

# SAFE HARBOR MARINA SUBDIVISION

## SAFE HARBOR MARINA LTD.

DESCRIPTION	SHEET	PERMITS
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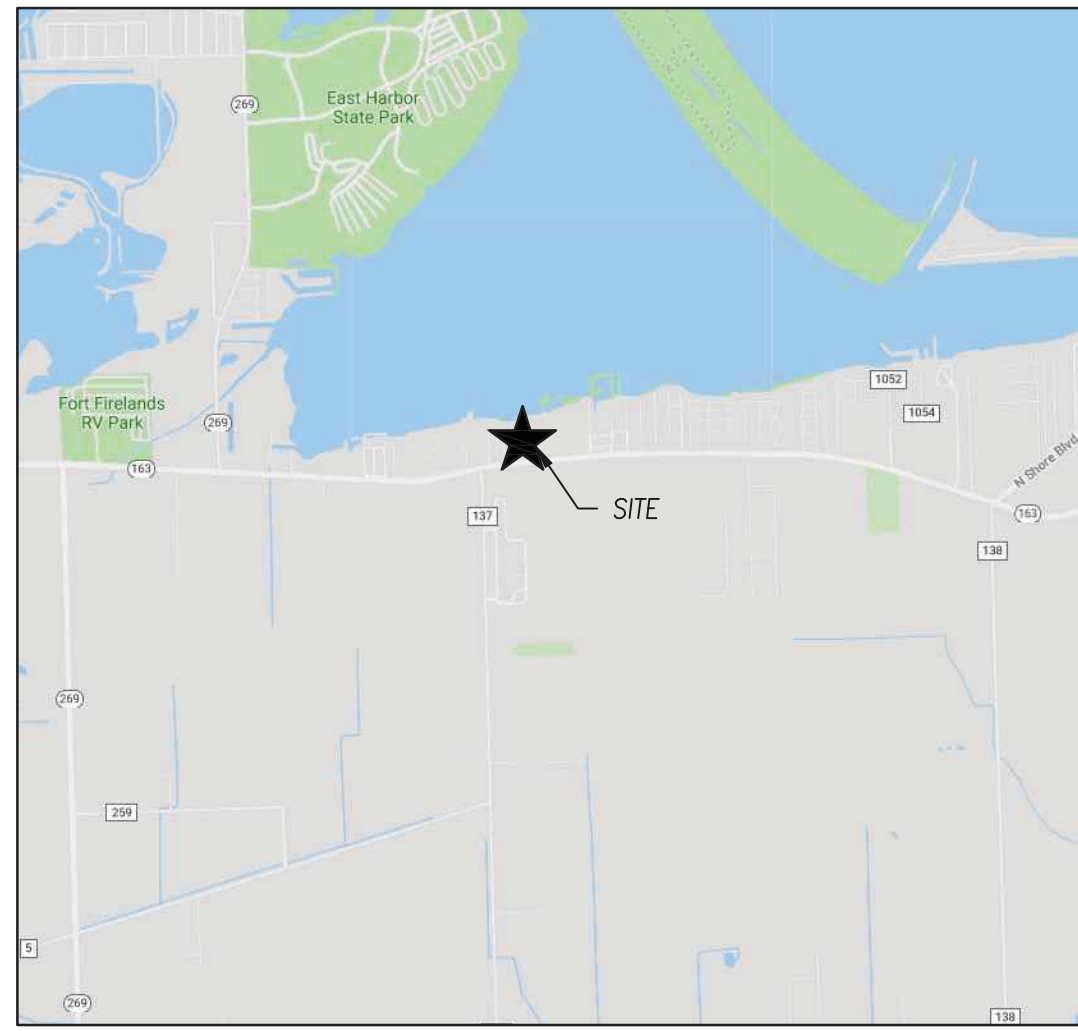
Know what's below.  
Call before you dig.

**UNDERGROUND UTILITIES**  
CONTACT BOTH SERVICES  
CALL TWO WORKING DAYS  
BEFORE YOU DIG

CALL  
1-800-362-2764  
(TOLL FREE)

OHIO UTILITIES PROTECTION SERVICE  
NON-MEMBERS  
MUST BE CALLED DIRECTLY

OIL & GAS PRODUCERS PROTECTIVE  
SERVICE CALL: 1-800-925-0988



**VICINITY MAP**  
NOT TO SCALE

**SITE ADDRESS**  
6721 EAST HARBOR ROAD  
LAKESIDE MARBLEHEAD, OHIO, 43440  
OTTAWA COUNTY

LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP  
**ZONING: R-C, RECREATIONAL COMMERCIAL**  
**R-3, HIGH DENSITY RESIDENTIAL**  
**FLOOD ZONE:**  
**AE (1% (100-YR) AND 0.2% (500-YR))**

**SCALE: HORIZONTAL**  
0 30 60  
**SCALE: 1" = 30'**

**PROJECT DESCRIPTION:**

THIS PROJECT CONSISTS OF THE DEVELOPMENT & DESIGN OF SAFE HARBOR SUBDIVISION. LAYOUT OF ROADS, SANITARY, STORM, WATER, WATER QUALITY POND, WATER AND GRADING ARE BEING DONE IN CONJUNCTION WITH THIS PROJECT.

**OWNER**

SAFE HARBOR MARINA LTD.  
6721 EAST HARBOR ROAD  
MARBLEHEAD, OHIO 43440  
PHONE: (419) 734-5576

**SURVEYOR/CIVIL ENGINEER**

DGL CONSULTING ENGINEERS, LLC  
3455 BRIARFIELD BLVD. SUITE E  
MAUMEE, OHIO 43537  
PHONE: (419) 535-1015

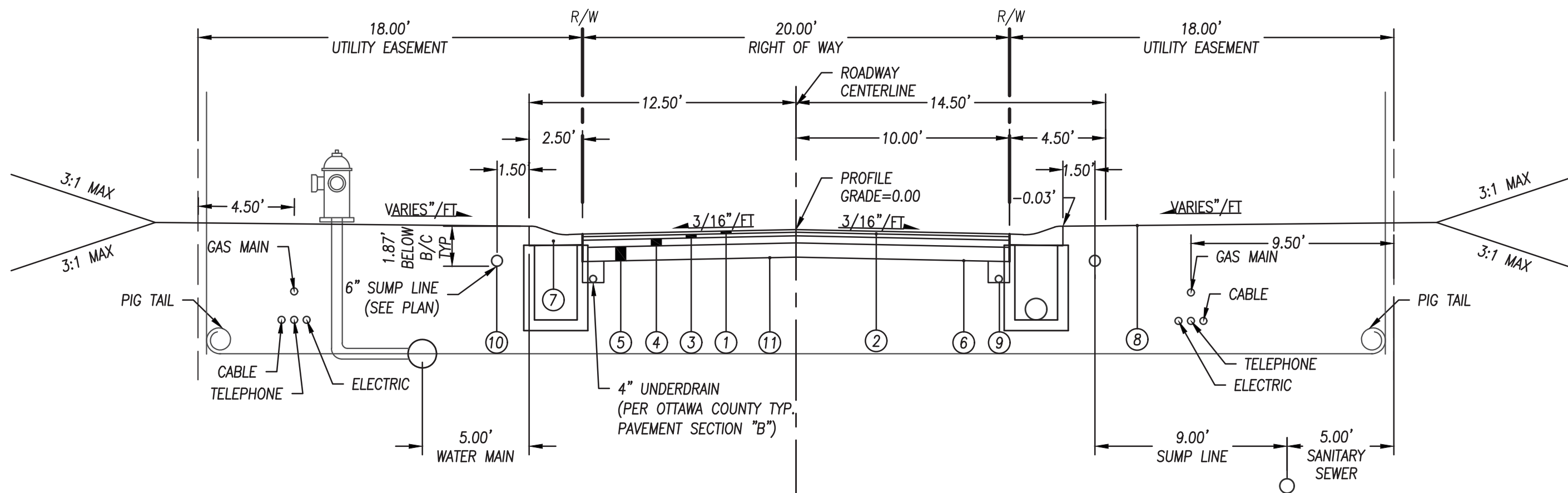
- ① 1 1/2" ITEM 441 ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG 64-22
- ② ITEM 407 TACK COAT (0.10 GAL/SQ. YD.)
- ③ 1 1/2" ITEM 441 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448), PG 64-22
- ④ 4" ITEM 301 BITUMINOUS AGGREGATE BASE
- ⑤ 8" ITEM 304 AGGREGATE BASE, AS PER PLAN (2 COURSES)
- ⑥ ITEM 204 SUBGRADE COMPACTION
- ⑦ ITEM 609 ODOT TYPE 3 CURB & GUTTER
- ⑧ ITEM 659 SEEDING AND MULCHING
- ⑨ 4" ITEM 607 UNDERDRAIN. CONNECT TO NEAREST CATCH BASIN
- ⑩ 6" ITEM 611 SUMP LINE. CONNECT TO NEAREST CATCH BASIN
- ⑪ ITEM 203 ROADWAY EXCAVATION AND EMBANKMENT (203.13)

**SYMBOL LEGEND**

EXISTING	PROPOSED	DESCRIPTION
⊕	⊕	BENCHMARK
⊕	⊕	MONUMENT
⊕ I.P.F.	⊕ I.P.S.	IRON PIN
⊕	⊕	MONUMENT BOX
⊕ P.K.F.	⊕ P.K.S.	PK NAIL
⊕ M.N.F.	⊕ M.N.S.	MAG NAIL
⊕ D.H.F.	⊕ D.H.S.	DRILL HOLE
⊕	⊕	MONUMENT SPIKE
⊕	⊕	TACKED HUB
⊕	⊕	CATCH BASIN
⊕	⊕	CURB INLET
⊕	⊕	STORM MANHOLE
⊕	⊕	SANITARY MANHOLE
⊕	⊕	CLEANOUT
⊕	⊕	ELECTRIC RISER/PULL BOX
⊕	⊕	ELECTRIC METER
⊕	⊕	ELECTRIC MANHOLE
⊕	⊕	ELECTRIC TRANSFORMER
⊕	⊕	GAS METER
⊕	⊕	GAS MARKER
⊕	⊕	GAS VALVE
⊕	⊕	POWER POLE
⊕	⊕	LIGHT POLE
⊕	⊕	POWER/LIGHT POLE
⊕	⊕	TELEPHONE POLE
⊕	⊕	GUY WIRE
⊕	⊕	TELEPHONE PEDESTAL
⊕	⊕	FIRE HYDRANT
⊕	⊕	WATER GATE VALVE
⊕	⊕	WATER METER
⊕	⊕	WATER MANHOLE
⊕	⊕	STUMP
⊕	⊕	SHRUB
⊕	⊕	TREE-DECIDUOUS
⊕	⊕	TREE-EVERGREEN
⊕	⊕	AIR CONDITIONER
⊕	⊕	MAIL BOX
⊕	⊕	POST
⊕	⊕	SATELLITE DISH
⊕	⊕	SPRINKLER HEAD
⊕	⊕	SIGN
⊕	⊕	SIGNAL

**ABBREVIATION LEGEND**

SYMBOL	DESCRIPTION
BLDG	BUILDING
BM	BENCHMARK
CB	CATCH BASIN
CO	CLEANOUT
CONC	CONCRETE
CP	CONTROL POINT
CPP	CORRUGATED POLYETHYLENE PIPE
E	EAST, EASTING
ELEV	ELEVATION
EX	EXISTING
FF	FINISHED FLOOR
FO	FIBER OPTIC
FM	FORCE MAIN
FND	FOUNDATION
FT	FOOT, FEET
HW	HEADWALL
IMPERV	IMPERVIOUS
ICW	INTEGRAL CURB AND WALK
INV	INVERT
LL	LOWER LEVEL
MH	MANHOLE
MON	MONUMENT
N	NORTH, NORTHING
NE	NORTHEAST
NW	NORTHWEST
OC	ON CENTER
OFF	OFFSET
RCP	ROCK CHANNEL PROTECTION
RCP	REINFORCED CONCRETE PIPE
R/W	RIGHT OF WAY
S	SOUTH
SAN	SANITARY
SE	SOUTHEAST
STA	STATION
STM	STORM
SW	SOUTHWEST
TBR	TO BE REMOVED
TC	TOP OF CURB
T/GR	TOP OF GR
T/RIM	TOP OF RIM
TYP	TYPICAL
UD	UNDERDRAIN
VIT	VITREOUS
W	WEST
WM	WATER MAIN



**LINETYPE LEGEND**

EXISTING	PROPOSED	DESCRIPTION	EXISTING	PROPOSED	DESCRIPTION
---	---	INDEX CONTOURS	---	---	FIBER OPTIC
---	---	INTERMEDIATE CONTOURS	---	---	GAS
---	---	CABLE	---	---	TELEPHONE
---	---	ELECTRIC	---	---	SANITARY
---	---	OVERHEAD ELECTRIC	---	---	FORCE MAIN
---	---	OVERHEAD CABLE	---	---	SANITARY LATERAL
---	---	OVERHEAD TELEPHONE	---	---	WATER
---	---	OVERHEAD UTILITIES	---	---	WATER SERVICE
---	---	UNDERDRAIN	---	---	SUMP LINE

**ODOT STANDARD CONSTRUCTION DRAWINGS**

DRAWING	DATE	DRAWING	DATE
BP-4.1	07/19/13	DM-4.4	01/15/16
BP-5.1	01/18/19	MH-1.2	01/15/16
CB-1.1	07/20/18		
CB-1.2	01/15/16		
DM-1.2	01/18/13		

**APPROVED**

RONALD P. LAJTI JR, P.E., P.S. DATE \_\_\_\_\_  
OTTAWA COUNTY ENGINEER

JAMES K. FREY, P.E., P.S. DATE \_\_\_\_\_  
OTTAWA COUNTY SANITARY ENGINEER



NO	ISSUED FOR PERMITS	REVISION	DATE
9			
8			
7			
6			
5			
4			
3			
2			
1	ISSUED FOR PERMITS		04/01/19



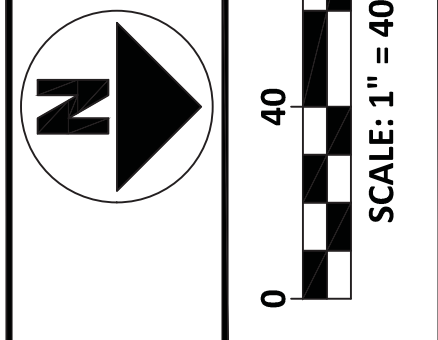
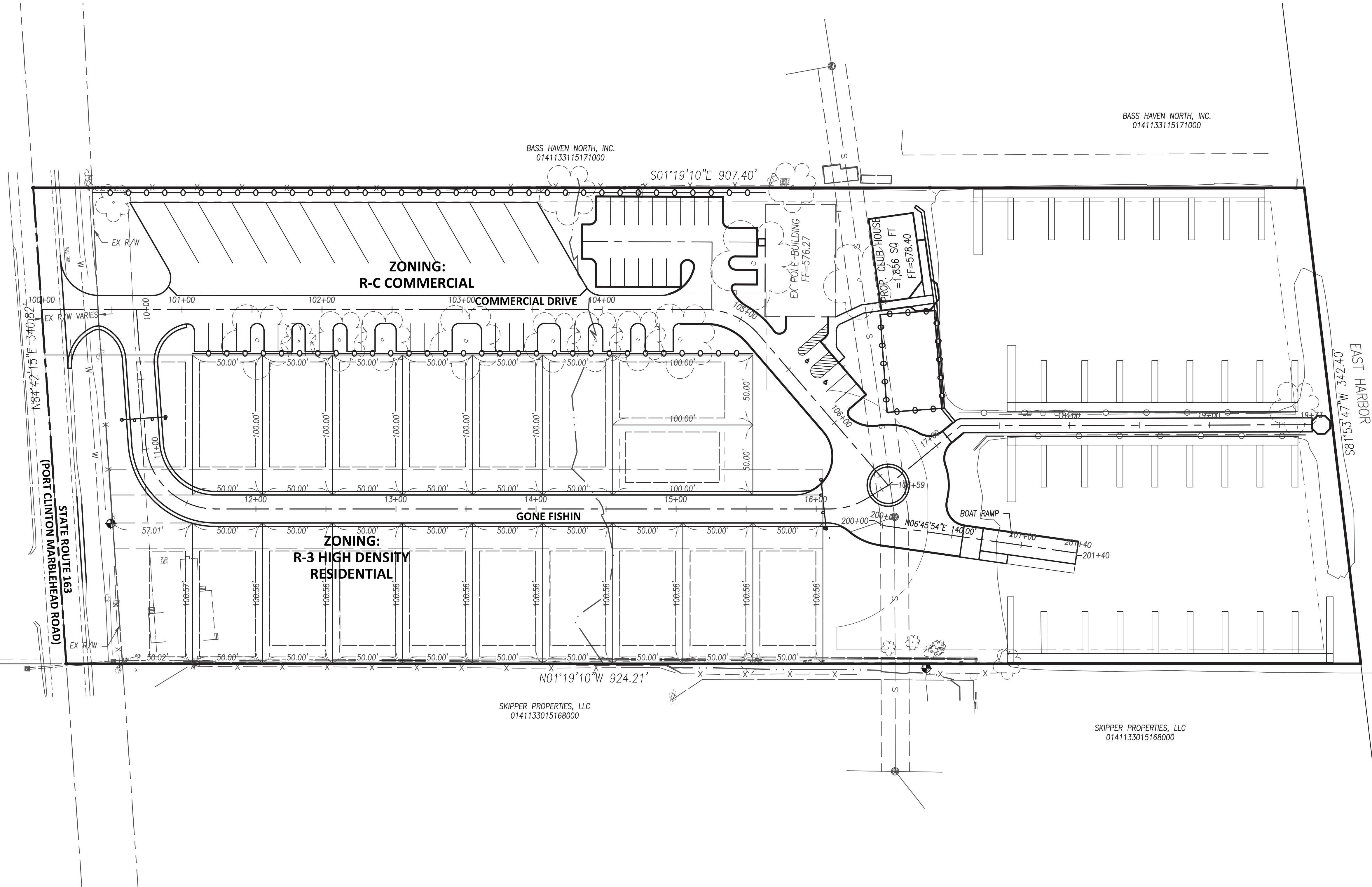
**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
6721 EAST HARBOR ROAD  
LAKESIDE MARBLEHEAD, OHIO, 43440  
OTTAWA COUNTY  
LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP

FILE: 18201 CD.dwg  
JOB NO.: 18201  
DRAWN BY: LMM  
ISSUED: APRIL 3, 2019

**C1**



PLOTTED: Apr 03, 2019 - 8:41pm  
 DRAWING: M:\18201 (Safe Harbor -Snug Harbor)\CIVIL\DWG\18201 CD.dwg: C02 SCH SAFE HARBOR



STATE OF OHIO  
 ROBERT W. BAILEY  
 E-62836  
 PROFESSIONAL SEALER  
 April 03, 2019

NO	REVISION	DATE
1	ISSUED FOR PERMITS	04/01/19
2		
3		
4		
5		
6		
7		
8		
9		

**DGL**  
 DGL CONSULTING ENGINEERS, LLC  
 3455 BRIARFIELD BLVD, SUITE E  
 MAUMINEE, OH 43037  
 PHONE: 419.535.1015  
 www.dgl-td.com

**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
 6721 EAST HARBOR ROAD  
 LAKESIDE MARBLEHEAD, OHIO, 43440  
 OTTAWA COUNTY  
 LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP  
**SCHEMATIC PLAN**

FILE: 18201 CD.dwg  
 JOB NO.: 18201  
 DRAWN BY: LMM  
 ISSUED: APRIL 3, 2019

**C2**



**GENERAL NOTES**

- BIDDERS SHALL VISIT AND EXAMINE THE SITE AND ALL CONTRACT DOCUMENTS.
- ITEM NUMBERS REFER TO THE OHIO DEPARTMENT OF TRANSPORTATION (ODOT) CONSTRUCTION AND MATERIAL SPECIFICATIONS (CURRENT EDITION) AND ALL CONSTRUCTION WORK SHALL BE DONE ACCORDING TO SAID SPECIFICATIONS AND IN ACCORDANCE WITH APPLICABLE STANDARDS OF THE GOVERNING AGENCIES. WHEN IN CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.
- ALL CONSTRUCTION DETAILS SHALL CONFORM TO THE CURRENT EDITION OF THE STANDARD CONSTRUCTION DRAWINGS OF THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION (ODOT) UNLESS OTHERWISE NOTED.
- WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES.
- ALL SIDEWALKS, RAMPS, BUILDING ENTRANCES AND HANDICAP PARKING AREAS SHALL BE ADA COMPLIANT
- CONTRACTOR IS RESPONSIBLE FOR OBTAINING A PERMIT FOR ALL CONSTRUCTION ACTIVITIES ACCORDING TO THE GOVERNING AGENCY REQUIREMENTS, SCHEDULING INSPECTIONS, AND PAYING ALL INSPECTION FEES.
- CONTRACTOR SHALL CONTACT THE LOCAL GOVERNING AGENCIES A MINIMUM OF SEVEN (7) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION IN RIGHT OF WAY.
- A RIGHT-OF-WAY PERMIT WILL BE REQUIRED FOR THIS PROJECT. CONTACT THE OTTAWA COUNTY ENGINEERS OFFICE FOR A PERMIT PRIOR TO STARTING THE WORK.
- CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL EXISTING CONDITIONS, DIMENSIONS, LOCATIONS, AND MATERIALS.
- CONTRACTOR SHALL REPAIR OR REPLACE, AT NO ADDITIONAL COST, ANY EXISTING IMPROVEMENTS DAMAGED DURING THE WORK.
- CONTRACTOR SHALL PROVIDE TEMPORARY SIGNS AND BARRIERS AT LIMITS OF CONSTRUCTION TO ASSURE PUBLIC SAFETY DURING CONSTRUCTION.
- CONTRACTOR SHALL MAINTAIN A CLEAN PROJECT SITE AND REMOVE ALL WASTE MATERIALS AND RUBBISH FROM THE PROJECT.
- ALL PAVEMENT DIMENSIONS, STRIPING DIMENSIONS, AND NODES ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
- EXISTING EDGE OF PAVEMENT ABUTTING PROPOSED PAVEMENT SHALL BE SAWCUT AND SEALED WITH ITEM 407 TACK COAT PRIOR TO PLACEMENT OF ITEM 301 OR 448.
- THE CONTRACTOR AND OWNER MUST VERIFY, TAKE OFF, AND AGREE TO ALL QUANTITIES, INCLUDING EXCAVATION AND EMBANKMENT QUANTITIES PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL VERIFY THAT COORDINATES, IF USED, MATCH PLAN DIMENSIONS. WHEN IN CONFLICT, THE PLAN DIMENSIONS SHALL GOVERN OVER COORDINATES, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

**EARTHWORK**

- EXISTING SITE SURVEY, TOPOGRAPHY, AND SUBSURFACE CONDITIONS AS PRESENTED IN THE DRAWINGS, REPORTS, OR SPECIFICATION FORM ARE BELIEVED ACCURATE WITHIN NORMAL INDUSTRY TOLERANCES BUT ARE NOT GUARANTEED. INVESTIGATE, SURVEY, CONFIRM, AND VERIFY ALL CONDITIONS BEARING ON THE WORK BY ANY MEANS NECESSARY BEFORE STARTING ANY WORK THAT CHANGES EXISTING CONDITIONS. REPORT ANY UNACCEPTABLE DISCREPANCIES TO THE ENGINEER IN WRITING BEFORE BEGINNING OPERATIONS.
  - WRITTEN CLAIMS OF DIFFERENCE SHALL BE ACCOMPANIED BY SUBSTANTIATING EVIDENCE. CLAIMS OF DIFFERENCE SHALL BE RESOLVED, INCLUDING DETERMINATION OF QUANTITIES AND COSTS, AND METHODS OF CONTRACT MODIFICATION, BEFORE WORK THAT ALTERS SUCH EXISTING CONDITIONS IS STARTED.
  - INITIATION OF SITE-CLEARING, SOIL MOVING OPERATIONS, DEMOLITION, OR OTHER ACTIVITY THAT ALTERS EXISTING CONDITIONS SHALL BE EVIDENCE THAT CONTRACTOR HAS MADE ALL INVESTIGATIONS AND EVALUATIONS IT DEEMS NECESSARY AND HAS ACCEPTED ALL EXISTING CONDITIONS PRESENT WHETHER OR NOT THEY CONFORM EXACTLY TO THE DOCUMENTS.
  - WITHOUT ADVANCE WRITTEN NOTIFICATION OF UNACCEPTABLE DISCREPANCY, NO CLAIM FOR EXTRA PAYMENT WILL BE CONSIDERED FOR A CLAIM OF DIFFERENCE BETWEEN DOCUMENTS AND ACTUAL CONDITIONS AFTER THE CONTRACTOR HAS ALTERED EXISTING CONDITIONS.
- ALL SPOT ELEVATIONS ARE TO THE TOP OF FINISHED PAVEMENT/GRADE UNLESS NOTED OTHERWISE.
- ANY DIGITAL SURFACE MODELS PROVIDED FOR THE PROJECT BY THE ENGINEER HAVE BEEN GENERATED FOR THE PREPARATION OF THE CONSTRUCTION DRAWINGS. THE CONTRACTOR SHALL VERIFY THAT THE DIGITAL SURFACE MODEL IS CONSISTENT WITH THE FULL SET OF CONSTRUCTION DOCUMENTS AND IS SUITABLE FOR THEIR PURPOSES. WHEN IN CONFLICT, THE PRINTED DRAWINGS GOVERN UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- ANY DETENTION OR RETENTION BASIN ON SITE SHOULD BE CONSTRUCTED PRIOR TO THE CLEARING OF VEGETATION, STRIPPING TOPSOIL, AND GRADING OF THE SITE OR AS SOON AS PRACTICAL TO CONTROL STORMWATER RUNOFF AND SEDIMENTS FROM LEAVING THE SITE.
- CONTRACTOR SHALL REMOVE ALL TREES AND CLEAN ALL AREAS AS DETERMINED BY THE ENGINEER OR ARCHITECT TO PERFORM ALL GRADING AND UTILITY WORK IN ACCORDANCE WITH THE DRAWINGS, GENERAL NOTES, AND PROJECT SPECIFICATIONS.
- THE SITE SHALL BE STRIPPED OF ALL VEGETATION, TOPSOIL, AND OTHER ORGANIC MATERIAL AND STOCKPILED PRIOR TO GRADING.
- EMBANKMENT MATERIAL SHOULD CONSIST OF PLASTIC CLAY MATERIALS, FREE OF ORGANIC MATTER, WHICH CLASSIFY AS CL ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM AND SHALL CONTAIN NO STONES WHOSE LARGEST DIMENSION EXCEEDS FOUR (4) INCHES.
- CONTRACTOR SHALL ENGAGE A QUALIFIED INDEPENDENT GEOTECHNICAL TESTING AGENCY TO PERFORM FIELD QUALITY CONTROL TESTING.
- A MINIMUM OF SIX (6) INCHES OF TOPSOIL SHALL BE PLACED ON ALL GRASS AREAS UNLESS SPECIFIED OTHERWISE IN THE LANDSCAPE DRAWINGS.
- ALL SITE EXCAVATION AND EMBANKMENT SHALL BE COMPLETED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND/OR THE PROJECT SPECIFICATIONS. WHEN IN CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.
- UNLESS OTHERWISE STATED IN A GEOTECHNICAL REPORT OR THE PROJECT SPECIFICATIONS, COMPACTION IN STRUCTURAL FILL FOR BUILDINGS SHALL BE A MINIMUM OF 95% OF THE MODIFIED PROCTOR MAX DRY DENSITY PER ASTM D 1557. FILLS IN OTHER AREAS TO BE COMPACTED TO A MINIMUM OF 90% PROCTOR MAX DRY DENSITY. FILLS TO BE PLACED AND COMPACTED WITHIN ±3% OF OPTIMUM MOISTURE CONTENT FOR THE MATERIAL.

