

# SCIOTO RESERVE

DELAWARE COUNTY, OHIO  
JANUARY 1999



GEOGRAPHICAL MAP  
NOT TO SCALE

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VICINITY MAP  
SCALE: 1"=10000'

## APPROVED:

BY Chris Bannum 3-24-99 COUNTY ENGINEER, DELAWARE COUNTY  
DATE

BY Jack Smelker 3-24-99 SANITARY ENGINEER, DELAWARE COUNTY  
DATE

BY Donald W. Wootz 3-29-99 DELAWARE COUNTY COMMISSIONER  
DATE

BY Debra B. Mast 3-30-99 DELAWARE COUNTY COMMISSIONER  
DATE

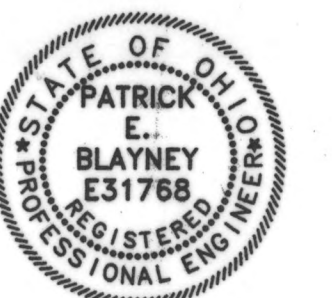
BY \_\_\_\_\_ DELAWARE COUNTY COMMISSIONER  
DATE

PLANS PREPARED BY:

Patrick E. Blaney  
PATRICK E. BLANEY, P.E.

NO. E31768

1-29-99  
DATE



R.D.Zande  
& Associates

- △ ELIMINATE 2" FORCE MAIN. 1-5-00
- △ ADDED 11.25' BEND, MOVED MANHOLE, END INVERT & HEADWALL LOCATION. CHANGED RENO MATRESS TO DUMPED ROCK FILL. 9-1-99
- △ MOVED MANHOLE LOCATION, PIPE SLOPE, PIPE INVERT ON GRAVITY SEWER. 8/27/99
- △ REVISED HORIZONTAL ALIGNMENT OF FORCE MAIN TO AVOID WATERLINE. 8/25/99

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# GENERAL NOTES

## GENERAL

ALL WORK SHALL BE DONE AND ALL MATERIAL FURNISHED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATIONS, LATEST EDITION AND CURRENT DELAWARE COUNTY SPECIFICATIONS. SEWER STANDARD DRAWINGS REFER TO THE DELAWARE COUNTY SANITARY ENGINEERING DEPARTMENT STANDARD DRAWINGS.

### COMMENCEMENT OF WORK

THE CONTRACTOR SHALL NOTIFY THE DELAWARE COUNTY SANITARY DEPARTMENT 48 HOURS PRIOR TO COMMENCING WORK ON THIS PROJECT, HOLIDAYS AND WEEKENDS EXCLUDED.

### EXTRA COMPENSATION

NO EXTRA COMPENSATION WILL BE PAID TO THE CONTRACTOR BY REASON OF COMPLIANCE WITH ANY OF THE REQUIREMENTS INDICATED IN THE CONTRACT DRAWINGS. PAYMENT SHALL BE DEEMED TO BE INCLUDED AMONG THE PAY ITEMS, AS BID UPON, UNLESS OTHERWISE SPECIFICALLY PROVIDED.

### SAFETY REQUIREMENTS

THE CONTRACTOR AND SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL AMENDMENTS THERETO, DURING THE CONDUCT AND PERFORMANCE ON AND IN CONJUNCTION WITH THIS PROJECT.

### STATIONING

STATIONING ALONG THE DRAINAGE CHANNELS ARE BASED ON DISTANCES ALONG THE CHANNEL CENTERLINE. BASELINE AND CENTERLINE ARE FIELD LOCATED WITH THE REFERENCE POINTS SHOWN ON THE DRAWING.

### BENCHMARKS AND ELEVATIONS

ALL ELEVATIONS SHOWN ARE BASED ON U.S.G.S. DATUM. BENCHMARKS HAVE BEEN SET AND REFERENCED ON THE DRAWINGS. CONTRACTOR SHALL VERIFY ELEVATION ON EACH WITH PERMANENT BENCHMARKS PRIOR TO COMMENCING THE WORK. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE COUNTY'S REPRESENTATIVE AND RESOLVED BEFORE PROCEEDING WITH WORK. BENCHMARKS SHALL BE MAINTAINED AS REQUIRED TO COMPLETE THE WORK AT THE CONTRACTOR'S COST.

### IRON PINS AND MONUMENTS

THE CONTRACTOR SHALL REFERENCE ALL IRON PINS, AND MONUMENTS FOUND BEFORE EXCAVATING AT OR NEAR THEM. COPIES OF REFERENCE DOCUMENTATION SHALL BE SUBMITTED TO COUNTY. IF ANY PINS OR MONUMENTS ARE DESTROYED OR DAMAGED THEY SHALL BE ACCURATELY REPLACED BY A REGISTERED SURVEYOR AT THE COMPLETION OF THE PROJECT AT CONTRACTOR'S COST.

### MAINTENANCE OF TRAFFIC

ALL TRAFFIC CONTROL DEVICES SHALL BE FURNISHED, ERECTED, MAINTAINED AND REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH THE OHIO MANUAL OF CONTROL DEVICES FOR CONSTRUCTION AND MAINTENANCE OPERATION (CURRENT EDITION); COPIES OF WHICH ARE AVAILABLE FROM THE OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF TRAFFIC, 25 S. FRONT STREET, COLUMBUS, OHIO 43215.

THE CONTRACTOR SHALL NOT BEGIN WORK UNTIL STANDARD BARRICADES AND WARNING SIGNS ARE IN ACCEPTABLE POSITION AND THE MARKERS AND SIGNS CONFORM TO THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".

TWO-WAY, ONE LANE TRAFFIC SHALL BE MAINTAINED ON HOME ROAD AT ALL TIMES DURING WORKING HOURS IN ACCORDANCE WITH PAGE C-22 OF THE OHIO MANUAL.

THE CONTRACTOR SHALL MAINTAIN LOCAL TRAFFIC AT ALL TIMES DURING CONSTRUCTION OF THIS PROJECT IN A MANNER CAUSING THE LEAST AMOUNT OF INCONVENIENCE TO THE ADJUTING PROPERTY OWNERS. TEMPORARY DRIVEWAYS, TEMPORARY ROADWAYS, OR RUN-AROUNDS MAY BE NECESSARY TO PROVIDE VEHICULAR ACCESS TO AND FROM THE ADJUTING PROPERTIES SHALL BE CONSTRUCTED, MAINTAINED AND SUBSEQUENTLY REMOVED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER.

ALL PAVEMENT AND/OR RIGHT-OF-WAY OPENINGS WITHIN THE PUBLIC RIGHT-OF-WAY MUST CONFORM TO THE CURRENT EDITION OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATIONS, WITH SUPPLEMENTS OR CHANGES THERETO. ALSO, THE CONTRACTOR ASSUMES ALL RESPONSIBILITIES AND LIABILITIES REGARDING STRICT ADHERENCE TO APPLICABLE SECTIONS FOR THE MAINTENANCE OF TRAFFIC AND PUBLIC SAFETY AS SET FORTH IN THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS". ALL TRAFFIC CONTROL DEVICES MUST BE IN PLACE PRIOR TO STARTING CONSTRUCTION.

EXCAVATION WHICH ARE NOT PROTECTED BY TEMPORARY FENCING SHALL BE BACKFILLED AT THE END OF EACH WORKING DAY.

IF AT ANY TIME TRAFFIC HAS TO BE BLOCKED, THE CONTRACTOR SHALL NOTIFY THE NEAREST F. E. AND POLICE DEPARTMENTS (EMERGENCIES ONLY).

NO NON-RUBBER Tired VEHICLES SHALL BE MOVED ON COUNTY ROADS.

### EXISTING UTILITIES

THE CONTRACT DRAWINGS SHOW ALL UTILITIES, WATER, GAS, AND SEWER LINES KNOWN TO EXIST. HOWEVER, THIS DOES NOT GUARANTEE THAT ALL EXISTING LINES AND APPURTENANCES HAVE BEEN SHOWN ON THE CONTRACT DRAWINGS, AND THE COUNTY ASSUMES NO RESPONSIBILITY FOR THE ACCURACY THEREOF AND DOES NOT FREE THE CONTRACTOR FROM NECESSARY PRECAUTIONS FOR THE PROTECTION OF ANY UTILITY ENCOUNTERED ON THE PROJECT OR THE RESTORATION OF ANY UTILITY DAMAGED DURING THE WORK.

THE CONTRACTOR SHALL EXPOSE THE UTILITY OR STRUCTURE INDICATED ON THE DRAWING BEFORE PERFORMING THE ASSOCIATED WORK IN ORDER TO VERIFY THE LOCATION.

THE CONTRACTOR SHALL NOTIFY AT LEAST 48 HOURS BEFORE BREAKING GROUND, ALL PUBLIC AND/OR PRIVATE SERVICE CORPORATIONS HAVING WIRE, POLES, PIPES, CONDUIT, MANHOLES OR OTHER STRUCTURES THAT MAY BE AFFECTED BY THIS OPERATION, INCLUDING ALL STRUCTURES WHICH ARE AFFECTED AND NOT SHOWN ON THESE PLANS. OWNERS OF UNDERGROUND UTILITIES WHICH ARE MEMBERS OF THE OHIO UTILITIES PROTECTION SERVICE CAN BE NOTIFIED BY CALLING 800-362-2784 (TOLL FREE). NON-MEMBER UNDERGROUND UTILITY OWNERS MUST BE CALLED DIRECTLY.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL RESIDENTS OF INTERRUPTION TO THEIR UTILITIES THAT WILL BE CAUSED BY CONSTRUCTION AT LEAST 24 HOURS IN ADVANCE.

SUPPORTING AND/OR PROTECTING EXISTING WATER LINES, GAS MAINS, TELEPHONE CONDUIT, STORM SEWERS, ETC., SHALL BE INCLUDED IN PAYMENT FOR THE VARIOUS CONTRACT ITEMS OF WORK.

ALL WORK REQUIRED FOR THE MAINTENANCE OF SERVICE OF EXISTING UTILITIES SHALL BE DONE BY, AND AT THE EXPENSE OF THE CONTRACTOR.

ALL MAINTENANCE, REPAIR AND/OR REPLACEMENT OF EXISTING UTILITIES, WHETHER SHOWN ON THE DRAWINGS OR NOT, SHALL BE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE VARIOUS UTILITY COMPANIES HAVING JURISDICTION, AND SHALL BE INCLUDED IN PAYMENT FOR THE VARIOUS CONTRACT ITEMS OF WORK.

ALL EXISTING STORM SEWERS, DRIVEWAY DRAINS, AND OTHER SURFACE DRAIN PIPES, WHETHER SHOWN ON THE CONTRACT DRAWINGS OR NOT, REMOVED OR DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AND RECONNECTED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER, AT NO COST TO THE COUNTY.

## USE OF PREMISES

IN ADDITION TO DIRECT REQUIREMENTS OF THE CONTRACT SPECIFICATION, THE CONTRACTOR SHALL OBSERVE AND CONFORM TO THE SPECIFIC REQUIREMENTS OF ALL RIGHT-OF-WAY, INCLUDING EASEMENT COURT ENTRIES, RIGHT-OF-ENTRY, OR ACTION FILED IN COURT IN ACCORDANCE WITH THE CODE OF APPLICABLE GOVERNING AGENCY.

THE CONTRACTOR SHALL NOT TRESPASS UPON OR IN ANY WAY DISTURB PROPERTY ADJACENT TO THE STREET RIGHT-OF-WAY WITHOUT FIRST OBTAINING WRITTEN PERMISSION FROM THE OWNER TO DO SO. A COPY OF SUCH WRITTEN PERMISSION SHALL BE FURNISHED TO THE ENGINEER.

IF THE CONTRACTOR FINDS IT NECESSARY TO OBTAIN ADDITIONAL WORKING AREA, IT SHALL BE HIS RESPONSIBILITY FOR ITS ACQUISITION. ALL REQUIREMENTS LISTED UNDER THE "USE OF PREMISES" SHALL APPLY IF ADDITIONAL AREA IS OBTAINED.

THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, RESTORE SUCH PROPERTY TO THE FULL SATISFACTION OF THE OWNER, AND SHALL OBTAIN FROM THE OWNER A WRITTEN RELEASE STATING THAT RESTORATION HAS BEEN SATISFACTORILY MADE. A COPY OF THE WRITTEN RELEASE SHALL BE FURNISHED TO THE ENGINEER.

THE CONTRACTOR SHALL NOT WASTE ANY EXCESS EARTH, STONE, OR OTHER EXCAVATED MATERIAL ON ANY PROPERTY WITHOUT FIRST OBTAINING WRITTEN PERMISSION OF THE OWNER OF THE PROPERTY AND SECURING THE APPROVAL OF THE ENGINEER. ONE COPY OF THE OWNER'S WRITTEN PERMISSION AND ONE COPY OF A WRITTEN RELEASE FROM THE OWNER STATING THAT THE WORK HAS BEEN COMPLETED SATISFACTORILY, SHALL BE FURNISHED TO THE ENGINEER.

ALL ITEMS WITHIN THE STREET RIGHT-OF-WAY SHALL BE REMOVED, OR REMOVED AND REPLACED, OR RESTORED AS REQUIRED BY THE CONTRACT DRAWINGS AND DETAILED PROVISIONS, AS DIRECTED BY THE ENGINEER.

### STORAGE OF MATERIALS

THE CONTRACTOR SHALL NOT PARK EQUIPMENT OR STORE MATERIALS WITHIN THE RIGHT-OF-WAY.

### PROTECTION OF TREES

SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGES TO TREES AND THEIR ROOT SYSTEM. MACHINE EXCAVATION SHALL NOT BE USED WHEN, IN THE OPINION OF THE ENGINEER, IT WOULD ENDANGER TREE ROOTS. IN GENERAL, WHERE THE LINE OF TRENCH FALLS WITHIN THE LIMITS OF THE LIMB SPREAD, THE LEAVING OF HEADERS ACROSS THE TRENCH TO PROTECT ROOTS WILL BE REQUIRED. THE OPERATION OF ALL EQUIPMENT, PARTICULARLY WHEN EMPLOYING BOOMS, THE STORAGE OF MATERIALS, AND THE DEPOSITION OF EXCAVATION SHALL BE CONDUCTED IN THE MANNER WHICH WILL NOT INJURE TREES, TRUNKS, BRANCHES OR THEIR ROOTS.

BRANCHES WHICH OVERHANG THE CONSTRUCTION LIMITS AND WHICH INTERFERE WITH THE OPERATION OF EQUIPMENT SHALL BE TIED BACK TO AVOID DAMAGE, IF POSSIBLE, WHERE INJURY TO BRANCHES IS UNAVOIDABLE. THE BRANCHES SHALL BE SAWOED OFF NEARLY AT THE TRUNK OR MAIN BRANCH AND THE CUT AREA SHALL BE PAINTED WITH AN APPROVED TREE PAINT IMMEDIATELY. ANY TREE DAMAGED BEYOND SAVING SHALL BE REMOVED BY THE CONTRACTOR AT HIS OWN EXPENSE, AND IN THE CASE OF TREES LOCATED ON PRIVATE PROPERTY, RESTITUTION SHALL BE MADE TO THE OWNER BY THE CONTRACTOR.

### CLEARING AND GRUBBING

TREES AND SHRUBS WITHIN CONSTRUCTION EASEMENT NOT DESIGNATED TO BE SAVED ON THE DRAWINGS MAY BE REMOVED AND SHALL BE DISPOSED OF WITH NO ADDITIONAL COST TO THE COUNTY.

### SURPLUS EXCAVATION

THE CONTRACTOR SHALL REMOVE FROM THE SITE ALL SURPLUS EXCAVATION TO A LOCATION ACCEPTABLE BY THE COUNTY.

### ENCOUNTERING HAZARDOUS OR TOXIC MATERIALS

IF THE CONTRACTOR ENCOUNTERS ANY ABNORMAL MATERIALS SUCH AS, BUT NOT LIMITED TO, DRUMS, TANKS, OR STAINED EARTH OR ANY UNUSUAL ODOR DURING CONSTRUCTION OPERATION, THE WORK IN THIS AREA SHALL BE TEMPORARILY DISCONTINUED, EQUIPMENT LEFT IN PLACE, THE AREA CORDONED OFF AND THE COUNTY NOTIFIED. THE AREA IS CONSIDERED TO CONTAIN HAZARDOUS OR TOXIC MATERIALS IT MUST BE HANDLED CORRECTLY IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL LAWS.

### DELAWARE COUNTY PERMIT

ALL WORK WITHIN DELAWARE COUNTY ROAD RIGHT-OF-WAY IS SUBJECT TO THE INSPECTION AND APPROVAL OF THE DELAWARE COUNTY ENGINEER. THE CONTRACTOR SHALL SECURE A WRITTEN PERMIT FROM THE DELAWARE COUNTY ENGINEER, 50 CHANNING STREET, DELAWARE, OHIO 43015, 48 HOURS IN ADVANCE OF STARTING ANY WORK WITHIN THE COUNTY RIGHT-OF-WAY.

### DELAWARE COUNTY NOTIFICATION

THE CONTRACTOR SHALL NOTIFY THE DELAWARE COUNTY ENGINEER, AND COUNTY SANITARY ENGINEER 48 HOURS IN ADVANCE OF COMMENCING ANY WORK.

## 8.1 EXCAVATION, BACKFILL AND EMBANKMENTS

### TOP SOIL

ALL TOP SOIL SHALL BE REMOVED AND STOCKPILED FOR FUTURE COVERING OF THE EXCAVATED OR OTHERWISE DISTURBED AREAS.

### BACKFILL AND EMBANKMENT

THE CONTRACTOR SHALL FURNISH AND PLACE ACCEPTABLE MATERIAL AS BACKFILL AND EMBANKMENT AROUND THE STRUCTURES. MATERIALS USED SHALL BE OBTAINED FROM THE POND EXCAVATION AREA. WASTE EXCAVATION MAY BE DISPOSED OF ON THE SITE, OR ON OFF-SITE AREAS WHEN REQUIRED. ALL BACKFILL AND EMBANKMENT SHALL BE PLACED SO AS TO MINIMIZE SUBSEQUENT SETTLEMENT.

### TOP SOIL PLACEMENT

BACKFILL AND EMBANKMENT SHALL BE MADE TO WITHIN APPROXIMATELY 3 INCHES OF FINAL GRADE, MAKING REASONABLE ALLOWANCE FOR SETTLEMENT. TOP SOIL SHALL THEN BE DISTRIBUTED OVER THE AREA TO THE FINISHED GRADE LINES SHOWN ON THE PLANS. EXCESS MATERIAL SHALL BE REMOVED FROM THE TOP SOIL AS IT IS PLACED AND THE SURFACE RAKED EVENLY.

### GRANULAR BACKFILL

GRANULAR BACKFILL, WHERE SHOWN ON THE DRAWINGS, MAY BE CRUSHED STONE OR GRAVEL COMPACTED TO THE THICKNESS SHOWN. THE GRANULAR MATERIAL SHALL BE DEPOSITED AFTER THE SUBGRADES HAVE BEEN LEVELED AND CLEARED OF ALL DEBRIS AND IMMEDIATELY PRIOR TO THE POURING OF THE CONCRETE SLABS.

THE GRANULAR MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 310.02, 304.02, STATE OF OHIO, DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS OR BE OTHER WELL GRADED GRANULAR MATERIAL APPROVED BY THE ENGINEER.

## 8.2 GRADING, FERTILIZING, AND SEEDING

### DESCRIPTION

THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, AND MATERIALS REQUIRED TO ACCOMPLISH THE FINE GRADING, FERTILIZING, AND SEEDING AS SPECIFIED HEREIN.

IF SUITABLE TOPSOIL IS AVAILABLE AS PART OF THE MATERIAL EXCAVATED, IT SHALL BE REMOVED AND STORED SEPARATELY AND USED TO BACKFILL THE TOP 4 INCHES. AFTER THE BACKFILL HAS BEEN GIVEN A REASONABLE TIME TO SETTLE, IT SHALL BE GRADED OFF TO THE FINISHED GRADE, THEN HARROWED TO A DEPTH OF 3 INCHES. ALL GRASS, WEEDS, ROOTS, STICKS, STONES, ETC. ARE TO BE REMOVED AND THE SOIL CAREFULLY BROUGHT TO THE FINISHED GRADE BY RAKING. AN APPLICATION OF NOT LESS THAN 1 POUND PER 100 S.F. OF A 12-7-5 LAWN OR TURF GRADE FERTILIZER SHALL BE UNIFORMLY DISTRIBUTED AND RANED IN. IF THERE IS NO SUITABLE TOPSOIL AVAILABLE ON ANY PART OF THE WORK, OR IF THERE IS A DEFICIENCY OF SUITABLE TOPSOIL, THE CONTRACTOR SHALL FURNISH AND APPLY NOT LESS THAN 2 POUNDS PER 100 S.F. OF 12-7-5 LAWN OR TURF GRADE FERTILIZER IN THE METHOD ABOVE SPECIFIED.

IMMEDIATELY AFTER THE PREPARATION AND FERTILIZATION OF THE SEED BED, THE SEED SHALL BE THOROUGHLY MIXED AND THEN EVENLY SOWN OVER THE PREPARED AREAS AT THE RATE OF 3 POUNDS PER 1,000 S.F. SEED SHALL BE SOWN DRY OR HYDRAULICALLY.

A. ALL AREAS TO BE SEEDING WHICH ARE CONSIDERED TO BE URBAN IN CHARACTER, AND ANY AREA IMMEDIATELY IN FRONT OF A RESIDENCE, SHALL BE SEEDING WITH THE FOLLOWING MIXTURE: (PERCENTAGES ARE BY WEIGHT.)

- 35 PERCENT KENTUCKY BLUEGRASS (POA PRATENSIS)
- 55 PERCENT CREEPING RED FESCUE (FESTUCA RUBRA)
- 5 PERCENT RED TOP (AGROSTIS ALBA)
- 5 PERCENT WHITE DUTCH CLOVER (ARFOLIUM REPENS)

B. ALL AREAS IN RIGHT-OF-WAY OR IN EASEMENTS ADJACENT TO RIGHT-OF-WAY AND OTHER THAN THOSE MENTIONED ABOVE, SHALL BE SEEDING WITH THE FOLLOWING MIXTURE:

- 100 PERCENT KENTUCKY 31 FESCUE (FESTUCA ARUNDINACEA VAR. KY. 31)

THE SEED SHALL BE CAREFULLY AND UNIFORMLY SOWN BY EXPERIENCED AND SKILLED WORKMEN. FOLLOWING THE SEEDING, THE SURFACE SHALL BE LIGHTLY RAKED AND ROLLED WITH A LIGHT ROLLER. FOLLOWING THE ROLLING, THE AREA SEEDING SHALL BE COVERED WITH 2 INCHES, LOOSE MEASUREMENT, OF VEGETATIVE MULCH, TIED DOWN OR KEPT IN PLACE BY OTHER ACCEPTABLE METHOD.

ALL SEEDING AREAS SHALL BE CAREFULLY LOOKED AFTER AND TENDED BY THE CONTRACTOR. WATERING AS NECESSARY TO SECURE A GOOD TURF. SETTLED AREA SHALL BE FILLED, GRADED, AND RESEEDING.

### SEEDING TIME

ALL FERTILIZING AND SEEDING SHALL BE DONE IN THE MONTHS BETWEEN APRIL AND NOVEMBER. THE CONTRACTOR SHALL MAINTAIN AREAS UNTIL SEEDING IS COMPLETE.

### AREAS TO BE SEEDING

ALL THE EMBANKMENTS AND DISTURBED AREAS WITHIN THE PROJECT SITE, ALL ROADWAY EMBANKMENTS, FILLS, AND DITCHES NOT SODDED, SHALL BE SEEDING.

## 8.3 TEMPORARY SEEDING

THE WORK SHALL CONSIST OF FURNISHING ALL LABOR, EQUIPMENT, AND MATERIALS FOR SEEDING THE AREAS AS DIRECTED BY THE ENGINEER, AND FOR LIMING, FERTILIZING, PREPARING A SEEDBED, AND MULCHING WHEN REQUIRED.

### SEED REQUIREMENTS

ALL SEED SHALL BE LABELED OR MARKED IN ACCORDANCE WITH SECTION 907.03 OF THE REVISED CODE OF OHIO. ALL SEED TEMPORARILY STORED ON THE JOB SHALL BE PROTECTED FROM DAMPNESS AT ALL TIMES.

### SEEDING

THE VARIETY OF SEED AND RATE OF APPLICATION SHALL BE AS SPECIFIED. UNLESS SPECIFIED OTHERWISE, THE TEMPORARY SEEDING OPERATION MAY BE PERFORMED AT ANY TIME DURING THE YEAR.

### DETAILS

NO SEEDBED PREPARATION IS REQUIRED AND NO MULCH IS REQUIRED.

SEEDING SHALL BE MADE BEFORE THE CLOSE OF EACH DAY'S WORK ON ALL AREAS AS SPECIFIED BY THE ENGINEER FOR TEMPORARY SEEDING. SEEDING AND FERTILIZER SHALL BE COVERED TO A DEPTH OF ONE (1) INCH. A DISK HARROW, OR OTHER SUITABLE EQUIPMENT AS APPROVED BY THE ENGINEER, SHALL BE USED TO COVER SEED AND FERTILIZER.

FERTILIZER SHALL BE UNIFORMLY APPLIED ON ALL AREAS TO BE SEEDING AT THE RATE OF 30 POUNDS PER ACRE OF NITROGEN; 30 POUNDS PER ACRE OF P205; AND 30 POUNDS PER ACRE OF K2O. (EXAMPLE: THIS SPECIFICATION CAN BE MET BY APPLYING FERTILIZER HAVING AN ANALYSIS OF 10-10-10 AT THE RATE OF 300 POUNDS PER ACRE.)

### TEMPORARY SEEDING SCHEDULE

DATES FROM TO (INCLUSIVE)	KIND OF SEED	RATE OF SEEDING BU./AC.	MINIMUM GERMINATION	MINIMUM PURITY
3/1 8/15	OATS*	3	80%	97.5%
8/16 11/1	RYE**	3	85%	97.0%

\* RYE GRASS MAY BE SUBSTITUTED FOR THIS TIME OF YEAR, IF OATS ARE IN SHORT SUPPLY.

\*\* RYE GRASS OR WINTER WHEAT MAY BE SUBSTITUTED FOR THIS TIME OF YEAR, IF RYE IS IN SHORT SUPPLY.

## 8.4 EROSION AND SEDIMENTATION CONTROL

THE CONTRACTOR SHALL PROVIDE LABOR AND MATERIAL REQUIRED TO PROTECT THOSE DISTURBED AREAS OF EXPOSED SOILS REQUIRING IMMEDIATE VEGETATIVE STABILIZATION (AS DETERMINED BY THE ENGINEER), SUCH AS THE WATERCOURSE CHANNELS AND OTHER EARTHEN STRUCTURES. THE METHOD OF PROTECTION SHALL BE DEPENDENT UPON THE TIME OF YEAR WHEN CONSTRUCTION OF THE ABOVE IS COMPLETED. DURING FAVORABLE PLANTING CONDITIONS, TEMPORARY SEEDING SHALL BE PLANTED IMMEDIATELY UPON COMPLETION OF CONSTRUCTION. DURING UNFAVORABLE PLANTING CONDITIONS, A PROTECTIVE LAYER OF STRAW OR HAY MULCH SHALL BE SPREAD OVER THE EXPOSED SUBSOILS WITH OVER SEEDING CONDUCTED LATER WHEN FAVORABLE GROWING CONDITIONS DEVELOP. EROSION CONTROL FABRIC CONSISTING OF KNITTED YARN CONSTRUCTION WITH INTERWOVEN STRIPS OF BIODEGRADABLE PAPER, SUCH AS HULL/GRO AS MANUFACTURED BY GULF STATES PAPER, TUSCALOOSA, ALABAMA, OR EQUAL, SHALL ALSO BE ACCEPTABLE.

ON LARGE AREAS OF DISTURBANCE NEAR WATERCOURSE, WHICH WILL BE DISTURBED IN EXCESS OF 30 DAYS THE CONTRACTOR SHALL PROVIDE A SEDIMENTATION TRAP BY INSTALLING A CONTINUOUS CUT-OFF WALL OF STRAW BALES BETWEEN THE CONSTRUCTION AREA AND CREEK. THE WIRE OR PLASTIC TIED STRAW BALES SHALL BE LAID ON THEIR SIDE, SET IN A TRENCH WITH A MINIMUM PROJECTION ABOVE THE GROUND SURFACE OF 10 INCHES, AND ANCHORED TO THE GROUND BY DRIVING TWO WOODEN OR METAL STAKES THROUGH EACH BALE. THE STRAW BALE WALL SHALL BE MAINTAINED UNTIL THE SITE SEEDING IS ESTABLISHED, AFTER WHICH SAID WALL SHALL BE REMOVED, THE TRENCH FILLED WITH TOPSOIL, AND THE STRAW AND SEDIMENT UTILIZED AS MULCHING AND FILL MATERIAL ON THE SITE.

## 8.5 RIPRAP

### DESCRIPTION

THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY FOR CONSTRUCTION AND PLACEMENT OF RIPRAP WITHIN THE LIMITS AND AT THE ELEVATION SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.

### MATERIAL

ALL RIPRAP STONE SHALL BE OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE UNDER ACTION OF AIR, WATER OR CONDITIONS TO BE MET IN HANDLING AND PLACING. THE MATERIAL SHALL BE HARD, DURABLE, CLEAN AND FREE FROM EARTH, CLAY, REFUSE, ADHERENT COATING AND OTHER FOREIGN MATTER. INDIVIDUAL STONES SHALL NOT EXCEED ONE MAN SIZE AND SHALL WEIGH BETWEEN TEN POUNDS AND THREE HUNDRED POUNDS.

### INSTALLATION

THE LOOSE ROCK RIPRAP SHALL BE PLACED BY SKIP, CLAMSHELL, BY HAND OR OTHER ACCEPTABLE METHOD AND ARRANGED, IF NECESSARY, BY HAND SO AS TO PROVIDE A DENSE COMPACT PAVING OF A MINIMUM THICKNESS OF TWELVE INCHES. THE SPACES BETWEEN THE LARGER STONES SHALL BE FILLED WITH SMALLER PIECES TO FORM A DENSE COMPACT ROCK BLANKET OF FAIRLY EVEN SURFACE. SOME HANDWORK WILL BE REQUIRED TO PROPERLY SEAT AND KEY THE ROCK TOGETHER, AND TO CHINK THE VOIDS LEFT AFTER THE ROUGH PLACEMENT. IF EXCESSIVE FINES EXIST IN THE ROCK AS DELIVERED, IT MUST BE DUMPED AND REMANDED TO REMOVE THE EXCESS THEREFROM. THE CONTRACTOR SHALL MAINTAIN THE SLOPE PAVING UNTIL ACCEPTED BY THE OWNER. ANY MATERIAL DISPLACED BY SLIPPAGE OR ANY OTHER CAUSE SHALL BE REPLACED TO THE LINES AND GRADES AS SHOWN OR AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.

## 8.6 SOILS COMPACTION

### STRUCTURAL FILL

SOIL UTILIZED FOR STRUCTURAL FILL WILL BE PLACED IN COMPACTED LIFTS NO GREATER THAN 12-INCHES IN THICKNESS. FILL WILL BE COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY DETERMINED BY THE STANDARD PROCTOR DENSITY TEST (ASTM-D968). THE SOIL WILL BE COMPACTED USING MACHINERY OF SUFFICIENT WEIGHT AND MECHANICAL CHARACTERISTICS TO PROVIDE THE COMPACTIVE EFFORT AND MANIPULATION NECESSARY. PENETRATING-FOOT COMPACTOR (CAT 815 OR EQUIVALENT) SHOULD BE USED AS COMPACTION MACHINERY SUBJECT TO THE APPROVAL OF THE ENGINEER.

### COHESIVE SOIL LINER $\Delta$

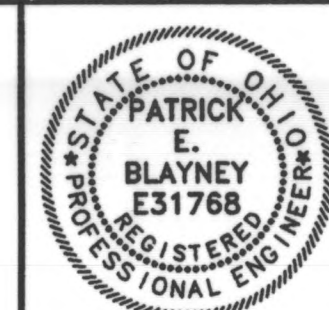
THE PRIMARY AND SECONDARY IRRIGATION IMPOUNDMENTS WILL BE EXCAVATED TO BOTTOM OF RECOMPACTED SOIL LINER GRADES. A 2 FOOT RECOMPACTED COHESIVE SOIL LINER WILL BE CONSTRUCTED FOR THE BOTTOM AND SIDE SLOPES OF BOTH THE PRIMARY AND SECONDARY IMPOUNDMENTS. ANY LIFT PENETRATIONS MADE INTO THE COHESIVE SOIL LINER SHALL BE BACKFILLED WITH BENTONITE / WATER MIXTURE.

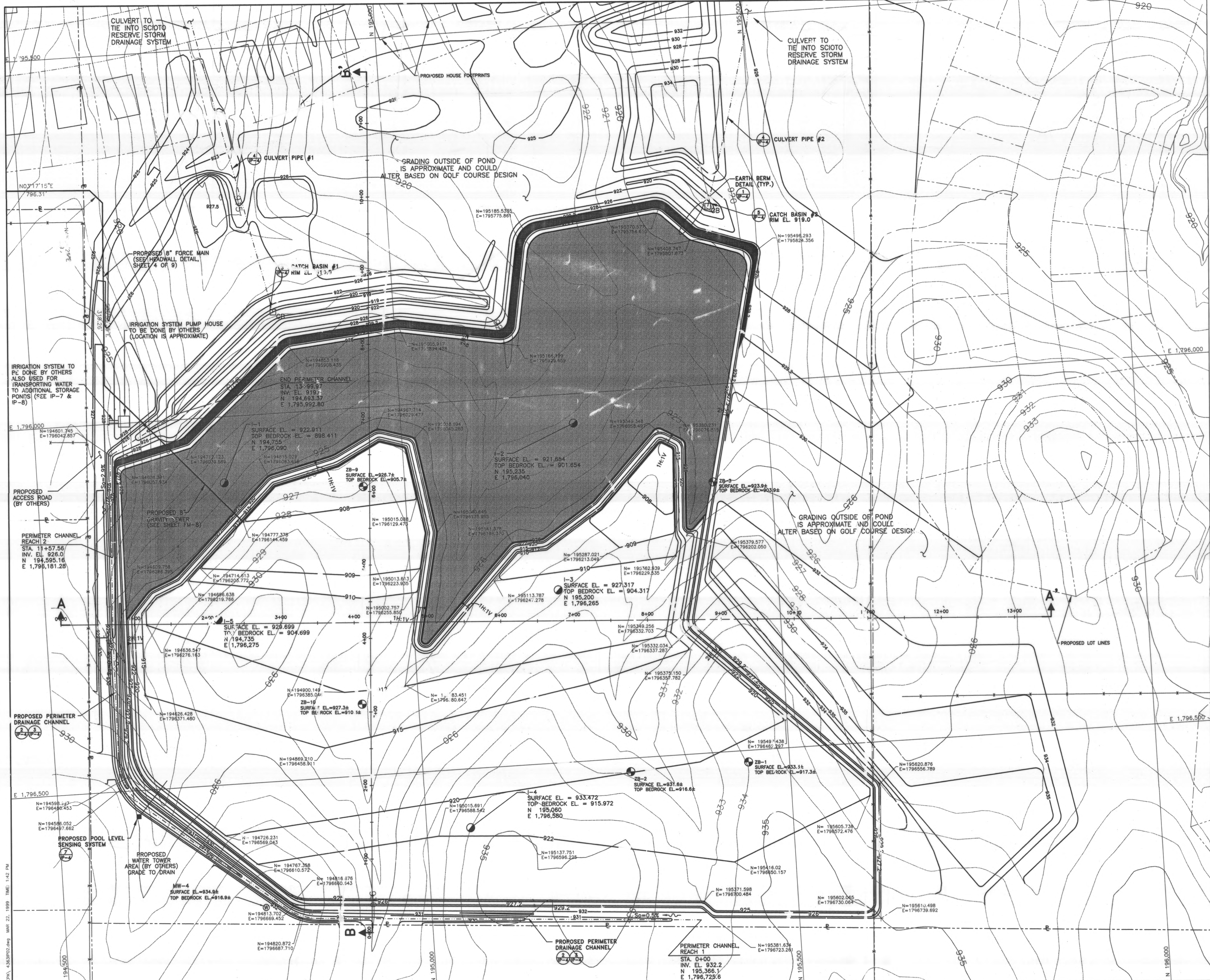
COHESIVE SOILS WILL BE PLACED IN NO GREATER THAN 6-INCH THICK COMPACTED LIFTS. FILL WILL BE COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY DETERMINED BY THE STANDARD PROCTOR DENSITY TEST (ASTM-D968). THE SOIL WILL BE COMPACTED USING MACHINERY OF SUFFICIENT WEIGHT AND MECHANICAL CHARACTERISTICS TO PROVIDE THE COMPACTIVE EFFORT AND MANIPULATION NECESSARY. PENETRATING-FOOT COMPACTOR (CAT 815 OR EQUIVALENT) SHOULD BE USED AS COMPACTION MACHINERY SUBJECT TO THE APPROVAL OF THE ENGINEER.

### GENERAL FILL

GENERAL FILL WILL BE PLACED IN 6-INCH THICK COMPACTED LIFTS. FILL WILL BE COMPACTED USING A PENETRATING FOOT COMPACTOR OR ENGINEER APPROVED EQUIVALENT.

DESIGNED BY:	TAM	REVISIONS
DRAWN BY:	MDK	DATE
CHECKED BY:	TAM	4-13-99 NOTE REVISED $\Delta$
APPROVED BY:	JFS	
DATE:	JANUARY 25, 1999	
JOB NO.	4363EN	





**LEGEND**

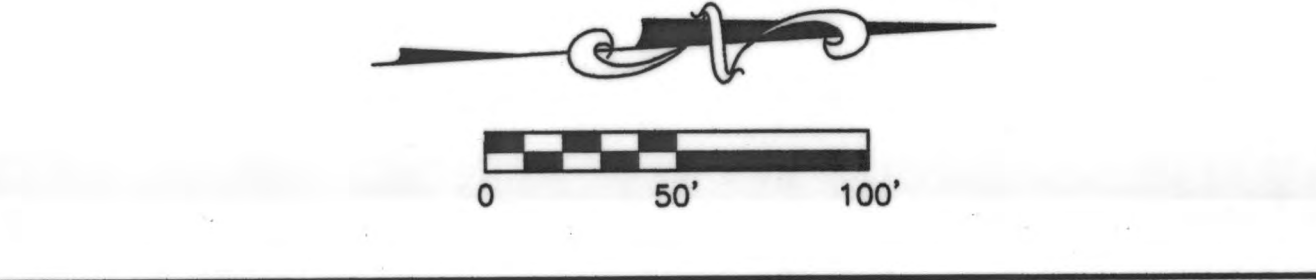
- PROPOSED FORCE MAIN
- - - PROPERTY LINE
- 960 EXISTING CONTOUR WITH ELEVATION
- 960 PROPOSED SLOPE INDICATOR
- 960 PROPOSED CONTOUR WITH ELEVATION
- 908.0 X MAXIMUM POOL ELEVATION
- PROPOSED SPOT ELEVATION
- PROPOSED DRAINAGE CHANNEL
- ZB-1 TEST BORING LOCATION
- I-2 TEST BORING LOCATION (NOT SURVEYED)
- WELL
- TOP OF BERM @ EL. 929.2
- AREA OF 926 PLATEAU

- NOTES:**
- TEST BORINGS ZB-1, ZB-2, ZB-3, ZB-9 AND ZB-10 WERE SURVEYED BY R.D. ZANDE & ASSOCIATES, INC. ON SEPTEMBER 22, 1998.
  - COORDINATE GRID SYSTEM DEPICTED ON THIS DRAWING REPRESENTS THE STATE PLANE COORDINATE GRID SYSTEM.
  - THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IF ANY SPRINGS OR SEEPS ARE ENCOUNTERED WITHIN THE SUBGRADE AREA.
  - BOUNDARY AND TOPOGRAPHIC MAPPING IS BASED ON THE DELAWARE COUNTY GIS MAPPING AND WAS FIELD VERIFIED BY GPS SURVEY, BY R.D. ZANDE & ASSOCIATES, INC. IN JULY AND AUGUST 1998. THE BEARINGS SHOWN ARE BASED ON THE GRID BEARING OF N 86°28'32" W BETWEEN DELAWARE COUNTY GIS MONUMENTS, DEL94 AND DEL89, DETERMINED BY A GPS NETWORK OF FIELD OBSERVATIONS PERFORMED IN JULY, 1998.
  - REFER TO SHEET IP-4 FOR SURFACE WATER CONTROL NOTES AND SURFACE WATER CONTROL DETAILS.
  - A POOL LEVEL SENSING SYSTEM WILL BE INSTALLED TO CONTINUOUSLY MONITOR THE WATER LEVEL IN THE IRRIGATION POND. THE SYSTEM WILL CONSIST OF A STILLING PIPE WITH AN ULTRASONIC LEVEL SENSOR AND TELEMETRY EQUIPMENT. WHEN THE POOL LEVEL RISES TO A DETERMINED SET POINT ELEVATION, A 4-20 mA SIGNAL IS TELEMETERED TO THE PUMP CONTROLS AT THE WASTEWATER TREATMENT PLANT. THIS SIGNAL WILL CAUSE THE PLANT INFLUENT AND EFFLUENT PUMPS TO SHUT DOWN AND SOUND AN ALARM AT BOTH THE TREATMENT PLANT AND GOLF COURSE CLUB HOUSE. GOLF COURSE PERSONNEL MUST THEN RESPOND BY TAKING MEASURES TO LOWER THE LEVEL IN THE IRRIGATION POND. WHEN THE POOL LEVEL HAS BEEN LOWERED TO A PRESET ELEVATION AS MEASURED BY THE ULTRASONIC LEVEL SENSOR, ANOTHER SIGNAL IS TELEMETERED TO THE WASTEWATER PLANT TO AUTOMATICALLY RESTART THE PUMPS.
  - CATCH BASINS AND CULVERTS ARE SHOWN FOR INFORMATION PURPOSES ONLY. CATCH BASINS AND CULVERTS SHOWN ON THIS PLAN SHEET ARE TO BE CONSTRUCTED BY THE GOLF COURSE CONTRACTOR.

