APPENDIX H

TDCS PERMANENT PUMP SYSTEM INSTALLATION

Contents of Appendix H

SUMMARY OF PERMANENT PUMP SYSTEM INSTALLATION

The original TDCS Phase 4 Construction drawings includes the Final Build Out of the TDCS and was expected to begin after the six month performance-monitoring and evaluation period following the completion of the piezometers and drain wells installation. However, with the failure of the temporary pump only three weeks after the demobilization of the TDCS construction contractor, the temporary pumping system was deemed unreliable and it was therefore decided that the permanent pumps and some other key components that were originally included in Phase 4 would need to be installed before the end of Phase 3 performance monitoring. In addition, other items related to improvements to the TDCS were implemented.

The Phase 4 items and activities included: two vertical turbine pumps; variable frequency drive controllers; sump level transmitters; Ethernet (fiber optic) communication link from the TDCS to the Hudson Falls WTP; pump base frame; sump cover support frame and deck; access ladder; pump discharge hoses and pipe header support bracket; HF-303 piping to TDCS tunnel gutter; TDCS piping from shaft to utility tunnel; electrical shed and; reconfiguration of drain piping from spoils structure. The installation of new piping required the coordinated removal of the temporary pre-treatment system weir (frac) tanks and a new connection to the TDCS discharge (process water) pipe in the utility tunnel beneath John Street.

RE-DESIGN AND PROCUREMENT

The re-design of the permanent pump system and support deck and framing as well as plans for permanent piping and removal of the temporary piping and pre-treatment system began in early June 2009. The TDCS average weekly flow was about 70 gallons per minute one week after opening the drain wells and this value was used for determining the discharge capacity of the permanent pumps for the TDCS Lift Station. The pump support structure design was changed from cast-in-place concrete to all steel construction and included a steel frame and deck to cover the open top of the elevator sump, for safety reasons. The pumps were selected and ordered on July 16, 2009 with a 12 week delivery (October 8, 2009). The long lead time was attributed to the special motor required for the corrosive environment in the TDCS bell-out and sump. The control cabinet was ordered on August 26, 2009 with a delivery date of September 15, 2009. The structural steel for the sump deck was ordered on September 8, 2009. A safety improvement to the TDCS shaft cover was made, including adding a galvanized steel hand rail with toe plate around the hatch opening (9 ft x12 ft). The hand rail was ordered on September 18, 2009 and installed on October 13, 2009. Additionally, a weather-protected structure (electrical shed) was required for the electrical panel and control cabinet for the new pumps. The electrical shed was located immediately adjacent to the TDCS shaft collar and housed the new pump control equipment, as well as the existing electrical, instrumentation and control equipment including electrical power feeds, transformer, panels, shunt trip switch, emergency backup pump controller, auto-dialer and TDCS piezometer data acquisition system data logger.

Vertical Turbine Pumps Re-Design

The permanent pumps in the original design of the TDCS lift station included a duplex pump system consisting of two vertical turbine pumps each designed for a discharge of 250 gallons per minute and total dynamic head of 300 feet. These pumps were selected prior to construction based on the estimated TDCS flow rate of 110 gpm with a large safety factor. This is over-designed for the actual TDCS total flow of 70 gallons per minute that existed at the end of Phase 3 Construction and therefore, a re-design and re-sizing of the pumps was required. The selected pump capacity was 125 gallons per minute with a total dynamic head of 300 feet. Other changes in the pump design included a motor for corrosive duty with a chemical resistant coating due to the constant groundwater seepage through the shotcrete lining in the TDCS shaft. The pump was required to have a stainless steel shaft, impeller, bowl coupling and mechanical seal. The power feed from the electrical panel at the top of the shaft was included as a more reliable configuration than the temporary electrical panel at the bottom of the shaft which has proven to be problematic due to the constant presence of water and high humidity.

Pump Support and Sump Deck

The cover over the sump at the bottom of the shaft was left by the general contractor and included a temporary arrangement of steel plates, crane mat timbers, and plywood decking. In order to install the new vertical turbine pumps, the sump deck and pump support frame needed to be installed. The original design for the pump support was a composite galvanized steel and concrete deck slab supported by steel beams. The placing of concrete in the bell-out for the pump support slab would be time consuming and difficult to complete and still achieve a high degree of quality control. Therefore, the pump support was re-designed to consist of all steel instead of a composite deck. For safety, reasons the entire top opening of the sump needed to be covered. The original design of the sump deck was steel beams supporting steel grating with checker (diamond) plate welded to the top. The original design included no provision for a deck over the Elevator Sump. The design concept for the sump deck was also used for the top of the Elevator Sump. Additionally, an access door with handrail and ladder to the bottom of the sump was included in the re-design of the sump deck. The final pump support and sump deck were all-steel construction and hot dipped galvanized after shop welding.

Vertical Turbine Pumps Installation

The new vertical turbine pumps were delivered on October 12, 2009, and the pump control cabinet was delivered on October 27, 2009. The installation of the vertical turbine pumps included the control cabinet, power cables and control signal wiring from the controller to the pumps, the pump base frame, the pump, and the drive motor. The installation process began on October 29, 2009, and was interrupted on November 3, 2009, when the final assembly of the pumps could not be completed due to improper mechanical seal components. The proper components were delivered and the final assembly completed on November 18, 2009. The permanent vertical turbine pumps were commissioned and placed in service on November 19, 2009.

Pump Discharge Lines

The temporary pump discharge lines from the temporary pumps (left by the general contractor) consisted of two 4-inch diameter hoses from the pumps in the sump to a separate 4-inch check valve connected to a 4-inch steel pipe welded to a 6-inch steel pipe header. The backup pump on the bell-out invert had a 6-inch diameter discharge hose connected to a 6-inch check valve and 90 degree elbow into the bottom of the 6-inch steel pipe header. The header pipe is connected to the 6-inch steel Victaulic pipe that is fastened to the wall of the bell-out and shaft and continues through a 90 degree elbow and through the shaft collar concrete and underground to the pre-treatment system weir tanks. During the installation of the vertical turbine pumps, new chemical resistant hoses consisting of polyethylene tubes inside Ethylene Propylene Dimonomer [EPDM] covers were installed from the vertical turbine pumps to the header. The hose from the ABS pump is 6-inch diameter EPDM hose. The EPDM hose is inspected during each entry to the TDCS.

DECOMMISSIONING OF TEMPORARY PRE-TREATMENT SYSTEM

A temporary pre-treatment system was installed prior to the start of the TDCS construction. The system was in place during the construction and was needed to remove sediment from the construction water before final processing in the on-Site WTP. The temporary pre-treatment system included the piping from the TDCS Shaft and the Spoils Structure to the two 18,000 gallon weir (frac) tanks, piping from the tanks to the TDCS process water piping, two booster pumps in the utility tunnel beneath Allen Street, and an overflow pipe from the North Tank to the South Basin. After construction, the TDCS discharge water was mostly free of sediment and the pre-treatment system was no longer needed. Refer to Figures 3-1 and 3-2 for TDCS Site Plan features as of May 2009 following the demobilization of the TDCS Contractor. The pre-treatment system removal work was sequenced to facilitate both the removal of the temporary pre-treatment system and the installation of the permanent piping so as to minimize the downtime of the TDCS pump outage required to make the final connections. The pre-treatment system was taken out of service on October 19, 2009 when the permanent piping system was connected to the TDCS discharge pipe at the top of the TDCS shaft. Refer to Figure 3-3, TDCS Site Plan for the pre-treatment system removal information.

WEIR TANK REMOVAL

The South Tank was located over the alignment of the permanent TDCS process water piping and therefore was removed first on July 17, 2009, to allow for the permanent pipe installation. The North Tank remained in operation until permanent piping was completed and in service on October 19, 2009. The following procedure was used to decommission both tanks before the tanks were demobilized from the Site. Prior to removal, all piping connections to the tank were removed and piping was either placed in contaminated storage area on site or properly disposed off site. The tank was emptied using a vacuum truck, to remove water and sediment. The water was decanted into the North Basin and the sediment was dumped into a roll-off and stabilized with cement prior to proper disposal off site. Once the tank was empty, it was moved to the North Basin decontamination pad where it was decontaminated and wipe samples collected. The Tanks were cleaned until acceptable wipe tests were achieved (i.e. a total PCB concentration of less than 10 micro grams per wipe). When acceptable wipe test results were achieved the tank was removed by the tank rental company. The South Tank was removed from the Site on August 31, 2009, and the North Tank on December 15, 2009. The results of the tank wipe samples are summarized in the following Table.

TABLE: FRAC TANK CLEANING WIPE TESTS

Date Sampled/Wipe	**PCB 1016**	**PCB 1221**	**PCB 1232**	**PCB 1242**	**PCB 1248**	**PCB 1254**	**PCB 1260**
8/18/2009							
Wipe 1	ND	ND	ND	**1.95**	ND	ND	ND
Wipe 2	ND	ND	ND	ND	ND	ND	ND
Wipe 3	ND	ND	ND	**1.17**	ND	ND	ND
Wipe 4	ND	ND	ND	**0.783**	ND	ND	ND
Wipe 5	ND	ND	ND	**4.06**	ND	ND	ND
12/5/2009							
Wipe 008F	ND	ND	ND	**3.02**	ND	ND	ND
Wipe 009F	ND	ND	ND	ND	ND	ND	ND
Wipe 010F	ND	ND	ND	**0.791**	ND	ND	ND
Wipe 011F	ND	ND	ND	ND	ND	ND	ND
Wipe 012F	ND	ND	ND	ND	ND	ND	ND
Wipe 013F	ND	ND	ND	ND	ND	ND	ND
LIMITS	0.500 µg/Wipe	0.500 µg/Wipe	0.500 µg/Wipe	0.500 µg/Wipe	0.500 µg/Wipe	0.500 µg/Wipe	0.500 µg/Wipe

Notes: ND = Non-Detect

Permanent Underground Piping

The permanent piping replaced the temporary piping and made a direct connection from the TDCS and from the spoils structure drain sump pump to the existing piping in the utility tunnel. The permanent TDCS process piping (double containment pipe with 4-inch Schedule 80 PVC inside 8-inch Schedule 80 PVC pipe with centralizers) was installed from the utility tunnel through the existing concrete bulkhead beneath Allen St. to the utility pipe sleeves on the east side of the TDCS shaft. The spoils drain line was cut and connected to new piping were it crossed the new alignment of the permanent TDCS discharge pipe. Installation of the permanent piping began on July 27, 2009. The piping installation included coring holes through the concrete bulkhead for permanent piping, conduits for signal circuits and fiber optic cables. The TDCS process water piping was connected to the existing 6 in PVC Schedule 80 process water pipe that runs to the WTP. A 6 in diameter check valve was installed in the 6 in process line to the WTP.   The Spoils Structure drain (4 in PVC Schedule 80) was mounted to the wall of the utility tunnel with outlet directly into the existing John Street Sump. Refer to Figure 3-4 for the TDCS site layout and Figure 3-2 for the piping layout in the Utility Tunnel as of November 2009, after completion of the permanent pump system installation.

Safety Improvements to TDCS Shaft cover

The shaft cover has a 9 ft x12 ft hatch in the center to facilitate entry into the shaft without having to remove the entire shaft cover. In order to improve the safety of personnel working near the hatch opening during crane operations, a handrail was added around the hatch opening. The railing includes a toe or kick plate to prevent small items from going over the edge of the hatch opening.   The safety of personnel on the shaft collar when the entire shaft cover is removed is dependent on adequate fall protection features around the collar.

Electrical Shed Improvements

A new electrical shed was constructed to accommodate the existing electrical equipment and the items required for the permanent pump system. At the completion of the drain wells, the existing TDCS electrical equipment including electrical transformer; shunt trip switch; load panels and; ABS pump controller, were housed immediately adjacent to the shaft collar in a small open structure with three sides and a roof. In June 2009 an auto-dialer for alarm conditions in the TDCS was added. The new electrical equipment required for the permanent pump system included a large control panel, Ethernet panel, and room for a power conditioning transformer if it is found to be necessary. A new structure was required to protect the electrical equipment from the weather. The electrical shed (interior height 8 ft x 14 ft x 8 ft) on a concrete slab with 2 x 6 walls and roof and is sided with T-111 plywood. There is one man-door and no windows and it is not insulated. The existing electrical structure walls and roof were removed and the new shed was constructed over the existing electrical equipment. The piezometer data logger is also located in the electrical shed.

Ethernet Communication Link to WTP

The WTP control room is located about ¼ mile away from the TDCS shaft lift station. Information on the real-time status of the TDCS pump system is important for managing water and the WTP. Prior to the TDCS, an existing fiber optic cable link connected computers in Building 12 to the WTP control room. A new fiber optic cable with ethernet hardware was installed to make a complete data communication circuit between the TDCS electrical shed and the water treatment plant control system. Data are sent to the WTP control system from the two vertical turbine pump controllers (sump water level, motor current and rpm), the emergency backup pump controller (on-off data) and, the TDCS flow meter (located in the utility tunnel beneath John Street). The programming for the WTP control system was revised to use, record and display the new data available from the TDCS.

SUMP LEVELS AND AUTO-DIALER ALARMS

The following are the sump water levels and associated attributes (sump levels measured from the bottom of TDCS Sump):

Backup Pump, P3 (ABS), OFF: 3 feet;

Vertical Turbine Pumps, P1 & P2, Set Point: 4.33 feet (52 inches);

Backup Pump, P3 (ABS), ON – ALARM – Autodialer callout: 7 feet;

High Water (per LVT Programmed) – Autodialer callout: 8 feet;

High Water Float – ALARM Autodialer callout: 9 feet and;

Shunt Trip Float – ALARM Autodialer callout: 11 feet (1 feet above top of sump wall).

Other Autodialer ALARM callouts include:

Loss of power to Autodialer, i.e. NO Power Need Generator and;

Low Battery on Autodialer.

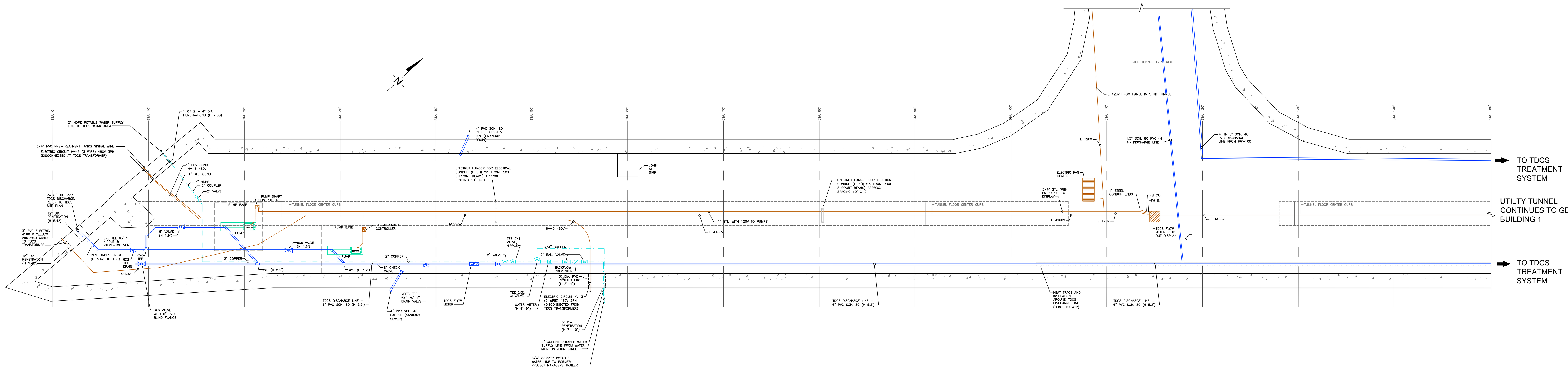
APPROVED BY:	DATE	REVISION	APRD.

TITLE: **TDCS SITE PLAN MAY 2009**

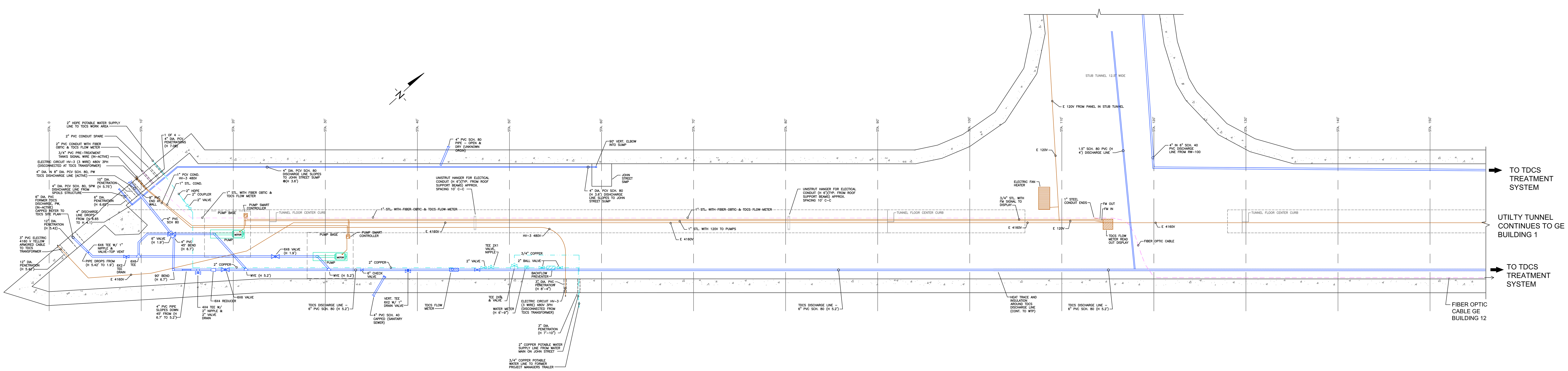
LOCATION: **GE HUDSON FALLS, NEW YORK**

TETRA TECH GEO

		FIGURE
APPROVED	JFB	3-1
DRAFTED	RMK	
PROJECT#	117–2204	
DATE	APRIL 2011	



TDCS UTILITY PIPING MAY 2009 - UTILITY TUNNEL PLAN



TDCS UTILITY PIPING NOVEMBER 2009 - UTILITY TUNNEL PLAN

NOTE: INFORMATION SHOWN IS THE RESULT OF A TAPE SURVEY. LOCATIONS ARE APPROXIMATE AND MAY HAVE CHANGED DUE TO ON GOING SITE ACTIVITIES.

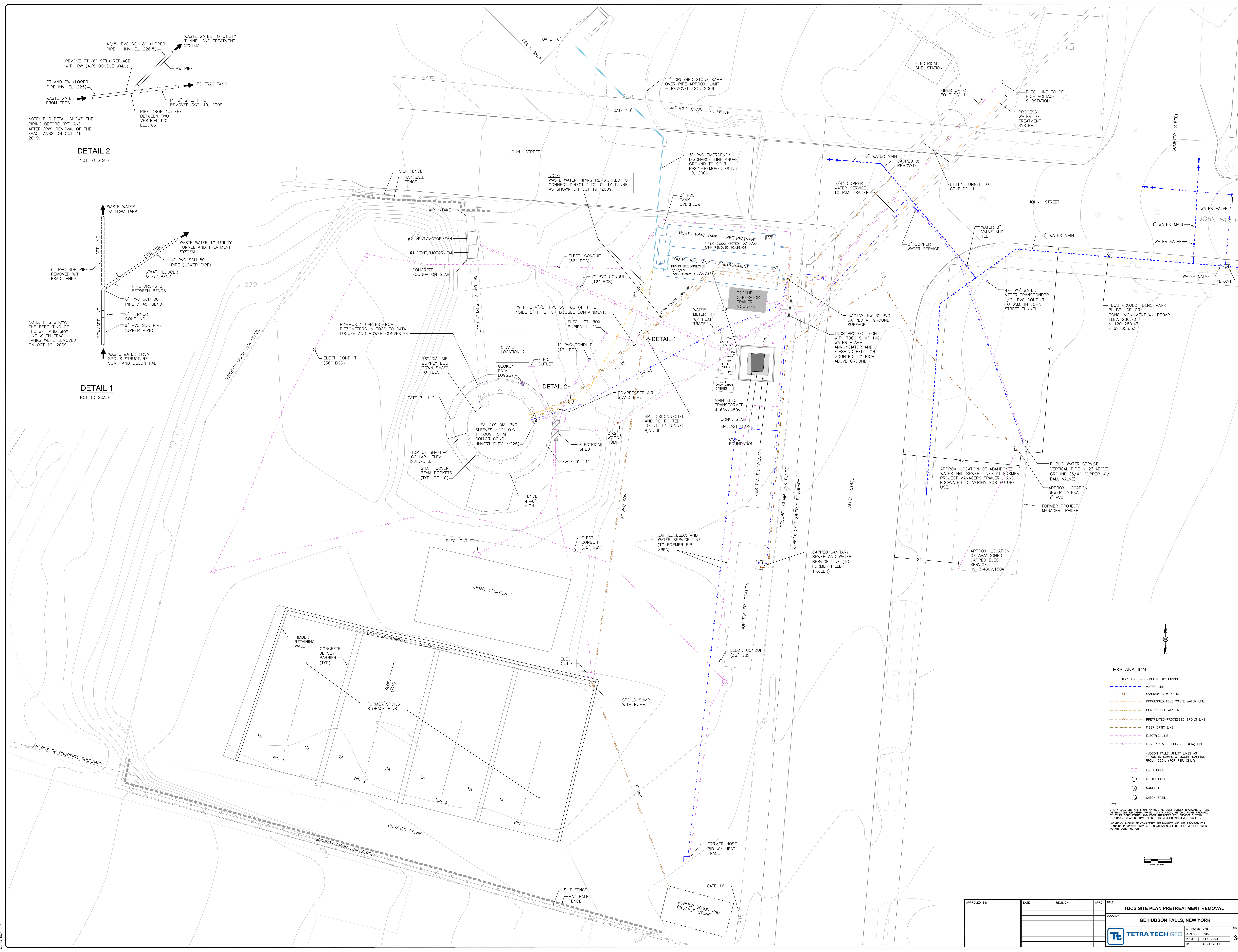
APPROVED BY:	DATE	REVISION	APPR.

