV		DIVISION	C	CONTRACT	11315.00026	SHEET	E-2
REV		OF					

SACO PRODUCTS • NEW HOPE, MINNESOTA  
 REORDER BY PART NUMBER 8552  
 2007  
 SACO PRODUCTS • NEW HOPE, MINNESOTA  
 REORDER BY PART NUMBER 8552  
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 REORDER BY PART NUMBER 8552



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DESIGNED: M. HAWKINS	CITY OF ALPENA, MICHIGAN WATER AND WASTEWATER IMPROVEMENTS SRF PROJECT NO.: 5266.01 DWRP PROJECT NO.: 7200.01 WASTE RECYCLING PLANT <b>ONE-LINE DIAGRAM ELECTRICAL</b>
CHECKED: D. HOLMGREN	
CADD DATE: 4/13/07 JAH	
SCALE: AS NOTED	
PART: PROJECT: 11315100026/30/00/01/E-2	DIVISION: C CONTRACT: 11315.00026 SHEET: E-3 OF: