

GENERAL NOTES

The County of Delaware requirements, together with the Specifications of the State of Ohio, Department of Transportation, including all supplements thereto in force on June 1, 1997 shall govern all materials and workmanship involved in the improvements shown on these plans unless otherwise noted.

The Contractor and Sub-Contractor shall be solely responsible for all federal, state and local safety requirements, together with exercising precautions at all times for the protection of persons (including employees) and property. It is also the sole responsibility of the Contractor and Sub-Contractor to initiate, maintain and supervise all safety requirements, precautions and programs in connection with the work.

The Contractor shall obtain all necessary permits.

The Contractor shall furnish and maintain sanitary convenience facilities for the workmen and inspectors for the duration of the work.

All Force Mains shall be Cast Iron Pipe meeting the requirements of ANSI Specifications A21.6 (AWWA C106) or A21.8 (AWWA C108); Ductile Iron Pipe meeting the requirements of ANSI A21.51 (AWWA C151); PE Plastic Pipe meeting the requirements of ASTM Specification D-1248 and D-2837 or PVC Pipe Meeting the requirements of ASTM D-1784 and ASTM D-2241 and shall be a minimum SDR 21. Cast Iron Pipe and Ductile Iron Pipe minimum barrel thickness shall be calculated meeting the requirements of the Standard Plans and Specifications for Construction of Sanitary Facilities in Delaware County, Ohio.

The Contractor shall furnish and place acceptable material as backfill and embankment around the proposed structures. Material used may be obtained from the material excavated or from approved off-site borrow, if required. Waste excavation may be disposed of on the site or on off-site areas when required. All backfill and embankment shall be placed in accordance with Delaware County Engineer Drawing R100 and Delaware County Engineer Construction and Materials Specification 203.08.

The Contractor shall provide Reaction Backing at all horizontal and vertical bends per Delaware County Sanitary Standard Dwg. #24.

The Contractor shall cooperate with the Delaware County Sanitary Engineer and shall provide all necessary equipment to perform all testing.

No connection shall be made to receiving sanitary system until the project has been fully installed, tested and approved. Sewer trenches shall be de-watered to 2" below bell of pipe prior to installation of the pipe.

Roof drains, foundation drains and other clean water connections to the Sanitary Sewer are prohibited on this project.

Force mains shall be tested by a hydrostatic pressure and leakage test. With the main subjected to a hydrostatic pressure of 125 psi at its lowest elevation, allowable leakage shall not exceed 20 gallons per inch diameter per mile per 24 hours.

Automatic Air Release Valves shall be manufactured by Crispin Valves, model number S10AB.

The cost for all compacted backfill shall be included in the price bid for the various items.

Finished grade at sanitary sewer manholes shall be six inches (6") below the top of casting to avoid unnecessary infiltration into the sanitary sewer system.

Any changes in the materials will need to be approved by the Delaware County Sanitary Engineer and Engineer of Record.

EXISTING UTILITIES

The identity and location of the existing underground utility facilities known to be located in the construction area have been shown on the plans as accurately as provided by the Owner of the underground utility. Delaware County and/or the Engineer assume no responsibility as to the accuracy of the underground facilities shown on the plans.

Support, protection and restoration of all existing utilities and appurtenances shall be the responsibility of the Contractor. The cost of this work shall be included in the price bid for the various items.

The Contractor shall cause notice to be given to the Ohio Utilities Protection Service (O.U.P.S.) (Telephone 1-800-362-2764 toll free) and to the Owners of underground utility facilities shown on the plans who are not members of a registered underground protection service in accordance with section 153.64 of the Revised Code. The above mentioned notice shall be given at least 48 hours prior to start of construction.

The Contractor is responsible to coordinate the relocation of any utilities as required by the plan with the utility company.

The Contractor shall expose the utility or structure indicated sufficiently in advance of laying the proposed sewer in order to verify the proposed location. Cost to be included in the price bid for the various sewer items.

Any field tile disturbed during construction shall be replaced as directed by the County, with PVC/HDPE pipe spanning the trench. The trench shall be filled with Compacted Granular Material. Cost of this work is to be included in the price bid for the various items.

The following utilities are located within the work limits of this project and the Owners do not subscribe to a registered underground utility protection service.

UTILITY	OWNER	TELEPHONE
Water Mains	Del-Co Water Co., Inc. 6773 Olentangy River Road Delaware, Ohio 43015	(740) 548-7746
Sanitary Sewers	Delaware County 50 Channing Street Delaware, Ohio 43015	(740) 833-2240
Storm Sewers	Delaware County 50 Channing Street Delaware, Ohio 43015	(740) 833-2400

AREA RESTORATION

All areas, including fence, that are disturbed by this project, shall be restored to original or better condition, per item 659 (Seeding and Mulching), or other applicable specification.

All items of work for which no specific method of payment is provided, including the restoration of disturbed or damaged property to its original state, shall be performed by the Contractor and the cost of same shall be included in the price for the various related bid items.

STORAGE OF EQUIPMENT AND MATERIALS

No materials, including pipe, shall be stored within twenty (20) feet of the edge of pavement of St. Rt. 3 or Worthington Road nor within fifty (50) feet of any intersecting street or driveway. During non-working hours, storage of equipment shall comply with these same requirements. Compliance with these requirements shall not in any way relieve the Contractor of his legal responsibilities or liabilities for the safety of the public.

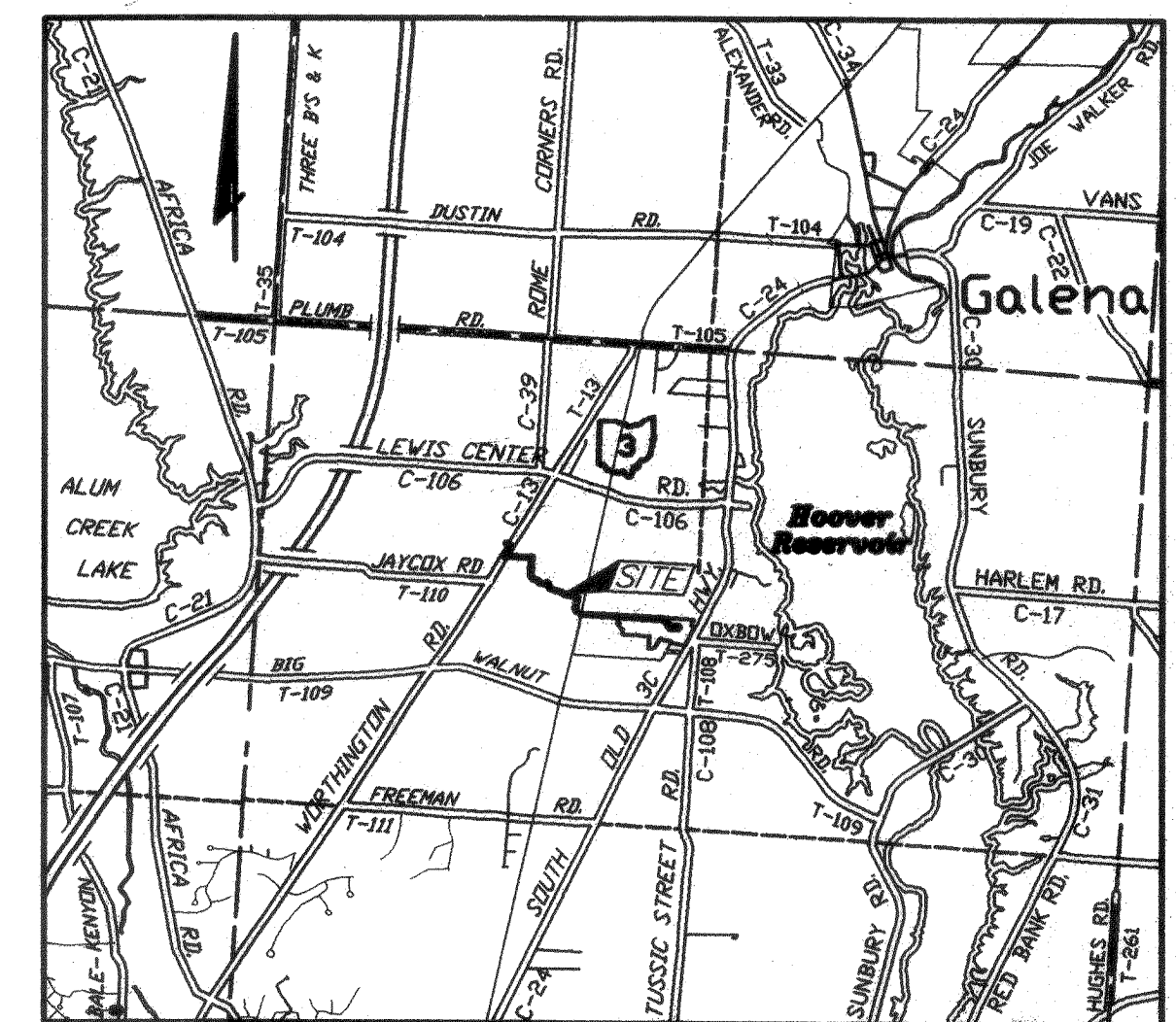
RIGHT OF WAY

In addition to direct requirements of the Contract Documents, the Contractor shall observe and conform to the specific requirements of all rights-of-way including easements, court entries, rights of entry or action filed in court in accordance with the code of the applicable governing agency. The cost of the operations necessary to fulfill such requirements shall be included in the price bid for the various items of the contract unless specific provision is made in the Contract Documents for the measurement of and payment for such cost specific items of the Contract.

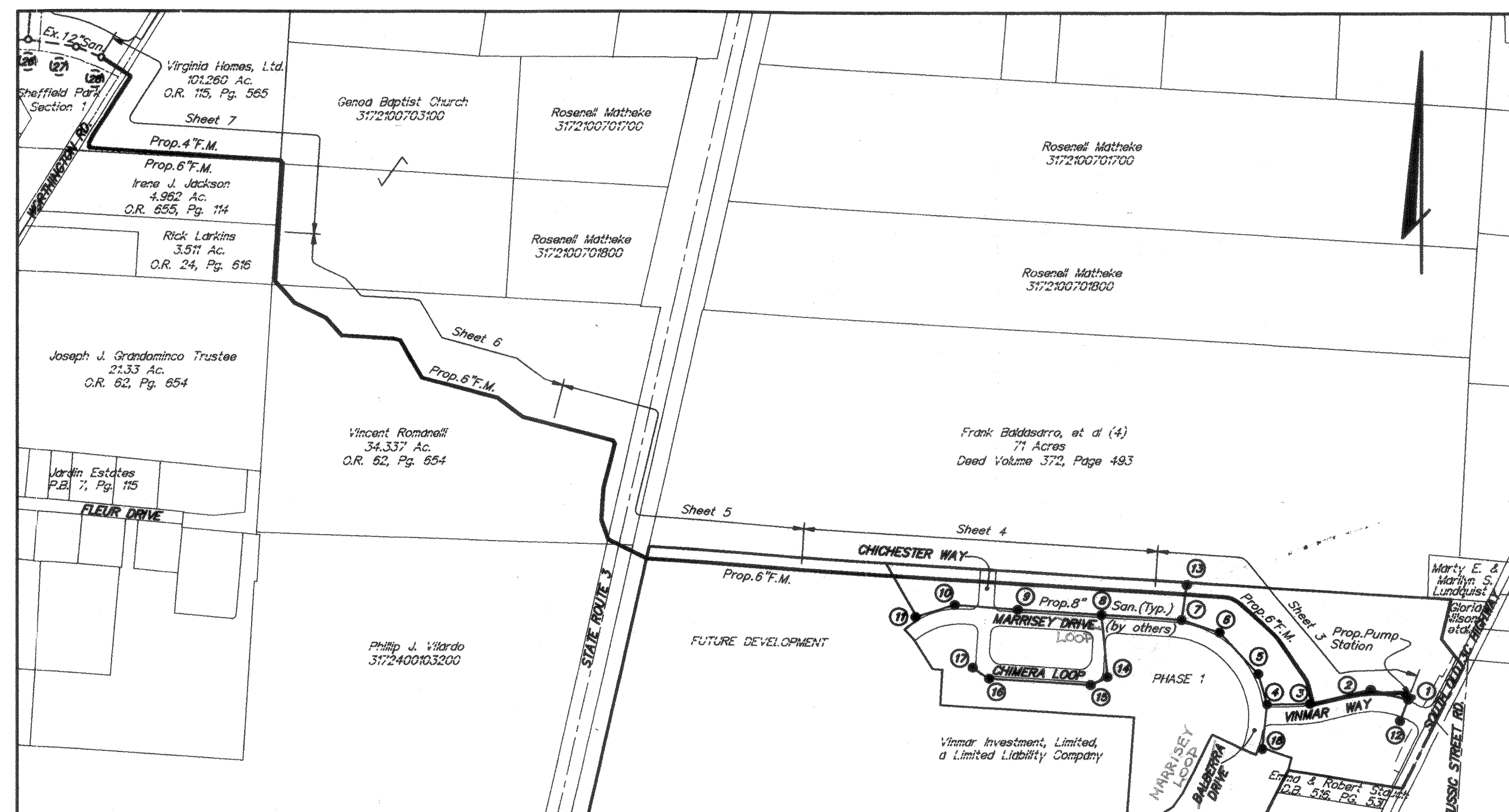
DELAWARE COUNTY, OHIO VINMAR FARMS PUMP STATION & 6" OFFSITE FORCE MAIN SANITARY SEWER IMPROVEMENT

2003

LOCATED IN:
FARM LOT 4, 5, 6, 7 & 14 SECTION 2
TOWNSHIP 3, RANGE 17
UNITED STATES MILITARY LANDS
GENOA TOWNSHIP, DELAWARE COUNTY, STATE OF OHIO



LOCATION MAP
Scale: 1" = 5280'



INDEX MAP
Scale 1"=400'

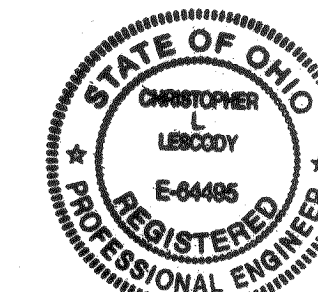
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OWNER/DEVELOPER

Vince Romanelli
148 Schrock Road
Westerville, Ohio 43081
Tele: (614) 891-2042
Fax: (614) 891-2045

PREPARED BY
EVANS, MECHWART, HABLETON & TILTON, INC.
CONSULTING ENGINEERS & SURVEYORS
GAHANNA, OHIO
(614) 471-5150



Christopher L. Leedy
Professional Engineer No. 64495

8-22-03
Date

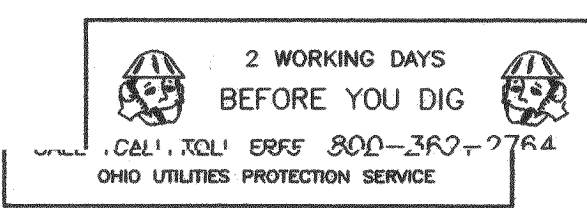
BENCH MARKS NAVD 1988

Source B.M. BP in CM near intersection of Big Walnut Rd. and new S.R. 3, 70 Ft. N. of E. of Big Walnut Rd., 50 Ft. E. of E. of new S.R. 3, 31 Ft. W. of W. rail of Penn Central RR, 1 Inch above ground. Elev. = 945.289 (NGVD 29 Elev. = 945.819)

B.M. #1 RRS in N. Root of 30" Oak along S. E. approximately 885 Ft. W. of W. R/W of South Old 3C Highway. N:188590.12, E:1855732.46 Elev. = 949.32 (NGVD 29 Elev. = 949.85)

B.M. #2 RRS in S. Side of 18" Oak along N. E. 150 Ft. ± E. of S.R. 3 Bike Path. Elev. = 948.81

B.M. #3 RRS in S. Side of 18" Cottonwood in Edge of Woods, 150 Ft. ± N. of S. E. 125 Ft. ± E. of S.R. 3 Bike Path. Elev. = 949.39



Approved this 3rd day of November, 2003
Abner B. Mart
County Commissioner

Approved this 3rd day of November, 2003
James D. Ward
County Commissioner

Approved this 3rd day of November, 2003
Kevin M. Goff
County Commissioner

Approved this 4th day of September, 2003
Jack Smelker
Delaware County Sanitary Engineer

Approved this 23rd day of October, 2003
Chris E. Bauserman
Delaware County Engineer

Date approved	Approved	Prepared	Change	Date Prepared	CHANGE ORDER SCHEDULE	Sht. No.
2-9-04	J.S.	D.J.W.	/1	2/3/04	Revised Grading at Pump Station access drive and revised electrical notes and diagrams.	2,3,9,10, 11 & 12.
		J.M.H.	/2	9/01/04	Revised location of the Bioxide Fill Valve Chamber, Utility Pad Mount Transformer, Driveway, Easement, Generator Receptacle, and Emergency pump out connections.	2,3,9, 10 & 11
9-9-04	J.S.				Updated Quantities. Added Access Drive Gate Detail.	

GENERAL NOTES (CONTINUED)

TRAFFIC
No non-rubber tired vehicles shall be moved on public streets.
Access to all adjoining properties shall be maintained at all times.
All traffic control devices shall be furnished, erected, maintained and removed by the Contractor in accordance with the "Ohio Manual of Uniform Traffic Control Devices for Streets and Highways", copies of which are available from the Ohio Department of Transportation, Bureau of Traffic, 1980 E. Broad Street, Columbus, Ohio 43215.

Type "C" Steady Burn Lights shall be used on all barricades, drums and similar traffic control devices in use at night.

All trenches shall be backfilled or securely plated during non-working hours.

Ingress and egress shall be maintained at all times to public and private property.

MAINTAIN DRAINAGE
The flow in all sewers, drains and watercourses encountered shall be maintained by the Contractor at his own expense, and whenever such watercourses and drains are disturbed or destroyed during the prosecution of the work they shall be restored by the Contractor at his own cost and expense to a condition satisfactory to the Engineer.

TREE PRESERVATION
The Developer will preserve as many existing trees as possible during the course of construction of the force main to prevent mechanical and compaction injury to existing trees not exempt under the Tree Impact Plan, per Township Zoning Officer. The Developer will require the Contractor and Builders to install snow fencing or barrier around a tree or group of trees to protect the trees and forest floor. Tree protection shall be placed before any construction or grading is begun and shall be maintained in repair during construction. The fencing shall be located as far out from the trunk as the dripline to restrict construction within that area.

All trees, whether shown or not shown on the plans, are to be preserved unless approval to remove is given in writing by the Engineer or their removal has been designated thusly on the plans. The Contractor shall use special precautions to avoid damage to all other trees. When, in the opinion of the Engineer, trunks or branches of trees would be endangered by the use of mechanical excavation devices, hand excavation will be required. The cost of tree removal and disposal and the cost of tree protection shall be included in the price bid for Trees Removed and Disposed of.

All disturbed surface areas not covered by structures or a hard surface improvement shall be covered with stone or shall be seeded or sodded, per EPA and County Erosion & Sedimentation Control Requirements and sloped to drain. All grass or stone areas shall have a minimum slope or grade of eight-tenths percent, except that the ground next to buildings shall slope away from the building at a five percent grade for a minimum of ten feet.

In addition to all of the above, the Contractor shall read the Township's Development Regulations for the Vinmar Tract, and abide by required specifications listed in same.

STANDARD DRAWINGS
Standard Drawings listed on these plans, as shown in the "Preliminary Standard Plans and Specifications for Construction of Sanitary Facilities in Delaware County, Ohio, shall be considered a part thereof:

1	23
14	24
20	25

City of Columbus
DCED-R1441

Note:
Trees, Shrubs & Evergreens
Are To Be Planted At The Same
Grade As Grown in Nursery.

Rubber Hose Tree Protection
No. 10 Or No. 12 Gauge
Galvanized Wire Inside.
2" X 2" X 8' Wood Stake
1 Per Tree Up To 8' Hgt.

Construction Tape
Safety Flag

Drive Stakes To 18"
Min. Below Pit

3" Minimum
Mulch Collar
4" Minimum Saucer

Prepare Topsoil As Specified
(do Not Allow Air Pockets To
Form When Backfilling.)

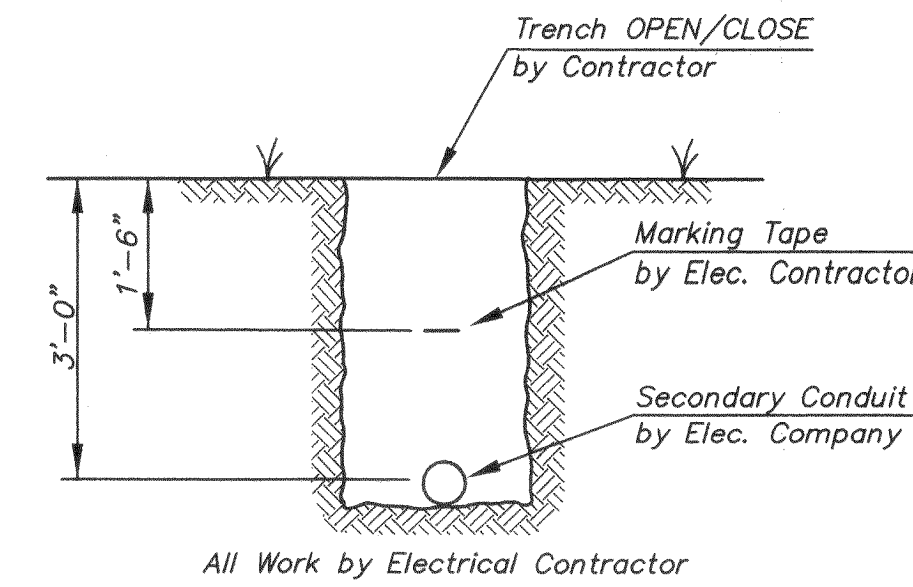
Remove Top 1/3 Of Burlap.
All Non-biodegradable Material
Shall Be Totally Removed.

Note:
The Contractor shall preserve trees in the area of the proposed pump station and service drive as required by Genoa Township. Prior to any tree clearing, the Contractor shall stake the location of the pump station and service drive and contact Genoa Township (614-899-0725) to arrange a field meeting to determine specific tree removal, replacement and screening requirements. If tree removal is necessary that removes screening between the pump station and South Old 3C highway, the area shall be re-planted to provide heavy screening as directed by Genoa Township.

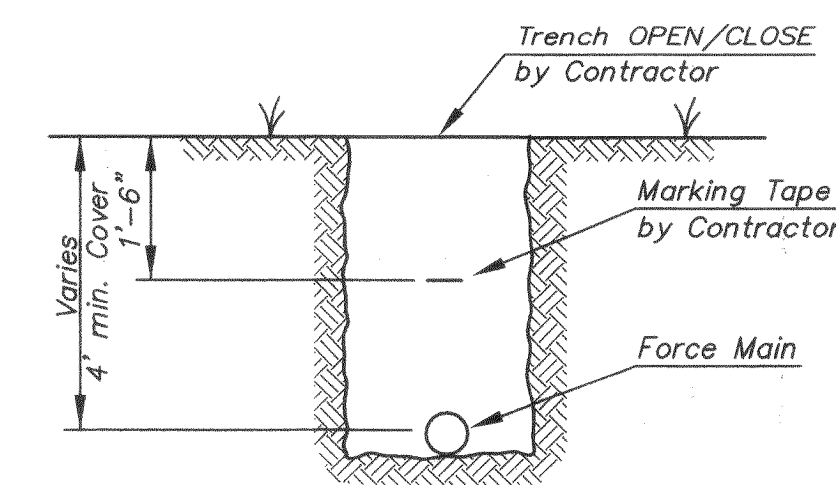
EVERGREEN TREE PLANTING
No Scale

ESTIMATE OF QUANTITIES			
ITEM	QUANTITY	UNIT	DESCRIPTION
201	Lump	Sum	Clearing and Grubbing
207	2	Each	Dandy Bag Inlet Protection
207	190 230	Lin. Ft.	Filter Fabric Fence
608	245 270	Sq. Ft.	Concrete Walk
659	Lump	Sum	Seeding and Mulching
Spec.	Lump	Sum	Pump Station and Valve Chamber, Complete
Spec.	Lump	Sum	Bioxide System, Complete
Spec.	Lump	Sum	Valve Chamber Building, Complete
Spec.	1,215	Lin. Ft.	4" PVC Sewage Force Main
Spec.	7,025	Lin. Ft.	6" PVC Sewage Force Main
Spec.	3	Each	Automatic Air Release Valve & Manhole
Spec.	82	Lin. Ft.	8" Casing Pipe Bored & Jacked, Complete
Spec.	246	Lin. Ft.	12" Casing Pipe Bored & Jacked, Complete
Spec.	Lump	Sum	Landscaping (Pump Station)

Note:
The quantities shown on this plan are the Engineers best determination of the work to be performed. The Contractor, in making his bid, should make his own determination of the quantities and discuss any differences with the Engineer prior to bidding.

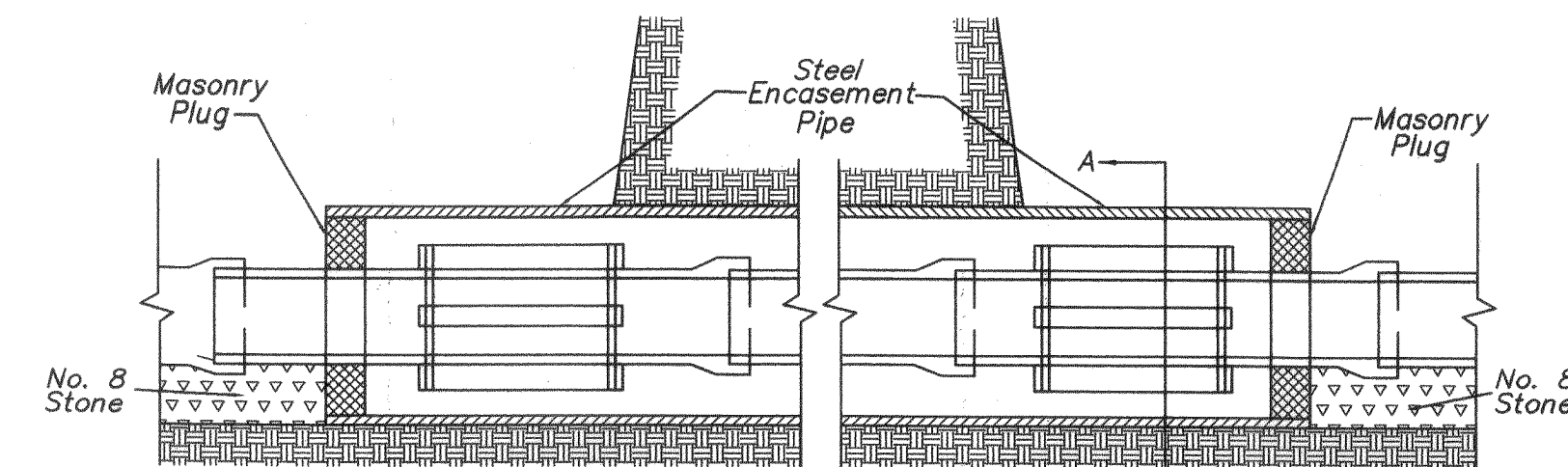


ELECTRICAL TRENCH DETAIL
No Scale

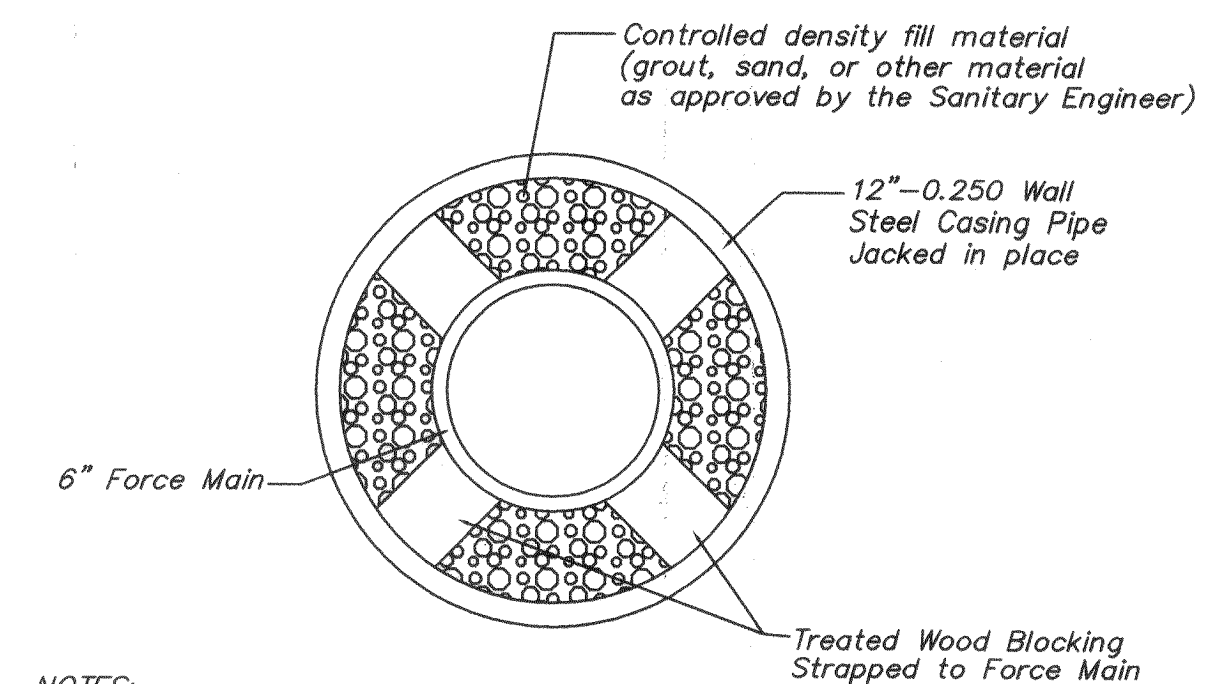


MARKING TAPE DETAIL
No Scale

Note: Cost to be included in price bid for Sewage Force Main.