TITLE: **TDCS UTILITY TUNNEL PIPING MAY& NOVEMBER 2009**

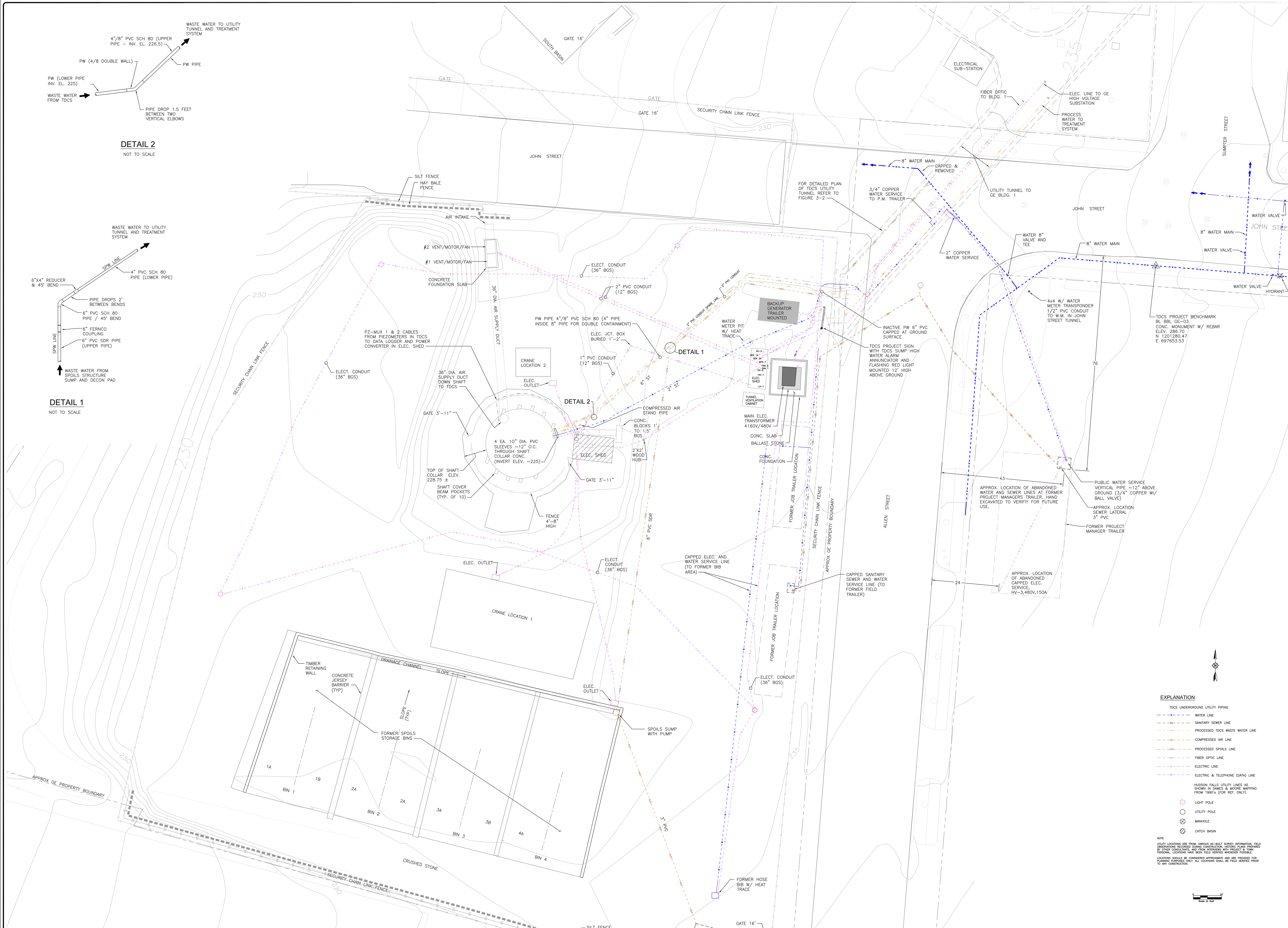
LOCATION: **GE HUDSON FALLS, NEW YORK**

TETRA TECH GEO

APPROVED	JFB	FIGURE
DRAFTED	RMK	3-2
PROJECT#	117-2204	
DATE	APRIL 2011	



DETAIL 2
NOT TO SCALE
4"/8" PVC SCH 80 (UPPER PIPE - INV. EL. 226.5)
WASTE WATER TO UTILITY TUNNEL AND TREATMENT SYSTEM
REMOVE PT (6" ST'L) REPLACE WITH PW (4/8 DOUBLE WALL)
PW PIPE
PT AND PW (LOWER PIPE INV. EL. 225)
TO FRAC TANK
WASTE WATER FROM TDCS
PT 6" ST'L. PIPE REMOVED OCT. 19, 2009
PIPE DROP 1.5 FEET BETWEEN TWO VERTICAL 90° ELBOWS
NOTE: THIS DETAIL SHOWS THE PIPING BEFORE (PT) AND AFTER (PW) REMOVAL OF THE FRAC TANKS ON OCT. 19, 2009.
DETAIL 1
NOT TO SCALE
WASTE WATER TO FRAC TANK
WASTE WATER TO UTILITY TUNNEL AND TREATMENT SYSTEM
4" PVC SCH 80 PIPE (LOWER PIPE)
6" PVC SDR PIPE REMOVED WITH FRAC TANKS
6"X4" REDUCER & 45° BEND
PIPE DROPS 2' BETWEEN BENDS
6" PVC SCH 80 PIPE / 45° BEND
6" FERNCO COUPLING
6" PVC SDR PIPE (UPPER PIPE)
NOTE: THIS SHOWS THE REROUTING OF THE SPT AND SPW LINE WHEN FRAC TANKS WERE REMOVED ON OCT 19, 2009
WASTE WATER FROM SPOILS STRUCTURE SUMP AND DECON PAD
SOUTH BASIN
GATE 16'
12" CRUSHED STONE RAMP OVER PIPE APPROX. LIMIT - REMOVED OCT. 2009
GATE 16'
SECURITY CHAIN LINK FENCE
JOHN STREET
3" PVC EMERGENCY DISCHARGE LINE ABOVE GROUND TO SOUTH BASIN-REMOVED OCT. 19, 2009
NOTE: WASTE WATER PIPING RE-WORKED TO CONNECT DIRECTLY TO UTILITY TUNNEL AS SHOWN ON OCT 19, 2009.
SILT FENCE
HAY BALE FENCE
AIR INTAKE
3" PVC TANK OVERFLOW
NORTH FRAC TANK - PRETREATMENT
PIPING DISCONNECTED 10/19/09 TANK REMOVED 10/28/09
SOUTH FRAC TANK - PRETREATMENT
PIPING DISCONNECTED 7/17/09 TANK REMOVED 7/27/09
BACKUP GENERATOR TRAILER MOUNTED
#2 VENT/MOTOR/FAN
#1 VENT/MOTOR/FAN
CONCRETE FOUNDATION SLAB
36" DIA. AIR SUPPLY DUCT
ELEC. CONDUIT (36" BGS)
2" PVC CONDUIT (12" BGS)
PW PIPE 4"/8" PVC SCH 80 (4" PIPE INSIDE 8" PIPE FOR DOUBLE CONTAINMENT)
ELEC. JCT. BOX BURIED 1'-2'
WATER METER PIT W/ HEAT TRACE
DETAIL 1
PZ-MUX 1 CABLES FROM PIEZOMETERS IN TDCS TO DATA LOGGER AND POWER CONVERTER
CRANE LOCATION 2
1" PVC CONDUIT (12" BGS)
ELEC. CONDUIT (36" BGS)
36" DIA. AIR SUPPLY DUCT DOWN SHAFT TO TDCS
GEOKON DATA LOGGER
ELEC. OUTLET
DETAIL 2
COMPRESSED AIR STAND PIPE
GATE 3'-11"
4 EA. 10" DIA. PVC SLEEVES ~12" O.C. THROUGH SHAFT COLLAR CONC. (INVERT ELEV. ~225)
TOP OF SHAFT COLLAR ELEV. 228.75 ±
SHAFT COVER BEAM POCKETS (TYP. OF 10)
ELECTRICAL SHED
2'X2' WOOD HUB
GATE 3'-11"
FENCE 4'-8" HIGH
SPT DISCONNECTED AND RE-ROUTED TO UTILITY TUNNEL 8/3/09
ELEC. SHED
TUNNEL VENTILATION CABINET
MAIN ELEC. TRANSFORMER 4160V/480V
CONC. SLAB
BALLAST STONE
CONC. FOUNDATION
JOB TRAILER LOCATION
SECURITY CHAIN LINK FENCE
APPROX GE PROPERTY BOUNDARY
ALLEN STREET
INACTIVE PW 6" PVC CAPPED AT GROUND SURFACE
TDCS PROJECT SIGN WITH TDCS SUMP HIGH WATER ALARM ANNUNCIATOR AND FLASHING RED LIGHT MOUNTED 12' HIGH ABOVE GROUND
ELECTRICAL SUB-STATION
FIBER OPTIC TO BLDG. 1
ELEC. LINE TO GE HIGH VOLTAGE SUBSTATION
PROCESS WATER TO TREATMENT SYSTEM
8" WATER MAIN
CAPPED & REMOVED
3/4" COPPER WATER SERVICE TO P.M. TRAILER
UTILITY TUNNEL TO GE BLDG. 1
JOHN STREET
SUMPTER STREET
2" COPPER WATER SERVICE
WATER 8" VALVE AND TEE
8" WATER MAIN
WATER VALVE
8" WATER MAIN
WATER VALVE
WATER VALVE
HYDRANT
4x4 W/ WATER METER TRANSPONDER 1/2" PVC CONDUIT TO W.M. IN JOHN STREET TUNNEL
TDCS PROJECT BENCHMARK BL BBL GE-03 CONC. MONUMENT W/ REBAR ELEV. 286.70 N 1201280.47 E 697653.53
76
43
APPROX. LOCATION OF ABANDONED WATER AND SEWER LINES AT FORMER PROJECT MANAGERS TRAILER. HAND EXCAVATED TO VERIFY FOR FUTURE USE.
PUBLIC WATER SERVICE VERTICAL PIPE ~12" ABOVE GROUND (3/4" COPPER W/ BALL VALVE)
APPROX. LOCATION SEWER LATERAL 3" PVC
FORMER PROJECT MANAGER TRAILER
ELECT. CONDUIT (36" BGS)
ELEC. OUTLET
CAPPED ELEC. AND WATER SERVICE LINE (TO FORMER BIB AREA)
CAPPED SANITARY SEWER AND WATER SERVICE LINE (TO FORMER FIELD TRAILER)
24
APPROX. LOCATION OF ABANDONED CAPPED ELEC. SERVICE, HV-3,480V,150A
CRANE LOCATION 1
6" PVC SDR
TIMBER RETAINING WALL
CONCRETE JERSEY BARRIER (TYP)
DRAINAGE CHANNEL SLOPE
SLOPE (TYP)
FORMER SPOILS STORAGE BINS
ELEC. OUTLET
SPOILS SUMP WITH PUMP
ELECT. CONDUIT (36" BGS)
1A 1B BIN 1 2A 2A BIN 2 3A 3B BIN 3 4A BIN 4
CRUSHED STONE
SECURITY CHAIN LINK FENCE
3" PVC
FORMER HOSE BIB W/ HEAT TRACE
SILT FENCE
HAY BALE FENCE
GATE 16'
FORMER DECON PAD CRUSHED STONE
EXPLANATION
TDCS UNDERGROUND UTILITY PIPING
W WATER LINE
SS SANITARY SEWER LINE
PW PROCESSED TDCS WASTE WATER LINE
CA COMPRESSED AIR LINE
SPW PRETREATED/PROCESSED SPOILS LINE
FO FIBER OPTIC LINE
E ELECTRIC LINE
ET ELECTRIC & TELEPHONE (DATA) LINE
HUDSON FALLS UTILITY LINES AS SHOWN IN DAMES & MOORE MAPPING FROM 1990's (FOR REF. ONLY)
LIGHT POLE
UTILITY POLE
MANHOLE
CATCH BASIN
NOTE:
UTILITY LOCATIONS ARE FROM: VARIOUS AS-BUILT SURVEY INFORMATION, FIELD OBSERVATIONS RECORDED DURING CONSTRUCTION, HISTORIC PLANS PREPARED BY OTHER CONSULTANTS, AND FROM INTERVIEWS WITH PROJECT & TOWN PERSONAL. LOCATIONS HAVE BEEN FIELD VERIFIED WHENEVER POSSIBLE.
LOCATIONS SHOULD BE CONSIDERED APPROXIMATE AND ARE PROVIDED FOR PLANNING PURPOSES ONLY. ALL LOCATIONS SHALL BE FIELD VERIFIED PRIOR TO ANY CONSTRUCTION.
0 10'
Scale in feet
APPROVED BY:
DATE
REVISION
APRD.
TITLE:
TDCS SITE PLAN PRETREATMENT REMOVAL
LOCATION:
GE HUDSON FALLS, NEW YORK
TETRA TECH GEO
APPROVED JFB
DRAFTED RMK
PROJECT# 117-2204
DATE APRIL 2011
FIGURE
3-3