**STAGE STORAGE**

ELEVATION (FT.)	AREA (ACRES)	ACCUMULATIVE DEPTH (FT.)	VOLUME (ACRES FT.)	CUMULATIVE (ACRES FT.)
908.0	0.37	1	0.7	0.7
909.0	1.04	2	1.2	1.9
910.0	1.44	4	4.6	6.5
912.0	3.16	7	11.3	17.8
915.0	4.35	12	28.3	46.1
920.0	6.97	14	15.7	61.8
922.0	8.70	17	28.7	90.5
925.0	10.43	18	10.5	101.0
926.0	10.55	18	0.0	101.0
926.0	15.28	19.2	18.5	119.6
927.2	15.67	21.2	31.5	151.1
929.2	15.83			

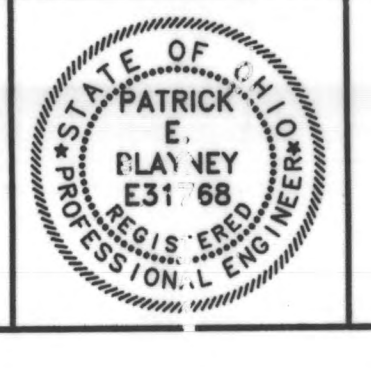
- \* REQUIRED STORAGE VOLUME = 166.0 ACFT.
- \* VOLUME ABOVE INSIDE EXISTING TOE = 49.9 ACFT. (BETWEEN 929.2 - 926.0)
- \* APPROXIMATE TOTAL EXCAVATION = 225,000 C.Y.
- \* APPROXIMATE AMOUNT OF MATERIAL NEEDED FOR COMPACTED EARTH BERMS AND PLATEAU = 35,000 C.Y.
- \* APPROXIMATE AMOUNT OF TOP SOIL EXCAVATED = 25,000 C.Y.
- \* APPROXIMATE AMOUNT OF TOP SOIL NEEDED = 13,500 C.Y.



**R.D. Zande & Associates**

DESIGNED BY:	TAM	REVISIONS	
DRAWN BY:	MDK	REMARKS	
CHECKED BY:	TAM		
APPROVED BY:	JFS		
DATE:	JANUARY 25, 1999		
JOB NO.	4363EN		

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER

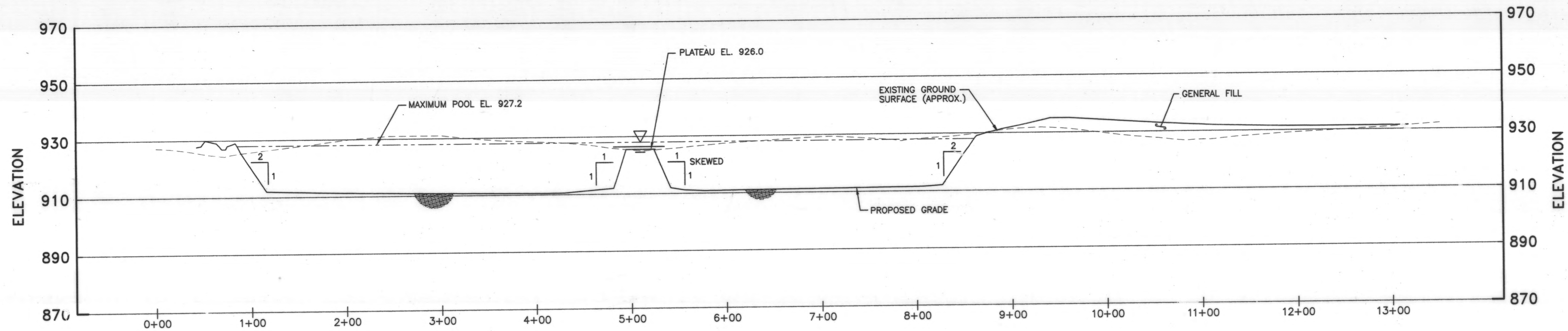


SCIOTO RESERVE  
IRRIGATION POND

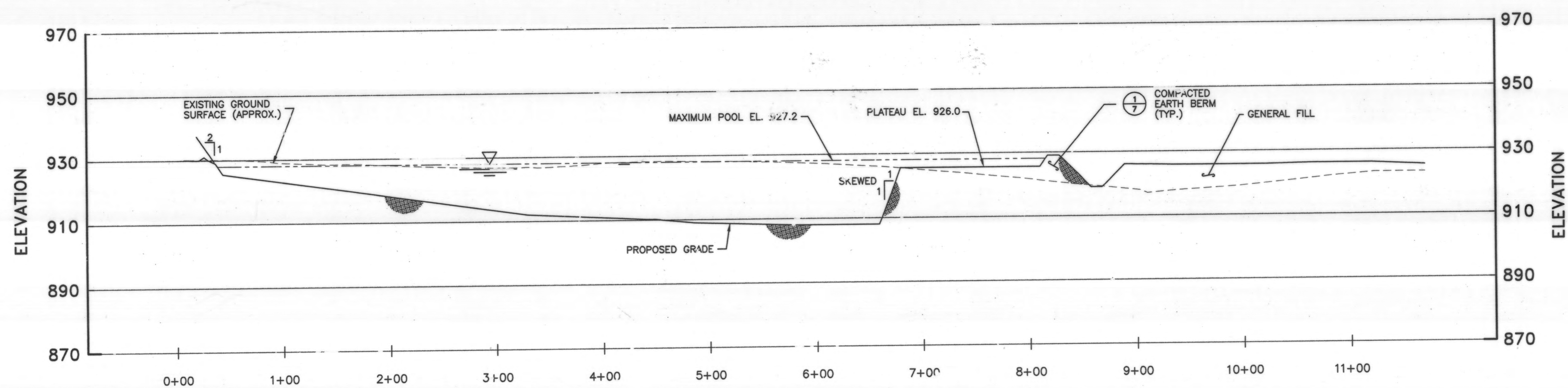
SCALE:  
1"=50'

IRRIGATION POND  
FINAL GRADE PLAN

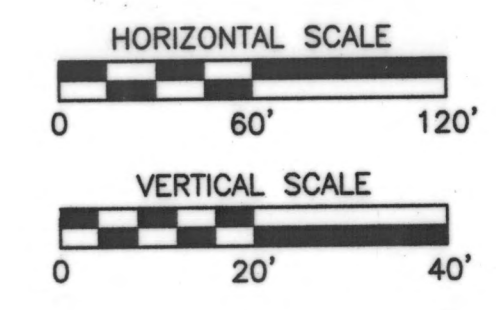
SHEET NO.  
IP-2



IRRIGATION POND CROSS SECTION A-A'  
(LOOKING WEST)



IRRIGATION POND CROSS SECTION B-B'  
(LOOKING SOUTH)

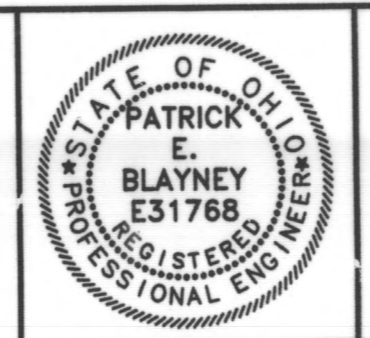


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**R.D.Zande & Associates**

DESIGNED BY:	TAM	REVISIONS
DRAWN BY:	MDK	DATE
CHECKED BY:	TAM	REMARKS
APPROVED BY:	JFS	
DATE:	JANUARY 25, 1999	
JOB NO.	4363EN	

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER

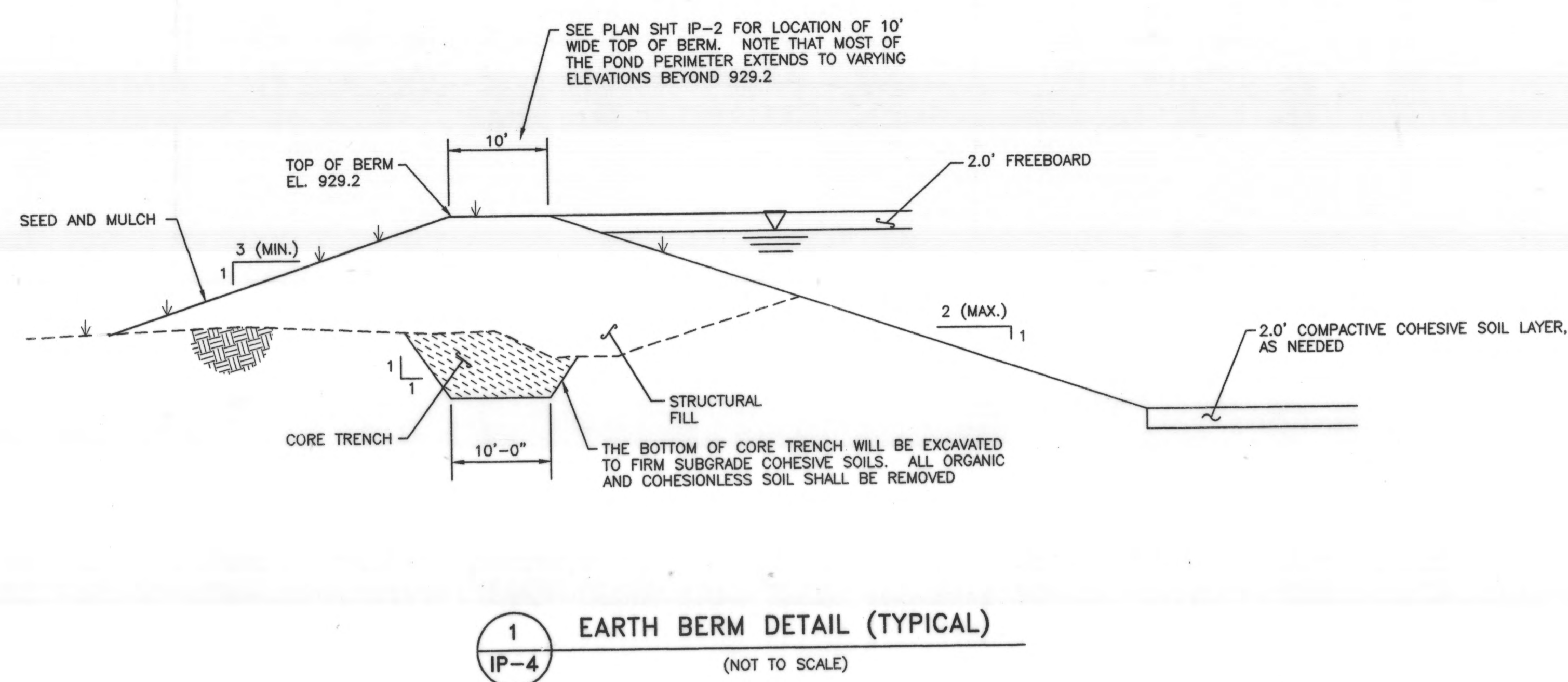


SCIOTO RESERVE  
IRRIGATION POND

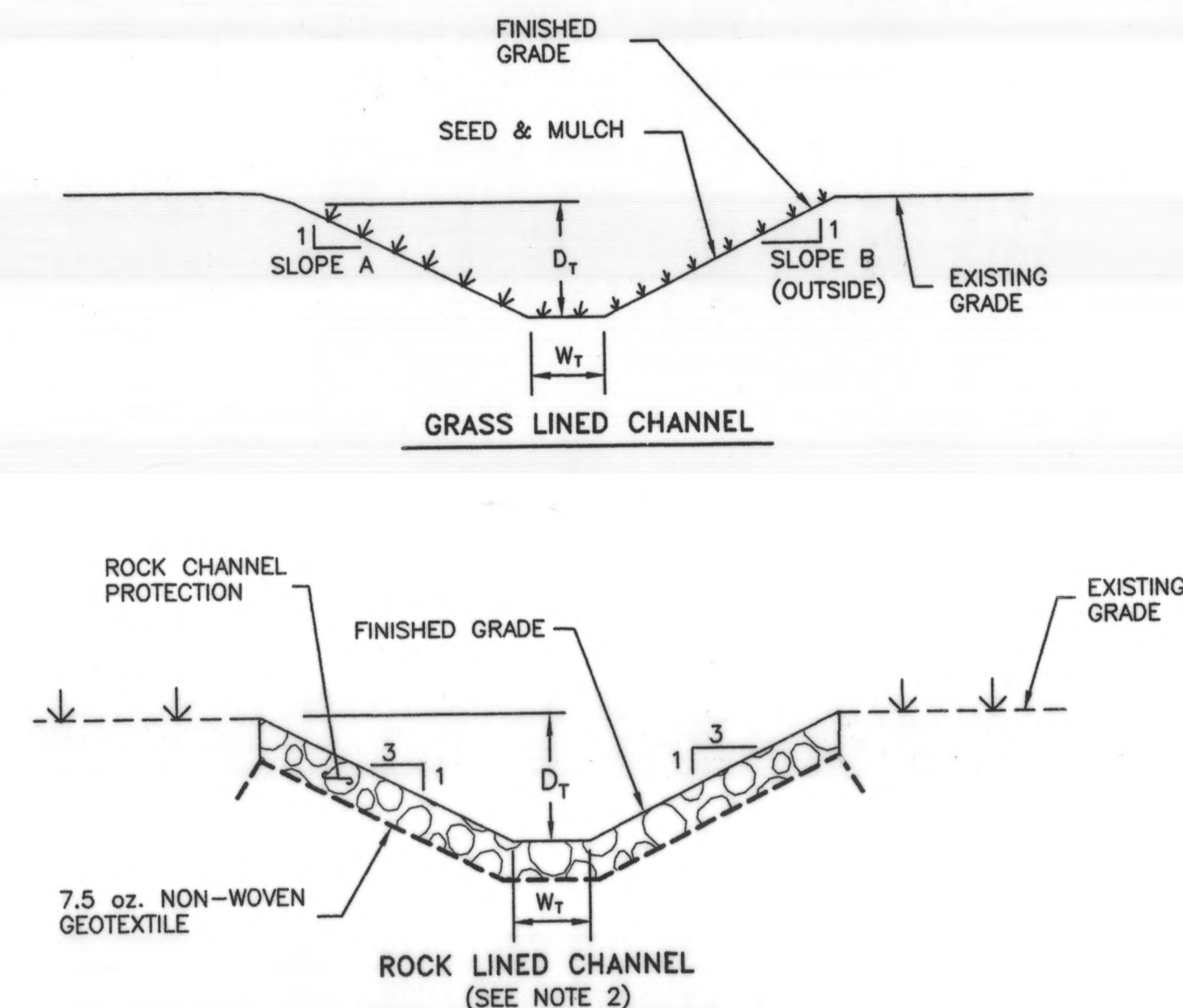
SCALE:  
HORZ. 1"=60'  
VERT. 1"=20'

IRRIGATION POND  
CROSS SECTIONS  
A-A' AND B-B'

SHEET NO.  
IP-3



1 EARTH BERM DETAIL (TYPICAL)  
IP-4 (NOT TO SCALE)



2 TYPICAL CHANNEL SECTIONS  
IP-4 (NOT TO SCALE)

- NOTES:
1. THE CONTRACTOR SHALL DETERMINE THE APPROPRIATE AMOUNT OF EXCAVATION REQUIRED TO INSTALL CHANNELS TO THE FINISHED GRADE. THE CONTRACTOR SHALL NOT BE PAID FOR OVEREXCAVATION OF THESE CHANNELS.
  2. ROCK CHANNEL PROTECTION SHALL BE ODOT TYPE "C" DUMPED ROCK FILL PLACED TO A MINIMUM LAYER THICKNESS OF 1.0 FOOT.
  3. ONE LAYER OF 7.5 OZ. PER S.Y. NON-WOVEN GEOTEXTILE SHALL BE INSTALLED BENEATH ROCK CHANNEL PROTECTION AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. A MINIMUM OF 12 INCHES GEOTEXTILE OVERLAP IS REQUIRED WHEN JOINING TWO SECTIONS OF MATERIAL.
  4. TEMPORARY SEDIMENT TRAPS WILL BE PLACED NEAR THE DOWNSTREAM END OF THE PROPOSED PERIMETER DRAINAGE CHANNEL AT 15 FOOT INTERVALS AND SHALL REMAIN IN PLACE UNTIL VEGETATIVE GROWTH IN THE GRASS LINED CHANNEL IS SUFFICIENT TO PERMIT THEIR REMOVAL. THE CONTRACTOR SHALL PLACE TEMPORARY SEDIMENT TRAPS AT OTHER LOCATIONS AS NEEDED.
  5. CATCH BASINS AND CULVERTS ARE SHOWN FOR INFORMATION PURPOSES ONLY. CATCH BASINS AND CULVERTS SHOWN ON THIS PLAN SHEET ARE TO BE CONSTRUCTED BY THE GOLF COURSE CONTRACTOR.
  6. THE PRIMARY AND SECONDARY IRRIGATION IMPOUNDMENTS WILL BE EXCAVATED TO BOTTOM OF RECOMPACTED SOIL LINER GRADES. A 2 FOOT RECOMPACTED COHESIVE SOIL LINER WILL BE CONSTRUCTED FOR THE BOTTOM AND SIDE SLOPES OF BOTH THE PRIMARY AND SECONDARY IMPOUNDMENTS. ANY LIFT PENETRATIONS MADE INTO THE COHESIVE SOIL LINER SHALL BE BACKFILLED WITH BENTONITE / WATER MIXTURE.

3 CHANNEL SCHEDULE  
IP-4

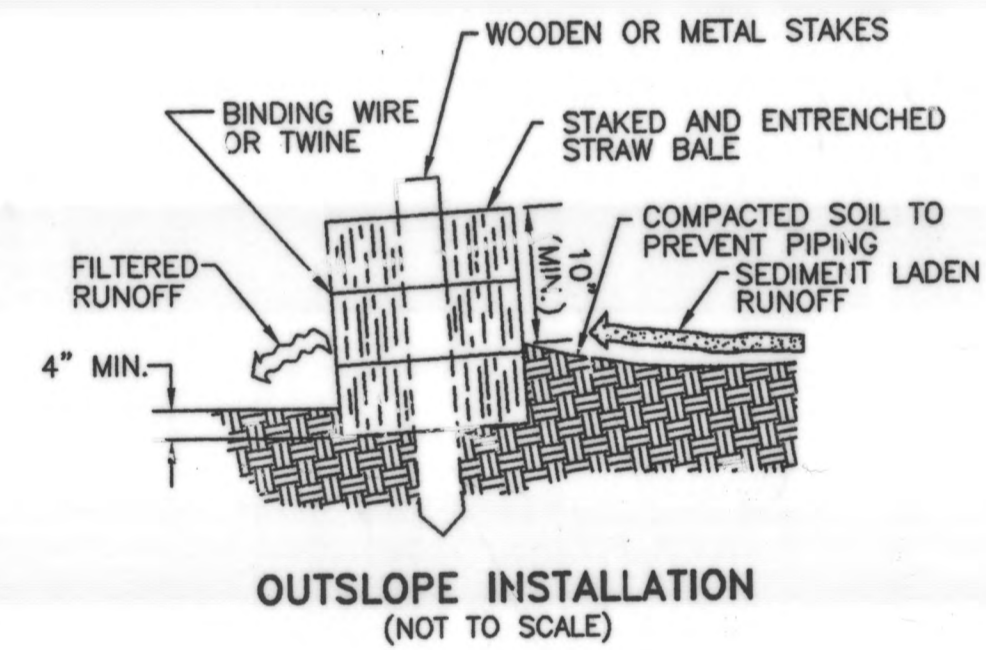
DRAINAGE CHANNEL	REACH	LENGTH (ft.)	SLOPE (ft./ft.)	SIDE SLOPE A	SIDE SLOPE B	BOTTOM WIDTH $W_b$ (ft.)	TOTAL DEPTH $D_t$ (ft.)	LINING
PERIMETER	1	1157	0.005	3	3	4	2.5	GRASS
	2	242	0.029	3	3	4	2.5	ROCK

4 CULVERT SCHEDULE  
IP-4

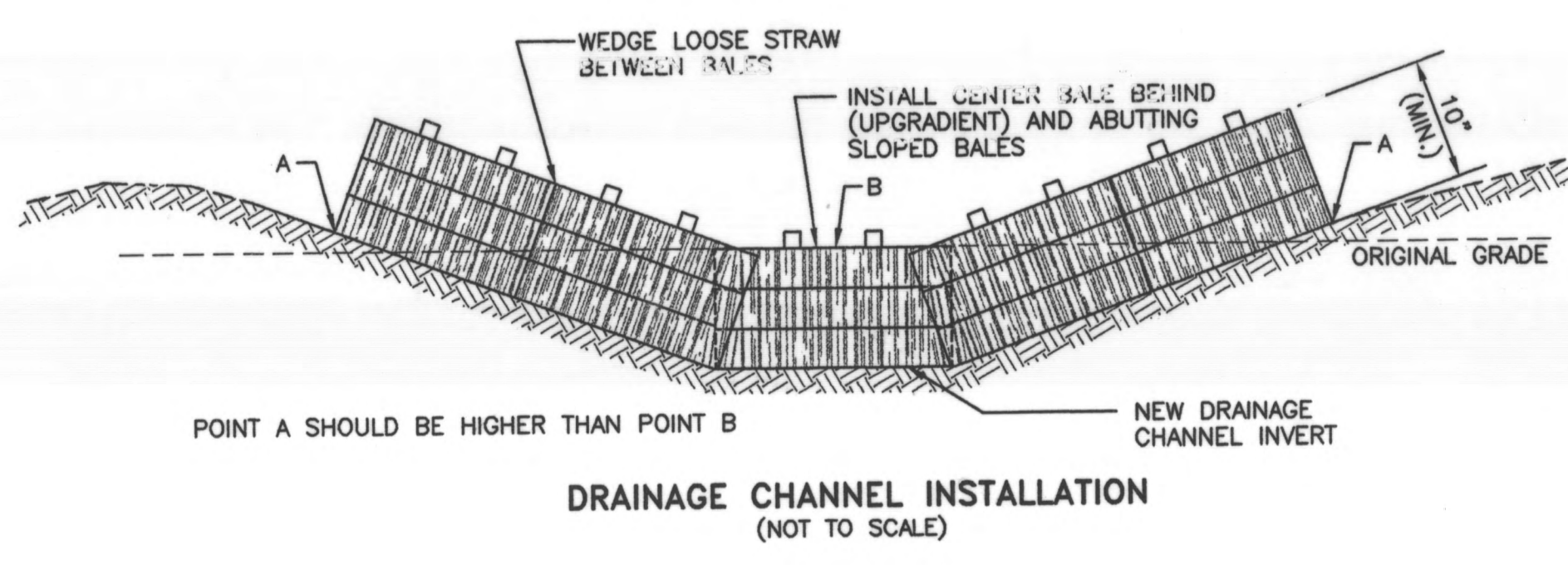
CULVERT	DIAMETER (IN)
PIPE 1	24"
PIPE 2	12"

5 CATCH BASIN SCHEDULE  
IP-4

CATCH BASIN	ODOT TYPE
CB #1	ODOT 2-3 CATCH BASIN
CB #2	ODOT 2-3 CATCH BASIN

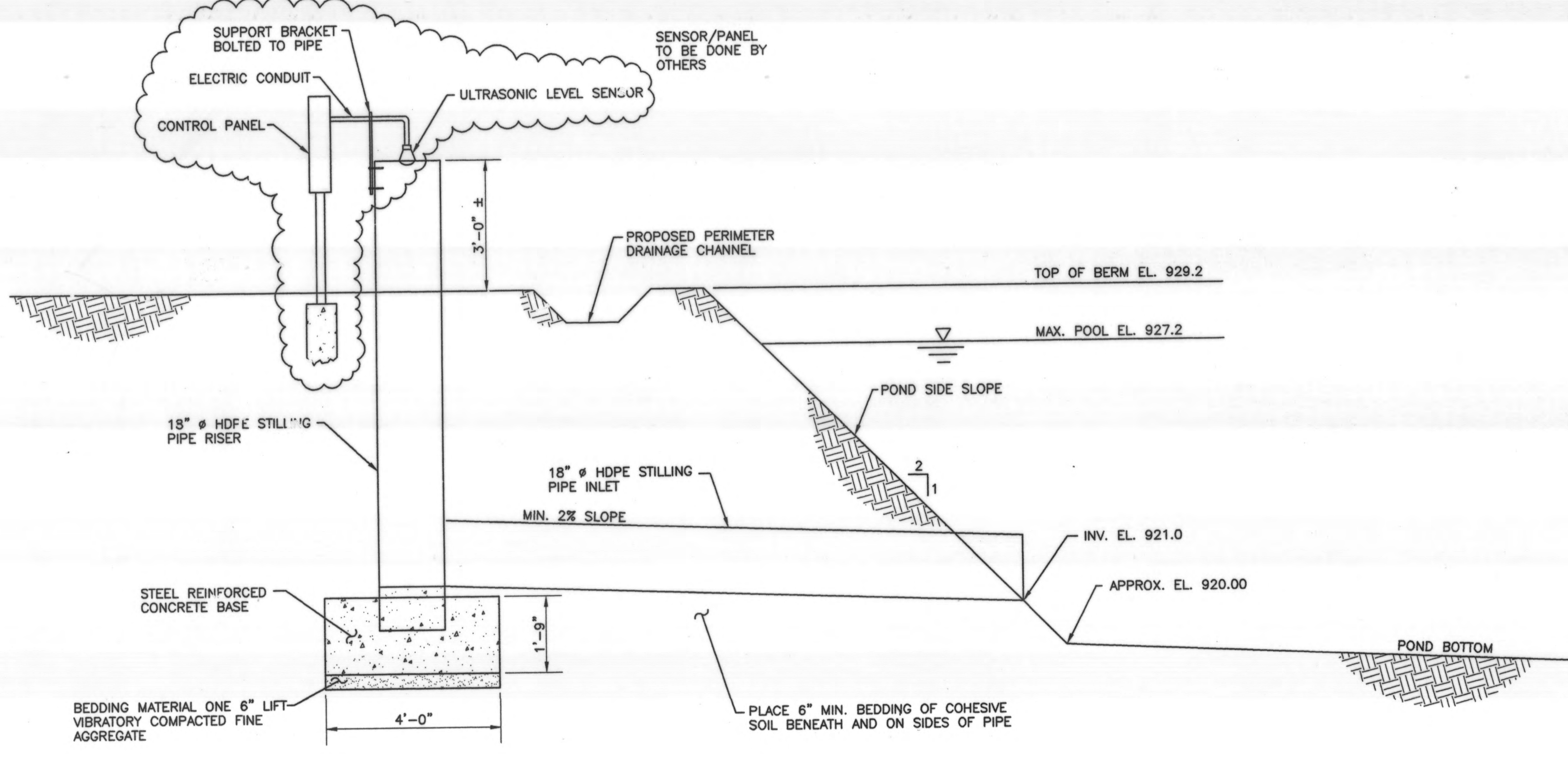


OUTSLOPE INSTALLATION (NOT TO SCALE)



DRAINAGE CHANNEL INSTALLATION (NOT TO SCALE)

6 SEDIMENTATION TRAP DETAILS (NOT TO SCALE)



7 POOL LEVEL SENSING SYSTEM DETAIL (NOT TO SCALE)

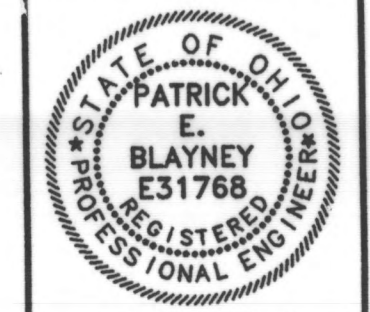
NOTE: CONCRETE TO BE POURED IN SUCH A MANNER TO INSURE THAT THE CONCRETE FILLS THE BOTTOM OF THE RISER TO THE INVERT OF THE INLET TO PREVENT THE RISER FROM BREAKING AWAY FROM BASE

P:\353\ENVIRON\POND\LEPA\_436304.dwg APR 13, 1999 TIME: 2:57 PM

R.D.Zande & Associates

DESIGNED BY:	TAM	REVISIONS
DRAWN BY:	MDK	DATE
CHECKED BY:	TAM	4.13.99
APPROVED BY:	JFS	NOTE REVISED
DATE:	JANUARY 25, 1999	
JOB NO.	4363EN	

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER



SCIOTO RESERVE  
IRRIGATION POND

SCALE:  
NOT TO SCALE

IRRIGATION POND  
BERM AND DRAINAGE DETAILS

SHEET NO.  
IP-4

FIELD BOREHOLE LOG										BOREHOLE NUMBER	
PROJECT NUMBER RD 4363 EN										FIELD BOOK NO. ZB-9	
PROJECT NAME SCIOTO RESERVE IRRIGATION POND										TOTAL DEPTH 30.0	
LOCATION NW CORNER OF HOME & STEETS ROADS, DELAWARE CO., OHIO DRILLING SURFACE ELEVATION 926.50										OF 1	
DRILLING COMPANY MICHIGAN DRILLING COMPANY, FT. STEARNS, OHIO SHEET										DATE COMPLETED 09/23/99	
RIS TYPE & NUMBER CENTRAL POND EQUIPMENT CREEPS										DATE COMPLETED 09/23/99	
DRILLING METHOD 4-1/4" I.D. x 10' I.D. ROCK CORING BIT										DATE COMPLETED 09/23/99	
WEATHER TO F, PARTLY SUNNY										DATE COMPLETED 09/23/99	
GEOLOGIST NATE HALL & CHRIS WURR										DATE COMPLETED 09/23/99	
DATE RECORDED 09/23/99										DATE COMPLETED 09/23/99	
LITHOLOGIC DESCRIPTION										LITHOLOGIC DESCRIPTION	
DEPTH	SOIL SAMPLES	DEPTH	SOIL SAMPLES	DEPTH	SOIL SAMPLES	DEPTH	SOIL SAMPLES	DEPTH	SOIL SAMPLES	DEPTH	SOIL SAMPLES
0.0	DT NA NA NA	0.0	DT NA NA NA	0.0	DT NA NA NA	0.0	DT NA NA NA	0.0	DT NA NA NA	0.0	DT NA NA NA
1.0	DT NA NA NA	1.0	DT NA NA NA	1.0	DT NA NA NA	1.0	DT NA NA NA	1.0	DT NA NA NA	1.0	DT NA NA NA
2.0	DT NA NA NA	2.0	DT NA NA NA	2.0	DT NA NA NA	2.0	DT NA NA NA	2.0	DT NA NA NA	2.0	DT NA NA NA
3.0	DT NA NA NA	3.0	DT NA NA NA	3.0	DT NA NA NA	3.0	DT NA NA NA	3.0	DT NA NA NA	3.0	DT NA NA NA
4.0	DT NA NA NA	4.0	DT NA NA NA	4.0	DT NA NA NA	4.0	DT NA NA NA	4.0	DT NA NA NA	4.0	DT NA NA NA
5.0	DT NA NA NA	5.0	DT NA NA NA	5.0	DT NA NA NA	5.0	DT NA NA NA	5.0	DT NA NA NA	5.0	DT NA NA NA
6.0	DT NA NA NA	6.0	DT NA NA NA	6.0	DT NA NA NA	6.0	DT NA NA NA	6.0	DT NA NA NA	6.0	DT NA NA NA
7.0	DT NA NA NA	7.0	DT NA NA NA	7.0	DT NA NA NA	7.0	DT NA NA NA	7.0	DT NA NA NA	7.0	DT NA NA NA
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30.0	DT NA NA NA	30.0	DT NA NA NA	30.0	DT NA NA NA	30.0	DT NA NA NA	30.0	DT NA NA NA	30.0	DT NA NA NA

TEST BORING LOG									
PROJECT NAME Proposed Scioto Reserve Development - Home Rd. & 257, Delaware Co., OH BORING NO. ZB-1									
CLIENT R.D. Zande & Associates, Inc. PROJ. NO. 7408-A DATE DRILLED 8-12-98									
GROUND WATER OBSERVATION									
4.5 FEET BELOW SURFACE AT COMPLETION									
FEET BELOW SURFACE AT 24 HOURS									
FEET BELOW SURFACE AT _____ HOURS									
LOCATION OF BORING Proposed Detention Pond									
DEPTH	Sample Depth From To	Type of Sample	Blows per 6" on Sampler From To	Moisture Density or Consist.	Soils* Change Depth	SOIL IDENTIFICATION			
0.0-2.0	D 2 3 4		6			TOPSOIL			
2.0-4.0	D 5 7 9		9	Moist		Brown CLAY-SILT, Little F-C Sand, Trace Gravel (Glacial TILL)			
4.0-6.0	D 7 8 6		7	Moist					
6.0-8.0	D 5 7 8		8	Moist					
8.0-10.0	U					SHELBY TUBE SAMPLE FROM 8.0'-10.0'			
10.0-12.0	D 11 12 15		15	Moist					
12.0-14.0	U					SHELBY TUBE SAMPLE FROM 12.0'-14.0'			
14.0-16.0	D 6 7 7		7	Moist to Wet		Gray CLAY-SILT, Some F-C Sand, Little Gravel (Glacial TILL)			
16.0-18.0	D 6 7 10		10	Wet		Water Seepage at 15.0'			
						Black SHALE			
						BOTTOM OF BORING: 18.0'			

TEST BORING LOG									
PROJECT NAME Proposed Scioto Reserve Development - Home Rd. & 257, Delaware Co., OH BORING NO. ZB-2									
CLIENT R.D. Zande & Associates, Inc. PROJ. NO. 7408-A DATE DRILLED 8-12-98									
GROUND WATER OBSERVATION									
12.8 FEET BELOW SURFACE AT COMPLETION									
FEET BELOW SURFACE AT 24 HOURS									
FEET BELOW SURFACE AT _____ HOURS									
LOCATION OF BORING Proposed Detention Pond									
DEPTH	Sample Depth From To	Type of Sample	Blows per 6" on Sampler From To	Moisture Density or Consist.	Soils* Change Depth	SOIL IDENTIFICATION			
0.0-2.0	D 3 4 5		6			TOPSOIL			
2.0-4.0	D 8 8 9		9	Moist		Brown CLAY-SILT, Little F-C Sand, Trace Gravel (Glacial TILL) with Sand and Gravel Layers and Cobbles			
4.0-6.0	D 6 6 6		6	Moist					
6.0-8.0	D 4 5 5		6	Moist					
8.0-10.0	U					SHELBY TUBE SAMPLE FROM 8.0'-10.0'			
10.0-12.0	D 8 8 9		9	Moist		Gray CLAY-SILT, Some F-C Sand, Little Gravel (Glacial TILL)			
12.0-14.0	D 8 7 7		10	Moist					
14.0-16.0	U					SHELBY TUBE SAMPLE FROM 14.0'-16.0'			
						Water Seepage at 15.0'			
						Black SHALE			
						BOTTOM OF BORING: 16.0'			