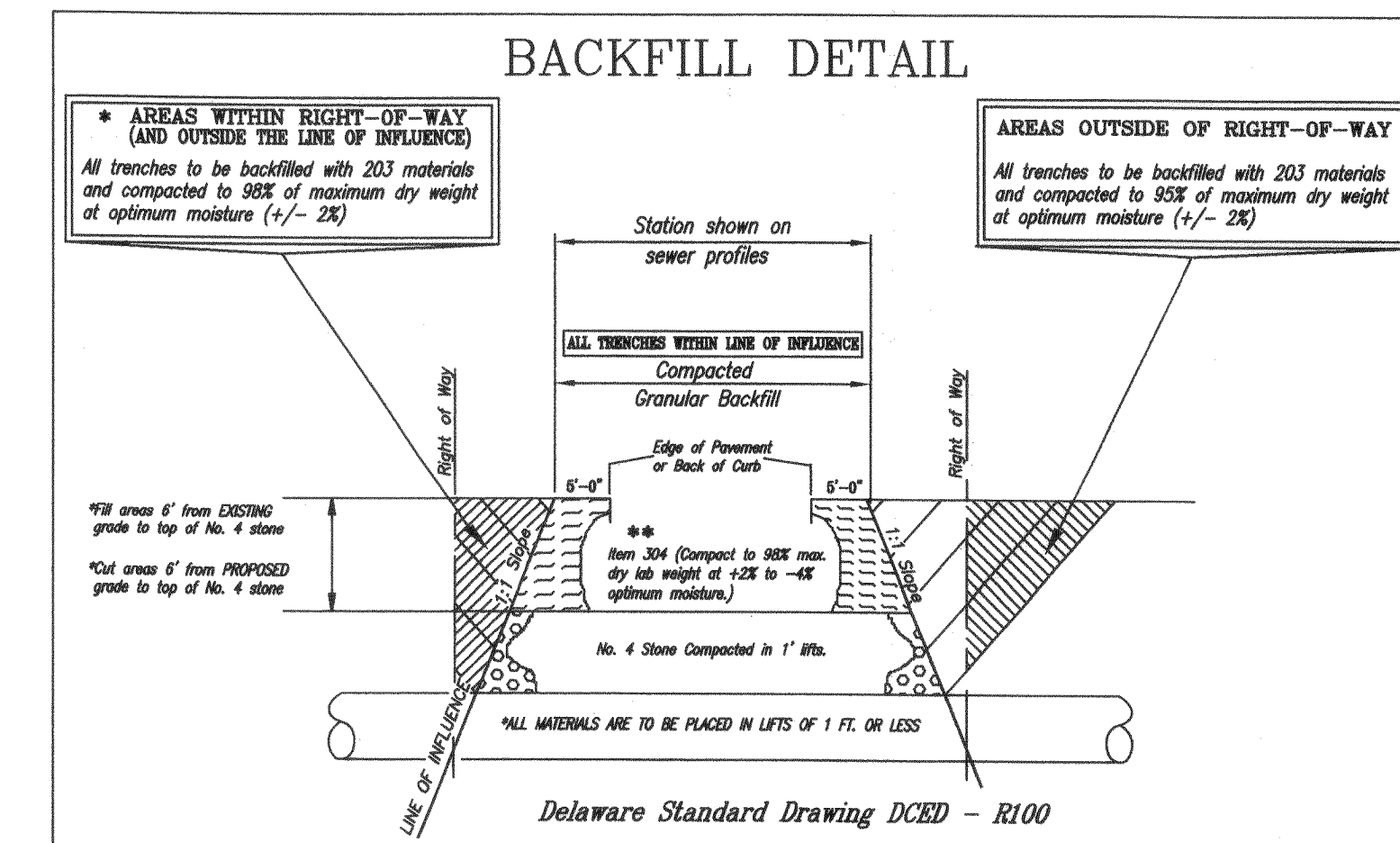


BORING DETAIL
No Scale



- NOTES:
- Treated Wood Blocking to be 8 Inches Long Banded to Each Length Of Pipe, 8'-0" Maximum C/C. Allow 1 Inch Maximum Clearance Between Blocks And Casing Pipe.
 - Steel Casing Pipe to be 12" in Diameter for 6" Force Main unless approved in writing by the Engineer. Minimum Yield Strength= 35,000 PSI; Nominal Wall Thickness=0.250 Inches unless calculations are submitted that justify other wall thicknesses.
 - Steel Casing Pipe to be 8" in Diameter for 4" Force Main unless approved in writing by the Engineer. Minimum Yield Strength= 35,000 PSI; Nominal Wall Thickness=0.188 Inches unless calculations are submitted that justify other wall thicknesses.

JACK CASING DETAIL (12" & 8")
SECTION A-A
No Scale

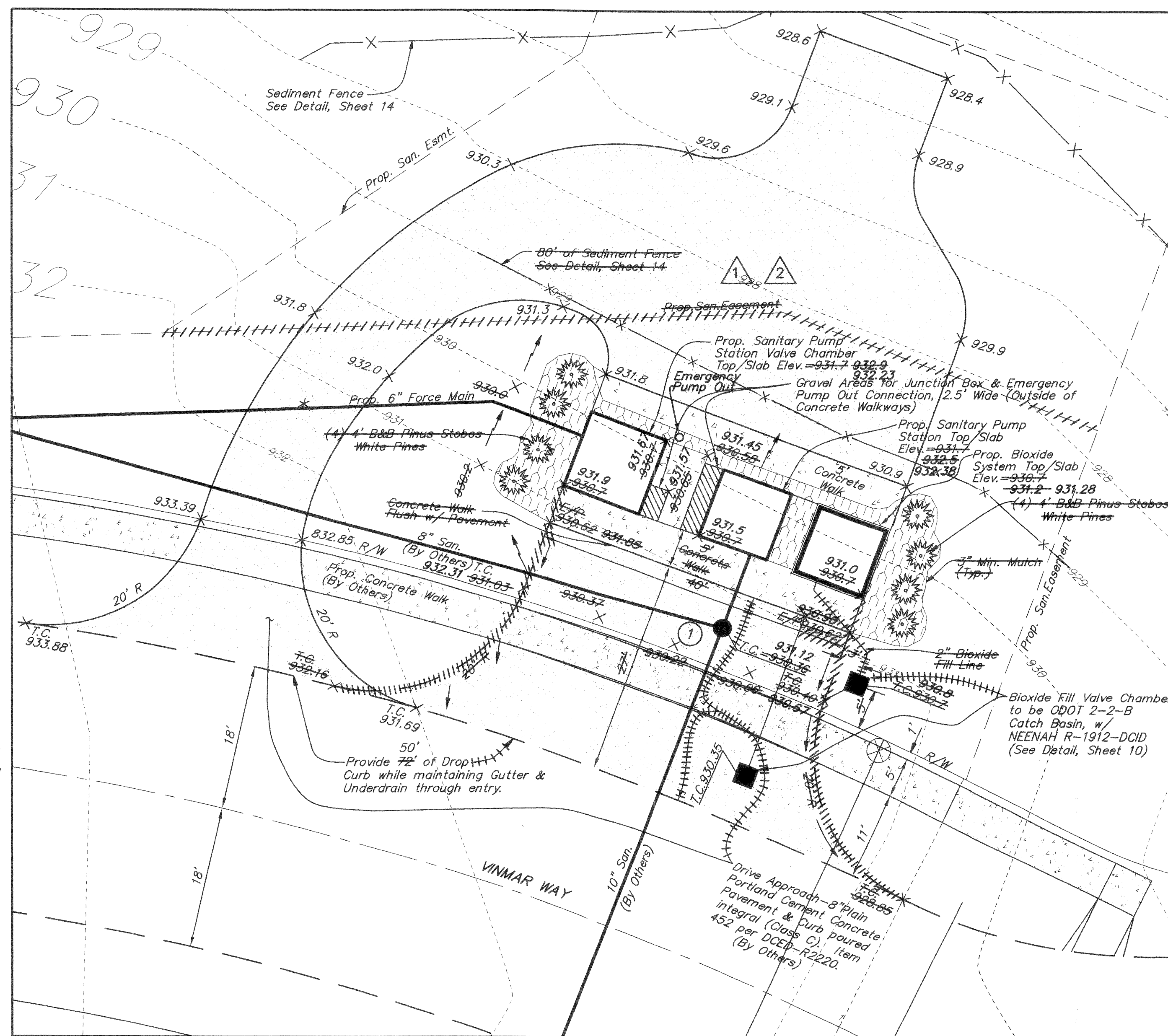


- 1 - Revised grading at pump station access drive, including elevations of Pump Station Slab.
- 2 - Revised location of Bioxide Fill Valve Chamber, Driveway, Easement, and updated Quantities.
- * The force main backfill under the access drive shall be compacted granular backfill as per the backfill detail on this sheet.

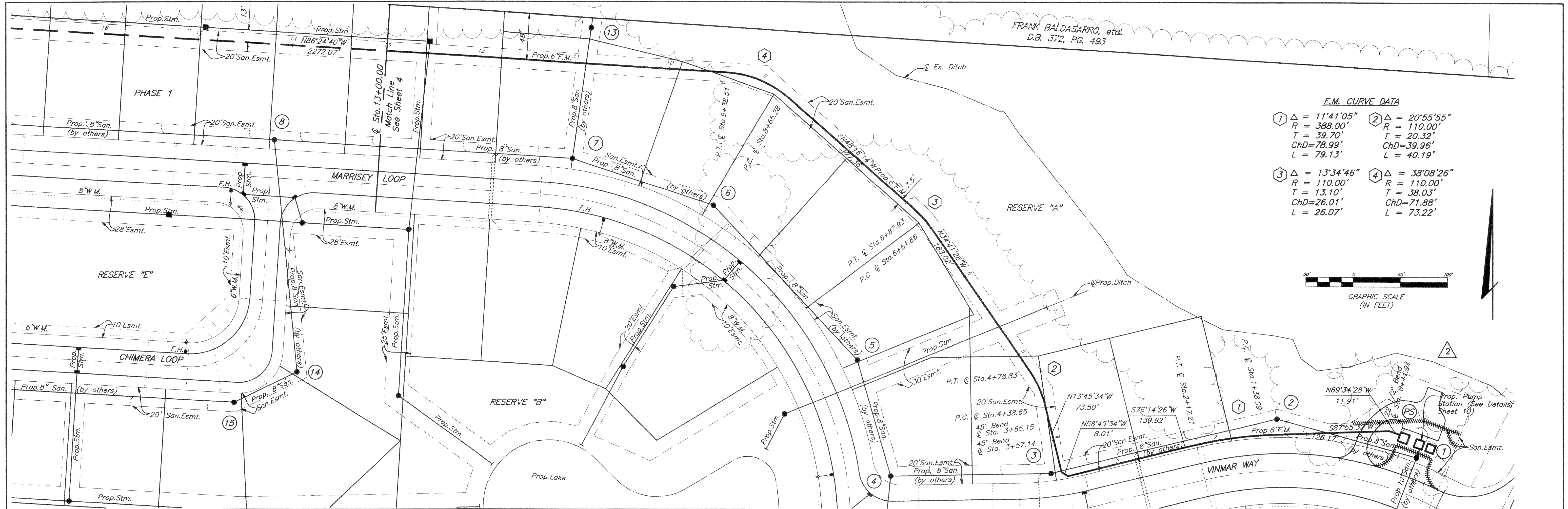
DELAWARE COUNTY, OHIO
SANITARY SEWER IMPROVEMENT
FOR
VINMAR FARMS
PUMP STATION &
6" OFFSITE FORCE MAIN

SCALE: As Noted August 22, 2003

EVANS, MECHWART, HAMBLETON & TILTON, INC.
CONSULTING ENGINEERS & SURVEYORS

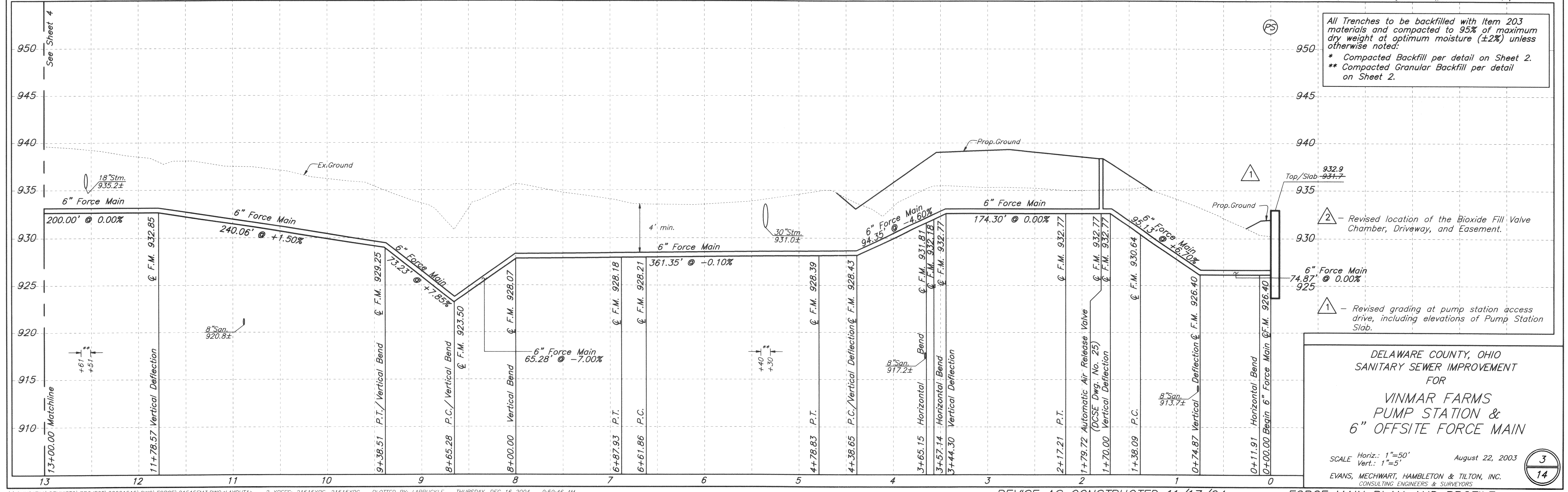
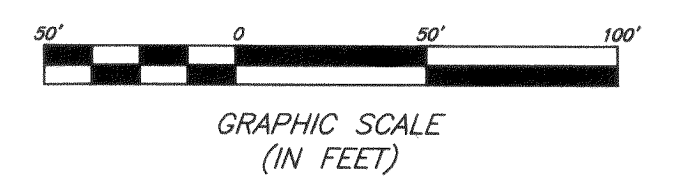


PUMP STATION SITE PLAN
Scale 1"=10'



F.M. CURVE DATA

① $\Delta = 11'41'05''$ R = 388.00' T = 39.70' ChD = 78.99' L = 79.13'	② $\Delta = 20'55'55''$ R = 110.00' T = 20.32' ChD = 39.96' L = 40.19'
③ $\Delta = 13'34'46''$ R = 110.00' T = 13.10' ChD = 26.01' L = 26.07'	④ $\Delta = 38'08'26''$ R = 110.00' T = 38.03' ChD = 71.88' L = 73.22'



All Trenches to be backfilled with Item 203 materials and compacted to 95% of maximum dry weight at optimum moisture ($\pm 2\%$) unless otherwise noted.
 * Compacted Backfill per detail on Sheet 2.
 ** Compacted Granular Backfill per detail on Sheet 2.

① - Revised grading at pump station access drive, including elevations of Pump Station Slab.
 ② - Revised location of the Bioxide Fill Valve Chamber, Driveway, and Easement.

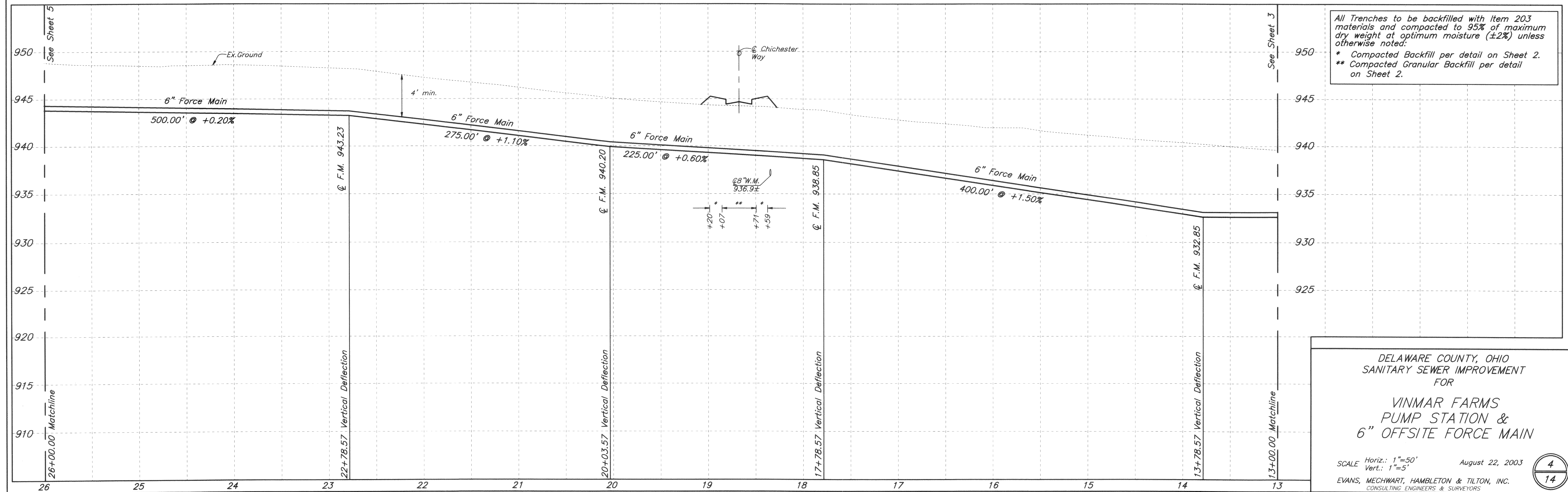
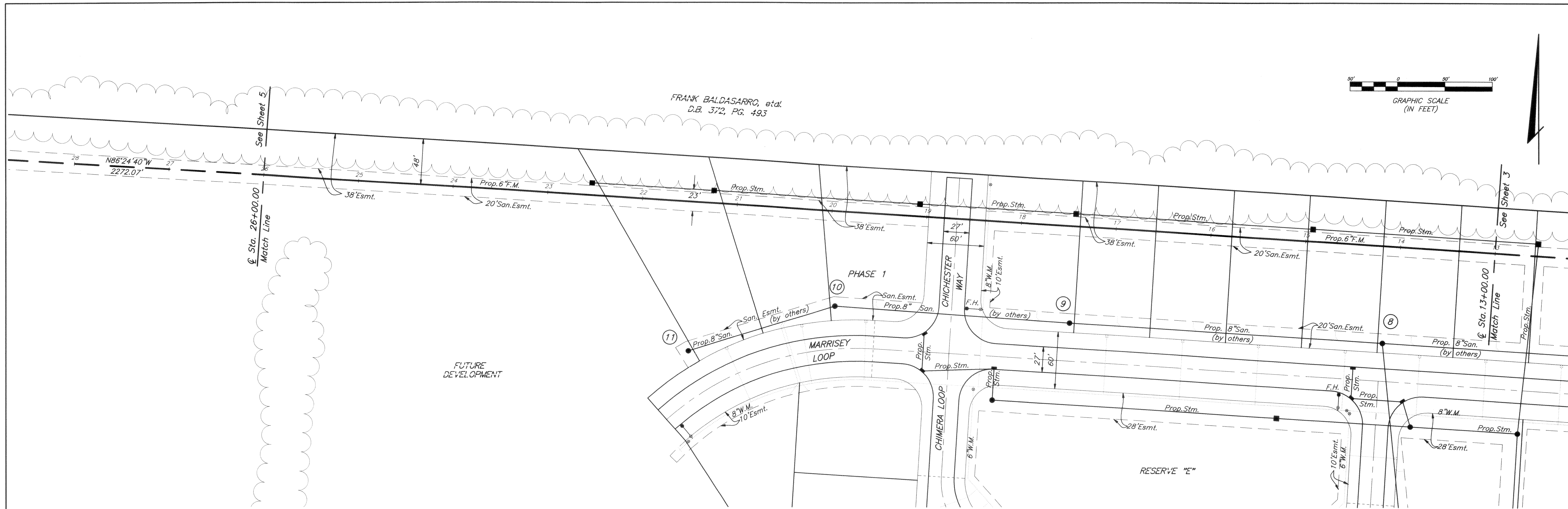
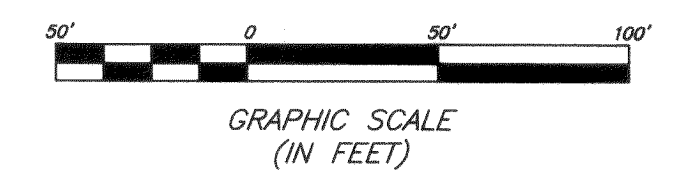
DELAWARE COUNTY, OHIO
 SANITARY SEWER IMPROVEMENT
 FOR
**VINMAR FARMS
 PUMP STATION &
 6" OFFSITE FORCE MAIN**

SCALE Horiz.: 1"=50'
 Vert.: 1"=5'

August 22, 2003

EVANS, MECHWART, HAMBLETON & TILTON, INC.
 CONSULTING ENGINEERS & SURVEYORS

FRANK BALDASARRO, etd.
D.B. 372, Pg. 493



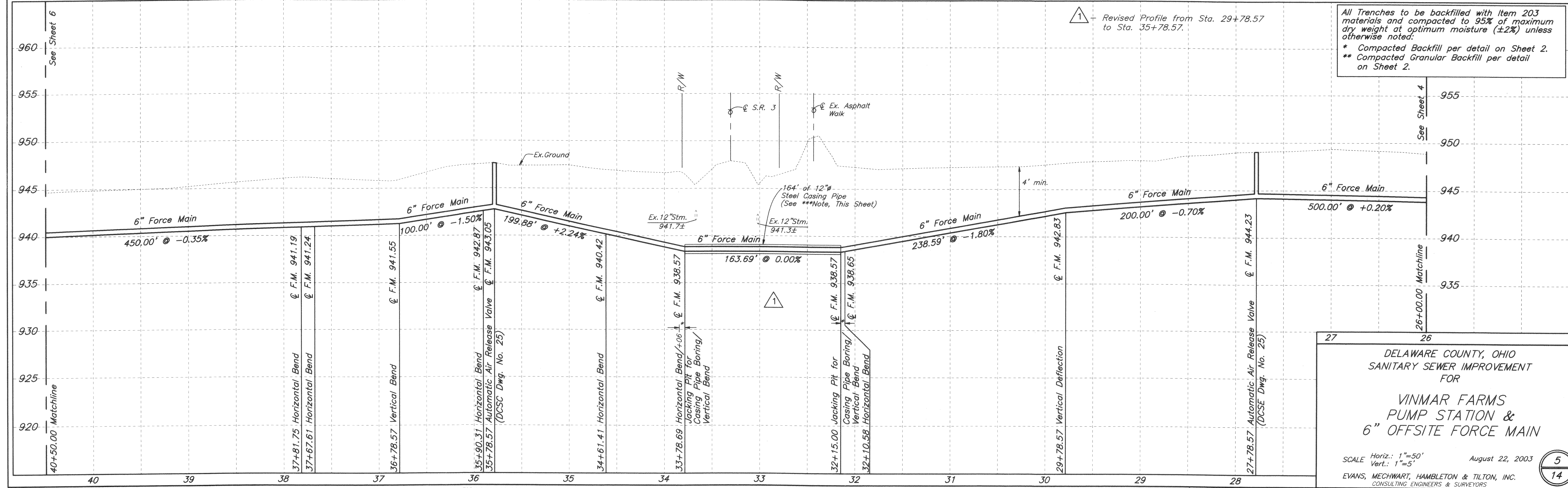
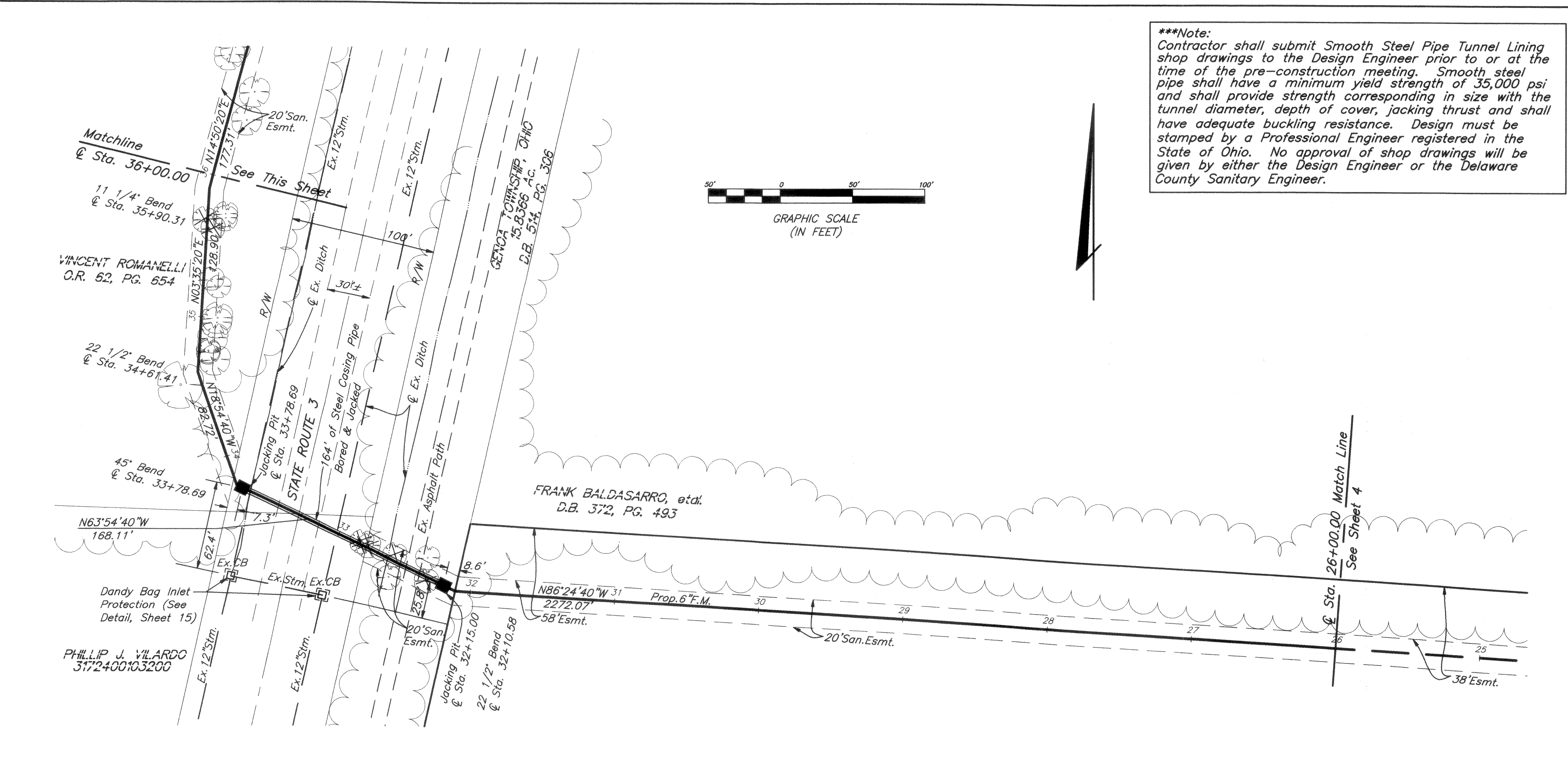
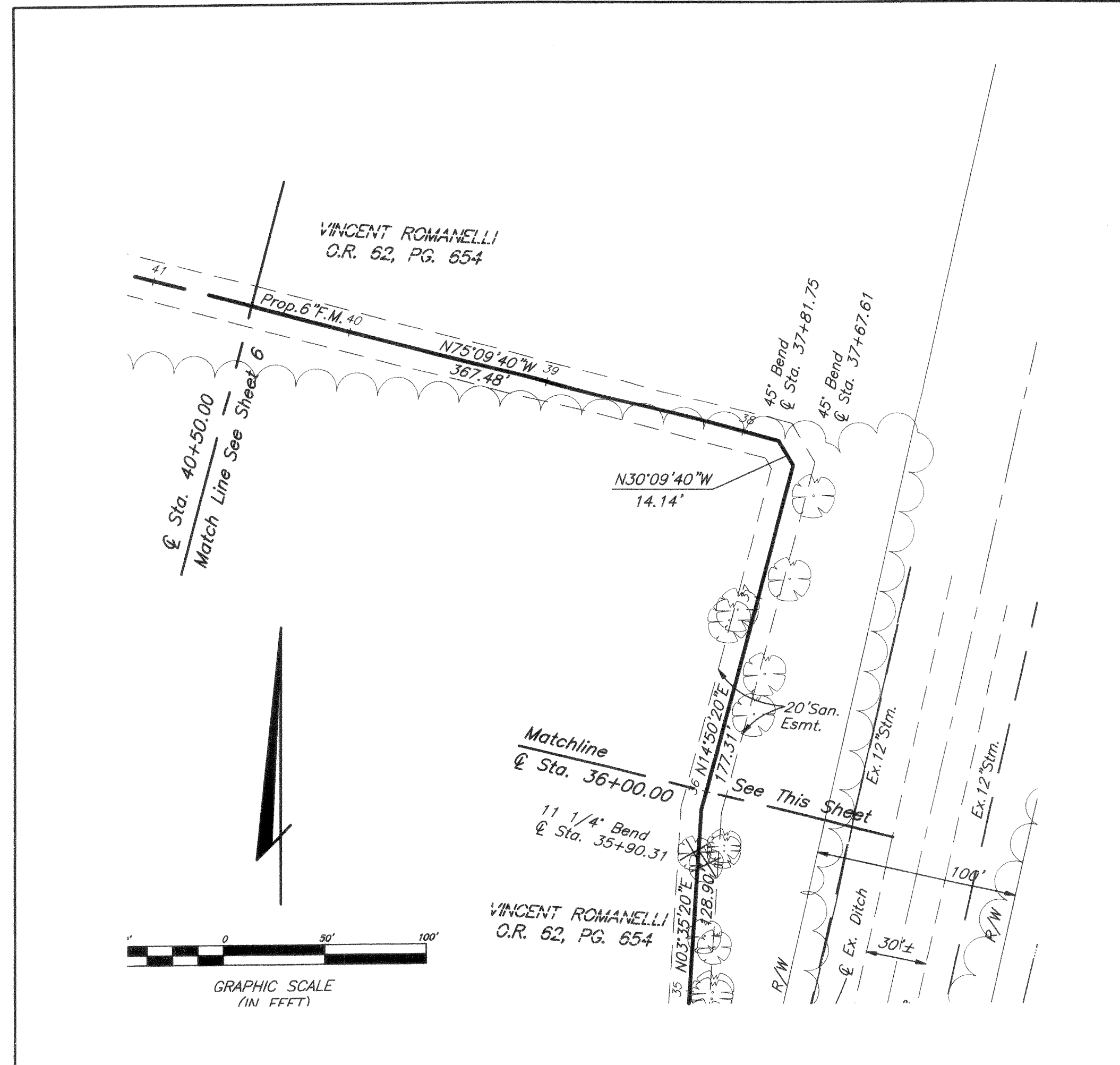
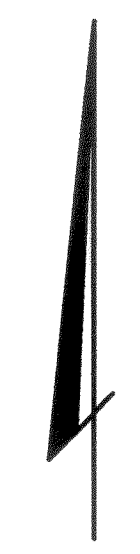
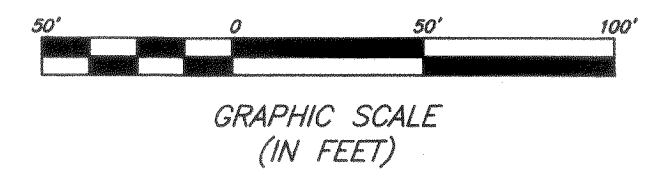
DELAWARE COUNTY, OHIO
SANITARY SEWER IMPROVEMENT
FOR
VINMAR FARMS
PUMP STATION &
6" OFFSITE FORCE MAIN

SCALE Horiz.: 1"=50'
Vert.: 1"=5'

August 22, 2003

EVANS, MECHWART, HAMBLETON & TILTON, INC.
CONSULTING ENGINEERS & SURVEYORS

***Note:
Contractor shall submit Smooth Steel Pipe Tunnel Lining shop drawings to the Design Engineer prior to or at the time of the pre-construction meeting. Smooth steel pipe shall have a minimum yield strength of 35,000 psi and shall provide strength corresponding in size with the tunnel diameter, depth of cover, jacking thrust and shall have adequate buckling resistance. Design must be stamped by a Professional Engineer registered in the State of Ohio. No approval of shop drawings will be given by either the Design Engineer or the Delaware County Sanitary Engineer.