**GENERAL UTILITY NOTES**

- UNDERGROUND UTILITIES AS SHOWN WERE LOCATED IN THE FIELD AND/OR TAKEN FROM VARIOUS DEPARTMENT RECORDS AND RECORD PLAN SETS FROM PREVIOUS PROJECTS. THE LOCATIONS ARE AS ACCURATE AS CAN BE CONFIRMED FROM SURFACE APPURTENANCES (MANHOLES, VALVES, ETC.). NO EXCAVATION WAS DONE TO DETERMINE LOCATION OR DEPTH UNLESS OTHERWISE NOTED.
- THE LOCATION OF ALL UNDERGROUND UTILITIES ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION AND ELEVATION OF ANY EXISTING UNDERGROUND UTILITIES PRIOR TO BEGINNING CONSTRUCTION OR EARTH MOVING OPERATIONS.
- A MINIMUM OF 48 HOURS BEFORE COMMENCING WORK, THE CONTRACTOR SHALL CONTACT THE OHIO UTILITIES PROTECTION SERVICE (OUPS) AT 811 OR 1-800-362-2764 AND ALL OTHER AGENCIES WHICH MAY HAVE UNDERGROUND UTILITIES INVOLVED IN THIS PROJECT OR ARE NOT MEMBERS OF OHIO UNDERGROUND PROTECTION, INC.
- ALL PUBLIC AND PRIVATE UTILITY COMPANIES SHALL BE NOTIFIED BY THE CONTRACTOR, IN WRITING, AT LEAST SEVEN (7) DAYS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY TO ARRANGE FOR INSPECTION OF THE PROJECT.
- OTTAWA COUNTY SHALL BE NOTIFIED AT LEAST THREE (3) WORKING DAYS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY TO ARRANGE FOR INSPECTION OF THE PROJECT.
- PIPE UNDER OR WITHIN FIVE (5) FEET OF THE EXISTING OR PROPOSED EDGE OF PAVEMENT OR BACK OF CURB SHALL BE BACKFILLED WITH APPROVED GRANULAR MATERIAL TO THE SUBGRADE. GRANULAR MATERIAL SHALL MEET THE GRADING REQUIREMENTS OF ODOT ITEM 304 WITH A MAXIMUM DRY DENSITY EXCEEDING 110 LB/CU FT AND 98% COMPACTION AS DETERMINED BY STANDARD PROCTOR TESTS. THE ENGINEER RESERVES THE RIGHT TO ORDER COMPACTION TESTING IF DEEMED NECESSARY.
- ALL STORM SEWER, SANITARY SEWER, WATER MAIN, WATER SERVICES, AND UTILITY CROSSEOVERS LOCATED IN THE PUBLIC RIGHT-OF-WAY SHALL BE TOTALLY BACKFILLED WITH CONTROLLED DENSITY FILL UNDER EXISTING PAVEMENT CUT BY TRENCHING OPERATIONS TO A DISTANCE OF 5 FEET BEYOND THE BACK OF CURB.
- ALL TRENCHES SHALL BE COMPACTED AND BACKFILLED IN ACCORDANCE WITH ODOT SPECIFICATIONS ITEMS 203 AND 611 FOR TRENCHING OPERATIONS COMPLETED PRIOR TO PLACING PAVEMENT AND OUTSIDE OF PAVED AREAS.
- ITEMS THAT PERTAIN TO UNDERGROUND UTILITIES SUCH AS WATER MAIN PIPE, WATER VALVES, SANITARY SEWER PIPE, MANHOLE FRAMES AND COVERS, STORM SEWERS, ETC. WILL REMAIN UNDER THE SPECIFICATIONS OF THE UTILITY SERVING THE AREA AND THE LOCAL CITY OR COUNTY ENGINEER.
- NO OPEN CUT TRENCHES WILL BE ALLOWED TO REMAIN OPEN OVERNIGHT. OPEN TRENCHES SHALL BE COVERED WITH STEEL PLATES, 3/4" PLYWOOD, OR OTHER MEANS FOR TRENCHES WHICH WILL BE CONTINUED WITHIN THE NEXT 72 HOURS. THE OPEN TRENCH AREA SHALL ALSO BE SURROUNDED WITH CAUTION TAPE OUTSIDE OF AREAS OPEN TO TRAFFIC. TRENCHES TO REMAIN INACTIVE LONGER THAN 72 HOURS SHALL HAVE THE PIPE PLUGGED, MARKED, AND THE TRENCH FILLED UNTIL THE WORK PROGRESSES.
- CROSSINGS
  - WHENEVER A STORM OR SANITARY SEWER AND WATER MAIN MUST CROSS, THE SEWER SHALL BE AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN AS MEASURED BETWEEN THE OUTSIDE PIPE WALLS. IF IT IS ABSOLUTELY IMPOSSIBLE TO MAINTAIN THE 18 INCH VERTICAL SEPARATION, THE WATER MAIN SHALL BE RELOCATED OR THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:
    - A SEWER PASSING OVER OR UNDER THE WATER MAIN SHALL BE ENCASED OR CONSTRUCTED OF MATERIALS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS OF CONSTRUCTION FOR A MINIMUM DISTANCE OF 10 FEET ON EACH SIDE OF THE WATER MAIN.
    - THE SEWER CROSSING SHALL BE CONSTRUCTED SO THAT THE SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.
    - WHERE A WATER MAIN PASSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO PREVENT DAMAGE TO THE WATER MAIN.

**STORM SEWERS**

- STORM SEWER PIPES DESIGNATED AS "STM" SHALL MEET THE REQUIREMENTS OF ONE OF THE FOLLOWING:
  - NON-REINFORCED CONCRETE PIPE PER ODOT SPECIFICATION 706.01.
  - REINFORCED CONCRETE CIRCULAR PIPE PER ODOT SPECIFICATION 706.02 OR 706.03.
  - REINFORCED CONCRETE ELLIPTICAL CULVERT, STORM DRAIN, AND SEWER PIPE PER ODOT SPECIFICATION 706.04.
  - PRECAST REINFORCED BOX SECTIONS PER ODOT SPECIFICATION 706.05.
  - ALUMINIZED TYPE 2 CORRUGATED STEEL PIPE AND PIPE ARCHES WITH PAVED INVERT PER ODOT SPECIFICATIONS 707.01 OR 707.02.
  - ALUMINIZED TYPE 2 CORRUGATED STEEL SPIRAL RIB CONDUITS PER ODOT SPECIFICATION 707.12.
  - CORRUGATED POLYETHYLENE SMOOTH LINED PIPE PER ODOT SPECIFICATION 707.33.
  - POLYVINYL CHLORIDE PROFILE WALL PIPE PER ODOT SPECIFICATION 707.43.
  - POLYPROPYLENE CORRUGATED DOUBLE WALL PIPE PER ODOT SPECIFICATION 707.65.
  - POLYPROPYLENE TRIPLE WALL PIPE PER ODOT SPECIFICATION 707.69.
- ALL STORM STRUCTURES ARE ODOT TYPES UNLESS OTHERWISE NOTED.
- ALL CATCH BASINS SHALL BE EQUIPPED WITH HEAVY DUTY, BICYCLE SAFE GRATES CAPABLE OF CARRYING AN HS-20 LOADING.
- ALL CATCH BASINS SHALL BE CONSTRUCTED WITH FRAMES, IF NOT SPECIFIED AND BE CONSTRUCTED WITH THE APPROPRIATE GRATE. REAR YARD CATCH BASINS ARE PERMITTED TO BE DROP IN GRATES WITHOUT FRAMES.
- ALL CATCH BASINS WITHIN PAVEMENT ARE TO BE CONSTRUCTED WITH EAST JORDAN WORKS #5250 FRAME AND GRATE, OR APPROVED EQUAL.
- ANY EXISTING STORM SEWER CUT BY EXCAVATION WHICH DRAINS AN OFFSITE AREA MUST BE TIED INTO THE STORM SEWER SYSTEM.
- UNDERDRAINS SHALL BE PLACED 6 INCHES BELOW THE SUBGRADE PER ODOT STANDARD DRAWING DM-1.2.
- EROSION CONTROL MEASURES SHALL BE PLACED AT THE INLET AND OUTLET OF STORM SEWERS TO CONTROL SILT AS THE INSTALLATION OF THE STORM SEWER PROGRESSES.
- ALL JOINTS SHALL BE SOIL SEAL JOINTS UNLESS SPECIFICALLY NOTED ON THE PLANS.

- PIPE JOINTS SHALL MEET THE REQUIREMENTS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION SPECIFICATIONS, ITEM 706.11 (ASTM C-443), AND SHALL HAVE PREMIUM JOINTS.
- UNCONTROLLED STORM WATER AND EXTRANEOUS FLOWS ARE PROHIBITED FROM ENTERING THE EXISTING STORM SEWER SYSTEM DURING CONSTRUCTION. STORM DRAINS, DIVERSION DITCHES, PUMPS, ETC. SHALL BE USED AS REQUIRED TO MAINTAIN THE INTEGRITY OF THE SYSTEM AT ALL TIMES.
- ALL CATCH BASINS WITH A DEPTH GREATER THAN 4 FEET SHALL BE PROVIDED WITH STEPS MEETING THE REQUIREMENTS OF OMS ITEM 611 AND SHALL CONFORM TO THE DETAILS SHOWN ON ODOT STANDARD DRAWING MH-1.1.
- ASPHALT PAVEMENT AROUND ALL STORM WATER COLLECTION APPURTENANCES (CATCH BASINS, CURB INLETS, ETC.) SHALL BE NO LESS THAN 1/4" ABOVE THE STORM STRUCTURE.

**GAS**

- FOR GAS ENGINEERING NOTIFICATION, AGREEMENTS, AND OFFICIAL CORRESPONDENCE RELATED TO GAS FACILITIES, ADDRESS TO THE ADDRESS SHOWN ON THE DRAWINGS.
- THE GAS MAIN INFORMATION PROVIDED SHOWS THE APPROXIMATE LOCATIONS AND DEPTHS OF COVER AND IS PROVIDED TO COMPLY WITH STATUTORY REGULATIONS. THIS INFORMATION SHOULD BE USED ONLY FOR PLANNING, NOT CONSTRUCTION.
- ALL GAS MAIN DEPTHS OF COVER IF NOTED ARE APPROXIMATE DEPTHS OF COVER RECORDED AT THE TIME OF INSTALLATION. ANY RESULTING GRADE CHANGES SINCE THE TIME OF THE MAIN INSTALLATION WILL CAUSE THE EXISTING DEPTHS OF COVER TO BE DIFFERENT. EXTREME CARE MUST BE TAKEN TO ENSURE SAFE EXCAVATION WHEN APPROACHING KNOWN OR SUSPECTED GAS FACILITIES. GAS SERVICE SHALL MEET THE REQUIREMENTS OF THE UTILITY PROVIDER.
- GAS SERVICE SHALL BE POLYETHYLENE PIPE MEETING THE REQUIREMENTS OF ASTM D-2513 AND THE PLASTIC PIPE INSTITUTE PE 2406 FOR MEDIUM DENSITY PIPE.
- ALL GAS SERVICES WERE INSTALLED AT A MINIMUM OF 1'-6" OF COVER. SEE NOTE 3 ABOVE.
- FOR ADDITIONAL GAS FACILITY RECORD INFORMATION, CALL THE UTILITY PROVIDER AT THE PHONE NUMBER LISTED ON THE DRAWINGS.
- TO COMPLY WITH FEDERAL AND STATE REGULATIONS CONCERNING DAMAGE PREVENTION PROGRAMS, THE UTILITY COMPANIES MUST BE CONTACTED AT LEAST 48 HOURS (2 WORKING DAYS) PRIOR TO EXCAVATION BY CALLING THE OHIO UTILITIES PROTECTION SERVICE (OUPS), TOLL FREE AT 811 OR 1-800-362-2764.
- 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 THE CONTRACTOR'S CONSTRUCTION. ALL DAMAGE TO GAS FACILITIES REQUIRING ADJUSTMENTS, RELOCATIONS AND/OR REPAIRS WILL BE MADE AT THE CONTRACTOR'S EXPENSE.
- 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 THE GAS FACILITIES. CONTACT THE GAS PROVIDER 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 PREVENTING ANY DAMAGE TO EXISTING GAS FACILITIES. THIS INCLUDES PROTECTION OF COATINGS AND WRAPPINGS ON STEEL GAS MAINS. IT ALSO INCLUDES ANY DAMAGE WHICH MAY HAVE OCCURRED TO PLASTIC GAS MAINS, SUCH AS CRIMPS OR GOUGES.
- WHEN CAST IRON OR SIMILAR GAS FACILITIES ARE EXPOSED OR INTERFERED WITH BY THE CONTRACTOR, REPLACEMENT OR REINFORCEMENT BY THE UTILITY OWNER MAY BE REQUIRED AT THE CONTRACTOR'S EXPENSE. BACKFILL WITH CONTROL LOW STRENGTH MATERIAL WILL BE REQUIRED.
- BLASTING OR OTHER CONSTRUCTION PROCEDURES WHICH MAY TRANSMIT LOADS OR VIBRATIONS IN THE VICINITY OF GAS FACILITIES MUST BE APPROVED BY THE GAS UTILITY PROVIDER. A BLASTING PLAN, IDENTIFYING ALL PERTINENT INFORMATION, MUST BE SUBMITTED IN WRITING BY A BLASTING EXPERT PRIOR TO ANY WORK.
- PROPOSED DEVELOPMENT PLANS AROUND AND NEAR GAS FACILITIES WITHIN PRIVATE EASEMENTS MUST BE SUBMITTED TO THE GAS UTILITY PROVIDER FOR REVIEW. THESE PLANS MUST BE APPROVED BEFORE ANY WORK MAY BEGIN WITHIN THE UTILITY OWNER'S EASEMENTS.
- SPECIFIED EASEMENT WIDTHS MUST BE MAINTAINED IN ORDER FOR THE UTILITY PROVIDER TO PROTECT ITS FACILITIES.
- NO PERMANENT STRUCTURES MAY BE BUILT WITHIN THE EASEMENTS.
- CUTS AND FILLS ARE GENERALLY NOT PERMITTED WITHIN THE EASEMENTS. SOME FILLS MAY BE ALLOWED, AND WILL BE REVIEWED ON AN INDIVIDUAL BASIS. ANY PERMITTED FILLS WILL BE LIMITED TO AN AMOUNT WHICH WILL ALLOW THE UTILITY OWNERS TO PROPERLY MAINTAIN ITS FACILITIES.
- PERPENDICULAR UTILITY CROSSINGS OF GAS EASEMENTS ARE ACCEPTABLE, PROVIDED PROPER CLEARANCES ARE MAINTAINED. PARALLEL INSTALLATIONS ARE NORMALLY NOT ALLOWED.

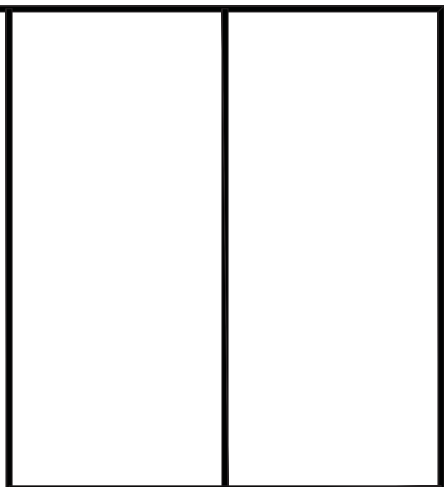
**ELECTRIC**

- ELECTRIC SERVICE SHALL MEET THE REQUIREMENTS OF THE UTILITY PROVIDER AND THE ELECTRICAL DRAWINGS IF PROVIDED. WHEN IN CONFLICT WITH THESE SPECIFICATIONS, THE MOST STRINGENT REQUIREMENTS OF THE UTILITY PROVIDER AND THE ELECTRICAL DRAWINGS SHALL PREVAIL.
- ALL ELECTRICAL TRANSFORMERS SHALL BE LOCATED SO THAT THEY DO NOT INTERFERE WITH THE EXISTING MANHOLES OR WATER MAIN APPURTENANCES.
- ELECTRIC CONDUITS SHALL CONSIST OF PVC SCHEDULE 40 NEMA RATED CONDUITS MEETING THE REQUIREMENTS OF THE ELECTRIC SERVICE PROVIDER. PULL LINES WITH A MINIMUM 200# TEST SHALL BE PROVIDED IN EACH CONDUIT.
- CONDUIT BENDS GREATER THAN 30° SHALL BE LONG, SWEEPING, RIGID GALVANIZED STEEL BENDS WITH A MINIMUM RADIUS OF AT LEAST TEN TIMES THE DIAMETER OF THE CONDUIT. STEEL BENDS SHALL BE JOINED TO THE PVC CONDUIT WITH THE APPROPRIATE COUPLING FITTINGS.
- CONDUITS RUNS WITH THREE OR MORE CONDUITS SHALL BE SUPPORTED ON PVC STANDS WHICH ARE ANCHORED TO THE SIDES OF THE TRENCH.
- ELECTRIC MANHOLES, IF NECESSARY, ARE TO BE DESIGNED BY, AND CONSTRUCTED IN ACCORDANCE WITH, THE ELECTRIC SERVICE PROVIDER REQUIREMENTS.
- ELECTRIC PULL BOXES SHALL BE A MINIMUM TIER 5 RATED, 48" X 48" X 45" IN-GROUND POLYMER CONCRETE JUNCTION BOXES WITH A BOLTED COVER. THE BOX SHALL HAVE A CLOSED BOTTOM ON A MINIMUM 12" STONE BASE. THE COVER SHALL HAVE "ELECTRIC" STAMPED/CAST INTO THE COVER. BOXES SHALL BE QUAZITE PG4848DA48/LG4848CA00 OR EQUAL.

**COMMUNICATIONS**

- TELEPHONE CONDUITS, WHETHER SHOWN IN THESE PLANS OR NOT, SHALL MEET THE FOLLOWING REQUIREMENTS, THE REQUIREMENTS OF THE UTILITY PROVIDER, AND THE ELECTRICAL AND COMMUNICATIONS DRAWINGS (IF PROVIDED). WHEN IN CONFLICT, THE MOST STRINGENT REQUIREMENTS OF THE UTILITY PROVIDER AND THE ELECTRICAL/COMMUNICATIONS DRAWINGS SHALL PREVAIL.
- TELEPHONE CONDUITS SHALL BE PVC SCH. 40 PRIVATELY OWNED (PO) CONDUITS, FOR TELEPHONE COMPANY USE, FROM THE PROPOSED BACK BOARD LOCATION TO THE POINT OF CONNECTION BY THE UTILITY PROVIDER. CONDUITS SHALL MEET THE REQUIREMENTS OF TELEPHONE SERVICE PROVIDER.
- TERMINATE UNDERGROUND CONDUIT AT DESIGNATED LOCATION WITH A MINIMUM COVER OF 24 INCHES AND MAXIMUM COVER OF 36 INCHES.
- WRAP THE END OF THE CONDUIT WITH A SUITABLE MATERIAL TO PREVENT CLOGGING UNTIL THE CABLE IS PLACED. TELEPHONE SERVICE PROVIDER WILL MAKE CONNECTION AT THIS POINT.
- FLAG OR IDENTIFY THE END OF THE CONDUIT IN ORDER TO DESIGNATE THE POINT OF CONNECTION BETWEEN TELEPHONE SERVICE PROVIDER AND ENTRANCE CONDUIT.
- POWER OR OTHER FOREIGN CONDUIT MUST BE SEPARATED FROM TELEPHONE CONDUIT BY A MINIMUM OF 12" OF EARTH OR 3" OF CONCRETE.
- CONDUIT MUST BE PLACED AT A MINIMUM DEPTH OF 24" AND A MAXIMUM OF 36".
- PROVIDE A 200# TEST PULL LINE IN CONDUIT.
- ALL BENDS MUST BE LONG, SWEEPING BENDS MADE OF RIGID GALVANIZED STEEL WITH A RADIUS NOT LESS THAN TEN TIMES THE INTERNAL DIAMETER OF CONDUIT. WITH A MAXIMUM OF 180 DEGREES OF BENDS BETWEEN PULLING POINTS. WHEN 180 DEGREES OF BENDS ARE REQUIRED, A PULL BOX WILL BE REQUIRED. STEEL BENDS SHALL BE JOINED TO PVC CONDUIT BY APPROPRIATE COUPLINGS TO CREATE A WATER TIGHT JOINT.
- PULL BOXES/HAND HOLES SHALL BE A MINIMUM OF TIER 22 RATED 24" X 36" X 18" IN-GROUND POLYMER CONCRETE JUNCTION BOXES WITH A BOLTED COVER AND AN OPEN BOTTOM ON A MINIMUM 12" STONE BASE. THE COVER SHALL BE PROVIDED WITH "COMMUNICATIONS" STAMP OR CAST INTO THE COVER. BOXES SHALL BE QUAZITE PG2436BB18/PG2436HH00 OR EQUAL.
- CONDUIT ENTERING FROM BELOW GRADE POINT MUST EXTEND 4" ABOVE FINISHED FLOOR.
- PROVIDE A 3/4" PLYWOOD BACKBOARD FOR TELEPHONE COMPANY USE. DIMENSIONS TO BE PROVIDED BY THE SERVICE PROVIDER. BACKBOARD SHALL BE PAINTED ON ALL SIDES WITH TWO COATS OF NONCONDUCTIVE, FIRE-RETARDANT PAINT OR FIRE RETARDANT VIRGIN PLYWOOD IS ALSO ACCEPTABLE.
- PROVIDE A 110 VOLT 20 AMP DUPLEX OUTLET ON THE BACKBOARD.
- PROVIDE AT THE BACKGROUND LOCATION, A COILED INSULATED #6 GROUND WIRE CONNECTED TO THE ELECTRIC SERVICE GROUND, FOR THE PROPER GROUNDING OF TELEPHONE COMPANY CABLES, TERMINALS, AND EQUIPMENT.
- TERMINATION SPACE SHALL BE CONTINUALLY ACCESSIBLE, WELL -LT, AND ENVIRONMENTALLY CLEAN.
- TERMINATION SPACE MUST CONTAIN A 20 AMP DUPLEX GROUNDED OUTLET FOR TESTING AND MAINTENANCE AND SHALL HAVE A MINIMUM MAINTENANCE AREA OF 36 INCHES IN FRONT OF ALL TELEPHONE BOARDS.
- CONDUIT MUST EXTEND 4" ABOVE FINAL GRADE AT THE CONNECTION TO THE UTILITY POLE.