FIELD BOREHOLE LOG										BOREHOLE NUMBER	
PROJECT NUMBER RD 4363 EN										FIELD BOOK NO. ZB-10	
PROJECT NAME SCIOTO RESERVE IRRIGATION POND										TOTAL DEPTH 26.0	
LOCATION NW CORNER OF HOME & STEETS ROADS, DELAWARE CO., OHIO DRILLING SURFACE ELEVATION 926.50										OF 1	
DRILLING COMPANY MICHIGAN DRILLING COMPANY, FT. STEARNS, OHIO SHEET										DATE COMPLETED 09/23/99	
RIS TYPE & NUMBER CENTRAL POND EQUIPMENT CREEPS										DATE COMPLETED 09/23/99	
DRILLING METHOD 4-1/4" I.D. x 10' I.D. ROCK CORING BIT										DATE COMPLETED 09/23/99	
WEATHER TO F, PARTLY SUNNY										DATE COMPLETED 09/23/99	
GEOLOGIST NATE HALL & CHRIS WURR										DATE COMPLETED 09/23/99	
DATE RECORDED 09/23/99										DATE COMPLETED 09/23/99	
LITHOLOGIC DESCRIPTION										LITHOLOGIC DESCRIPTION	
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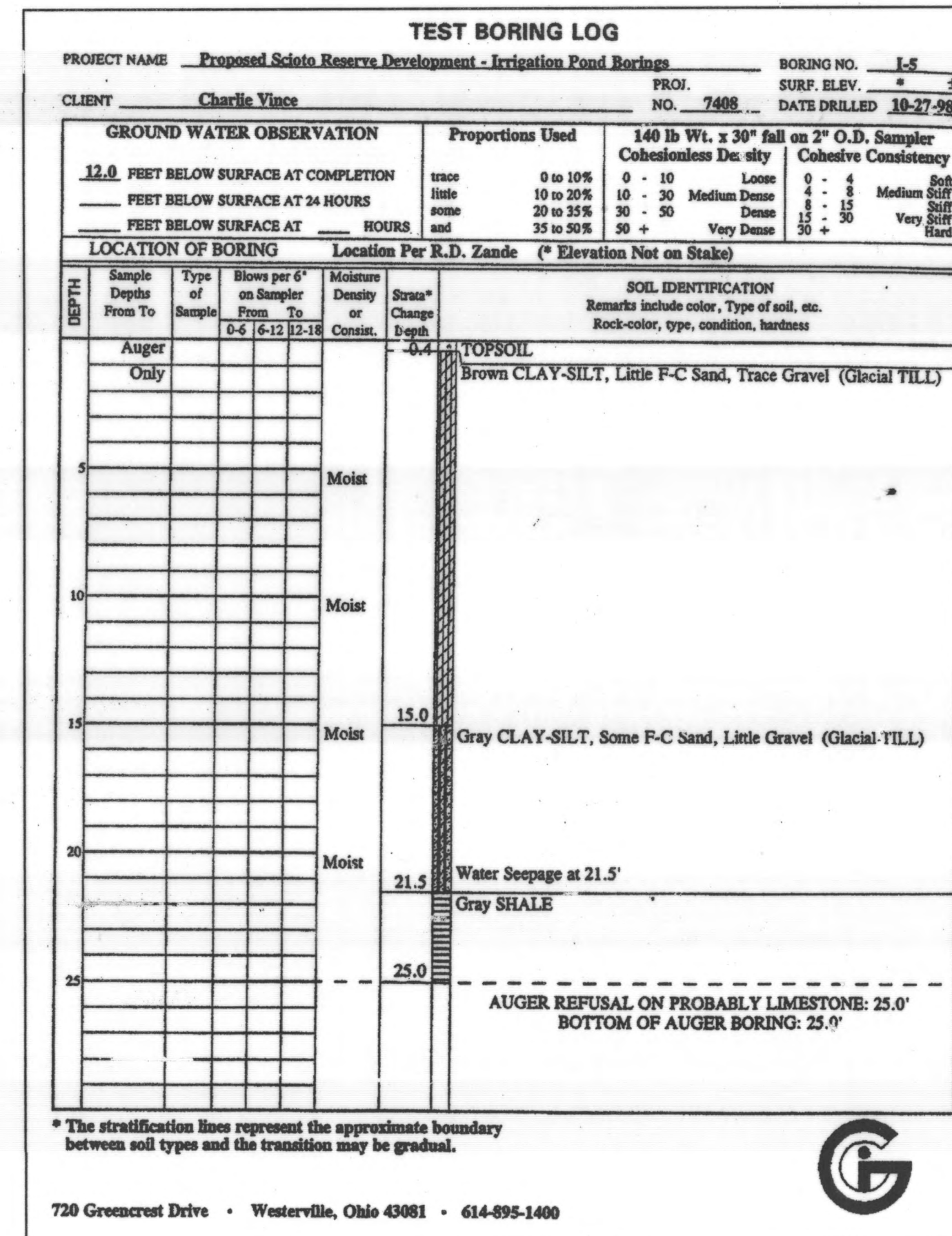
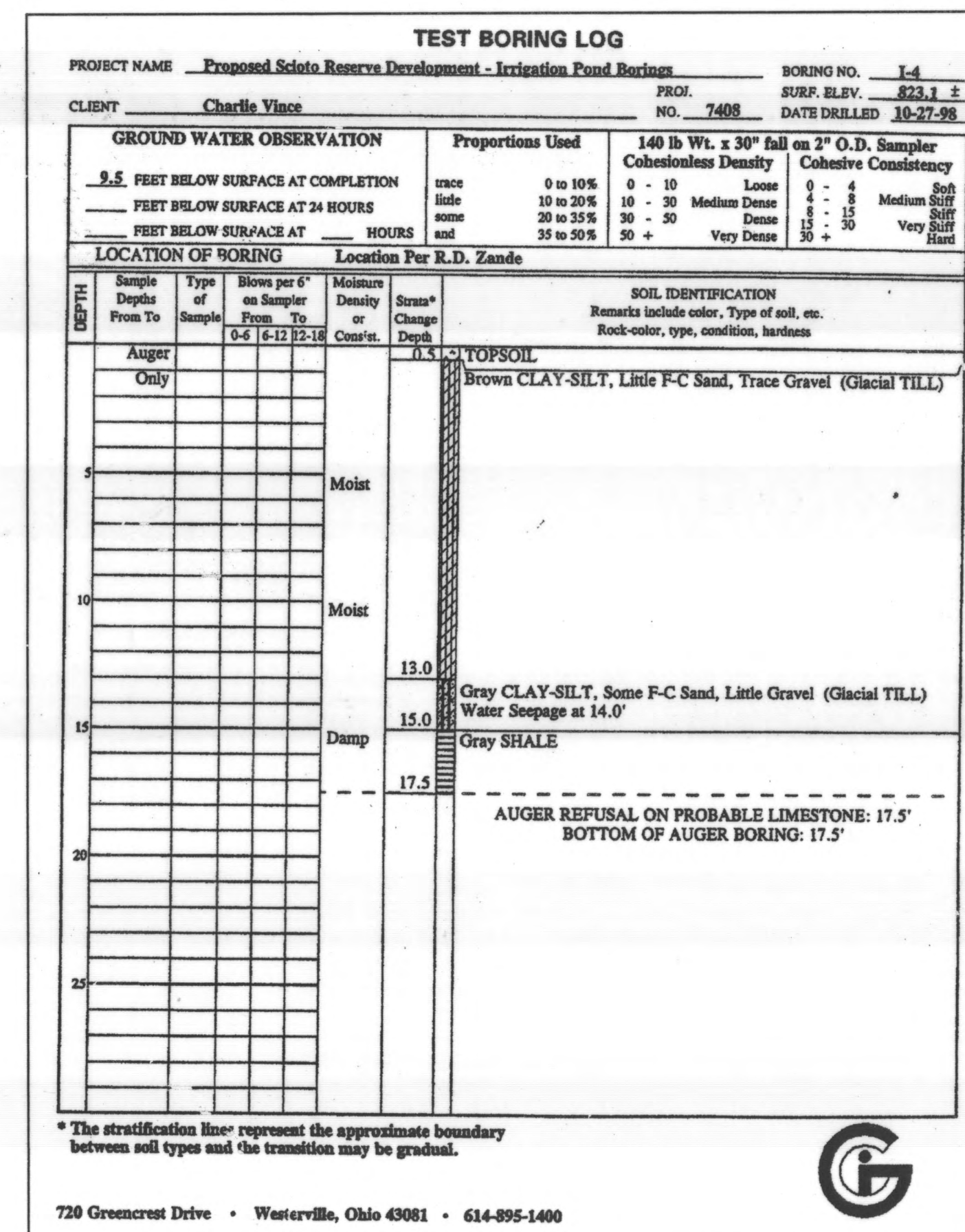
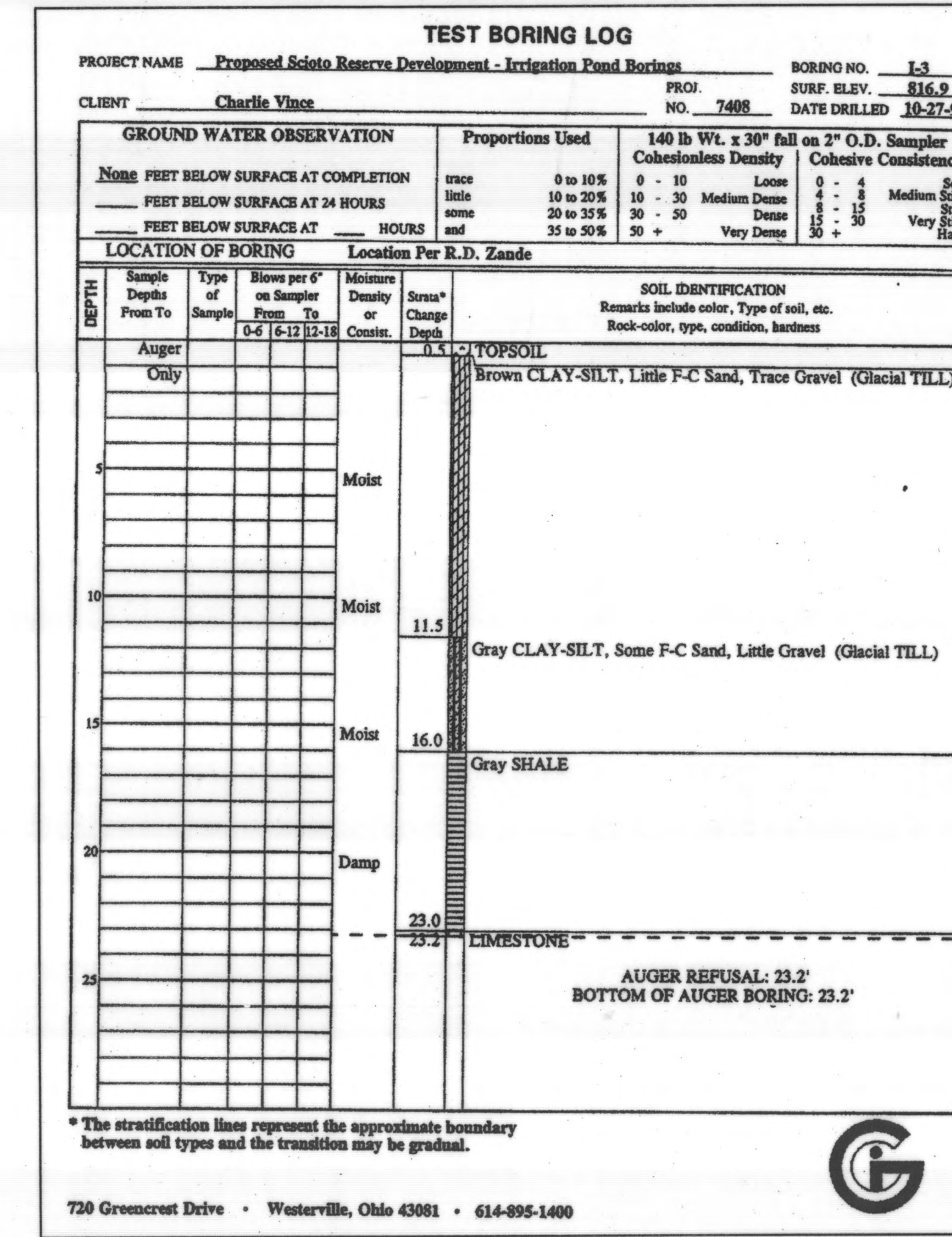
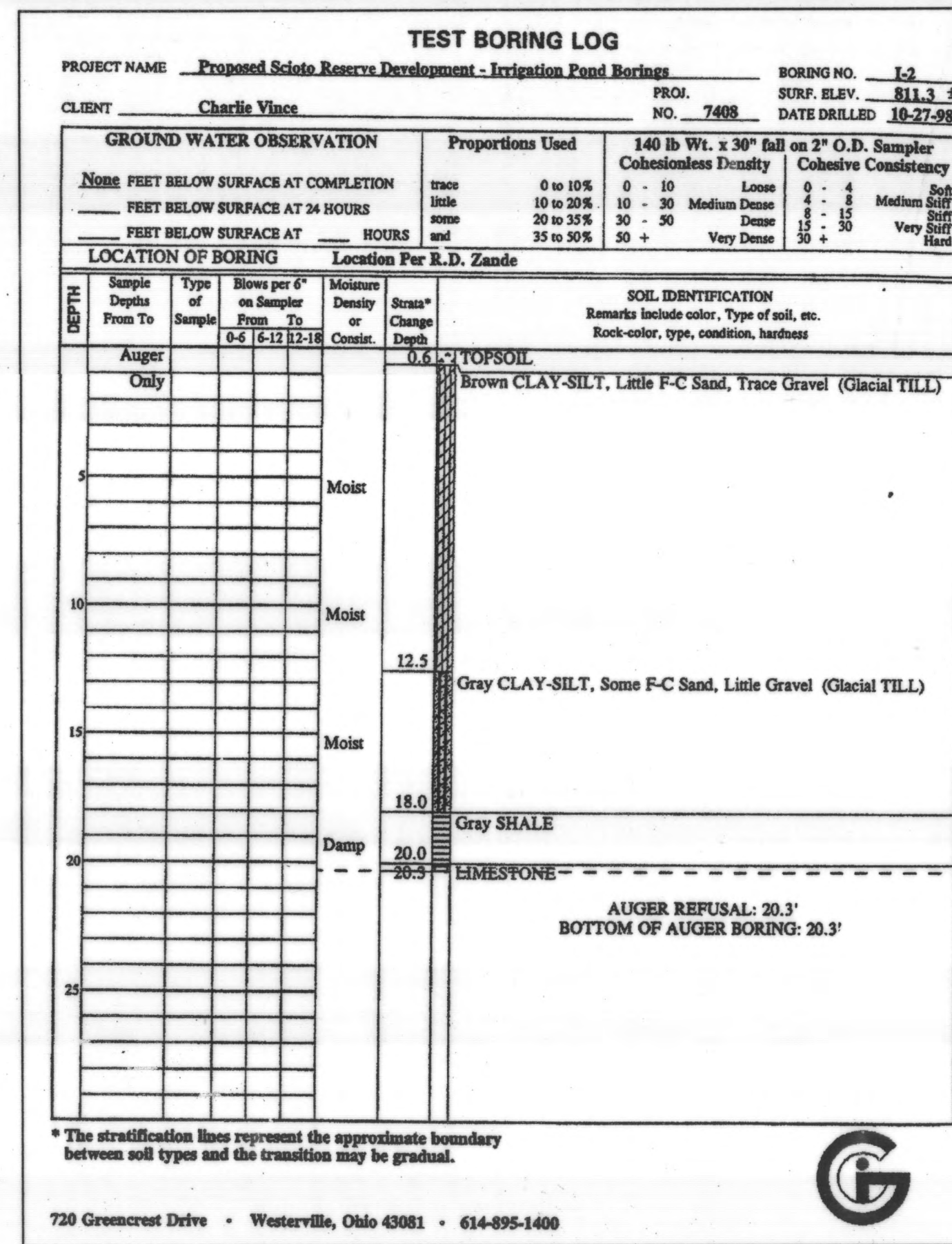
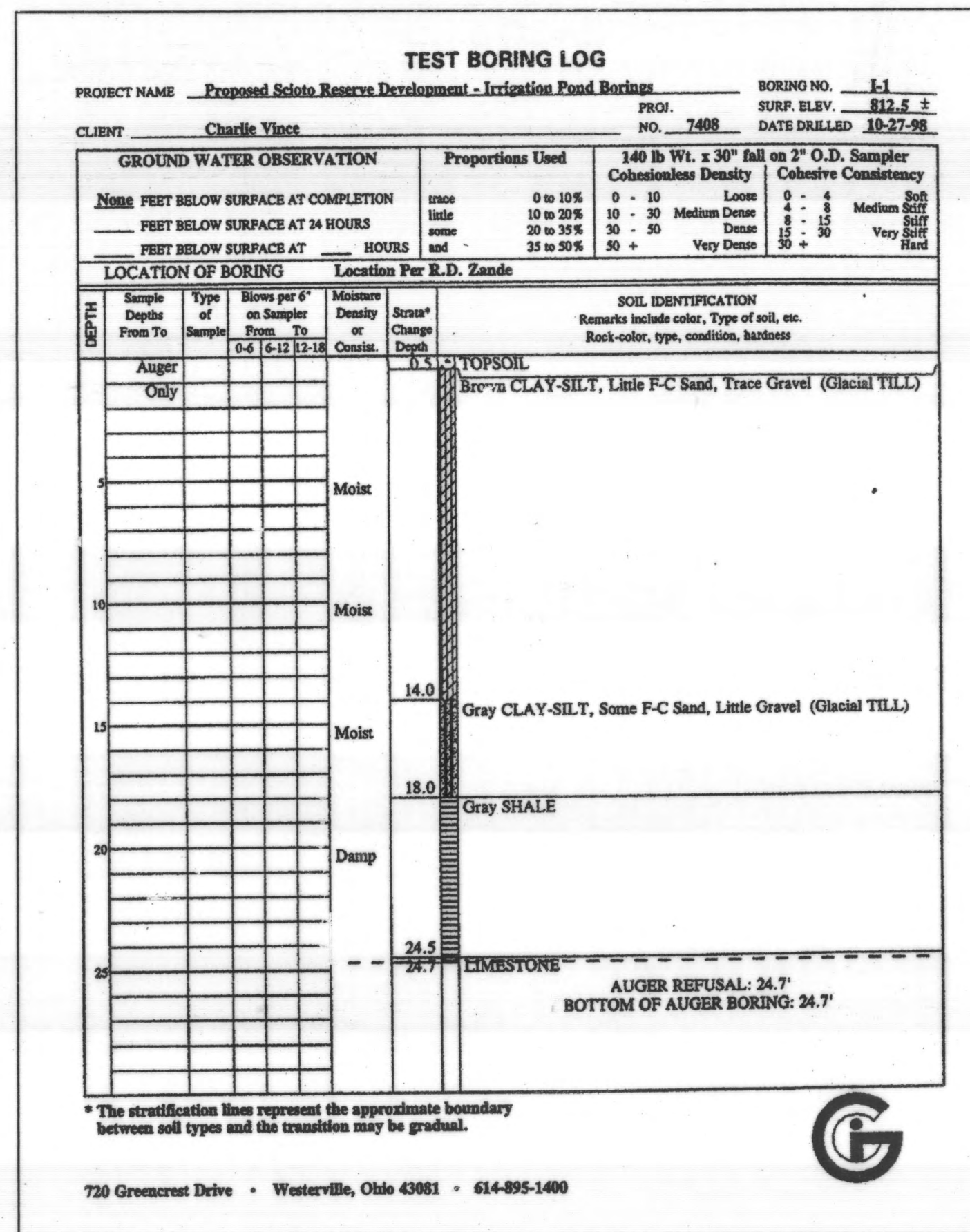
Proportions Used					
trace	0 to 10%	0 - 10	Loose	0 - 4	Soft
little	10 to 25%	10 - 30	Medium Dense	4 - 8	Medium Stiff
some	25 to 50%	30 - 50	Dense	8 - 15	Stiff
and	50 to 75%	50 +	Very Dense	15 - 30	Very Stiff
	75 to 90%	50 +		30 +	Hard

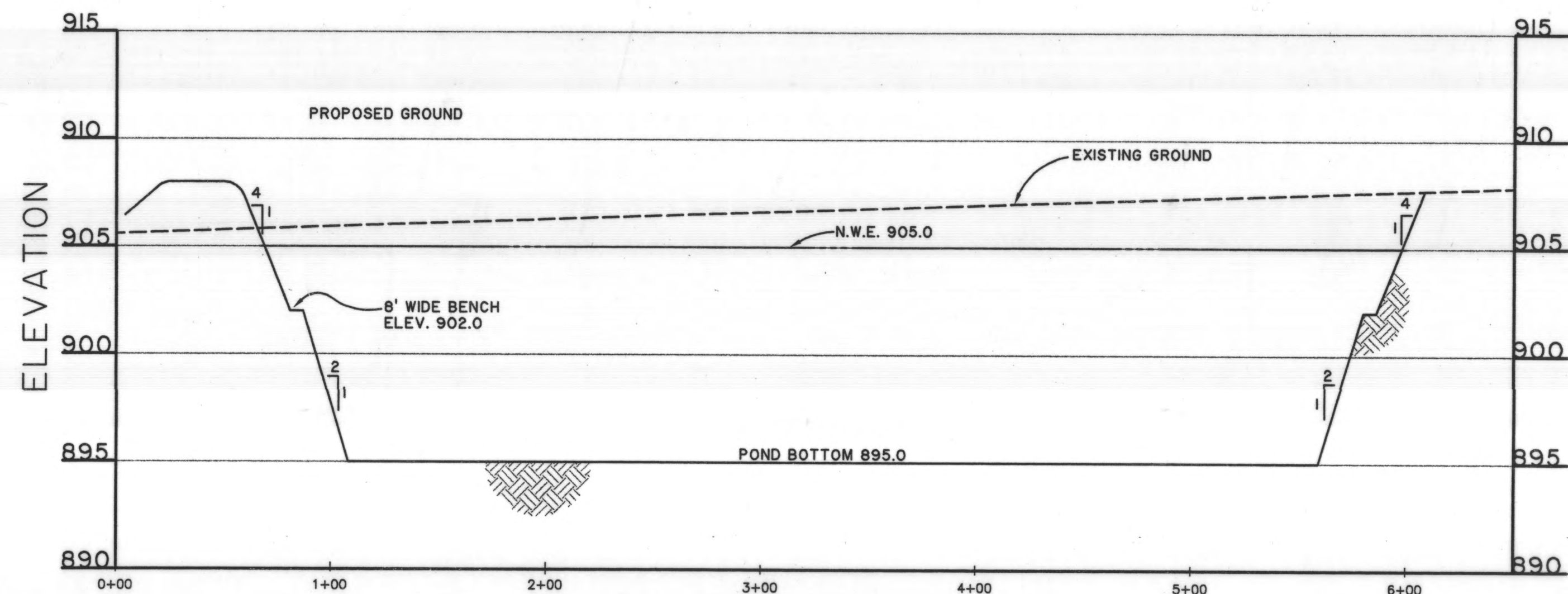
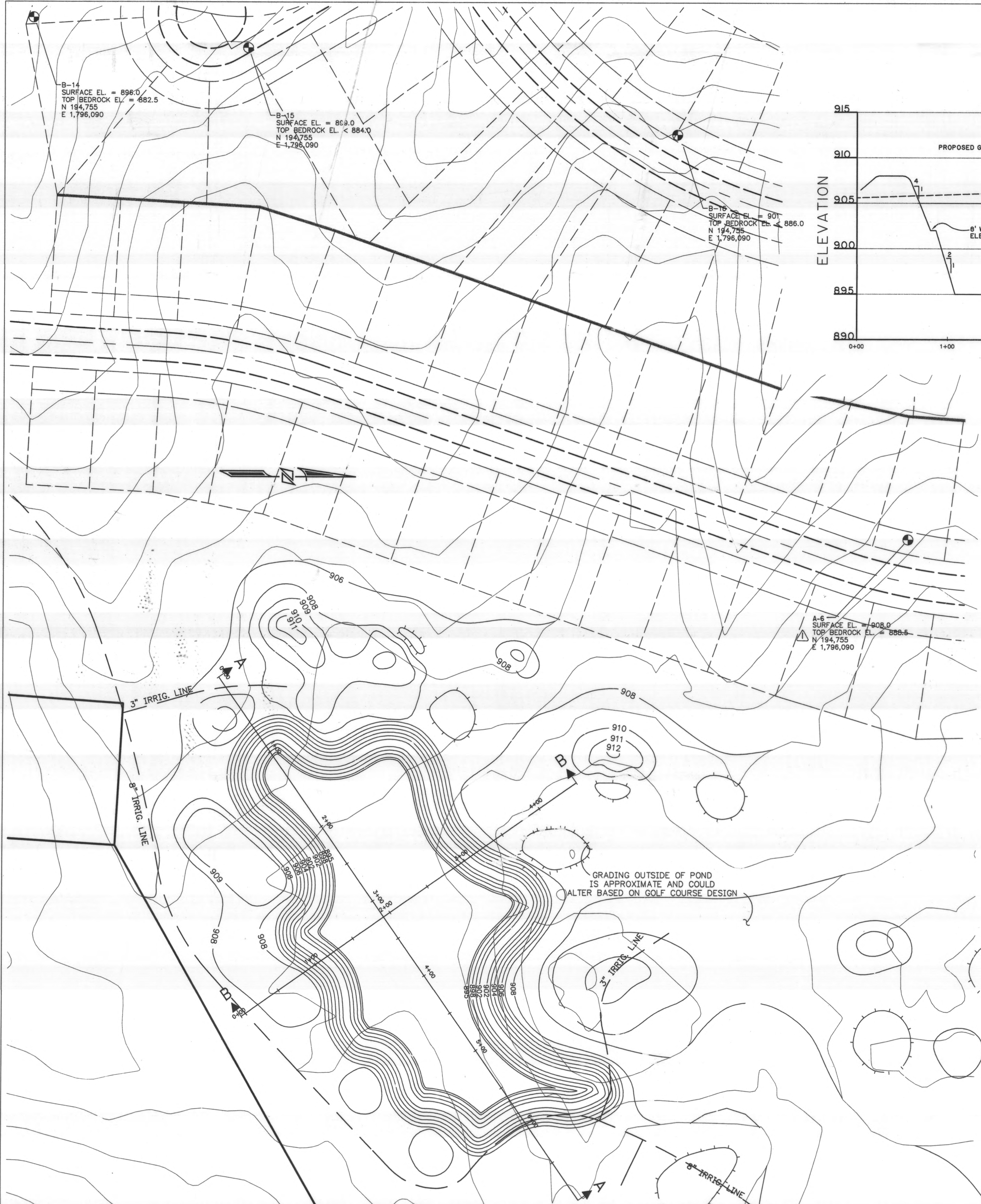
$$RQD = \frac{\sum \text{LENGTHS OF INTACT PIECES OF CORE} > 100\text{mm}}{\text{LENGTH OF CORE ADVANCE}}$$

ROCK QUALITY DESIGNATION	
RQD	ROCK DESCRIPTION
< 0.25	VERY POOR
0.25 - 0.50	POOR
0.50 - 0.75	FAIR
0.75 - 0.90	GOOD
> 0.90	EXCELLENT

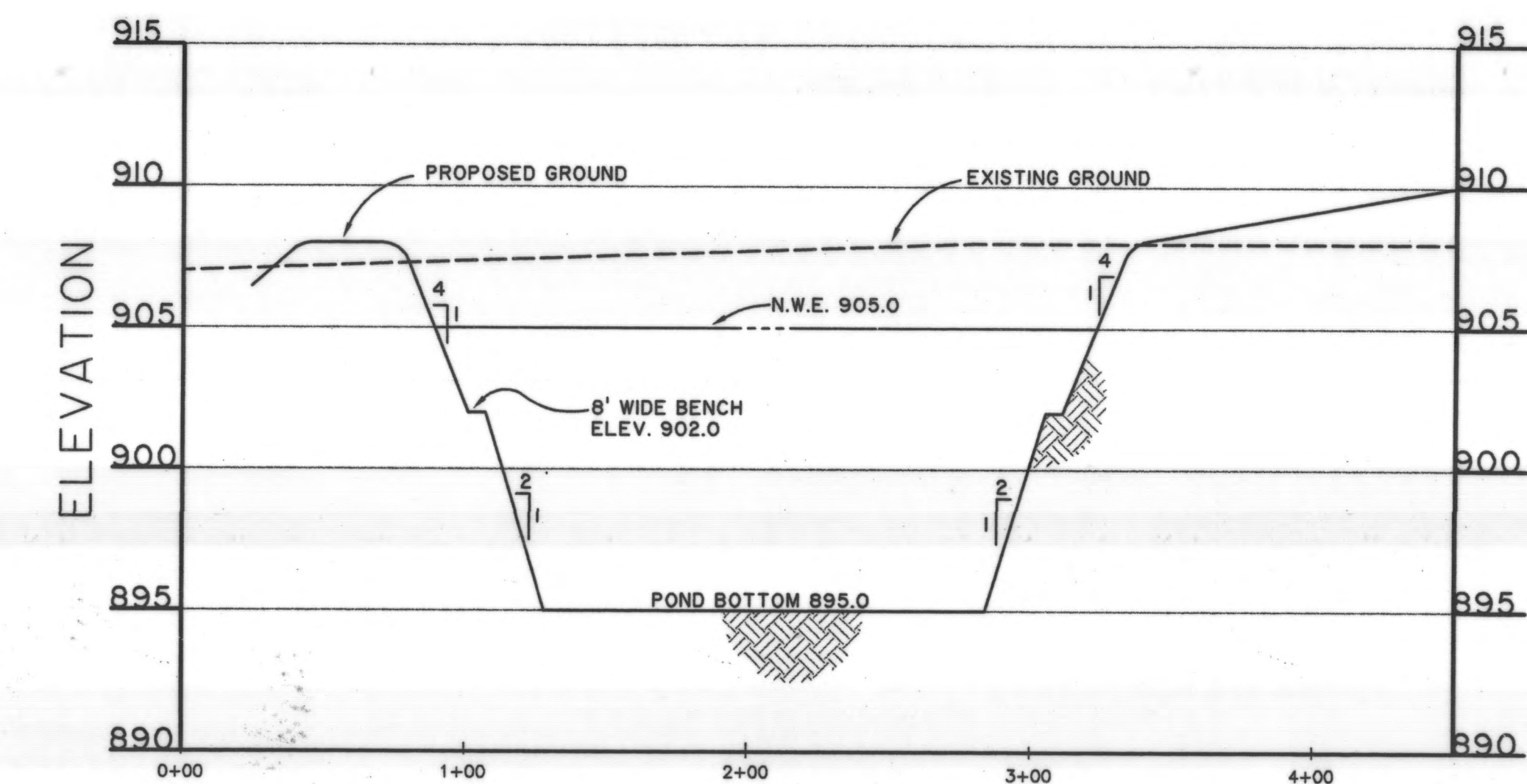
ROCK DESCRIPTIVE TERMS		
JOINT SPACING	BEDDING THICKNESS	JOINT SPACING
VERY CLOSE	VERY THIN	< 2"
CLOSE	THIN	2" - 1'
MODERATELY CLOSE	MEDIUM	1' - 3'
WIDE	THICK	3' - 10'
VERY WIDE	VERY THICK	> 10'

TEST BORING LOG									
PROJECT NAME Proposed Scioto Reserve Development - Home Rd. & 257, Delaware Co., OH BORING NO. ZB-3									
CLIENT R.D. Zande & Associates, Inc. PROJ. NO. 7408-A DATE DRILLED 8-12-98									
GROUND WATER OBSERVATION									
None FEET BELOW SURFACE AT COMPLETION									
FEET BELOW SURFACE AT 24 HOURS									
FEET BELOW SURFACE AT _____ HOURS									
LOCATION OF BORING Proposed Detention Pond									
DEPTH	Sample Depth From To	Type of Sample	Blows per 6" on Sampler From To	Moisture Density or Consist.	Soils* Change Depth	SOIL IDENTIFICATION			





POND CROSS SECTION A-A  
(LOOKING NORTHWEST)



POND CROSS SECTION B-B  
(LOOKING NORTHWEST)

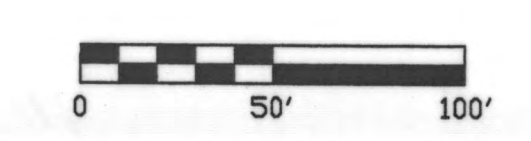
LEGEND

- PROPOSED FORCE MAIN
- PROPERTY LINE
- EXISTING CONTOUR WITH ELEVATION
- PROPOSED SLOPE INDICATOR
- PROPOSED CONTOUR WITH ELEVATION
- MAXIMUM POOL ELEVATION
- PROPOSED SPOT ELEVATION

- NOTES:
1. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IF ANY SPRINGS OR SEEPS ARE ENCOUNTERED WITHIN THE SUBGRADE AREA.
  2. BOUNDARY AND TOPOGRAPHIC MAPPING IS BASED ON THE DELAWARE COUNTY GIS MAPPING AND WAS FIELD VERIFIED BY GPS SURVEY, BY R.D. ZANDE & ASSOCIATES, INC., IN JULY AND AUGUST 1998. THE BEARINGS SHOWN ARE BASED ON THE GRID BEARING OF N 86°28'32" W BETWEEN DELAWARE COUNTY GIS MONUMENTS DEL94 AND DEL88 DETERMINED BY A GPS NETWORK OF FIELD OBSERVATIONS PERFORMED IN JULY, 1998.

STAGE STORAGE (HOLE 9)

ELEVATION (FT.)	AREA (SQ. FT.)	ACCUMULATIVE DEPTH (FT.)	VOLUME (CU. FT.)	CUMULATIVE (ACRES FT.)
895.0	51900	7	460600	10.57
902.0	79700	8	82625	12.17
903.0	85550	9	88525	14.50
904.0	91500	10	94550	16.67
905.0	97600	11	100800	18.99
906.0	104000	12	107000	21.44
907.0	110000			

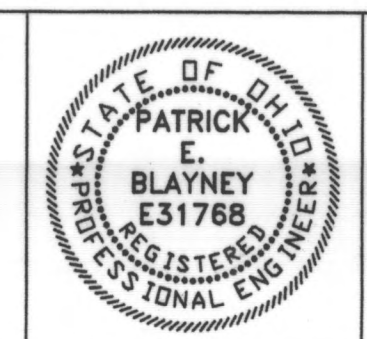


**R.D. Zande & Associates**

DESIGNED BY: xxx  
 DRAWN BY: xxx  
 CHECKED BY: xxx  
 APPROVED BY: xxx  
 DATE: JANUARY 25, 1999  
 JOB NO. 4363EN

REVISIONS	DATE	REMARKS
	4/9/99	REVISE BORE LABEL

DELAWARE COUNTY  
 DELAWARE COUNTY SANITARY ENGINEER



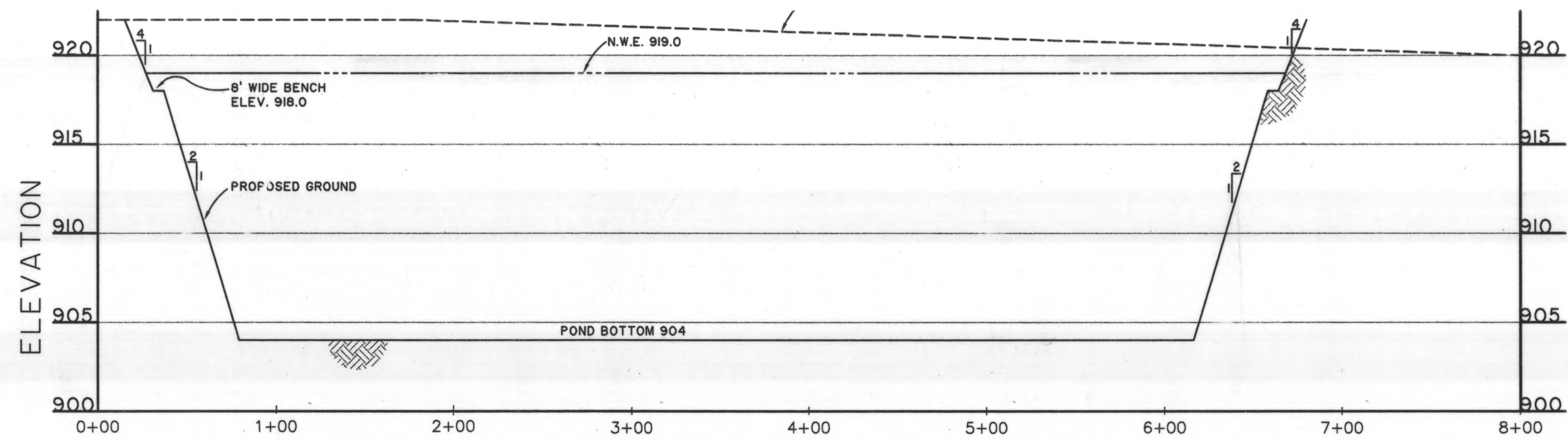
SCIOTO RESERVE  
 IRRIGATION POND

SCALE:  
 1"=50'

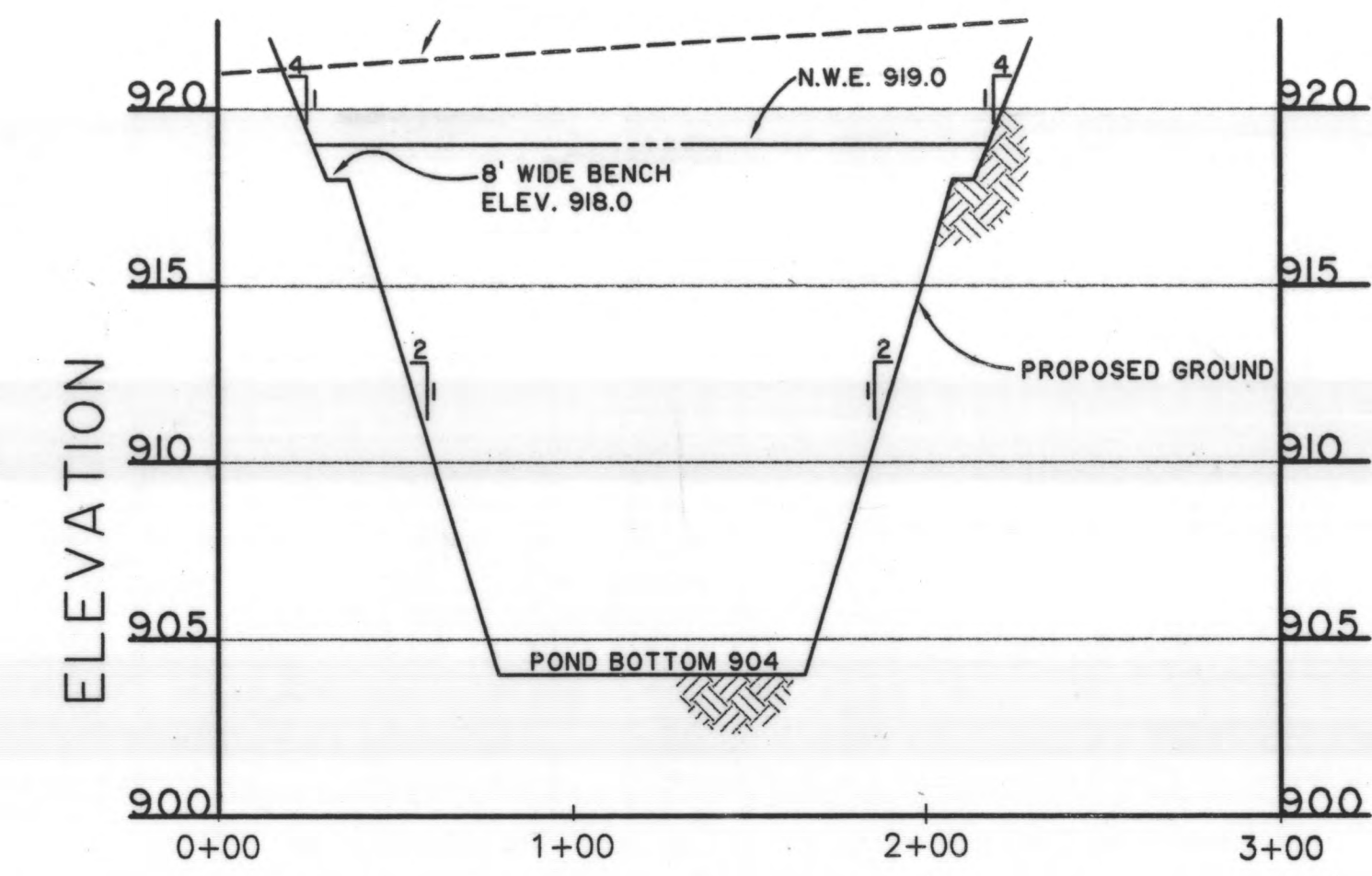
IRRIGATION POND  
 HOLE NO. 9 POND

SHEET NO.  
 IP-7

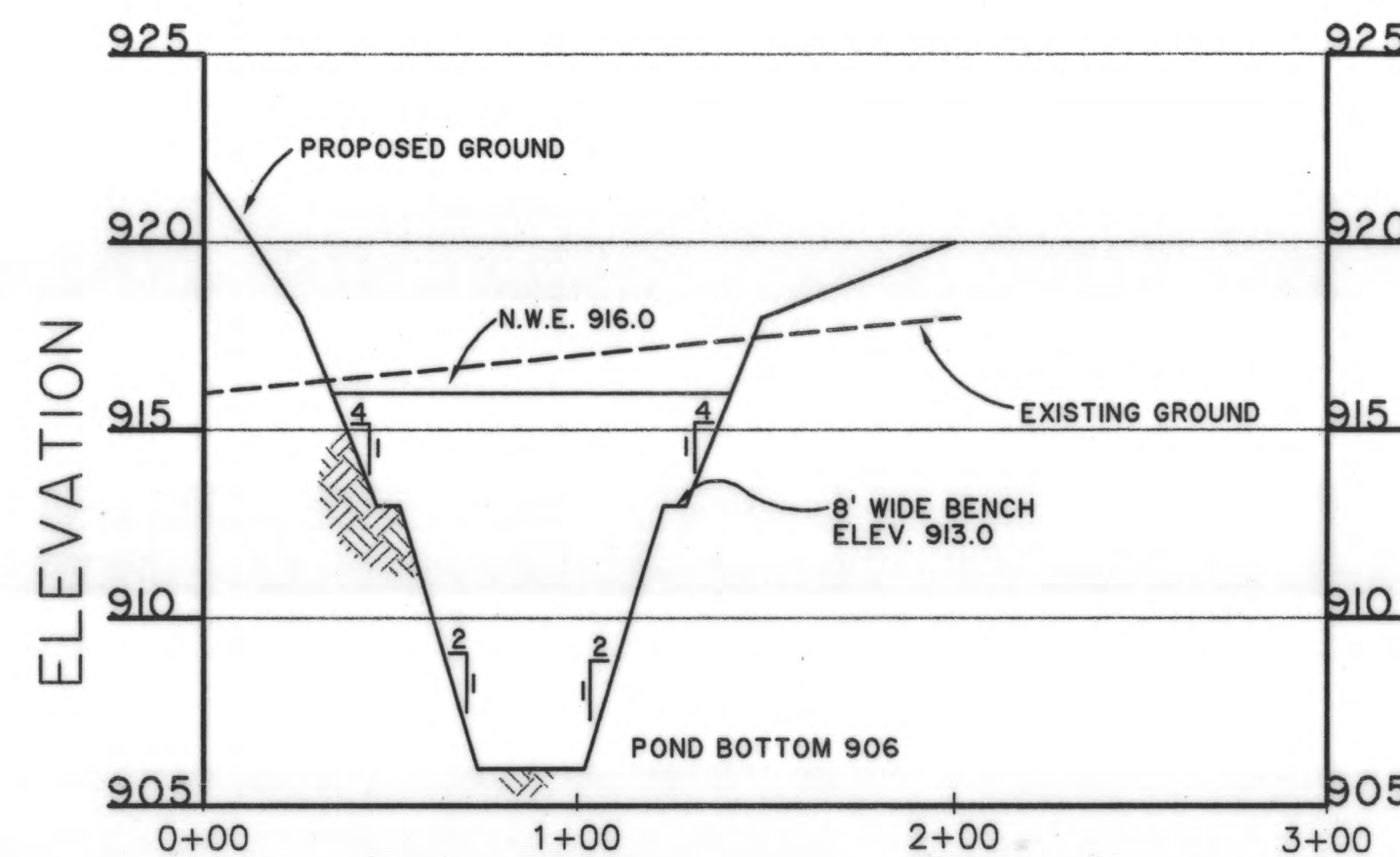




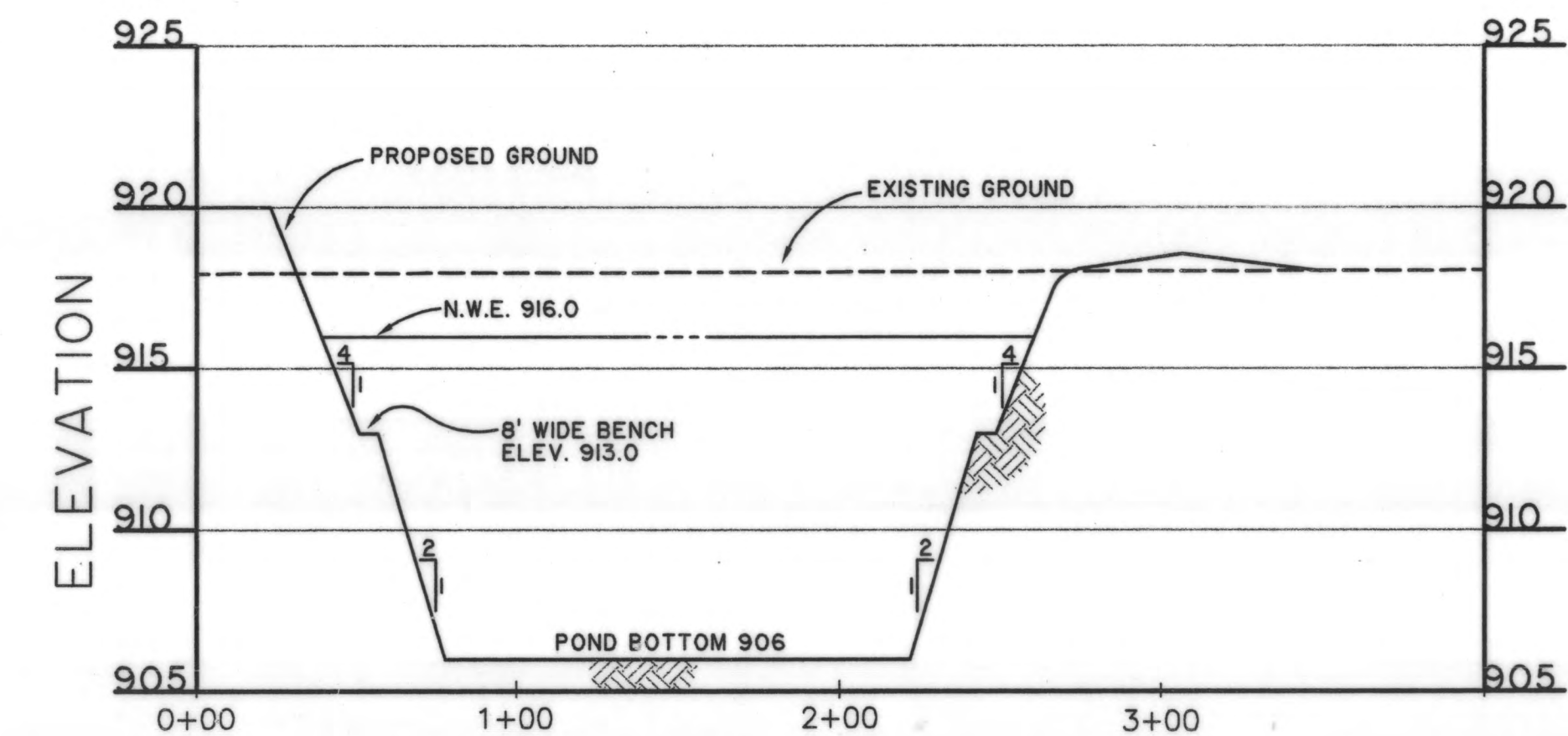
POND 15 CROSS SECTION A-A  
(LOOKING NORTH)



POND 15 CROSS SECTION B-B  
(LOOKING WEST)



POND 16 CROSS SECTION C-C  
(LOOKING NORTH)



POND 16 CROSS SECTION D-D  
(LOOKING EAST)

**LEGEND**

- PROPOSED FORCE MAIN
- PROPERTY LINE
- EXISTING CONTOUR WITH ELEVATION
- PROPOSED SLOPE INDICATOR
- PROPOSED CONTOUR WITH ELEVATION
- MAXIMUM POOL ELEVATION
- PROPOSED SPOT ELEVATION

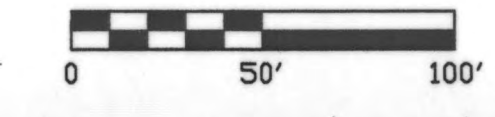
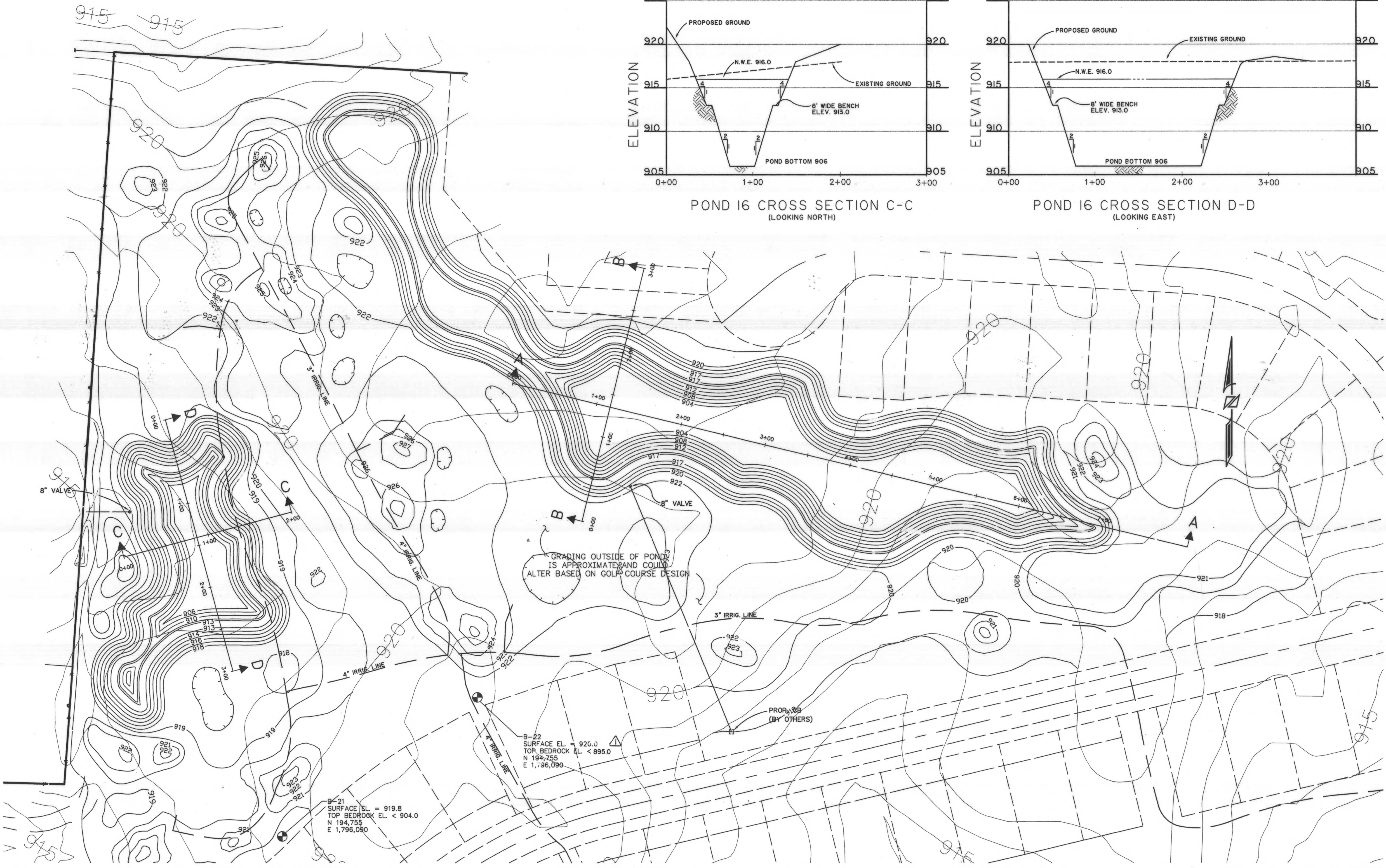
- NOTES:**
- THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IF ANY SPRINGS OR SEEPS ARE ENCOUNTERED WITHIN THE SUBGRADE AREA.
  - BOUNDARY AND TOPOGRAPHIC MAPPING IS BASED ON THE DELAWARE COUNTY GIS MAPPING AND WAS FIELD VERIFIED BY GPS SURVEY, BY R.D. ZANDE & ASSOCIATES, INC., IN JULY AND AUGUST 1998. THE BEARINGS SHOWN ARE BASED ON THE GRID BEARING OF N 88°28'32" W BETWEEN DELAWARE COUNTY GIS MONUMENTS, DEL94 AND DEL89, DETERMINED BY A GPS NETWORK OF FIELD OBSERVATIONS PERFORMED IN JULY, 1998.