1 Revised Profile from Sta. 29+78.57 to Sta. 35+78.57.

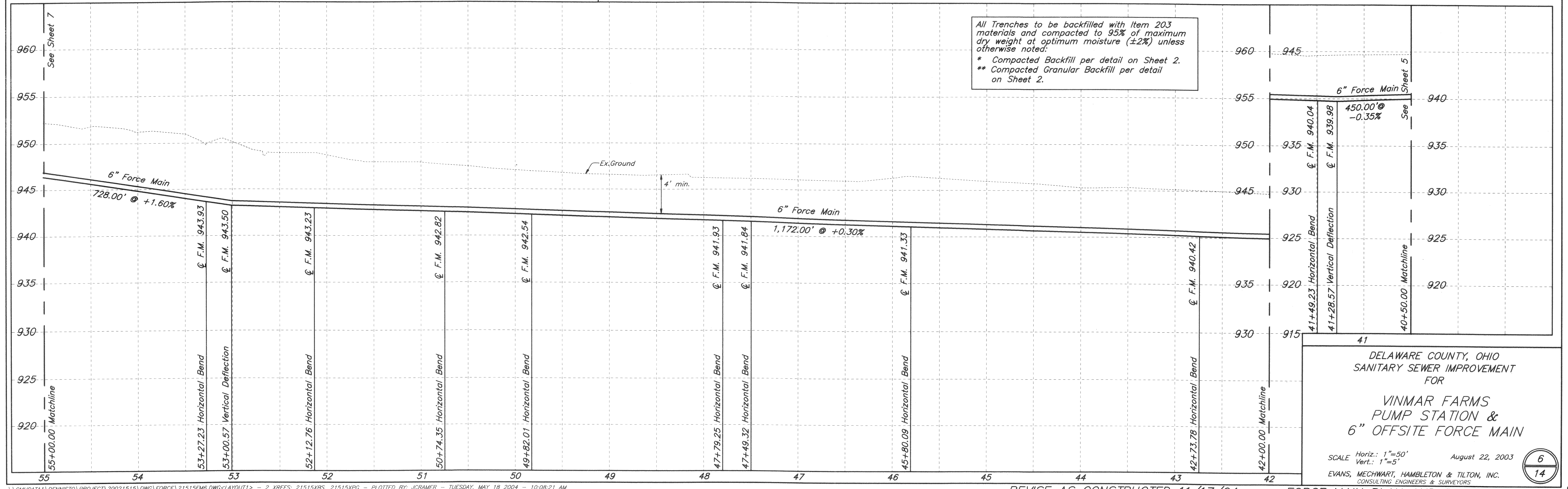
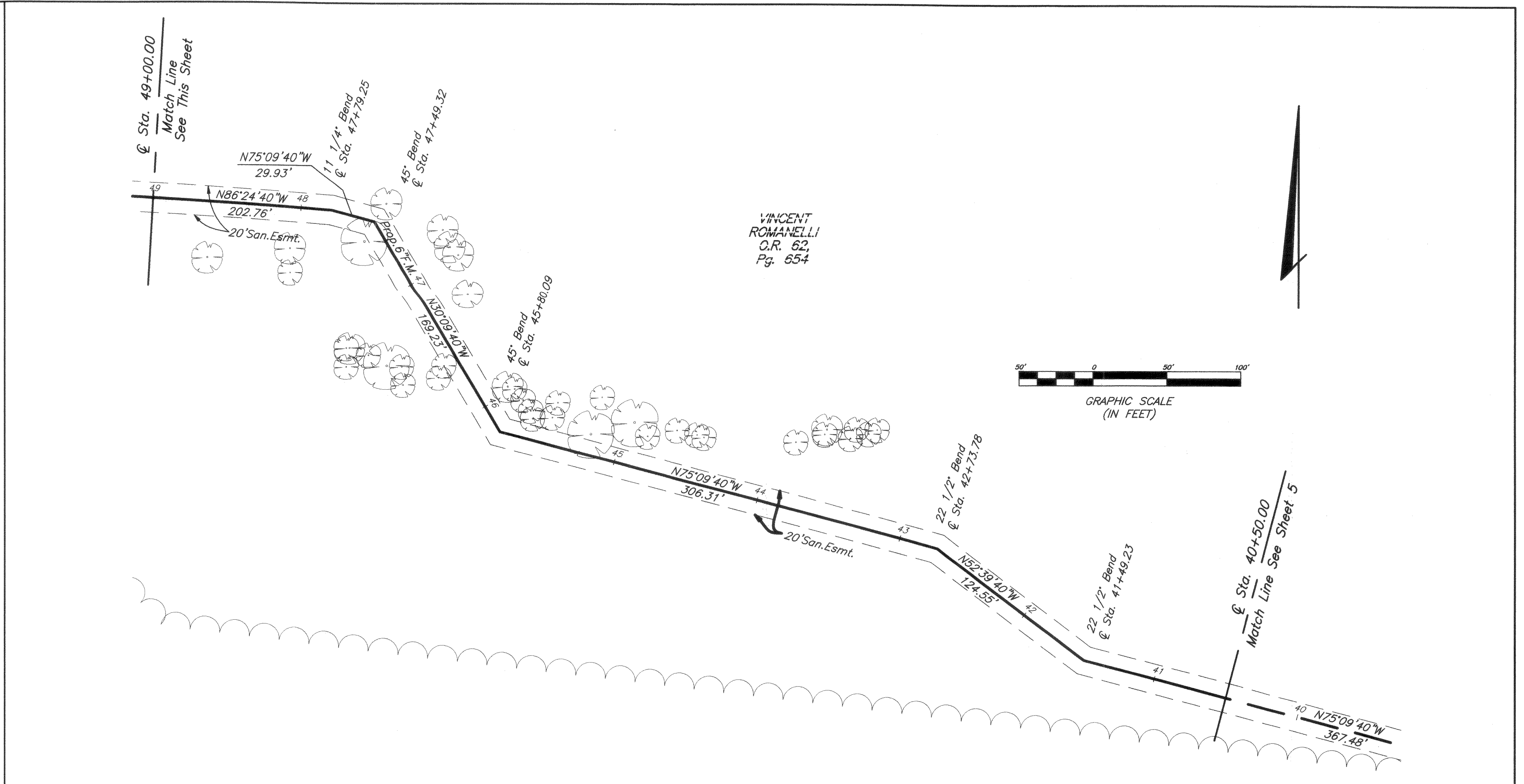
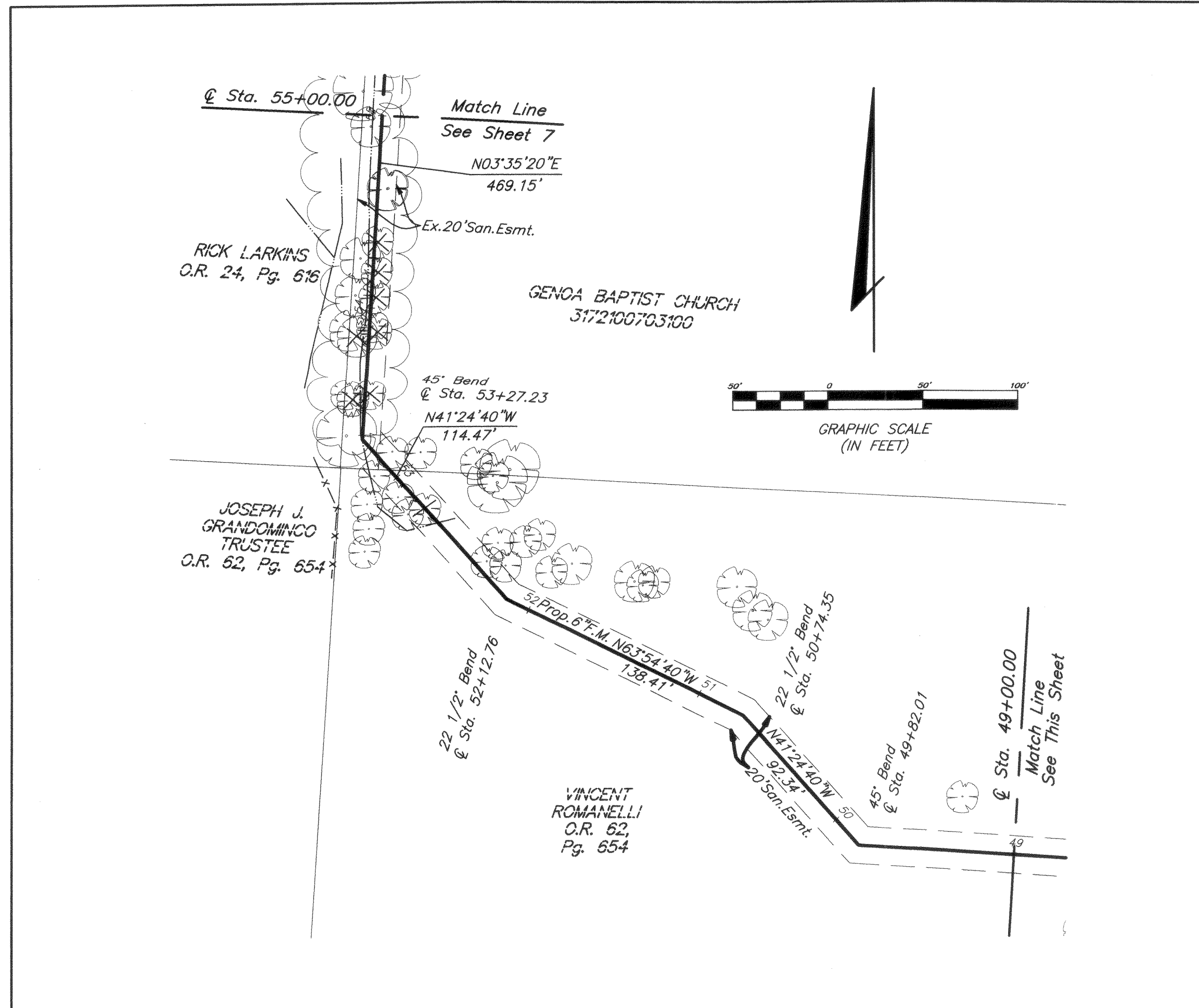
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* Compacted Backfill per detail on Sheet 2.
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DELAWARE COUNTY, OHIO
SANITARY SEWER IMPROVEMENT
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PUMP STATION &
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August 22, 2003

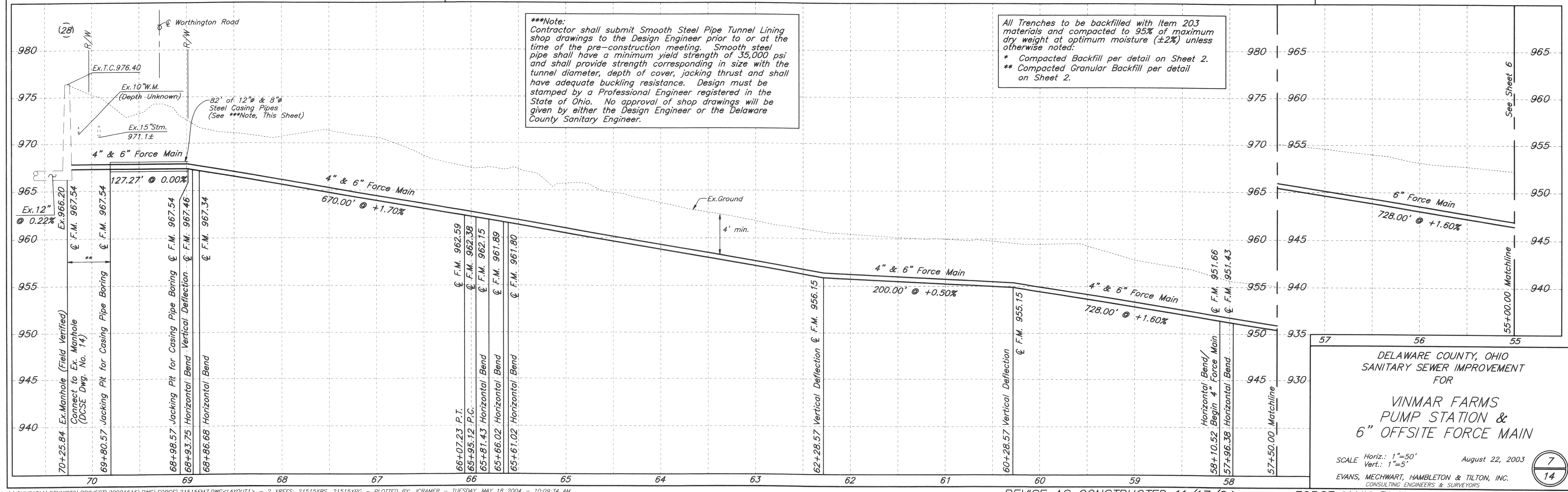
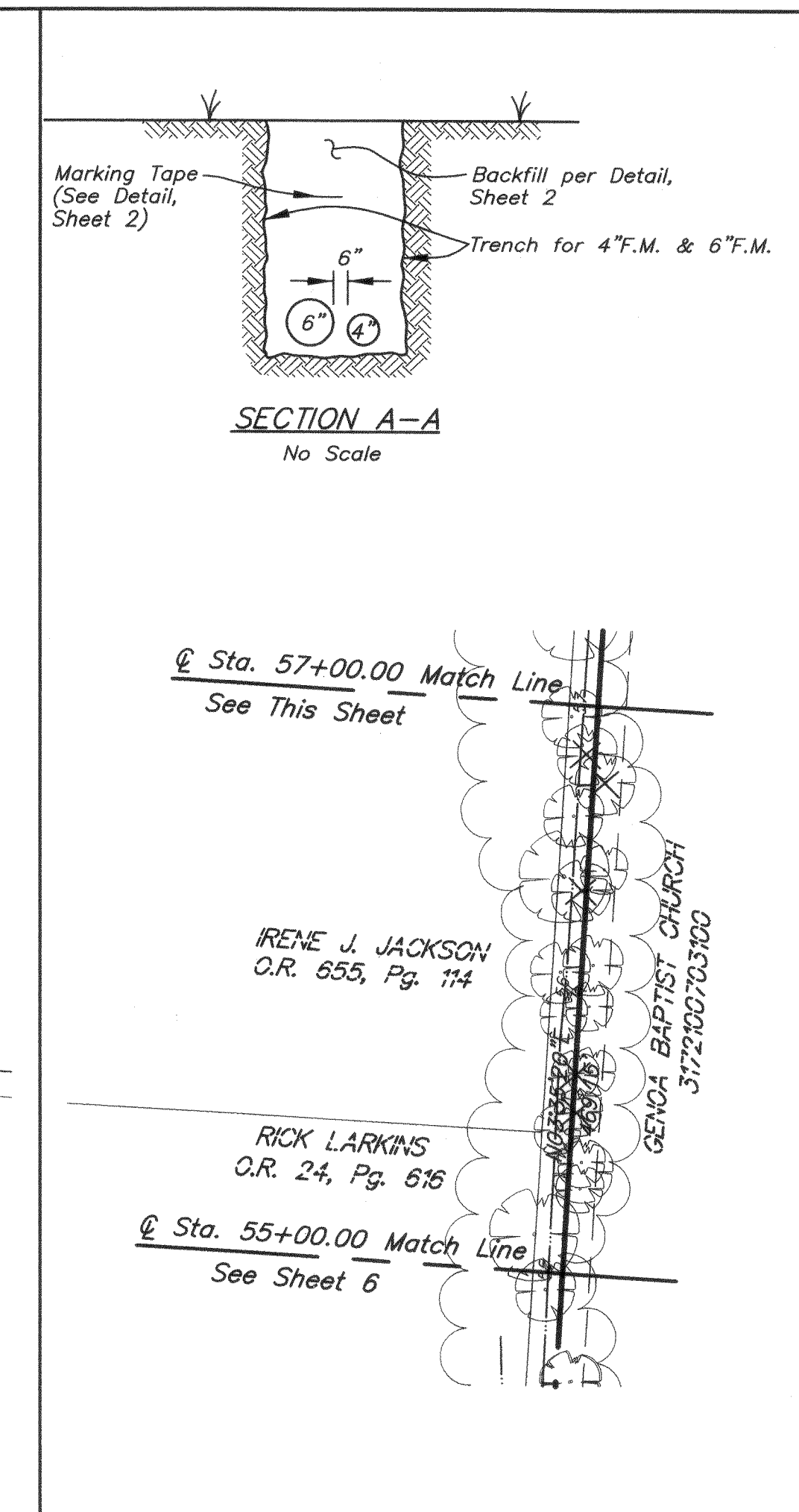
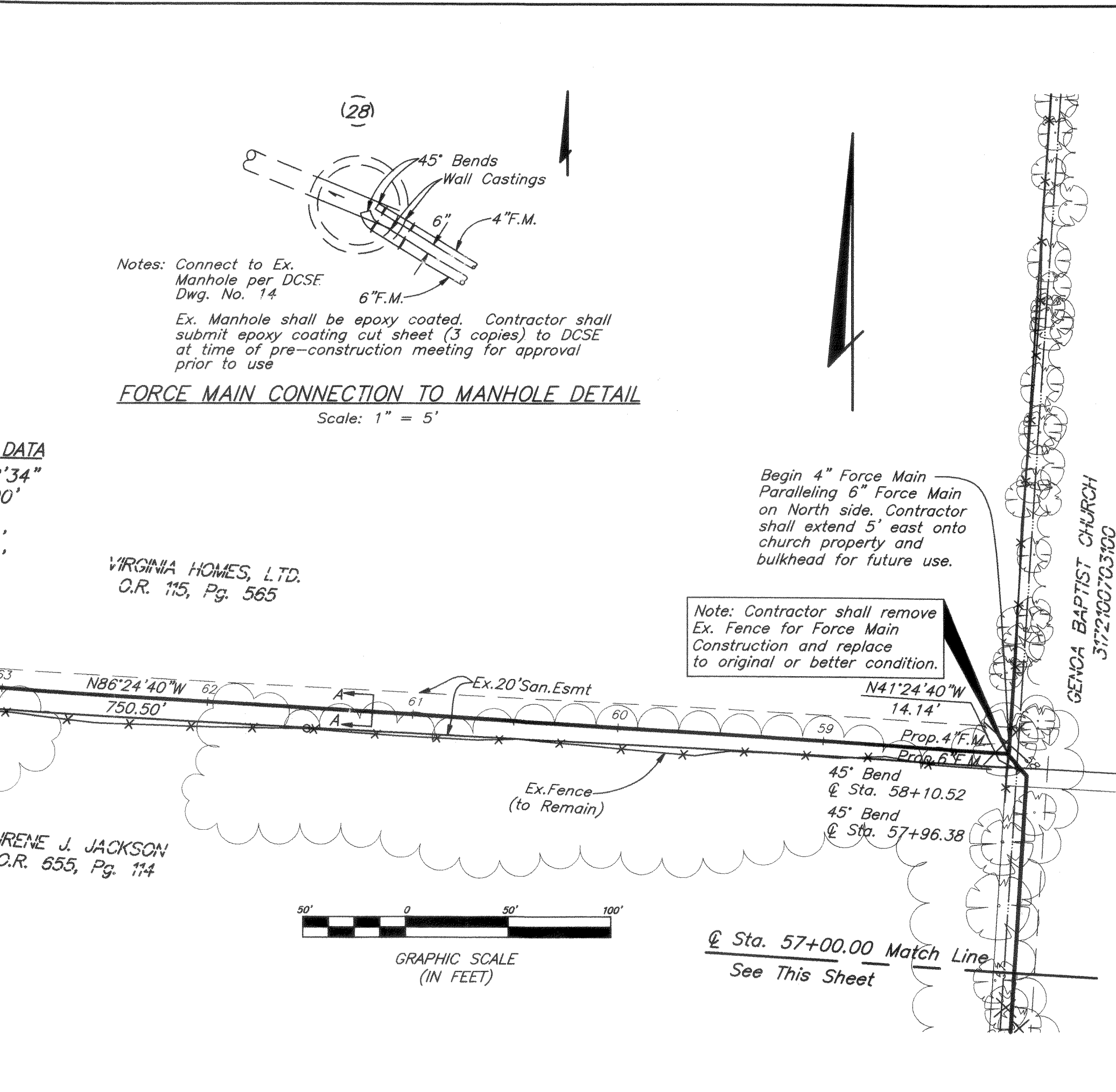
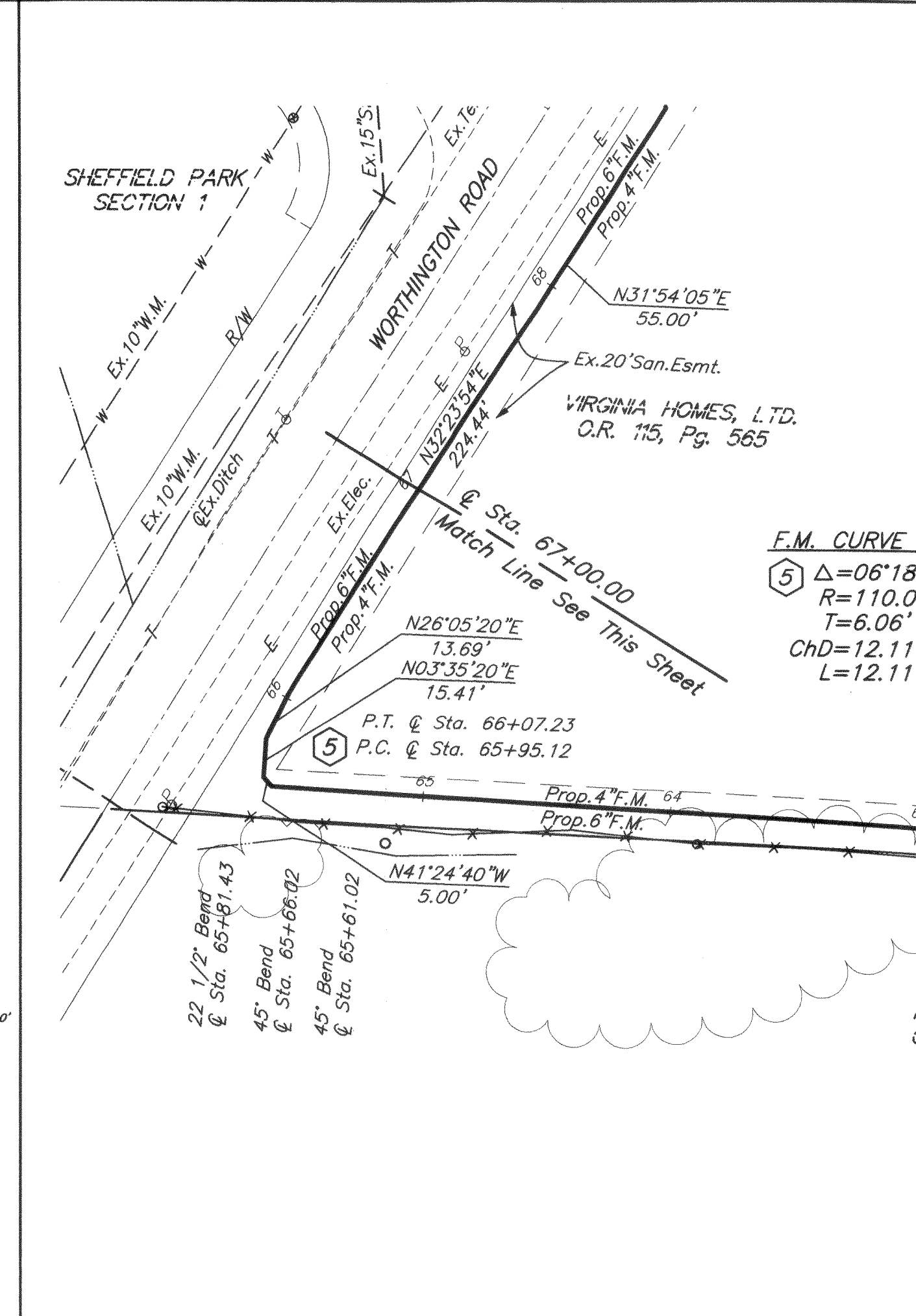
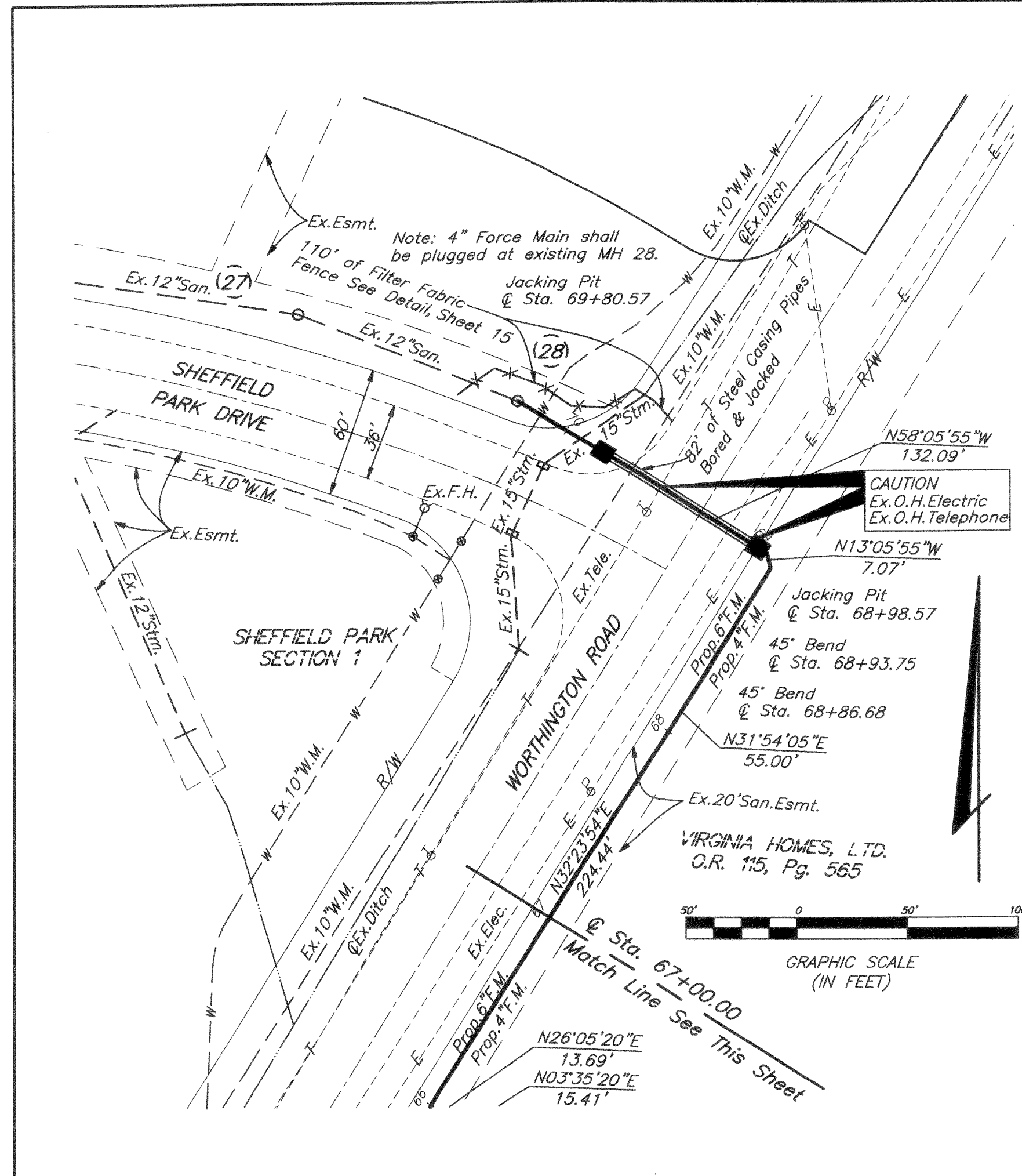
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CONSULTING ENGINEERS & SURVEYORS



DELAWARE COUNTY, OHIO
SANITARY SEWER IMPROVEMENT
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SCALE Horiz.: 1"=50'
Vert.: 1"=5' August 22, 2003

EVANS, MECHWART, HAMBLETON & TILTON, INC.
CONSULTING ENGINEERS & SURVEYORS



PUMP STATION GENERAL NOTES

All General Notes are to be hereby considered for the construction work of the sewage pump station, where applicable.