PLOTTED: Apr 03, 2019 -- 8:41pm  
DRAWING: M:\18201 (Safe Harbor -Stag Harbor)\CIVIL\DWG\18201 CD.dwg: C03 NOTES SAFE HARBOR



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**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
 6721 EAST HARBOR ROAD  
 LAKESIDE MARBLEHEAD, OHIO, 43440  
 OTTAWA COUNTY  
 LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP

**FILE:** 18201 CD.dwg  
**JOB NO.:** 18201  
**DRAWN BY:** LMM  
**ISSUED:** APRIL 3, 2019

**C3**



# SANITARY SEWER SPECIFICATIONS

## GENERAL

- ALL SANITARY SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE OTTAWA COUNTY SEWER DISTRICT PUBLIC WATER AND WASTEWATER RULES AND REGULATIONS, TEN STATE STANDARDS, ODOT STANDARDS, AND THE REQUIREMENTS OF THE OHIO E.P.A. ALL CONTRACTORS INSTALLING SANITARY SEWER IMPROVEMENTS MUST BE LICENSED WITH THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT (O.C.S.E.).
- PERMITS SHALL BE SECURED FOR SANITARY SEWER IMPROVEMENTS FROM THE O.C.S.E. PRIOR TO COMMENCING CONSTRUCTION. THE PROPERTY OWNER SHALL BE REQUIRED TO SECURE ALL REQUIRED PERMITS. COPIES OF SAID PERMITS SHOULD BE KEPT ON THE CONSTRUCTION SITE AND AVAILABLE FOR REVIEW AT ANYTIME. CONTRACTORS SHALL BE REQUIRED TO PROVIDE A VALID PERMIT NUMBER WHEN REQUESTING INSPECTIONS.
- CONTRACTORS SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE AND LOCAL SAFETY STANDARDS AND REGULATIONS. CONTRACTORS SHALL BE RESPONSIBLE FOR KEEPING THE CONSTRUCTION SITE SAFE FOR ITS EMPLOYEES, EMPLOYEES OF OTTAWA COUNTY, AND THE GENERAL PUBLIC.
- ALL SANITARY SEWER IMPROVEMENTS SHALL BE INSPECTED AND APPROVED BY THE OTTAWA COUNTY SANITARY ENGINEERING INSPECTOR PRIOR TO BACKFILLING THE IMPROVEMENTS. FORTY-EIGHT(48) HOURS NOTICE OF COMMENCING CONSTRUCTION SHALL BE GIVEN TO THE INSPECTOR PRIOR TO STARTING WORK. O.C.S.E. NOTIFICATIONS:

FIELD OPERATIONS:  
DANBURY WASTEWATER TREATMENT PLANT  
AND REGIONAL WATER DIST. SYSTEM  
5785 E. VON GLAHN RD.  
LAKESIDE/MARBLEHEAD, OHIO 43440  
PHONE 419-734-5953  
FAX 419-734-7072

OFFICE OPERATIONS  
OTTAWA COUNTY SANITARY  
ENGINEERING (OFFICE)  
315 MADISON ST. ROOM 105  
PORT CLINTON, OHIO 43452  
PHONE 419-734-6725  
FAX 419-734-6858

- OTTAWA COUNTY RESERVES THE RIGHT TO REQUIRE FIELD CHANGES THAT ARE NOT NOTED IN THE IMPROVEMENT DRAWINGS, APPROVAL LETTER(S), OR IN THE RULES AND REGULATIONS TO INSURE THE INTEGRITY AND COMPATIBILITY OF THE PUBLIC WATER AND WASTEWATER TREATMENT SYSTEMS.
- CONNECTIONS OF DWELLINGS OR OTHER TYPE OF STRUCTURES SHALL NOT BE PERMITTED UNTIL THE SANITARY SEWER MAINS ARE INSTALLED, INSPECTED, AND APPROVED FOR USE UNLESS OTHERWISE STATED ON THE PERMIT ISSUED BY THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT. CLEAN WATER CONNECTIONS SUCH AS, BUT NOT LIMITED TO, SLUMP PUMPS, DOWNSPOUTS, OR FOOTER DRAINS SHALL NOT BE PERMITTED TO BE CONNECTED TO THE SANITARY SEWER COLLECTION SYSTEM.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ANY INFORMATION ON EXISTING WATER AND SANITARY SEWER IMPROVEMENTS OR ANY GENERAL FIELD INFORMATION PROVIDED BY THE O.C.S.E. PRIOR TO STARTING CONSTRUCTION OF THE IMPROVEMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY RESTORING ANY DISTURBED AREAS AROUND EXISTING WATER AND/OR SANITARY SEWER INFRASTRUCTURE AS SOON AS REASONABLY POSSIBLE AFTER WORK HAS BEEN COMPLETED IN THAT IMMEDIATE AREA.
- IT SHALL BE THE PROPERTY OWNER AND CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL NECESSARY PERMITS OR APPROVALS ARE SECURED FROM ANY OTHER GOVERNMENTAL AGENCY, ASSOCIATION, OR ORGANIZATION THAT MAY HAVE THEIR JURISDICTION EFFECTED BY THE WATER AND/OR SANITARY SEWER IMPROVEMENTS.
- THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. THE EXACT LOCATION OF ALL UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL NOTIFY THE OHIO UTILITIES PROTECTION SERVICE (OUPS) AT 1-800-362-2764 AND ALL UTILITIES TO LOCATE THEIR EXISTING FACILITIES. AT LEAST TWO (2) WORKING DAYS PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGE TO UTILITIES CAUSED BY HIS OPERATIONS.
- GRANULAR BEDDING USED FOR BEDDING AND BACKFILL OVER, UNDER AND AROUND THE SANITARY SEWER SHALL CONTAIN LESS THAN ONE (1) PERCENT GYPSUM BY WEIGHT. CONTRACTOR SHALL SUPPLY CERTIFICATION FROM SUPPLIER WHICH STATES THE PERCENTAGE OF GYPSUM CONTAINED IN THE MATERIAL BEING USED ON THE JOB.
- COMPLETE ROAD CLOSURES REQUIRE PRIOR COUNTY APPROVAL. ANY LANE CLOSURE OR ENCROACHMENT ON OR UNDER STATE HIGHWAYS, FOR EXAMPLE, ROAD BORES, REQUIRE AN ODOT PERMIT.
- THE CONTRACTOR SHALL MAINTAIN TRAFFIC AT ALL TIMES IN ACCORDANCE WITH THE REQUIREMENTS OF SPECIFICATION ITEM 614, AS OUTLINED IN THE CONSTRUCTION AND MAINTENANCE OPERATION SECTION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, CURRENT EDITION IN EFFECT AT THE TIME OF CONTRACT AWARD.

### A. GRAVITY SANITARY SEWER NOTES

- ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT, THE TEN STATE STANDARD FOR THE GREAT LAKES--UPPER MISSISSIPPI RIVER BOARD STATE SANITARY ENGINEERS, AND THE OHIO ENVIRONMENTAL PROTECTION AGENCY.
- ALL SANITARY GRAVITY SEWERS 15 INCH IN DIAMETER AND SMALLER SHALL BE PVC, ASTM D-3034--SDR35 WITH PREMIUM JOINTS CONFORMING TO ASTM D-3212.
- PRECAST SANITARY MANHOLES SHALL CONFORM TO ASTM SPECIFICATIONS DESIGNATION C-478 AND THE JOINTS BETWEEN SECTIONS SHALL CONFORM TO ASTM C-443 (RUBBER GASKET).
- BACKFILL AT ALL TRENCHES WITHIN 5 FEET OF THE BACK OF THE CURB OR EDGE OF PAVEMENT AND ALL TRENCHES UNDER THE PAVEMENT TO WITHIN 5 FEET OF THE BACK OF CURB OR EDGE OF PAVEMENT SHALL BE BACKFILLED WITH GRANULAR MATERIAL TO THE BOTTOM OF THE PAVEMENT. GRANULAR MATERIAL SHALL CONFORM TO O.D.O.I. ITEMS 304, 411 OR 617 AND COMPACTED TO 98% OF STANDARD PROCTOR.
- ROOF DRAINS, FOUNDATION DRAINS, SLUMP PUMPS AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.
- ALL SANITARY SEWERS SHALL BE TESTED FOR DEFLECTION AND INFILTRATION (AT LEAST 30 DAYS FOLLOWING INSTALLATION & BACKFILL) BY THE CONTRACTOR WHO SHALL BE LICENSED WITH THE SANITARY ENGINEERING DEPARTMENT. DEFLECTION SHALL NOT EXCEED 5 PERCENT. THE MAXIMUM RATE OF LEAKAGE OR INFILTRATION ALLOWABLE IS 100 GALLONS PER INCH OF PIPE DIAMETER PER MILE PER 24 HOURS. THE COST OF ALL MATERIALS, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY FOR PERFORMING THE TEST AND MAKING ANY NECESSARY CORRECTIONS AND REPLACEMENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
- ALL SANITARY TAP LOCATIONS ARE APPROXIMATE. FINAL TAP LOCATIONS SHALL BE DETERMINED AT THE TIME OF CONSTRUCTION WITH THE CONTRACTOR RESPONSIBLE FOR AS BUILT PLANS.
- ALL SANITARY MANHOLE TOP ELEVATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD SET THE MANHOLE TOP ELEVATION AT EXISTING OR PROPOSED GRADE DEPENDING ON THE MANHOLE LOCATION.

- NO SANITARY SERVICE CONNECTIONS SHALL BE PERMITTED TO ENTER MANHOLES.
- ALL SANITARY SEWERS SHALL BE INSTALLED WITH CONSTANT LINE AND GRADE USING LASER TECHNOLOGY.
- ALL PIPE NOT CONNECTED DURING CONSTRUCTION OF THE PROJECT SHALL BE FITTED WITH PLUGS AND MARKED WITH A 2" X 2" OAK STAKE. AN 18 INCH LENGTH OF 1/2 INCH DIAMETER REBAR SHALL BE VERTICALLY PLACED, ONE FOOT AWAY FROM THE PLUG AND POUNDED TO BE FLUSH WITH FINISH GRADE.
- A MINIMUM OF 5 HORIZONTAL FEET SHALL SEPARATE THE SANITARY SEWER FROM ANY OTHER UTILITY EXCEPT FOR WATER LINES AND APPURTENANCES WHICH SHALL BE SEPARATED BY 10 FEET OF HORIZONTAL CLEARANCE AND 18 INCHES OF VERTICAL CLEARANCE WITH THE SANITARY SEWER BEING BELOW THE WATER LINE AND APPURTENANCES. WHEN IT IS NECESSARY TO CROSS WATER AND SANITARY SEWER MAINS, ALL UNDERGROUND UTILITIES SHALL CROSS MORE PERPENDICULAR THAN PARALLEL.
- WHenever a SANITARY SEWER AND WATERLINE MUST CROSS, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER LINE. IF IT IS ABSOLUTELY IMPOSSIBLE TO MAINTAIN THE 18 INCH VERTICAL SEPARATION, THE SANITARY SEWER SHALL BE CONSTRUCTED OF WATER LINE TYPE MATERIALS WHICH WILL WITHSTAND A 50 PSI PRESSURE TEST. THESE REQUIREMENTS WILL EXTEND FOR A DISTANCE OF 10 FEET, MEASURED PERPENDICULAR, ON BOTH SIDES OF THE WATER LINE. CONSTRUCTION OF SEWERS IN STREAM BEDS IS NOT ACCEPTABLE EXCEPT FOR STREAM CROSSINGS.
- MANHOLE COATINGS - THE INTERIOR SURFACE OF THE ENTIRE SANITARY SEWER MANHOLE SHALL BE COMPLETELY COATED WITH A MIN. OF 125 MILLS OF THE COUNTY APPROVED POLYUREA OR URETHANE RESIN BASED COATING PRODUCT. FOR PRIVATE MANHOLES, SUBJECT TO LOW AMOUNTS OF HYDROGEN SULFIDE, 30 MILS OF COAL TAR, HIGH BUILD EPOXY SHALL BE FACTORY APPLIED. ACCEPTABLE PRODUCTS ARE 46H-413 HI-BUILD TNEM-TAR BY THE TNEC COMPANY OR GLID-GUARD HI-BUILD COAL TAR EPOXY FINISH NO. 5273-5274
- SANITARY SEWER MANHOLE CHIMNEY SEALS- CHIMNEY SEALS SHALL BE DESIGNED FOR PROVIDING A FLEXIBLE SEAL BETWEEN MANHOLE FRAMES AND THEIR SUPPORTING ADJUSTING RINGS AND DOME SECTIONS. THE SEALS SHALL BE INTERNAL TYPE AND SHALL CONSIST OF A RUBBER SLEEVE, EXPANSION BAND, AND HARDWARE. AN INTERNAL SEAL SHALL BE PROVIDED FOR ALL FRAMES. CHIMNEY SEALS SHALL BE AS MANUFACTURED BY CRETEX SPECIALTY PRODUCTS, OR COUNTY APPROVED EQUAL, AND SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS USING TOOLS DESIGNED SPECIFICALLY FOR THE SEALS BEING INSTALLED. THE INSTALLATION OF THE CHIMNEY SEALS SHALL INCLUDE PREPARATION OF THE WALL SURFACES IN THE CHIMNEY AREA AND CAULKING AS REQUIRED BY THE MANUFACTURER'S INSTRUCTIONS.
- ALL SANITARY SEWER SERVICE CONNECTIONS (TAPS) SHALL BE SIX (6) INCH IN DIAMETER. SERVICE CONNECTIONS SHALL BE INSTALLED ON THE SANITARY SEWER MAIN PIPE ONLY (NOT INTO MANHOLES) AND SHALL BE EXTENDED TO AT LEAST THE PROPERTY LINE OF THE PROPERTY TO BE SERVED. SERVICE CONNECTIONS SHOULD BE EXTENDED PAST THE PROPERTY LINE WHEN OTHER NEW UNDERGROUND UTILITIES ARE DESIGNED TO BE INSTALLED PARALLEL AND NEXT TO THE PROPERTY LINE. THE CONTRACTOR SHALL INSTALL A WATERTIGHT PLUG/CAP ON THE END OF THE SERVICE CONNECTION. AN 18 INCH LONG PIECE OF STEEL REBAR 1/2 INCH IN DIAMETER SHALL BE INSTALLED VERTICALLY AT THE END OF EACH SERVICE CONNECTION AND SHALL EXTEND UP TO WITHIN ONE FOOT OF THE FINISHED GRADE.
- SANITARY SEWERS SHALL HAVE A MINIMUM DEPTH OF FOUR AND A HALF (4 1/2) FEET.
- TESTING REQUIREMENTS: UNLESS OTHERWISE DIRECTED BY THE ENGINEER, TESTS SHALL BE CONDUCTED ON THE SANITARY SEWER IN ACCORDANCE WITH SECTIONS OF THE OTTAWA COUNTY SEWER DISTRICT RULES AND REGULATIONS AS FOLLOWS: AIR TESTS FOR INFILTRATION AND EXFILTRATION-SECTION 7.0.4 TESTS FOR DEFLECTION- 7.0.5 AND ASTM 1417 VACUUM TESTING OF MANHOLES- 7.0.7 AND ASTM C 1244.

### B. GRAVITY SANITARY SEWER NOTES

- FORCE MAINS/LOW PRESSURE SEWERS SHALL BE HDPE - DIPS, OR PVC PIPE & WITH FITTINGS MEETING THE REQUIREMENTS OF ASTM D-2241, LATEST EDITION, AND SHALL BE SDR-21, SDR-26 PIPE & SHALL BE JOINED BY MEANS OF A GASKETED BELL JOINT WHICH SHALL BE AN INTEGRAL AND HOMOGENEOUS PART OF THE PIPE BARREL. JOINTS AND GASKETS SHALL CONFORM TO ASTM D-3139 AND ASTM F477 RESPECTIVELY. ALL FITTINGS SHALL BE SCHEDULE 80, PIPE FOUR (4) INCHES IN DIAMETER OR LARGER SHALL HAVE A NOMINAL LAYING LENGTH OF 20 FEET OR 40 FEET. HDPE PIPE SHALL BE PRE APPROVED BY THE COUNTY IN TERMS OF THE SDR AND FUSING.
- ALL FORCE MAINS AND LOW PRESSURE SANITARY SEWERS SHALL BE PRESSURE TESTED AT AN AVERAGE PRESSURE OF 100 PSI FOR 2 HOURS. THE ALLOWABLE LEAKAGE SHALL BE DETERMINED AT THE TIME OF THE TEST. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM THIS TEST PROPERLY AND IN THE PRESENCE OF THE ENGINEER. IF THE TEST DOES NOT PASS, THE CONTRACTOR SHALL MAKE ALL NECESSARY CORRECTIONS AND RETEST UNTIL ACCEPTABLE. THE COST OF ALL MATERIALS, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY FOR PERFORMING THE TEST AND MAKING ANY CORRECTIONS AND REPLACEMENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
- THE CONTRACTOR SHALL INSTALL A DETECTABLE TRACER TAPE DIRECTLY OVER THE CENTERLINE OF THE FORCE MAIN OR LOW PRESSURE SEWER AT A DEPTH OF 18 INCHES BELOW THE GROUND SURFACE. THE DETECTABLE TRACER TAPE SHALL EXTEND ALONG THE ENTIRE LENGTH OF THE PIPE, SHALL BE BRIGHTLY COLORED TO CONTRAST WITH THE SOIL, AND SHALL READ "CAUTION: FORCE MAIN BURIED BELOW". ALL COSTS FOR PROVIDING THE DETECTION TAPE SHALL BE INCLUDED IN THE PRICE OF THE PIPE. TWO (2) GREEN TRACER WIRES ARE REQUIRED DIRECTLY OVER AND ON THE CENTER OF THE FORCE MAIN FOR ITS ENTIRE LENGTH TO PROVIDE FOR AN INDUCTIVE PATH TO DETERMINE PIPE LOCATION AFTER INSTALLATION. THE WIRES SHALL BE #12 AWG COPPER-CLAD STEEL CORE WITH 30 MIL INSULATION FOR LINES INSTALLED BY OPEN-CUT TRENCHING METHODS. DIRECTIONALLY DRILLED/BORED LINES (WHERE PERMITTED) SHALL HAVE #12 AWG COPPER-CLAD STEEL CORE WITH 45 MIL INSULATION WIRES. TRACER WIRES SHALL BE TERMINATED INSIDE OF ALL VALVE BOXES. CONTRACTOR SHALL PERFORM A CONTINUITY TEST ON TRACER WIRE TO ENSURE CONTINUITY OF THE TRACER WIRE OVER THE LENGTH OF THE ENTIRE FORCE MAIN. TEST SHALL BE REQUIRED UPON COMPLETION OF THE PROJECT AND PRIOR TO COUNTY ACCEPTANCE.

## WATER LINE SPECIFICATIONS

### GENERAL

- ALL WATER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE OTTAWA COUNTY SEWER DISTRICT PUBLIC WATER AND WASTEWATER RULES AND REGULATIONS, TEN STATE STANDARDS, O.D.O.I. STANDARDS, AND THE REQUIREMENTS OF THE OHIO E.P.A. ALL CONTRACTORS INSTALLING WATER IMPROVEMENTS MUST BE LICENSED WITH THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT (O.C.S.E.).
- PERMITS SHALL BE SECURED FOR WATER IMPROVEMENTS FROM THE O.C.S.E. PRIOR TO COMMENCING CONSTRUCTION. THE PROPERTY OWNER SHALL BE REQUIRED TO SECURE ALL REQUIRED PERMITS. COPIES OF SAID PERMITS SHOULD BE KEPT ON THE CONSTRUCTION SITE AND AVAILABLE FOR REVIEW AT ANYTIME. CONTRACTORS SHALL BE REQUIRED TO PROVIDE A VALID PERMIT NUMBER WHEN REQUESTING INSPECTIONS.
- CONTRACTORS SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE AND LOCAL SAFETY STANDARDS AND REGULATIONS. CONTRACTORS SHALL BE RESPONSIBLE FOR KEEPING THE CONSTRUCTION SITE SAFE FOR ITS EMPLOYEES, EMPLOYEES OF OTTAWA COUNTY, AND THE GENERAL PUBLIC.

- ALL WATER IMPROVEMENTS SHALL BE INSPECTED AND APPROVED BY THE OTTAWA COUNTY SANITARY ENGINEERING FIELD OBSERVER PRIOR TO BACKFILLING THE IMPROVEMENTS. FORTY-EIGHT(48) HOURS NOTICE OF COMMENCING CONSTRUCTION SHALL BE GIVEN TO THE FIELD OBSERVER PRIOR TO STARTING WORK. O.C.S.E. NOTIFICATIONS:  
  
FIELD OPERATIONS:  
DANBURY WASTEWATER TREATMENT PLANT;  
AND REGIONAL WATER DIST. SYSTEM  
5785 E. VON GLAHN RD.  
LAKESIDE/MARBLEHEAD, OHIO 43440  
PHONE 419-734-5953  
FAX 419-734-7072  
  
OFFICE OPERATIONS:  
OTTAWA COUNTY SANITARY  
ENGINEERING (OFFICE)  
315 MADISON ST. ROOM 105  
PORT CLINTON, OHIO 43452  
PHONE 419-734-6725  
FAX 419-734-6858

- OTTAWA COUNTY RESERVES THE RIGHT TO REQUIRE FIELD CHANGES THAT ARE NOT NOTED IN THE IMPROVEMENT DRAWINGS, APPROVAL LETTER(S), OR IN THE RULES AND REGULATIONS TO INSURE THE INTEGRITY AND COMPATIBILITY OF THE PUBLIC WATER AND WASTEWATER TREATMENT SYSTEMS.
- CONNECTIONS OF DWELLINGS OR OTHER TYPE OF STRUCTURES SHALL NOT BE PERMITTED UNTIL THE WATER MAINS ARE INSTALLED, INSPECTED, AND APPROVED FOR USE UNLESS OTHERWISE STATED ON THE PERMIT ISSUED BY THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT. CROSS-CONNECTIONS WITH AUXILIARY WATER SOURCES ARE PROHIBITED. WHERE APPLICABLE, OHIO EPA APPROVED BACKFLOW PREVENTERS ARE REQUIRED WITH INSTALLATION AND TESTING IN ACCORDANCE WITH THE COUNTY'S BACKFLOW PREVENTION REGULATIONS.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ANY INFORMATION ON EXISTING WATER AND SANITARY SEWER IMPROVEMENTS OR ANY GENERAL FIELD INFORMATION PROVIDED BY THE O.C.S.E. PRIOR TO STARTING CONSTRUCTION OF THE IMPROVEMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY RESTORING ANY DISTURBED AREAS AROUND EXISTING WATER AND/OR SANITARY SEWER INFRASTRUCTURE AS SOON AS REASONABLY POSSIBLE AFTER WORK HAS BEEN COMPLETED IN THAT IMMEDIATE AREA.
- IT SHALL BE THE PROPERTY OWNER AND CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL NECESSARY PERMITS OR APPROVALS ARE SECURED FROM ANY OTHER GOVERNMENTAL AGENCY, ASSOCIATION, OR ORGANIZATION THAT MAY HAVE THEIR JURISDICTION EFFECTED BY THE WATER AND/OR SANITARY SEWER IMPROVEMENTS.
- THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. THE EXACT LOCATION OF ALL UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL NOTIFY ALL UTILITIES TO LOCATE THEIR EXISTING FACILITIES AT LEAST TWO (2) WORKING DAYS PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGE TO UTILITIES CAUSED BY HIS OPERATIONS. THE OHIO UTILITIES PROTECTION SERVICE (OUPS) TOLL FREE TELEPHONE NUMBER IS: 1-800-362-2764.
- CONTRACTOR RESPONSIBLE FOR ADHERING TO ALL O.S.H.A. SAFETY STANDARDS. OTTAWA COUNTY SHALL NOT BE HELD LIABLE FOR CONTRACTORS NOT ADHERING TO SAID STANDARDS.