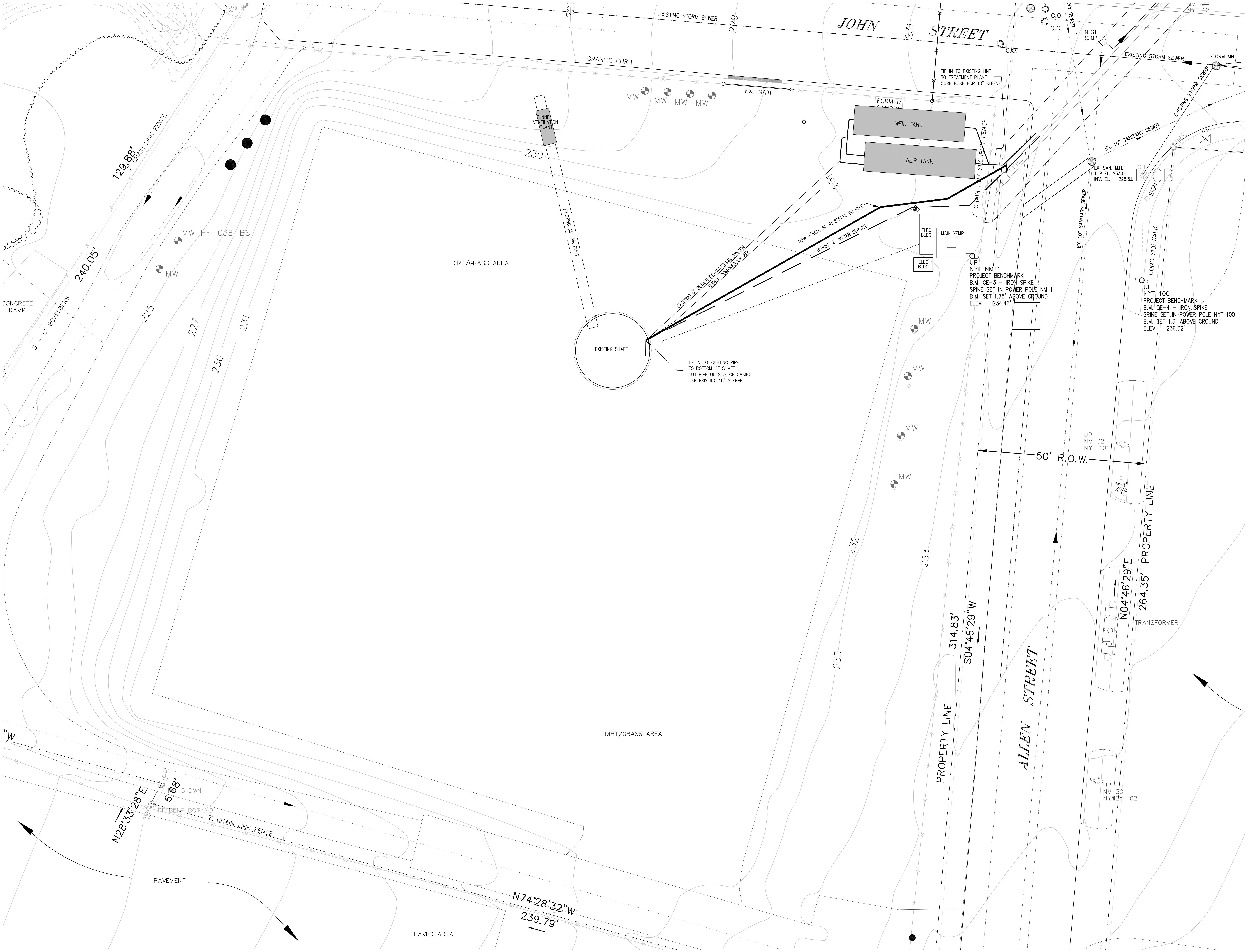
APPROVED BY:	DATE	REVISION	APRD.

TITLE: **TDCS SITE PLAN NOVEMBER 2009**

LOCATION: **GE HUDSON FALLS, NEW YORK**

TETRA TECH GEO

APPROVED	JFB	FIGURE
DRAFTED	RMK	3-4
PROJECT#	117–2204	
DATE	APRIL 2011	



REVISIONS

ISSUE DATES

ISSUED FOR CONSTRUCTION
PHASE TWO: PUMPS & TIE IN TO WWTP

10 JULY 2009

CONSULTANTS

TETRA TECH ENGINEERS, ARCHITECTS & LANDSCAPE ARCHITECTS, P.C.
56 West Main Street
Christiana, Delaware 19702-1501
ph. 302 738-7551
fax 302 454-5980
www.tetratech-de.com

RCN:	112IC02194
DRAWN BY:	SNL
CHECKED BY:	CD/HKM
SCALE:	1"=10'-0'
APPROVED BY:	CKH
DATE:	10 JULY 2009
CAD FILE:	C-3

General Electric Company

TUNNEL/DRAIN COLLECTION SYSTEM

Hudson Falls, New York

DRAWING TITLE: CIVIL UNDERGROUND UTILITY PLAN

DRAWING NUMBER: C-3

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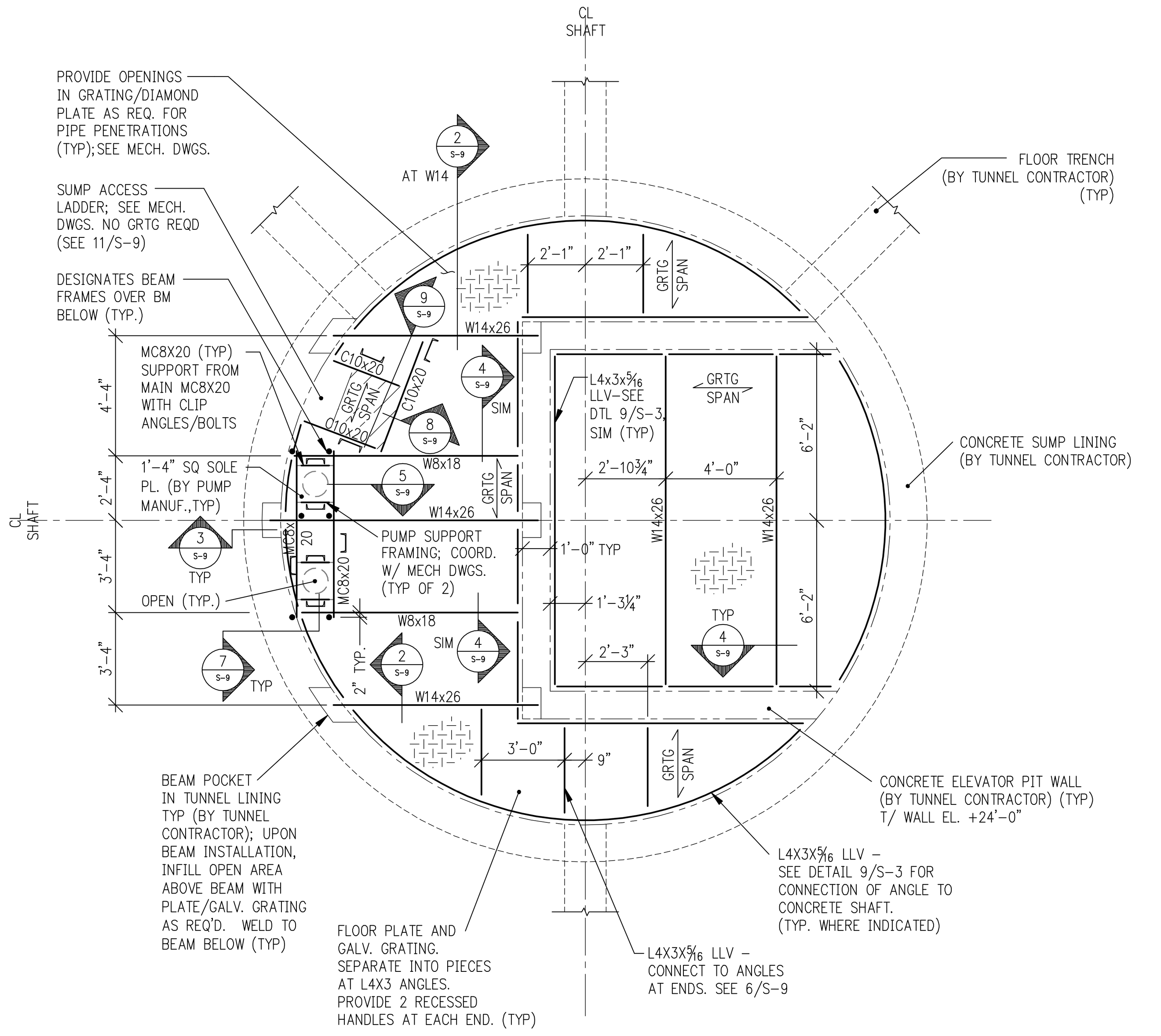
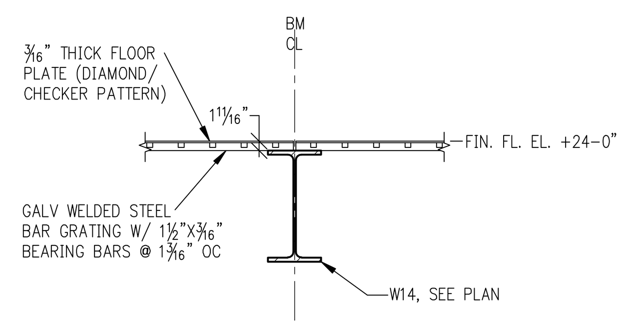


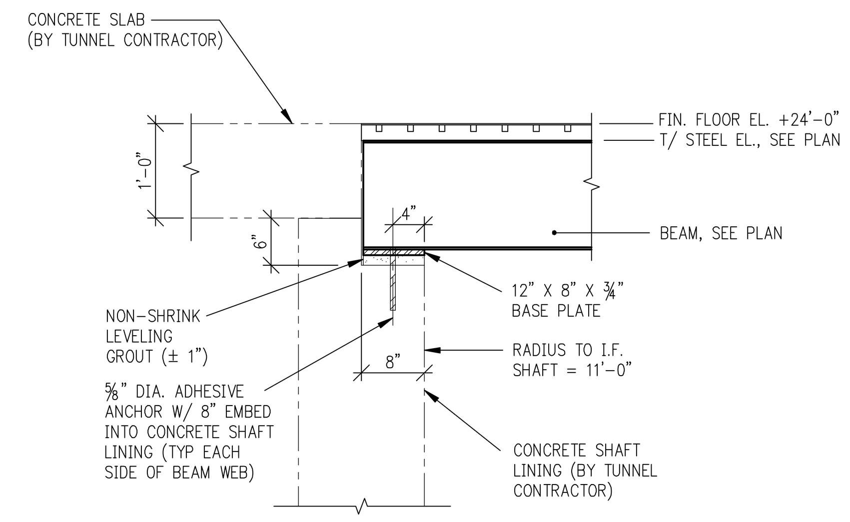
1 PLAN: FRAMING @ SUMP
S-9 SCALE: ¼" = 1'-0"

NOTES:
- T/W14X26 & T/W8x18 EL. +23'-10⅝"
- T/MC8x20 EL. +24'-6⅝"
- T/C10x20 EL. +23'-9⅝"
- ALL STEEL TO BE HOT-DIP GALVANIZED, G90 COATING, PER ASTM A123.
- SIGNAGE TO INDICATE MAXIMUM ALLOWABLE PLATFORM LOADS AS FOLLOWS: DISTRIBUTED ≤ 250 PSF, POINT LOADS ≤ 750 LBS.
- SEE 10/S-9 FOR DIMENSIONS TO PUMP SUPPORT/REMOVABLE GRATING SUPPORT FRAMING

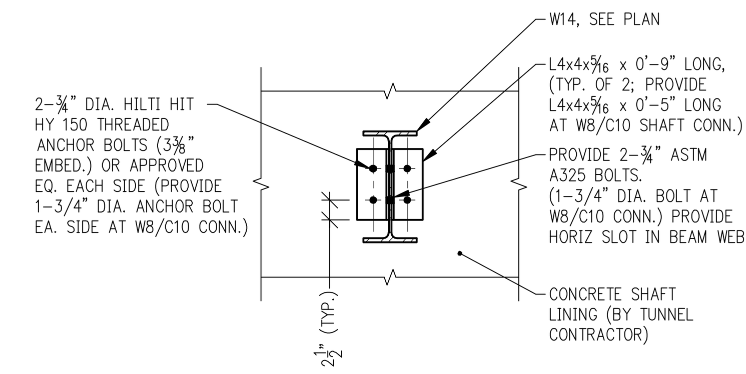


2 SECTION: GRATING/BEAM CONNECTION
S-9 SCALE: ¾" = 1'-0"

NOTES:
- SECURELY ATTACH FLOOR PLATE TO GRATING WITH HOLD DOWN CLIPS OR WELDS AS REQUIRED. IF HOLD DOWN CLIPS ARE USED, PROVIDE FLAT HEAD BOLTS AND COUNTERSINK FLUSH WITH PLATE.
- INSTALL GRATING IN MAXIMUM 4'-0"x 6'-0" PANELS. PROVIDE MIN. OF 2 HANDLES PER PANEL. HANDLES SHOULD LAY FLUSH WITH TOP OF PLATE WHEN NOT IN USE.