The Contractor shall comply with material and construction requirements of Delaware County Sanitary Engineer. The Contractor shall obtain any and all permits required, and pay cost for any and all fees.

The Contractor shall furnish all materials, labor, tools, transportation, incidentals and appurtenances to complete in every detail and leave in working order all items of work called for and/or shown on the accompanying drawings. Any material or work not specifically mentioned or shown on the drawings, but necessary to complete the work, shall be furnished.

The Contractor is required to visit the site and fully inform himself concerning all conditions affecting the scope of the work. Failure to visit the site shall not relieve him from any responsibility in the performance of this Contract.

The Contractor shall investigate and locate all existing utilities and notify all utility companies a minimum of 48 hours prior to construction.

The Contractor shall provide 4" to 6" sand or grit leveling base under each concrete structure and shall place granular fill as required, dependent on soil conditions.

Contractor shall grade area to drain surface water away from station.

All disturbed areas shall be seeded and mulched after final grading by Contractor.

Roof drains, foundation drains, and other clean water connections to the sanitary system are prohibited.

All General Notes shown on Sheet 1 and 2 are to be hereby considered for the construction work of the wastewater pump station, where applicable.

1.0 PUMP STATION SPECIFICATIONS

1.01 GENERAL

A. Scope of Work

Work under this section includes furnishing and installing the pump station, complete as shown on the Drawings and as specified herein.

1.02 WET WELL AND VALVE CHAMBER

A. The wet well shall be constructed of 8' x 8' precast concrete vault. The valve chamber shall be constructed of a 9' x 9' precast concrete vault. Concrete shall comply with ACI Committee 350 requirements for Sanitary Structures and ODOT CMS Item 511 - Concrete For Structures; reinforcing steel per ODOT CMS Item 709 - Reinforcing Steel. Concrete shall test minimum 4500 psi at 28 days and finish shall be free of spills, chips, and honeycombs. Openings for piping, sumps, roof hatches, electrical conduit and sensor lines shall be cast smoothly into the structure. Chipping or punching openings will not be allowed under any circumstances.

Asphaltic tar based mastic sealant shall be neatly applied between precast sections before the next section is installed. Two coats of Thoroseal waterproofing shall be liberally applied on all section seams, inside and outside, after which two complete coats shall be applied to all exterior concrete surfaces. Drying time between successive coats shall be the minimums recommended by the manufacturer. Silicon caulking shall be applied at all perpendicular joints.

Contractor shall submit 6 sets of supplier's shop drawings with all dimensions and pertinent information included.

All materials on or in the wet well shall be stainless steel and/or aluminum unless specified differently unless specified differently by the manufacturer.

1.03 ACCESS LID AND FRAME ASSEMBLIES

- A. The wet well top shall be fitted with double leaf 36" x 60" and a 24" x 36" Heavy-Duty Access Covers "Safehatch" by Flygt.
- B. Each door shall have a handle, a latch to hold it in the open position, and lockable hasp.
- C. The access covers, cover frames, and top slab shall be designed for a 300 p.s.f. live load
- D. The frame assemblies shall be placed in the concrete wet well top when it is poured.

1.04 PIPING

A. The Contractor shall supply and install all piping and valves required in the concrete valve chamber as shown on the Drawings. Flanged Joint-Ductile Iron Pipe shall be Class 52 (min.) conforming to AWWA C-110, C-150 and C-151 w/ rubber gaskets per C-111.

1.05 PUMPS - (Explosion proof motors & electrical items are required per Class 1, Div. 1, Group D requirements.)

- A. Furnish and install two (2) submersible pumps as called for on the Drawings and as specified herein. Pumps shall be Model CP-3152 as manufactured by ITT Flygt.
- B. Pump impellers shall be Model 269 SH.
- C. Each pump shall have a capacity to pump 255 GPM at a total dynamic head (TDH) of 125 feet. Pump shut off head shall exceed 185 feet. Pump motors shall be non-overloaded over the entire range of the pump performance curve. Pump efficiency at 255 GPM shall exceed 35%.
- D. Motors shall be 23 HP (max.), 3500 RPM (max.) designed to operate on 460 volt, three phase 60 hertz power. Motors shall have two (2) heavy duty ball bearings; design life shall be 50,000 hours (B-10). Heat sensors shall be imbedded in each motor winding to stop motor if winding exceeds a temperature of 125°C; motor to be re-energized when temperature returns to safe operating temperature. The common pump/ motor shaft shall be 416 stainless steel.
- E. Seals - Each motor shall be protected by two (2) mechanical seal assemblies, in tandem, with a seal chamber between the seals. Seal chambers shall be oil filled to lubricate seal faces and to transmit heat from shafts to outer shells. Seal faces shall be carbon and ceramic and lapped to a flatness of one light band. Lower seal faces shall be tungsten carbide. A double electrode shall be mounted in the seal chamber to detect any water entering the chamber through the bottom seal. Water in the chamber shall illuminate a warning light in the control panel and also activate a fault circuit of the telemetry system; this signaling shall not stop motor. A Mini CAS (Control and Status) monitoring unit shall be mounted in the control panel and connected to the thermal switches and Float Leakage Sensor as detailed in the electrical specifications within drawings 11-13.
- F. Pump monitoring shall be provided as detailed in the electrical specifications.

- G. Pump valve cases shall be cast iron with 4" discharge flange. Wearing surfaces shall be fitted with replaceable bronze wearing rings. Provide each pump with a 4" X 4" "Slide-Away" base elbow if required by the pump manufacturer.
- H. Pump and motor castings shall be high tensile strength cast iron treated with phosphate and chromate rinse. All fasteners, for each assembled pump and motor unit, shall be 302 stainless steel.
- I. Pumps shall include ITT Flygt 4901 flush valve.
- J. Power Cables - Each power cord and control cord shall be double sealed. The power & control conductor shall be single strand sealed with epoxy potting compound and then clamped in place with rubber seal bushing to seal outer jacket against leakage and to provide for strain pull. Cords shall withstand a pull of 300 pounds. Insulation of power and control cords shall be type SO, SOW, or SOW-A. Both control and power cords shall have a green carrier ground conductor that attaches to motor frame. Contractor shall field measure for requirements of cable lengths to connection points; no field splicing of cables will be allowed.
- K. Lift-Out Rail system - Provide two (2) pump slide assembly units including 4" x 4" flanged elbows and mounting bases. The design of this system shall be such that a minimum up or down force, via lifting chains, exerted between the stationary base elbow and the pump discharge flange will be sufficient to remove or place the pumps into proper position for leak-proof operation.

A seal plate shall be attached to each pump and with an "O" ring embedded in machined face to mate against base elbows. Tapered lug connections shall allow for positive leak-proof seals as well as easy removal and replacement. Provide two (2) pump connection units.

Two (2) rail pipes shall be used to guide the pump from the surface to the discharge base connection. The guide rails shall be 2-inch schedule 40 stainless steel pipe. The weight of the pump shall bear solely on the discharge base and not on the guide rails. Rail systems which require the pump to be supported by legs which might interfere with the flow of solids into the pump suction will not be considered. The guide rail shall be firmly attached to the access hatch frame. Contractor shall install an intermediate guide for each pump as directed by the manufacturer.

An adequate length of 1/4" diameter stainless steel lifting chain shall be supplied for removing each pump. The chain shall be of sufficient length and shall include an adequate number of lifting rings for easy removal. Provide and install chain for two (2) pump units. Chain shall be rated at 1600# (Min.) safe working load capacity. Lift eyes shall be provided for all lift chains.

L. Operation and Maintenance Manuals: Three (3) copies of the manufacturer's O & M manuals, for the specified pumps, shall be delivered to the Owner to familiarize themselves with the operation of these pumps.

1.06 PUMP CONTROLS

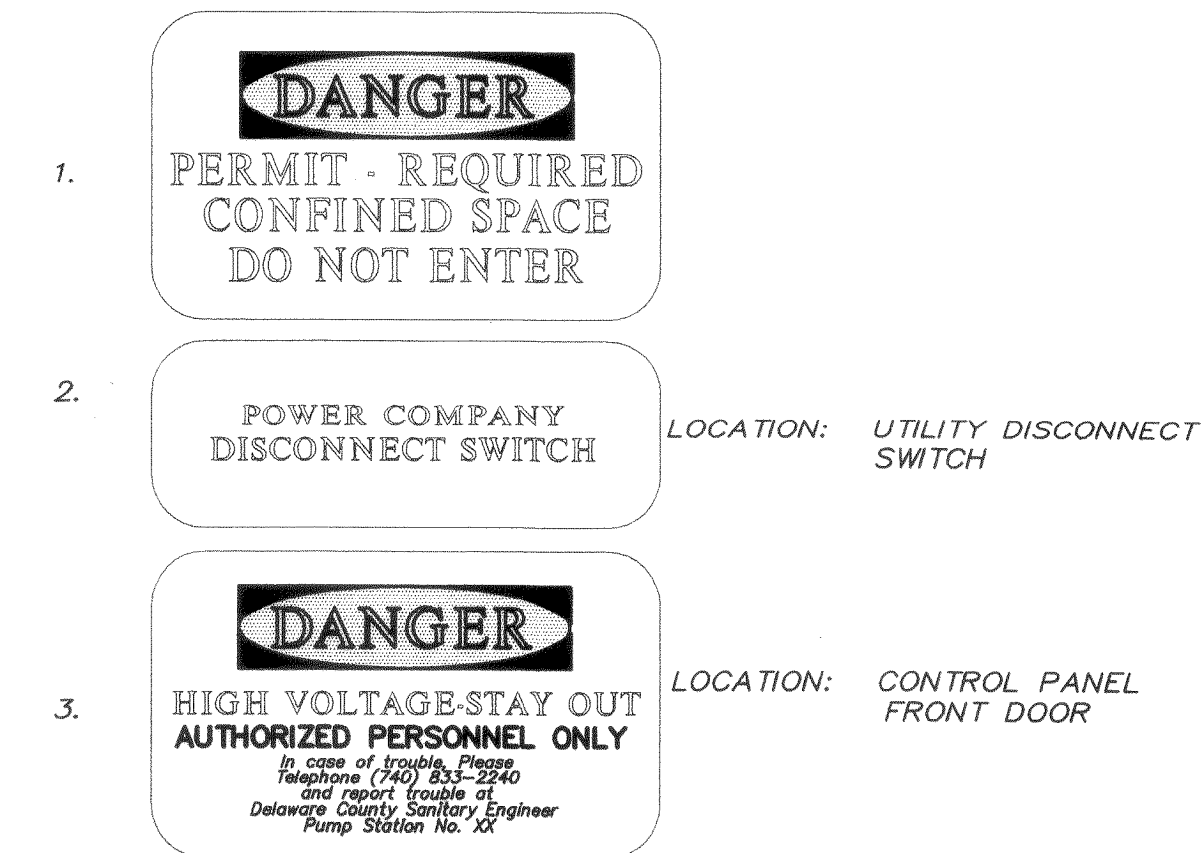
- A. Level Controls
 - 1. A Multitrode Liquid level control system as supplied by Flygt shall also be mounted in the wet well to control the All Pumps OFF Level, Lead Pump ON Level, High Water Alarm Level and Standby Pump ON Level.
- B. Control Panel
 - 1. See electrical drawings for specifications.

1.07 CONFINED SPACE ENTRY SIGNS

- A. Confined space entry signs shall be provided and installed at both sides of entry doors at the following locations:
 - 1. Wet Well
 - A. Sign posts shall be 4" x 4" (nominal) meeting the requirements of ODOT CMS Item 710.14 x 7"-0" pressure treated lumber.
 - B. Installation
 - 1. Posts - install posts on opposite sides of each structure near each access opening as directed on site by the Engineer. Posts to be placed in 8" diameter holes at depths of 3.0' (min.) below finished grade. Posts shall be set plumb, centered in holes with concrete around them to within 6" from finished grade.
 - 2. Secure each sign near top of posts that extend 4' above finished grade; use 2-3/8" x 3" cadmium plated lag screws and washers for attachment. Signs shall be readable from sides facing away from structures. A total of two (2) signs are required at each of the structures.
 - 2. Valve Chamber
 - A. Signs shall be secured to building at door location.

B. Signs shall meet the requirements of Item 630 (ODOT) and be as follows:

- 1. Sign material shall be 0.063" thick aluminum.
- 2. Paint colors shall be red and black on white, non-reflective.
- 3. Approximate sign size: 11" x 16" wide.
- 4. Text and style: As follows:



1.08 PAINTING

- A. All valve chamber piping and valves shall be painted (except flanges and machined edges). All painting preparations and application shall be in accordance with standard practice and per paint manufacturer's recommendations.
- B. Paint brand types shall be ICI DeVoe Coatings (stated); equivalent types by Sherwin-Williams, Detroit Graphite, Rustoleum or equal.
- C. Application
 - 1. Priming
 - a. Piping - One (1) coat of (Tar Stop)
 - b. Valves - One (1) coat of (Rust Penetrating Primer No. 622)
 - 2. Finish Coats - Brown color
 - Two (2) coats of (Glamortex Enamel)

1.09 PRESSURE GAUGES

- A. Pump pressure gauges shall be provided and installed on the discharge lines of each pump furnished and placed on the project. Locations of gauges shall be on tops of the horizontal discharge piping, inside the valve chamber and upstream from each check valve.
- B. Gauge and Accessory Requirements
 - 1. Pressure gauges shall be solid front, liquid filled gauges with clear glass windows, bottom 1/4" NPT outlet and stainless steel Bourdon tube. All gauges shall be dual-calibrated in feet of water and psig. Gauges shall be 4 1/2" diameter. All gauges shall be fitted with an approved impulse dampener. Gauges shall be No. 1279SL with No. 1105S impulse dampener, by Ashcraft, or approved equal by U.S. Gauge, H.O. Trerice Co., Helicoid of Robertshaw.
 - 2. Pump discharge side gauges shall have full dial registration for 0 to 50 psig / 0 to 100 feet.
 - C. Pressure Gauge Connections - At all pressure gauge connections, as denoted on the Drawings, furnished and installed pressure gauge connectors shall consist of brass gauge cocks with 1/4" brass union ends, No. 1094 by Ashcraft, or approved equal.

1.10 START-UP

- A. The Contractor shall arrange and conduct a Pump Station Start-Up meeting with the Owner prior to discharge of sewerage to Pump Station.
- B. All aspects of the pump station operation shall be tested and documented as detailed in the electrical specifications within drawings 11-13.

2.0 ODOR CONTROL SPECIFICATIONS

2.01 ODOR CONTROL SYSTEM (BIOXIDE DRIP)

- A. The contractor shall provide the required items for a bioxide odor control system, as manufactured and installed by US Filter, to be installed adjacent to the wet well. The bioxide odor control system will consist of a storage tank and a closing pump that feeds directly to the wet well. The Contractor shall provide all electrical, tubing, and mounting requirements for the proper operation of the odor control system as required by the drawings and supplemental specifications.
- B. Delaware County shall be cast into Bioxide Fill Line Lid.

3.0 HYDRAULIC POWERED GRINDER

3.01 MUFFIN MONSTER

A hydraulic powered grinder (Muffin Monster) as manufactured by JWC Environmental shall be provided. The installation of the grinder shall include a stainless steel frame and retrieval system mounted on the interior wall of the wet well at the invert of the influent line. All controls and hydraulic power supply will be installed complete as part of the grinder installation. Approximate net weight of grinder is 370lbs.

4. SPECIAL REQUIREMENTS- ELECTRICAL TELEMETRY NOTES

Telemetry:

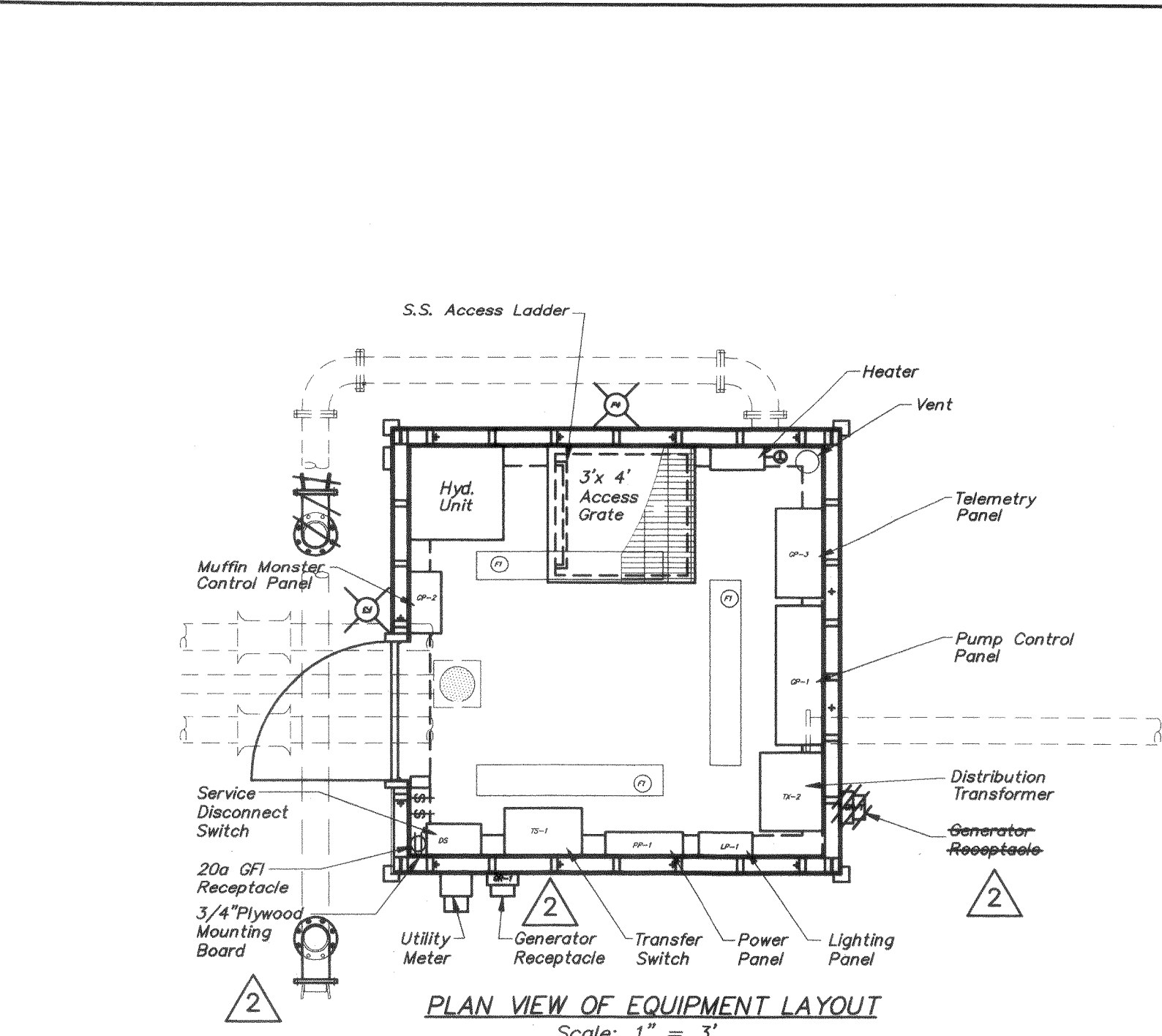
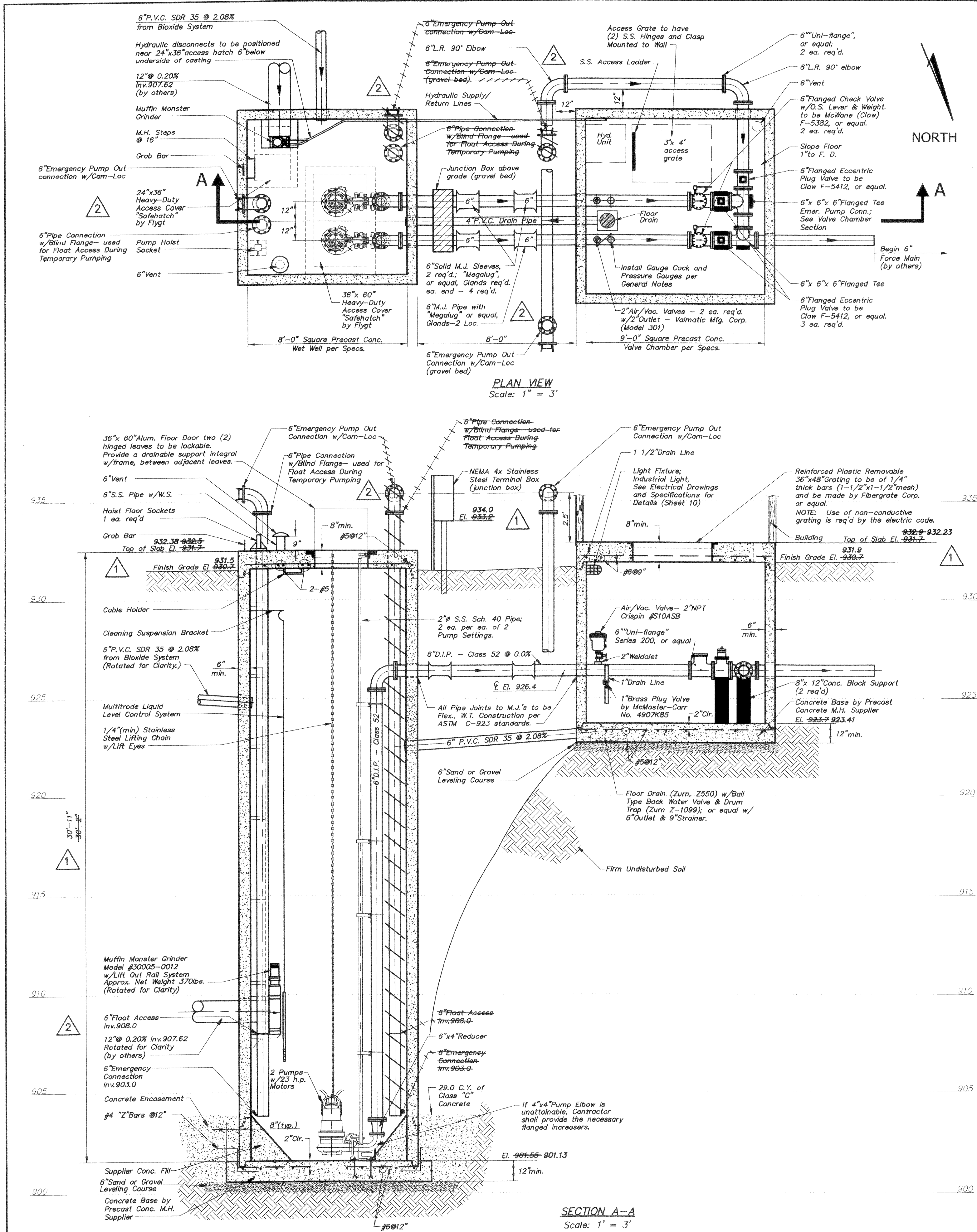
- A. One (1) - Westerman CT-4000 Microprocessor Board or Equal
- B. Three (3) - Westerman UO-4480 Input/Output Board or equal
- C. One (1) - Westerman I/O-4240 Analog Input Board or Equal
- D. One (1) - Meticom Spread Spectrum Data Radio, Model 20043 or Equal
- E. One (1) - Westerman CA-1511 9600 Baud Modem or Equal
- F. One (1) - Fabricated Back Panel
- G. One (1) - Nema 4/12 Enclosure
- H. One (1) - Wooden Pole (if required) and Onini Antenna
- I. All Related Conduit, Wire, Cabling, and Installation
- J. One (1) - Power Sonic 10 ah Battery
- K. One (1) - Enclosure Strip Heater
- L. All - Crydon Style Relays

DELAWARE COUNTY, OHIO
SANITARY SEWER IMPROVEMENT
FOR
**VINMAR FARMS
PUMP STATION &
6" OFFSITE FORCE MAIN**

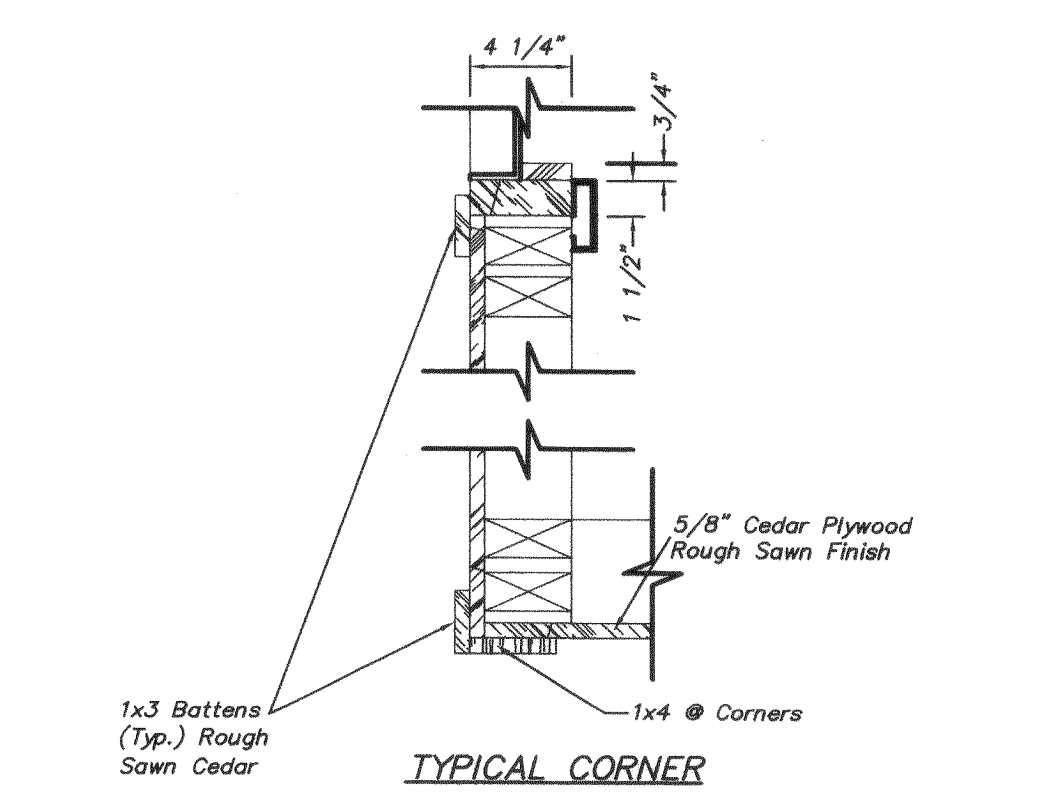
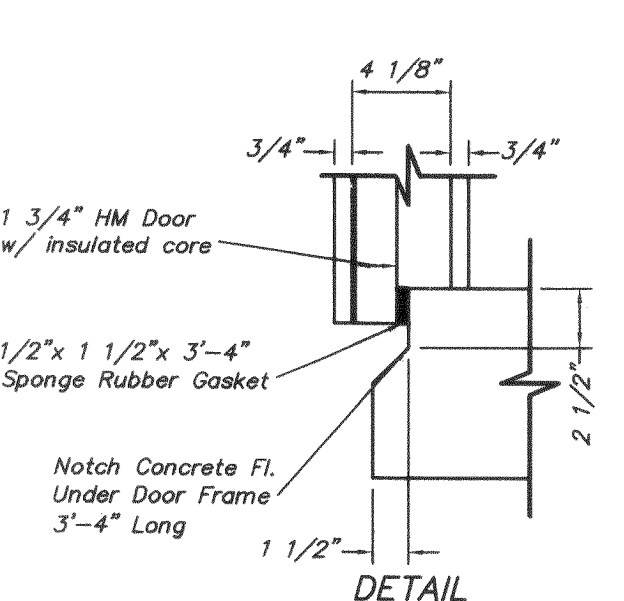
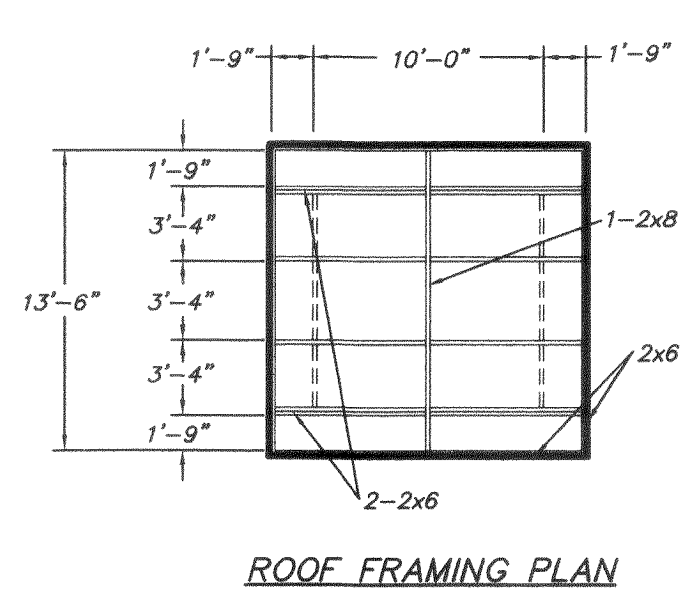
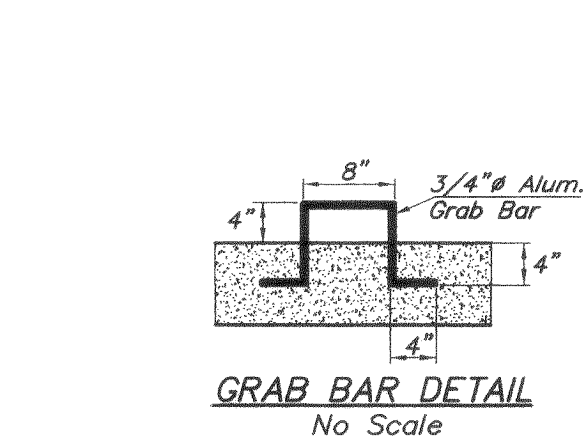
SCALE: As Noted August 22, 2003

EVANS, MECHWART, HAMBLETON & TILTON, INC.
CONSULTING ENGINEERS & SURVEYORS

PUMP STATION NOTES



Note: Electrical Items Layout for reference only. Please see Electrical Sheets for exact placement.