**STAGE STORAGE - HOLE 15**

ELEVATION (FT.)	AREA (SQ. FT.)	ACCUMULATIVE DEPTH (FT.)	VOLUME (CU. FT.)	CUMULATIVE (ACRES FT.)
904.0	37400	4	171200	3.93
908.0	48200	5	49600	5.07
909.0	51000	6	52450	6.27
910.0	53900	7	55400	7.54
911.0	56900	8	65050	9.04
912.0	73200	12	359800	17.30
916.0	106700	13	111600	19.86
917.0	116500	14	121450	22.65
918.0	126400	15	131400	25.66
919.0	136400	16	141450	28.91
920.0	146500	17	151950	32.40
921.0	157400			

**STAGE STORAGE - HOLE 16**

ELEVATION (FT.)	AREA (SQ. FT.)	ACCUMULATIVE DEPTH (FT.)	VOLUME (CU. FT.)	CUMULATIVE (ACRES FT.)
906.0	8300	3	29175	0.67
909.0	11150	4	11925	0.94
910.0	12700	5	13543	1.25
911.0	14385	6	15293	1.61
912.0	16200	7	19750	2.06
913.0	23300	8	25200	2.64
914.0	27100	9	29050	3.30
915.0	31000	10	32950	4.06
916.0	34900	11	36950	4.91
917.0	39000	12	41000	5.85
918.0	43000			



	DESIGNED BY: xxx	DATE: 4/9/99	REVISIONS	DELAWARE COUNTY		SCIOTO RESERVE	SCALE:	IRRIGATION POND	SHEET NO.
	DRAWN BY: ADM	REVISOR: xxx	REMARKS: REVISE BORE LABEL AND STAGE STORAGE TABLE	DELAWARE COUNTY SANITARY ENGINEER		IRRIGATION POND	1"=50'	HOLE NOS. 15 & 16	IP-8
	CHECKED BY: xxx								
	APPROVED BY: xxx								
	DATE: JANUARY 25, 1999								
	JOB NO. 4363EN								

P:\363EN\DRAWING\DWG\4363EN.DWG, Mon Mar 22 15:31:18 1999, mrc4

# GENERAL NOTES

## GENERAL

ALL WORK SHALL BE DONE AND ALL MATERIAL FURNISHED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATIONS, LATEST EDITION AND CURRENT DELAWARE COUNTY SPECIFICATIONS. SEWER STANDARD DRAWINGS REFER TO THE DELAWARE COUNTY SANITARY ENGINEERING DEPARTMENT STANDARD DRAWINGS.

PROPOSED 8" FORCE MAIN CONDUIT SHALL BE DUCTILE IRON IN ACCORDANCE WITH REQUIREMENTS OF ANSI A 21.51 (AWWA C151) OR POLYVINYL CHLORIDE (PVC) IN ACCORDANCE WITH REQUIREMENTS OF AWWA C900. PROPOSED 4" FORCE MAIN SHALL BE POLYVINYL CHLORIDE (PVC) IN ACCORDANCE WITH REQUIREMENTS OF AWWA C900. MECHANICAL AND PUSH-ON JOINTS INCLUDING ACCESSORIES SHALL CONFORM TO ANSI A 21.11 (AWWA C111). PROPOSED 2" FORCE MAIN CONDUIT SHALL BE PVC SDR 21.

ALL ROCK EXCAVATION NECESSARY FOR INSTALLATION OF FORCE MAIN AND STRUCTURAL SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

ALL PIPE, FITTINGS AND VALVES SHALL BE CAREFULLY LOWERED INTO THE TRENCH PIECE BY PIECE BY MEANS OF A DERRICK, ROPES OR OTHER SUITABLE TOOLS OR EQUIPMENT, IN SUCH MANNER AS TO PREVENT DAMAGE TO THE SEWER MATERIAL AND PROTECTIVE COATINGS AND LININGS. THE PIPE AND FITTING SHALL BE INSPECTED FOR DEFECTS AND, WHILE SUSPENDED ABOVE GRADE, BE RUNG WITH A LIGHT HAMMER TO DETECT CRACKS. AT TIMES WHEN PIPE LAYING IS NOT IN PROGRESS, THE OPEN ENDS OF PIPE SHALL BE CLOSED BY A WATERTIGHT PLUG OR OTHER MEANS APPROVED BY THE ENGINEER.

CONCRETE BLOCKING SHALL BE USED ON ALL HORIZONTAL AND VERTICAL BENDS AS SHOWN ON STANDARD DRAWING NO. 23 AND 24. COST FOR BLOCKING SHALL BE INCLUDED IN THE PRICE BID FOR THE FORCE MAIN.

THE SURFACES WITH WHICH THE RUBBER GASKET COMES IN CONTACT SHALL BE CLEANED THOROUGHLY JUST PRIOR TO ASSEMBLY.

ALL VALVES OUTSIDE STRUCTURES SHALL BE PROVIDED WITH VALVE BOX. VALVES SHALL BE SET ON FIRM FOUNDATION SO THAT NO LOAD WILL BE TRANSFERRED TO THE CONNECTING PIPE. VALVE BOXES SHALL BE OF STANDARD ADJUSTABLE, HEAVY PATTERN, CAST IRON, EXTENSION TYPE, OF SUCH LENGTH AS IS REQUIRED. IF THE TOP OF THE OPERATION NUT IS MORE THAN 36 INCHES BELOW FINISHED GRADE, AN EXTENSION STEM SHALL BE FURNISHED TO BRING THE TOP OF THE OPERATING NUT WITHIN 24 INCHES OF FINISHED GRADE.

PROVIDE MINIMUM COVER FOR FORCE MAIN AS SHOWN ON THE PLAN AND PROFILE DRAWINGS. MAINTAIN THE PROFILE GRADES IN ORDER TO PROVIDE HIGH POINTS AT LOCATIONS DESIGNATED FOR AIR RELEASE VALVES.

### COMMENCEMENT OF WORK

THE CONTRACTOR SHALL NOTIFY THE DELAWARE COUNTY SANITARY DEPARTMENT 48 HOURS PRIOR TO COMMENCING WORK ON THIS PROJECT, HOLIDAYS AND WEEKENDS EXCLUDED.

### EXTRA COMPENSATION

NO EXTRA COMPENSATION WILL BE PAID TO THE CONTRACTOR BY REASON OF COMPLIANCE WITH ANY OF THE REQUIREMENTS INDICATED IN THE CONTRACT DRAWINGS. PAYMENT SHALL BE DEEMED TO BE INCLUDED AMONG THE PAY ITEMS, AS BID UPON, UNLESS OTHERWISE SPECIFICALLY PROVIDED.

### SAFETY REQUIREMENTS

THE CONTRACTOR AND SUB-COTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 AND ALL AMENDMENTS THERETO, DURING THE CONDUCT AND PERFORMANCE ON AND IN CONJUNCTION WITH THIS PROJECT.

### STATIONING

STATIONING ALONG THE FORCE MAINS ARE BASED ON DISTANCES ALONG THE PIPE CENTERLINE. BASELINE AND CENTERLINE ARE FIELD LOCATED WITH THE REFERENCE POINTS SHOWN ON THE DRAWING.

### BENCHMARKS AND ELEVATIONS

ALL ELEVATIONS SHOWN ARE BASED ON U.S.G.S. DATUM. BENCHMARKS HAVE BEEN SET AND REFERENCED ON THE DRAWINGS. CONTRACTOR SHALL VERIFY ELEVATION ON EACH WITH PERMANENT BENCHMARKS PRIOR TO COMMENCING THE WORK. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE COUNTY'S REPRESENTATIVE AND RESOLVED BEFORE PROCEEDING WITH WORK. BENCHMARKS SHALL BE MAINTAINED AS REQUIRED TO COMPLETE THE WORK AT THE CONTRACTOR'S COST.

### IRON PINS AND MONUMENTS

THE CONTRACTOR SHALL REFERENCE ALL IRON PINS, AND MONUMENTS FOUND BEFORE EXCAVATING AT OR NEAR THEM. COPIES OF REFERENCE DOCUMENTATION SHALL BE SUBMITTED TO COUNTY. IF ANY PINS OR MONUMENTS ARE DESTROYED OR DAMAGED THEY SHALL BE ACCURATELY REPLACED BY A REGISTERED SURVEYOR AT THE COMPLETION OF THE PROJECT AT CONTRACTOR'S COST.

### MAINTENANCE OF TRAFFIC

ALL TRAFFIC CONTROL DEVICES SHALL BE FURNISHED, ERECTED, MAINTAINED AND REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH THE 'OHIO MANUAL OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION AND MAINTENANCE OPERATION' (CURRENT EDITION); COPIES OF WHICH ARE AVAILABLE FROM THE OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF TRAFFIC, 25 S. FRONT STREET, COLUMBUS, OHIO 43215.

ALL TRENCHES SHALL BE BACKFILLED OR SECURELY PLATED DURING NON-WORKING HOURS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING "LOCAL" TRAFFIC AT ALL TIMES AND OF NOTIFYING THE PROPER AUTHORITIES REGARDING THE CLOSING OF ROADS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL, STORAGE AND REPLACEMENT OF ALL PERMANENT TRAFFIC CONTROL DEVICES WITHIN THE PROJECT LIMITS. PERMANENT TRAFFIC CONTROL DEVICES INCLUDE, BUT ARE NOT LIMITED TO PAVEMENT MARKINGS AND SIGNS.

THE CONTRACTOR SHALL NOT BEGIN WORK UNTIL STANDARD BARRICADES AND WARNING SIGNS ARE IN ACCEPTABLE POSITION AND THE MARKERS AND SIGNS CONFORM TO THE 'OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS'.

TWO-WAY, ONE LANE TRAFFIC SHALL BE MAINTAINED ON HOME ROAD AT ALL TIMES DURING WORKING HOURS IN ACCORDANCE WITH PAGE C-22 OF THE OHIO MANUAL.

THE CONTRACTOR SHALL MAINTAIN LOCAL TRAFFIC AT ALL TIMES DURING CONSTRUCTION OF THIS PROJECT IN A MANNER CAUSING THE LEAST AMOUNT OF INCONVENIENCE TO THE ADJUTING PROPERTY OWNERS. TEMPORARY DRIVEWAYS, TEMPORARY ROADWAYS, OR RUN-AROUNDS AS MAY BE NECESSARY TO PROVIDE VEHICULAR ACCESS TO AND FROM THE ADJUTING PROPERTIES SHALL BE CONSTRUCTED, MAINTAINED AND SUBSEQUENTLY REMOVED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER.

ALL PAVEMENT AND/OR RIGHT-OF-WAY OPENINGS WITHIN THE PUBLIC RIGHT-OF-WAY MUST CONFORM TO THE CURRENT EDITION OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATIONS, WITH SUPPLEMENTS OR CHANGES THERETO. ALSO, THE CONTRACTOR ASSUMES ALL RESPONSIBILITIES AND LIABILITIES REGARDING STRICT ADHERENCE TO APPLICABLE SECTIONS FOR THE MAINTENANCE OF TRAFFIC AND PUBLIC SAFETY AS SET FORTH IN THE 'OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS'. ALL TRAFFIC CONTROL DEVICES MUST BE IN PLACE PRIOR TO STARTING CONSTRUCTION.

THE PORTION OF THE PAVEMENT NOT IN THE SEWER MAIN CONSTRUCTION SHALL BE KEPT CLEAR OF ALL EXCAVATED MATERIAL. ONLY A PORTION OF THE TRENCH SHALL BE EXCAVATED AT A TIME AND CLOSED AGAIN WITH GRANULAR MATERIAL, BEFORE THE PAVEMENT OVER THE BALANCE IS REMOVED, AS DIRECTED BY THE ENGINEER.

EXCAVATION WHICH ARE NOT PROTECTED BY TEMPORARY FENCING SHALL BE BACKFILLED AT THE END OF EACH WORKING DAY.

IF AT ANY TIME TRAFFIC HAS TO BE BLOCKED, THE CONTRACTOR SHALL NOTIFY THE NEAREST FIRE AND POLICE DEPARTMENTS (EMERGENCIES ONLY).

NO NON-RUBBER Tired VEHICLES SHALL BE MOVED ON COUNTY ROADS.

### EXISTING UTILITIES

THE CONTRACT DRAWINGS SHOW ALL UTILITIES, WATER, GAS, AND SEWER LINES KNOWN TO EXIST. HOWEVER, THIS DOES NOT GUARANTEE THAT ALL EXISTING LINES AND APPURTENANCES HAVE BEEN SHOWN ON THE CONTRACT DRAWINGS, AND THE COUNTY ASSUMES NO RESPONSIBILITY FOR THE ACCURACY THEREOF AND DOES NOT FREE THE CONTRACTOR FROM NECESSARY PRECAUTIONS FOR THE PROTECTION OF ANY UTILITY ENCOUNTERED ON THE PROJECT OR THE RESTORATION OF ANY UTILITY DAMAGED DURING THE WORK.

THE CONTRACTOR SHALL EXPOSE THE UTILITY OR STRUCTURE INDICATED ON THE DRAWING BEFORE PERFORMING THE ASSOCIATED WORK IN ORDER TO VERIFY THE LOCATION.

THE CONTRACTOR SHALL NOTIFY AT LEAST 48 HOURS BEFORE BREAKING GROUND, ALL PUBLIC AND/OR PRIVATE SERVICE CORPORATIONS HAVING WIRE, POLES, PIPES, CONDUIT, MANHOLES OR OTHER STRUCTURES THAT MAY BE AFFECTED BY THIS OPERATION, INCLUDING ALL STRUCTURES WHICH ARE AFFECTED AND NOT SHOWN ON THESE PLANS. OWNERS OF UNDERGROUND UTILITIES WHICH ARE MEMBERS OF THE OHIO UTILITIES PROTECTION SERVICE CAN BE NOTIFIED BY CALLING 800-362-2764 (TOLL FREE). NON-MEMBER UNDERGROUND UTILITY OWNERS MUST BE CALLED DIRECTLY.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ALL RESIDENTS OF INTERRUPTION TO THEIR UTILITIES THAT WILL BE CAUSED BY CONSTRUCTION AT LEAST 24 HOURS IN ADVANCE.

SUPPORTING AND/OR PROTECTING EXISTING WATER LINES, GAS MAINS, TELEPHONE CONDUIT, STORM SEWERS, ETC., SHALL BE INCLUDED IN PAYMENT FOR THE VARIOUS CONTRACT ITEMS OF WORK.

ALL WORK REQUIRED FOR THE MAINTENANCE OF SERVICE OF EXISTING UTILITIES SHALL BE DONE BY, AND AT THE EXPENSE OF THE CONTRACTOR.

ALL MAINTENANCE, REPAIR AND/OR REPLACEMENT OF EXISTING UTILITIES, WHETHER SHOWN ON THE DRAWINGS OR NOT, SHALL BE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE VARIOUS UTILITY COMPANIES HAVING JURISDICTION, AND SHALL BE INCLUDED IN PAYMENT FOR THE VARIOUS CONTRACT ITEMS OF WORK.

ALL EXISTING STORM SEWERS, DRIVEWAY DRAINS, AND OTHER SURFACE DRAIN PIPES, WHETHER SHOWN ON THE CONTRACT DRAWINGS OR NOT, REMOVED OR DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AND RECONNECTED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER, AT NO COST TO THE COUNTY.

IT IS ASSUMED THAT THERE ARE WATER AND GAS BRANCH LINES, ELECTRIC AND TELEPHONE SERVICES, ETC., SERVING EACH RESIDENCE. THE CONTRACTOR SHALL REPAIR AND REPLACE THESE UTILITIES IF DAMAGED AT NO COST TO THE COUNTY.

### COLUMBUS SOUTHERN POWER

CONTRACTOR SHALL CONTACT THE COMPANY PRIOR TO EXCAVATION IN THE VICINITY OF ELECTRIC UNDERGROUND FACILITIES (APPROXIMATE PLAN LOCATION SHOWN) OR WHEN WORKING NEAR OVERHEAD ELECTRIC FACILITIES.

(A) FOR FIELD INSPECTOR TO LOCATE UNDERGROUND ELECTRIC LINE, IN OHIO CALL OHIO UTILITIES PROTECTION SERVICE 1-800-362-2764, (AT LEAST 48 HOURS IN ADVANCE), EXCLUDING HOURS, SAT., SUN., AND STATE LEGAL HOLIDAYS.

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES TO ELECTRIC FACILITIES DURING CONSTRUCTION.

ELECTRIC FACILITIES TO BE KEPT IN SERVICE AT ALL TIMES.

CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPORTING EXISTING ELECTRIC FACILITIES AFFECTED BY THE PROPOSED CONSTRUCTION.

(A) WHERE CONCRETE ENCASED CONDUIT SYSTEMS OR DIRECT BURIED CABLE SYSTEMS ARE EXPOSED OR OTHERWISE INTERFERED WITH, THE CONTRACTOR SHALL PROTECT THE SYSTEM AS NECESSARY AGAINST DAMAGE. AS SOON AS FEASIBLE, THE CONTRACTOR SHALL TAKE ADDITIONAL APPROPRIATE STEPS TO PROVIDE PERMANENT MEASURES TO RESTORE SUPPORT. THE METHODS USED SHALL BE BASED ON CONDITIONS TO BE DETERMINED BY THE UTILITY.

(B) WHERE POLES OR ANCHORS THAT SUPPORT OVERHEAD ELECTRIC FACILITIES ARE EXPOSED OR OTHERWISE INTERFERED WITH, THE CONTRACTOR SHALL PROTECT THEM FROM DAMAGE AND PROVIDE TEMPORARY SUPPORT TO INSURE THE INTEGRITY OF THE SYSTEM. AS SOON AS FEASIBLE, THE CONTRACTOR SHALL TAKE ADDITIONAL APPROPRIATE STEPS TO PROVIDE PERMANENT MEASURES TO RESTORE SUPPORT. THE METHODS USED SHALL BE BASED ON CONDITIONS TO BE DETERMINED BY THE UTILITY.

(C) WHERE THE DEPTH OF EXCAVATION FOR THE PROPOSED WORK IS GREATER THAN FIVE (5) FEET, THE CONTRACTOR SHALL SHEET AND SHORE THE TRENCH TO CONTINUOUSLY MAINTAIN THE SUPPORT OF ELECTRIC FACILITIES AT LOCATIONS WHERE THE ELECTRIC FACILITIES ARE WITHIN THE ZONE OF INFLUENCE ADJACENT TO THE EXCAVATION AS DETERMINED BY THE NATURAL ANGLE OF RESPONSE OF THE SOIL.

(D) ALL DAMAGE TO ELECTRIC FACILITIES AND SERVICES REQUIRING ADJUSTMENTS, RELOCATIONS AND/OR REPAIRS WILL BE MADE AT THE CONTRACTOR'S COST.

CONTRACTOR SHALL NOT BACKFILL EXPOSED ELECTRIC FACILITIES UNTIL THE COMPANY HAS INSPECTED ITS FACILITY OR PERFORMED ANY ADJUSTMENTS AND/OR MAINTENANCE THAT MAY BE REQUIRED.

SHOULD CONTRACTOR DAMAGE ELECTRIC FACILITIES, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ELECTRIC SERVICE DESK THROUGH THE COMPANY OPERATOR. CONTRACTOR SHALL KEEP EVERYONE CLEAR OF DAMAGED ELECTRIC FACILITIES UNTIL COMPANY PERSONNEL ARRIVE AT THE WORK SITE.

### COLUMBIA GAS OF OHIO SUBURBAN NATURAL GAS

GAS FACILITIES ARE TO BE KEPT IN SERVICE AT ALL TIMES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES TO GAS FACILITIES DURING OR AS A RESULT OF HIS CONSTRUCTION. ALL DAMAGE TO GAS FACILITIES REQUIRING ADJUSTMENTS, RELOCATIONS AND/OR REPAIRS WILL BE MADE AT THE CONTRACTOR'S COST.

THE CONTRACTOR SHALL SHEET AND SHORE ALL EXCAVATIONS AS REQUIRED TO CONTINUOUSLY SUPPORT GAS FACILITIES WITHIN THE ZONE OF INFLUENCE (AS DETERMINED BY THE NATURAL ANGLE OF REPOSE OF THE SOIL).

CROSSING BURIED GAS FACILITIES WITH HEAVY CONSTRUCTION EQUIPMENT MAY CAUSE DAMAGE TO THEM. CONTACT THE GAS DISTRIBUTION ENGINEERING DEPT. FOR DETAILS ON HOW TO PROTECT THE GAS FACILITIES FROM DAMAGE.

THE CONTRACTOR SHALL NOT BACKFILL EXPOSED GAS FACILITIES UNTIL THE UTILITY HAS INSPECTED ITS FACILITIES AND PERFORMED ANY MAINTENANCE AND/OR ADJUSTMENTS THAT MAY BE REQUIRED.

THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING AGAINST DAMAGE TO THE COATING AND WRAPPING OF STEEL WELDED GAS MAINS.

### DEL-CO WATER

THE CONTRACTOR IS ADVISED THAT DUE TO THE PROXIMITY OF THE PROPOSED FORCE MAIN, THE INTEGRITY OF THE EXISTING WATER MAINS MUST BE MAINTAINED AT ALL TIMES.

IF DURING CONSTRUCTION THE EXISTING WATER MAIN(S) BECOME DISTURBED, THE CONTRACTOR MUST IMMEDIATELY REMEDY THE SITUATION AND PROVIDE DEL-CO WATER AND THE COUNTY WITH A PLAN OF SUPPORTING THE EXISTING WATER MAIN(S) SO THAT FURTHER DAMAGE DOES NOT OCCUR. REPLACEMENT OF WATER MAIN MAY BE NECESSARY.

ALL CONCRETE THRUST BLOCKING OF EXISTING BENDS MUST NOT BE DISTURBED. SHOULD IT BE NECESSARY TO DO ANY WORK WHICH COULD POSSIBLY ALTER OR IMPAIR THE THRUST BLOCKING THE CONTRACTOR MUST RESTRAIN ALL JOINTS WHICH WOULD BE AFFECTED. THIS RESTRAINT MUST BE APPROVED BY DEL-CO WATER BEFORE THE CONTRACTOR CAN PROCEED WITH HIS WORK.

DEL-CO WATER WILL NOT BE LIABLE FOR ANY COST RELATED TO THE REQUIREMENTS OF ITEMS ABOVE. ALL COST SHALL BE BORNE BY THE CONTRACTOR AND INCLUDED IN THE VARIOUS BID ITEMS.

### TELEPHONE

CONTRACTOR SHALL CONTACT THE COMPANY PRIOR TO EXCAVATION IN THE VICINITY OF UNDERGROUND TELEPHONE FACILITIES (APPROXIMATE PLAN LOCATION SHOWN) OR WHEN WORKING NEAR OVERHEAD TELEPHONE FACILITIES.

CONTRACTOR SHALL SHALL COORDINATE CROSSING OF THE EXISTING GTE FIBER OPTIC CABLE WITH SCOTT EARLY AT (740) 369-5109. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE FIBER OPTIC CABLE DURING CONSTRUCTION. ALL DAMAGE TO THE FIBER OPTIC CABLE REQUIRING ADJUSTMENTS AND/OR REPAIRS WILL BE MADE AT THE CONTRACTOR'S EXPENSE.

### USE OF PREMISES

IN ADDITION TO DIRECT REQUIREMENTS OF THE CONTRACT SPECIFICATION, THE CONTRACTOR SHALL OBSERVE AND CONFORM TO THE SPECIFIC REQUIREMENTS OF ALL RIGHT-OF-WAY, INCLUDING EASEMENTS, COURT ENTRIES, RIGHT-OF-ENTRY, OR ACTION FILED IN COURT IN ACCORDANCE WITH THE CODE OF APPLICABLE GOVERNING AGENCY.

THE CONTRACTOR SHALL NOT TRESPASS UPON OR IN ANY WAY DISTURB PROPERTY ADJACENT TO THE STREET RIGHT-OF-WAY WITHOUT FIRST OBTAINING WRITTEN PERMISSION FROM THE OWNER TO DO SO. A COPY OF SUCH WRITTEN PERMISSION SHALL BE FURNISHED TO THE ENGINEER.

IF THE CONTRACTOR FINDS IT NECESSARY TO OBTAIN ADDITIONAL WORKING AREA, IT SHALL BE HIS RESPONSIBILITY FOR ITS ACQUISITION. ALL REQUIREMENTS LISTED UNDER THE "USE OF PREMISES" SHALL APPLY IF ADDITIONAL AREA IS OBTAINED.

THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, RESTORE SUCH PROPERTY TO THE FULL SATISFACTION OF THE OWNER, AND SHALL OBTAIN FROM THE OWNER A WRITTEN RELEASE STATING THAT RESTORATION HAS BEEN SATISFACTORILY MADE. A COPY OF THE WRITTEN RELEASE SHALL BE FURNISHED TO THE ENGINEER.

THE CONTRACTOR SHALL NOT WASTE ANY EXCESS EARTH, STONE, OR OTHER EXCAVATED MATERIAL ON ANY PROPERTY WITHOUT FIRST OBTAINING WRITTEN PERMISSION OF THE OWNER OF THE PROPERTY AND SECURING THE APPROVAL OF THE ENGINEER. ONE COPY OF THE OWNER'S WRITTEN PERMISSION AND ONE COPY OF A WRITTEN RELEASE FROM THE OWNER STATING THAT THE WORK HAS BEEN COMPLETED SATISFACTORILY, SHALL BE FURNISHED TO THE ENGINEER.

ALL ITEMS WITHIN THE STREET RIGHT-OF-WAY SHALL BE REMOVED, OR REMOVED AND REPLACED, OR RESTORED AS REQUIRED BY THE CONTRACT DRAWINGS AND DETAILED PROVISIONS, AS DIRECTED BY THE ENGINEER.

### STORAGE OF MATERIALS

THE CONTRACTOR SHALL NOT PARK EQUIPMENT OR STORE MATERIALS WITHIN THE RIGHT-OF-WAY.

### PROTECTION OF TREES

SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGES TO TREES AND THEIR ROOT SYSTEM. MACHINE EXCAVATION SHALL NOT BE USED WHEN, IN THE OPINION OF THE ENGINEER, IT WOULD ENDANGER TREE ROOTS. IN GENERAL, WHERE THE LINE OF TRENCH FALLS WITHIN THE LIMITS OF THE LIMB SPREAD, THE LEAVING OF HEADERS ACROSS THE TRENCH TO PROTECT ROOTS WILL BE REQUIRED. THE OPERATION OF ALL EQUIPMENT, PARTICULARLY WHEN EMPLOYING BOOMS; THE STORAGE OF MATERIALS; AND THE DEPOSITION OF EXCAVATION SHALL BE CONDUCTED IN THE MANNER WHICH WILL NOT HARM TREES, TRUNKS, BRANCHES OR THEIR ROOTS.

BRANCHES WHICH OVERHANG THE CONSTRUCTION LIMITS AND WHICH INTERFERE WITH THE OPERATION OF EQUIPMENT SHALL BE TIED BACK TO AVOID DAMAGE. IF POSSIBLE, WHERE INJURY TO BRANCHES IS UNAVOIDABLE, THE BRANCHES SHALL BE SAWS OFF NEARLY AT THE TRUNK OR MAIN BRANCH; AND THE CUT AREA SHALL BE PAINTED WITH AN APPROVED TREE PAINT IMMEDIATELY. ANY TREE DAMAGE BEYOND SAVING SHALL BE REMOVED BY THE CONTRACTOR AT HIS OWN EXPENSE, AND IN THE CASE OF TREES LOCATED ON PRIVATE PROPERTY, RESTITUTION SHALL BE MADE TO THE OWNER BY THE CONTRACTOR.

### CLEARING AND GRUBBING

TREES AND SHRUBS WITHIN CONSTRUCTION EASEMENT NOT DESIGNATED TO BE SAVED ON THE DRAWINGS MAY BE REMOVED AND SHALL BE DISPOSED OF WITH NO ADDITIONAL COST TO THE COUNTY.

### MAINTAINING FLOW

IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR, THROUGHOUT THE TENURE OF THIS CONTRACT, TO PROVIDE AND MAINTAIN SUFFICIENT FLOW AT ALL TIMES TO PASS ANY FLASH OR STORM FLOW OF DRAINAGE DITCHES, CREEKS, STREAMS AND RIVERS, AND TO PREVENT ANY SIGNIFICANT FLOODING DUE TO OBSTRUCTION CAUSED BY CONSTRUCTION EQUIPMENT AND/OR MATERIALS.

THE CONTRACTOR SHALL MAINTAIN SEWAGE FLOW OF THE SEWER MAIN AT ALL TIMES DURING CONSTRUCTION OF THE PROPOSED CONDUIT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROHIBITING STORM OR SUBSURFACE WATER FROM ENTERING THE SANITARY SEWER DURING CONSTRUCTION AS MAY BE CAUSED BY FLASH FLOODS, HEAVY RAINS, ETC.

THE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

### FENCES, SIGNS, MAILBOXES, GUARDRAILS, ETC.

ANY FENCES, INCLUDING HEDGES AND SHRUBS, SIGNS, MAILBOXES AND GUARDRAILS THAT NEED TO BE REMOVED TO FACILITATE SEWER CONSTRUCTION OPERATIONS SHALL BE REPLACED, IN KIND OR WITH REPAIRS SATISFACTORY TO THE OWNER, AT THE CONTRACTOR'S EXPENSE. REPLACEMENT OF FENCES, HEDGES AND SHRUBS, SIGNS, MAILBOXES AND GUARDRAILS SHALL BE CONSIDERED A PART OF THE FORCE MAIN INSTALLATION AND SHALL BE DONE IMMEDIATELY AFTER THE INSTALLATION AND BACKFILLING OF THE FORCE MAIN.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING MAIL SERVICE IN THE CONSTRUCTION AREA PRIOR TO DISTURBING ANY MAILBOXES. THE CONTRACTOR SHALL CONTACT THE POSTAL AUTHORITIES AND SHALL TEMPORARILY RELOCATE MAILBOXES IN ACCORDANCE WITH THE REQUIREMENTS THEREOF. THE CONTRACTOR SHALL RESTORE MAILBOXES TO THEIR ORIGINAL CONDITION AND LOCATION. COST OF SAME SHALL BE INCLUDED IN UNIT PRICE BID FOR THE FORCE MAIN.

### SAW CUTTING OF PAVEMENT

WHERE NECESSARY TO DISTURB PAVEMENT OR DRIVES, THE PAVEMENT SHALL BE SAW CUT TO FULL DEPTH OF PAVEMENT AND IN NEAR STRAIGHT LINES. IF DURING CONSTRUCTION, THE PAVEMENT IS DAMAGED BEYOND THE ORIGINAL SAW CUT, THE PAVEMENT SHALL BE RECUT TO NEAT LINES.

### RESTORATION

ALL ROADWAY BERMS AND DRAINAGE DITCHES DISTURBED BY THE WORK SHALL BE RESTORED, RESHAPED AND GRADED TO DRAIN PROPERLY AND TO A CONDITION EQUAL TO OR BETTER THAN PRIOR TO CONSTRUCTION.

PAVEMENT RESTORATION SHALL BE IN ACCORDANCE WITH DELAWARE COUNTY SANITARY ENGINEERING DEPARTMENT STANDARD DRAWING NO. 22, AND THE PROVISIONS OF THE GOVERNING AGENCY RESPONSIBLE FOR THE PARTICULAR ROAD AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL RESTORE UNPAVED AREAS BY SEEDING AND MULCHING (ITEM 659) UNLESS OTHERWISE NOTED HEREIN. COMMERCIAL FERTILIZER SHALL BE USED AND SHALL HAVE A CHEMICAL ANALYSIS OF 12-7-5. THE FERTILIZER SHALL BE DELIVERED TO THE PROJECT SITE IN MANUFACTURER'S CONTAINERS. UNLESS THE CONTAINER OR AN ATTACHED TAG SHALL HAVE PRINTED UPON IT THE MANUFACTURER'S NAME AND THE CHEMICAL ANALYSIS OF THE CONTENTS.

DRIVES AND WALKS SHALL BE RESTORED AS SHOWN ON STANDARD DRAWING 22 OF DELAWARE COUNTY SANITARY ENGINEERING DEPARTMENT, AND IN ACCORDANCE WITH THE LATEST CONSTRUCTION AND MATERIAL SPECIFICATION, STATE OF OHIO, AND DEPARTMENT OF TRANSPORTATION.

ALL DISTURBED AREAS SHALL BE RESTORED AS NEARLY AS PRACTICAL TO THE CONDITION IT WAS PRIOR TO CONSTRUCTION, INCLUDING SIDEWALKS.

ALL RESTORATION SHALL BE COMPLETED IN STRICT ACCORDANCE WITH THE APPROPRIATE ITEMS OF THE SPECIFICATIONS AS DIRECTED BY THE ENGINEER. COST OF RESTORATION AND BACKFILL SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

### SURPLUS EXCAVATION

THE CONTRACTOR SHALL REMOVE FROM THE SITE ALL SURPLUS EXCAVATION TO A LOCATION ACCEPTABLE BY THE COUNTY.

### BACKFILLING

TRENCHES SHALL BE BACKFILLED WITH GRANULAR MATERIAL WHERE INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

GRANULAR MATERIAL SHALL BE PLACED AT ALL UTILITY AND ROAD CROSSINGS.

GRANULAR MATERIAL MAY BE GRAVEL OR CRUSHED STONE MEETING THE REQUIREMENTS OF SECTION 304.02 (AS APPROVED BY THE COUNTY ENGINEER), STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATIONS, OR OTHER WELL GRADED GRANULAR MATERIAL APPROVED BY THE ENGINEER.

THE MATERIAL SHALL BE PLACED IN LAYERS OF APPROXIMATELY SIX (6) INCHES IN THICKNESS AND COMPACTED TO THE SATISFACTION OF THE SANITARY ENGINEER IN ACCORDANCE WITH STATE OF OHIO, CONSTRUCTION AND MATERIAL SPECIFICATIONS, SECTION 203.12. IT MAY BE COMPACTED WITH WATER IF SATISFACTORY DRAINAGE IS PROVIDED FOR THE FREE WATER. IF IN PAVEMENT, DRIVEWAY OR BERM, THE TOP EIGHT (8) INCHES OF GRANULAR MATERIAL SHALL BE SUITABLE FOR TEMPORARY PAVING MATERIAL. IF IN LAWN, THE TOP FOUR (4) INCHES SHALL BE TOPSOIL.

WHERE THE CONTRACTOR IS REQUIRED TO EXCAVATE BELOW PIPE GRADE, SUCH AS IN ROCK EXCAVATION OR TO OBTAIN A STABLE FOUNDATION FOR THE PIPE, THE GRANULAR MATERIAL REQUIRED TO RESTORE THE GRADE SHALL BE AS HEREIN SPECIFIED, OR AS APPROVED BY THE SANITARY ENGINEER.

### ENCOUNTERING HAZARDOUS OR TOXIC MATERIALS

IF THE CONTRACTOR ENCOUNTERS ANY ABNORMAL MATERIALS SUCH AS BUT NOT LIMITED TO, DRUMS, TANKS, OR STAINED EARTH OR ANY UNUSUAL ODD DURING CONSTRUCTION OPERATION, THE WORK IN THIS AREA SHALL BE TEMPORARILY DISCONTINUED, EQUIPMENT LEFT IN PLACE, THE AREA CORDONED OFF AND THE COUNTY NOTIFIED. IF THE AREA IS CONSIDERED TO CONTAIN HAZARDOUS OR TOXIC MATERIALS IT MUST BE HANDLED CORRECTLY IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL LAWS.