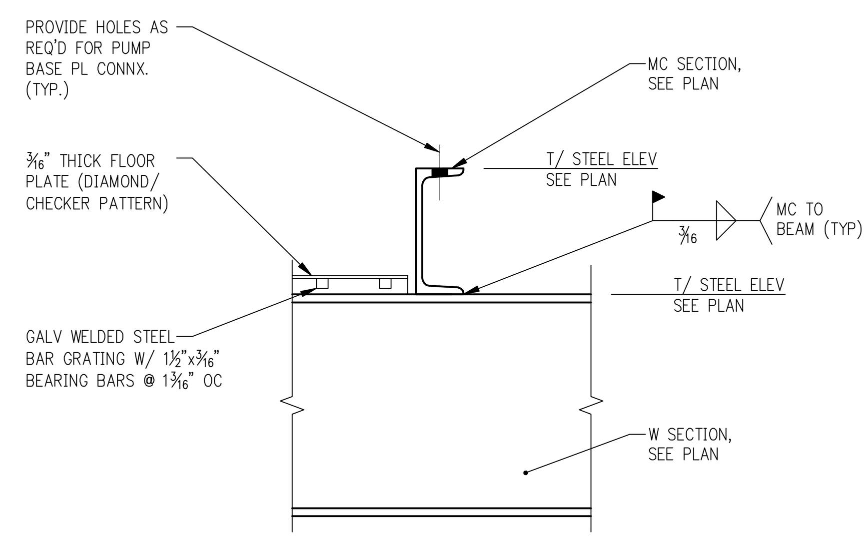


3 DETAIL: BEAM BEARING AT EL. 24'-0"
S-9 SCALE: ¾" = 1'-0"



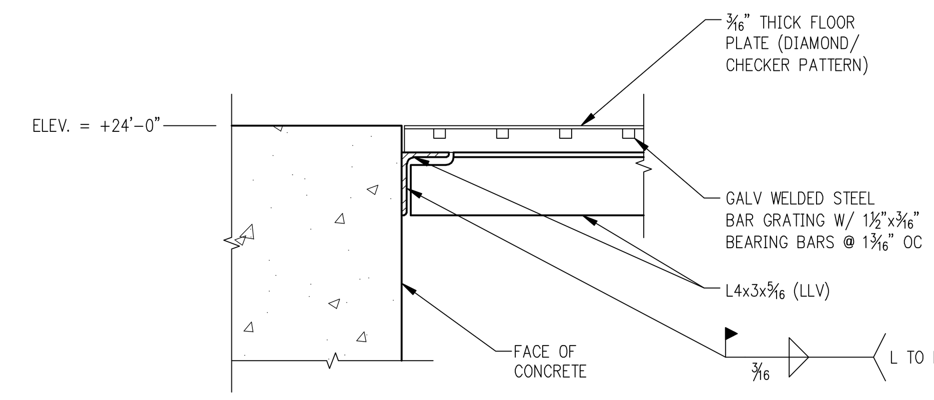
4 DETAIL: W14 CONN. AT ELEV. PIT WALL
S-9 SCALE: ¾" = 1'-0"

NOTES: • CONNECTION OCCURS AT BOTH ENDS OF STEEL BEAM

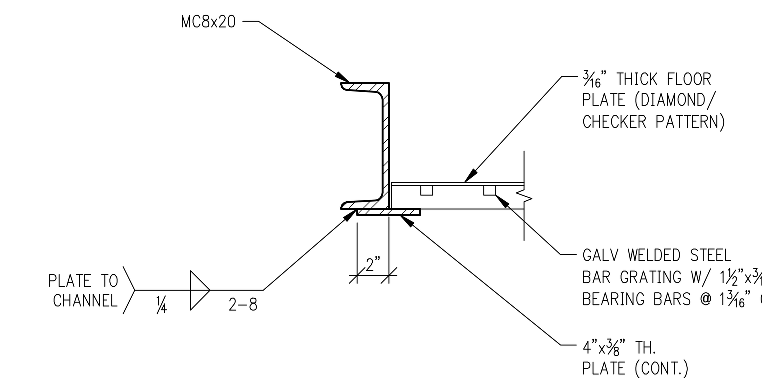


5 SECTION: CHANNEL BEARING ON BEAM
S-9 SCALE: 1½" = 1'-0"

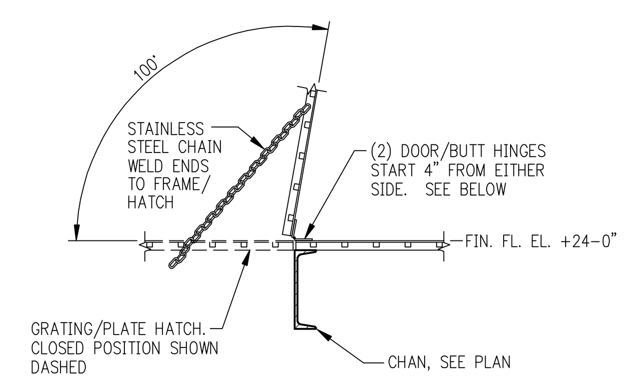
NOTES:
- BREAK GRATING AT CHANNEL LOCATIONS AS REQUIRED PER PUMP INSTALLATION
- AT CONTRACTOR'S OPTION, PROVIDE 2-¾" DIA. BOLTS AT CHANNEL FLANGE TO BEAM FLANGE CONNECTION SHOWN (ONE BOLT EACH SIDE OF W SECTION BEAM WEB) IN LIEU OF WELDED CONNECTION



6 SECTION: ANGLE TO ANGLE CONNECTION
S-9 SCALE: 1½" = 1'-0"

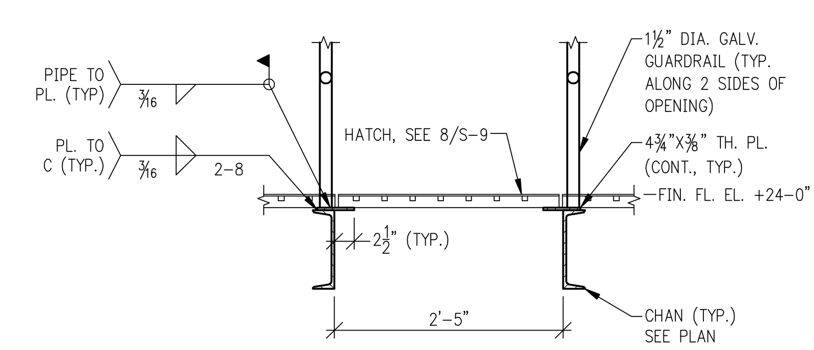


7 SECTION: CHANNEL/GRATING CONNECTION
S-9 SCALE: 1½" = 1'-0"



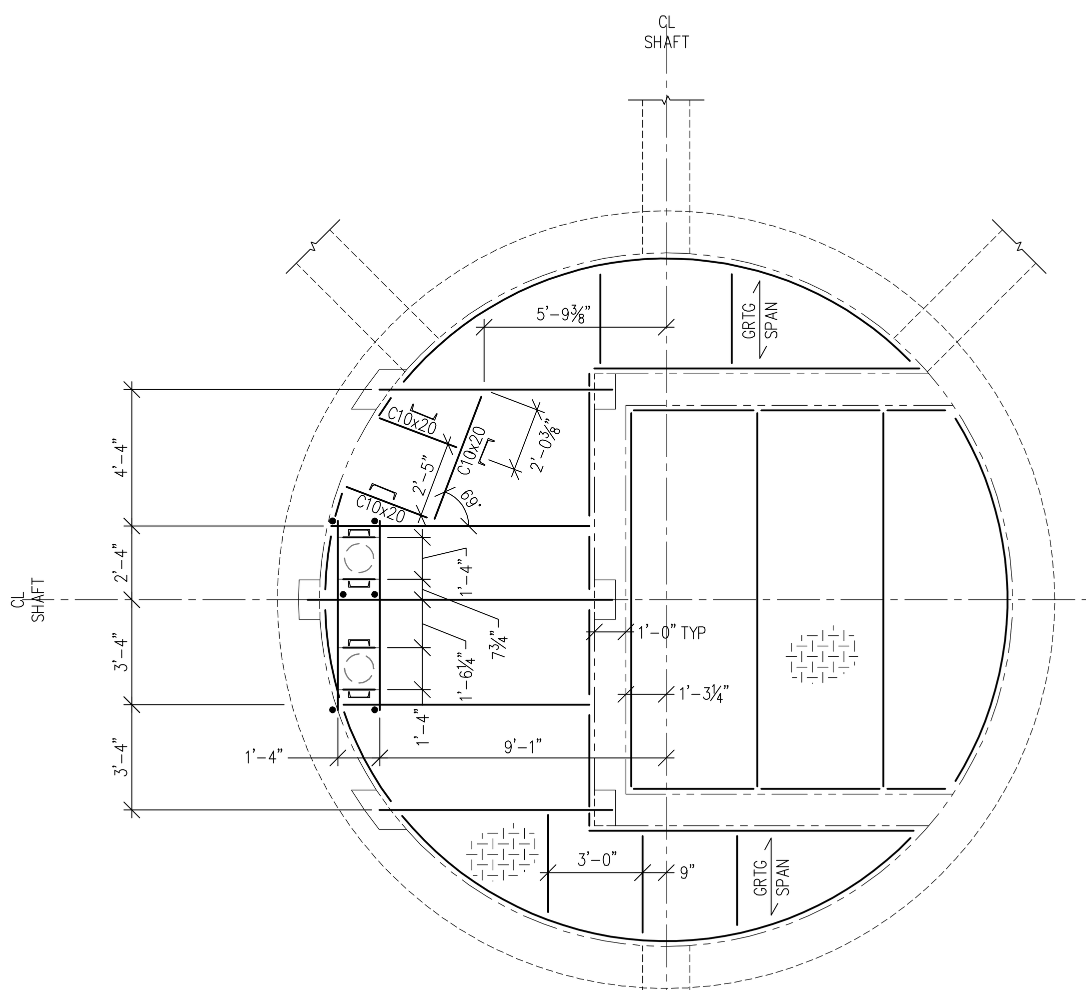
8 SECTION: GRATING HATCH AT OPNG
S-9 SCALE: ¾" = 1'-0"

NOTES: • DOOR/BUTT HINGE TO BE 300 SERIES STAINLESS STEEL WITH 180 DEGREES RANGE OF MOTION, SIMILAR TO ITEM "1499A14" AS MANUFACTURED BY McMASTER-CARR SUPPLY COMPANY, OR APPROVED EQUAL. ATTACH TO DIAMOND PLATE SURFACE WITH 4 – 1/4" DIA. STAINLESS STEEL BOLTS WITH LOCKING NUTS. TYP EACH SIDE.