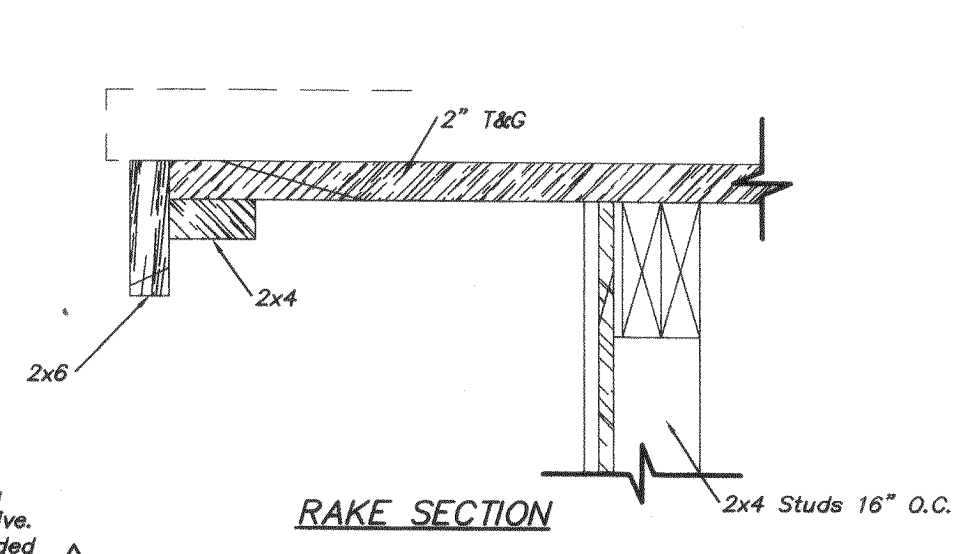
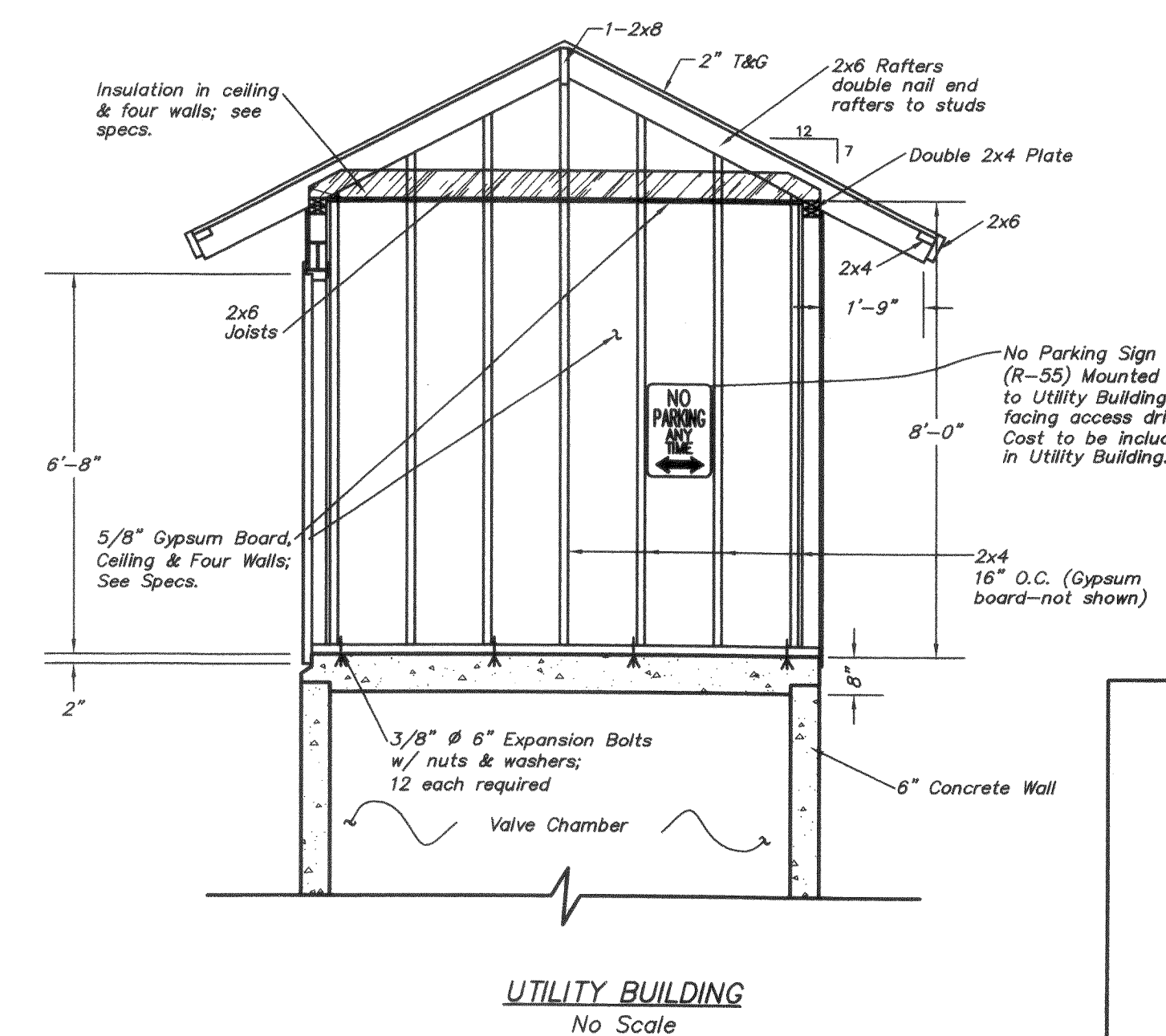


PUMP SCHEDULE
SEE SHEET 12 OF ELECTRICAL DRAWING

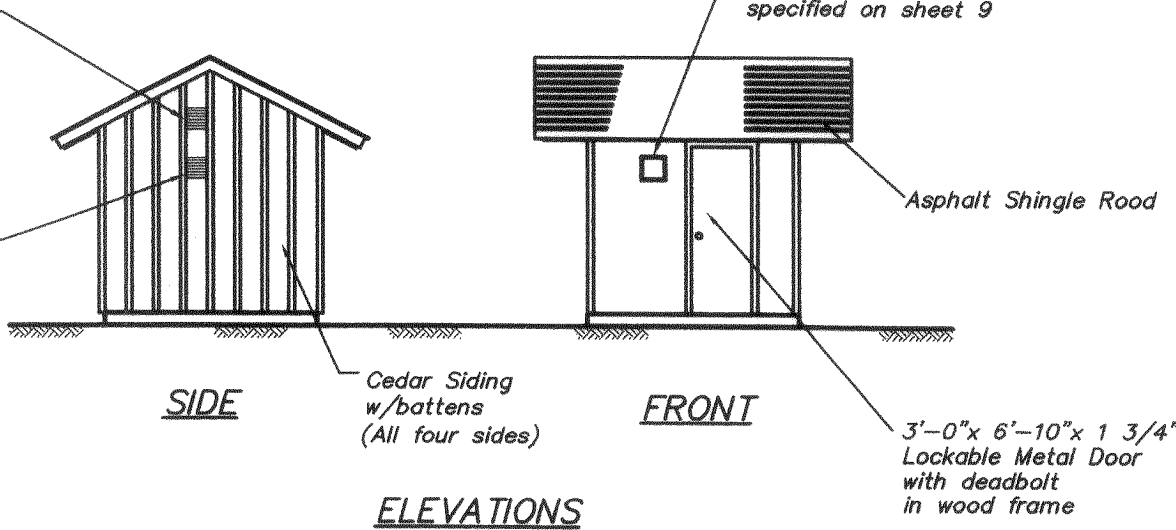
Floot 2	EL. 903.80
Floot 1	EL. 906.30
High Level Alarm	EL. 905.80
Lag Pump On	EL. 905.30
Lead Pump On	EL. 904.80
Low Level (All Pumps Off)	EL. 903.80

Notes: Aluminum in contact with concrete shall be covered with a bitumastic material.

The Contractor shall be responsible for anti-flotation methods needed during construction until earth backfill is properly placed.



- UTILITY BUILDING NOTES**
- Ceiling lights shall be provided according to electrical specification drawings sheets 11-13.
 - Float cords: install stainless steel cord support bracket with individual insulated cable support grips. provide slack for required adjustment (cord length 25' + as required). Weight cords for negative buoyancy to maintain position and alignment.
 - The proposed construction shall conform to the requirements of Chapter 11 OBBC and the "Americans with Disabilities Act Accessibility Guidelines" (ADAAG) as modified by Sections 1102.2 and 1103.0 OBBC.
 - Installation of plumbing equipment and systems shall comply with OBBC Chapter 29 and the Ohio Plumbing Code (OPC).
 - Mechanical equipment shall be installed in accordance with its underwriter approval, the manufacturer's recommendations, specifications and good engineering practices; Articles M-401 ANDM-403.1 of the OBMC.
 - For all electrical layout, see sheets 11-13.
 - Two coats of weather proofing sealer shall be applied to all wood siding.



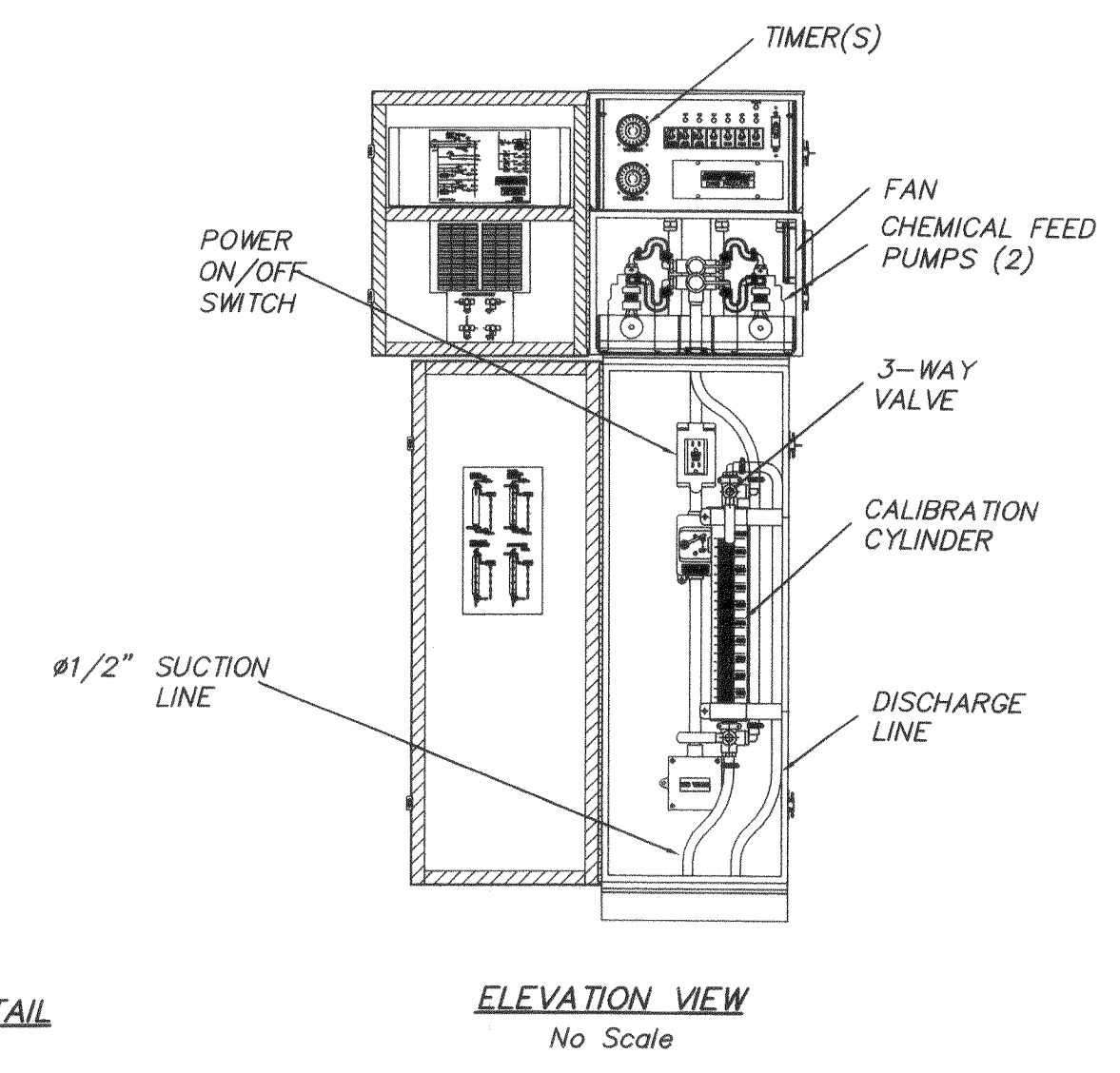
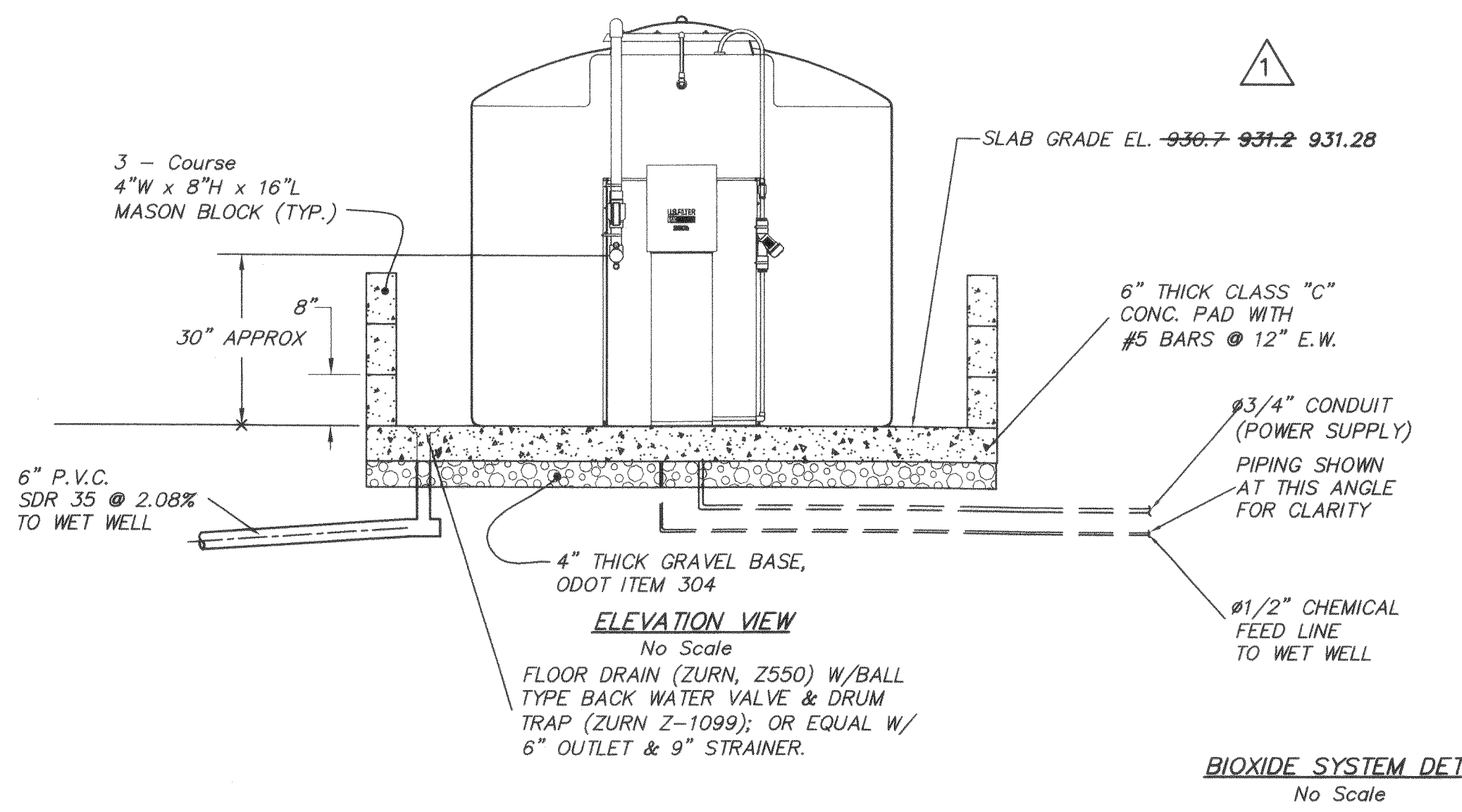
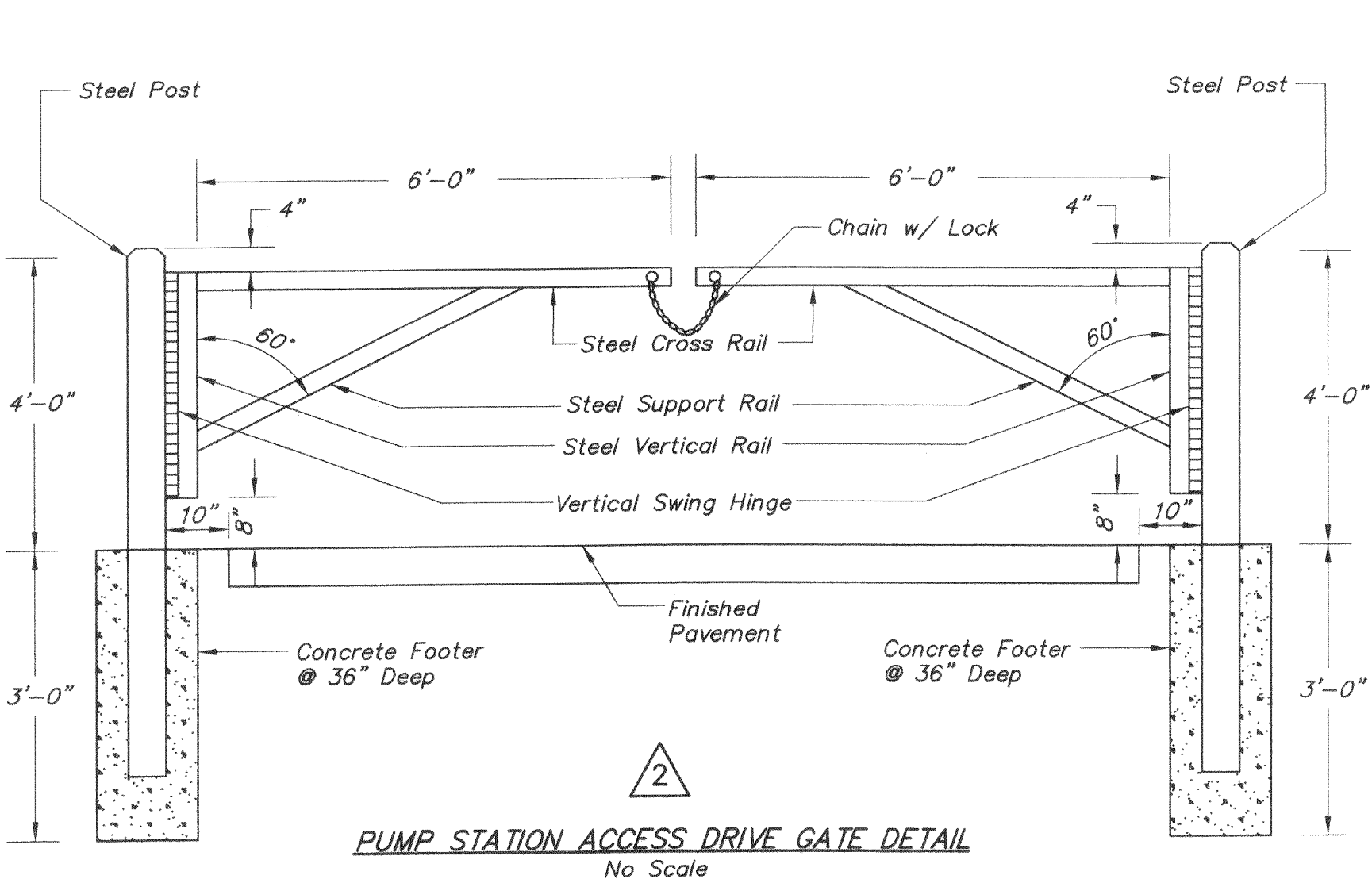
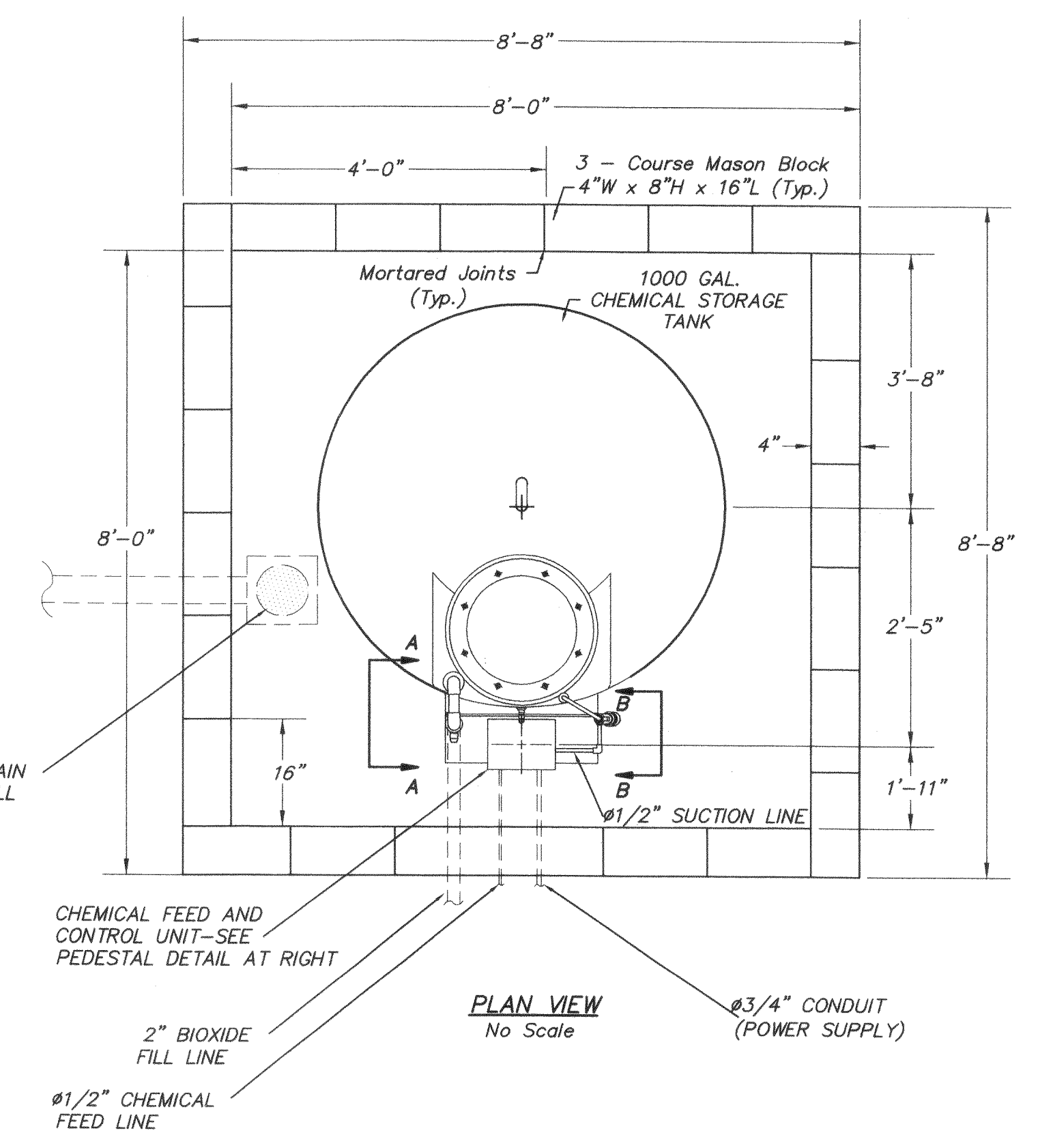
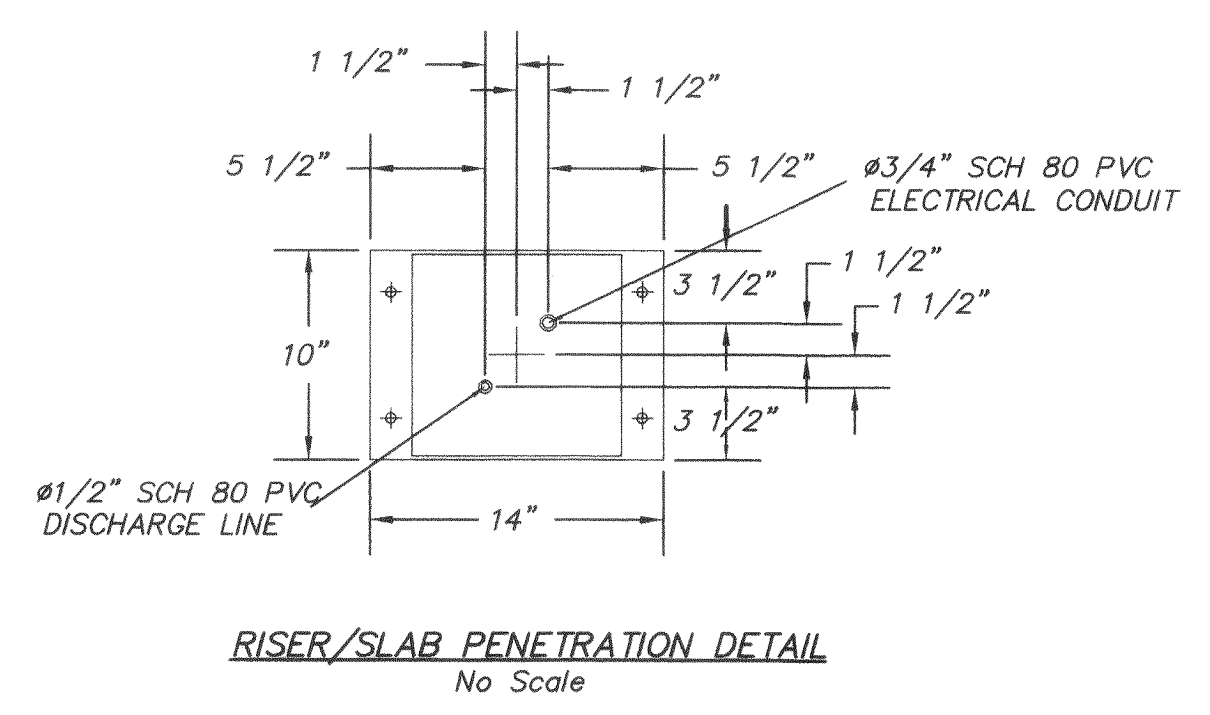
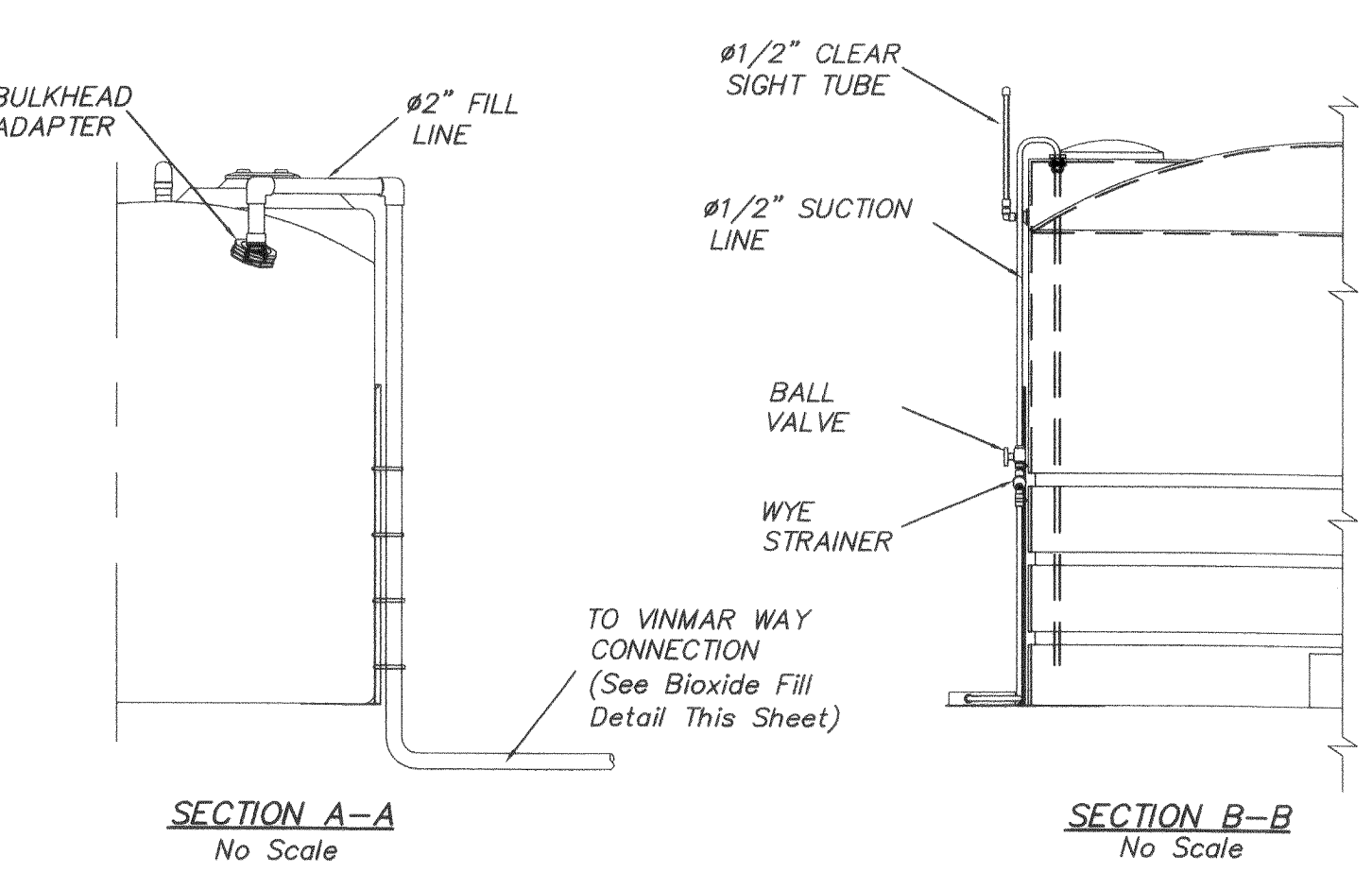
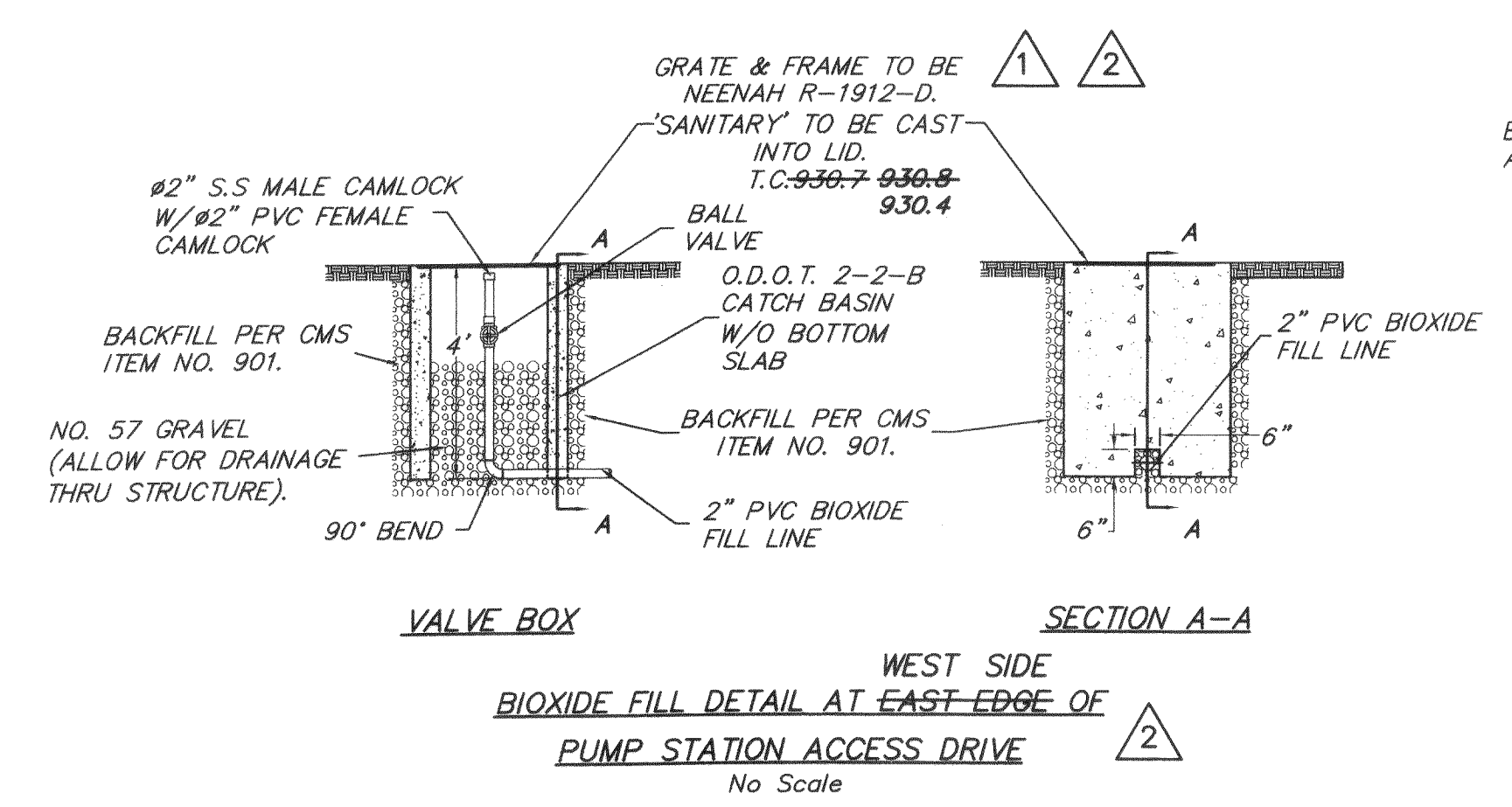
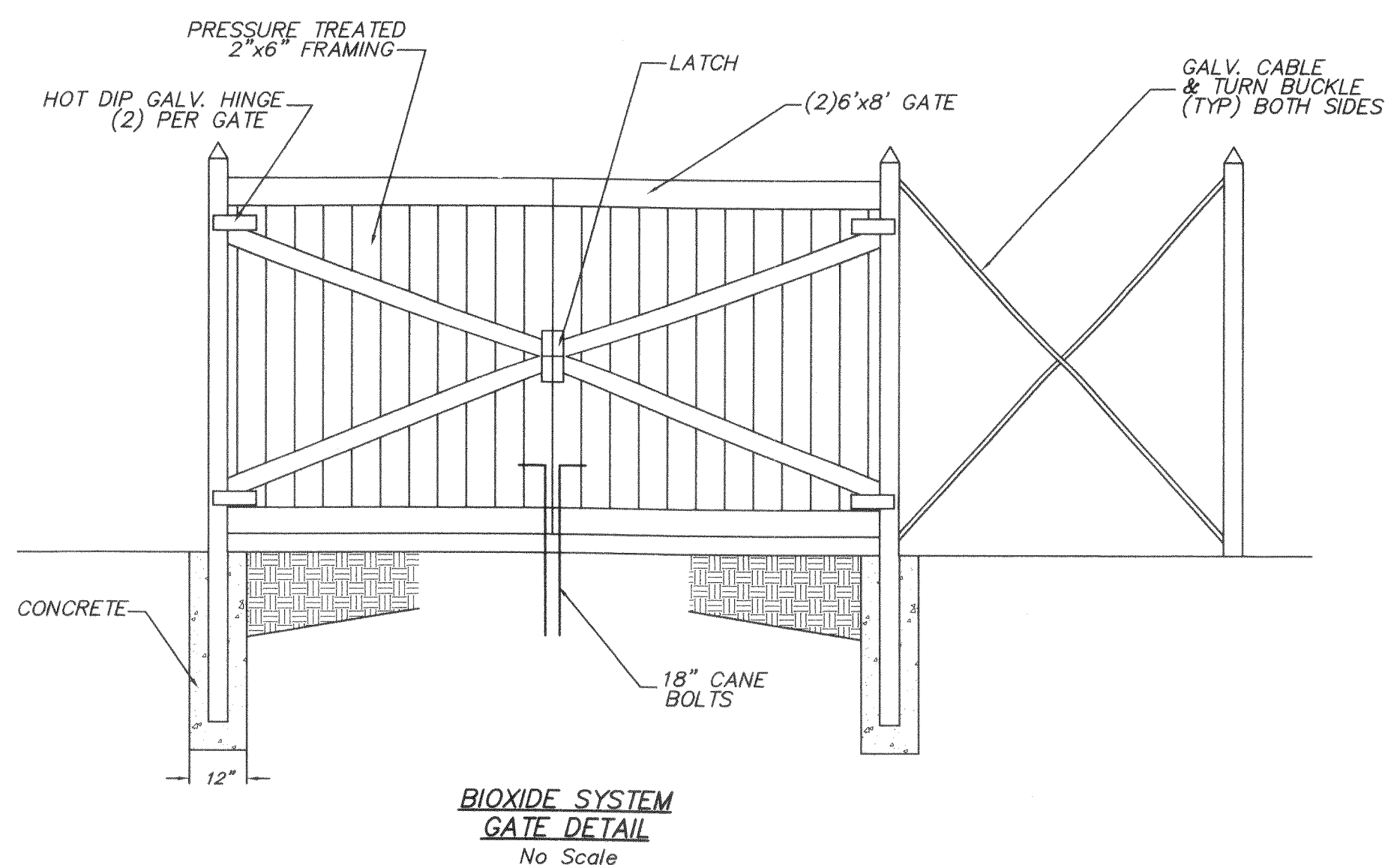
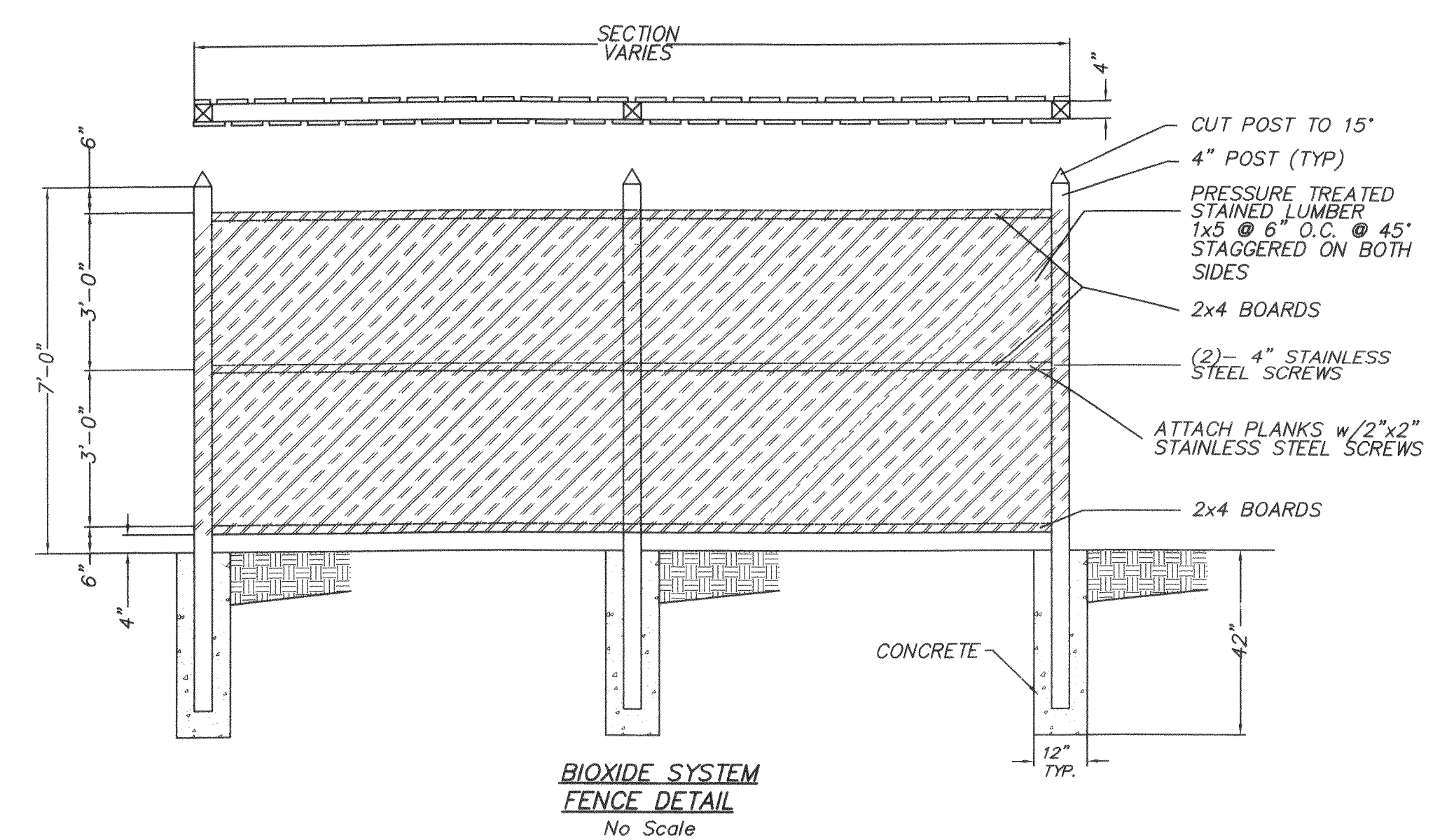
DELAWARE COUNTY, OHIO
SANITARY SEWER IMPROVEMENT
FOR
VINMAR FARMS
PUMP STATION &
6" OFFSITE FORCE MAIN