### DELAWARE COUNTY PERMIT

ALL WORK WITHIN DELAWARE COUNTY ROAD RIGHT-OF-WAY IS SUBJECT TO THE INSPECTION AND APPROVAL OF THE DELAWARE COUNTY ENGINEER. THE CONTRACTOR SHALL SECURE A WRITTEN PERMIT FROM THE DELAWARE COUNTY ENGINEER, 80 CHANNING STREET, DELAWARE, OHIO 43015, 48 HOURS IN ADVANCE OF STARTING ANY WORK WITHIN THE COUNTY RIGHT-OF-WAY.

### DELAWARE COUNTY NOTIFICATION

THE CONTRACTOR SHALL NOTIFY THE DELAWARE COUNTY ENGINEER, AND COUNTY SANITARY ENGINEER 48 HOURS IN ADVANCE OF COMMENCING ANY WORK.

### STANDARD DRAWINGS

- 01 SEWER INSTALLATION
- 14 FORCE MAIN CONNECTION TO MANHOLE DETAIL
- 20 WATERLINE CROSSING
- 22 PAVEMENT REPLACEMENT DETAILS
- 23 CONCRETE REACTION BACKING DETAILS
- 24 BACKING FOR VERTICAL BEND
- 25 AUTOMATIC AIR RELEASE VALVE
- 31 BACKFILLING WITHIN HIGHWAY RIGHT-OF-WAY

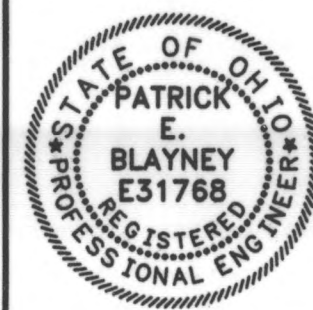
### BACKFILLING

SEE DELAWARE COUNTY STANDARD DRAWING OCED-8100.

DESIGNED BY:	BGD	REVISIONS	
DRAWN BY:	ACM	DATE	
CHECKED BY:	THB	REMARKS	
APPROVED BY:	MBT		
DATE:	JANUARY 25, 1999		
JOB NO.	4363EN		

DELAWARE COUNTY

DELAWARE COUNTY SANITARY ENGINEER



SCIOTO RESERVE

8", 4" & 2" FORCE MAINS

SCALE:

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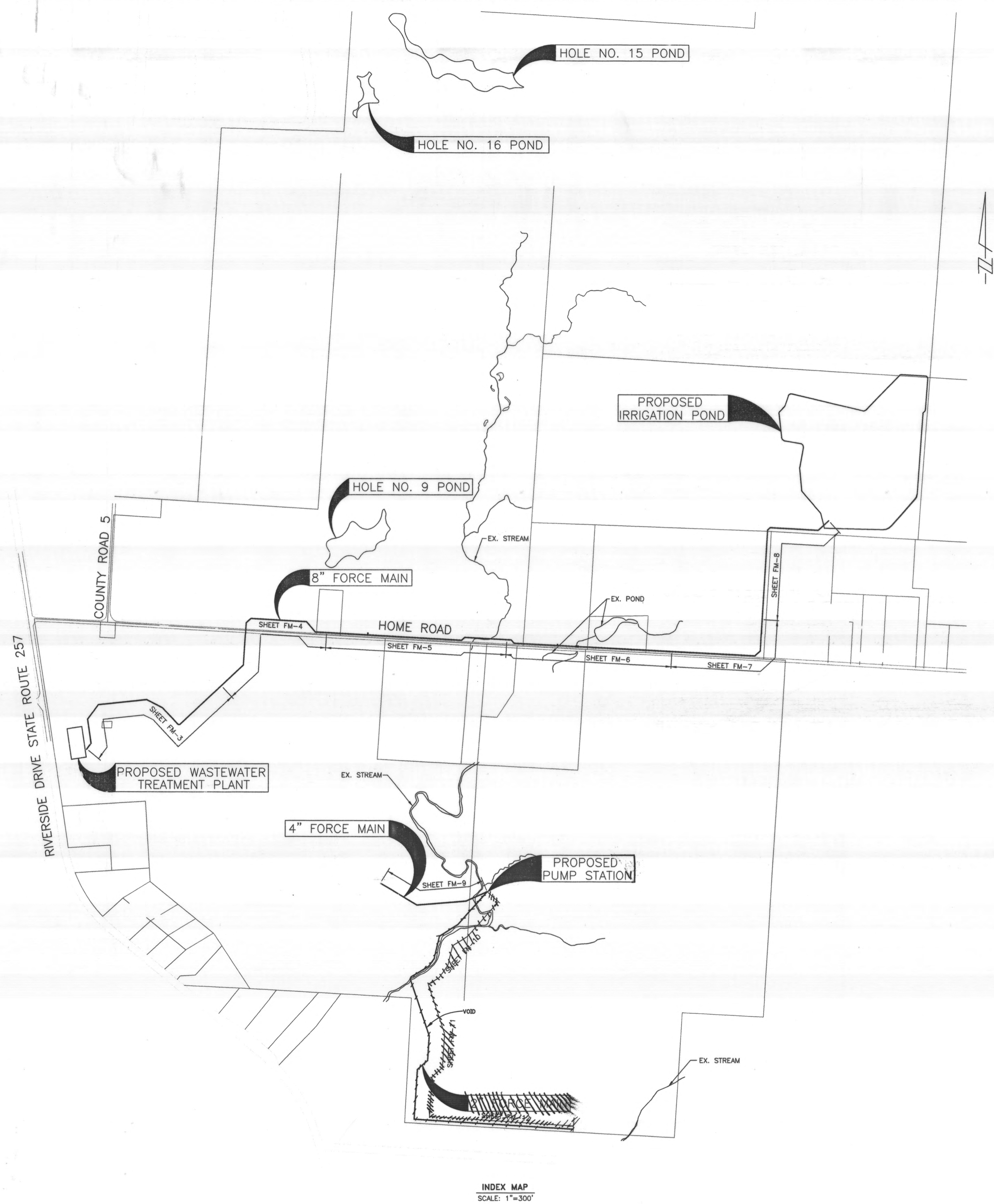
GENERAL

GENERAL NOTES

SHEET NO.

FM-1

R.D.Zande & Associates



ESTIMATED QUANTITIES			
ITEM/SEC. NO.	DESCRIPTION	UNIT	QUANTITY
3.5/3.7/4.3/4.4	8" PIPE AND FITTINGS, DUCTILE IRON CLASS 53 OR PVC AWWA C900	LF	6313
SPEC.	8" GRAVITY SEWER PIPE, PVC SDR 35	LF	187
3.7/4.3/4.4	4" PIPE AND FITTINGS, PVC AWWA C900	LF	760
SPEC.	2" PIPE AND FITTINGS, PVC SDR 21	LF	2622
8.2	SEEDING AND MULCHING	S.Y.	9150
10.1	TEMPORARY PAVEMENT REPLACEMENT	S.Y.	14
201	CLEARING AND GRUBBING	L.S.	L.S.
207	TEMPORARY SOIL EROSION AND SEDIMENT CONTROL	L.S.	L.S.
601	DUMPED ROCK FILL, TYPE "D"	C.Y.	265
614	MAINTAINING TRAFFIC	L.S.	L.S.
SPEC.	REINFORCED CONCRETE HEADWALL (PER DETAIL ON SHEET 13)	L.S.	L.S.
SPEC.	CONCRETE ENCASEMENT (PER DETAIL ON SHEET 13)	C.Y.	85
SPEC.	PERMANENT PAVEMENT REPLACEMENT, TYPE "C" (PER STD. DWG. 22)	S.Y.	14
SPEC.	PERMANENT PAVEMENT REPLACEMENT, TYPE "D" (PER STD. DWG. 22)	S.Y.	50
SPEC.	MH W/ FLUSH-OUT (PER DETAIL ON SHEET 13)	EA.	2
SPEC.	AIR RELEASE MANHOLE (PER DETAIL ON SHEET 13)	EA.	5
SPEC.	VALVE BOX W/ FLUSH-OUT (PER DETAIL ON SHEET 13)	EA.	5
SPEC.	DUPLEX SUBMERSIBLE LIFT STATION, COMPLETE	L.S.	1
3.5/3.7	FITTINGS INCREASE OR DECREASE (CONTINGENCY ITEM)	LBS.	300
4.3/4.4	INCREASE OR DECREASE IN EXCAVATION (CONTINGENCY ITEM)	C.Y.	150

NOTE: SECTION NO.S REFER TO "STANDARD PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF SANITARY FACILITIES, DELAWARE COUNTY, OHIO. ITEM NO'S, REFER TO ODOT CMS.

FORCE MAIN REFERENCES					
8" FORCE MAIN			4" FORCE MAIN		
STATION	NORTHING	EASTING	STATION	NORTHING	EASTING
0+00.00	193147.40	1791190.92	0+00	192215.85	1793842.17
0+50.00	193187.62	1791220.62	1+51.80	192154.08	1793703.50
2+10.64	193346.48	1791196.75	4+80.06	192127.54	1793376.31
3+29.13	193441.79	1791267.15	7+59.86	192270.62	1793135.86
8+91.18	193501.04	1791826.06			
16+23.78	194005.48	1792357.32			
19+07.32	193989.80	1792640.44			
19+96.41	193922.55	1792698.87			
29+66.57	193870.15	1793667.61			
29+94.63	193888.93	1793688.46			
33+01.43	193872.88	1793994.84			
33+30.54	193851.24	1794014.32			
49+18.47	193770.14	1795600.17			
49+66.74	193802.48	1795636.01			
57+63.05	194597.48	1795681.67			
58+04.66	194625.29	1795712.63			
60+52.58	194611.99	1795960.19			
62+98.18	194776.09	1796142.92			

**LEGEND**

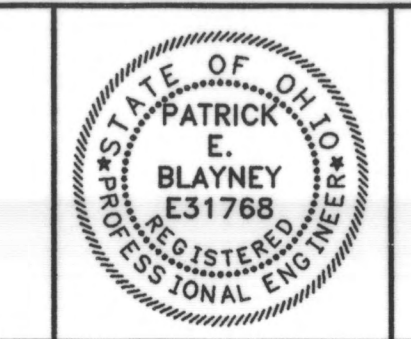
	BENCHMARK		EX. RIGHT OF WAY
	GUY WIRE		EXISTING FENCE
	MAIL BOX		PROPERTY LINE
	UTILITY POLE		WATER LINE
	SIGN		TELEPHONE LINE
	WATER VALVE		PROPOSED FORCE MAINS
	TREE (CONIFER)		EDGE OF PAVEMENT
	TREE (DECIDUOUS)		BUILDINGS
	TREE LINE		DITCH
	BUSH		PROPOSED PROPERTY LINES
	DUMPED ROCK FILL		PROPOSED RIGHT OF WAY
	COMPACTED GRANULAR BACKFILL		GUARDRAIL
	CONCRETE ENCASEMENT		AIR RELEASE MANHOLE
			PAVEMENT REPLACEMENT

INDEX MAP  
SCALE: 1"=300'

**R.D.Zande & Associates**

DESIGNED BY:	BGD	REVISIONS	
DRAWN BY:	ACM	DATE	
CHECKED BY:	THB	1/8/99	2" & 4" ALIGNMENT CHANGE
APPROVED BY:	MBT	1/15/99	8" ALIGNMENT CHANGE
DATE:	JANUARY 25, 1999		
JOB NO.	4363EN		

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER



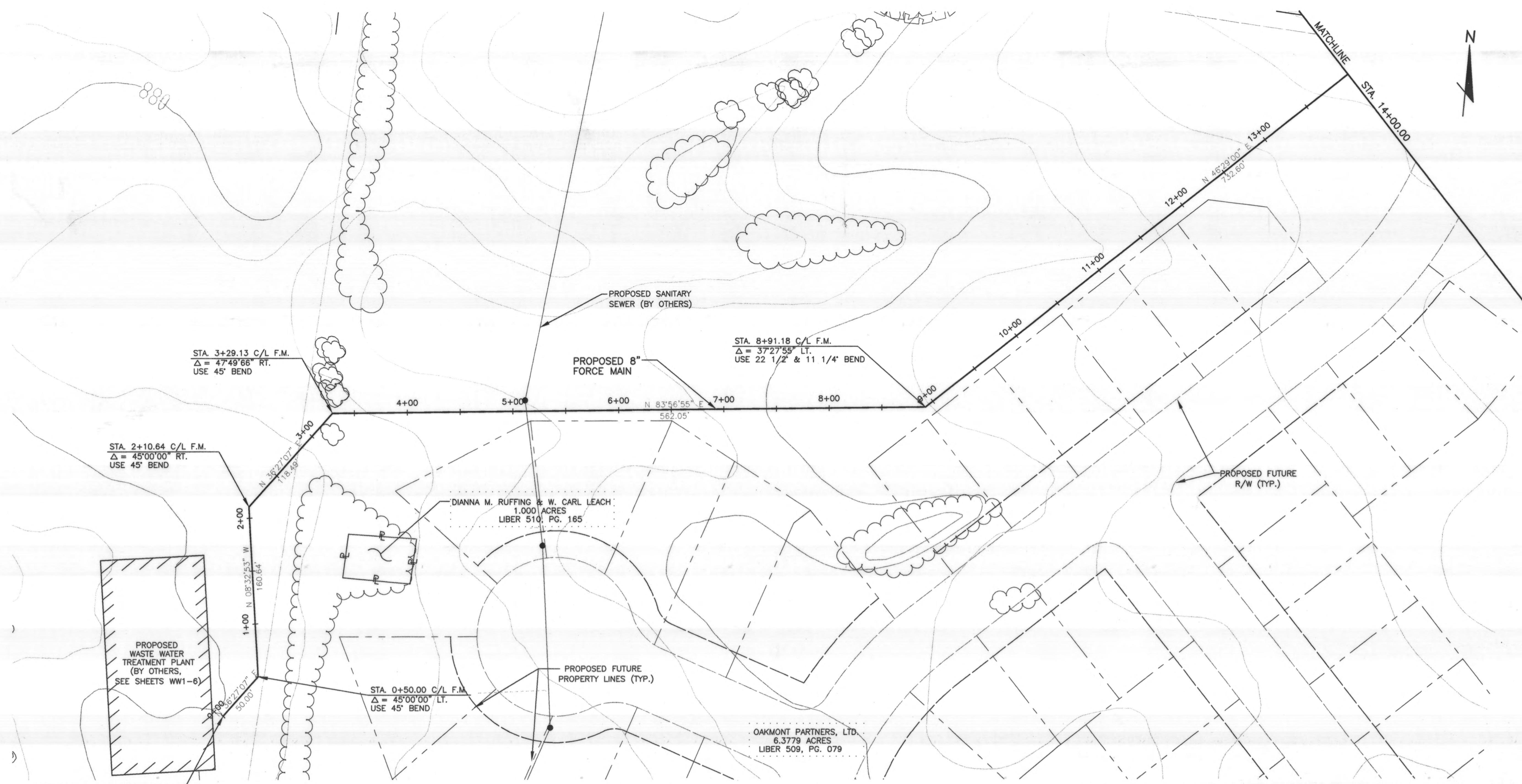
SCIOTO RESERVE  
8" , 4" & 2" FORCE MAINS

SCALE:  
AS SHOWN

GENERAL  
INDEX MAP AND  
ESTIMATED QUANTITIES

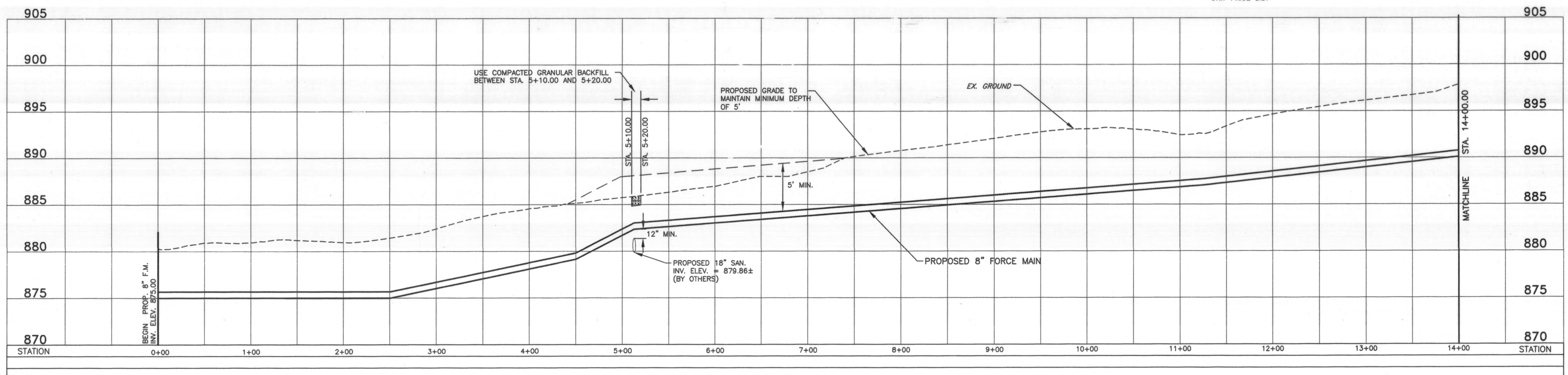
SHEET NO.  
FM-2

1/24/99 10:06 AM



CONTRACTOR SHALL COORDINATE STARTING LOCATION OF 8" FORCE MAIN WITH THE CONSTRUCTION OF THE PROPOSED WASTEWATER TREATMENT PLANT. IF FORCE MAIN IS INSTALLED PRIOR TO INSTALLATION OF THE PLANT CONTRACTOR SHALL PLUG 8" FORCE MAIN. COST TO BE INCLUDED IN THE BID PRICE FOR THE FORCE MAIN

NOTE: CONTRACTOR SHALL MAINTAIN A 5' MIN. COVER (EXCEPT WHERE INDICATED) ABOVE THE CROWN OF THE PIPE. AIR RELEASES ARE SHOWN AT ALL HIGH POINTS IN THE FORCE MAIN. IF, PRIOR TO CONSTRUCTION OF FORCE MAIN SECTIONS, THE CONTRACTOR DETERMINES THAT ADDITIONAL HIGH POINTS MAY BE CREATED TO MAINTAIN THE MIN. COVER REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER. AN AIR RELEASE SHALL BE INSTALLED AT EACH HIGH POINT ONLY WITH THE ENGINEER'S APPROVAL. THE ENGINEER'S APPROVAL MUST BE OBTAINED WELL IN ADVANCE OF THE POTENTIAL CREATION OF ADDITIONAL HIGH POINTS. THE CONTRACTOR WILL BE COMPENSATED FOR ADDITIONAL AIR RELEASES AT THE UNIT PRICE BID.

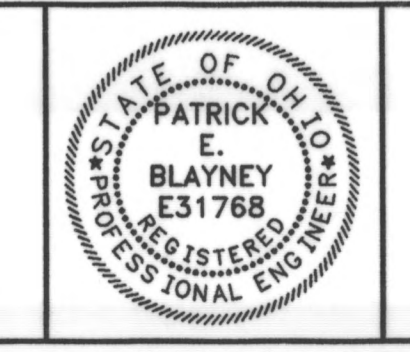


DATE PLOTTED: 1/25/99 10:15 AM



DESIGNED BY:	BGD	REVISIONS
DRAWN BY:	ACM	REMARKS
CHECKED BY:	THB	DATE
APPROVED BY:	MBT	1/8/99 STA. 1+50 TO 11+00
DATE:	JANUARY 25, 1999	
JOB NO.	4363EN	

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER

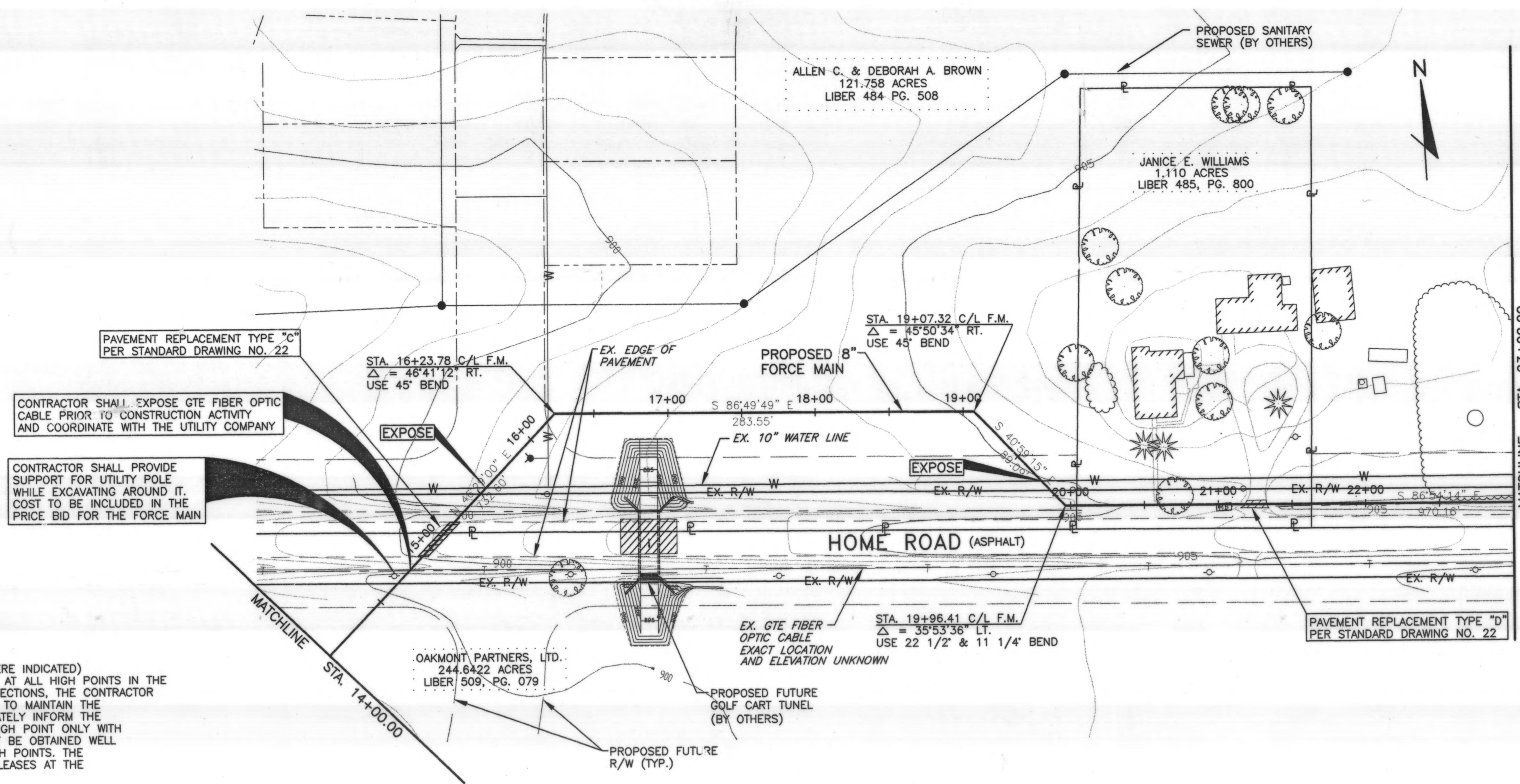


SCIOTO RESERVE  
8" , 4" & 2" FORCE MAINS

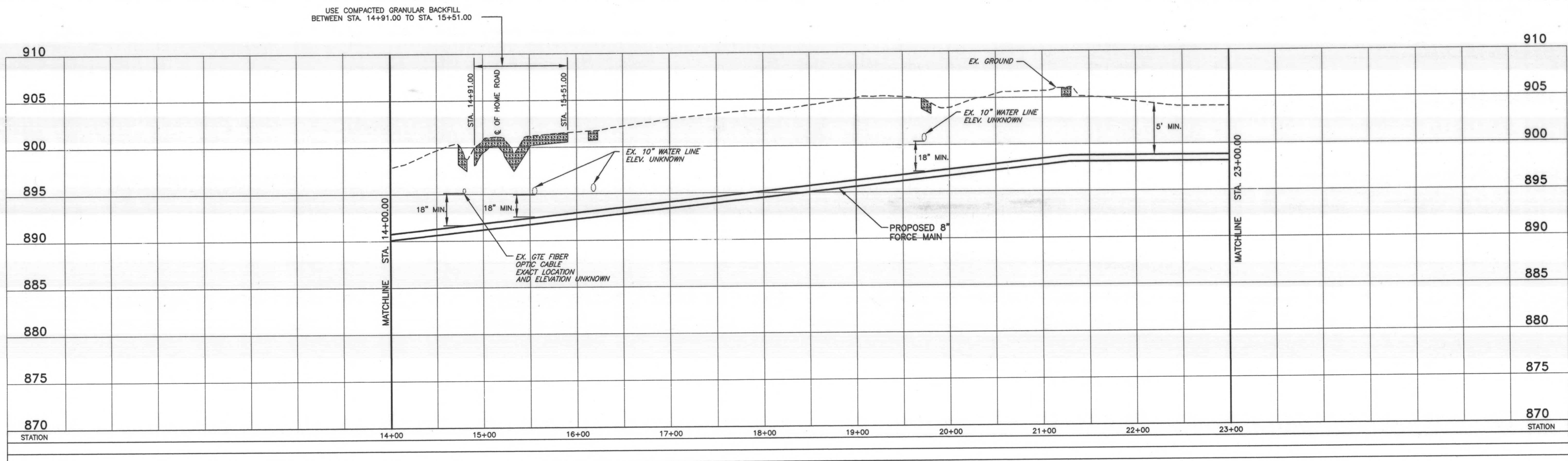
SCALE:  
HORZ. 1"=50'  
VERT. 1"=5'

8" FORCE MAIN  
PLAN & PROFILE

SHEET NO.  
FM-3



NOTE: CONTRACTOR SHALL MAINTAIN A 5' MIN. COVER (EXCEPT WHERE INDICATED) ABOVE THE CROWN OF THE PIPE. AIR RELEASES ARE SHOWN AT ALL HIGH POINTS IN THE FORCE MAIN. IF, PRIOR TO CONSTRUCTION OF FORCE MAIN SECTIONS, THE CONTRACTOR DETERMINES THAT ADDITIONAL HIGH POINTS MAY BE CREATED TO MAINTAIN THE MIN. COVER REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER. AN AIR RELEASE SHALL BE INSTALLED AT EACH HIGH POINT ONLY WITH THE ENGINEER'S APPROVAL. THE ENGINEER'S APPROVAL MUST BE OBTAINED WELL IN ADVANCE OF THE POTENTIAL CREATION OF ADDITIONAL HIGH POINTS. THE CONTRACTOR WILL BE COMPENSATED FOR ADDITIONAL AIR RELEASES AT THE UNIT PRICE BID.

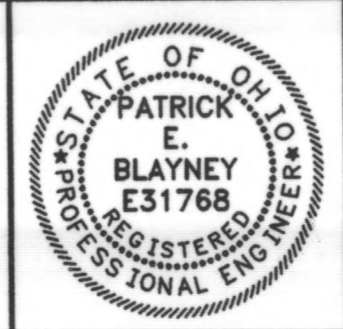


**R.D.Zande & Associates**

DESIGNED BY:	BGD
DRAWN BY:	ACM
CHECKED BY:	THB
APPROVED BY:	MBT
DATE:	JANUARY 25, 1999
JOB NO.	4363EN

REVISIONS	REMARKS

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER

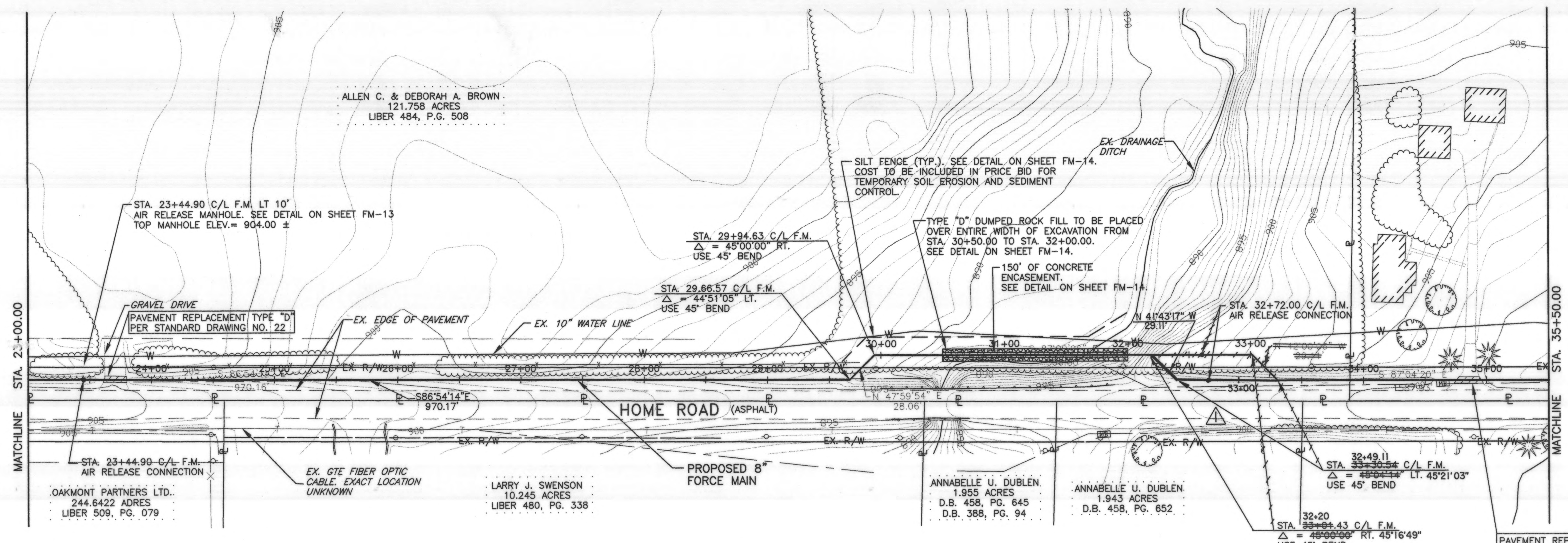


SCIOTO RESERVE  
8", 4" & 2" FORCE MAINS

SCALE:  
HORIZ. 1"=50'  
VERT. 1"=5'

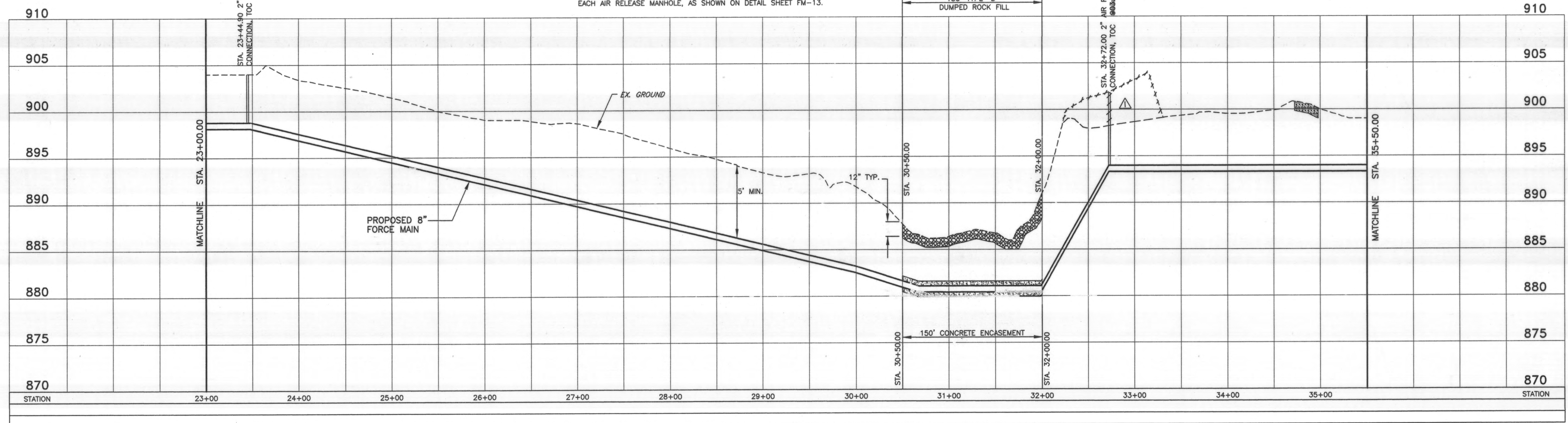
8" FORCE MAIN  
PLAN & PROFILE

SHEET NO.  
FM-4



NOTE: CONTRACTOR SHALL MAINTAIN A 5' MIN. COVER (EXCEPT WHERE INDICATED) ABOVE THE CROWN OF THE PIPE. AIR RELEASES ARE SHOWN AT ALL HIGH POINTS IN THE FORCE MAIN. IF, PRIOR TO CONSTRUCTION OF FORCE MAIN SECTIONS, THE CONTRACTOR DETERMINES THAT ADDITIONAL HIGH POINTS MAY BE CREATED TO MAINTAIN THE MIN. COVER REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER. AN AIR RELEASE SHALL BE INSTALLED AT EACH HIGH POINT ONLY WITH THE ENGINEER'S APPROVAL. THE ENGINEER'S APPROVAL MUST BE OBTAINED WELL IN ADVANCE OF THE POTENTIAL CREATION OF ADDITIONAL HIGH POINTS. THE CONTRACTOR WILL BE COMPENSATED FOR ADDITIONAL AIR RELEASES AT THE UNIT PRICE BID.

NOTE: PRIOR TO INSTALLATION OF THE FORCE MAIN LEADING INTO THE AIR RELEASE, THE CONTRACTOR SHALL ENSURE THAT THE DEPTH OF THE FORCE MAIN ALLOWS FOR PROPER CLEARANCE WITHIN EACH AIR RELEASE MANHOLE, AS SHOWN ON DETAIL SHEET FM-13.



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APPROVED BY:	MBT
DATE:	JANUARY 25, 1999
JOB NO.	4303EN

REVISIONS		REV. No.
DATE	REMARKS	
8-25-99	REVISED HORIZONTAL ALIGNMENT OF FORCE MAIN TO AVOID WATERLINE.	1

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER



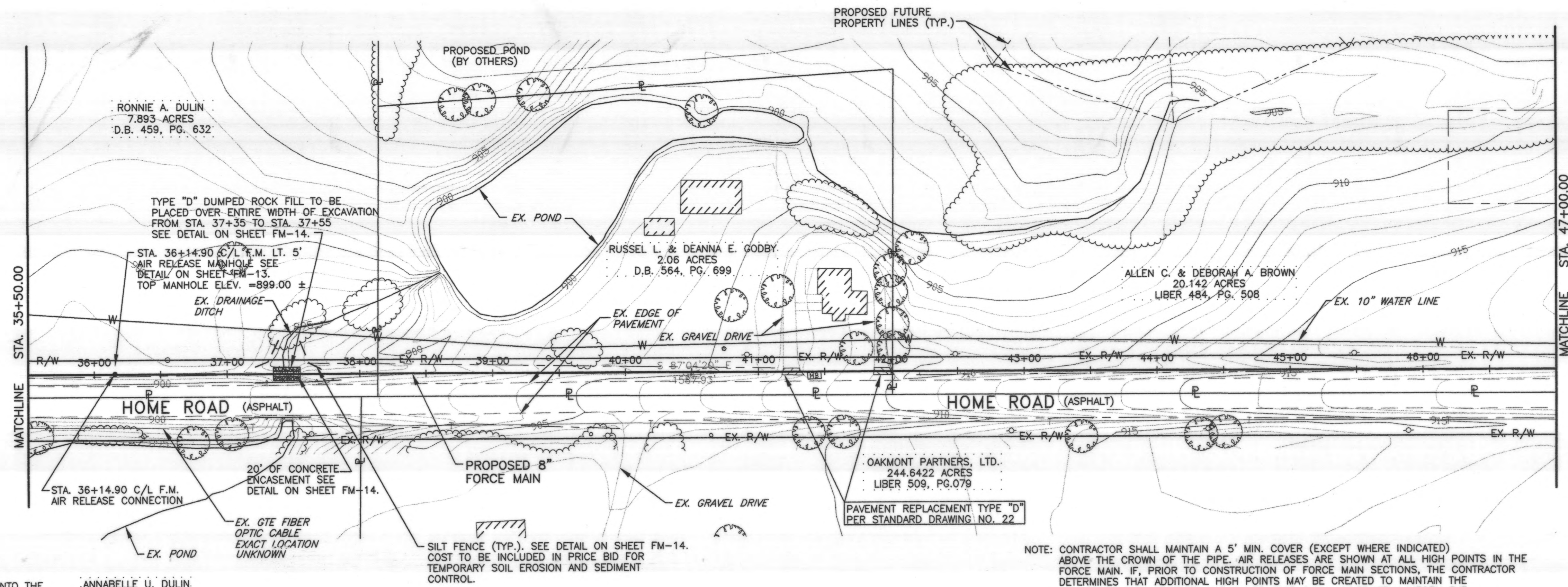
SCIOTO RESERVE  
8", 4" & 2" FORCE MAINS

SCALE:  
HORZ. 1"=50'  
VERT. 1"=5'

8" FORCE MAIN  
PLAN & PROFILE

SHEET NO.  
FM-5

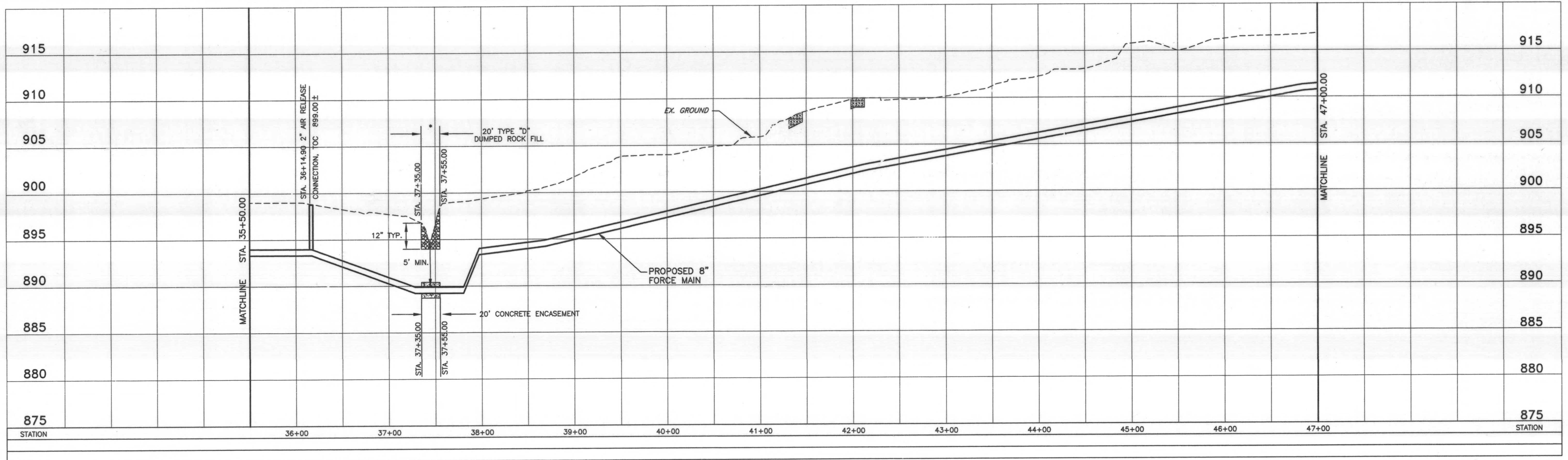
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NOTE: PRIOR TO INSTALLATION OF THE FORCE MAIN LEADING INTO THE AIR RELEASE, THE CONTRACTOR SHALL ENSURE THAT THE DEPTH OF THE FORCE MAIN ALLOWS FOR PROPER CLEARANCE WITHIN EACH AIR RELEASE MANHOLE, AS SHOWN ON DETAIL SHEET FM-13.

ANNABELLE U. DULIN  
10.157 ACRES  
D.B. 458, PG. 652

NOTE: CONTRACTOR SHALL MAINTAIN A 5' MIN. COVER (EXCEPT WHERE INDICATED) ABOVE THE CROWN OF THE PIPE. AIR RELEASES ARE SHOWN AT ALL HIGH POINTS IN THE FORCE MAIN. IF, PRIOR TO CONSTRUCTION OF FORCE MAIN SECTIONS, THE CONTRACTOR DETERMINES THAT ADDITIONAL HIGH POINTS MAY BE CREATED TO MAINTAIN THE MIN. COVER REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER. AN AIR RELEASE SHALL BE INSTALLED AT EACH HIGH POINT ONLY WITH THE ENGINEER'S APPROVAL. THE ENGINEER'S APPROVAL MUST BE OBTAINED WELL IN ADVANCE OF THE POTENTIAL CREATION OF ADDITIONAL HIGH POINTS. THE CONTRACTOR WILL BE COMPENSATED FOR ADDITIONAL AIR RELEASES AT THE UNIT PRICE BID.