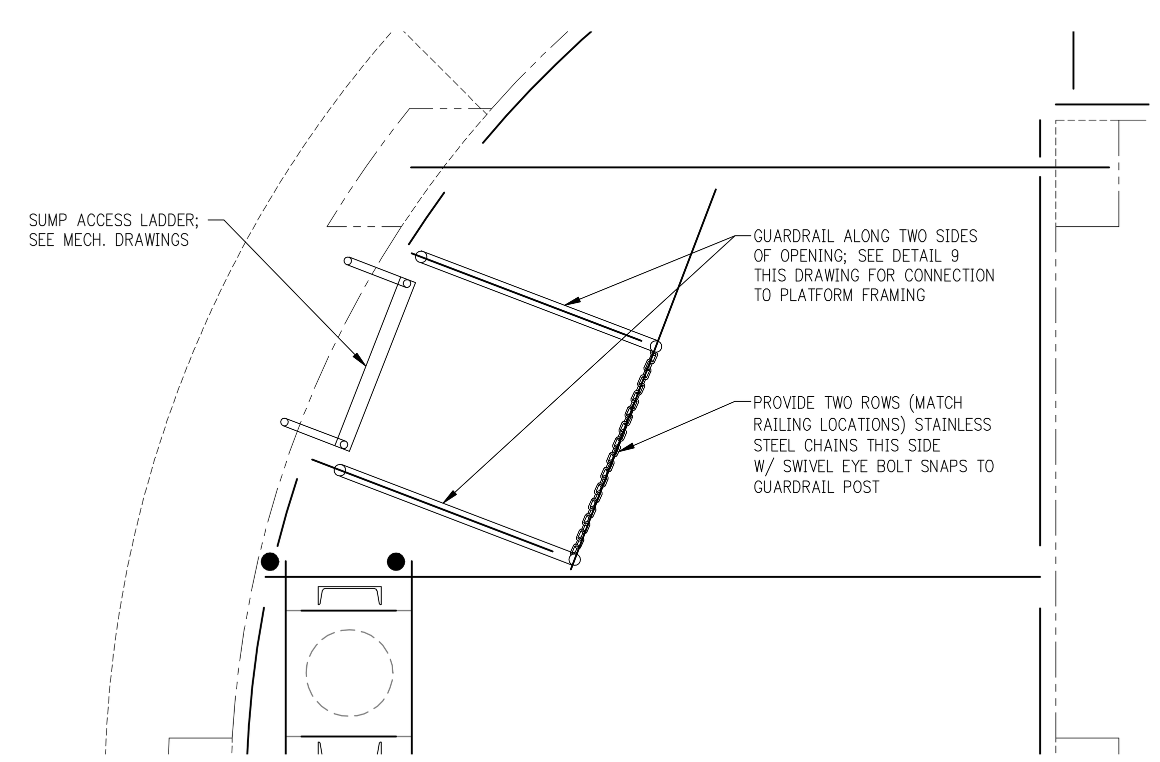
9 SECTION: GUARDRAIL/PLATE CONNECTION
S-9 SCALE: ¾" = 1'-0"

NOTES: • PROVIDE OPENINGS IN GRTG AND PLATE AS REQD FOR INSTALLATION OF GUARDRAIL.



10 PLAN: PUMP FRAMING DIMENSIONS
S-9 SCALE: ¼" = 1'-0"

NOTES: • DIMENSIONS TO PUMP SUPPORT STEEL ARE MEASURED TO BACK FACE OF MC SECTION



11 PLAN: SUMP ACCESS
S-9 SCALE: ¾" = 1'-0"

REVISIONS

ISSUE DATES

ISSUED FOR CONSTRUCTION
PHASE TWO: PUMPS & TIE IN TO WWTP

10 JULY 2009

CONSULTANTS

TETRA TECH ENGINEERS, ARCHITECTS & LANDSCAPE ARCHITECTS, P.C.
56 West Main Street
Christiana, Delaware 19702-1501
ph. 302 738-7551
fax 302 454-5980
www.tetratech-de.com

RCN:	1121C02194
DRAWN BY:	ATC/SEH
CHECKED BY:	ATC
SCALE:	AS NOTED
APPROVED BY:	HKM
DATE:	10 JULY 2009
CAD FILE:	K:\1121C02194\DWGS\NEW\S-9

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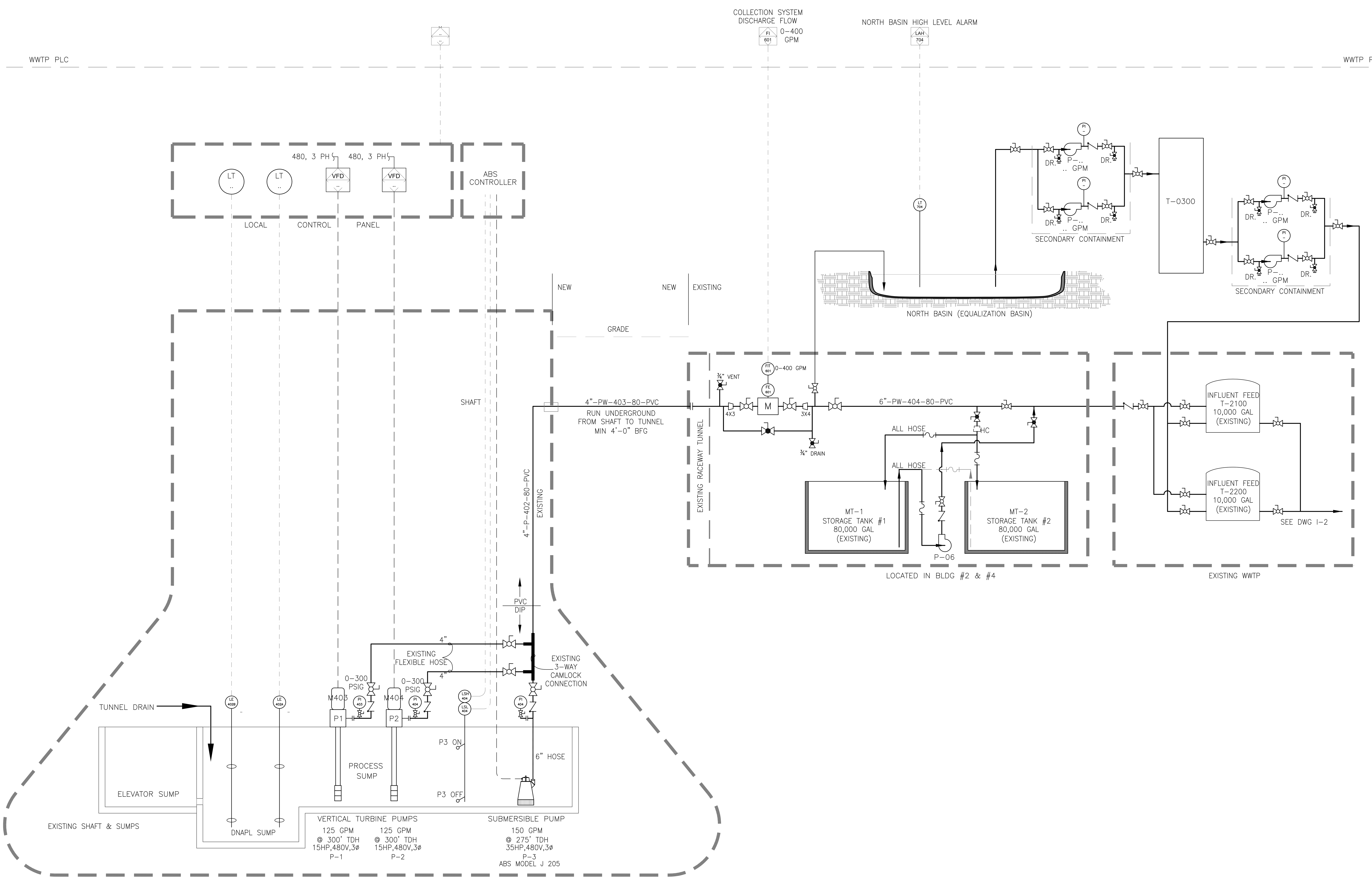
TUNNEL/DRAIN COLLECTION SYSTEM

Hudson Falls, New York

SUMP FRAMING PLAN AND DETAILS
DRAWING TITLE:

DRAWING NUMBER: S-9



REVISIONS

ISSUE DATES

ISSUED FOR CONSTRUCTION
PHASE ONE: SHAFT AND TUNNEL
25 JULY 2007

ISSUED FOR REVIEW
PHASE TWO: PUMP INSTALLATION
20 AUGUST 2009

CONSULTANTS

TETRA TECH

240 Continental Drive, Suite 200
Newark, Delaware 19713
ph. 302 738–7551
fax 302 454–5988
www.tetratech–de.com

RCN:	112IC02194
DRAWN BY:	SNL
CHECKED BY:	HKM
SCALE:	NOT TO SCALE
APPROVED BY:	CKH
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CAD FILE:	SEE PLOT STAMP

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TUNNEL/DRAIN COLLECTION SYSTEM