### A. WATERLINE NOTES:

- ALL WATER LINES AND ALL APPURTENANCES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE OTTAWA COUNTY REGIONAL WATER SYSTEM SPECIFICATIONS, TEN STATE STANDARDS, OHIO EPA, AWWA, AND THE DETAILS AND SPECIFICATIONS AS SHOWN ON THE WATERLINE DETAIL SHEET(S).
- ALL WATER LINE PIPING FROM 4--INCHES IN DIAMETER TO 12--INCHES IN DIAMETER SHALL BE AWWA C-909, MOLECULARLY ORIENTED POLYVINYL CHLORIDE (PVC) PRESSURE CLASS 150 WITH GASKETED JOINTS MEETING THE REQUIREMENTS OF AWWA C-111/A-21.11.
- PIPING SHALL BE LAID TO A DEPTH WHICH WILL INSURE A MINIMUM COVER ABOVE THE PIPE NOT LESS THAN FOUR (4) FEET FROM THE PROPOSED GRADES ON PUBLIC MAINS AND NOT LESS THAN THREE AND ONE HALF (3.5) FEET FROM THE PROPOSED GRADES ON PRIVATE MAINS.
- ALL WATER LINE FITTINGS SHALL BE DUCTILE CAST IRON CONFORMING TO ANSI A21.10 WITH A MINIMUM CLASS OF 250 WITH MECHANICAL JOINT ENDS AS SPECIFIED IN ANSI A21.10. IMPORT FITTINGS SHALL NOT BE USED.
- A SIX (6) INCH HYDRANT ASSEMBLY SHALL INCLUDE THE TEE, VALVE, ANCHOR COUPLINGS, A STANDARD SIX (6) INCH HYDRANT, THRUST BLOCKING AND NECESSARY OFFSET TO SET HYDRANT TO PROPER GRADE. HYDRANTS SHALL BE KENNEDY MODEL K-80-D AND SHALL HAVE STAINLESS STEEL INTERNAL SHAFT, AND BE PAINTED RED WITH WHITE TOP AND CAPS. STORZ FITTINGS PER LOCAL FIRE DEPARTMENT REVIEW.
- GATE VALVES 12--INCHES IN DIAMETER OR LESS SHALL BE COMPRESSION RESILIENT SEATED WITH MECHANICAL JOINTS AND NON RISING STEMS. VALVES SHALL TURN COUNTER-CLOCK WISE, "LEFT" WITH A 2 INCH OPERATING NUT TO OPEN AND SHALL BE KEN SEAL II RWG-94 AS MANUFACTURED BY KENNEDY.
- VALVE BOXES SHALL BE PROVIDED FOR ALL GATE VALVES. VALVE BOXES SHALL BE BUFFALO STYLE, TYLER BRAND, LID SHALL READ "WATER".
- CORROSION CONTROL THROUGH THE USE OF MAGNESIUM ANODES SHALL BE INSTALLED ON ALL DUCTILE CAST IRON COMPONENTS OF THE WATERLINE INCLUDING ALL FITTINGS, VALVES AND HYDRANTS. TEST STATIONS SHALL BE INSTALLED AT ALL OF THE ANODE LOCATIONS FOR MONITORING PURPOSES. (SEE DETAILED DRAWINGS)
- MEGA-LUGS SHALL BE INSTALLED AT ALL BENDS, TEES, END CAPS, AND VALVES.
- THE CONTRACTOR SHALL BE REQUIRED TO INSTALL A DETECTABLE TRACER TAPE AND TRACER WIRE DIRECTLY OVER AND IN THE CENTER OF THE PVC MAIN FOR ENTIRE LENGTH TO PROVIDE A REFLECTION PATH (INDUCTIVE) TO DETERMINE PIPE ALIGNMENT AND LOCATION AFTER INSTALLATION. DETECTABLE TRACER TAPE SHALL BE THREE (3) INCHES WIDE PIGMENTED IN BLUE WARNING COLORS AND SHALL READ "BURIED WATERLINE BELOW." WARNING TAPE SHALL BE MADE OF TOUGH, HIGH DENSITY, CROSS LAMINATED PLASTIC FILMS. THE MAXIMUM DEPTH OF THE BURIED TAPE IS 18 INCHES. TWO (2) TRACER WIRES ARE REQUIRED DIRECTLY OVER AND ON THE CENTER OF THE WATERLINE FOR ITS ENTIRE LENGTH TO PROVIDE FOR AN INDUCTIVE PATH TO DETERMINE PIPE LOCATION AFTER INSTALLATION. ONE (1) WIRE SHALL HAVE RED COLORED INSULATION AND THE OTHER BLUE. THE WIRE SHALL BE COPPER WIRE, #12 AWG THHN/THWN FOR LINES INSTALLED BY OPEN-CUT TRENCHING METHODS. DIRECTIONALLY DRILLED/BORED LINES (WHERE PERMITTED) SHALL HAVE #8 AWG WIRES. TRACER WIRES SHALL BE TERMINATED INSIDE OF ALL VALVE BOXES, INCLUDING FIRE HYDRANT WATCH VALVES. CONTRACTOR SHALL PERFORM CONTINUITY TEST ON TRACER WIRE TO ENSURE CONTINUITY OF THE TRACER WIRE OVER THE LENGTH OF THE ENTIRE WATERLINE.
- MAINTAIN A MINIMUM OF 18 INCH VERTICAL SEPARATION AND MINIMUM OF 10 FEET HORIZONTAL SEPARATION BETWEEN ALL WATER MAINS AND STORM SEWERS, PER OZPA REQUIREMENTS. ALL OTHER UNDERGROUND UTILITIES REQUIRE A MINIMUM OF FIVE (5) FEET HORIZONTAL SEPARATION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR HYDROSTATIC PRESSURE TESTING AND DISINFECTION OF WATER MAINS AS REQUIRED BY THE OTTAWA COUNTY SANITARY ENGINEER PRIOR TO FINAL ACCEPTANCE. AFTER MAIN HAS BEEN DISINFECTED AND TESTED FOR LEAKAGE, BACTERIOLOGICAL SAMPLES SHALL BE COLLECTED PER COUNTY REGULATIONS.
- THE OHIO ENVIRONMENTAL PROTECTION AGENCY REQUIRED CONFORMANCE TO THE LATEST EDITION OF

THE "RECOMMENDED STANDARDS FOR WATER WORKS" (TEN STATE STANDARDS). THIS STANDARD SHALL BE EQUALLED OR EXCEEDED FOR WATER LINES. SPECIAL ATTENTION SHALL BE GIVEN TO THE FOLLOWING SECTIONS OF PART 8:

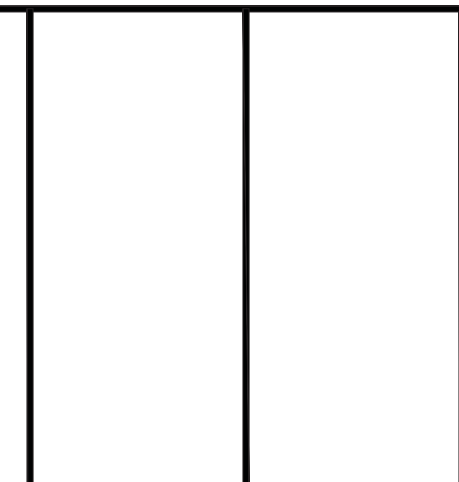
- 8.0.1. MATERIALS CONFORM TO AWWA STANDARDS
- 8.1.2. MINIMUM 6 INCH DIAMETER FIRE PROTECTION
- 8.5.3. MINIMUM 4 FEET GROUND COVER
- 8.5.5. PRESSURE TESTING AWWA C-600-RESPONSIBILITY\*
- 8.5.6. DISINFECTION AWWA C-651-RESPONSIBILITY\*
- 8.6.2. 10 FEET HORIZONTAL SEPARATION WATER MAIN/SEWER
- 8.6.3. 18 INCH VERTICAL SEPARATION WATER MAIN/SEWER
- 8.6.6. NO ENTRY AND/OR CONTACT WITH SEWER MANHOLE. ANY DEVIATION FROM THE ABOVE WILL NOT BE PERMITTED UNLESS SPECIFICALLY INCLUDED IN THE SPECIFICATIONS OR OTHERWISE SHOWN ON THESE PLANS.

\*NOTE: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM THIS TEST PROPERLY. RESPONSIBILITY FOR SUPERVISION AND APPROVAL RESTS WITH THE WATER SUPPLIER OR LOCAL GOVERNMENTAL AGENCY.

IN CASES WHERE ONE OR MORE OF THE ABOVE MENTIONED OHIO EPA STANDARDS FALL SHORT OF LOCAL STANDARDS, THE LATTER SHALL GOVERN. ALL WATERLINE PIPING SHALL BE LAID TO A DEPTH WHICH WILL INSURE A MINIMUM COVER ABOVE THE PIPE NOT LESS THAN FOUR (4) FEET FROM THE PROPOSED GRADES.

### WATER SERVICE LINES AND CONNECTIONS

- SERVICE LATERALS: FOR 3/4" AND 1" DIAMETER SERVICE LINES TYPE "K" COPPER WITH FLARED OR COMPRESSION FITTINGS OR POLYETHYLENE TUBING AWWA C901. SDR9, PRESSURE CLASS 200 (CTS), ASTM D2737, WITH MECHANICAL COMPRESSION FITTINGS AND INSERT STIFFENERS FOR CONNECTIONS SHALL BE USED. FOR ALL 1 1/8" AND 2" DIAMETER SERVICE LINES POLYETHYLENE TUBING AWWA C901. SDR9 PRESSURE CLASS 200 (CTS), ASTM D2737, WITH MECHANICAL COMPRESSION FITTINGS AND INSERT STIFFENERS FOR CONNECTIONS SHALL BE USED.
- SADDLES: SERVICE SADDLES ARE REQUIRED WHEN TAPPING ANY PVC MAIN LINE. ALL SERVICE SADDLES SHALL BE ALL STAINLESS STEEL, INCL. FLANGE, TYPE 304 GRADE 18-8 AND AS RECOMMENDED BY THE PIPE MANUFACTURER. SERVICE SADDLES SHALL BE A MINIMUM OF 6" WIDE WITH A DOUBLE BOLT. WELDS USED IN THE SADDLE CONSTRUCTION SHALL CONFORM TO ALL AWS CODES AND BE CHEMICALLY PASSIVATED. SERVICE SADDLES USED WITH 12" DIAMETER AND UNDER PVC PIPE SHALL BE ROMAC "306" SERIES, STYLE FS323 AS MANUFACTURED BY FORD METER BOX COMPANY OR APPROVED EQUAL.
- CORPORATION STOPS: ALL SERVICES 3/4" TO 2" SHALL HAVE A CORPORATION STOP UNLESS OTHERWISE NOTED. ALL CORPORATION STOPS MUST BE FULL PORT VALVE (OPENING NOT RESTRICTED) CORPORATION STOPS SHALL BE:  
  
3/4"-1" MUELLER COMPANY, MODEL H-15000N-FLARE OR MODEL H-15008N-COMP.  
  
1 1/2"-2" MUELLER COMPANY, MODEL H-15013N  
  
3" AND LARGER: MUELLER COMPANY, STAINLESS STEEL TAPPING SLEEVE (4"-24"), OR AS APPROVED BY THE COUNTY  
  
CURB STOPS: ALL SERVICES 3/4" TO 2" SHALL HAVE A CURB STOP UNLESS NOTED. CURB STOPS SHALL BE:  
  
3/4"-1" MUELLER COMPANY, MODEL H-15151N-FLARE OR MODEL B-25155N-COMP.  
  
1 1/2"-2" MUELLER COMPANY, MODEL B-25155N (COMPRESSION STYLE)  
  
3"-12" KENNEDY, "KEN SEAL II" GATE VALVE  
  
CURB BOXES: EACH STOP SHALL BE PROVIDED WITH A CURB BOX. CURB BOXES SHALL BE:  
  
3/4" MUELLER COMPANY, MODEL H-10300-99008 (MINNEAPOLIS STYLE). MINIMUM OF 54" EXTENDED LENGTH. LID SHALL READ "WATER"  
  
1" MUELLER COMPANY, MODEL H-10300-99008 (MINNEAPOLIS STYLE). MINIMUM OF 54" EXTENDED LENGTH. LID SHALL READ "WATER"  
  
1 1/2"-2" MUELLER COMPANY, MODEL H-10302-99007 (MINNEAPOLIS STYLE). MINIMUM OF 54" EXTENDED LENGTH. LID SHALL READ "WATER"  
  
3" AND LARGER: TYLER BRAND (BUFFALO STYLE) OR EQUAL AND AS APPROVED. LID SHALL READ "WATER"  
  
METER PITS: ALL COUNTY, OWNED, OPERATED, AND MAINTAINED METER PITS SHALL BE LOCATED WITHIN 3 FEET OF THE CURB STOP AND BOX UNLESS OTHERWISE APPROVED BY THE SANITARY ENGINEER AND SHALL MEET THE FOLLOWING SPECIFICATIONS:  
  
\*5/8"-3/4" CARSON METER PIT HOUSING (OLD CASTLE PRECAST, INC) CARSON 00182004, 18" DIAMETER, 36" DEPTH(LENGTH) WITH FORD W32 METER PIT CASTING. CARSON (LID) 00004003 MS-1L1-DN PLASTIC METER LID WITH RADIO READ MODULE (ERT).  
  
\*3/4"-1" CARSON METER PIT HOUSING (OLD CASTLE PRECAST, INC) CARSON 00242004, 24" DIAMETER, 36" DEPTH(LENGTH) WITH FORD METER BOX CO. EXTENSION RING EXT-1 CASTING. CARSON (LID) 00004003 MS-1L1-SN PLASTIC METER LID WITH RADIO READ MODULE (ERT).  
  
\*1 1/2"-2" CARSON METER PIT HOUSING (OLD CASTLE PRECAST, INC.) CARSON 00362003, 36" DIAMETER, 36" DEPTH(LENGTH) WITH 2" METER BOX LID (CASTING) FORD MC-36-MB-T  
  
\*3" AND LARGER PRECAST CONCRETE METER VAULT 8.0'x 6.0' +/- (PER COUNTY REVIEW).  
  
METER SETTING: THE METER SETTING SHALL MEET THE FOLLOWING SPECIFICATIONS:  
  
\*5/8", 3/4" & 1" - FORD METER BOX CO., Y-500 SERIES METER YOKE. SHALL HAVE INTEGRAL ANGLE YOKE BALL VALVE INLET. SHALL HAVE INTEGRAL ANGLE DUAL CHECK VALVE OUTLET.  
  
\*1 1/2"-2" - MUELLER B-2423-2N SERIES METER SETTER. SHALL HAVE INTEGRAL ANGLE YOKE BALL VALVE. SHALL HAVE ANGLE DUAL CHECK VALVE OUTLET.  
  
\*3" & LARGER: AS AGREED UPON BY THE METER MANUFACTURER AND THE COUNTY. TYPICALLY A FLANGED CONNECTION ON EACH END. SHALL HAVE AN INLET AND OUTLET GATE VALVE (SEE CURB VALVES). SHALL HAVE AN APPROVED DUAL TYPE CHECK VALVE (SEPARATE)  
  
WATER METERS: THE OTTAWA COUNTY REGIONAL WATER SYSTEM UTILIZES A RADIO READ METERING SYSTEM AND ALL METERS ARE TO REGISTER IN U.S. GALLONS. THE METERS MEET THE FOLLOWING SPECIFICATIONS:  
  
\*5/8"-1 1/2" INVENSYS, MODEL SR POSITIVE DISPLACEMENT METERS  
  
\*2"-6" INVENSYS, MODEL SRH, COMPOUND METER  
  
REMOTE SYSTEM- A REMOTE SYSTEM, INVENSYS MODEL ECR WP3R-PL WITH FACTORY ASSEMBLED ITRON AND END CAP AND CABLE FOR USE WITH A 50 W ITRON RADIO READ PIT ERT SYSTEM AND COMPATIBLE WITH THE ONE IN USE BY THE OTTAWA COUNTY SANITARY ENGINEERING DEPARTMENT SHALL BE FURNISHED AND INSTALLED WITH EACH WATER METER.



Robert W. Bailey  
Professional Engineer  
April 03, 2019

NO	ISSUED FOR PERMITS	REVISION	DATE
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**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
6721 EAST HARBOR ROAD  
LAKESIDE MARBLEHEAD, OHIO, 43440  
OTTAWA COUNTY  
LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP  
**GENERAL NOTES**

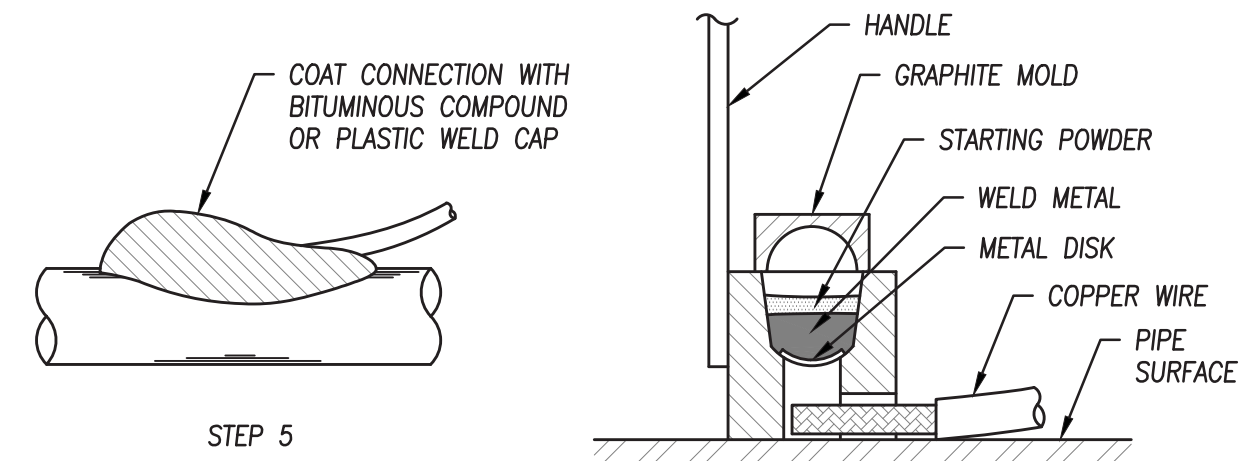
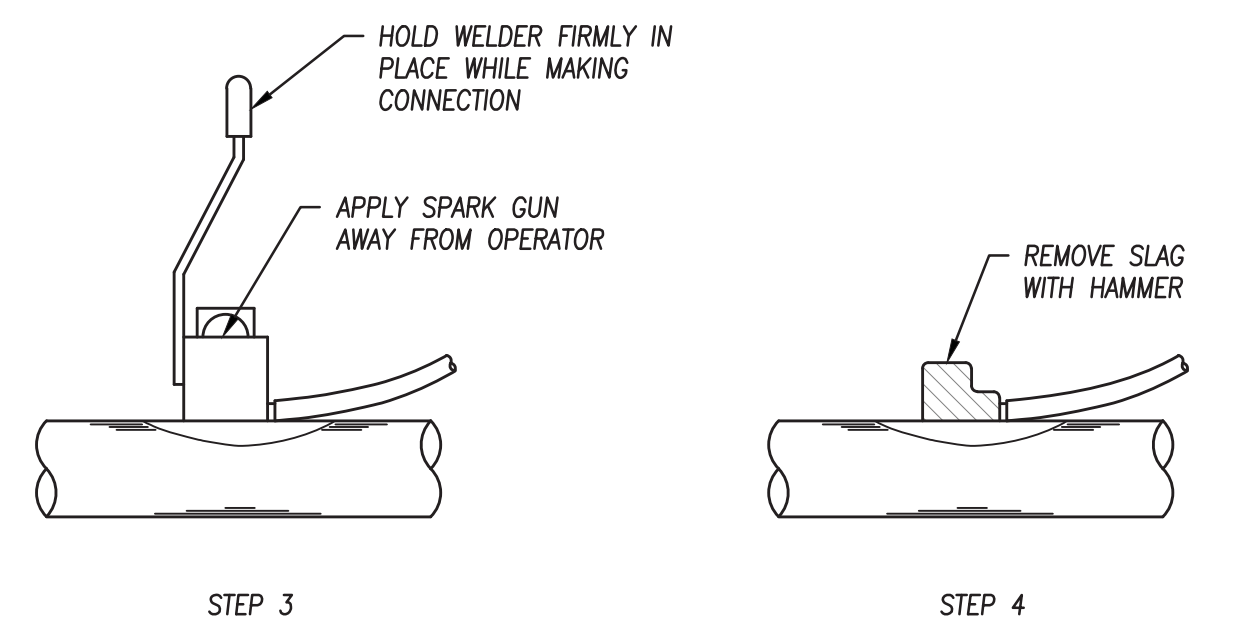
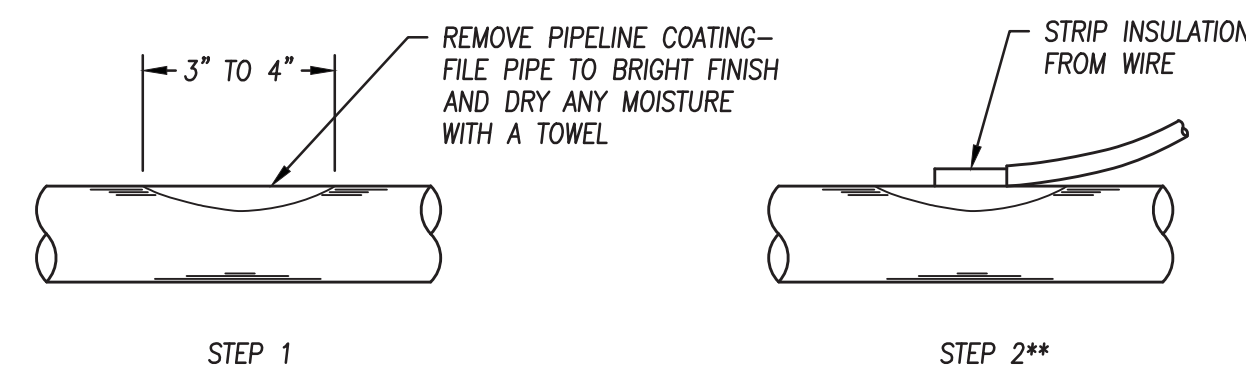
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ISSUED: APRIL 3, 2019

**C4**

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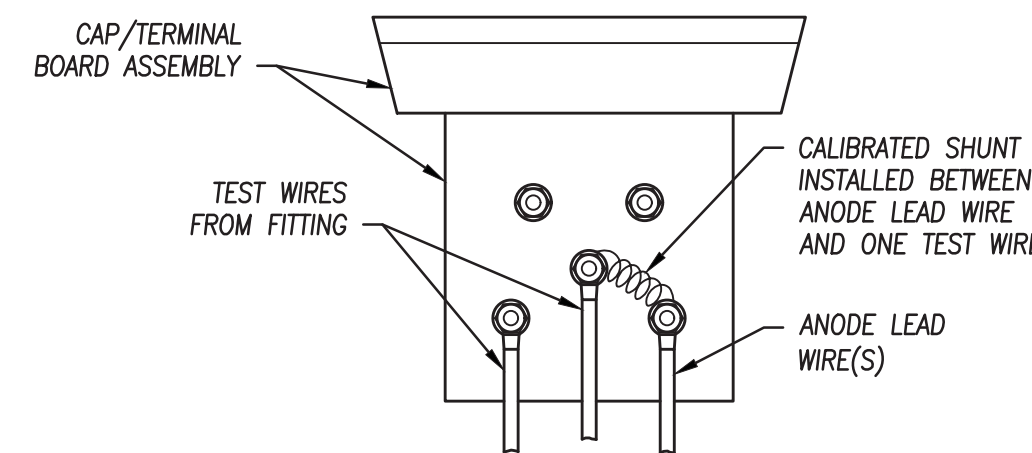
No.	DESCRIPTION OF COMPONENTS	32# MAGNESIUM ANODE NO. OF ANODES REQUIRED
	PVC PIPE	
1.0	8" MAINLINE VALVE	1
2.0	12" MAINLINE VALVE	1
3.0	HYDRANT ASSEMBLY (TEE, VALVE, COUPLING AND HYDRANT)	2
4.0	8" & 12" FITTINGS (TEE, BENDS, ETC...)	1
	DUCTILE IRON PIPE	
5.0	8" MAINLINE VALVE (INCLUDES 2 PIPE JOINTS - 1 EACH SIDE OF VALVE)	2
6.0	12" MAINLINE VALVE (INCLUDES 2 PIPE JOINTS - 1 EACH SIDE OF VALVE)	3
7.0	16" MAINLINE VALVE (INCLUDES 2 PIPE JOINTS - 1 EACH SIDE OF VALVE)	3
8.0	20" MAINLINE VALVE (INCLUDES 2 PIPE JOINTS - 1 EACH SIDE OF VALVE)	4
9.0	24" MAINLINE VALVE (INCLUDES 2 PIPE JOINTS - 1 EACH SIDE OF VALVE)	4
10.0	HYDRANT ASSEMBLY (TEE, VALVE, AND HYDRANT) 8" & 12" PIPE	4
11.0	HYDRANT ASSEMBLY (TEE, VALVE, AND HYDRANT) 16" PIPE	4
12.0	HYDRANT ASSEMBLY (TEE, VALVE, AND HYDRANT) 20" PIPE	5
13.0	HYDRANT ASSEMBLY (TEE, VALVE, AND HYDRANT) 24" PIPE	5
14.0	16"-24" DUCTILE IRON PIPE JOINTS (18' LENGTHS) IN LOW SOIL RESISTIVITY AREAS. (DEPENDS ON SOIL RESISTIVITY & PIPE DIAMETER)	1-2



\*\* WHEN NO. 14 TO NO. 10 AWG SOLID WIRE IS USED IT WILL BE NECESSARY TO INSTALL A COPPER SLEEVE (CAB-133-1H) OVER THE BARE SECTION OF WIRE BEFORE THE CONNECTION IS ATTEMPTED. WIRE SHOULD PROTRUDE 1/8" BEYOND END OF SLEEVE

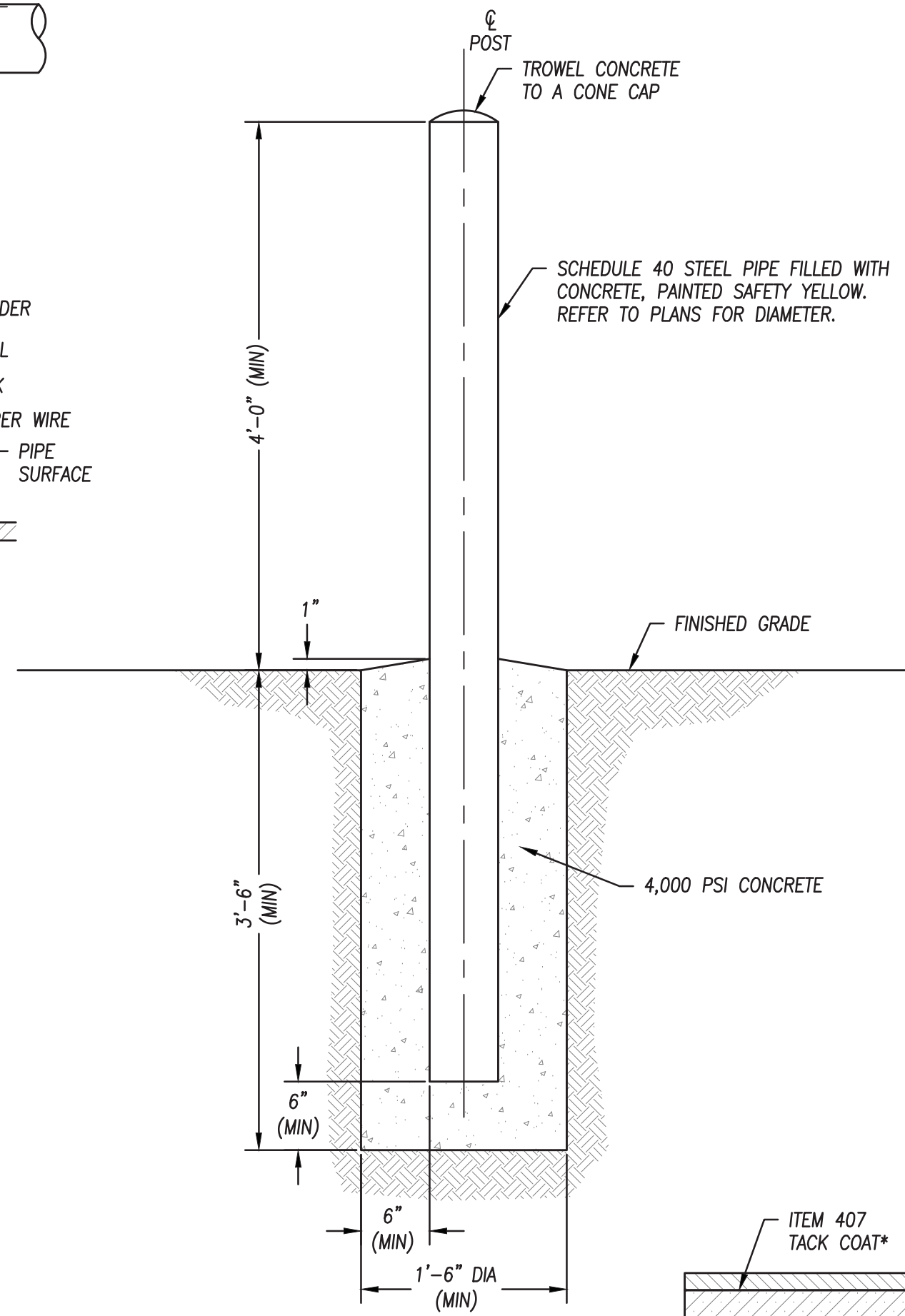
**PROCEDURE FOR MAKING CADWELD TYPE "HA" CONNECTIONS**

- WHEN USING No.14 TO No. 10 AWG SOLID WIRE, IT WILL BE NECESSARY TO INSTALL A COPPER SLEEVE (CAB-133-1H) OVER THE BARE END OF THE WIRE AND CRIMP IN PLACE BEFORE ATTEMPTING TO MAKE THE CONNECTION. FOR No.10 AWG STRANDED WIRE, USE CAB-133-1K. THE WIRE SHOULD PROTRUDE AT LEAST 1/8" FROM THE END OF THE SLEEVE.
- INSERT THE CONDUCTOR INTO MOLD NOTING ANY SPECIAL INFORMATION UNDER "POSITIONING" FOR APPLICATION TYPE IN THE MANUFACTURERS INSTRUCTIONS PACKAGED WITH THE WELDER.
- INSERT STEEL DISK IN BOTTOM OF CAVITY INSIDE MOLD. DUMP THE WELD METAL INTO MOLD BEING CAREFUL NOT TO UPSET THE STEEL DISK. TAP THE BOTTOM OF THE TUBE TO LOOSEN ALL THE STARTING POWDER AND SPREAD IT EVENLY OVER THE WELD METAL. PLACE A SMALL AMOUNT OF STARTING POWDER ON THE TOP EDGE OF MOLD UNDER COVER OPENING FOR EASY IGNITION.
- CLOSE COVER AND IGNITE WITH THE FLINT GUN. MOVE FLINT GUN AWAY QUICKLY TO PREVENT FOULING. IF FLINT GUN SHOULD BECOME FOULED, SOAK IT IN HOUSEHOLD AMMONIA.
- AFTER IGNITION, HOLD THE WELDER IN PLACE FOR A MOMENT TO ALLOW THE WELD TO SOLIDIFY. AFTER THE WELD HAS COOLED, REMOVE THE SLAG WITH A CHIPPING HAMMER OR WIRE BRUSH.
- COAT THE CONNECTION AND THE ENTIRE PREPARED SURFACE WITH BITUMASTIC COMPOUND (KOPPERS No.50 OR EQUAL) OR PLASTIC WELD CAPS.
- REMOVE ALL SLAG FROM THE WELDER BEFORE MAKING THE NEXT WELD. CLEAN THE COVER EVERY 6 TO 10 WELDS.
- WET OR DAMP MOLDS WILL PRODUCE POROUS WELDS. MOLDS MUST BE DRIED OUT BEFORE ATTEMPTING TO WELD.
- CONNECTIONS ARE TO BE PLACED A MINIMUM OF 3 INCHES APART. UNSUCCESSFUL WELDS ARE TO BE ABANDONED AND MOVED TO ANOTHER PREPARED SURFACE NOT LESS THAN 3 INCHES AWAY.