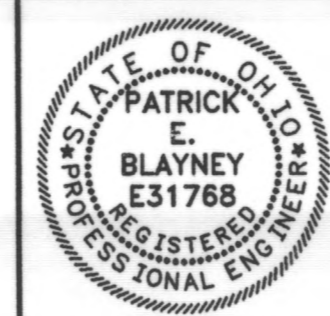
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**R.D.Zande & Associates**

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CHECKED BY:	THB
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DATE:	JANUARY 25, 1999
JOB NO.	4363EN

REVISIONS	REMARKS

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER

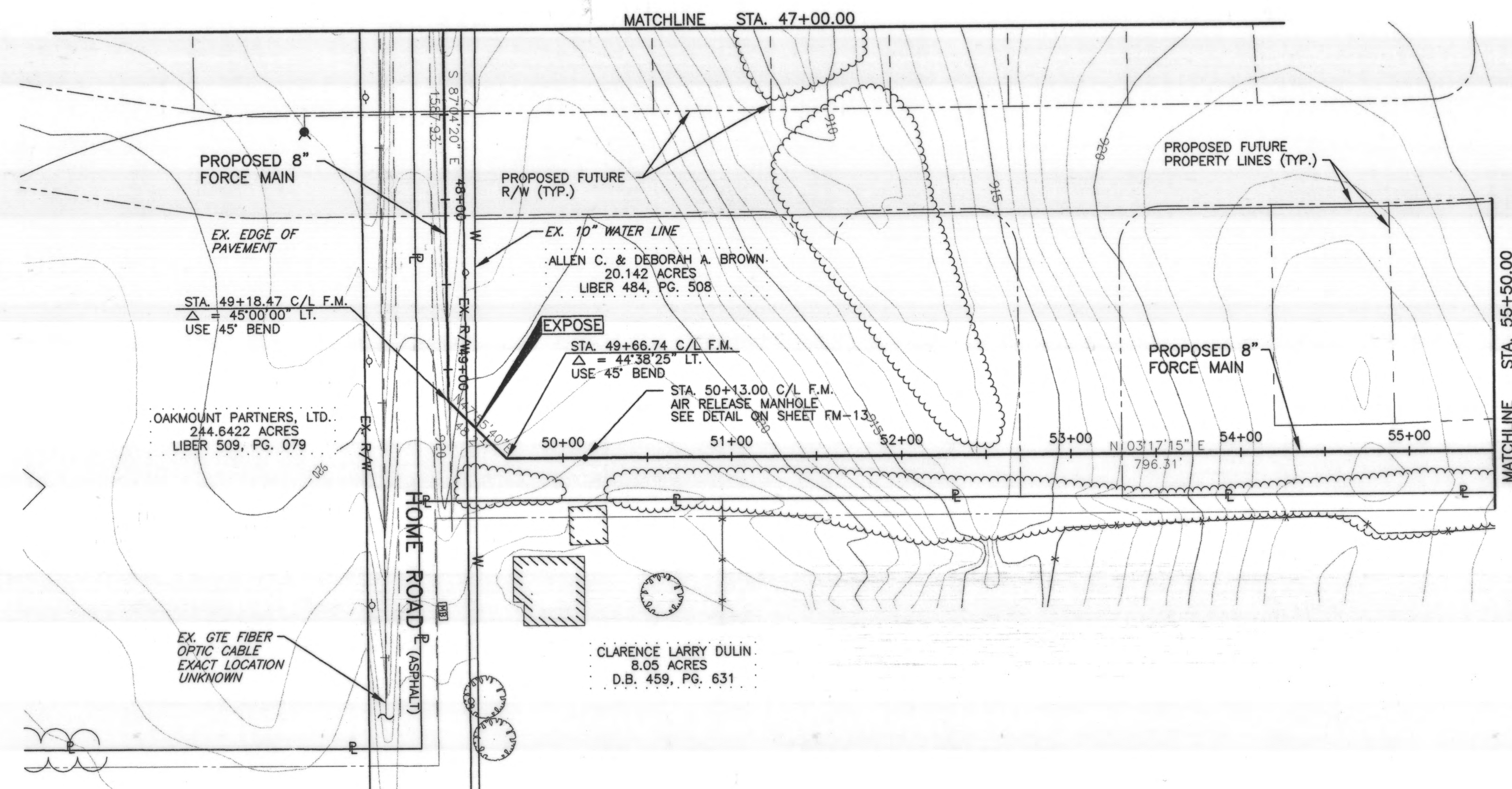


SCIO TO RESERVE  
8" , 4" & 2" FORCE MAINS

SCALE:  
HORZ. 1"=50'  
VERT. 1"=5'

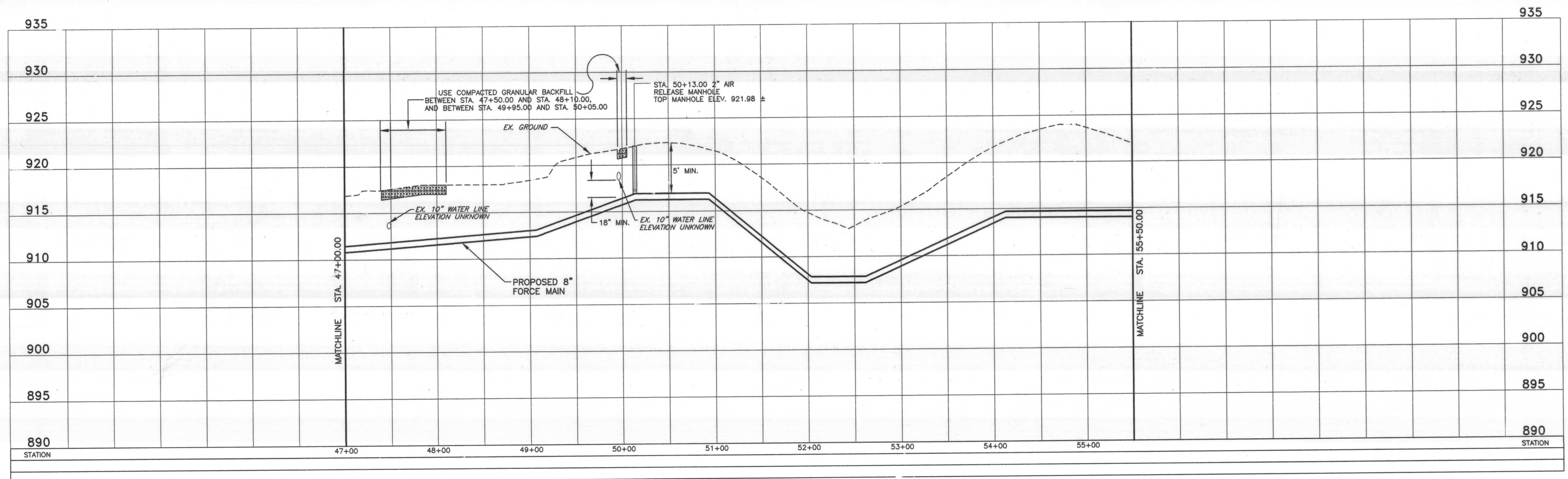
8" FORCE MAIN  
PLAN & PROFILE

SHEET NO.  
FM-6



NOTE: PRIOR TO INSTALLATION OF THE FORCE MAIN LEADING INTO THE AIR RELEASE, THE CONTRACTOR SHALL ENSURE THAT THE DEPTH OF THE FORCE MAIN ALLOWS FOR PROPER CLEARANCE WITHIN EACH AIR RELEASE MANHOLE, AS SHOWN ON DETAIL SHEET FM-13.

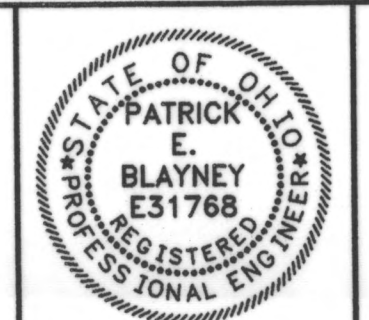
NOTE: CONTRACTOR SHALL MAINTAIN A 5' MIN. COVER (EXCEPT WHERE INDICATED) ABOVE THE CROWN OF THE PIPE. AIR RELEASES ARE SHOWN AT ALL HIGH POINTS IN THE FORCE MAIN. IF, PRIOR TO CONSTRUCTION OF FORCE MAIN SECTIONS, THE CONTRACTOR DETERMINES THAT ADDITIONAL HIGH POINTS MAY BE CREATED TO MAINTAIN THE MIN. COVER REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER. AN AIR RELEASE SHALL BE INSTALLED AT EACH HIGH POINT ONLY WITH THE ENGINEER'S APPROVAL. THE ENGINEER'S APPROVAL MUST BE OBTAINED WELL IN ADVANCE OF THE POTENTIAL CREATION OF ADDITIONAL HIGH POINTS. THE CONTRACTOR WILL BE COMPENSATED FOR ADDITIONAL AIR RELEASES AT THE UNIT PRICE BID.



**R.D.Zande & Associates**

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DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER



SCIOTO RESERVE  
8" , 4" & 2" FORCE MAINS

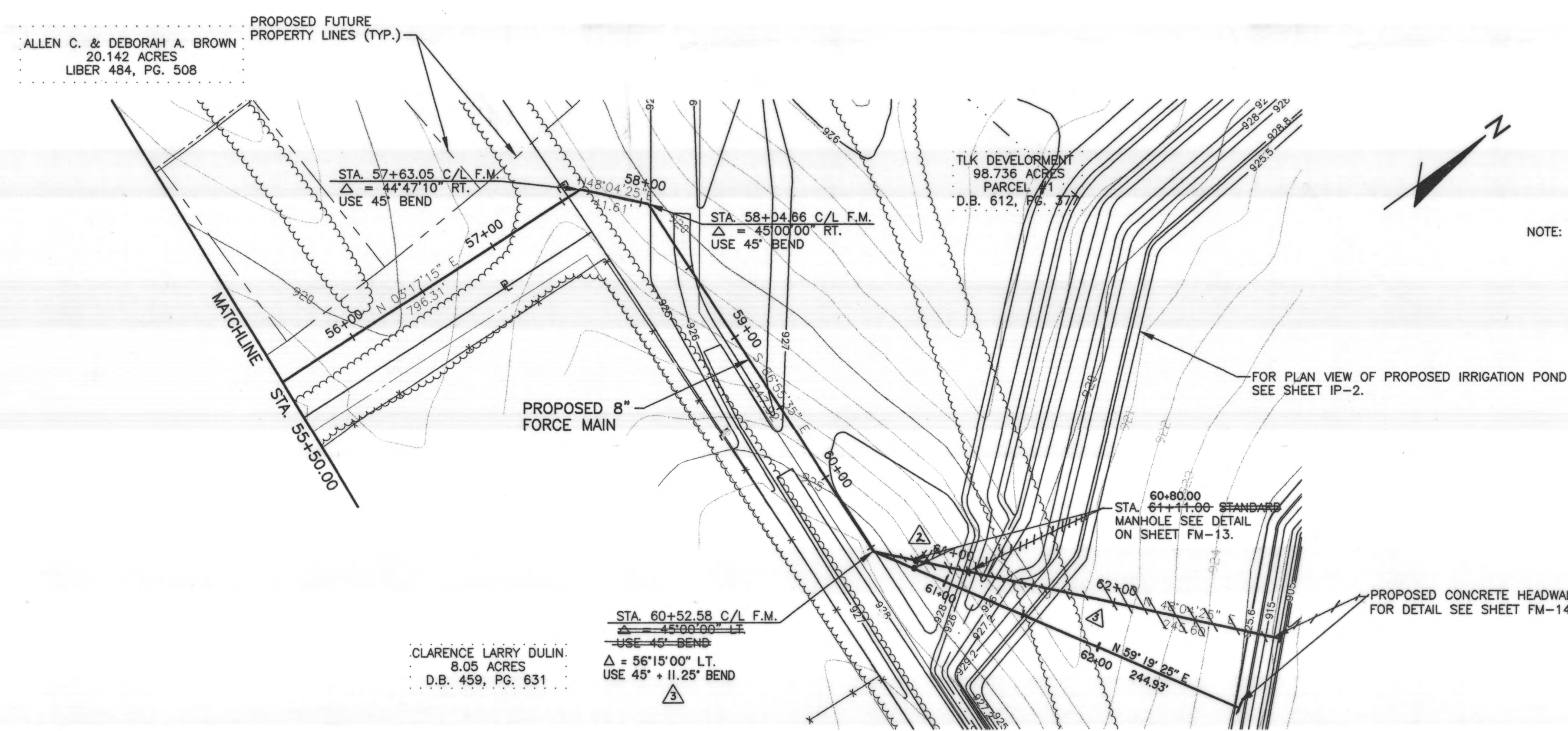
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HORZ. 1"=50'  
VERT. 1"=5'

8" FORCE MAIN  
PLAN & PROFILE

SHEET NO.  
FM-7

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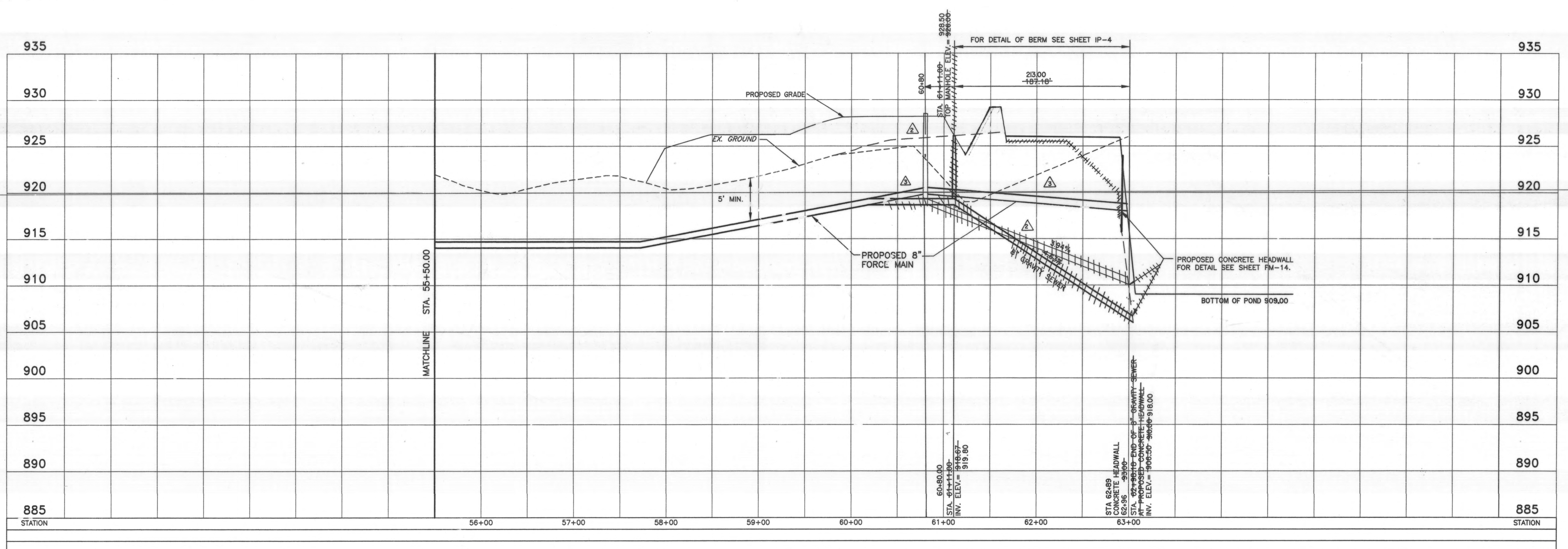
PRIOR TO INSTALLATION OF THE FORCE MAIN LEADING INTO THE AIR RELEASE, THE CONTRACTOR SHALL ENSURE THAT THE DEPTH OF THE FORCE MAIN ALLOWS FOR PROPER CLEARANCE WITHIN EACH AIR RELEASE MANHOLE, AS SHOWN ON DETAIL SHEET FM-13.

NOTE: CONTRACTOR SHALL MAINTAIN A 5' MIN. COVER (EXCEPT WHERE INDICATED) ABOVE THE CROWN OF THE PIPE. AIR RELEASES ARE SHOWN AT ALL HIGH POINTS IN THE FORCE MAIN IF, PRIOR TO CONSTRUCTION OF FORCE MAIN SECTIONS, THE CONTRACTOR DETERMINES THAT ADDITIONAL HIGH POINTS MAY BE CREATED TO MAINTAIN THE MIN. COVER REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER. AN AIR RELEASE SHALL BE INSTALLED AT EACH HIGH POINT ONLY WITH THE ENGINEER'S APPROVAL. THE ENGINEER'S APPROVAL MUST BE OBTAINED WELL IN ADVANCE OF THE POTENTIAL CREATION OF ADDITIONAL HIGH POINTS. THE CONTRACTOR WILL BE COMPENSATED FOR ADDITIONAL AIR RELEASES AT THE UNIT PRICE BID.

NOTE: CONTRACTOR SHALL COORDINATE FORCE MAIN AND CONCRETE HEADWALL INSTALLATION WITH CONSTRUCTION OF PROPOSED IRRIGATION POND. IF FORCE MAIN IS INSTALLED PRIOR TO IRRIGATION POND, THE END OF FORCE MAIN SHALL BE PLUGGED AND CONSTRUCTION OF CONCRETE HEADWALL SHALL BE DELAYED UNTIL POND IS BUILT.

FOR PLAN VIEW OF PROPOSED IRRIGATION POND SEE SHEET IP-2.

PROPOSED CONCRETE HEADWALL FOR DETAIL SEE SHEET FM-14.

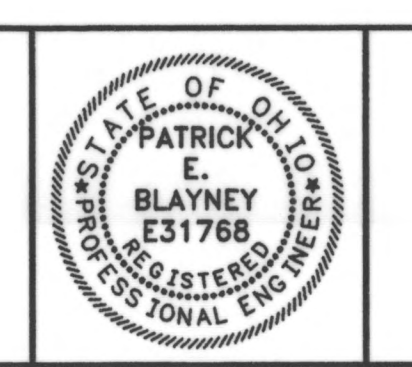


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DESIGNED BY:	BGD	REVISIONS
DRAWN BY:	ACM	DATE
CHECKED BY:	THB	8/27/99
APPROVED BY:	MBT	9/11/99
DATE:	JANUARY 25, 1999	
JOB NO.	4363EN	

DELAWARE COUNTY  
 DELAWARE COUNTY SANITARY ENGINEER

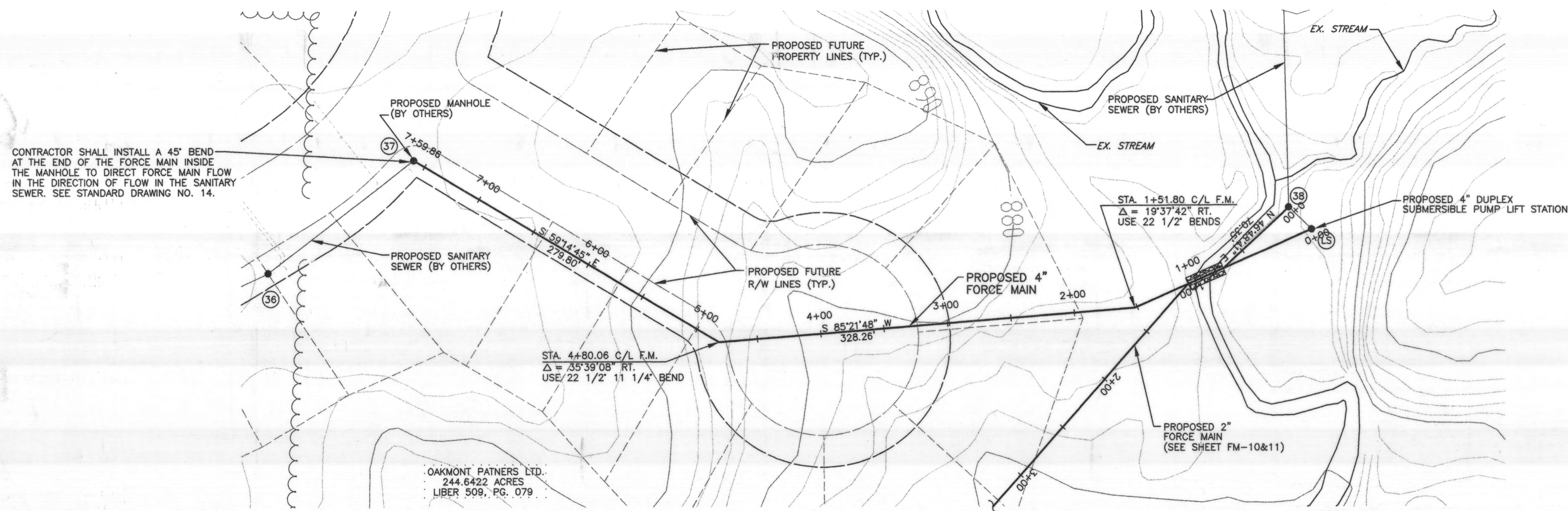


SCIOTO RESERVE  
 8", 4" & 2" FORCE MAINS

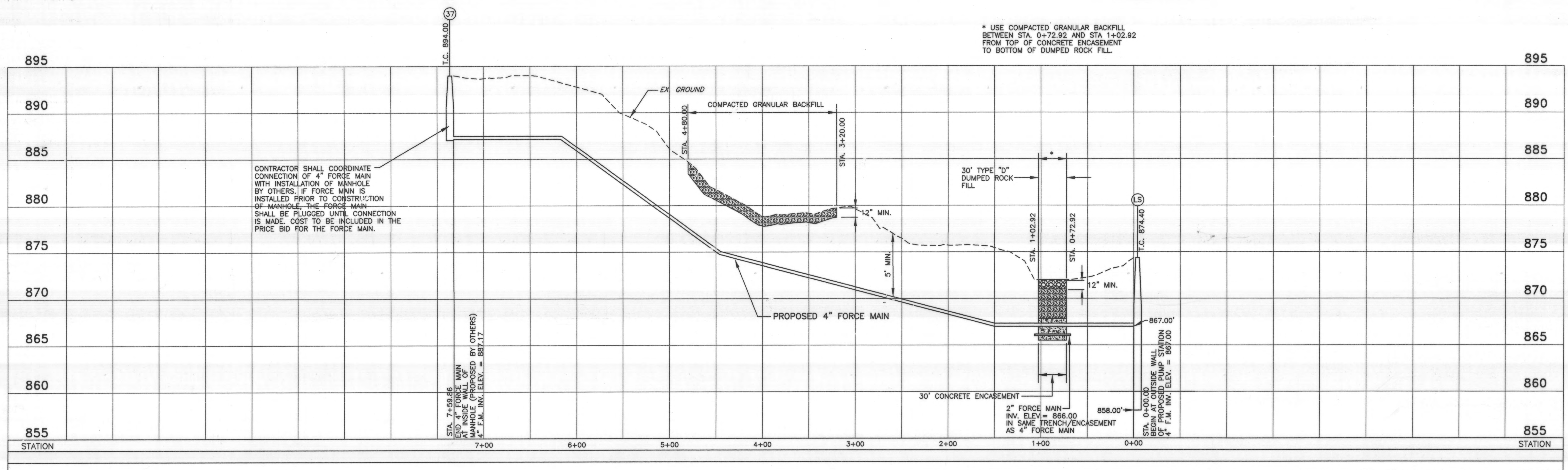
SCALE:  
 HORZ. 1"=50'  
 VERT. 1"=5'

8" FORCE MAIN  
 FORCE MAIN  
 PLAN & PROFILE

SHEET NO.  
 FM-8



NOTE: CONTRACTOR SHALL MAINTAIN A 5' MIN. COVER (EXCEPT WHERE INDICATED) ABOVE THE CROWN OF THE PIPE. AIR RELEASES ARE SHOWN AT ALL HIGH POINTS IN THE FORCE MAIN. IF, PRIOR TO CONSTRUCTION OF FORCE MAIN SECTIONS, THE CONTRACTOR DETERMINES THAT ADDITIONAL HIGH POINTS MAY BE CREATED TO MAINTAIN THE MIN. COVER REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER. AN AIR RELEASE SHALL BE INSTALLED AT EACH HIGH POINT ONLY WITH THE ENGINEER'S APPROVAL. THE ENGINEER'S APPROVAL MUST BE OBTAINED WELL IN ADVANCE OF THE POTENTIAL CREATION OF ADDITIONAL HIGH POINTS. THE CONTRACTOR WILL BE COMPENSATED FOR ADDITIONAL AIR RELEASES AT THE UNIT PRICE BID.



\* USE COMPACTED GRANULAR BACKFILL BETWEEN STA. 0+72.92 AND STA. 1+02.92 FROM TOP OF CONCRETE ENCASUREMENT TO BOTTOM OF DUMPED ROCK FILL.

CONTRACTOR SHALL COORDINATE CONNECTION OF 4" FORCE MAIN WITH INSTALLATION OF MANHOLE BY OTHERS. IF FORCE MAIN IS INSTALLED PRIOR TO CONSTRUCTION OF MANHOLE, THE FORCE MAIN SHALL BE PLUGGED UNTIL CONNECTION IS MADE. COST TO BE INCLUDED IN THE PRICE BID FOR THE FORCE MAIN.

STA. 7+68.08 END 4" FORCE MAIN AT INSIDE WALL OF MANHOLE (PROPOSED BY OTHERS) 4" F.M. INV. ELEV. = 868.17

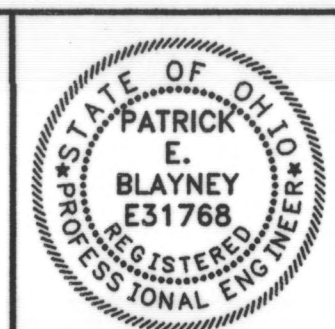
30" TYPE "D" DUMPED ROCK FILL  
 12" MIN.  
 5' MIN.  
 30' CONCRETE ENCASUREMENT  
 2" FORCE MAIN INV. ELEV. = 866.00 IN SAME TRENCH/ENCASUREMENT AS 4" FORCE MAIN  
 858.00'  
 STA. 0+00.00 INSIDE WALL OF PROPOSED PUMP STATION OF 4" F.M. INV. ELEV. = 867.00



DESIGNED BY: BGD  
 DRAWN BY: ACM  
 CHECKED BY: THB  
 APPROVED BY: MBT  
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REVISIONS	DATE	REMARKS

DELAWARE COUNTY  
 DELAWARE COUNTY SANITARY ENGINEER

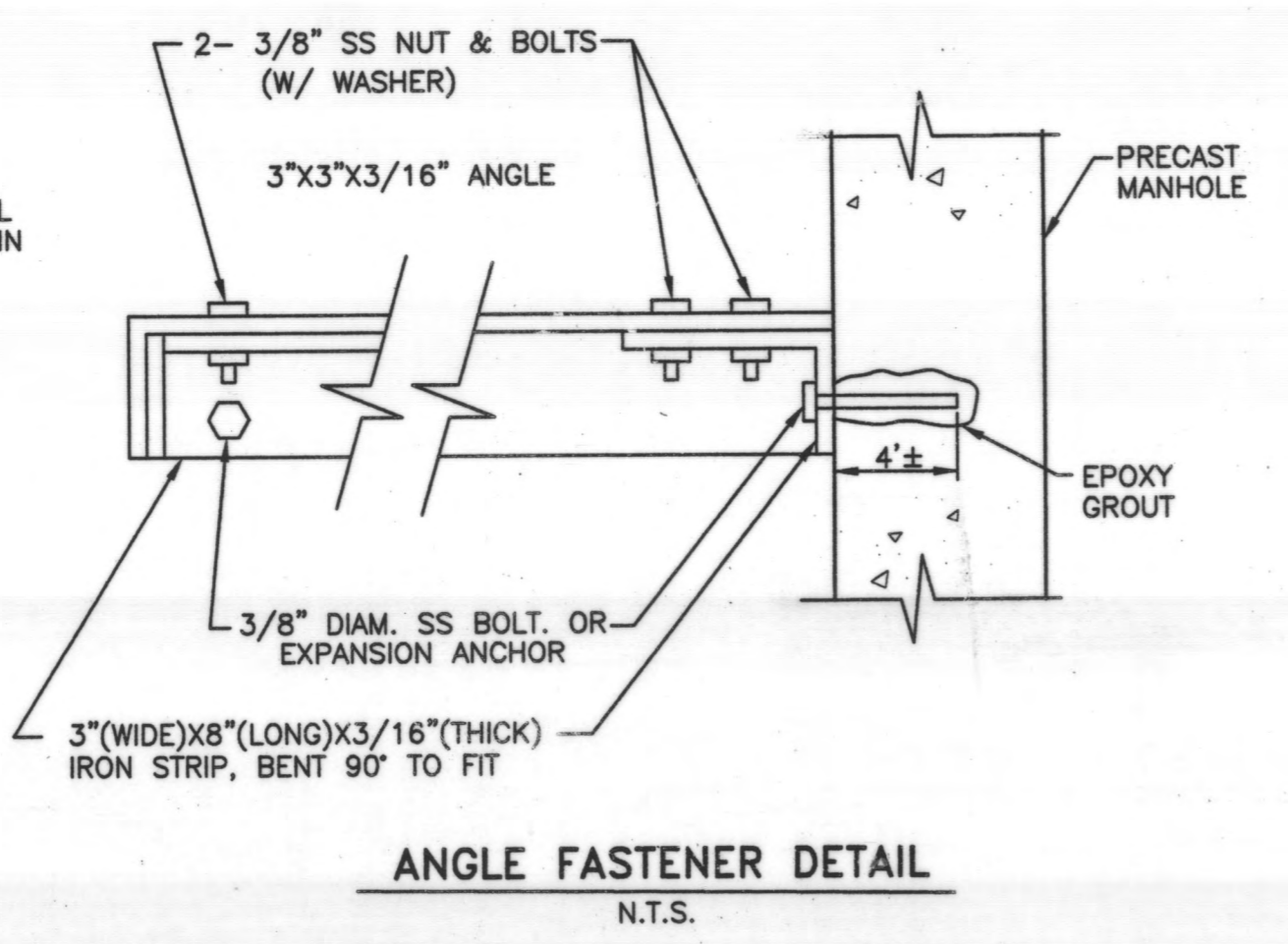
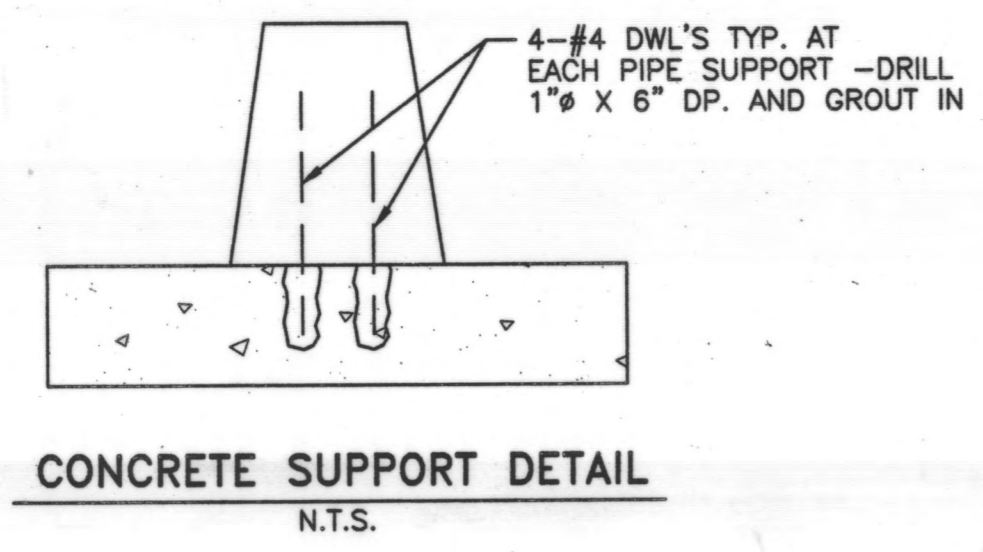


SCIOTO RESERVE  
 8" , 4" & 2" FORCE MAINS

SCALE:  
 HORZ. 1"=50'  
 VERT. 1"=5'

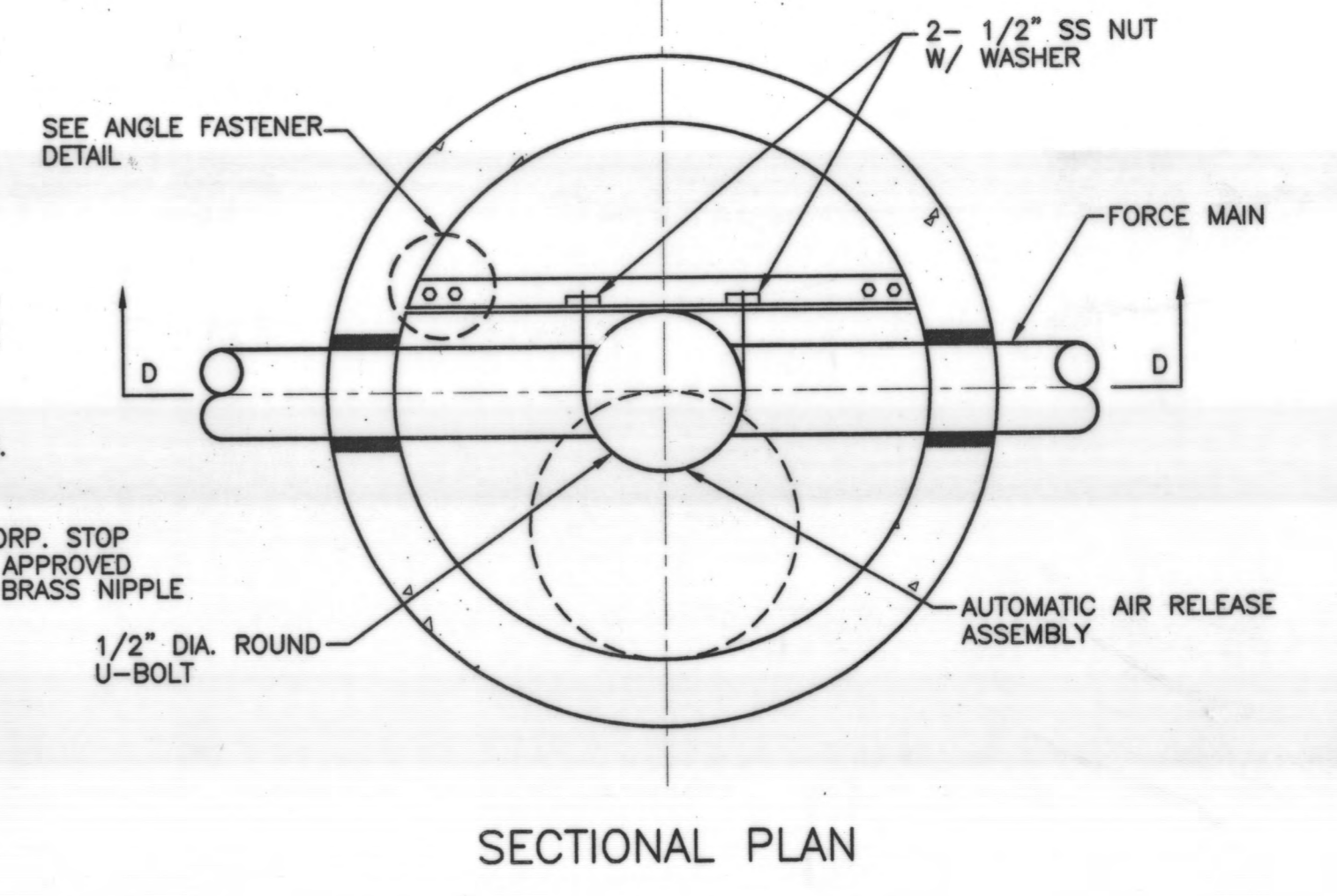
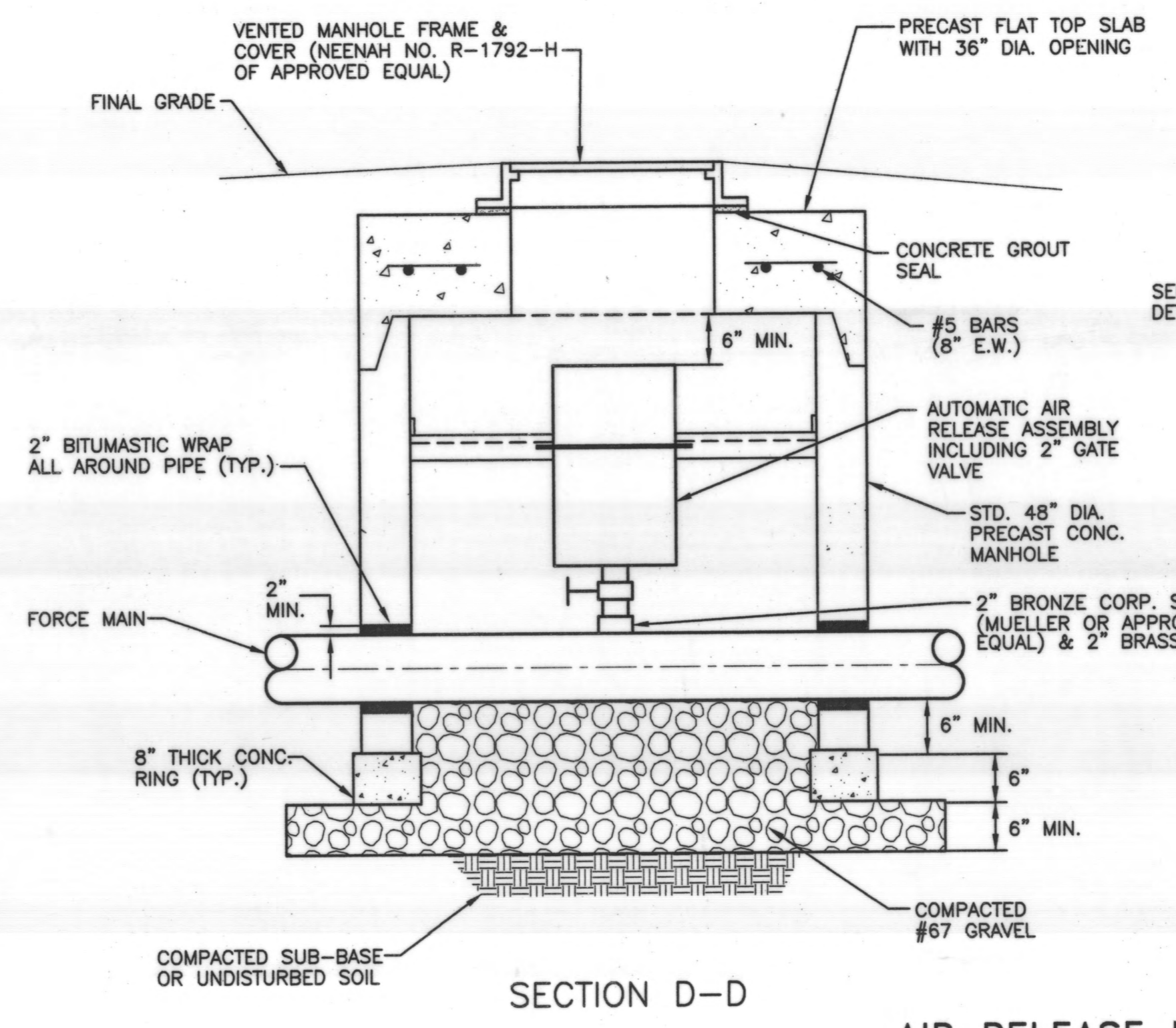
4" FORCE MAIN  
 PLAN & PROFILE

SHEET NO.  
 FM-9

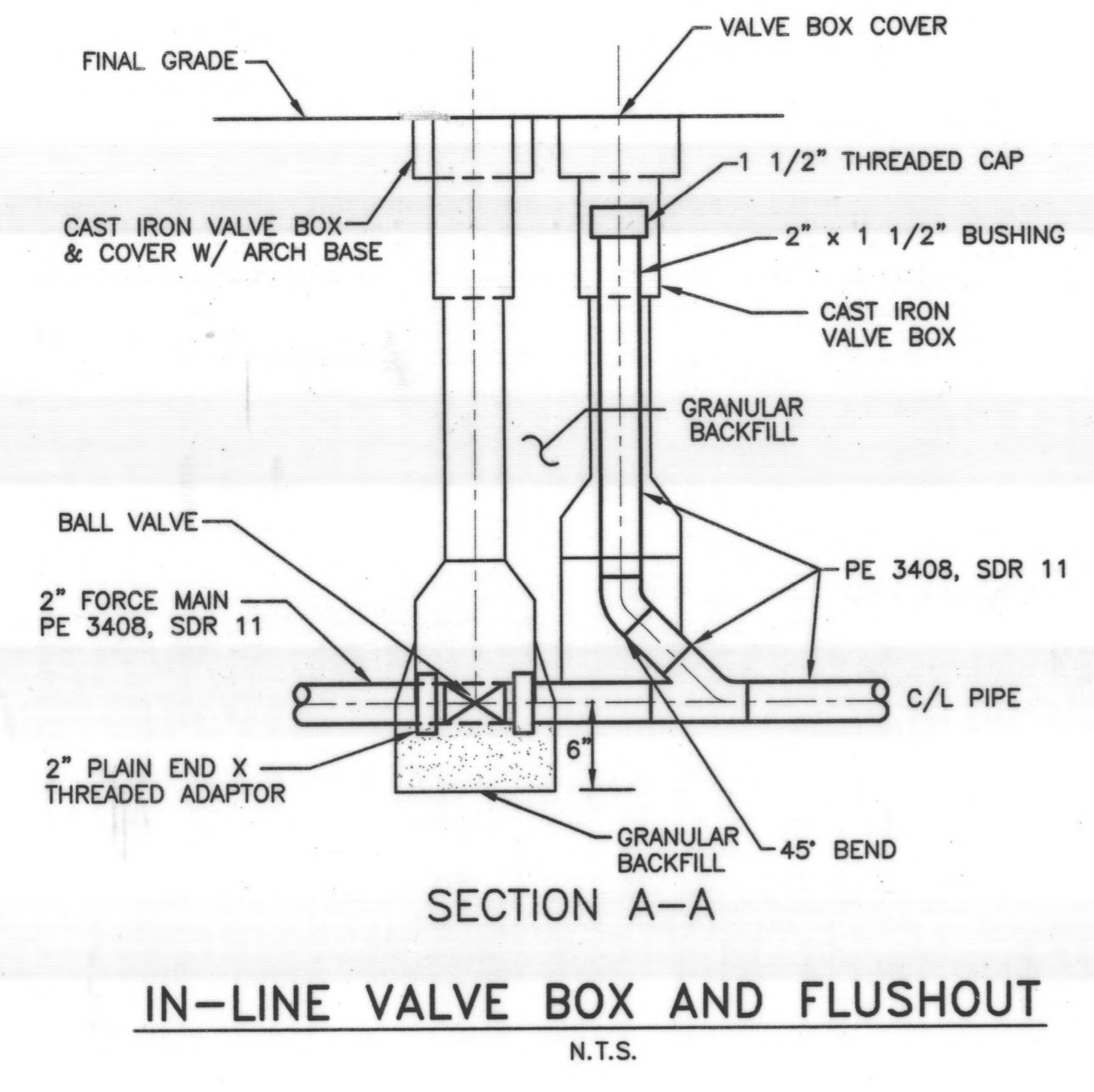
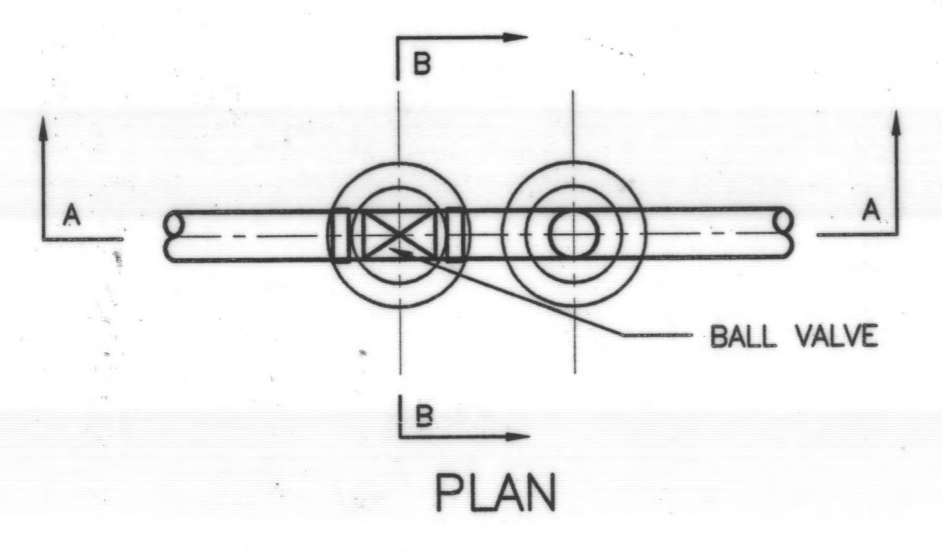
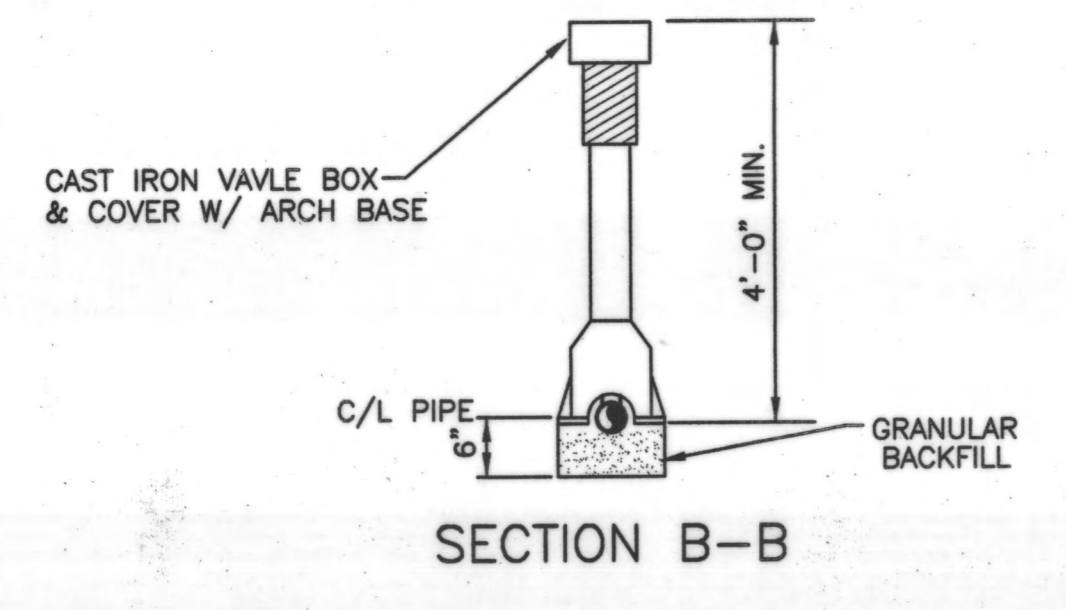


**AIR RELEASE NOTES**

1. AIR RELEASE DETAILS SHALL BE USED IN CONJUNCTION WITH THE DELAWARE COUNTY STANDARD PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF SANITARY FACILITIES.
2. 36" OPENINGS IN THE AIR RELEASE MANHOLES SHALL BE OFFSET FROM THE CENTER OF THE MANHOLE TO ALLOW FOR ACCESS BY MAINTENANCE PERSONNEL. THE DISTANCE OFFSET SHALL BE APPROVED BY THE ENGINEER PRIOR TO THE ORDERING OF MANHOLES.