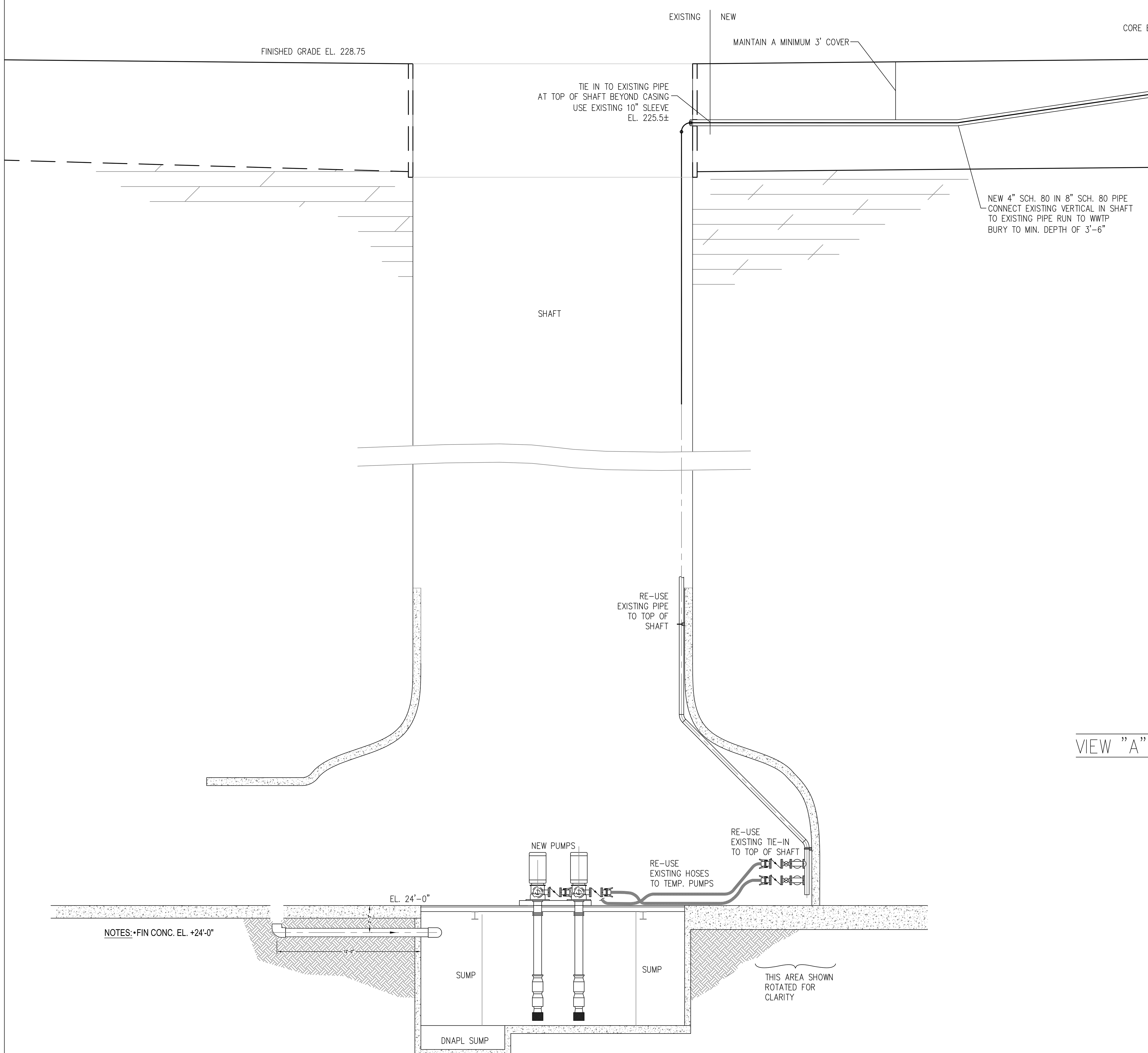
Hudson Falls, New York

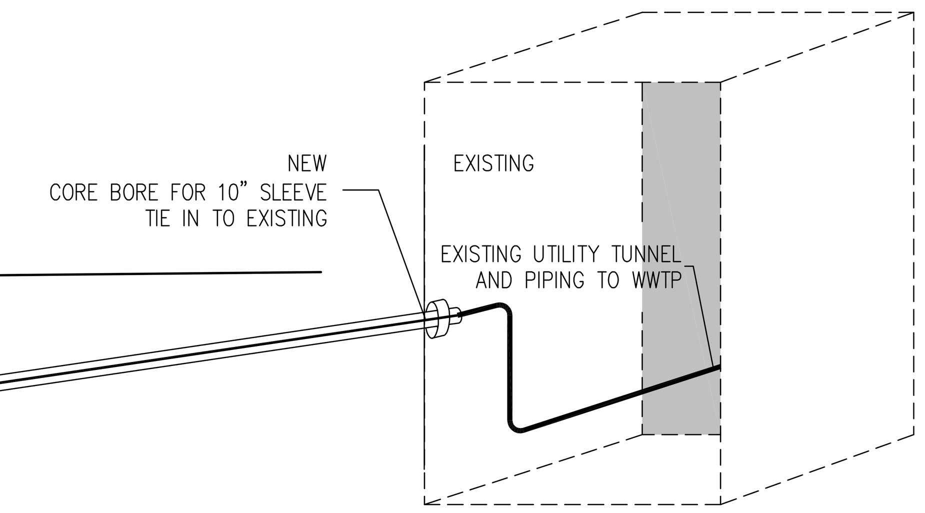
PIPING AND INSTRUMENT DIAGRAM

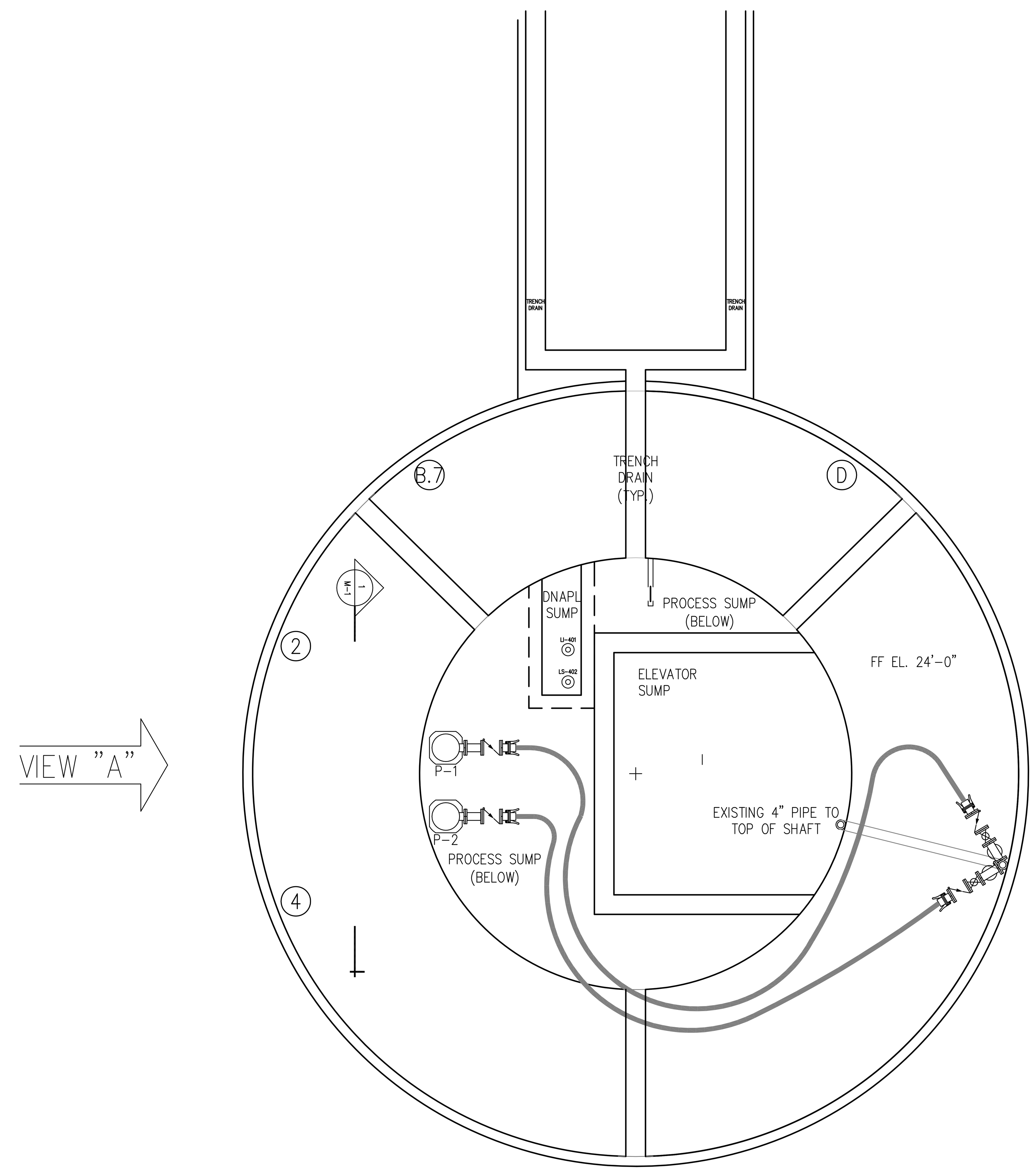
DRAWING TITLE:

PID

DRAWING NUMBER:







VIEW "A"

1 M-1 ELEVATION: PUMP & PIPING INSTALLATION VIEW "A"
SCALE: 1/4" = 1'-0"

2 M-1 PLAN: PUMP & PIPING INSTALLATION
SCALE: 1/4" = 1'-0"

REVISIONS

ISSUE DATES

ISSUED FOR CONSTRUCTION
PHASE TWO: PUMPS & TIE IN TO WWTP

10 JULY 2009

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TETRA TECH ENGINEERS, ARCHITECTS & LANDSCAPE ARCHITECTS, P.C.
56 West Main Street
Christiana, Delaware 19702-1501
ph. 302 738-7551
fax 302 454-5980
www.tetratech-de.com

RCN:	112IC02194
DRAWN BY:	SNL
CHECKED BY:	HKM
SCALE:	AS NOTED
APPROVED BY:	
DATE:	10 JULY 2009
CAD FILE:	M-11

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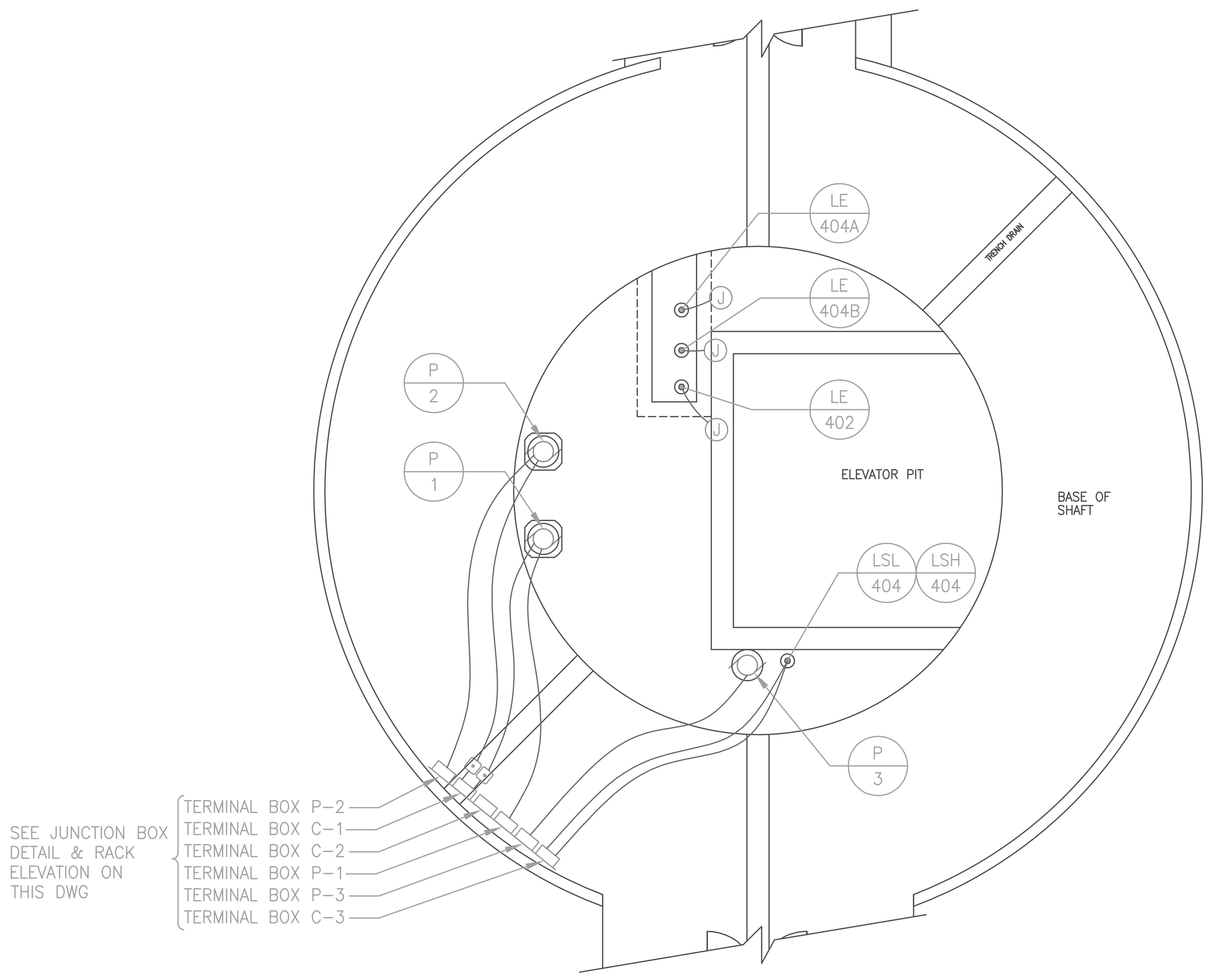
TUNNEL/DRAIN COLLECTION SYSTEM