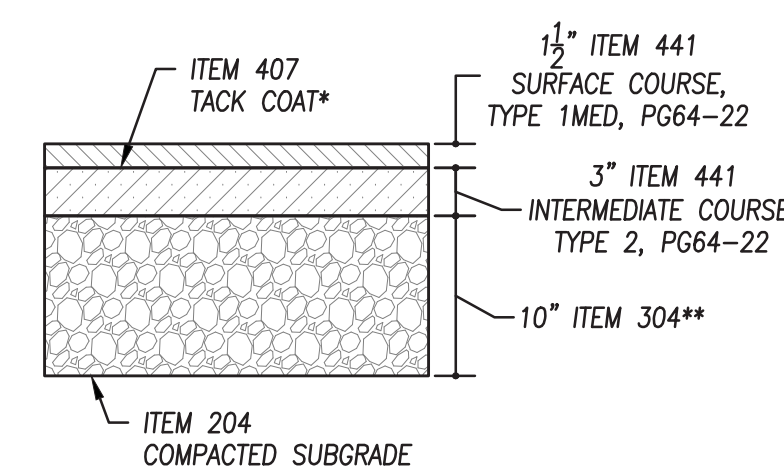


**TYPICAL TEST STATION TERMINAL BOARD**  
N.T.S.

NOTE: THIS EXAMPLE IS ONE CONFIGURATION TO CONNECT ANODES THROUGH A SHUNT. OTHER CONFIGURATIONS ARE POSSIBLE.



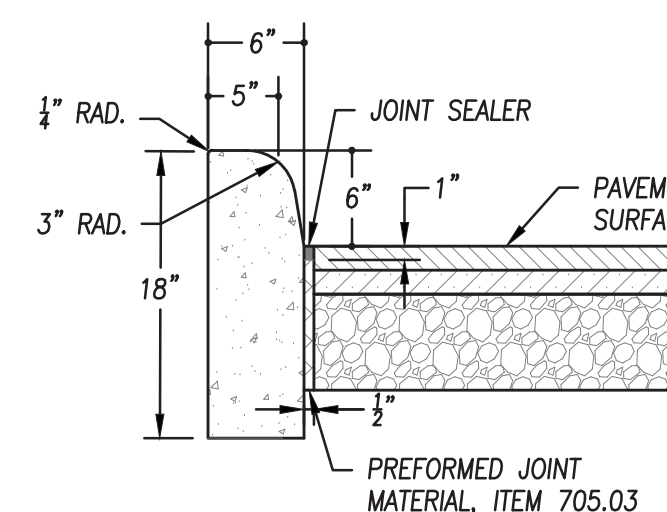
**PIPE BOLLARD**  
N.T.S.



\* ITEM 407 TACK COAT TO BE PLACED BETWEEN ASPHALT LAYERS WHEN PAVEMENT HAS BEEN SUBJECTED TO TRAFFIC BEFORE UPPER LAYERS OF ASPHALT ARE PLACED. APPLICATION RATE TO BE A MINIMUM OF 0.100 GAL/SQ YD.

\*\* ITEM 304, AGGREGATE BASE COURSE, SHALL BE CRUSHED CARBONATE (LIMESTONE) CONFORMING TO OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATION 703.17

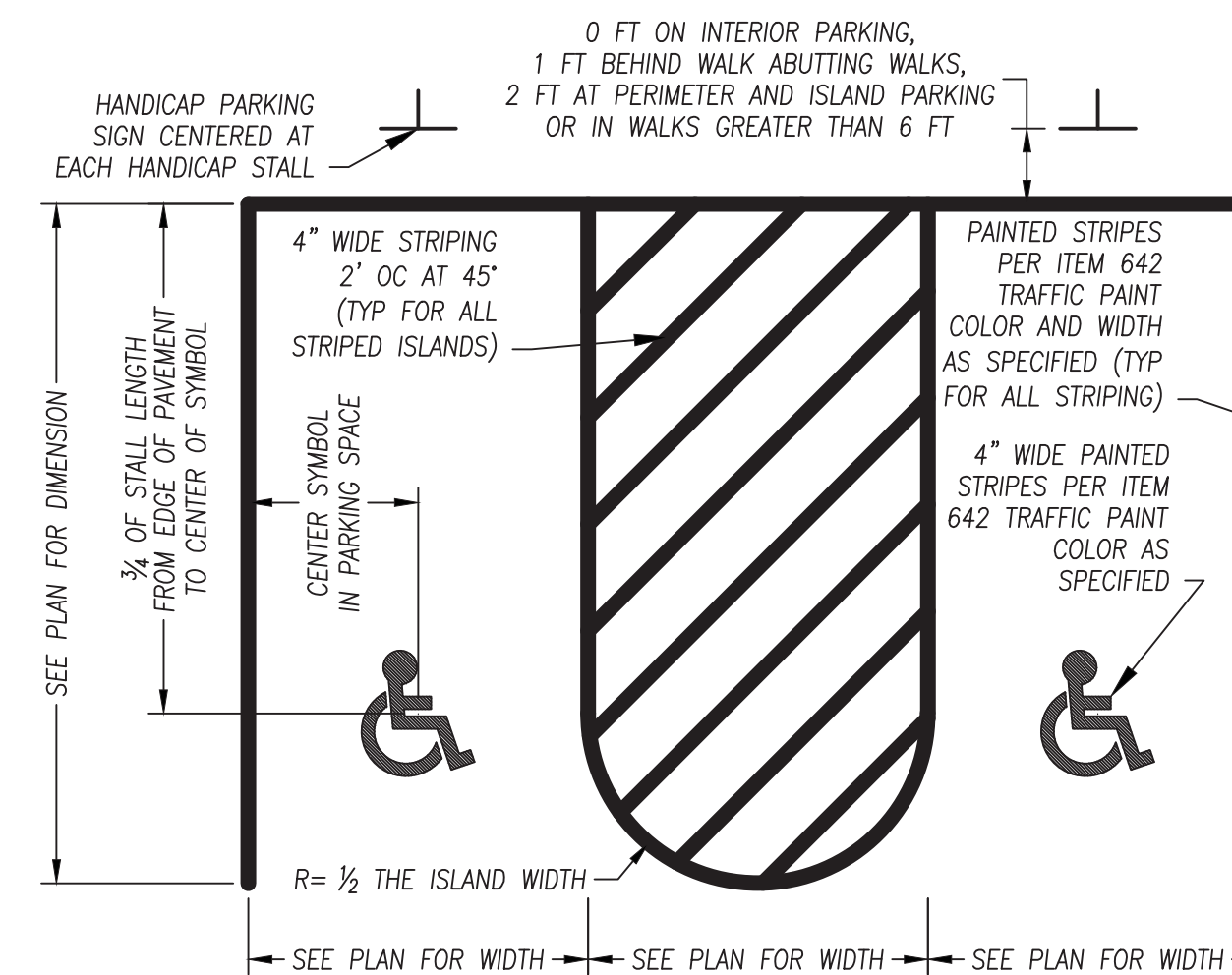
**HEAVY PAVEMENT SECTION**



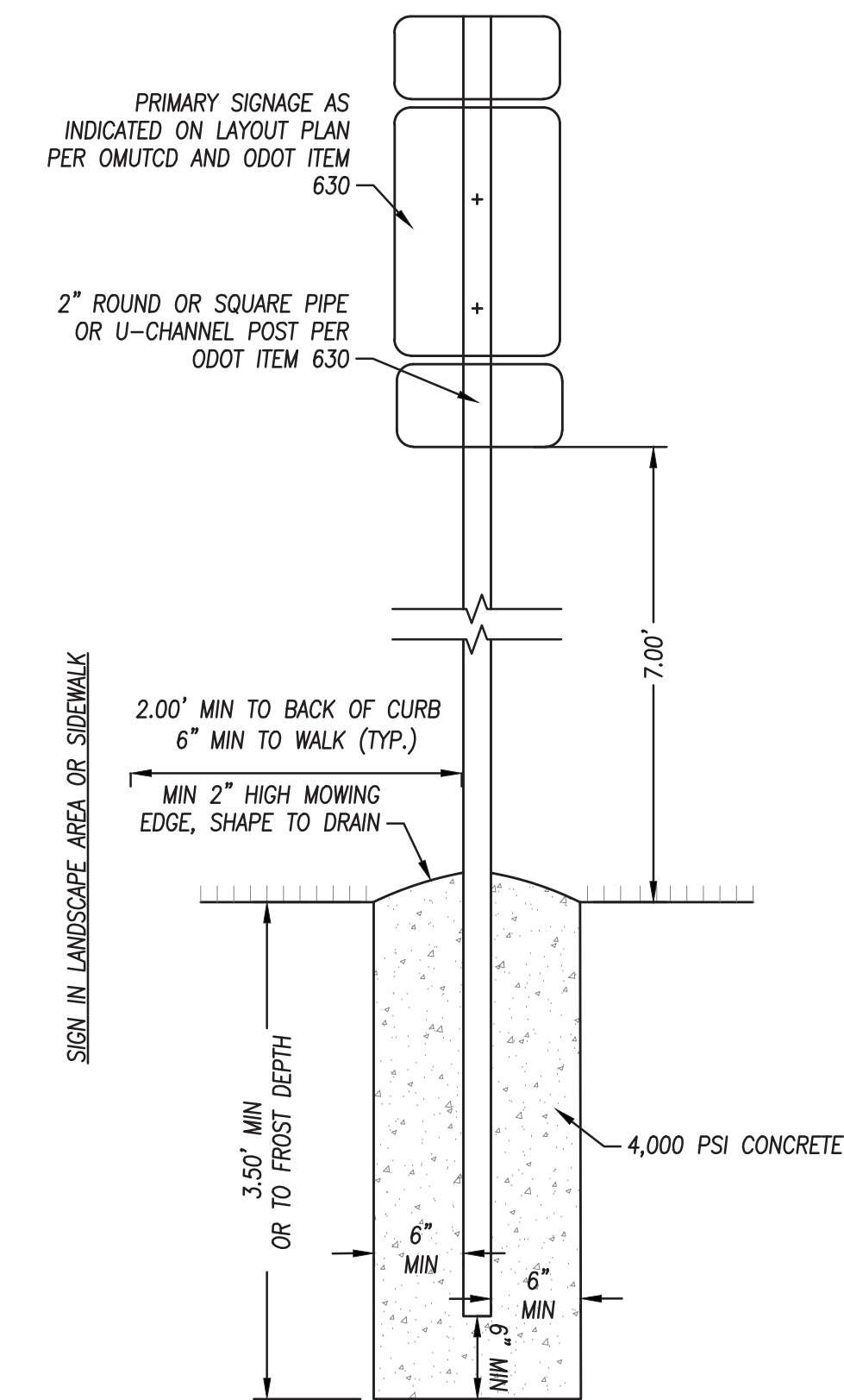
**TYPE 6 CURB DETAIL**

**HANDICAP PARKING/STRIPING**

(NOT TO SCALE)



**TYPICAL HANDICAP SIGNAGE**



**TYPICAL SIGNAGE IN LANDSCAPE AREA OR SIDEWALK**



NO	REVISION	DATE
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**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
 6721 EAST HARBOR ROAD  
 LAKESIDE MARBLEHEAD, OHIO, 43440  
 OTTAWA COUNTY  
 LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP  
**GENERAL NOTES & DETAILS**

FILE: 18201 CD.dwg  
 JOB NO.: 18201  
 DRAWN BY: LMM  
 ISSUED: APRIL 3, 2019

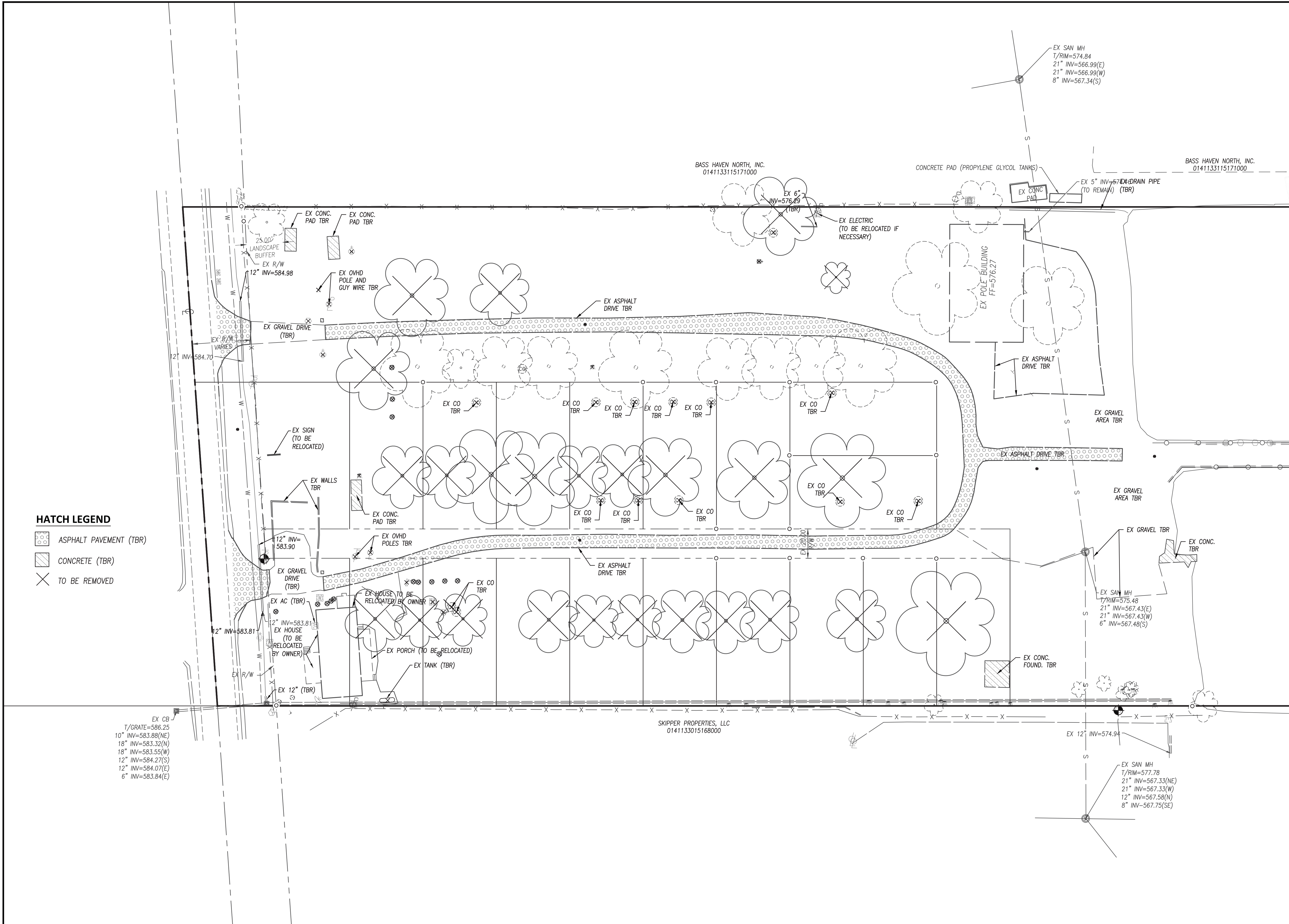
**C5**

**CONCRETE SIDEWALK SECTION CONCRETE PAVEMENT SECTION INTEGRAL CURB AND WALK**

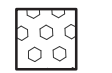


**LIGHT PAVEMENT SECTION**

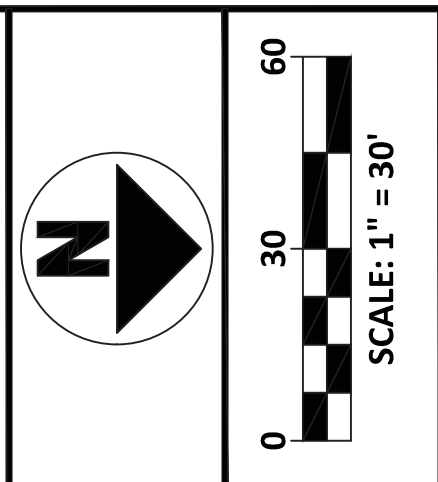


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**HATCH LEGEND**

-  ASPHALT PAVEMENT (TBR)
-  CONCRETE (TBR)
-  TO BE REMOVED



STATE OF OHIO  
 ROBERT W. BAILEY  
 E-62836  
 PROFESSIONAL ENGINEER  
 April 03, 2019

NO	REVISION	DATE
1	ISSUED FOR PERMITS	04/01/19
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**DGL**  
 DGL CONSULTING ENGINEERS, LLC  
 3455 BRIARFIELD BLVD, SUITE E  
 MAJUMEE, OH 43037  
 PHONE: 419.535.1015  
 www.dgl-td.com

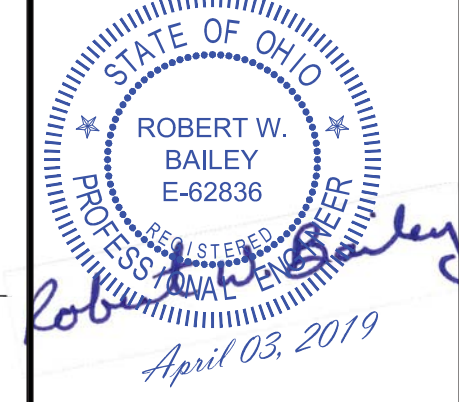
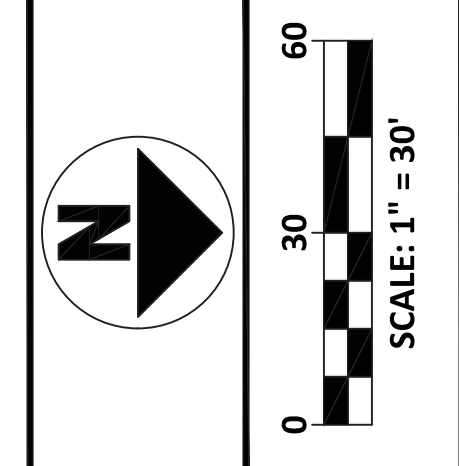
**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
 6721 EAST HARBOR ROAD  
 LAKESIDE MARBLEHEAD, OHIO, 43440  
 OTTAWA COUNTY  
 LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP  
**DEMOLITION PLAN**

FILE: 18201 CD.dwg  
 JOB NO.: 18201  
 DRAWN BY: LMM  
 ISSUED: APRIL 3, 2019

**C6**



Curve Table					
Curve#	Length	Pavement Radius	Delta	Chord Bearing	Chord Length
C1	24.11'	43.00'	032°08'	N22°49'46"E	23.80'
C4	62.72'	27.50'	130°41'	N66°39'44"W	49.98'
C2	24.97'	43.00'	033°16'	S86°04'06"W	24.62'
C3	30.11'	43.00'	040°07'	S09°01'57"W	29.50'



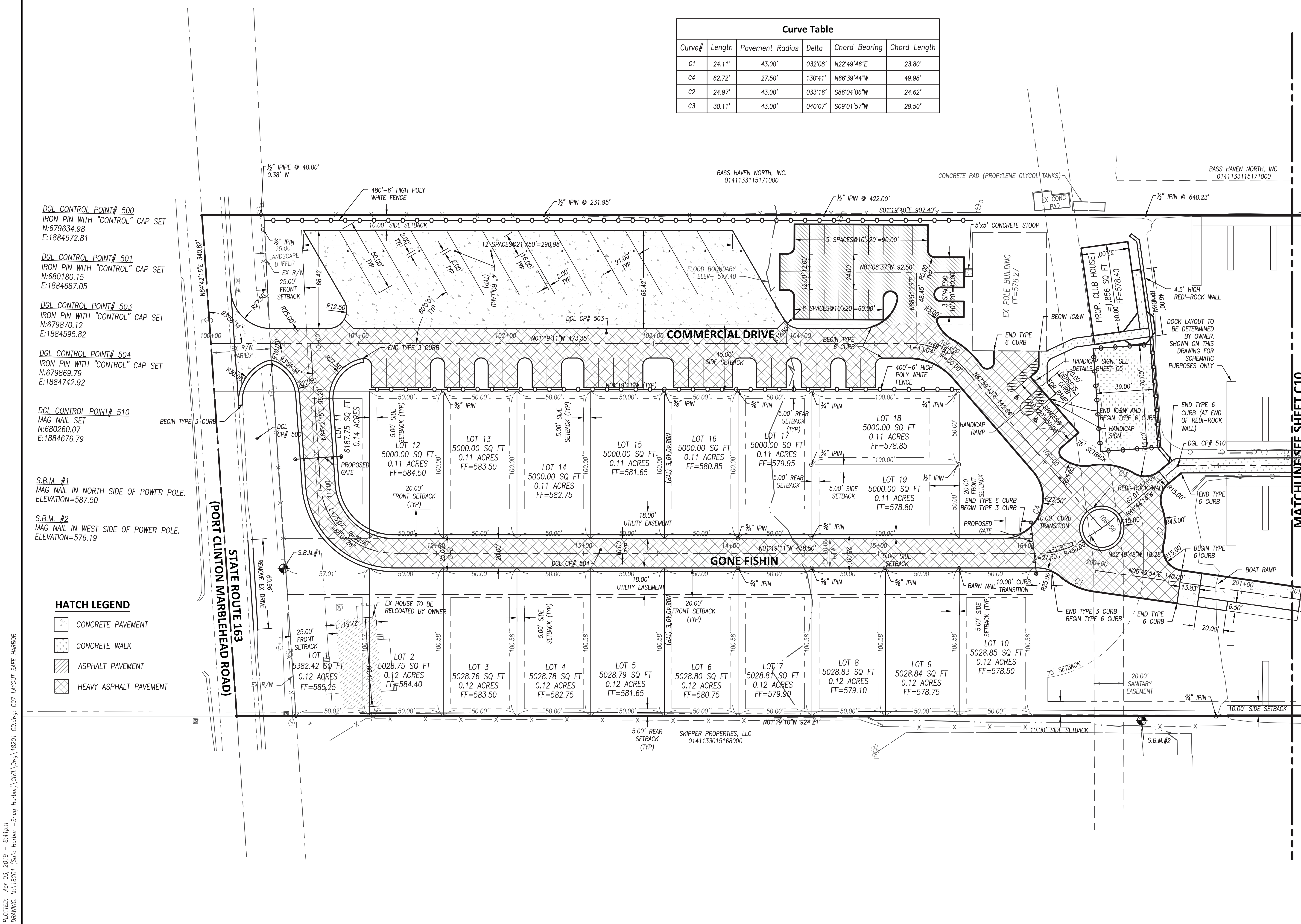
NO	REVISION	DATE
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**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
 6721 EAST HARBOR ROAD  
 LAKESIDE MARBLEHEAD, OHIO, 43440  
 OTTAWA COUNTY  
 LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP

FILE: 18201 CD.dwg  
 JOB NO.: 18201  
 DRAWN BY: LMM  
 ISSUED: APRIL 3, 2019

**C7**



DGL CONTROL POINT# 500  
 IRON PIN WITH "CONTROL" CAP SET  
 N:679634.98  
 E:1884672.81

DGL CONTROL POINT# 501  
 IRON PIN WITH "CONTROL" CAP SET  
 N:680180.15  
 E:1884687.05

DGL CONTROL POINT# 503  
 IRON PIN WITH "CONTROL" CAP SET  
 N:679870.12  
 E:1884595.82

DGL CONTROL POINT# 504  
 IRON PIN WITH "CONTROL" CAP SET  
 N:679869.79  
 E:1884742.92

DGL CONTROL POINT# 510  
 MAG NAIL SET  
 N:680260.07  
 E:1884676.79

S.B.M. #1  
 MAG NAIL IN NORTH SIDE OF POWER POLE.  
 ELEVATION=587.50

S.B.M. #2  
 MAG NAIL IN WEST SIDE OF POWER POLE.  
 ELEVATION=576.19

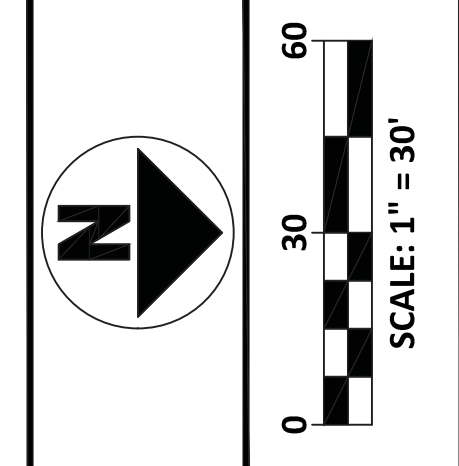
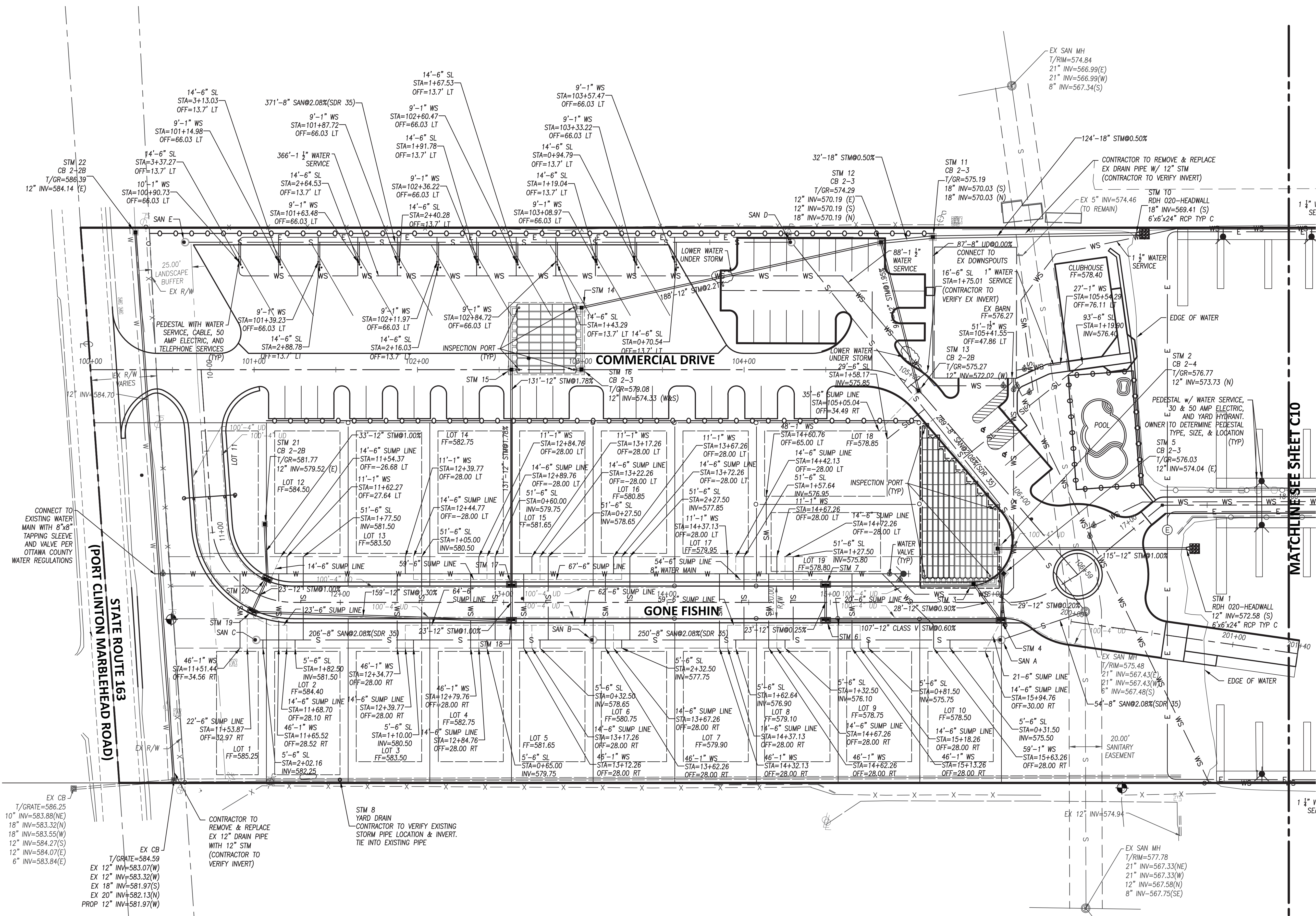
**HATCH LEGEND**

	CONCRETE PAVEMENT
	CONCRETE WALK
	ASPHALT PAVEMENT
	HEAVY ASPHALT PAVEMENT

PLOTTED: Apr 03, 2019 - 8:41pm  
 DRAWING: M:\18201 (Safe Harbor -Snug Harbor)\CIVIL\18201 CD.dwg: C07 LAYOUT SAFE HARBOR



PLOTTED: Apr 03, 2019 - 8:41pm  
 DRAWING: M:\18201 (Safe Harbor - Snag Harbor)\CIVIL\DWG\18201\_CD.dwg: C08 UTILITY SAFE HARBOR



STATE OF OHIO  
 ROBERT W. BAILEY  
 E-62836  
 PROFESSIONAL ENGINEER  
 April 03, 2019

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**C8**

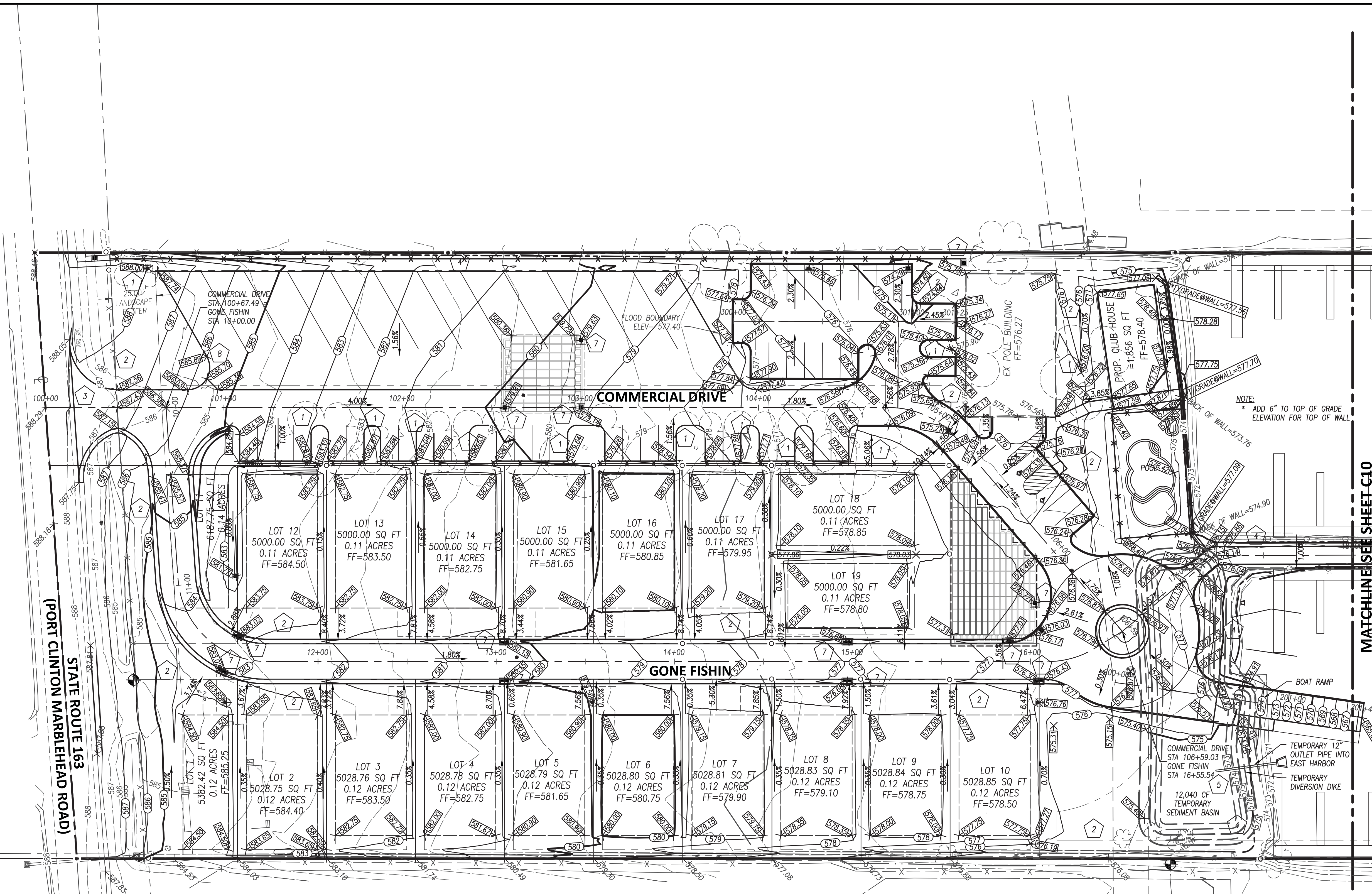


PLOTTED: Apr 03, 2019 - 8:42pm  
 DRAWING: M:\18201 (Safe Harbor - Snug Harbor)\CIVIL\DWG\18201 GR.dwg: C09 GRADING SAFE HARBOR

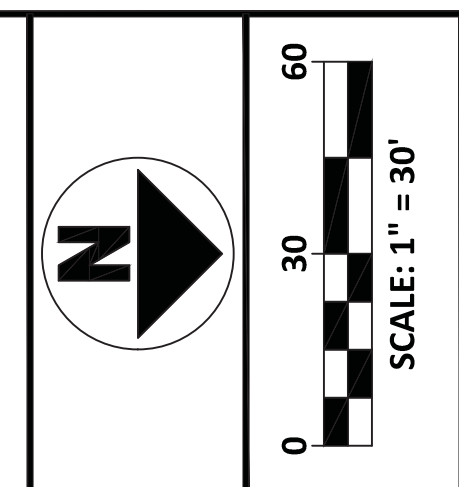
**EROSION CONTROL LEGEND**

- 1 PRESERVATION VEGETATION
- 2 SEEDING AND MULCHING
- 3 CONSTRUCTION ENTRANCE
- 4 SILT FENCE
- 7 MANUFACTURED INLET FILTER
- 8 CONCRETE TRUCK WASHOUT

REFER TO EROSION AND SEDIMENT CONTROL DETAIL SHEET FOR DETAILS



TEMPORARY SEDIMENT BASIN	
SEDIMENT STORAGE VOLUME (CU. FT)	= 4300
DEWATERING VOLUME REQUIRED (CU. FT)	= 7740
PROVIDED VOLUME (TO STRUCTURE ORIFICE)	= 12040
SET SKIMMER STOP ELEVATION AT	= 573.86
FAIRCLOTH SKIMMER	= 2.5" WITH 2.0" Ø ORIFICE



STATE OF OHIO  
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 PROFESSIONAL ENGINEER  
*Robert W. Bailey*  
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2	ISSUED FOR PERMITS	04/01/19
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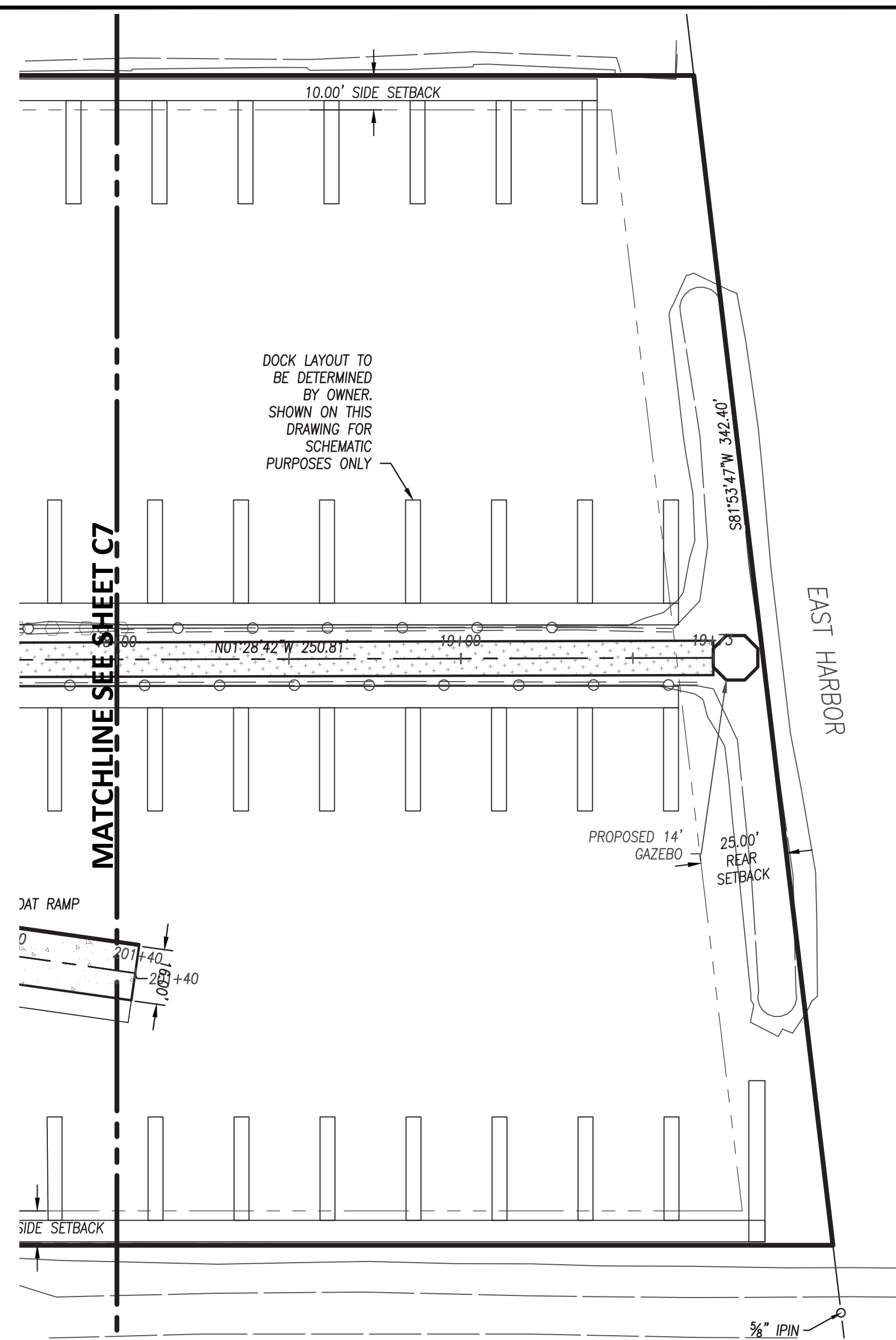
**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
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 LAKESIDE MARBLEHEAD, OHIO, 43440  
 OTTAWA COUNTY  
 LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP  
**GRADING & EROSION CONTROL**

FILE: 18201 GR.dwg  
 JOB NO.: 18201  
 DRAWN BY: LMM  
 ISSUED: APRIL 3, 2019

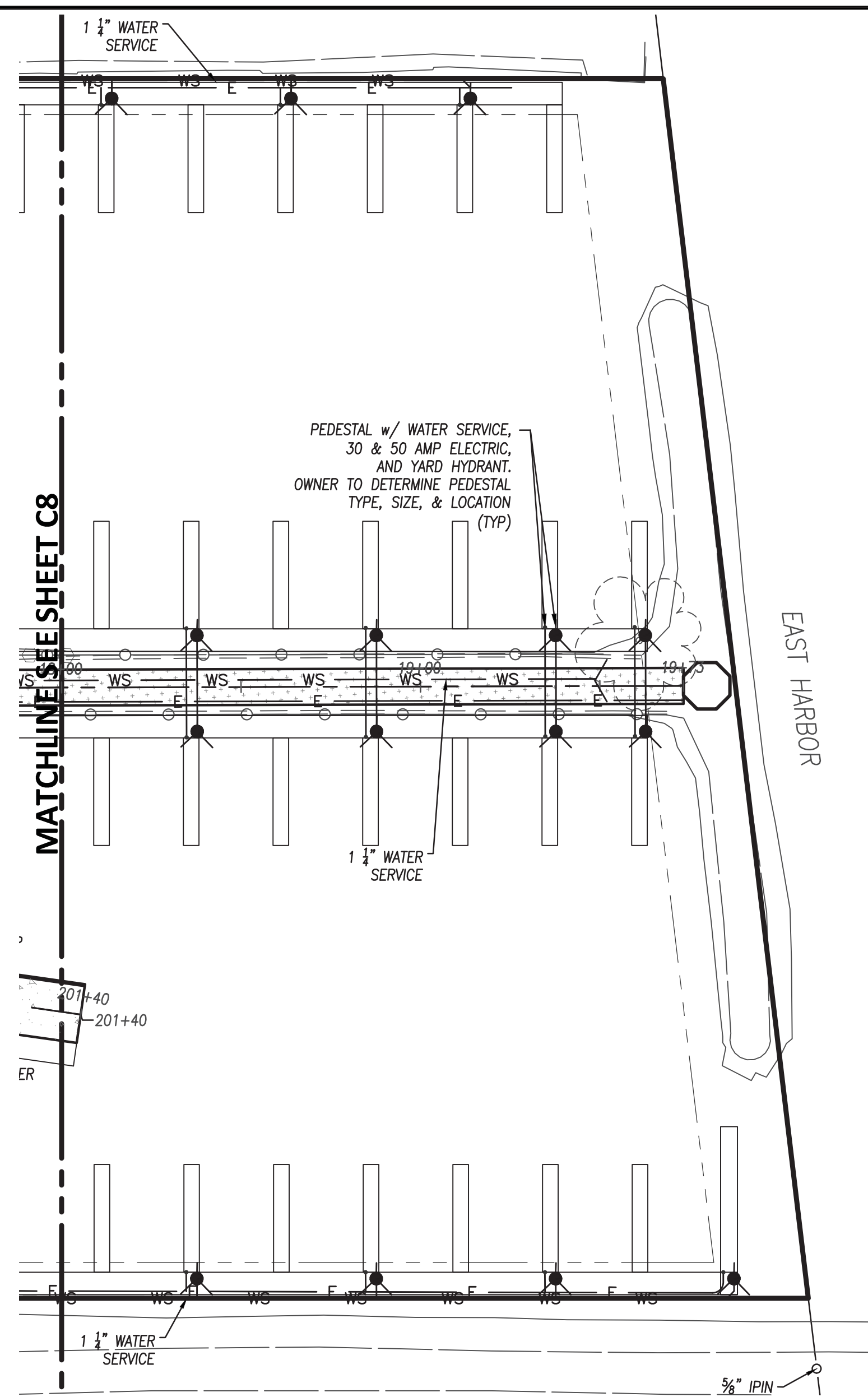
**C9**



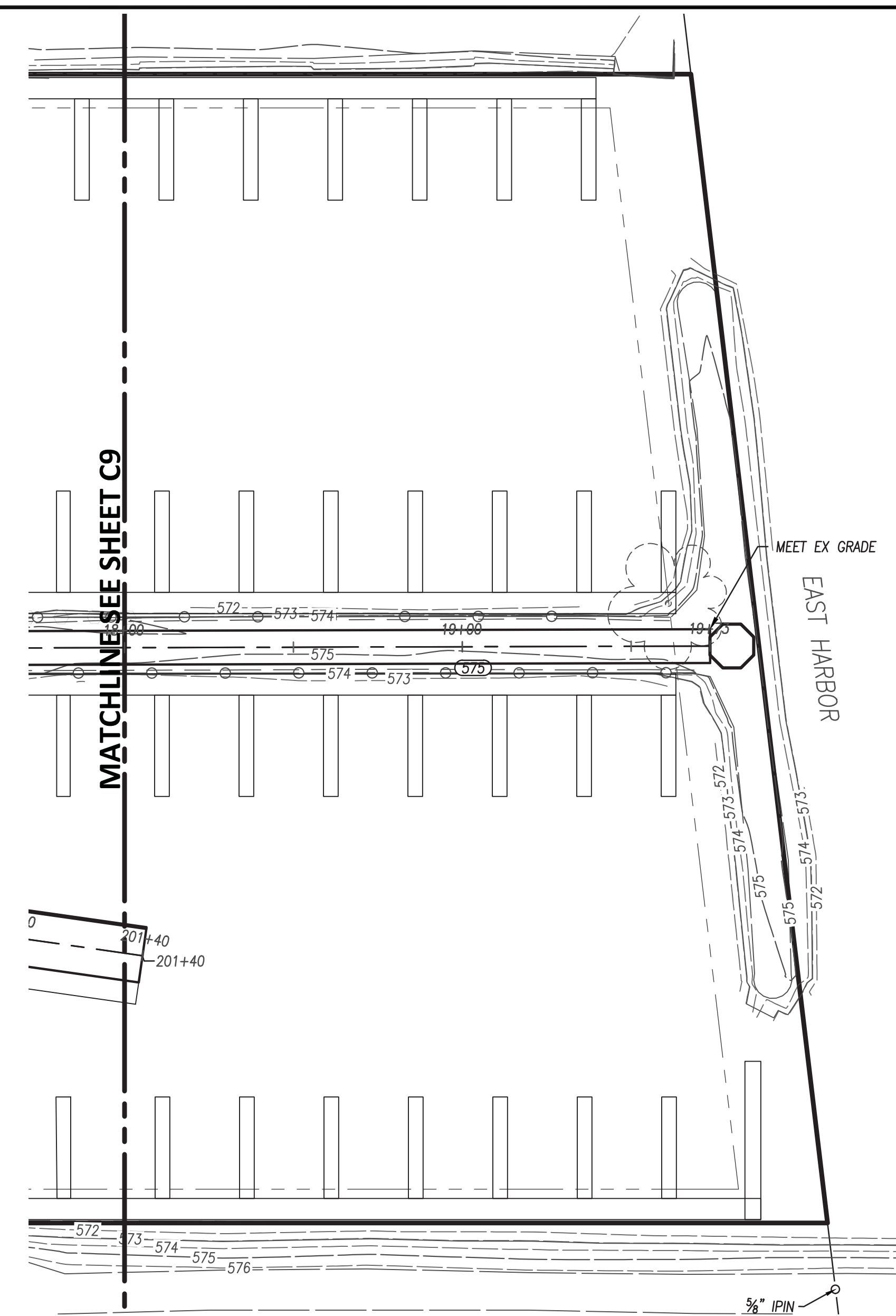
PLOTTED: Apr 03, 2019 - 8:42pm  
 DRAWING: M:\18201 (Safe Harbor)\Civil\18201 CD.dwg: C10 MARINA SAFE HARBOR



LAYOUT PLAN



UTILITY PLAN



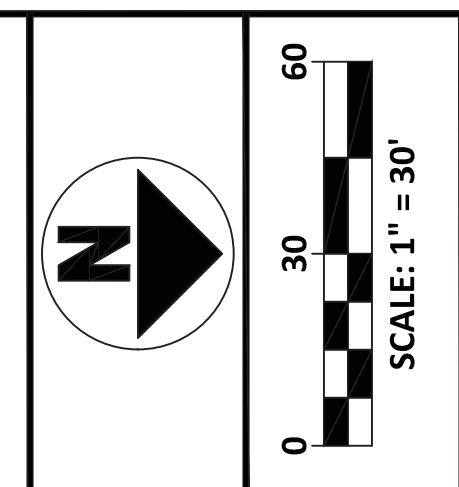
GRADING PLAN

**GONE FISHIN PROFILE**

595	575.45	575.43	575.41	575.39	575.37	575.36	575.34	575.32	595
590									590
585	MATCHLINE SEE SHEET C11								585
580									580
575	PROPOSED GRADE								575
570	EX PROFILE GRADE								570
565	575.18	575.17	575.16	575.17	575.22	575.40	575.50	575.32	565
	18+00				19+00			19+73.36	

**BOAT RAMP PROFILE**

595	576.73	576.79	575.93	574.71	571.66	567.91	565.66	595	
590								590	
585	PVI STA=200+81.52 PVI ELEV=574.43								585
580	R=51.25 L=20.00'								580
575	GRADE BREAK STA=200+00.00 ELEV=576.73								575
570	STA=200+71.52 ELEV=574.91								570
565	STA=200+91.52 ELEV=572.93								565
	200+00			201+00			201+40		