**AIR RELEASE MANHOLE DETAIL**  
N.T.S.



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REVISIONS	REMARKS

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER



SCIOTO RESERVE  
8" , 4" & 2" FORCE MAINS

SCALE:  
NOT TO SCALE

GENERAL
DETAILS

SHEET NO.  
FM-13

**STREAM MITIGATIVE MEASURES**

CONTRACTOR SHALL GIVE SPECIAL ATTENTION TO PROPER SEWER CONSTRUCTION, PROTECTION OF THE STREAM AND RIPARIAN AREAS, AND THE MITIGATIVE MEASURE NOTES, SHOWN BELOW AS WELL AS THOSE ON THE DRAWINGS AND STATED IN THE SPECIFICATIONS. FAILURE TO CONFORM TO THESE NOTES WILL RESULT IN PENALTIES INCLUDING PAYMENT WITHHOLDING UNTIL COMPLIANCE WITH NOTES REMEDIATION HAS BEEN COMPLETED.

THE CONTRACTOR SHALL CONFORM TO THE FOLLOWING REQUIREMENTS WHEN CONSTRUCTION OF THE SEWER IS WITHIN THE STREAM BANKS. THESE MEASURES ARE BEING TAKEN SO THAT THE STREAM CAN BE RESTORED TO THE "BEFORE CONSTRUCTION" CONDITIONS.

- A. STREAM AREA CONSTRUCTION SHALL BE INITIATED AND COMPLETED DURING NORMAL TO LOW FLOW PERIODS AND WITHIN THE SAME DAY.
- B. TEMPORARY DIVERSION OF STREAM FLOW AROUND CONSTRUCTION AREA WILL BE PERMITTED PROVIDED THE METHOD TO BE USED RECEIVED PRIOR APPROVAL BY GREENE COUNTY AND ANY DISTURBANCE TO THE STREAM IS MINIMIZED. DISTURBED AREAS SHALL BE IMMEDIATELY RESTORED USING THE PROPER MITIGATIVE MEASURES.
- C. STOCKPILE EXISTING STREAM BOTTOM MATERIAL FOR A MINIMUM DEPTH OF 12" PRIOR TO EXCAVATION OF TRENCH. STOCKPILE IN AREAS THAT DO NOT INCREASE DAMAGE TO THE STREAM AND WILL NOT BE SUBJECT TO REMOVAL BY HIGH STREAM FLOWS AND NOT DAMAGE THE RIPARIAN VEGETATION.
- D. DEPOSIT EXCAVATED TRENCH MATERIAL WITHIN CONSTRUCTION AREA AND PROTECTED FROM STREAM FLOW OR OUTSIDE STREAM AREA.
- E. WHERE THE TRENCH CROSSES A STREAM WITH A SOLID OR LAYERED ROCK BOTTOM, THE CONTRACTOR SHALL SAWCUT THE TRENCH EDGES TO A MINIMUM DEPTH OF 4 INCHES. THE TRENCH SHALL BE BACKFILLED WITH CONCRETE ENCASUREMENT AS INDICATED IN THE STREAM CROSSING DETAIL. THE CONTRACTOR SHALL ALSO PROVIDE NECESSARY MEANS TO PREVENT FRACTURING OF THE BEDROCK DUE TO EQUIPMENT CROSSINGS.
- F. IMMEDIATELY FOLLOWING INSTALLATION OF SEWER, REPLACE STREAM BOTTOM MATERIAL IN A REASONABLY SIMILAR MANNER AS THAT OF PRE-CONSTRUCTION. CONSTRUCT AND MAINTAIN PRE-CONSTRUCTION STREAM BED SLOPE.
- G. STREAM BANK RESTORATION OR ROCK CHANNEL PROTECTION SHALL BE USED WHEN THE EXCAVATION OF THE SEWER DISTURBS THE STREAM BANK AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER. THE LIMITS OF CONSTRUCTION SHALL BE AS SHOWN ON THE DRAWINGS.
- H. AT STREAM CROSSINGS, DO NOT DISTURB THE VEGETATION WITHIN THE CONSTRUCTION EASEMENT EXCEPT FOR THE AREA REQUIRED FOR EXCAVATION AND EQUIPMENT PASSAGE. THIS STREAM CROSSING AREA SHALL INCLUDE THE STREAM AND THE STREAM BANKS.
- I. SEE SPECIFIC NOTES ON THE DRAWINGS FOR OTHER CONSIDERATIONS.

DURING HIGH STREAM FLOW PERIODS, CONSTRUCTION WORK IN THE STREAM IS PROHIBITED. CONSTRUCTION OF SEWER SEGMENTS IN AREAS AWAY FROM THE STREAM WILL BE PERMITTED. CONTRACTOR MUST VERIFY SEWER SLOPES FOR CONFORMANCE WITH THE DRAWINGS AND INSTALLED SEGMENTS IN THESE AREAS.

OPERATION OF EQUIPMENT WITHIN THE STREAM BANKS SHALL NOT BE PERMITTED, EXCEPT DURING ACTUAL SEWER INSTALLATION. THE CONTRACTOR SHALL NOT CONSTRUCT HAUL ROADS THROUGH STREAM UNLESS PRIOR APPROVAL IS GRANTED BY THE ENGINEER. IF IT IS NECESSARY TO HAVE HAUL ROADS CROSS THE STREAM, TEMPORARY BRIDGE CULVERT CROSSINGS, PLACEMENT OF TREE TRUNKS REMOVED FROM OTHER LOCATIONS OF THE PROJECT LAID LENGTH WISE IN THE STREAM, OR OTHER PRE-APPROVED METHODS SHALL BE CONSTRUCTED TO AVOID CONTINUOUS STREAM IMPACTS. LIMIT CLEARING WITHIN THE EASEMENT TO THE MINIMUM AREA REQUIRED FOR THE PERFORMANCE OF THE WORK.

PROVIDE AND MAINTAIN EROSION PROTECTION USING STRAW BALES OR SILT FENCING ALONG CLEARED SLOPING AREAS, EXPOSED SOILS WITHIN 25 FEET OF TOP OF STREAM BANK, STREAM CROSSING SITES, AND ANY OTHER EROSION PRONE AREA.

WHEN CONSTRUCTION IS ADJACENT TO THE STREAM, MAINTAIN STREAM BANK COVER BY USING THE AREA ON THE OPPOSITE SIDE OF THE SEWER TO DEPOSIT EXCAVATED MATERIAL DURING CONSTRUCTION WORK. NO VEGETATION SHALL BE DAMAGED OUTSIDE THE CONSTRUCTION LIMITS. MATERIAL STORAGE FOR LONGER THAN 3 DAYS AND CONTINUOUS EQUIPMENT MOVEMENT WITHIN THE DRIPLINE OF TREES TO BE SAVED WILL NOT BE ALLOWED.

RUNOFF SHALL BE DIVERTED WITH WATER BARS OR SWALES TO A SEDIMENT TRAPPING DEVICE A MINIMUM OF 50 FEET FROM THE STREAM.

STOCKPILE TOP SOIL ON UP-SLOPE SIDE OF THE SEWER TRENCH AND REPLACE DURING FINAL RESTORATION; PROVIDE EROSION CONTROL FOR ALL STOCKPILED AREAS.

TEMPORARILY STABILIZE BY SEEDING PER ITEM 207 AND DISTURBED IMMEDIATELY FOLLOWING TRENCH BACKFILL UNTIL FINAL RESTORATION IS COMPLETED.

FINAL RESTORATION SHALL BEGIN SOON AS POSSIBLE AFTER CONSTRUCTION IN THE AREA IS COMPLETED. FINAL RESTORATION SHALL BE PHASED TO FOLLOW CLOSELY WITH COMPLETION OF FINAL GRADING WORK.

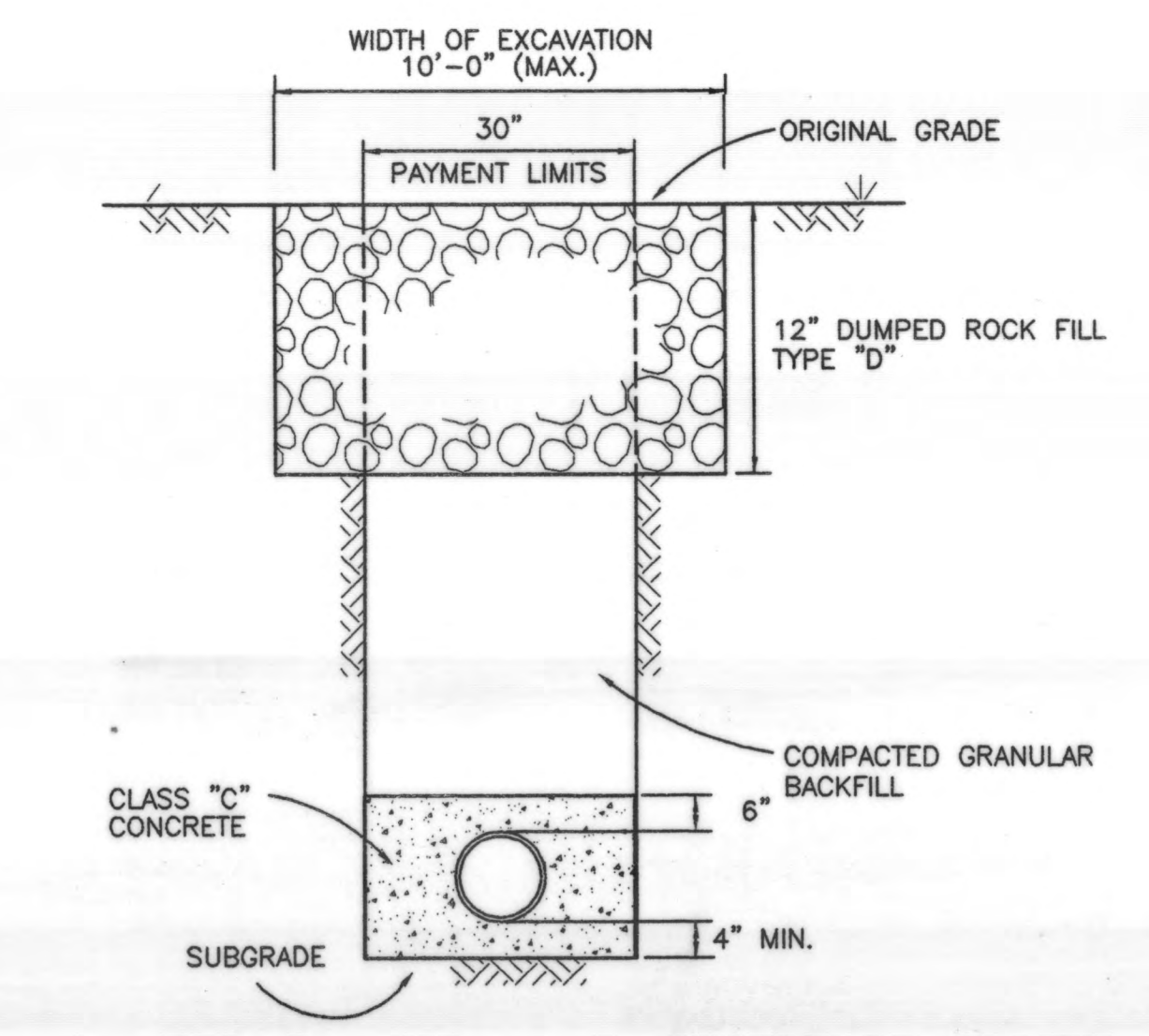
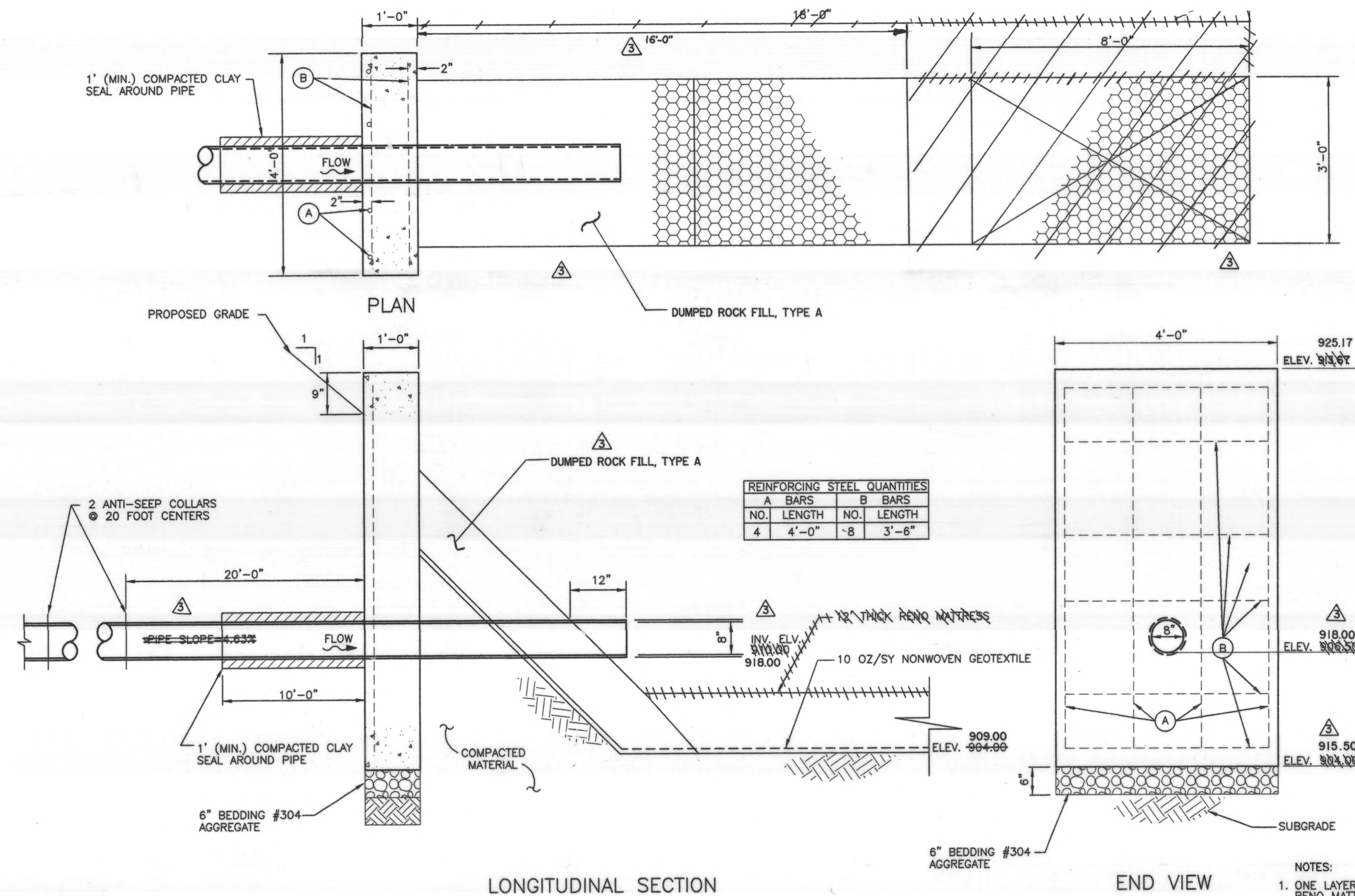
FINAL GRADING WORK SHALL BE CONSISTENT WITH PRE-CONSTRUCTION TOPOGRAPHY. FINAL GRADING SHALL BE PHASED TO FOLLOW SEWER CONSTRUCTION AND SHALL BE COMPLETED AS SOON AS AREAS ARE NO LONGER NEEDED FOR TRAFFICKING OF CONSTRUCTION EQUIPMENT AND MATERIALS.

NO CHEMICALS, FUELS, LUBRICANTS, BITUMINOUS MATERIAL, RAW SEWAGE, TREES, BRUSH, OR DEBRIS FROM DEMOLITION OR EXCAVATION ACTIVITIES WILL BE DISCHARGED OR DISPOSED OF ONTO OR ALONGSIDE ANY STREAM, WATERCOURSE, FLOODPLAIN, OR WETLAND UNDER ANY CIRCUMSTANCES.

FINAL STREAM BANK STABILIZATION SHALL BE COMPLETED IMMEDIATELY AFTER COMPLETION OF THE STREAM CROSSING. BANK STABILIZATION SHALL INCLUDE SEEDING, ACCORDING TO ITEM 659, AND THE PLACEMENT OF EXCELSIOR MATTING, OR EROSION CONTROL MEASURES, ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS. THE STREAM BANK SHALL BE STABILIZED WITHIN 48 HOURS OF THE COMPLETION OF THE STREAM CROSSING.

STREAM CROSSINGS: DISTURBED STREAM BANKS WILL BE STABILIZED AND THE ENTIRE CONSTRUCTION SITE AT THE STREAM CROSSING WILL BE IMMEDIATELY RESTORED UPON COMPLETION OF THE WORK THERE. NATURAL STREAM COURSE WILL NOT BE ALTERED.

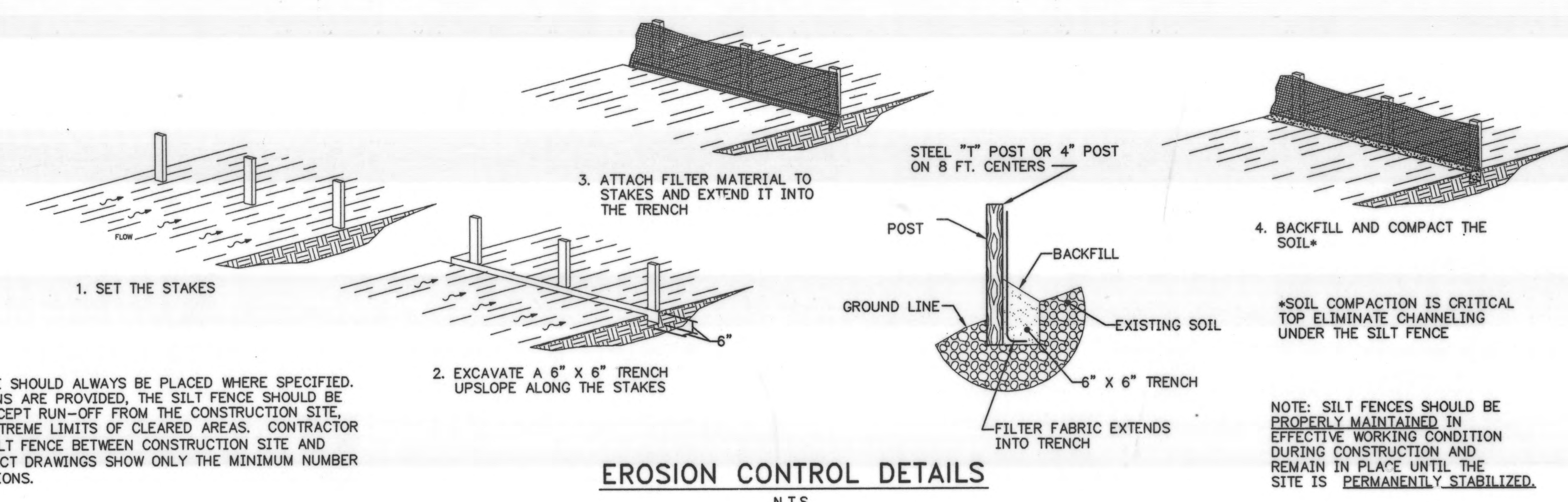
STOCKPILED BEDDING AND BACKFILL MATERIAL SHALL NOT BE STORED WITHIN THE RIPARIAN ZONE.



**STREAM CROSSING TRENCH DETAIL**  
N.T.S.

- 8" FORCE MAIN - (STA. 30+50.00 TO STA. 32+00.00)  
(STA. 37+35.00 TO STA. 37+55.00)
- 2" FORCE MAIN - (STA. 0+75.80 TO STA. 1+05.80)  
(STA. 7+89.00 TO STA. 8+18.00)
- 4" FORCE MAIN - (STA. 0+72.02 TO STA. 1+02.92)

- NOTES:
- ONE LAYER OF 10 OZ. PER S.Y. WOVEN GEOTEXTILE SHALL BE INSTALLED BENEATH RENO MATTRESS LINING AS SHOWN ON THE PLANS AND IN ACCORDANCE TO THE MANUFACTURER'S REQUIREMENTS. A MINIMUM OF 12 INCHES GEOTEXTILE OVERLAP IS REQUIRED WHEN JOINING TWO SECTIONS OF MATERIAL.
  - GABIONS SHALL BE A DOUBLE TWISTED HEXAGONAL WOVEN STEEL WIRE MESH OF NOMINAL SIZE TWO AND ONE-HALF INCHES BY THREE AND ONE-QUARTER INCHES. STONE PLACED IN THE WIRE MESH SHALL BE POORLY GRADED WITH A MEAN SPHERICAL DIAMETER (D50) MINIMUM DIAMETER OF FIVE INCHES.
  - COST TO BE INCLUDED WITH THE COST OF THE CONCRETE HEADWALL.
  - ANTI-SEEP COLLARS SHALL BE 12-INCHES WIDER THAN THE TRENCH WIDTH. TRENCH SHALL BE BACKFILLED WITH COHESIVE SOIL MATERIALS.



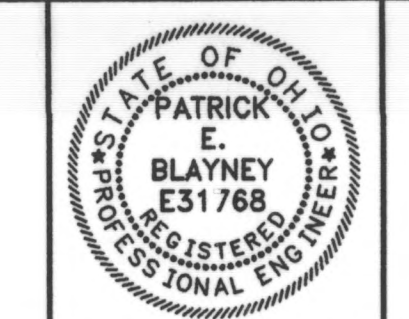
LOCATION: SILT FENCE SHOULD ALWAYS BE PLACED WHERE SPECIFIED. WHEN NO INSTRUCTIONS ARE PROVIDED, THE SILT FENCE SHOULD BE POSITIONED TO INTERCEPT RUN-OFF FROM THE CONSTRUCTION SITE, GENERALLY AT THE EXTREME LIMITS OF CLEARED AREAS. CONTRACTOR SHALL ALSO PLACE SILT FENCE BETWEEN CONSTRUCTION SITE AND THE STREAM. CONTRACT DRAWINGS SHOW ONLY THE MINIMUM NUMBER OF SILT FENCE LOCATIONS.

**EROSION CONTROL DETAILS**  
N.T.S.



DESIGNED BY:	BGD	REVISIONS
DRAWN BY:	ACM	DATE
CHECKED BY:	THB	9/1/99
APPROVED BY:	MBT	ADDED 11.25" BEND, MOVED MANHOLE, END INVERT, & HEADWALL LOCATION. CHANGED RENO MATTRESS TO DUMPED ROCK FILL.
DATE:	JANUARY 25, 1999	
JOB NO.	4363EN	

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER



SCIOTO RESERVE  
8" , 4" & 2" FORCE MAINS

SCALE:  
NOT TO SCALE

GENERAL  
DETAILS

SHEET NO.  
FM-14

MAR 25, 1999 TIME: 12:07 PM



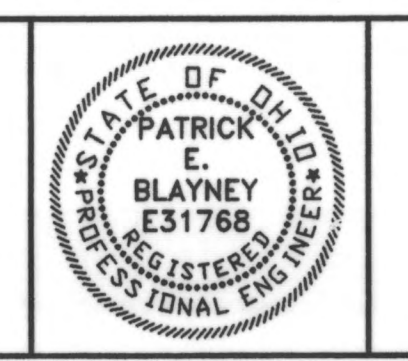
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DESIGNED BY:	BGD
DRAWN BY:	ACM
CHECKED BY:	THB
APPROVED BY:	MBT
DATE:	JANUARY 25, 1999
JOB NO.	4363EN

REVISIONS	DATE	REMARKS

DELAWARE COUNTY  
 DELAWARE COUNTY SANITARY ENGINEER



SCIOTO RESERVE  
 8" , 4" & 2" FORCE MAINS

SCALE:  
 HORZ. 1"=100'

LIFT STATION  
 SITE PLAN

SHEET NO.  
 LS-1

**LIFT STATION GENERAL NOTES**

THE CONTRACTOR SHALL COMPLY WITH THE MATERIAL AND CONSTRUCTION REQUIREMENTS OF THE DELAWARE COUNTY DOCUMENT ENTITLED STANDARD PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF SANITARY FACILITIES, SECTION 7.1. THE CONTRACTOR SHALL OBTAIN ANY AND ALL PERMITS REQUIRED BY THE BOARD OF HEALTH AND PAY ALL PERMIT 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 DRAWINGS. ANY MATERIALS 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 THE CONTRACTOR 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 BEGINNING ANY CONSTRUCTION ACTIVITIES THAT WILL DISTURB OR ENCRUCH UPON EXISTING UTILITIES.

THE CONTRACTOR SHALL PROVIDE 4" TO 6" OF SAND OR GRIT LEVELING BASE, DEPENDING ON SUBSURFACE SOIL CONDITIONS, UNDER EACH CONCRETE STRUCTURE FOLLOWED BY A MINIMUM OF 6" COMPACTED GRANULAR FILL.

THE CONTRACTOR SHALL GRADE THE AREA AROUND THE LIFT STATION TO DRAIN SURFACE WATER AWAY FROM THE STRUCTURES.

ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED AFTER FINAL GRADING.

ALL GENERAL NOTES SHOWN ON SHEET FM-1, WHERE APPLICABLE AND NOT COVERED IN THE NOTES ON THE LIFT STATION DRAWINGS, SHALL BE CONSIDERED AS A REQUIREMENT FOR THE CONSTRUCTION WORK OF THE LIFT STATION.

**ELECTRICAL NOTES**

THE CONTRACTOR SHALL PROVIDE ALL ELECTRICAL COMPONENTS AND DEVICES TO PROPERLY SERVE THE ELECTRICAL REQUIREMENTS OF THE LIFT STATION. ALL WORKMANSHIP, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE OHIO BASIC BUILDING CODE, THE NATIONAL ELECTRICAL CODE, LOCAL BUILDING CODES AND ALL OTHER REGULATIONS BY AUTHORITIES HAVING JURISDICTIONAL RIGHTS FOR THE ENFORCEMENT OF CONSTRUCTION AND SAFETY STANDARDS. THE CONTRACTOR SHALL PAY THE COSTS OR FEES FOR ANY PERMITS OR AGENCY INSPECTION CHARGES ASSOCIATED WITH THE ELECTRICAL WORK.

ELECTRICAL SERVICE SHALL BE PROVIDED TO WITHIN APPROXIMATELY TEN (10) FEET OF THE PROPOSED LIFT STATION, TERMINATING AT THE CONTRACTOR'S POLE. ALL ELECTRICAL CONNECTION WORK SHALL BE PERFORMED BY THE LIFT STATION CONTRACTOR. THE COST FOR PURCHASING AND INSTALLING THE ELECTRIC METER SHALL BE AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS AND PAY ALL FEES REQUIRED FOR MAKING THE PROPER CONNECTIONS TO THE COLUMBUS SOUTHERN POWER SERVICE WIRING.

A FEMALE RECEPTACLE FOR CONNECTION TO DELAWARE COUNTY'S PORTABLE EMERGENCY GENERATOR SHALL BE PROVIDED AT THE ELECTRICAL CONTROL PANEL. THE ELECTRICAL SERVICE RATING OF THE RECEPTACLE SHALL BE 100A, 600VAC. MANUFACTURER SHALL BE CROUSE-HINDS, CATALOGUE NO. AR1041-M7Z. NO SUBSTITUTIONS SHALL BE PERMITTED.

A MANUAL TRANSFER SWITCH SHALL BE PROVIDED TO TRANSFER LOADS FROM THE LINE SOURCE TO A PORTABLE EMERGENCY GENERATOR. THE SWITCH SHALL BE NON-FUSIBLE, 4 POLE, DOUBLE THROW, IN A NEMA 3R ENCLOSURE MOUNTED ON THE INSIDE OF THE STATION ENCLOSURE. MANUFACTURER SHALL BE SQUARE D CLASS 3140 OR APPROVED EQUAL.

PROVIDE AND INSTALL A LIGHTNING ARRESTOR PER DELAWARE COUNTY STANDARDS.

THE CONTRACTOR SHALL FURNISH AND INSTALL A TELEMETRY SYSTEM AS FOLLOWS:

- ONE (1) WESTERMAN CT-400 MICROPROCESSOR BOARD, OR APPROVED EQUAL.
- THREE (3) WESTERMAN I/O-4480 INPUT/OUTPUT BOARD, OR APPROVED EQUAL.
- ONE (1) WESTERMAN I/O-4240 ANALOG INPUT BOARD, OR APPROVED EQUAL.
- ONE (1) METRICOM SPREAD SPECTRUM DATA RADIO, MODEL 20043, OR APPROVED EQUAL.
- ONE (1) WESTERMAN CA-1511 9600 BAUD MODEM, OR APPROVED EQUAL.
- ONE (1) OMNI-DIRECTIONAL ANTENNA WITH WOODEN MOUNTING POLE IF REQUIRED.
- ALL RELAYS SHALL BE CRYDOM STYLE, SOLID STATE RELAYS.
- ONE (1) POWER SONIC 10 AH BATTERY BACK-UP.

ALL TELEMETRY COMPONENTS SHALL BE MOUNTED IN A NEMA 4X 316 STAINLESS STEEL ENCLOSURE WITH A FABRICATED BACK PANEL AND STRIP HEATER. THE TELEMETRY PANEL SHALL BE INSTALLED IN THE LIFT STATION ENCLOSURE AND MOUNTED NEAR THE PUMP CONTROL PANEL.

ALL PUMP MOTOR STARTERS SHALL BE SOLID STATE TYPE, SERIES SMC BY ALLEN-BRADLEY, OR APPROVED EQUAL.

**LIFT STATION SPECIFICATIONS**

**GENERAL**

THE SCOPE OF WORK UNDER THIS CONTRACT INCLUDES FURNISHING AND INSTALLING THE LIFT STATION, COMPLETE AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.

**WET WELL AND VALVE VAULT**

THE WET WELL AND VALVE VAULT SHALL BE CONSTRUCTED OF PRE-CAST CONCRETE SECTIONS MEETING THE REQUIREMENTS OF ASTM C478.

ALL RISER SECTION JOINTS SHALL BE SEALED WITH ALL RUBBER O-RING SEALS COMPLYING WITH ASTM C443.

**ACCESS HATCH AND FRAME ASSEMBLY**

A DOUBLE LEAF ALUMINUM ACCESS HATCH SHALL BE CAST INTO THE TOP SLAB OF THE WET WELL. SIZE SHALL BE AS SHOWN ON THE DRAWINGS. EACH LEAF OF THE HATCH SHALL BE PROVIDED WITH AN AUTOMATIC HOLD OPEN ARM AND COVER RELEASE. EACH LEAF SHALL HAVE A SLAM LOCKING MECHANISM WITH A REMOVABLE KEY WRENCH OPERATING HANDLE. A HASP SHALL BE PROVIDED FOR PADLOCKING BOTH LEAFS OF THE COVER.

THE ACCESS HATCH FRAME SHALL HAVE A DRAINAGE CHANNEL WITH AN INTERNAL PIPE NIPPLE IN ONE CORNER OF THE FRAME FOR CONNECTING A TWO (2) INCH DRAIN LINE.

MANUFACTURER SHALL BE BILCO, "JD" SERIES, OR APPROVED EQUAL BY HALLIDAY PRODUCTS.

**PIPING**

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL PIPING, FITTINGS AND VALVES REQUIRED IN THE WET WELL AND VALVE VAULT AS SHOWN ON THE DRAWINGS. PIPE, FITTINGS AND VALVES SHALL BE FLANGED DUCTILE IRON CLASS 52 MINIMUM, AS MANUFACTURED BY CLOW OR MUELLER, AND CONFORMING TO AWWA C115. GASKETS SHALL BE FULL FACED RUBBER MEETING THE REQUIREMENTS OF AWWA C111.

**PUMPS**

FURNISH AND INSTALL TWO (2) SUBMERSIBLE PUMPS WITH DUPLEX CONTROLS AS MANUFACTURED BY FLVGT CORPORATION OR EQUAL BY GORMAN-RUPP COMPANY.

MOTORS AND RELATED ELECTRICAL EQUIPMENT SHALL BE EXPLOSION PROOF MEETING THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE FOR CLASS 1, DIVISION 1, GROUP D ENVIRONMENTS.

PUMP IMPELLERS SHALL BE NON-CLOG TYPE CAPABLE OF PASSING A 3-INCH SPHERE.

EACH PUMP SHALL HAVE A CAPACITY OF 225 GPM AT A TOTAL DYNAMIC HEAD OF 50 FEET. MOTORS SHALL BE 10HP, 1750 RPM DESIGNED FOR OPERATION ON 480VAC, 3 PHASE, 60 HZ POWER. PUMP SHUT OFF HEAD SHALL BE 70 FEET (MIN). MOTOR SHALL BE NON-OVERLOADING OVER FULL RANGE OF PUMP CURVE. PUMP EFFICIENCY AT DESIGN FLOW SHALL EXCEED 80%.

THE PUMP VOLUTE CASING, IMPELLER AND MOTOR HOUSING SHALL BE CONSTRUCTED OF CAST IRON OF NO LESSER GRADE THAN CLASS C PER ASTM A48. THE MOTOR SHAFT SHALL BE 316 STAINLESS STEEL WITH DOUBLE MECHANICAL SEAL ASSEMBLY AND LEAK SENSOR.

**PUMP INSTALLATION**

THE INSTALLATION AND REMOVAL SYSTEM FOR EACH PUMP SHALL CONSIST OF A STATIONARY CAST IRON DISCHARGE ELBOW WITH 125 LB FLANGES AND TWO GUIDE RAILS. GUIDE RAILS SHALL BE 316 STAINLESS STEEL. THE ELBOW SHALL BE ATTACHED TO A SUPPORT BASE THAT IS ANCHORED TO THE FLOOR OF THE WET WELL. THE GUIDE RAILS SHALL BE SECURED AT THE TOP WITH A CAP THAT IS ATTACHED TO THE FRAME OF THE ACCESS HATCH.

A SLIDING BRACKET ASSEMBLY WITH A YOKE CONNECTION TO THE GUIDE RAILS SHALL BE ATTACHED TO EACH PUMP VOLUTE. THE YOKE SHALL BE CONSTRUCTED OF U.L. LISTED, NON-SPARKING BRONZE DESIGNED FOR EXPLOSION PROOF SERVICE.

THE DESIGN OF THE SLIDING BRACKET ASSEMBLY SHALL BE SUCH THAT A MINIMUM FORCE IS EXERTED BETWEEN THE BASE ELBOW AND PUMP DISCHARGE WHILE PROVIDING A POSITIVE SEAL WITHOUT BOLTING OR FASTENING AND TO PROVIDE FOR EASY BREAK AWAY WHEN LIFTING THE PUMP.

**PORTABLE HOIST**

THE CONTRACTOR SHALL PROVIDE ONE (1) PORTABLE DAVIT TYPE HOIST WITH A HAND WINCH WITH ADEQUATE CAPACITY TO SET IN PLACE OR REMOVE THE SPECIFIED PUMPS. LIFTING CAPACITY OF THE HOIST SHALL BE A MINIMUM OF 50% GREATER THAN THE WEIGHT OF A PUMP INCLUDING MOTOR AND SLIDING BRACKET ASSEMBLY.

THE WINCH ASSEMBLY, HOOK, CABLE, DAVIT, DAVIT ADJUSTMENT CHAIN, AND MAST SHALL BE CONSTRUCTED OF 316 STAINLESS STEEL.

A MOUNTING SOCKET SHALL BE PROVIDED FOR SETTING THE MAST OF THE HOIST. THE SOCKET SHALL BE IMBEDDED IN THE TOP SLAB OF THE WET WELL AND LOCATED AS SHOWN ON THE DRAWINGS.

MANUFACTURER AND MODEL SHALL BE HALLIDAY PRODUCTS, SERIES "DB", OR APPROVED EQUAL.

**PUMP CONTROLS**

PUMPS SHALL BE CONTROLLED BY MEANS OF AN ULTRASONIC LEVEL SENSOR AND TRANSDUCER.