SCALE: 1"=3' August 22, 2003

EVANS, MECHWART, HAMBLETON & TILTON, INC.
CONSULTING ENGINEERS & SURVEYORS

NOTES

1. U.S. FILTER SHALL PROVIDE 1,000 GALLON BIOXIDE SYSTEM.
2. CONTRACTOR TO FURNISH CONCRETE PAD WITH ALL IN-SLAB PIPING AND CONDUIT.
3. ALL PIPING AND APPURTENANCES SHALL BE PVC, SCH 80.
4. ALL ELECTRICAL CONDUIT AND WIRING BY CONTRACTOR.
5. UTILIZE SWEEPS ONLY (NO ELBOWS) FOR CONDUIT DIRECTIONAL CHANGES.
6. CONTRACTOR TO FURNISH AND INSTALL ALL NECESSARY SLAB OPENINGS, SLEEVES AND SEALANT.
7. CONTRACTOR TO FURNISH AND INSTALL ALL NECESSARY HANGERS, SUPPORTS, AND BLOCKING FOR PIPING.
8. ALL HARDWARE REQUIRED FOR INSTALLATION SHALL BE STAINLESS STEEL, FURNISHED AND INSTALLED BY CONTRACTOR.
9. SEE SUPPLEMENTAL STANDARD DETAILS FOR CHEMICAL FEED UNIT, CALIBRATION PEDESTAL, PIPING SUPPORT, STORAGE TANK, LEVEL GAUGE AND VARIOUS OTHER COMPONENTS.
10. TWO COATS OF WEATER PROOFING SEALER SHALL BE APPLIED TO FENCING.



- 2 - Revised Bioxide Fill Chamber Detail. Added Access Drive Gate Detail.
- 1 - Revised grading at pump station access drive, including elevations of Pump Station Slab.

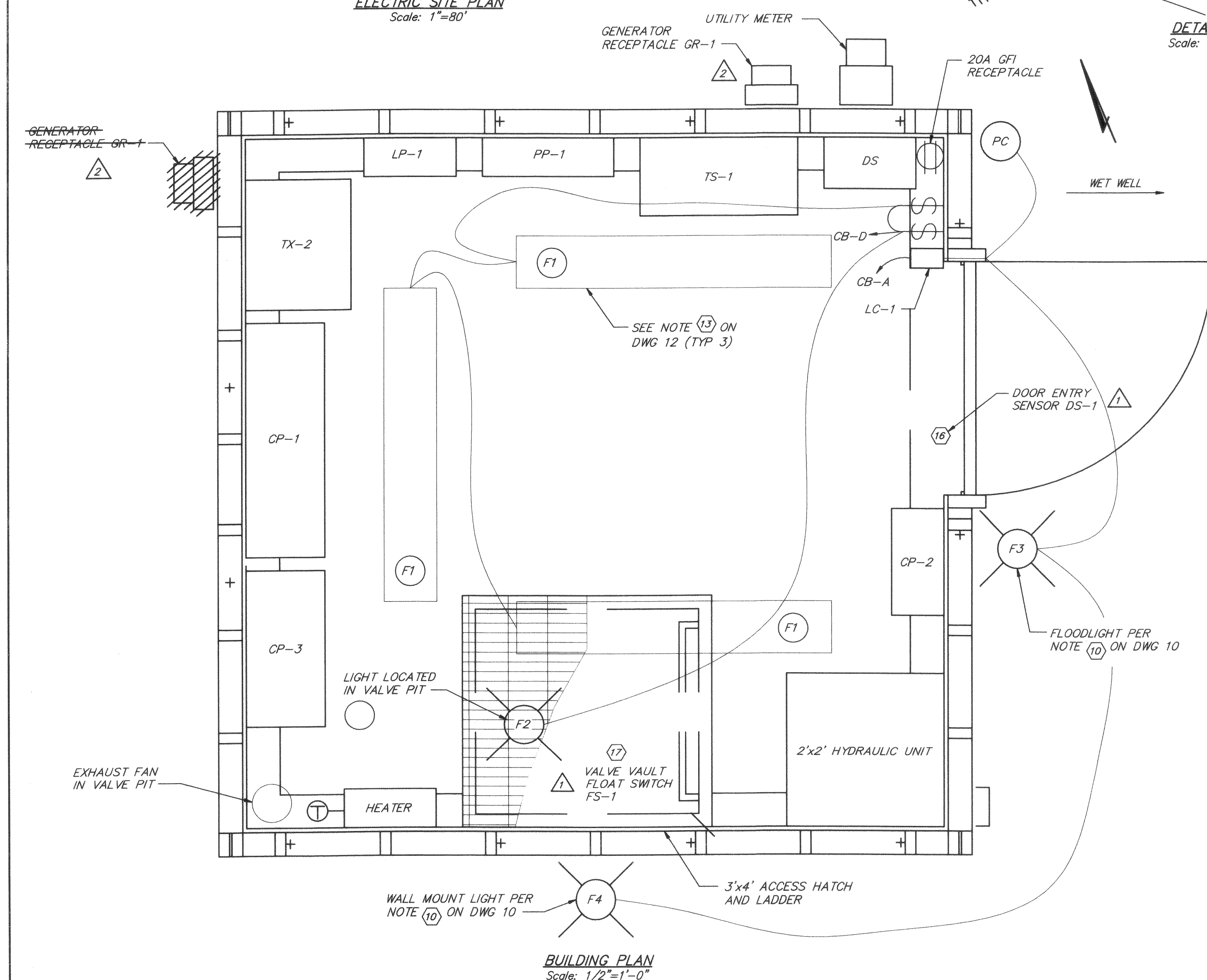
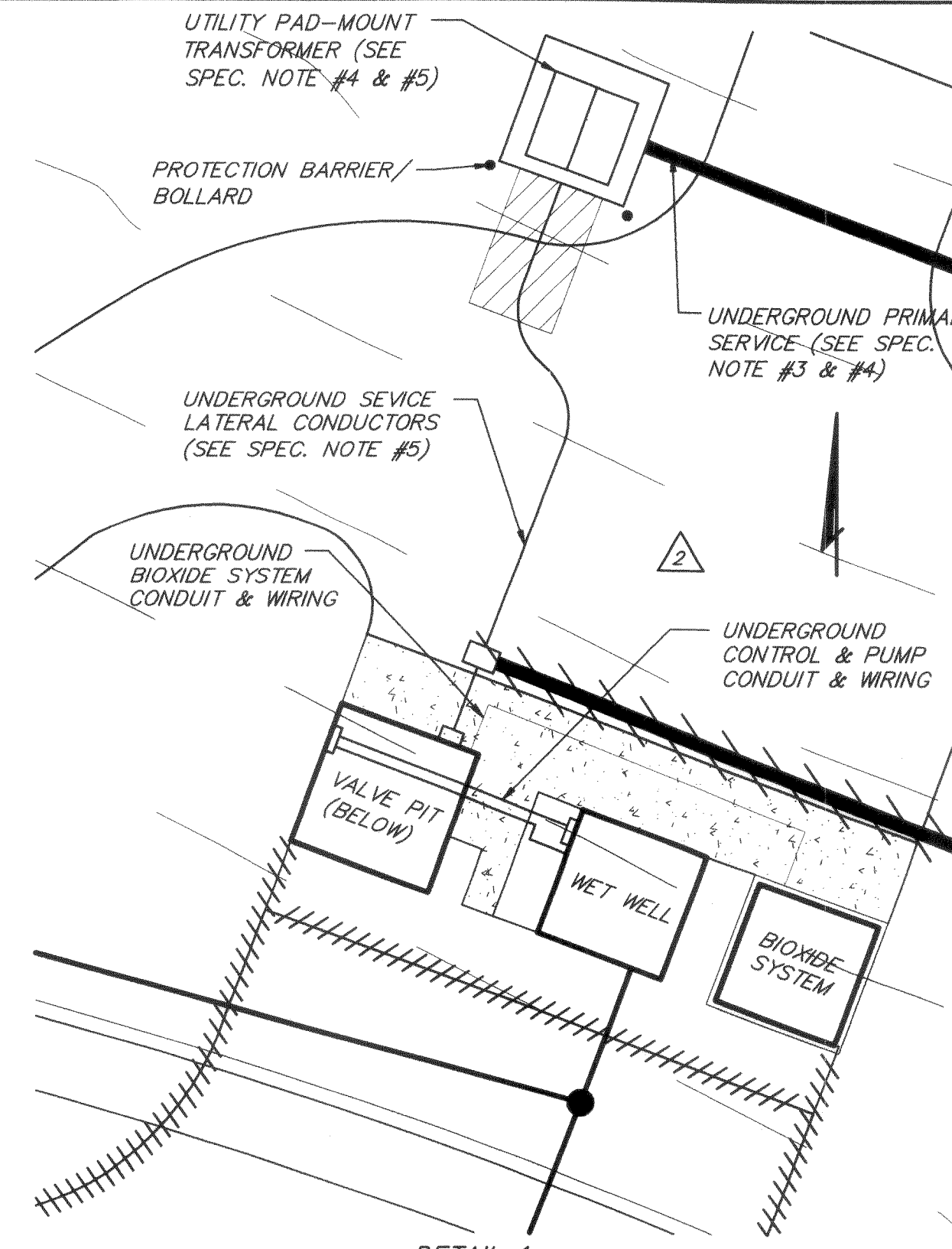
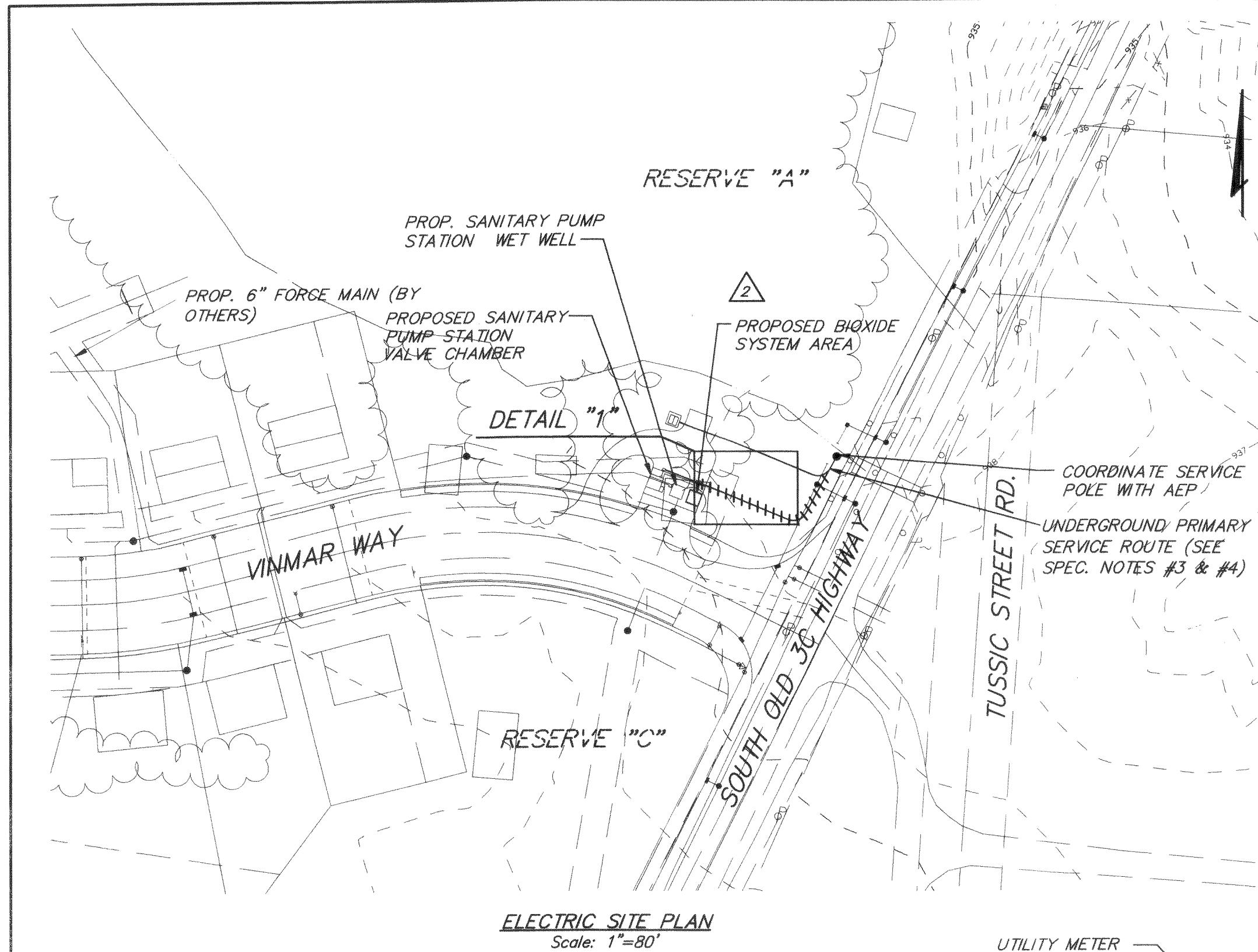
Note: The gate shall be painted and installed to meet the standards of the Delaware County Sanitary Engineer.