STATE OF OHIO  
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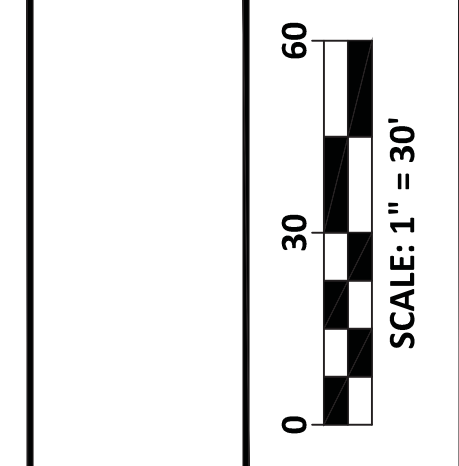
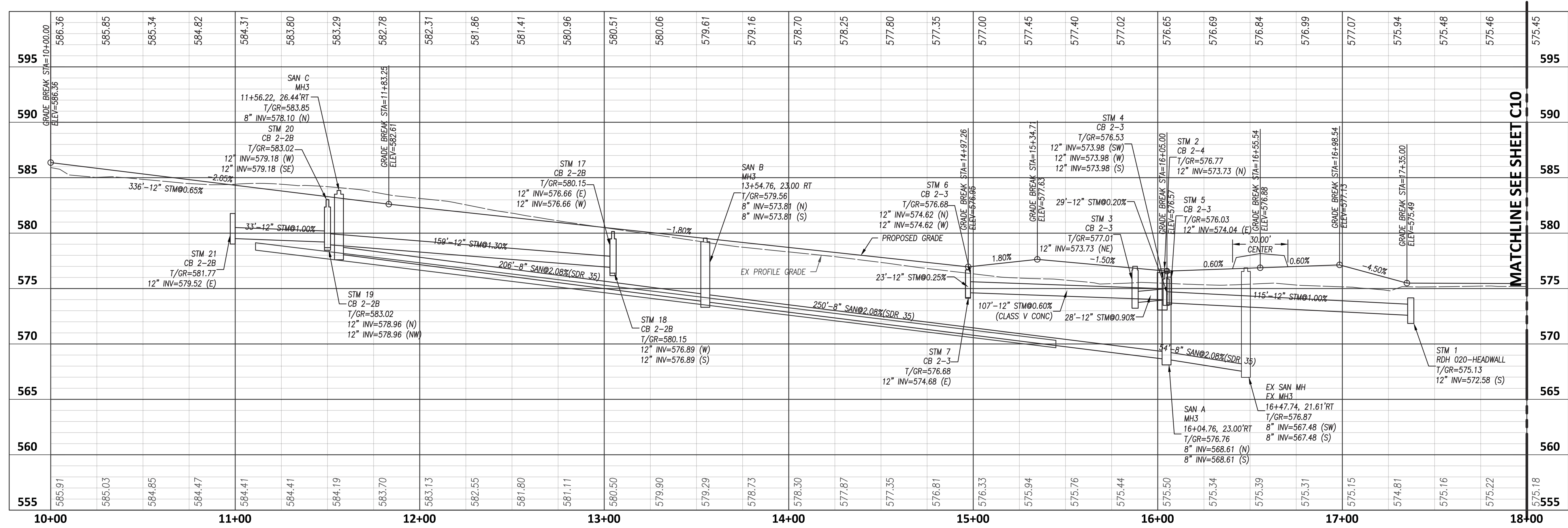
**SAFE HARBOR MARINA SUB.  
 SAFE HARBOR MARINA LTD.**  
 6721 EAST HARBOR ROAD  
 LAKESIDE MARBLEHEAD, OHIO, 43440  
 OTTAWA COUNTY  
 LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP  
**MARINA PLANS**

FILE: 18201 CD.dwg  
 JOB NO.: 18201  
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C10



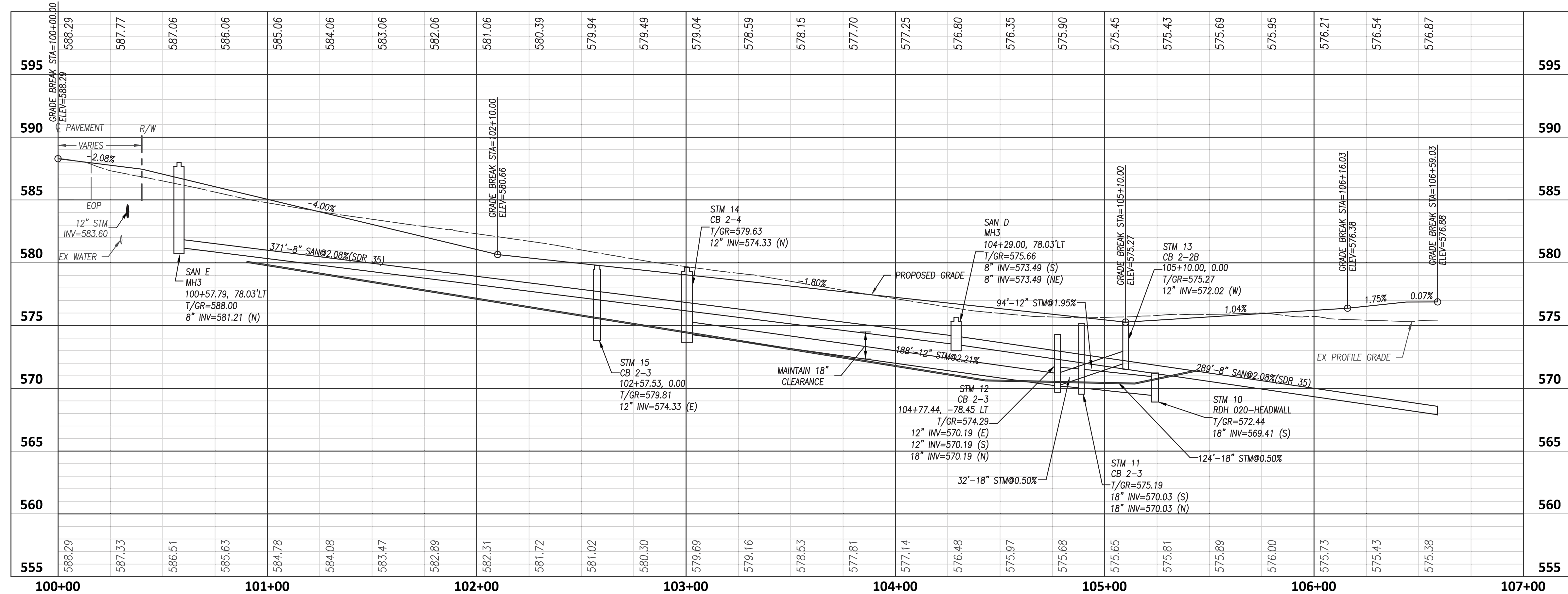
### GONE FISHIN PROFILE



STATE OF OHIO  
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### COMMERCIAL DRIVE PROFILE



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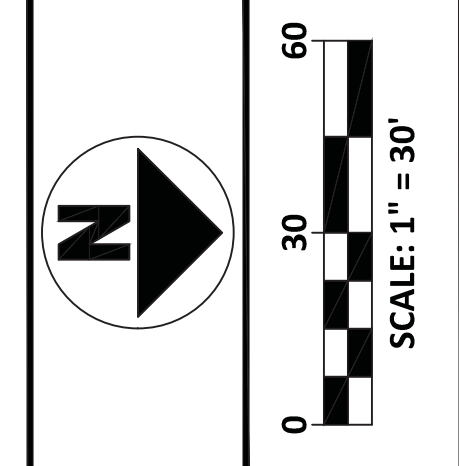
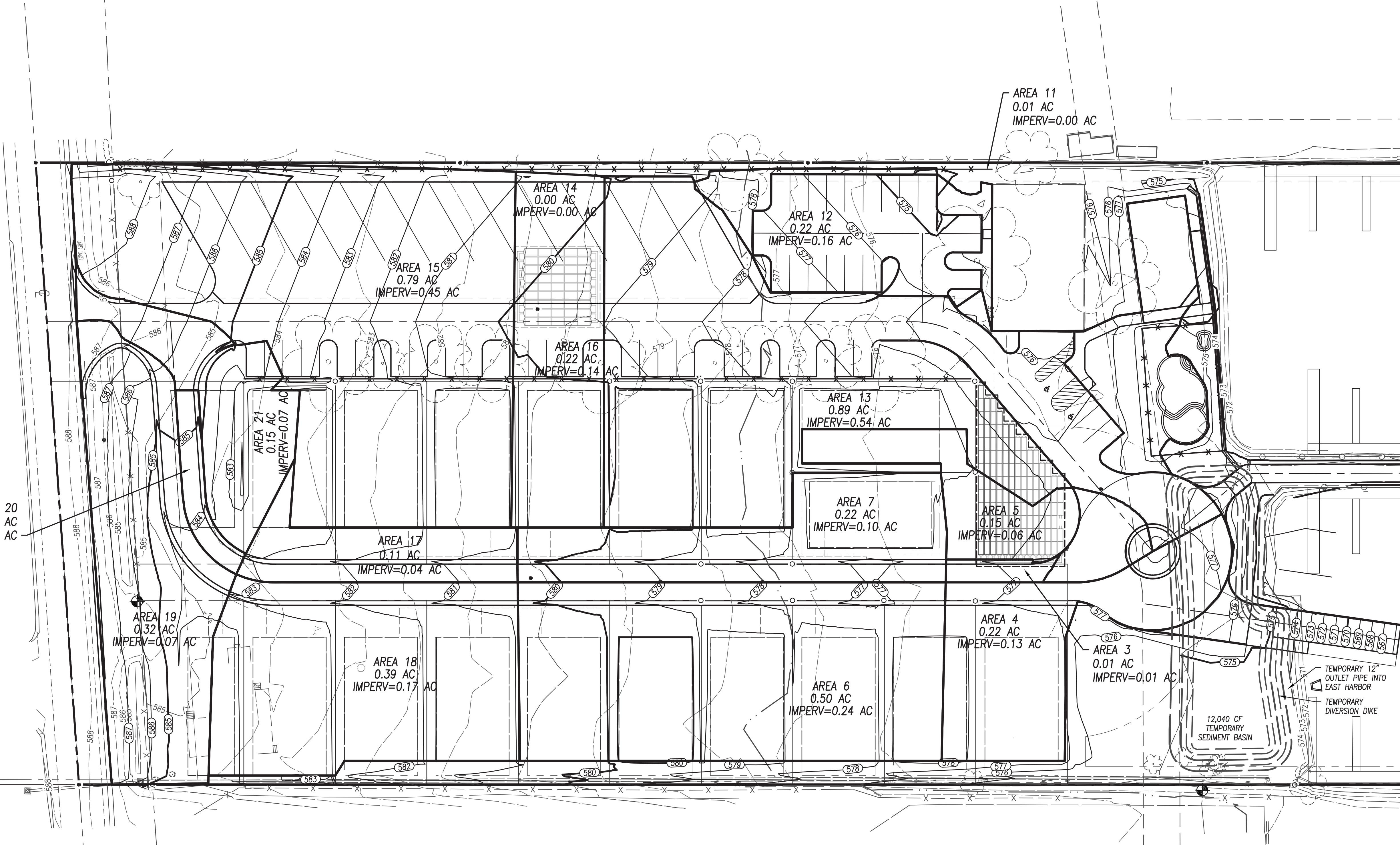
**PROFILES**  
**C11**

PLOTTED: Apr 03, 2019 - 8:42pm  
 DRAWING: M:\18201 (Safe Harbor)\CIVIL\DWG\18201 CD.dwg: C11 PROFILE SAFE HARBOR



PLOTTED: Apr 03, 2019 - 8:43pm  
 DRAWING: M:\18201 (Safe Harbor -Snug Harbor -CIVIL)\Dwg\18201 GR.dwg: C12 DRAINAGE SAFE HARBOR

AREA 20  
 0.03 AC  
 IMPERV=0.03 AC



STATE OF OHIO  
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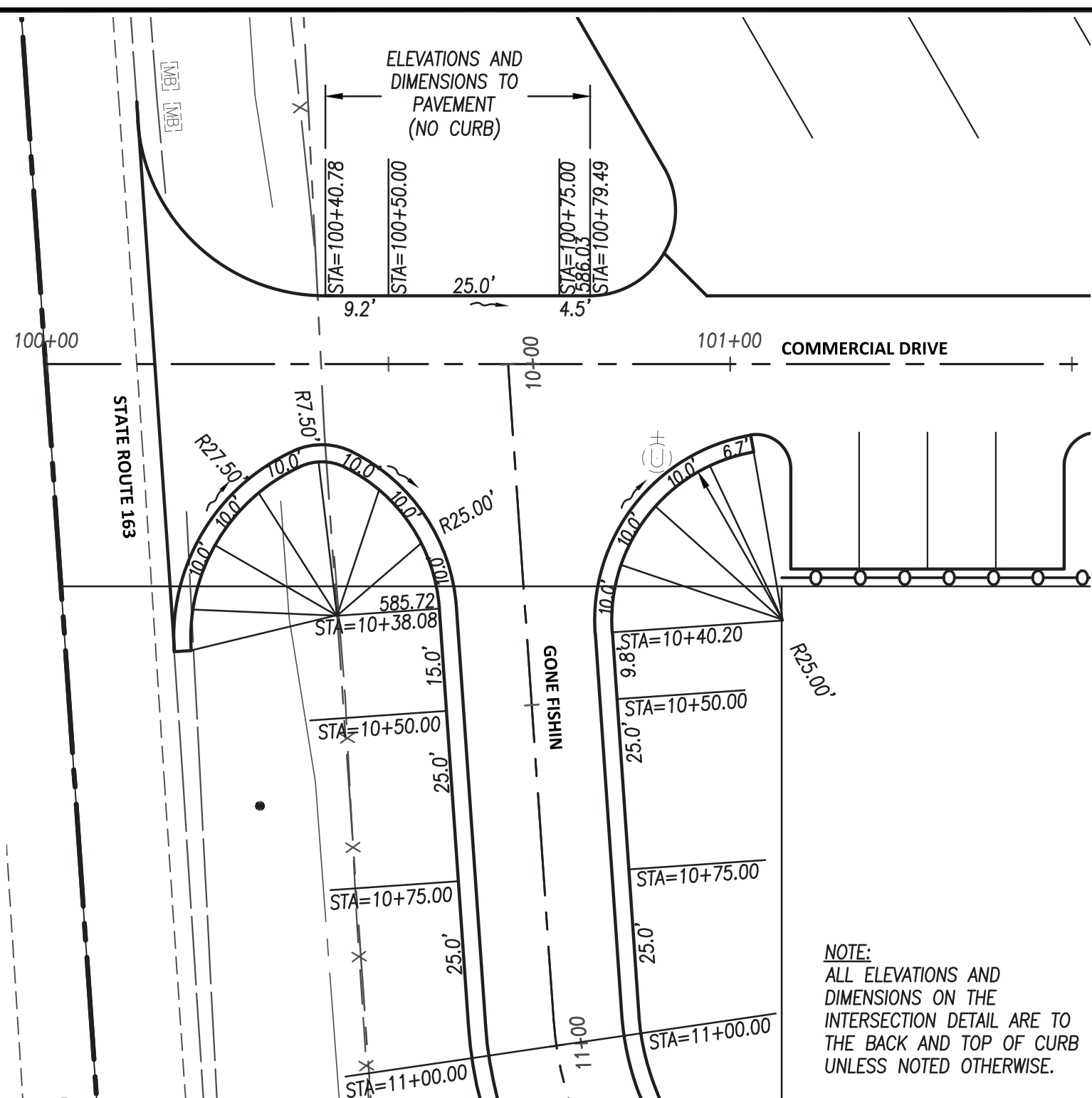
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**DRAINAGE MAP**

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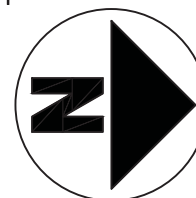
**C12**



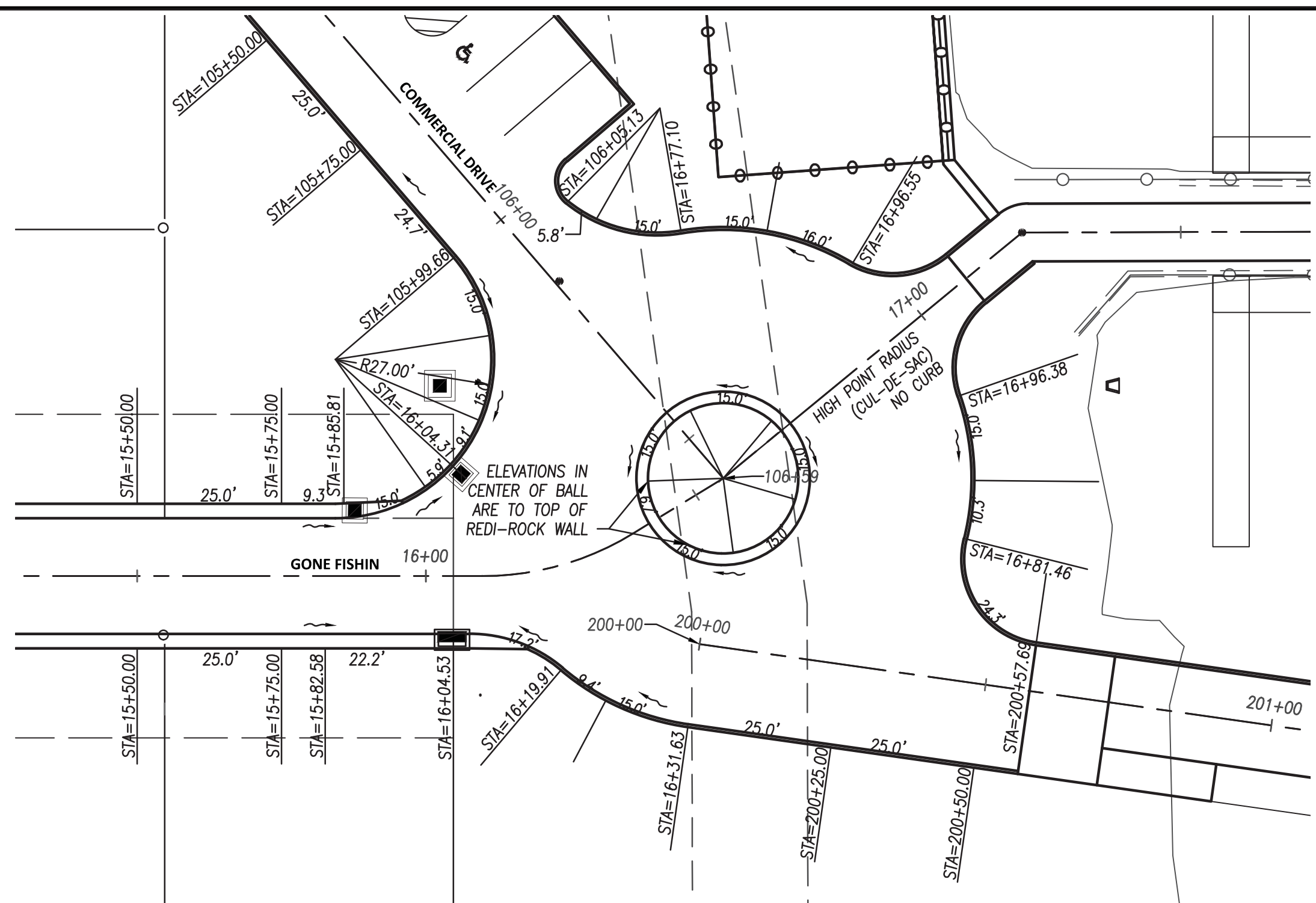


**INTERSECTION DETAIL**

1"=20'

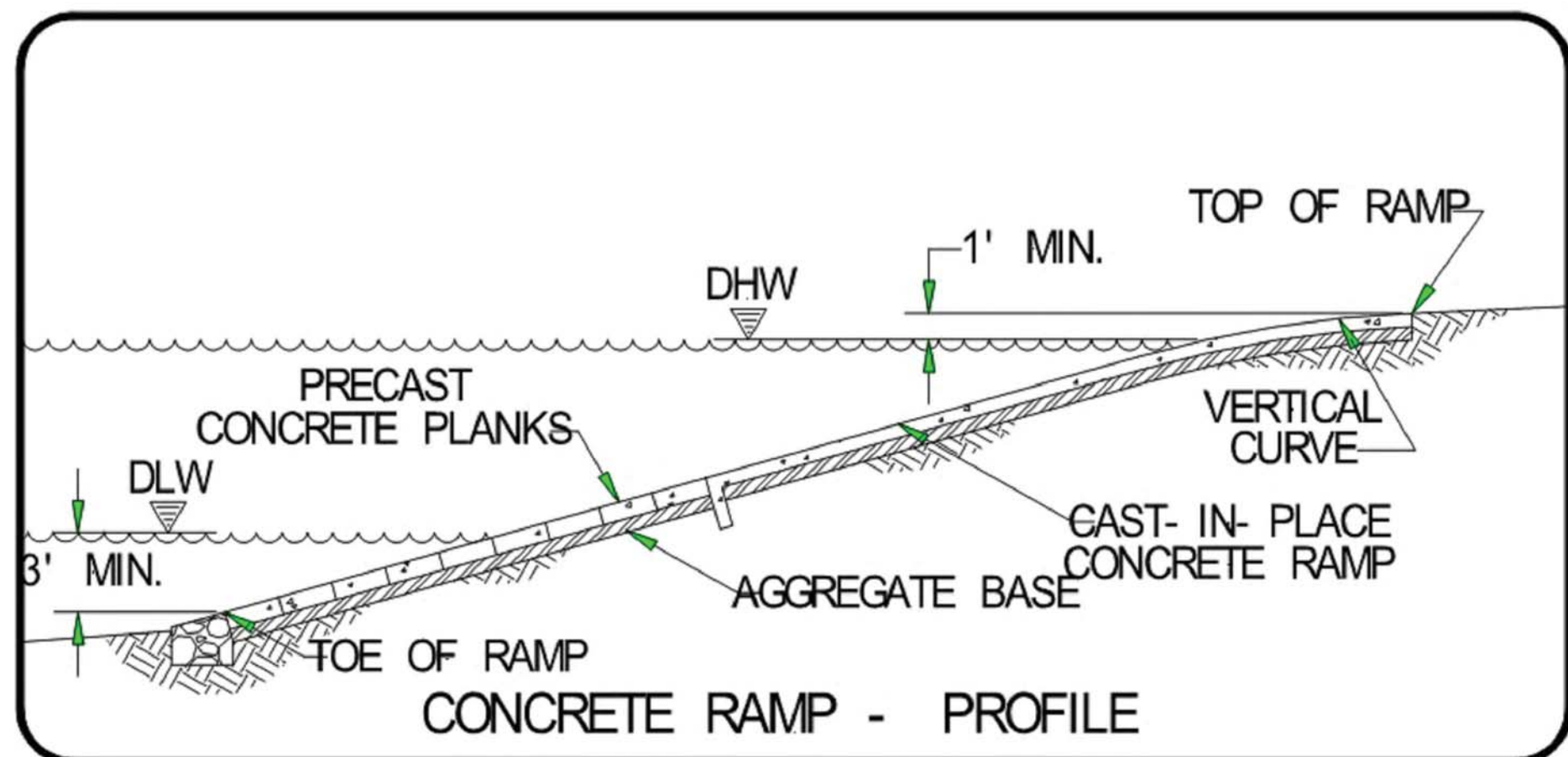
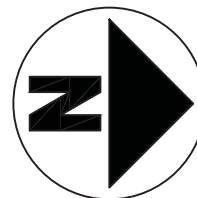


NOTE:  
ALL ELEVATIONS AND DIMENSIONS ON THE INTERSECTION DETAIL ARE TO THE BACK AND TOP OF CURB UNLESS NOTED OTHERWISE.