A DUPLEX PUMP CONTROLLER IN A REMOVABLE NEMA 12 STAINLESS STEEL PANEL SHALL BE MOUNTED WITHIN THE LIFT STATION ENCLOSURE. IT SHALL CONTAIN A CIRCUIT BREAKER, MAGNETIC STARTERS, HAND-OFF-AUTO SELECTOR SWITCH, ELAPSED TIME METER, AND SEAL LEAK INDICATING LIGHT FOR EACH PUMP. THE CONTROLLER SHALL CONTAIN AN ALTERNATOR RELAY TO ALTERNATE PUMPS ON EACH SUCCESSIVE PUMP CYCLE AND SHALL TURN ON THE SECOND (LAG) PUMP IF THE FIRST (LEAD) PUMP FAILS OR THE INFLOW EXCEEDS THE CAPACITY OF ONE PUMP.

EACH PUMPS POWER CABLE SHALL BE SUPPORTED FROM THE WET WELL BY BASKET WEAVE STAINLESS STEEL CABLE SUPPORT GRIPS (KELLUM GRIPS).

A 120VAC DUPLEX CONVENIENCE OUTLET WITH GROUND FAULT INTERRUPT PROTECTION SHALL BE PROVIDED.

LEVEL SENSOR CABLE SHALL BE INSTALLED IN A 1" PVC CONDUIT FROM THE LEVEL SENSOR HEAD TO THE PUMP CONTROL PANEL IN THE LIFT STATION ENCLOSURE. PROVIDE SEAL FITTINGS WHERE CONDUIT ENTERS THE CONTROL PANEL.

EACH PUMP POWER CABLE SHALL BE INSTALLED IN A 2" PVC CONDUIT FROM THE WET WELL TO THE PUMP CONTROL PANEL. PROVIDE SEAL FITTINGS WHERE CONDUIT ENTERS THE CONTROL PANEL.

**ODOR CONTROL**

A "BIOXIDE" ODOR CONTROL SYSTEM AS MANUFACTURED BY U. S. FILTER/DAVIS PROCESS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR AS SHOWN ON THE DRAWINGS. THIS SYSTEM SHALL INCLUDE THE FOLLOWING COMPONENTS AS A MINIMUM:

- ONE (1) 1.450 GALLON HIGH DENSITY CROSS LINKED POLYETHYLENE CHEMICAL STORAGE TANK (7'-1" DIA. BY 6' HIGH).
- ONE (1) COMPLETE CONTROL UNIT TO INDEPENDENTLY CONTROL TWO CHEMICAL FEED PUMPS. CONTROL UNIT SHALL BE HOUSED IN A HEATED 316 STAINLESS STEEL NEMA 4X ENCLOSURE MOUNTED ON A 316 SS SUPPORT PEDESTAL. THE CONTROL UNIT/ENCLOSURE SHALL CONSIST OF THE FOLLOWING:
  - 115VAC, 15 AMP CIRCUIT BREAKER
  - THERMOSTATICALLY CONTROL HEATER
  - 6PI CONVENIENCE RECEPTACLE
  - ON/OFF SWITCHES WITH LED, INDICATOR LIGHTS
  - 1000RPM VIBRATION CYLINDER WITH FLOW CONTROL VALVES AT TOP AND BOTTOM OF THE CYLINDER.
- TWO (2) M-15907-001 U. S. FILTER BELLOW PUMP WITH AN ADJUSTABLE FEED RATE FROM 5 TO 50 ml/min AT A MAXIMUM DISCHARGE PRESSURE OF 40 PSI.
- ONE (1) COMPLETE, HEAT TRACED AND INSULATED PIPING KIT CONSISTING OF THE FOLLOWING:
  - 40 FEET OF 1/2 INCH SCHEDULE 40 PVC PIPE
  - 2-INCH STAINLESS STEEL MALE CAMLOCK COUPLING
  - 2-INCH PLASTIC FEMALE CAMLOCK CAP
  - 2-INCH SCHEDULE 80 PVC TANK FILL PIPING
  - 30 FEET OF HEAT TRACING AND INSULATION
  - HEAT TRACING CONTROLLER

THE CHEMICAL STORAGE TANK SHALL BE MOUNTED ON A CURBED CONCRETE PAD ENCLOSED BY AN 8-FOOT HIGH CEDAR FENCE WITH A PADLOCKED GATE.

**PORTABLE PUMPING SYSTEM**

PROVIDE ONE (1) PORTABLE PUMPING SYSTEM FOR EMERGENCY PUMP OUT OF THE LIFT STATION WET WELL. THE PUMPING SYSTEM SHALL INCLUDE THE FOLLOWING:

- ENGINE-DRIVEN, SELF-PRIMING, SUCTION-LIFT, CENTRIFUGAL PUMP WITH 6-INCH SUCTION AND DISCHARGE. PUMP SHALL BE DESIGNED TO HANDLE RAW SEWAGE WITH SOLIDS UP TO 3 INCHES IN DIAMETER.

PUMP CASING SHALL BE ALL CAST IRON CONSTRUCTION. IMPELLER SHALL BE CAST CHROMIUM STEEL.

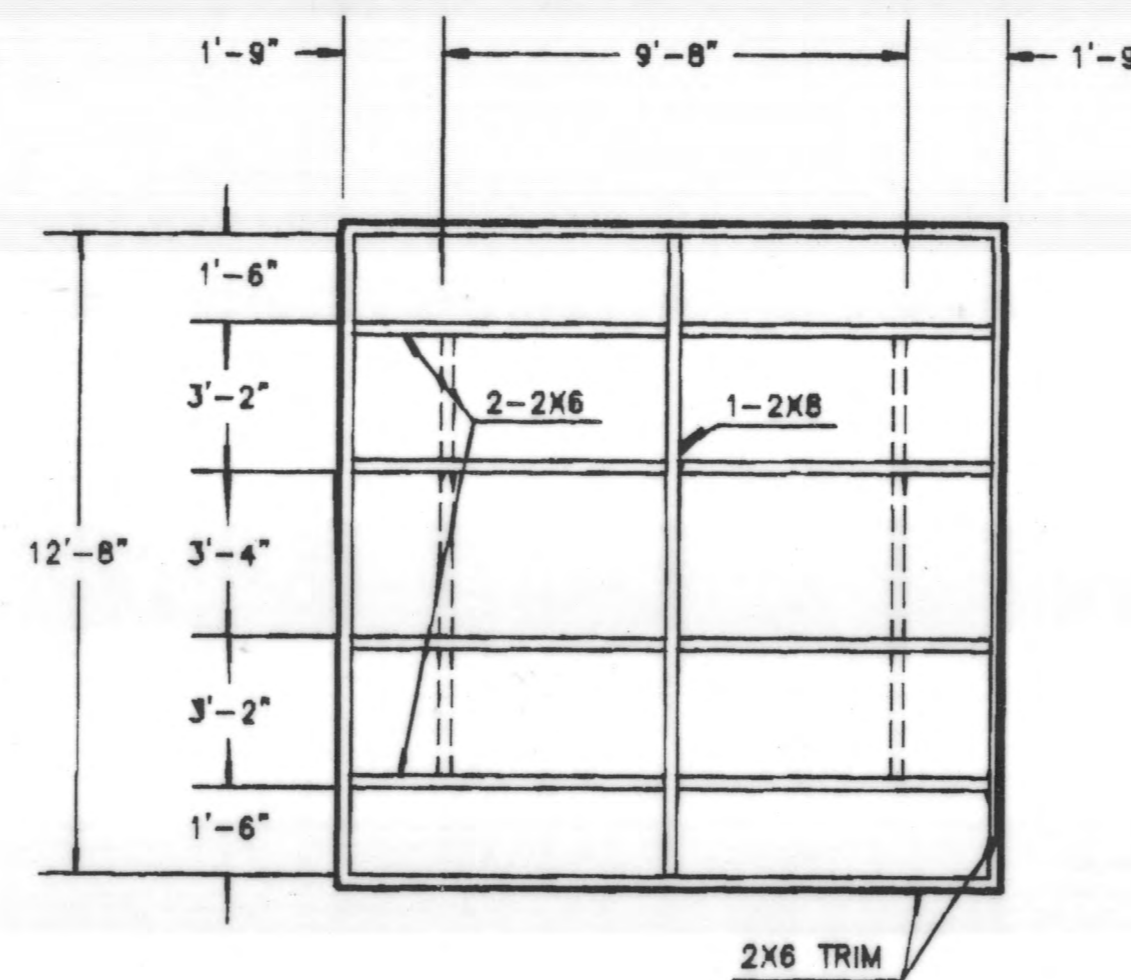
THE PUMP SUCTION HEAD SHALL BE EQUIPPED WITH A BALL TYPE NON-RETURN VALVE WITH A RENEWABLE, FLEXIBLE RUBBER SEAT AND QUICK RELEASE ACCESS FEATURE.

THE SHAFT SEAL SHALL BE A DOUBLE MECHANICAL SEAL RUNNING IN AN OIL BATH. SEALING FACES SHALL BE ABRASION RESISTANT SOLID SILICON CARBIDE.

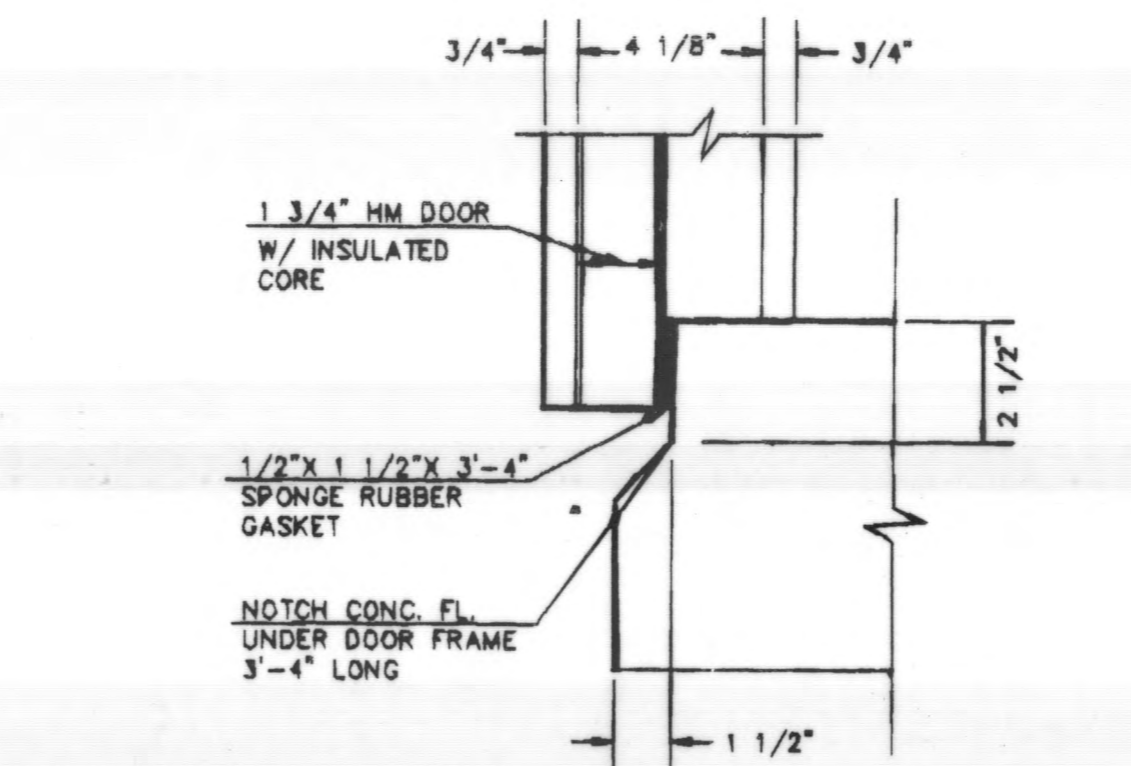
THE PUMP SHALL HAVE AN AUTOMATIC ON/OFF FEATURE AND SHALL BE DESIGNED FOR A TOTAL SUCTION LIFT OF 30 FEET, AND A DISCHARGE CAPACITY OF 500 GPM AT 50 FEET TDH. PUMP MODEL SHALL BE CD150M AS MANUFACTURED BY GODWIN PUMPS, OR APPROVED EQUAL.

- THE PUMP SHALL BE DRIVEN BY DIESEL ENGINE EQUIPPED WITH AN EXHAUST SILENCER AND A FUEL TANK WITH A MINIMUM CAPACITY OF 60 GALLONS. THE ENGINE AND PUMP SHALL BE TOTALLY ENCLOSED IN 14 GAUGE SHEET METAL PANEL BACKED WITH ACOUSTIC SOUND DEADENING MATERIAL. THE ACOUSTICAL ENCLOSURE SHALL ALLOW A MAXIMUM NOISE LEVEL OF 73dba AT A DISTANCE OF 30 FEET. THE ACOUSTICAL PANELS SHALL BE REMOVABLE FOR ACCESS TO THE PUMP AND ENGINE. THE ENGINE SHALL BE JOHN DEERE 4045D, OR APPROVED EQUAL.
- THE PUMP AND DIESEL ENGINE SHALL BE TRAILER MOUNTED. THE TRAILER SHALL BE JOHN DEERE GP 60 HIGHWAY TRAILER, OR APPROVED EQUAL.

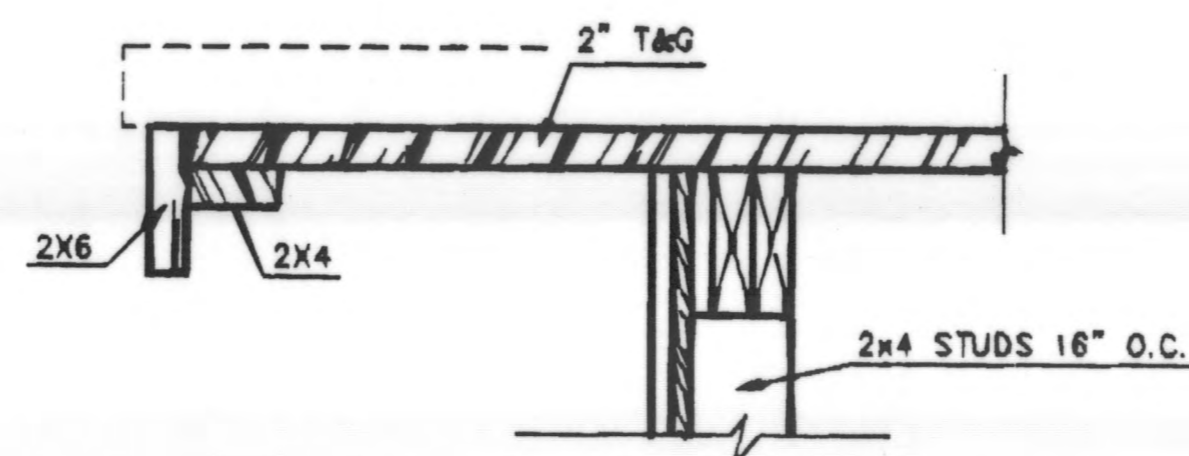
- PROVIDE A MINIMUM OF 25 FEET EACH OF 6 INCH SUCTION AND DISCHARGE HOSE. HOSES SHALL BE EQUIPPED WITH INTERCHANGEABLE MALE/FEMALE QUICK CONNECT COUPLINGS. COORDINATE COUPLING TYPE WITH COUPLINGS ON THE EMERGENCY PUMP OUT CONNECTIONS FOR THE LIFT STATION.



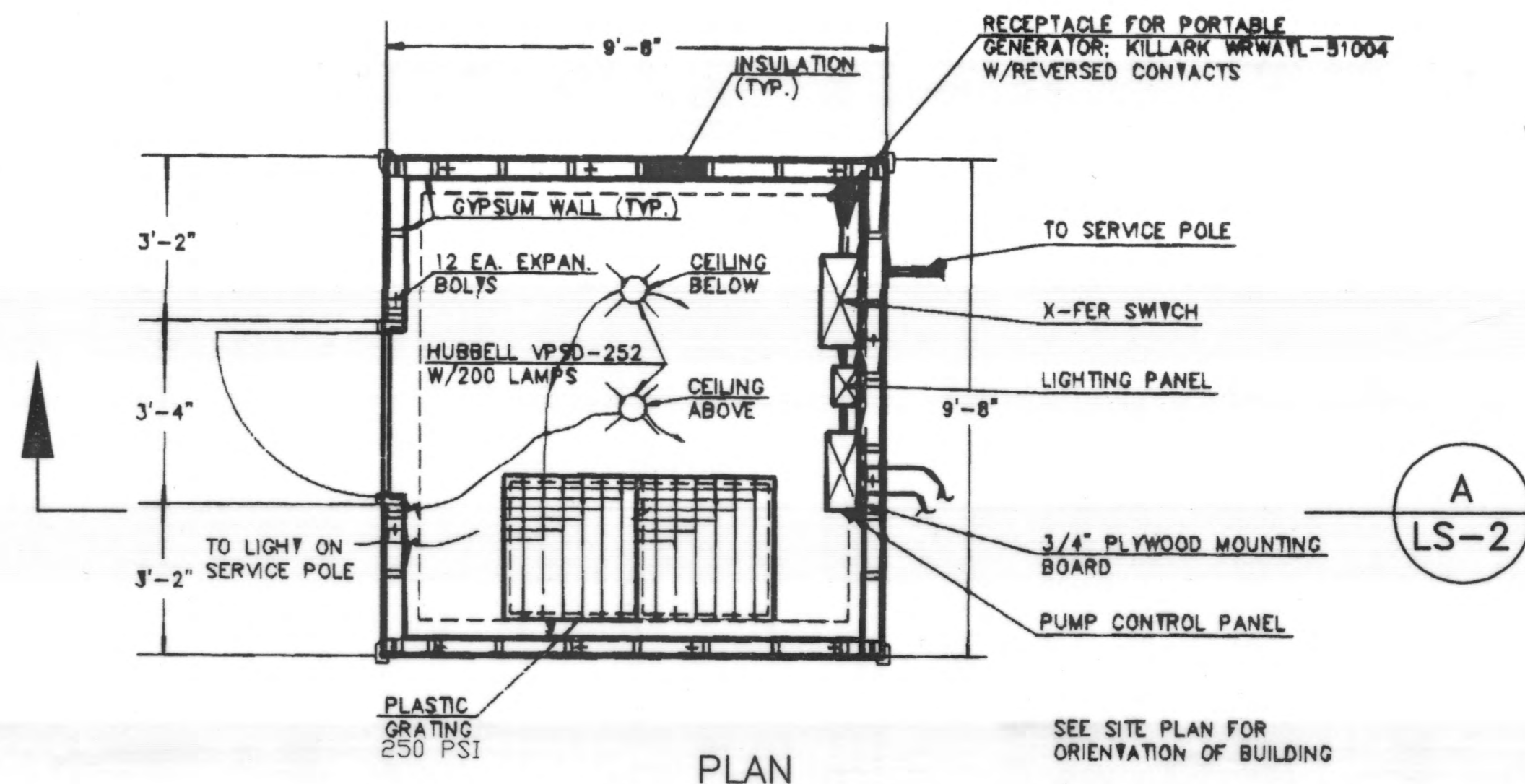
**ROOF FRAMING PLAN**  
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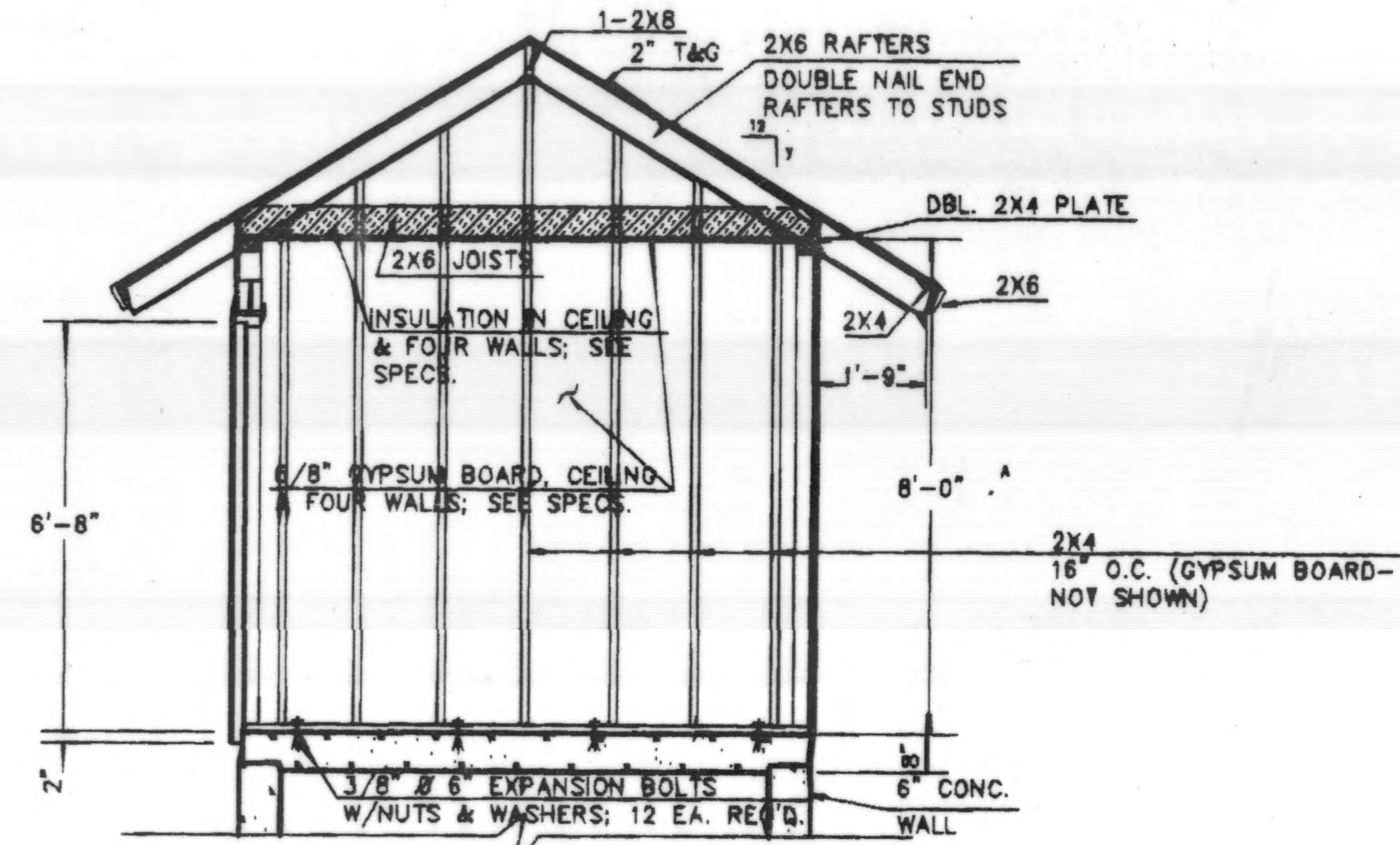
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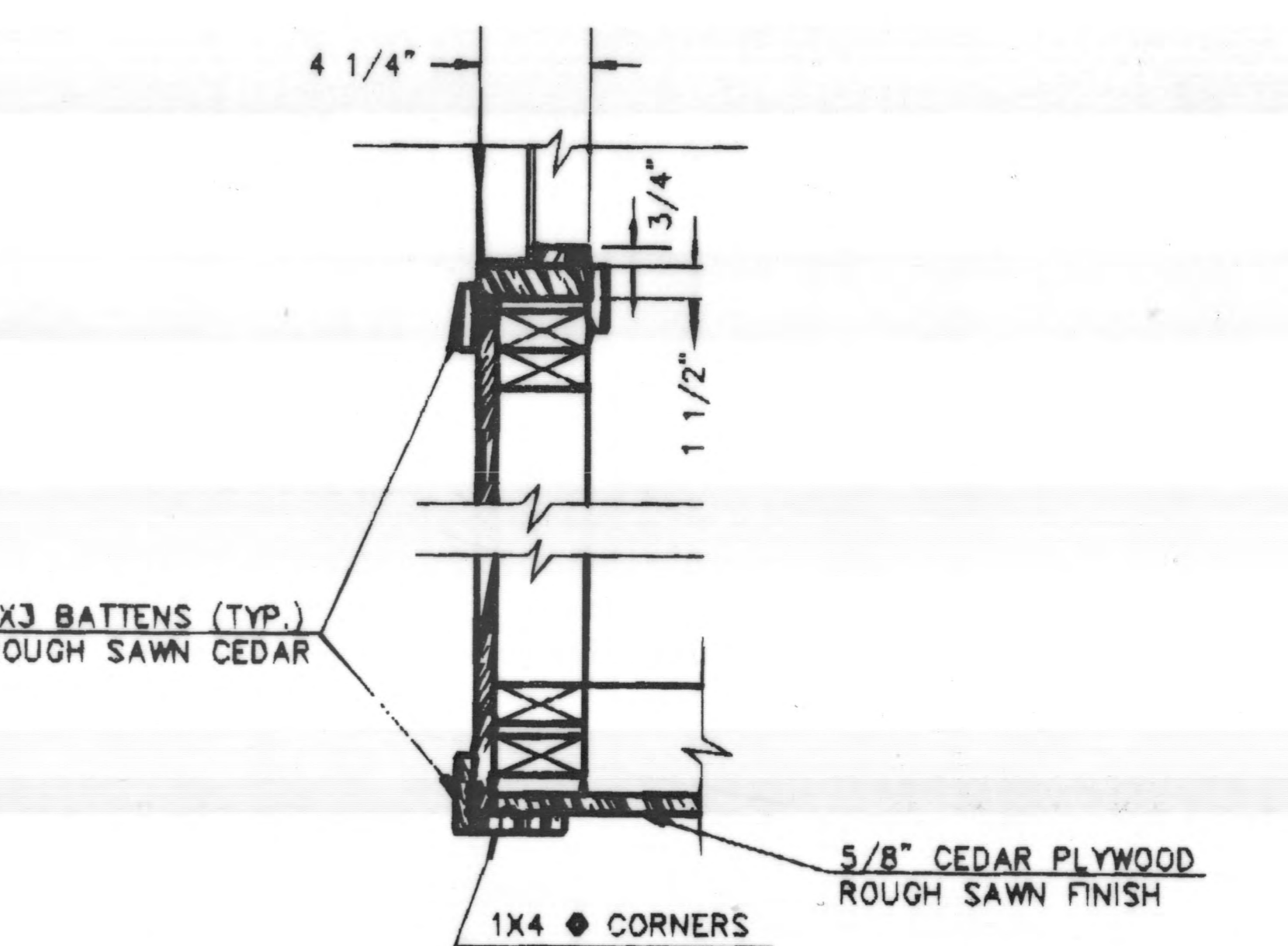
**RAKE SECTION**  
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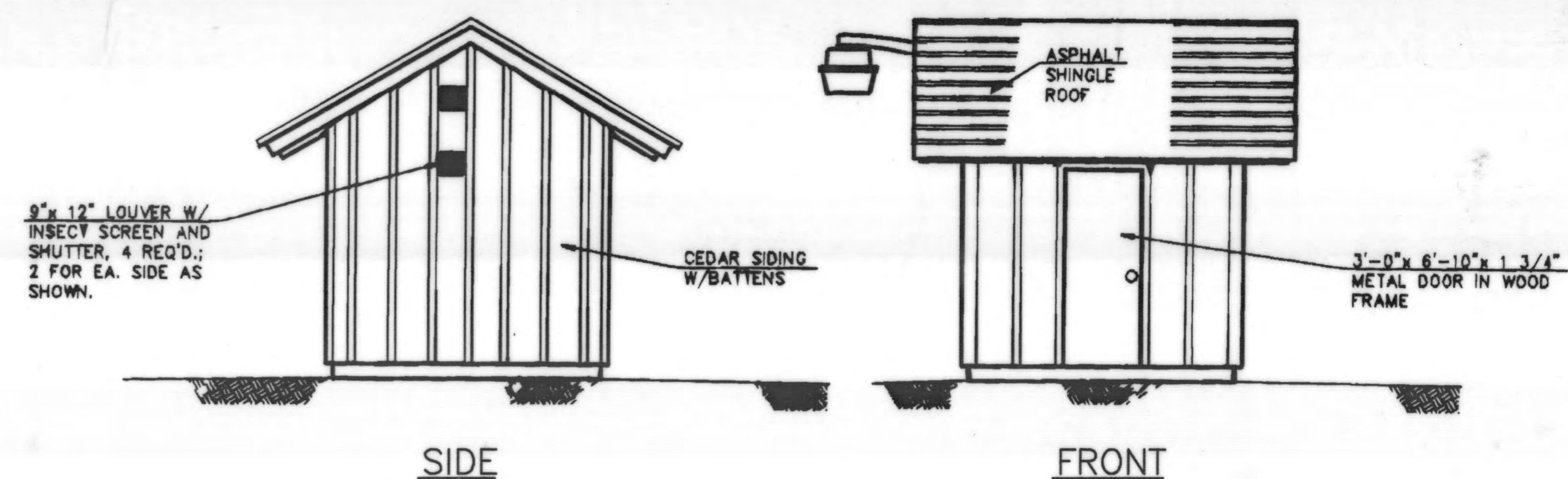
**PLAN**  
SCALE: 3/8" = 1'-0"



**SECTION A-A**  
SCALE: 3/8" = 1'-0"



**TYPICAL CORNER**  
SCALE: 1 1/2" = 1'-0"



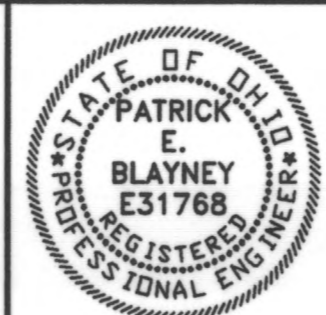
**ELEVATIONS**  
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**R.D.Zande & Associates**

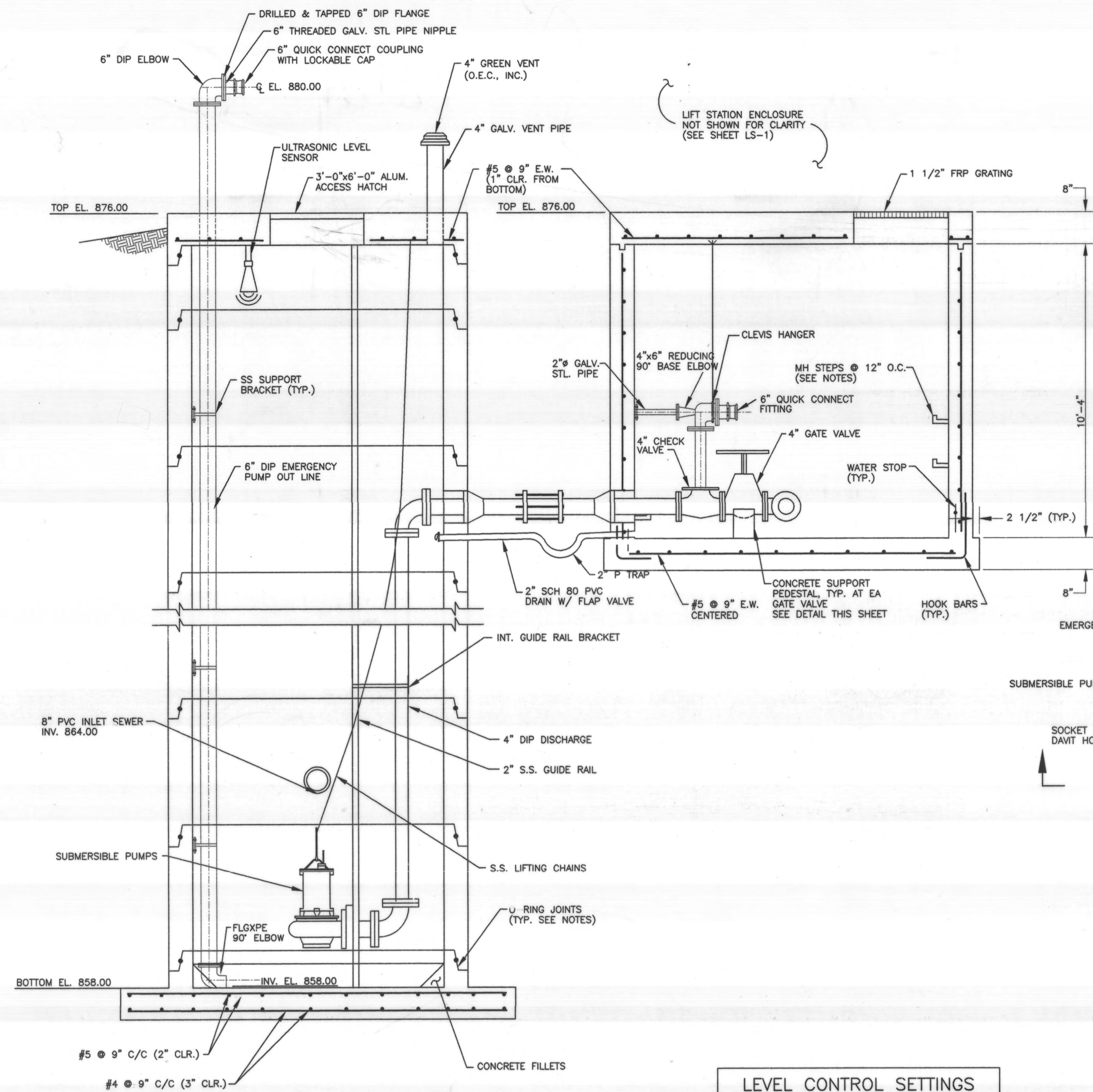
DESIGNED BY:	THB	REVISIONS	
DRAWN BY:	MDK	DATE	
CHECKED BY:	THB	REMARKS	
APPROVED BY:	MBT		
DATE:	JANUARY 25, 1999		
JOB NO.	4363EN		

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER



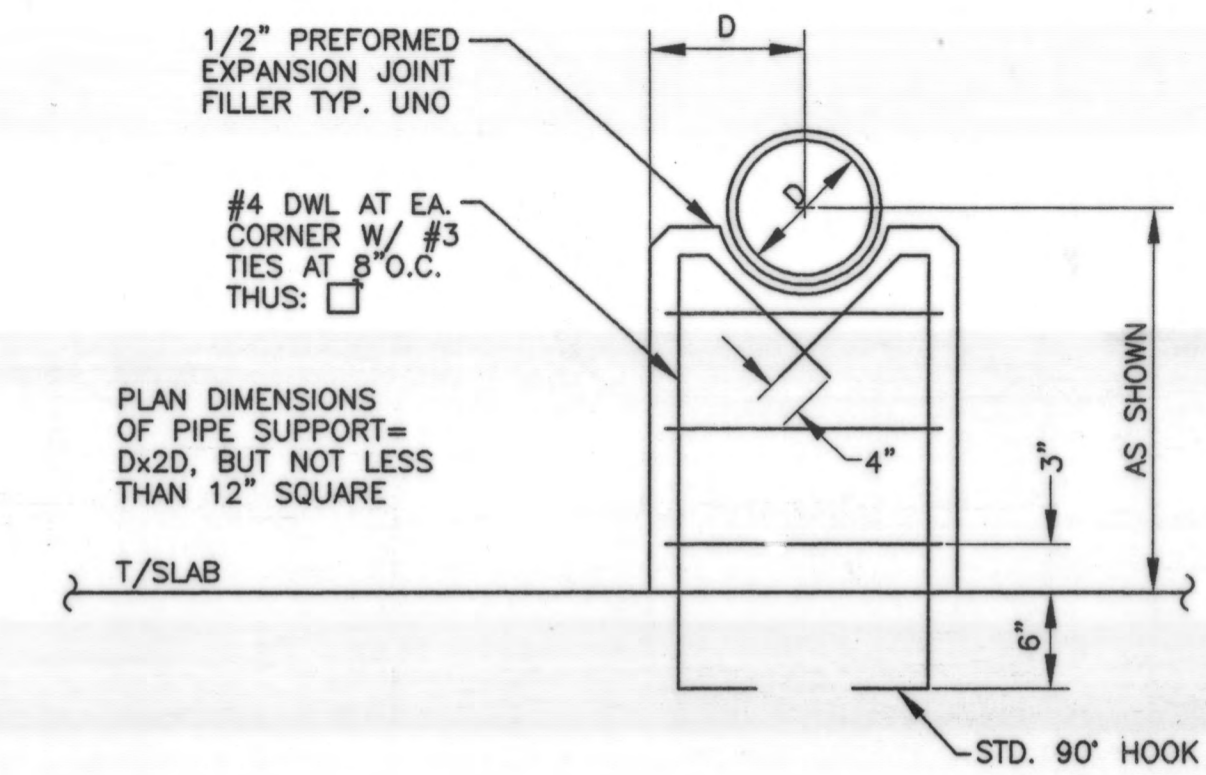
SCIOTO RESERVE  
LIFT STATION

SCALE:	GENERAL	SHEET NO.
AS NOTED	NOTES AND LIFT STATION ENCLOSURE	LS-2

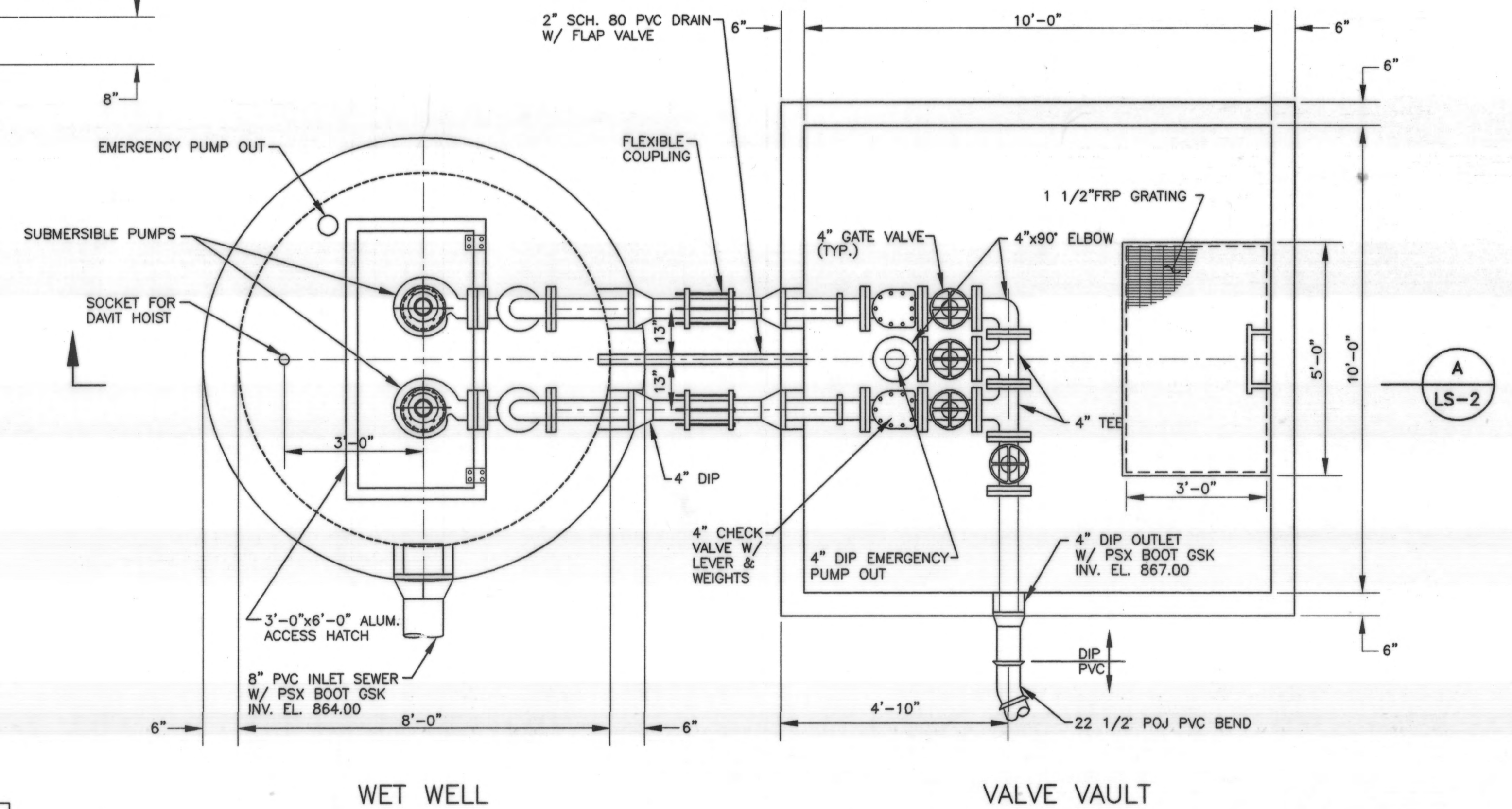


SECTION A-A  
N.T.S.

LEVEL CONTROL SETTINGS	
	ELEVATION
PUMPS OFF	860.00
LEAD PUMP ON	862.00
LAG PUMP ON & FAILURE ALARM	863.00
HIGH LEVEL ALARM	863.50



TYP. PIPE SUPPORT DETAIL  
N.T.S.



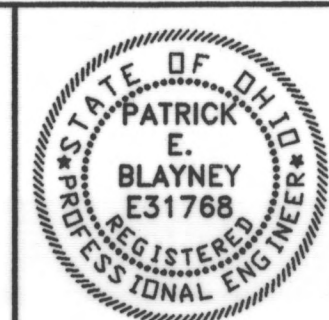
PLAN VIEW  
N.T.S.

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DRAWN BY:	ACM	DATE
CHECKED BY:	THB	REMARKS
APPROVED BY:	MBT	
DATE:	JANUARY 25, 1999	
JOB NO.	4363EN	

DELAWARE COUNTY  
DELAWARE COUNTY SANITARY ENGINEER



SCIOTO RESERVE  
LIFT STATION

SCALE:  
SCALE: NONE

GENERAL  
DUPLIX SUBMERSIBLE  
LIFT STATION

SHEET NO.  
LS-3