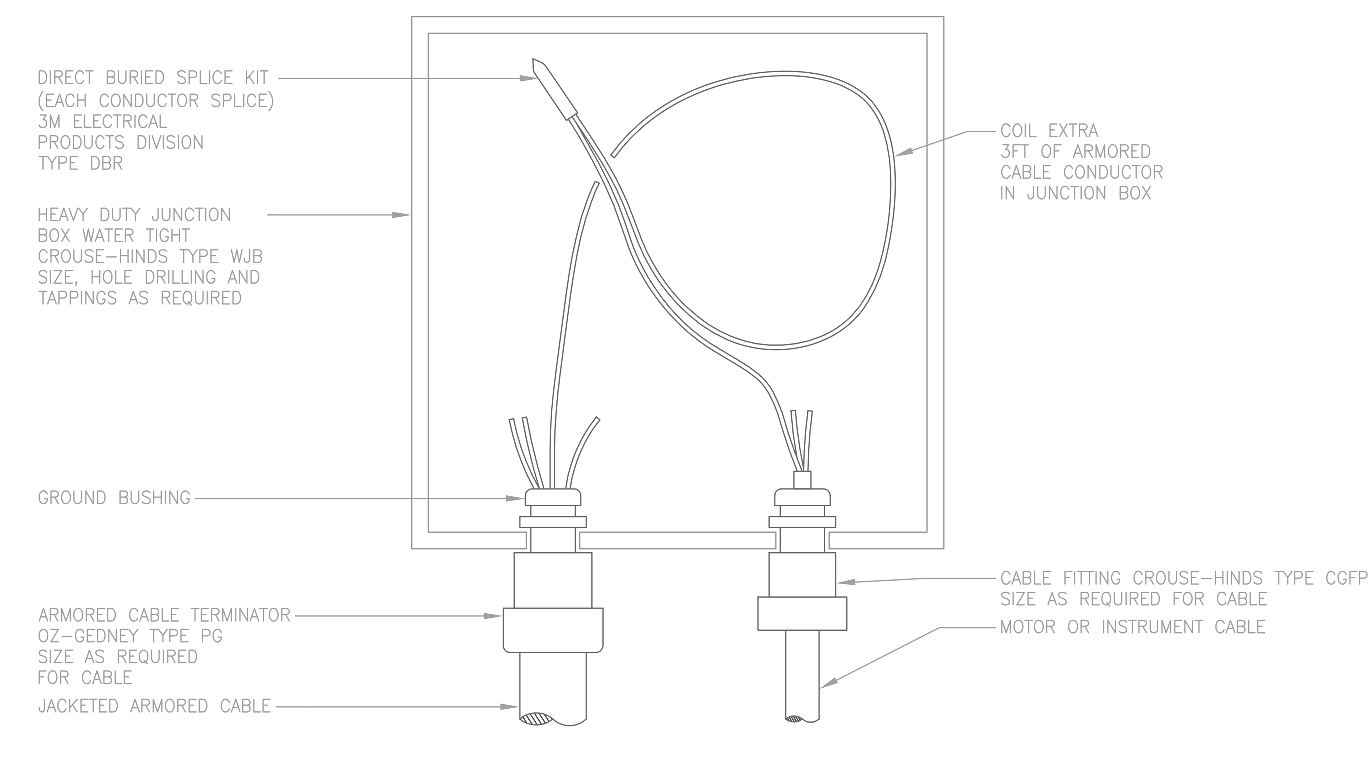
Hudson Falls, New York

DRAWING TITLE: PIPING LAYOUT PLAN AND ELEVATION

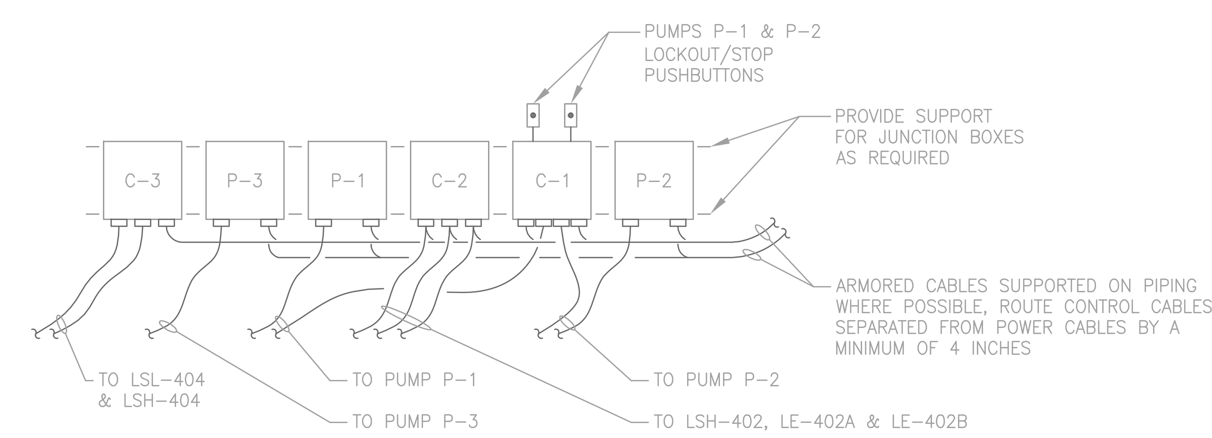
DRAWING NUMBER: M-11



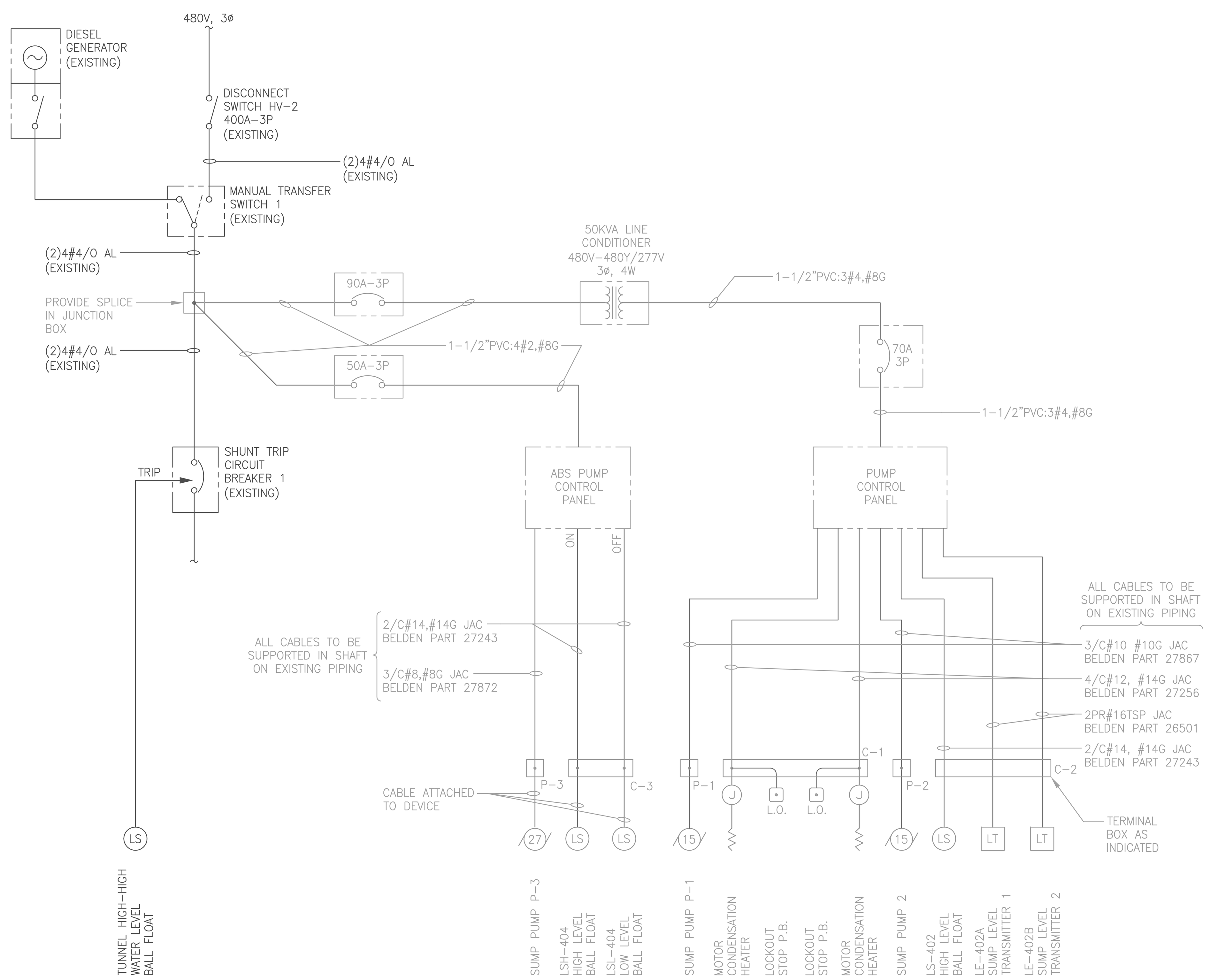
ELECTRICAL PLAN
SCALE: 3/16" = 1'-0"



JUNCTION BOX DETAIL
N.T.S.



JUNCTION BOX RACK ELEVATION
N.T.S.



SINGLE LINE DIAGRAM
N.T.S.

SPECIFICATIONS:

1. LINE CONDITIONER:
   50KVA, 480V-480Y/277V, 3ø, 4W
   INPUT VOLTAGE RANGE: 480V, -25% TO +15%
   OUTPUT VOLTAGE RANGE: 480Y/277V, +/-5%
   RESPONSE TIME: <1.5 CYCLES
   OPERATING FREQUENCY: 57-63 Hz
   EFFICIENCY: 96%
   WEIGHT: 950LBS
   AUDIBLE NOISE LEVEL: <50dBA AT 3FT
   AMBIENT TEMPERATURE: 0° TO 40°C
   UL LISTED: UL1612 AND UL 1449-2
   SOLA/HEVI-DUTY SOLATRON PLUS
   THREE PHASE POWER CONDITIONER
   CAT. NO. 63TCC350

2. LEVEL TRANSDUCER:
   SENSING RANGE: 0-15FT OF WATER
   SUPPLY VOLTAGE: 9-30VDC (LOOP POWERED)
   OUTPUT SIGNAL: 4-20maDC
   ACCURACY: +/-0.1% FULL SCALE
   STABILITY: +/-0.1% PER YEAR
   INTEGRAL SURGE ARRESTER (LEVEL 4)
   FLUOROPOLYMER VENTED CABLE
   ACCESSORY PACK TAS-A187
   GE SENSING - DRUCK MODEL PTX1885

3. BALL FLOAT LEVEL SWITCH:
   CONTACT: SPDT
   RATING: 4AMPS AT 120V
   MATERIAL: POLYPROPYLENE
   CABLE TYPE: STOOW

NOTES:

1. JAC = JACKETED ARMORED CABLE
2. TRANSFORMER, CIRCUIT BREAKER AND PUMP CONTROL PANEL TO BE LOCATED IN WEATHER SHELTER AT TOP OF SHAFT. MOUNTING AND SHELTER EXPANSION TO BE BY FILED AS REQUIRED.

REVISIONS

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PHASE ONE: SHAFT AND TUNNEL
25 JULY 2007

ISSUED FOR REVIEW
PHASE TWO: PUMP INSTALLATION
20 AUGUST 2009

CONSULTANTS

CAREW ASSOCIATES, INC.
CONSULTING ENGINEERS
2 Penns Way; Suite 203
New Castle Corporate Commons
New Castle, DE 19720
p. 302.328.3600
f. 302.328.3601
e. design@carewassoc.com

TETRA TECH
240 Continental Drive, Suite 200
Newark, Delaware 19713
ph. 302 738-7551
fax 302 454-5988
www.tetratech-de.com

RCN:	1112/CO2194
DRAWN BY:	DFD
CHECKED BY:	RKB
SCALE:	AS NOTED
APPROVED BY:	RC
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CAD FILE:	E-9.DWG

General Electric Company

TUNNEL/DRAIN
COLLECTION SYSTEM

Hudson Falls, New York

ELECTRICAL PLANS
& DIAGRAMS
DRAWING TITLE:

E-9
DRAWING NUMBER:
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