DELAWARE COUNTY, OHIO
SANITARY SEWER IMPROVEMENT
FOR
VINMAR FARMS
PUMP STATION &
6" OFFSITE FORCE MAIN

SCALE: As Noted August 22, 2003

EVANS, MECHWART, HAMBLETON & TILTON, INC.
CONSULTING ENGINEERS & SURVEYORS

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14



GENERAL ELECTRICAL SPECIFICATIONS

1. Electrical contractor Responsible for coordinating electrical service with electrical utility (AEP).
2. Electrical contractor to verify available fault current from AEP prior to purchasing equipment. If the fault current is higher than any specified equipment, notifying owner and owners engineer before proceeding.
3. Contractor to provide trench and backfill for primary service conductors. AEP to provide and install conductors.
4. AEP shall provide and install primary service conductors and pad mount transformer.
5. Contractor shall provide and install lateral service conductors from pad mount transformer to service disconnect. Contractor to coordinate with AEP to install PVC conduit in transformer pad. Contractor to provide terminal lugs with spare cable coiled up for AEP to terminate at transformer.
6. Contractor shall obtain and install meter enclosure and meter according to AEP requirements.
7. Contractor shall provide service installation according to AEP requirements. Reference AEP "Guide for Electric Service and Meter Installations", dated May 1, 2002 for minimum requirements.
8. Underground conductors shall be encased in rigid PVC schedule 40 conduits.
9. Galvanized rigid steel conduit shall be utilized in underground installation for the last upward bend where conduit transitions from underground to above ground and shall be utilized for all above ground installations. Galvanized rigid steel conduit shall continue underground for two feet after the bend.
10. All underground work must be inspected and approved prior to covering.
11. The Service Entrance switch, CT cabinet, meter socket, and transfer switch shall be grounded and grounded per NEC article 250.
12. Equipment, installation and wiring techniques utilized for the wet well shall be consistent with the NEC requirements for Class I, Division 1&II, Group D areas.
13. Power and Control cables from the wet well that are connected at the junction box are provided with the specific device. Provide Stainless Steel kellum grip for each cord at the top of the wet well. Provide slack cable to allow for adjustment prior to terminating conductors.
14. All equipment provided, installed, and interconnected by contractor unless otherwise noted.
15. All equipment shall, at a minimum, be rated for 125% of the available RMS symmetrical short circuit current with a minimum value of 10,000 amperes.
16. All electrical work shall comply with the following applicable codes and standards and be subject approval of the state electrical inspector.
 2002 National Electric Code (NFPA 70)
 NFPA National Fire Protection Association
 IEEE Institute of Electrical and Electronics Engineers
 NEMA National Electrical Manufacturer's Association
 UL Underwriters Laboratories, Inc.
 OBBC Ohio Basic Building Code
 Applicable state and local codes
17. Identification
 - a. Equipment labels: Each electrical component including all disconnect switches, transfer switches, transformers, power and lighting panels, control panels, and terminal boxes for auxiliary systems shall be identified on the front cover or trim with its name and/or designation number or letter as shown on the Drawings and with the voltage available within the panel.
 - b. Conduit Marking: Identify and clearly mark all conduits leaving motor control centers, panelboards, control panels, and other originations as to their destination.
 - c. Wire Labels: Mark each conductor, both power and control, with wire numbers at each terminal, junction, control device, motor, starter, etc. using printed wrap-around vinyl type wire markers.
 - d. Underground Marking Tape: A 2" wide, metal coated mylar detectable tape shall be buried the full length of all underground runs, approximately 8" below grade and directly above it. Warning on tape to read: "CAUTION BURIED ELECTRIC LINE BELOW".
18. Shop Drawing submittal and approval.
 - a. Submit shop drawings and associated documentation in accordance with all provisions of the specifications and Contract.
 - b. Review of manufacturer's drawings or schedules does not relieve Contractor from responsibility for errors or omissions in manufacturer's drawings or schedules and deviation from Contract Drawings or Technical Specifications.
19. Adjust all breaker short-time/instantaneous settings based on Manufacturer's recommendations. Do not exceed maximum settings as set forth in Table 430-152 of the latest NEC.
20. Provide conductors of the AWG size and type shown on the drawings. Where no size and/or type is shown, use conductors not less than #12 for power and lighting and #14 for control. Use copper conductors that have 600 volt Type XHHW, THHN, THWN, or THW insulation. Provide only stranded copper control conductors that are UL labeled and of American manufacturer.
21. Provide color coding for individual conductors as follows:
 - a. DC conductors: Blue
 - b. AC conductors

Power Conductors	A	B	C	Neutral	Ground
240 VAC and below:	Black	Red	Blue	White	Green
250-600 VAC:	Brown	Orange	Yellow	Gray	Green

 120 VAC Control Circuits: Hot(120 vac) - Black
 Control - Red
 Neutral - White
 Foreign (to panel)- Yellow
22. The ampacity of all conductors shall be based on the thermal rating of the fuse or circuit breaker on the line side of the conductors. All conductors for distribution and control equipment terminations shall be based on full 75°C ampacity. All conductors for appliance and utilization equipment terminations rated 100 amperes or less shall be based on 60°C ampacity.
23. All conductors shall be sized such that voltage drop does not exceed three percent (3%) for branch circuits or five percent (5%) for feeder branch circuit combinations required by the NEC.
24. Contractor shall furnish and install all hangers, supports, straps, boxes, fittings, and other necessary appurtenances not indicated on the drawings but which are required for a complete and properly installed system.
25. Supply only conduit and fittings that are UL listed and labeled for the locations in which they are being installed.
26. Seal off fittings shall be provided and installed according to the NEC for all cables entering the wet well to prevent the passage of explosion proof vapors. Seal off must be filled with Chico compound and fiber prior to full time operation of station.
27. Conduit run in exposed areas shall be neat in appearance and run normal or parallel to the structural lines of the building. Suitable and approved conduit fittings, hangers, and covers shall be used. Where exposed conduit is attached to reinforced concrete walls or ceiling, it shall be fastened by lead cinch or expansion anchors only, using spacers and galvanized malleable iron one-hole pipe straps.
28. Where conduit is to be supported from structural steel framing, the supporting system shall be suitable hangers or clamps, conforming to acceptable practice and to the approval of the Engineer. Power-activated fastenings shall not be used. The Contractor shall not drill, weld or cut structural members, tanks or containers, without the Engineer's prior approval.

29. Blockouts, sleeves, and inserts shall be installed to avoid, so far as possible, the cutting and drilling of concrete and masonry.
30. Contractor shall supply all temporary electrical distribution and lighting as needed to complete work.
31. Upon completion of the work, Contractor shall furnish to Owner one (1) complete set of prints which are marked and revised "as built" for electrical schematics, all detail shop drawings, bills of materials, conduit and cable installation, and all equipment installations.
32. Testing
 - a. Test all wiring for continuity after installation and prior to hookup of electrical equipment to insure that the system is free from short circuits and unintentional grounds.
 - b. Test grounding system at origin of each separately derived voltage system and at each piece of distribution equipment to verify conformance with NEC article 250.
 - c. Verify insulation integrity for all 480/277 wiring. Megger test between conductor and ground and between phases with a 1000 volt DC megger. All resistances must be 50 Megohms or greater.
 - d. Test all three-phase feeders for proper phase sequence. Perform test using phase sequence indicator. Verify that phase sequence has been maintained from point of supply of each separately derived system throughout the system.
 - e. Check continuity and insulation integrity of all dry type transformer windings.
 - f. Apply power to circuits and verify that all circuits and devices are functioning properly as shown on the schematics. Verify that Field Devices and Instruments are providing feedback or receiving command signals from the control panel. Calibrate and adjust all Field Devices and Instrumentation to ensure devices are functioning properly.
33. Provide 3/4" plywood mounting board on wall of electrical room where panels are mounted.
34. Contractor shall submit 2 paper copies and 1 digital copy of wiring schematics to DCSE.
 - a. The transformer pad shall be provide by the Electrical Contractor. Installation details and requirements for the pad will be provided by AEP. The Electrical Contractor shall provide the site drawings showing the proposed transformer location to AEP and coordinate final position with AEP. AEP will provide detailed pad installation drawings. The Electrical Contractor shall coordinate incoming and outgoing conduit route with the transformer pad requirements as determined by AEP.

△ - Revised Utility Pad-Mount Transformer location, Note 4, and Generator Receptacle location.
 △ - Revised to show door entry sensor and valve float switch in Building Plan.

DELAWARE COUNTY, OHIO
 SANITARY SEWER IMPROVEMENT
 FOR
**VINMAR FARMS
 PUMP STATION &
 6" OFFSITE FORCE MAIN**

SCALE: As Noted August 22, 2003

EVANS, MECHWART, HAMBLETTON & TILTON, INC.
 CONSULTING ENGINEERS & SURVEYORS

ELECTRICAL EQUIPMENT SPECIFICATIONS:

(Provide Shop Drawings for each item)

- Service Entrance Disconnect Switch (DS-1):**
Provide 600 Volt, 200 ampere, 4 wire, heavy duty fused disconnect switch rated for service entrance use. Switch shall be loadbreak and HP rated for the application. The enclosure shall be NEMA 1 rated with a pad-lockable handle. Provide with Class J fuse rated sized at 150 amperes.
- Generator Receptacle (GR-1):**
Provide 200 ampere receptacle assembly, Crouse Hinds AR2041-S22 receptacle assembly with back box, angle adapter, receptacle, and spring cover.
- Transfer Switch (TS-1):**
Provide 600 Volt, 200 ampere, 3 pole, manual, double throw disconnect switch rated for service entrance use. The disconnect switch shall have tri-lock capability to be locked in any position and be loadbreak and HP rated for the application. The enclosure shall be NEMA 1 rated. Provide auxiliary contact indicating switch in generator position.
- Power Panel (PP-1):**
Provide 3-phase 4 wire power panel with 150 ampere main circuit breaker rated for 480Y/277 Volts. Provide in Nema 1 enclosure with branch circuit breakers as shown on drawing. Panel shall be sized to allow up to 6-3 pole branch circuit breakers. Provide ground fault interrupt circuits as required by NEC.
- Pump Control Panel (CP-1):**
See Pump control panel specifications, dwg's 12 and 13.
- Distribution Transformer (TX-2):**
Provide 3-phase, 30 KVA, NEMA 1 dry type transformer with 480 volt primary and 208y/120 volt secondary. Provide mounting bracket to keep transformer off floor.
- Muffin Monster Control Panel (CP-2):**
See Muffin Monster supply specifications
- Lighting Panel (LP-1):**
Provide 3 phase-4 wire 208Y/120 volt lighting panel. Provide in Nema 1 enclosure with 150-Ampere main circuit breaker and branch circuit breakers as shown on drawings. Panel shall be sized to allow up to 12 single pole branch circuit breakers. Provide ground fault interrupt circuits as required by NEC.
- Junction Box (JB-1):**
Provide NEMA 4X terminal box with quick release latching mechanisms. Provide terminals as required by power and control wiring.

ELECTRICAL EQUIPMENT SPECIFICATIONS CONTINUED:

- Site Lighting:**
Provide lighting fixture with Hand/Off/Auto selector switch control in building to control lighting mounted on outside of building as shown on plan view drawing of building. Provide photocell mounted on building and connect to auto circuit to control outside lighting.
Provide GE Wall-lighter series light fixture; 120 Volt, 175 watt Metal Halide fixture with ballast, lamp, wall mount mounted, and UL 1572 listed as suitable for wet locations. Locate fixtures as indicated on dwg. 11 as F3.
Provide GE VPG series flood light fixture; 120 Volt, 175 watt Metal Halide fixture with ballast, lamp, guard, swivel mounting assembly to allow vertical and horizontal adjustment, and UL 1572 listed as suitable for wet locations. Locate fixture as indicated on dwg. 11 as F4.
- Bioxide Panel**
See Bioxide panel specifications.
- Telemetry Panel (CP-3)**
See telemetry panel specifications, dwg. 12.
- Building Lighting:**
Provide lighting fixtures in electrical equipment area of building where shown on plan view drawing. Fixtures shall be enclosed fluorescent with two 60-watt type T8 lamps. Fixture shall be Lithonia DMW type indicated on dwg. 11 as F1.
Provide a lighting fixture in the valve pit rated for Class 1 Division 1. The fixture shall be a 100 Watt Incandescent with Globe and Guard indicated on dwg. 11 as F2. Light shall be controlled by switch in electrical area with label indicating use.
- Building Heater**
Provide complete 5 kW heater system with blower, automatic reset linear thermal cut-out, temperature element, and thermostat control accessible at floor level. Provide heater manufactured by QMark series/model MUH35C.
- Building/Valve Pit exhaust fan**
Provide fan with integral control as shown on drawings. Fan shall be controlled by the valve pit light switch.
- Door Entry Sensor**
Provide limit switch mounted to sense the door position. Switch shall have single pole double throw contacts rated for 120 VAC, 1A. & 30 VDC, 1A.
- Valve Vault Float Switch**
Provide float switch rated for class 1 div.1 in the valve vault to sense water at 2" from floor. Provide conduit & wire to switch from telemetry panel utilizing explosion proof installation techniques such as rigid conduit & seal offs.

CONTROL PANEL INSTALLATION REQUIREMENTS

- Wire all power and devices to the Control Panels as detailed on the Contract Drawings.
- Clearly identify and mark all conduits entering/leaving the Control Panels as to their destination.
- Keep field wiring neat and bundled inside the Control Panels. All field wiring shall be contained in wireway provided within the Control Panels.
- Take care to keep conduit fillings from entering panels when installing conduit.
- Provide 3/4" plywood mounting board on wall of electrical room where panels are mounted.

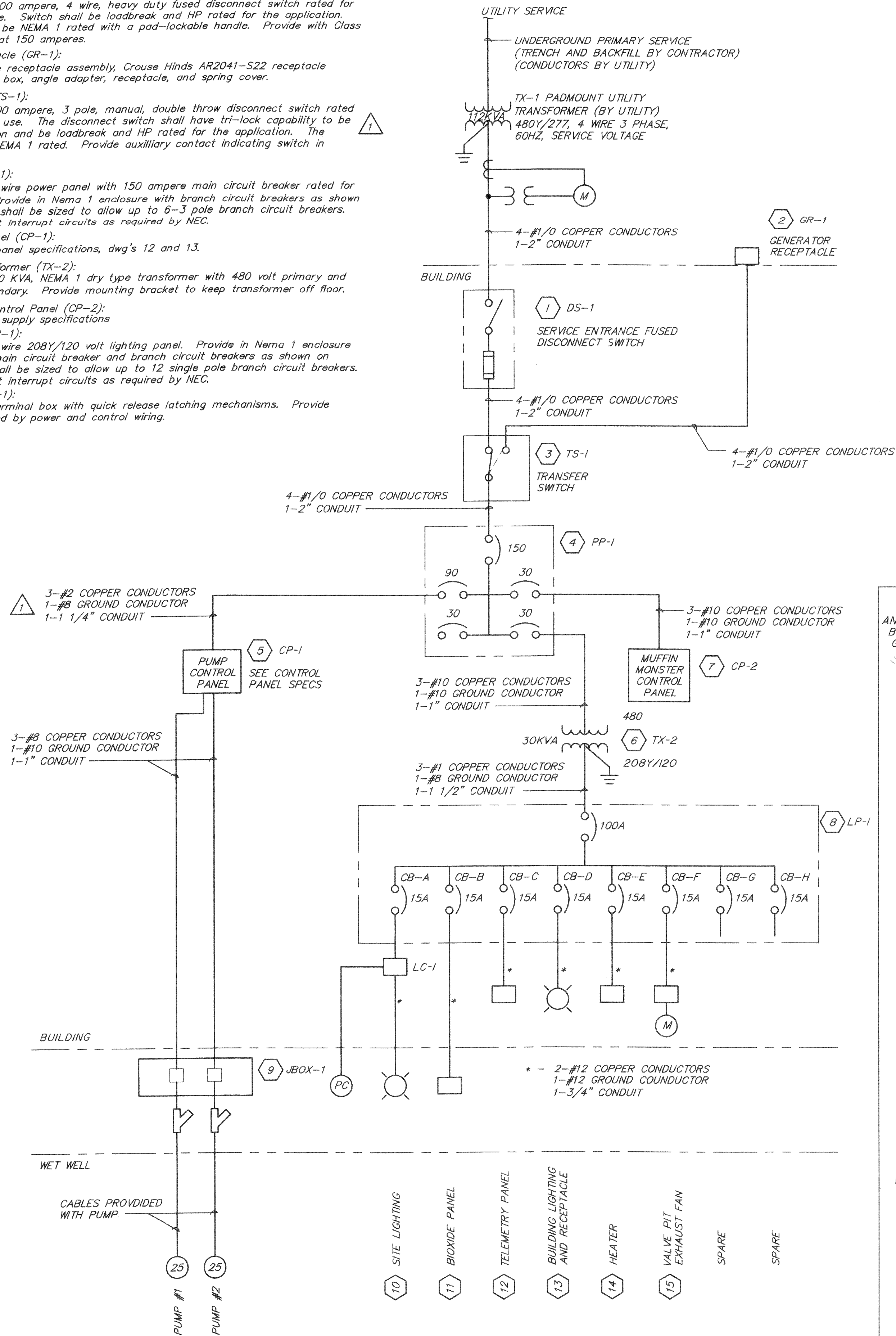
CONTROL PANEL WIRING AND FABRICATION REQUIREMENTS

- Provide a new Pump Control Panel (CP-1), Muffin Monster Control Panel (CP-2), and Telemetry panel (CP-3) constructed of new and un-deteriorated parts and components. Panel is to be installed in the Valve Building. Provide all equipment with components as shown and specified on the contract drawing.
- Provide panel schematics and panel layout drawings for each control panel supplied. Items on the schematic shall be labeled to match the labels used on the panel layout and bill of material.
- Provide wiring inside panels that is neatly bundled with wire ties and/or run inside plastic wire troughs. Terminate all device wiring on terminal blocks with no more than two (2) wires per screw. Provide 20% additional spare terminal blocks in each panel. Provide terminals for incoming power and neutral connections. Provide one wired terminal for every two field devices powered from the same wire. Provide one wired terminal for every two field devices sharing a common neutral. Provide spare terminals for DC voltage / analog signal wiring. Provide spare terminals for signal cable shield terminations.
- Provide isolated space inside panel for intrinsically safe wiring as required by NEC and manufacturer's recommendations.
- Label all terminals and wires with individual and unique wire numbers. Provide industrial type wire markers, such as Brady "Wrap Around" type wire labels. Provide labels with numbers that are printed, NOT hand written, on each wire label. Provide Nameplates with individual designations for all control relays, breakers, fuses, and all other miscellaneous equipment mounted inside panels. Provide sufficient wiring so that all doors may be fully opened for panel access without having to disconnect any wiring, terminal blocks, etc. Design interior of panels so that all devices, wiring, terminal blocks, etc. are easily accessible for maintenance and testing.
- Provide UL listed type MTW wire with 600 V insulation, minimum size AWG #18 copper for DC voltage / analog signal panel wiring, unless otherwise noted on the Drawings. Keep all DC voltage / analog signal wiring separate from 120 VAC wiring.
- Provide UL listed type MTW wire with 600 V insulation, minimum size AWG #16 copper for 120 VAC panel wiring.
- Color code all 120 VAC panel wiring as detailed in the General Electrical Specifications, to identify it separately from analog signal and communications wiring, and keep 120 VAC wiring in separate wiring troughs from all other wiring. Panels are arranged such that all wiring from the terminal blocks to the field is separated from that wiring within the panel. Maintain this segregation.
- Provide panels that are factory wired and tested prior to shipment so that field installation will consist only of setting panels in place and making final field connections.
- Provide and install all switches, pilot lights, and other panel devices as specified herein or as noted on the Drawings.
- Provide and install all plug-in control relays in Control Panels as noted on the Drawings.
- Provide original and three spare fuses for each type and size fuse in the panel.
- Mount sub-panel as indicated on the Drawings.

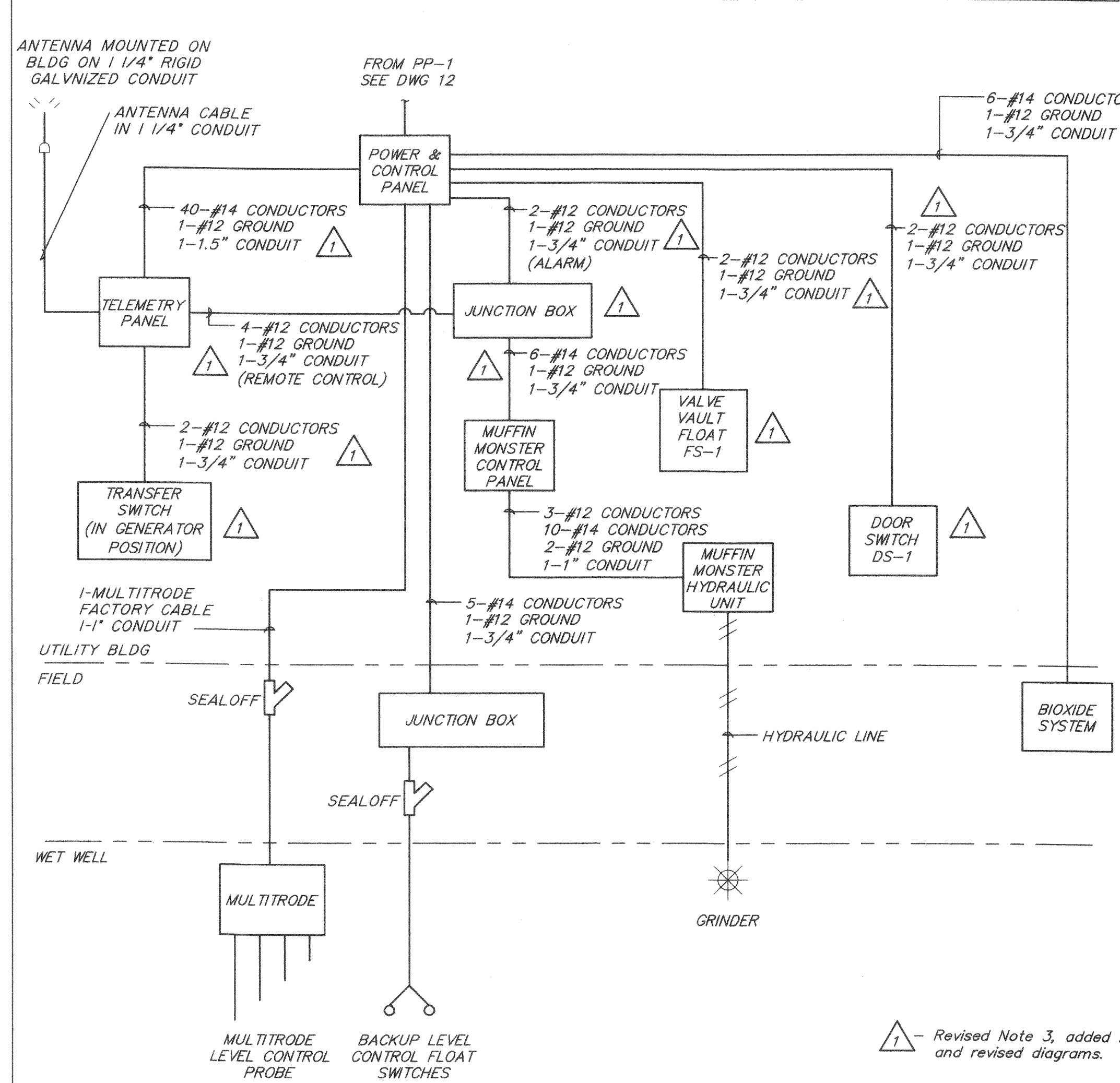
TELEMETRY PANEL:

Provide a telemetry system by the Westerman Company. The panel shall conform to the panel fabrication and wiring requirements listed above.

- Provide the following components:
 - One (1) - Westerman CT-4000 Microprocessor board or equal
 - Three (3) - Westerman UO-4480 Input /Output board or equal
 - One (1) - Westerman I/O-4240 Analog Input board or equal
 - One (1) - Meticom Spread Spectrum data radio, model 20043 or equal
 - One (1) - Westerman CA-1511 9600 Baud Modem or equal
 - One (1) - Fabricated Back Panel
 - One (1) - NEMA 4/12 enclosure
 - One (1) - Wooden Pole if required and Onini antenna
 - All-Related conduit, wire, cabling, and installation
 - One (1) - Power Sonic 10 AH batter
 - One (1) - Enclosure strip heater
 - Crydom style relays
- Provide the following signals to the telemetry system:
 - Pump 1 running
 - Pump 1 in auto mode
 - Pump 1 overload
 - Pump 1 winding temperature
 - Pump 1 seal failure
 - Pump 2 running
 - Pump 2 in auto mode
 - Pump 2 overload
 - Pump 2 winding temperature
 - Pump 2 seal failure
 - High Water Alarm
 - System operating on backup float system
 - Muffin Monster running
 - Muffin Monster alarm
 - Valve Vault alarm
 - Door entry alarm
 - Power failure
 - Generator on
 - Bioxide system alarm
- Incorporate the following telemetry signals into the pump control:
 - Remote stop/restart for Pump 1
 - Remote stop/restart for Pump 2
- Electrical Contractor is responsible for scheduling phone service to assure installation is complete prior to system testing.



ONE-LINE DIAGRAM
NO SCALE



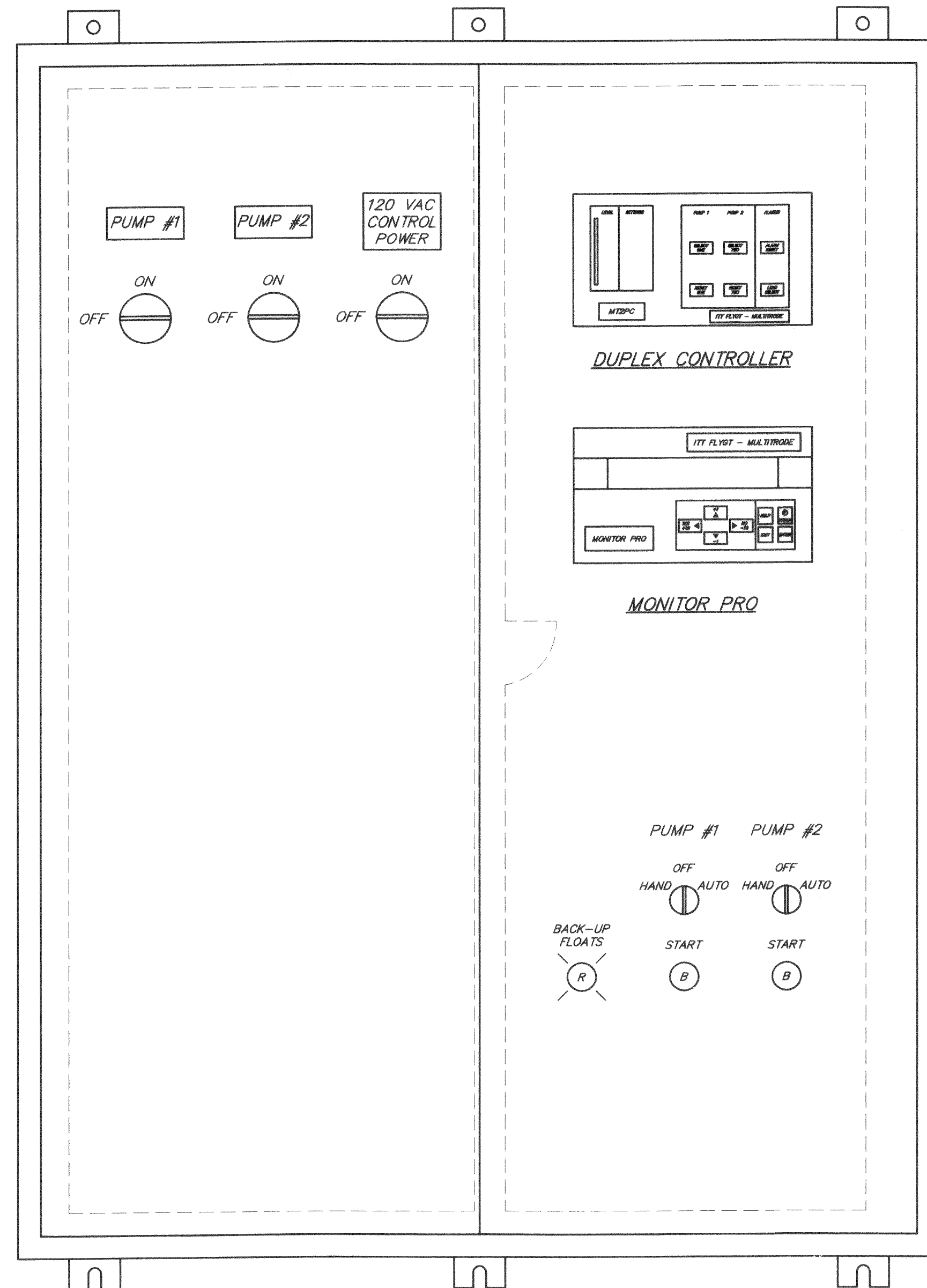
CONTROL BLOCK DIAGRAM
No Scale

1 - Revised Note 3, added Notes 16 & 17 and revised diagrams.

DELAWARE COUNTY, OHIO
SANITARY SEWER IMPROVEMENT
FOR
VINMAR FARMS
PUMP STATION &
6" OFFSITE FORCE MAIN

SCALE: As Noted August 22, 2003

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POWER AND CONTROL PANEL -
FRONT DOOR LAYOUT
NO SCALE

NOTE: MAXIMUM 36" WIDE

PUMP CONTROL PANEL COMPONENT DESCRIPTIONS:
(Provide Shop drawings for each item)

1. Pump Control Panel (CP-1):

- Provide a NEMA 12 enclosure that is UL, CSA, and IEC approved and sized as required. Provide enclosure complete with full size sub panel. Enclosure shall be provided by pump supplier. Provide enclosure that is fabricated from 14-gauge steel with the following features:
 - a. Continuously welded and ground smooth seams.
 - b. Oil-resistant continuously gasketed doors.
 - c. 3-point latching mechanism, operated by an oil-tight key locking handle.
 - d. Heavy gauge continuous hinges.
 - e. Removable print pocket mounted on door.
 - f. Collar studs for mounting sub panel.
 - g. Ground stud welded on door.
 - h. Finish to be white epoxy polyester coated inside and ANSI 61 high solids recoatable gray finish outside.
 - i. Sub panel to be full size of enclosure and constructed of 10 to 12-gauge steel with white epoxy polyester coated finish.

2. Duplex Pump Controller (DPC-1):

- Provide a Multitrode Liquid Level Control System and Probe as manufactured by Flygt. Provide Multitrode Model No. MT2PC Duplex Pump Controller and MultiTrode probe with the following features:
 - a. 120 VAC powered
 - b. Hi intensity LED's (red & green)
 - c. Level indication and pump / fault status
 - d. Monitoring for four levels of motor faults
 - e. Multiple pump operation
 - f. Pump alternating capability
 - g. Multiple level inputs from; multi-sensor probes, 4-20mA, ball floats
 - h. Modbus communication capability
 - i. Removable front keypad for remote mounting
 - * MultiTrode probe with four (4) sensing ranges (min.). Length as required.
 - * Provide spare Duplex Pump Controller

3. Pump Control Monitor (PCM-1)

- Provide a Monitor Pro Pump monitoring system as manufactured by Flygt. Provide Flygt model Monitor Pro-3 with the following features:
 - a. 120 VAC powered.
 - b. Four (4) lines by Forty (40) character LCD display.
 - c. Six (6) digital inputs, two (2) analog inputs
 - d. Three (3) relay outputs
 - e. Removable front keypad for remote mounting
 - f. Monitoring for up to three pumps for:
 1. Over current
 2. Under current
 3. Phase fail
 4. Phase rotation
 5. Motor insulation testing
 6. Motor ground short protection
 7. Pump starts per hour
 8. Flow rate and efficiency
 9. Hours run last and total
 10. Dual power supply backup
 11. Data Logger
 12. RS232, RS, 422 and RS485 communications
 13. Modbus protocol option, capable of communicating with Westerman telemetry system.

4. Pump Insulation Monitor (P1-IM, P2-IM)

- Provide a SUBMEG motor insulation-monitoring device as manufactured by Flygt. Provide Flygt automatic motor insulation monitoring device complete with relay and socket with the following features:
 - a. 120 VAC powered
 - b. "Power on" indicating light
 - c. "Low MEG" indicating light
 - d. "500 VDC on" indicating light
 - e. "Motor reset" pushbutton
 - f. "MEG test" pushbutton
 - g. "Emergency Bypass" pushbutton

5. Pump Leak / Temperature Switch (P1-LTS, P2-LTS)

- Provide a MiniCAS II pump motor high winding temperature and seal leakage module as manufactured by Flygt. Provide Flygt MiniCASS II modules complete with sockets and the following features:
 - a. 20 - 30 VAC powered
 - b. Two current sensing relays, One under current sensing relay for Over Temperature and One over current sensing relay for Seal Leakage
 - c. 12 VDC voltage output to sensors
 - d. Yellow LED for Supply Voltage present
 - e. Red LED for Over temperature indication
 - f. Red LED for Seal Leakage indication
 - g. Manual reset for winding over temperature integral with unit
 - h. Automatic reset for seal leakage

6. Circuit Breaker (CB-1, CB-2, CB-3)

- Provide molded case circuit breakers with inverse time and instantaneous tripping characteristics size per NEC requirements. All circuit breakers shall have ground fault protection where indicated or as required by NEC. Circuit breakers shall be operated by a toggle-type handle and shall have a quick-make/quick-break over-center switching mechanism that is mechanically trip-free. Automatic tripping of the breaker shall be clearly indicated by the handle position. Contacts shall be non-welding silver alloy, and arc extinction shall be accomplished by means of arc chutes. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.

7. Circuit Breaker Handle (for CB-1, CB-2, CB-3)

- Provide Allen Bradley Bulletin 198-H Rotary Circuit Breaker Operating Mechanism. Provide rotary circuit breaker operating mechanism complete with properly sized mechanism, operating shaft, and black operating handle.

8. Smart Motor Controller (P1-SMC, P2-SMC)

- Provide Allen Bradley Bulletin 150 Smart Motor Controller - SMC Dialog Plus. Provide SMC Dialog Plus units that are properly sized for the load they are controlling. Provide units with the following features:
 - a. 480 VAC rated power circuit
 - b. 120 VAC rated control circuit
 - c. multiple starting modes
 - d. electronic motor overload protection
 - e. metering
 - f. Built-in communication port
 - g. 2-line, 16 character backlit LCD display
 - h. Keypad programmable
 - i. 3 programmable auxiliary contacts
 - j. Bypass contactor
 - k. Isolation contactor

9. Control Power Transformer (CPT-1)

- Provide a control power transformer that is size properly supply 120VAC control power for the Pump Control Panel and its associated equipment. Provide a transformer that is 480 VAC single phase primary, 120 VAC single phase secondary.

10. Pump Selector Switch (P1-SS1, P2-SS1)

- Provide Allen Bradley Model 800T (NEMA 4/13) 3 position maintained contact non-illuminated selector switches with contacts rated for 125 VAC operation. Provide switches complete with contacts as required and legend plates engraved as shown on the contract drawings.

11. Back up float system in operation pilot light (PL-BU)

- Provide Red Allen Bradley Model 800T pilot lights rated for 125 VAC. Provide complete unit with engraved legend plates as shown on the contract drawings.

12. Misc. Control Relays

- Provide 120 VAC control relays with DPDT contacts rated for 5 amps (minimum) at 120 VAC. Provide relays as required, complete with mounting sockets.

13. Pump Control Panel Interior Light

- Provide Hoffman low profile 120 VAC fluorescent light, or approved equal. Provide light complete with integrally mounted manual switch and properly sized bulb.

- 14. A two-float back-up level control system shall be included to act as an emergency back-up level control system in the event that the main(duplex) system should fail. The backup system will operate when the pump selector switches are in Auto Mode. Indication shall be provided on the control panel when the backup float system is in operation and a signal shall be sent to the telemetry system. The back-up level control system will include two encapsulated mercury float switches suitable for suspending directly into wet well. Furnish floats with required length of 16/2 SJO cord. Floats shall be "UL" approved and suitable for operating intrinsically safe relays. Provide flat stainless steel mounting brackets for suspending floats with cord grips included.

- 15. All control panel components shall be integrated to form a complete and functioning system.

- 16. Interconnection schematics shall be submitted with shop drawings that detail how each component is wired.

- 17. All programmable settings shall be submitted with shop drawings that detail how the system will function.

PUMP CONTROL OPERATIONAL DESCRIPTION

The Pump Control Panel (CP-1) shall control two Wastewater Lift Pumps. The sequence of operation with features required for operation, safety & monitoring shall include, but not be limited to, the following:

1. Each pump shall be controlled by a "Hand-Off-Auto" selector switch and a Duplex Pump Controller.
2. A Selector Switch and start pushbutton shall be provided for each pump. The selector switch will control the pump in the following manner. In the "Off" position, the pump will not run. In the "Hand" position, the pump will run when the start pushbutton is pressed until the selector switch is turned to the "Off" position. Process interlocks such as level switches and duplex controller will be bypassed when in Hand mode. Safety interlocks such as winding temp, seal failure, pump overload will function in Hand mode. In the "Auto" position the pump will run based on the signals from the Duplex Pump Controller.
3. A single Duplex Pump Controller shall be provided to control the two pumps. The Duplex Pump Controller shall provide the following control based on a multi-point level probe. Pump Controller shall accept inputs from a multi-point probe (10 points). The controller will be able to select 4 signals to use as control points as described below. The following sequence shall be used to control the pumps:
 - Level 1: Low Level (all pumps off)
 - Level 2: Lead Pump On
 - Level 3: Lag Pump On
 - Level 4: High Level Alarm

Note: Elevations for levels are shown on "Pump Station Plan View & Cross Section", Sheet 9.

- 4. The two-float back-up level control system shall control the pumps in the following manner:
 - Float 1 - Both Pumps Off (Set 1 ft. above level 3 noted above)
 - Float 2 - Both Pumps On (Set at the same elevation as level 1 noted above)

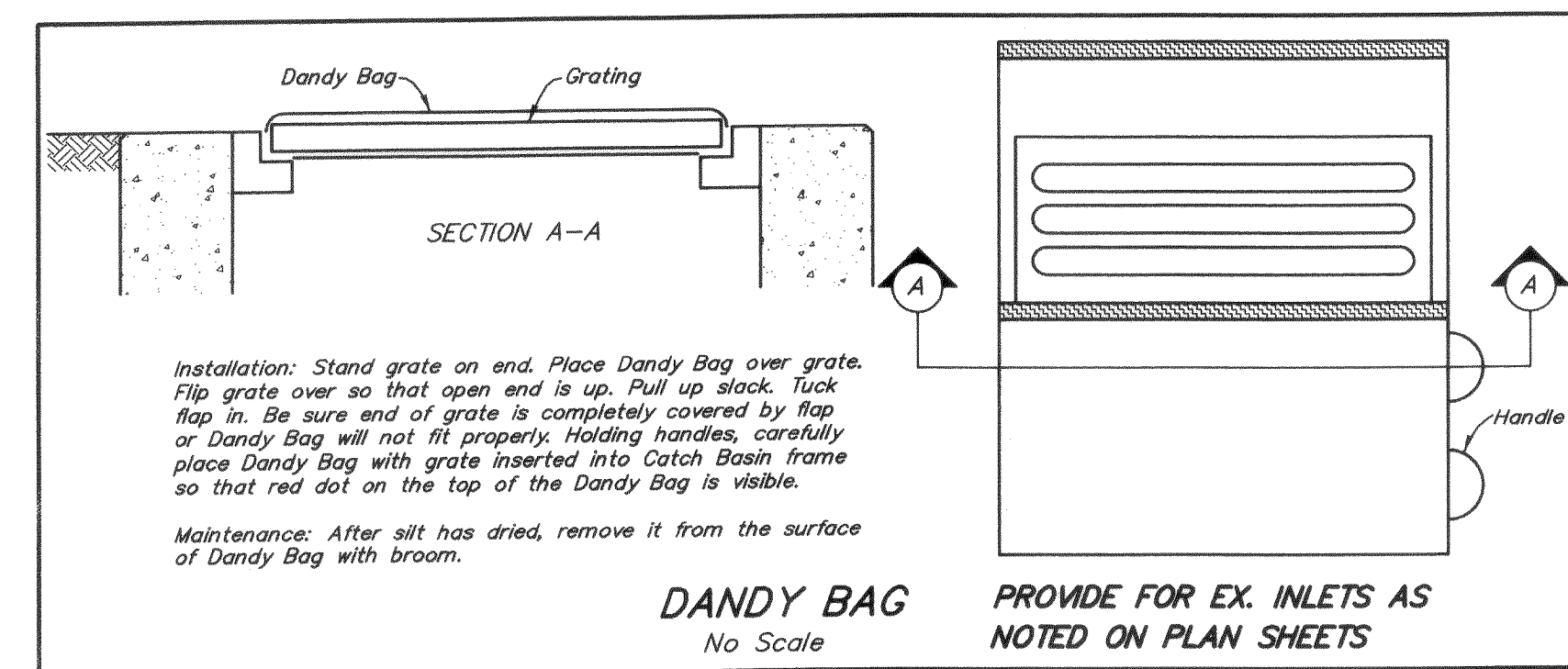
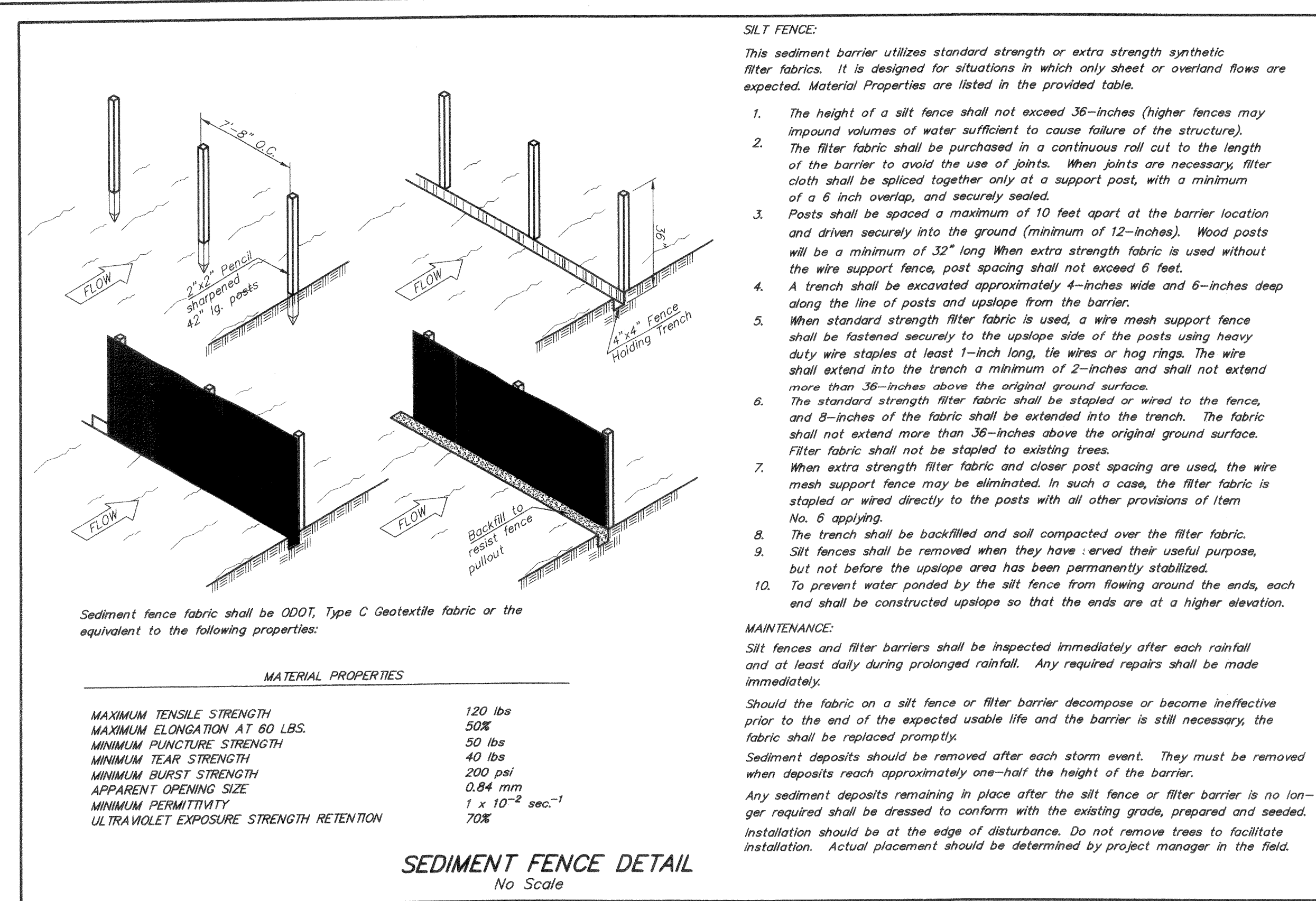
- 5. Motor starters shall be "Soft Start" and shall be programmed for interactive pump control to help eliminate fluid surges during starting and stopping. The motor starters shall be isolated from the pump motors when the insulation monitor is in its test cycle.

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TEMPORARY AND PERMANENT SEEDING

The limits of seeding and mulching are as shown within the plan. Seeding has been assumed to be 5'-0" outside the work limits or the right-of-way, whichever is greater. All areas not designated to be seeded shall remain under natural ground cover. Those areas disturbed outside the seeding limits shall be seeded and mulched at the Contractor's expense.

TEMPORARY SEEDING: Any area which will be left dormant (undisturbed) for more than 45 days shall be seeded within 7 days of terminated work. Disturbed areas within 50 feet of a stream, first order or larger, shall be stabilized within 2 days of inactivity. Temporary seeding consists of seedbed preparation and application of seed, fertilizer, and water. Soil test is recommended to determine proper application rate of fertilizer and if lime is necessary.

Fertilizer 12-12-12	12 lb/1000 sq. ft.
Straw Mulch	2 tons/acre
Water	300 G/1000 sq. ft.

PERMANENT SEEDING: Any area that is at final grade shall be seeded within 7 days of terminated work. Permanent seeding consists of seedbed preparation and application of seed, fertilizer, and water. Soil test is recommended to determine proper application rate of fertilizer and if lime is necessary. Ideal conditions for permanent seeding is March 1-May 31 and August 1-September 30.

TEMPORARY SEEDING

SEEDING DATES	SPECIES	lb./1000 sq. ft.	Per acre
March 1 to August 15	Oats	3	4 bushel
	Tall Fescue	1	40 lb.
	Annual Ryegrass	1	40 lb.
	Perennial Ryegrass	1	40 lb.
August 16 to November 1	Rye	3	2 bushel
	Tall Fescue	1	40 lb.
	Annual Ryegrass	1	40 lb.
	Wheat	3	2 bushel
Nov. 1 to Spring Seeding	Tall Fescue	1	40 lb.
	Annual Ryegrass	1	40 lb.
	Perennial Ryegrass	1	40 lb.
	Tall Fescue	1	40 lb.
NOTE: Other approved seed species may be substituted.	Annual Ryegrass	1	40 lb.
	Perennial Ryegrass	1	40 lb.
	Tall Fescue	1	40 lb.
	Annual Ryegrass	1	40 lb.

NOTE: Other approved seed species may be substituted.

PERMANENT SEEDING

SEED MIX	SEEDING RATE		NOTES
	lb/acre	lb/1000 sq.ft.	
GENERAL USE			
Creeping Red Fescue	20-40	1/2-1	
Domestic Ryegrass	10-20	1/4-1/2	
Kentucky Bluegrass	10-20	1/4-1/2	
Tall Fescue	40	1	
Dwarf Fescue	40	1	
STEEP BANKS or CUT SLOPES			
Tall Fescue	40	1	
Crown Vetch	10	1/4	Do not seed later than August.
Tall Fescue	20	1/4	
Flat Pea	20	1/2	Do not seed later than August.
Tall Fescue	20	1/2	
ROAD DITCHES and SWALES			
Tall Fescue	40	1	
Dwarf Fescue	90	2 1/4	
Kentucky Bluegrass	5		
LAWNS			
Kentucky Bluegrass	60	1 1/2	
Perennial Ryegrass	60	1 1/2	
Kentucky Bluegrass	60	1 1/2	For shaded areas
Creeping Red Fescue	60	1 1/2	

NOTE: Other approved seed species may be substituted.

MAINTENANCE

It is the Contractor's responsibility to maintain the sedimentation and erosion control features on this project. Any sediment or debris which has reduced the efficiency of a control shall be removed immediately. Should a structure or feature become damaged, the contractor shall repair or replace at no additional cost to the owner.

INSPECTIONS

The NPDES permit holder shall provide qualified personnel to conduct site inspections ensuring proper functionality of the erosion and sedimentation controls. All erosion and sedimentation controls are to be inspected once per every seven calendar days or within 24 hours of a .5" storm event or greater. Records of the site inspections shall be kept and made available to Jurisdictional agencies if requested.

CONTRACTOR RESPONSIBILITIES

Details have been provided on the plans in an effort to help the Contractor provide erosion and sedimentation control. The details shown on the plan shall be considered a minimum. Additional or alternate details may be found in the O.D.N.R. Manual "Rainwater and Land Development." The Contractor shall be solely responsible for providing necessary and adequate measures for proper control of erosion and sediment runoff from the site along with proper maintenance and inspection in compliance with the NPDES General Permit for Storm Discharges Associated with Construction Activity.

The Contractor shall provide a schedule of operations to the owner. The schedule should include a sequence of the placement of the sedimentation and erosion control measures that provides for continual protection of the site throughout the earth moving activities.

Prior to Construction Operations in a particular area, all sedimentation and erosion control features shall be in place. Field adjustments with respect to locations and dimensions may be made by the Engineer and the Ohio EPA.

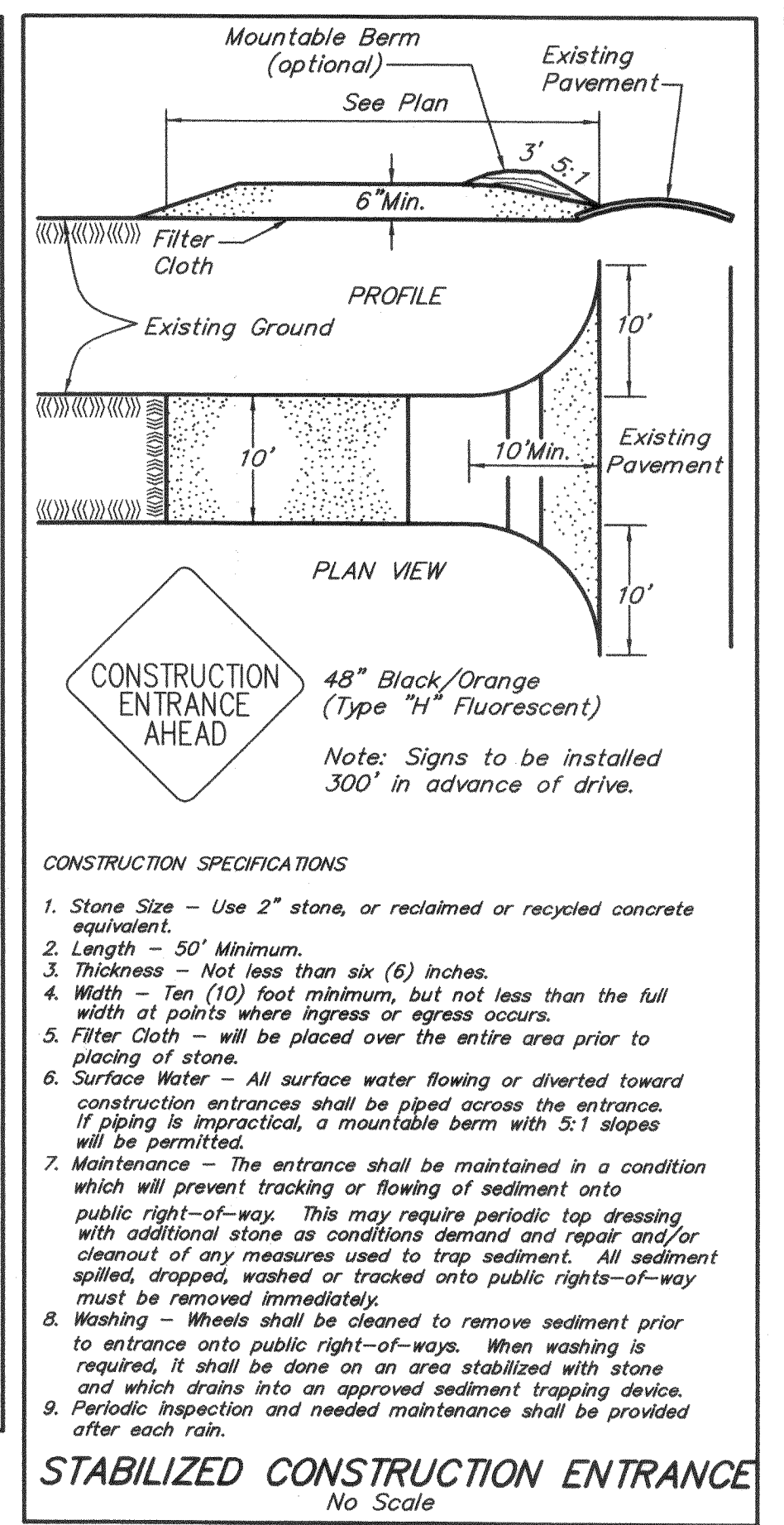
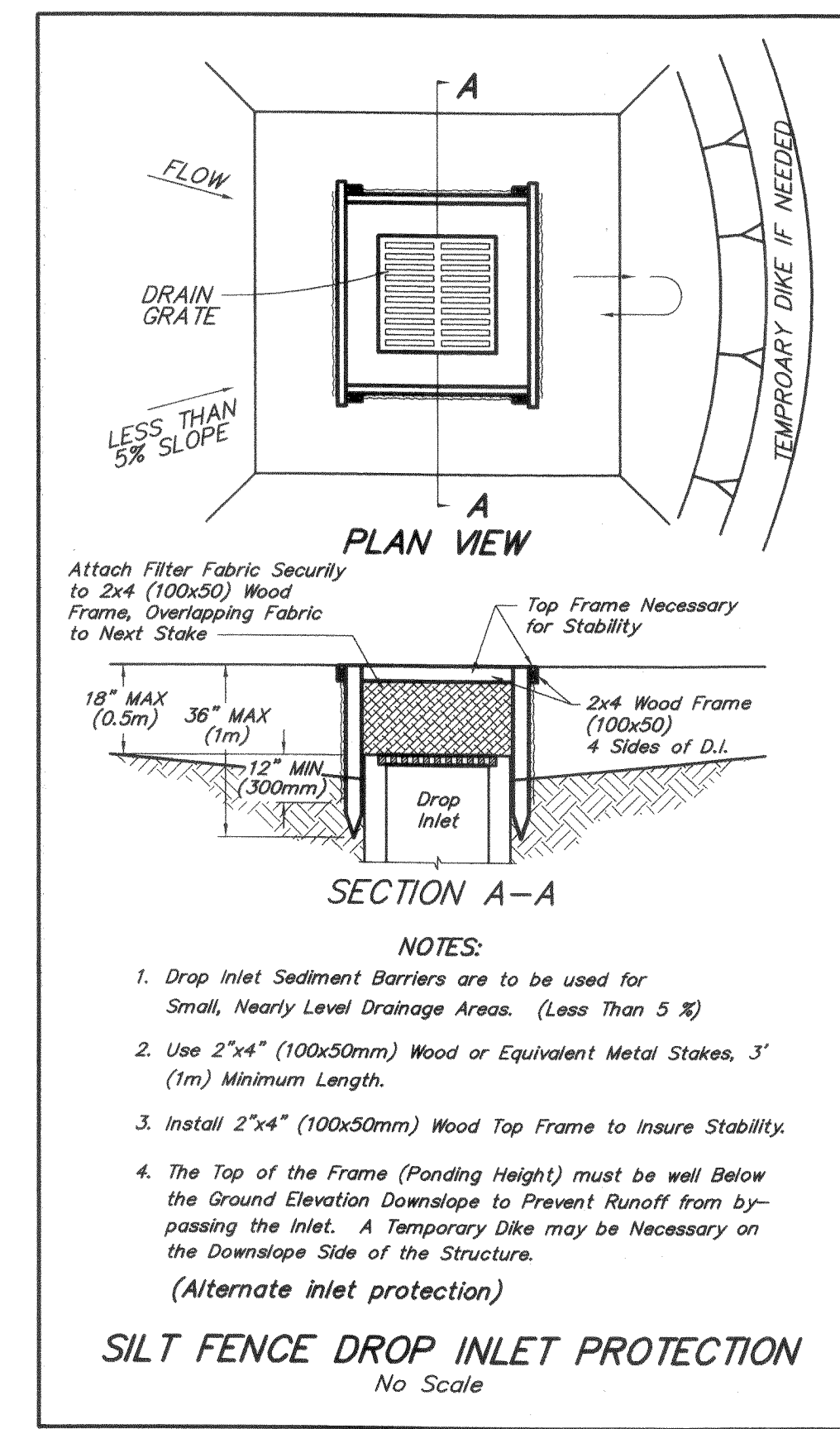
The Contractor shall place inlet protection for the sedimentation control immediately after construction of the catch basins or inlets which are not tributary to a sediment basin or dam.

It may become necessary to remove portions of sedimentation controls during construction to facilitate the grading operations in certain areas. However, the controls shall be replaced upon grading or during any inclement weather.

The Contractor shall be responsible to have the current Storm Water Pollution Prevention Plan immediately available or posted on site.

The Contractor shall be responsible to ensure that off-site tracking of sediments by vehicles and equipment is minimized. All such off-site sediment shall be cleaned up daily.

The Contractor shall be responsible to ensure that no solid or liquid waste is discharged into storm water runoff. Untreated sediment-laden runoff shall not flow off of site without being directed through a control practice. Concrete trucks will not be allowed to wash out or discharge surplus concrete into or along-side rivers, streams, or creeks or into natural or man-made channels or swales leading thereto. Concrete wash water and surplus concrete shall be confined to approved areas; after solidifying, these waste materials shall be removed from the site.



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