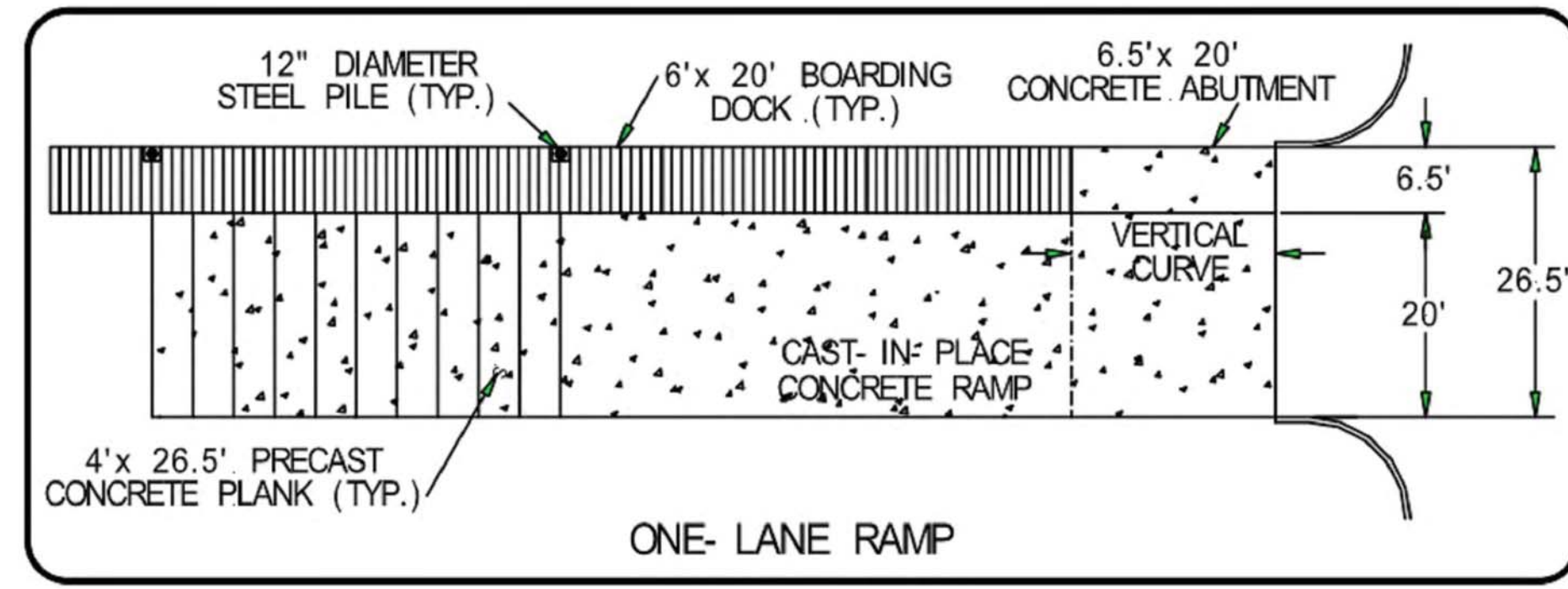


**INTERSECTION DETAIL**

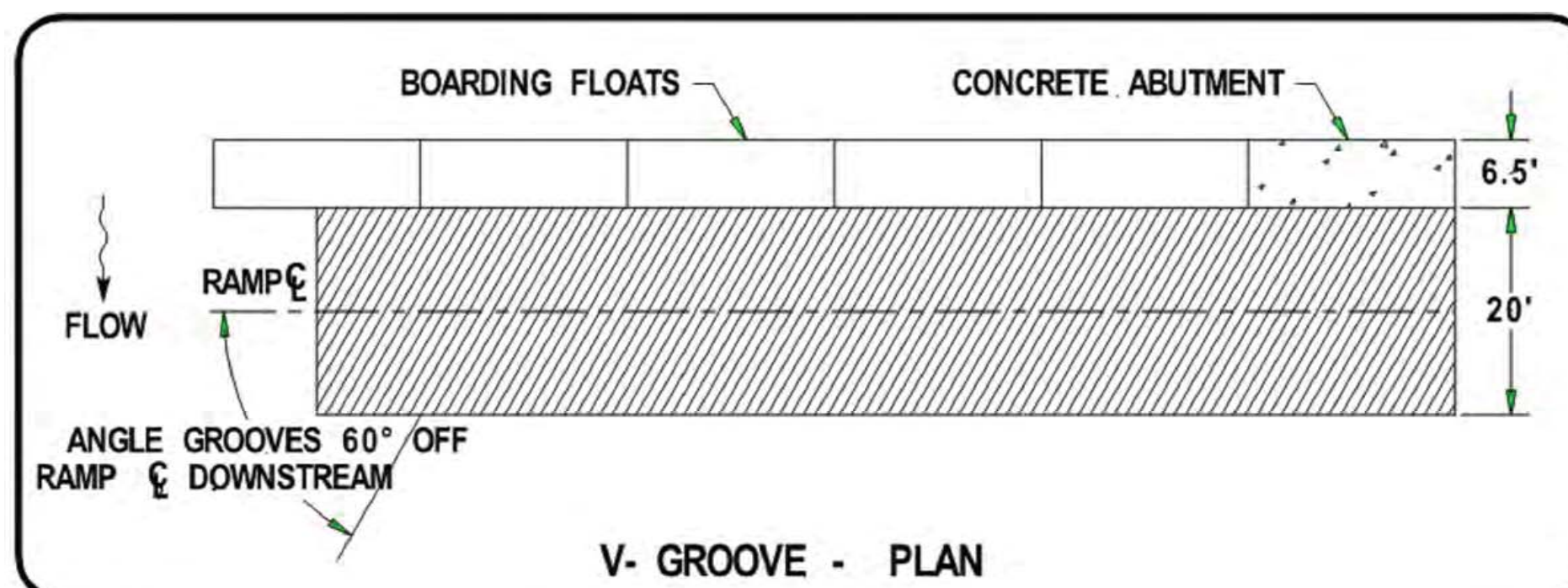
1"=20'



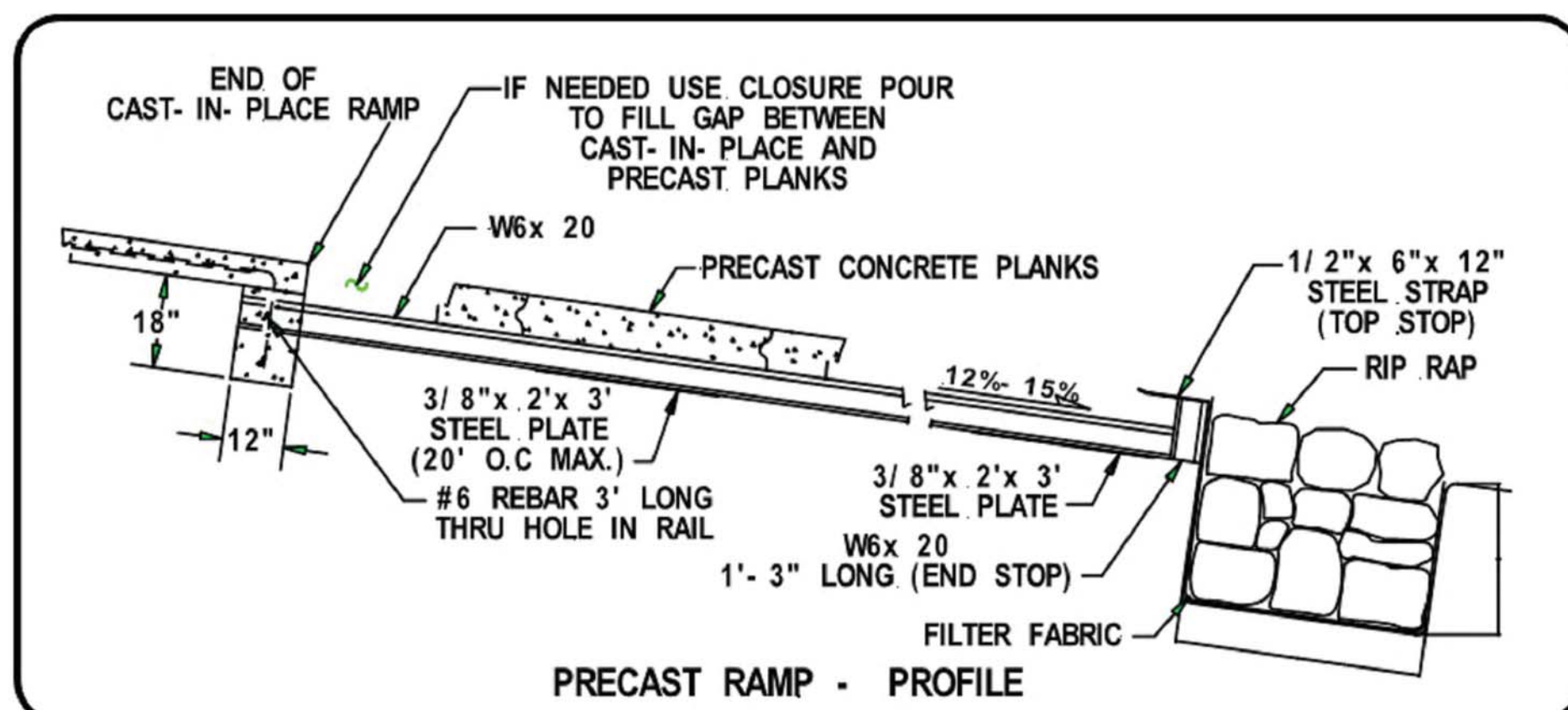
**CONCRETE RAMP - PROFILE**



**ONE-LANE RAMP**



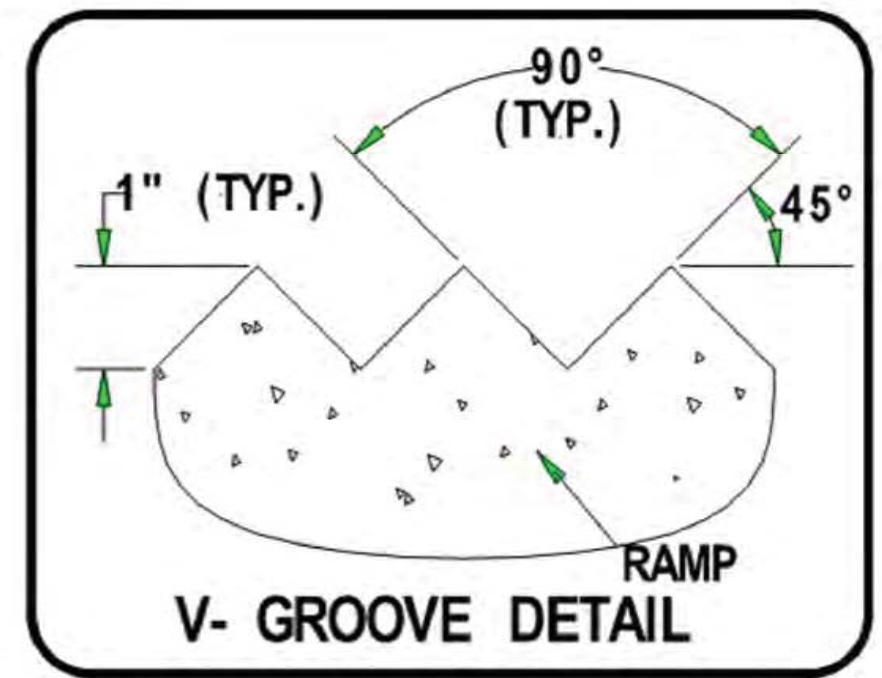
**V-GROOVE - PLAN**



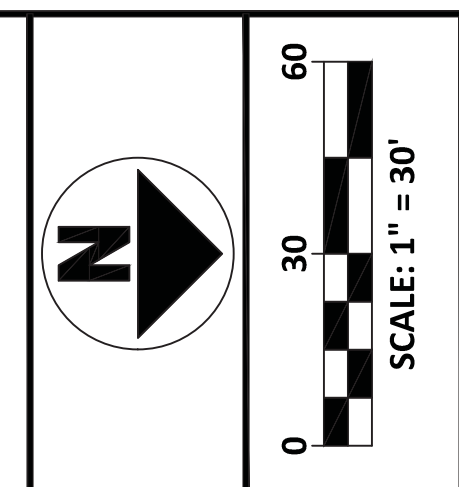
**BOAT RAMP DETAILS**

N.T.S.

- NOTE:
- DLW (DESIGN LOW WATER=ORDINARY LOW WATER) =569.41
  - BOAT RAMP TO EXTEND 3.5 FEET BELOW ORDINARY LOW WATER AT A MINIMUM OF 565.91



**V-GROOVE DETAIL**



STATE OF OHIO  
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OTTAWA COUNTY  
LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP

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**GRAVITY BUILDING SEWER SPECS.:**

PIPE:  
 \*PVC ASTM D-3034 - S.D.R. 35 WITH O-RING GASKETED JOINTS  
 \*SINGLE FAMILY DWELLINGS - 4" OR 6"  
 \*MULTI-FAMILY DWELLINGS - 6"  
 \*COMMERCIAL BUILDINGS - 6"

MINIMUM SLOPE: 1% (1/8" PER FOOT)

SEPARATION FROM WATER LINE: 10' HORIZONTAL FEET

MINIMUM COVER OVER CROWN (TOP) OF PIPE:  
 \*GRAVITY = 30" (18" IN SOLID ROCK)

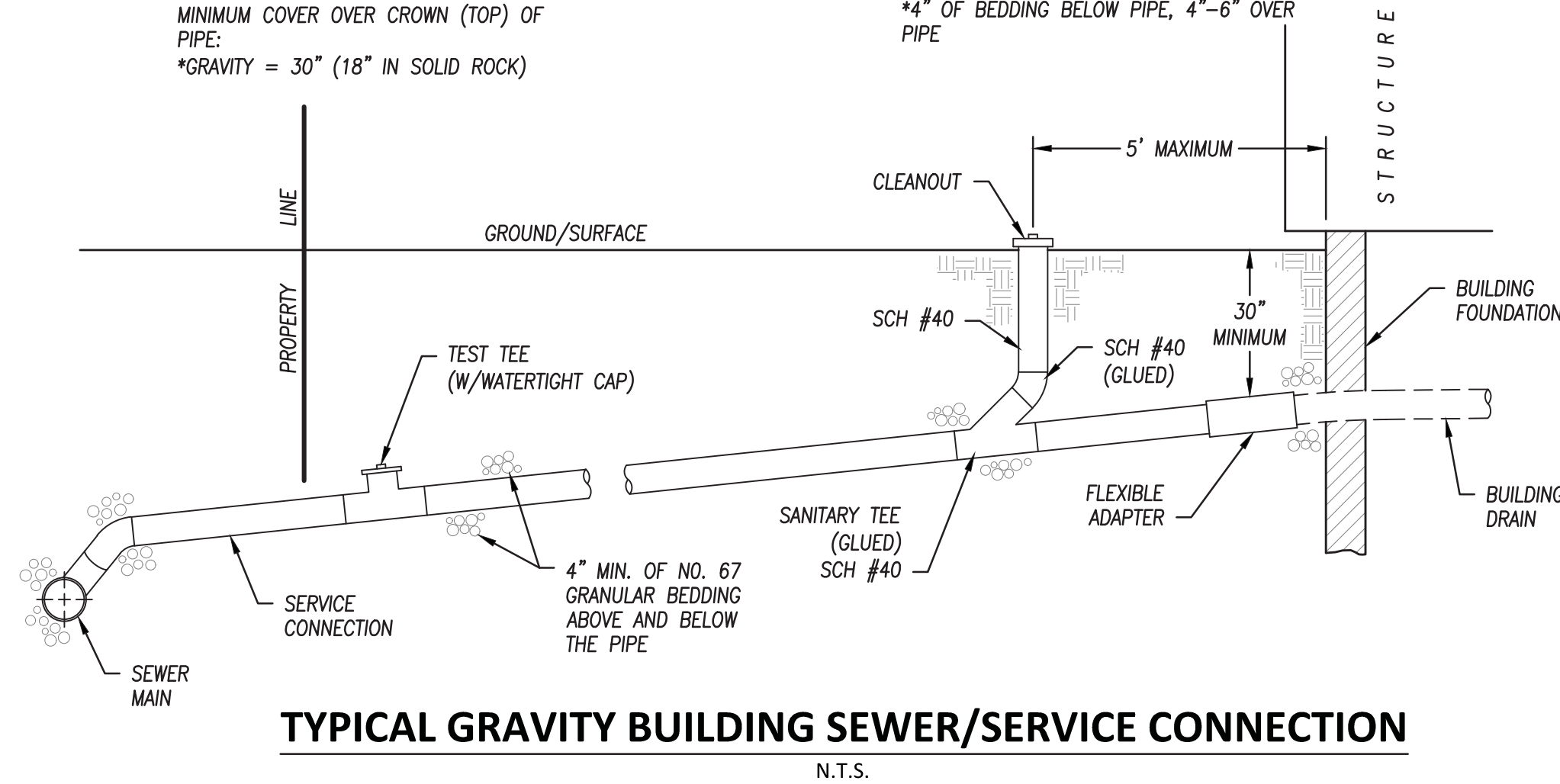
**GRAVITY BUILDING SEWER SPECS.:**

CLEANOUT REQUIRED WITHIN 5' OF FOUNDATION

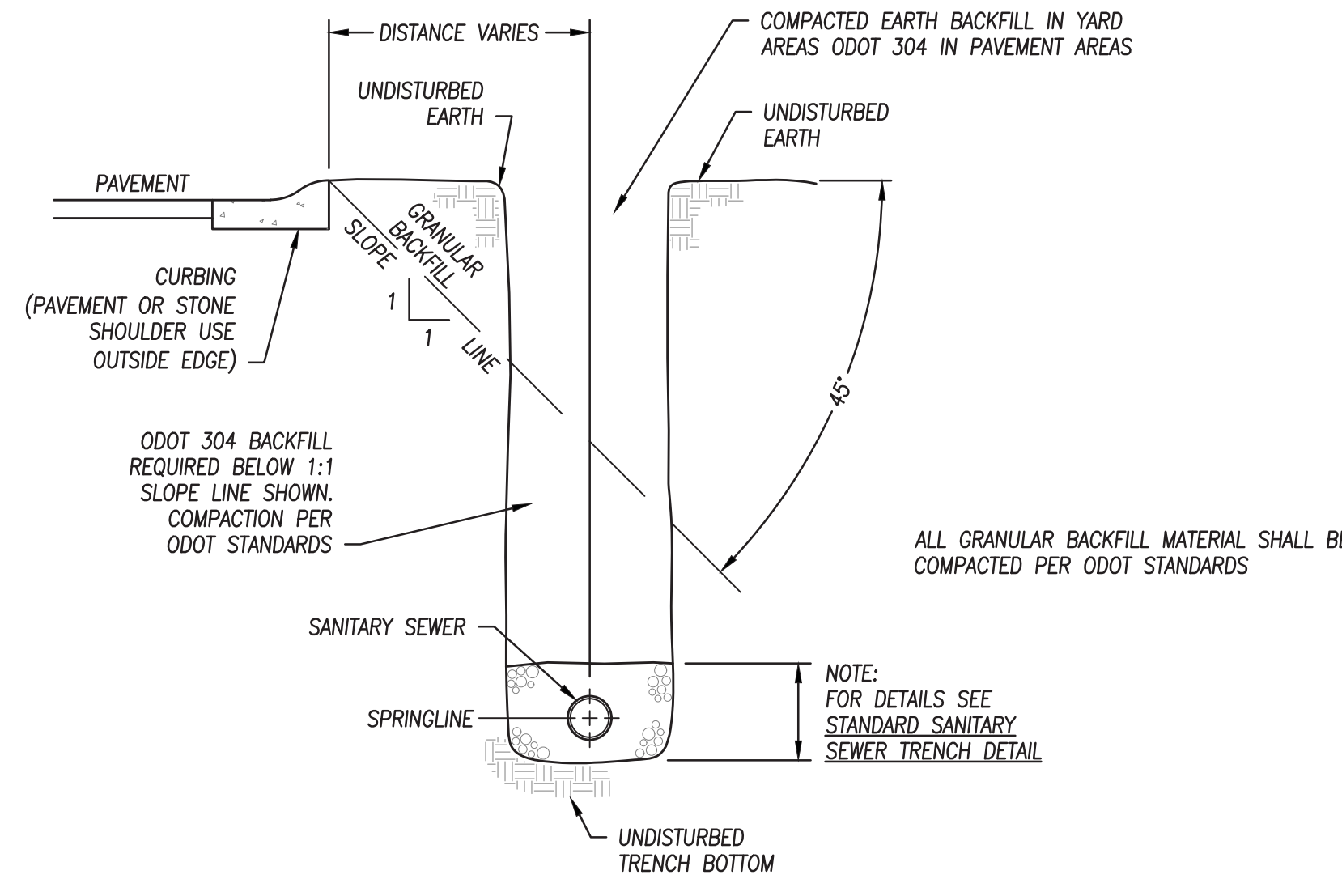
ALL PIPE MUST BE TESTED PRIOR TO BACKFILL

CLAY BENTONITE WRAP REQUIRED IN CATAWBA ISLAND TOWNSHIP

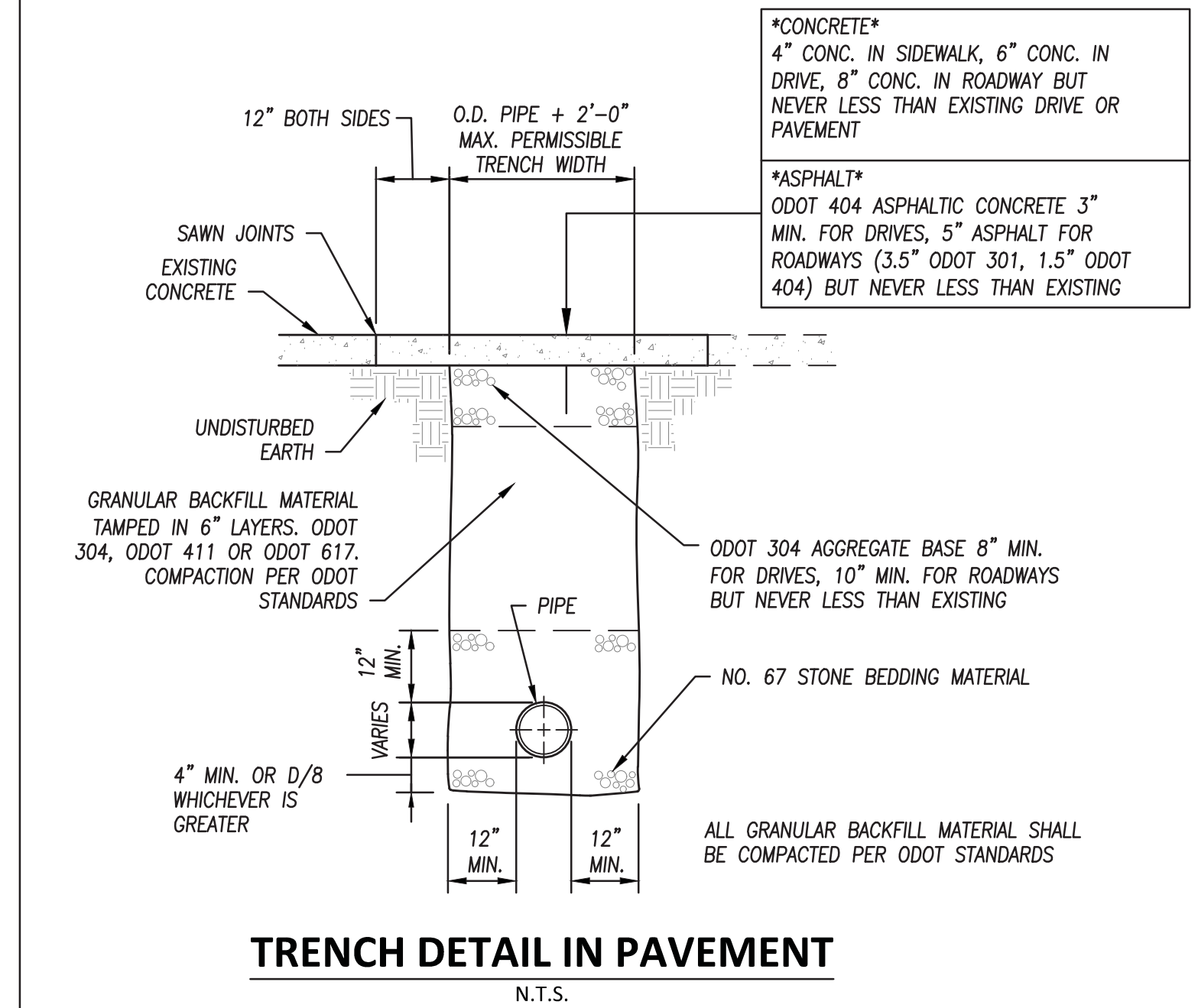
GRANULAR BEDDING REQUIREMENTS:  
 \*NO. 67 LIMESTONE (NORMAL)  
 \*ODOT 304 LIMESTONE (IN PAVED AREAS)  
 \*4" OF BEDDING BELOW PIPE, 4"-6" OVER PIPE



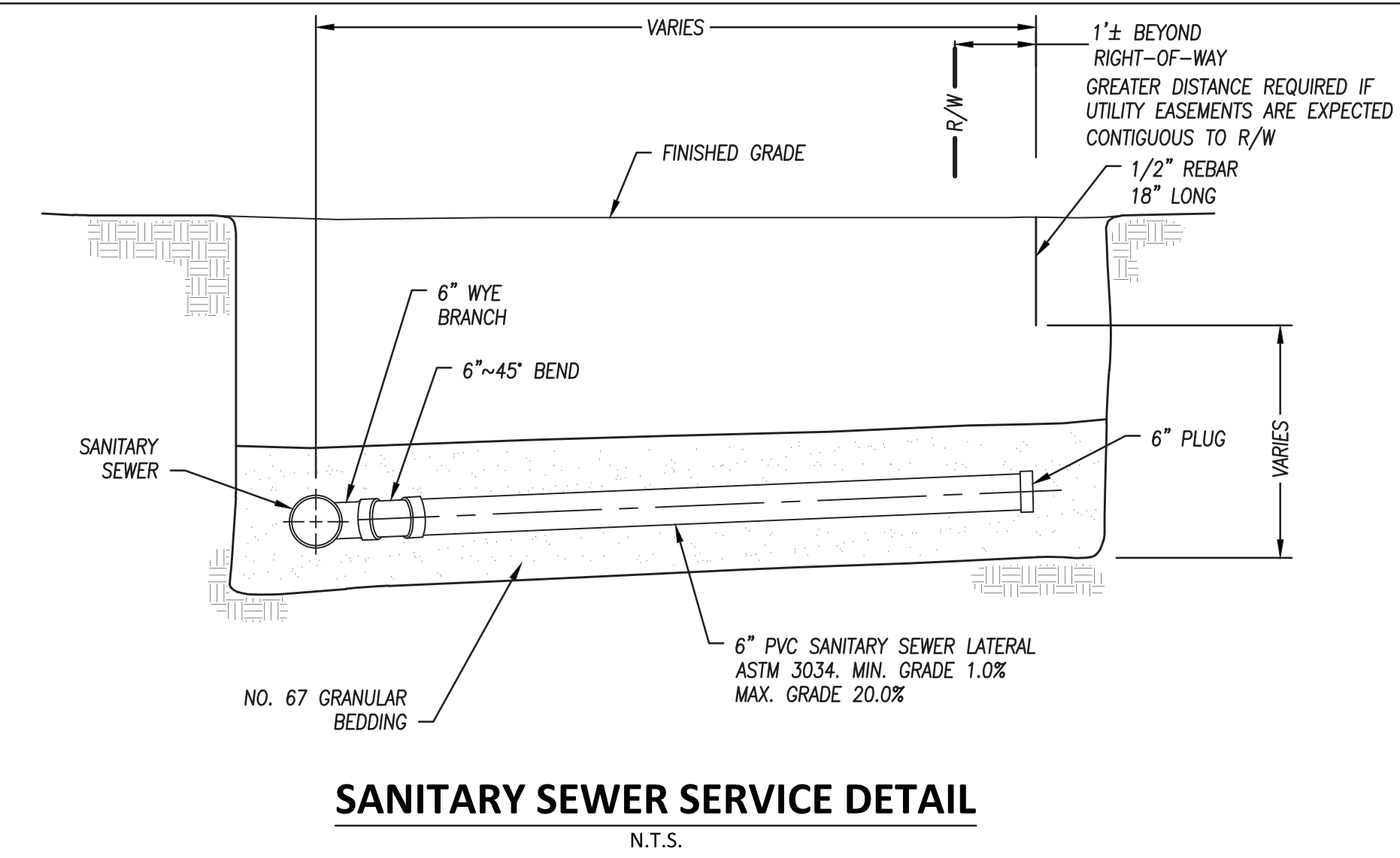
**TYPICAL GRAVITY BUILDING SEWER/SERVICE CONNECTION**  
N.T.S.



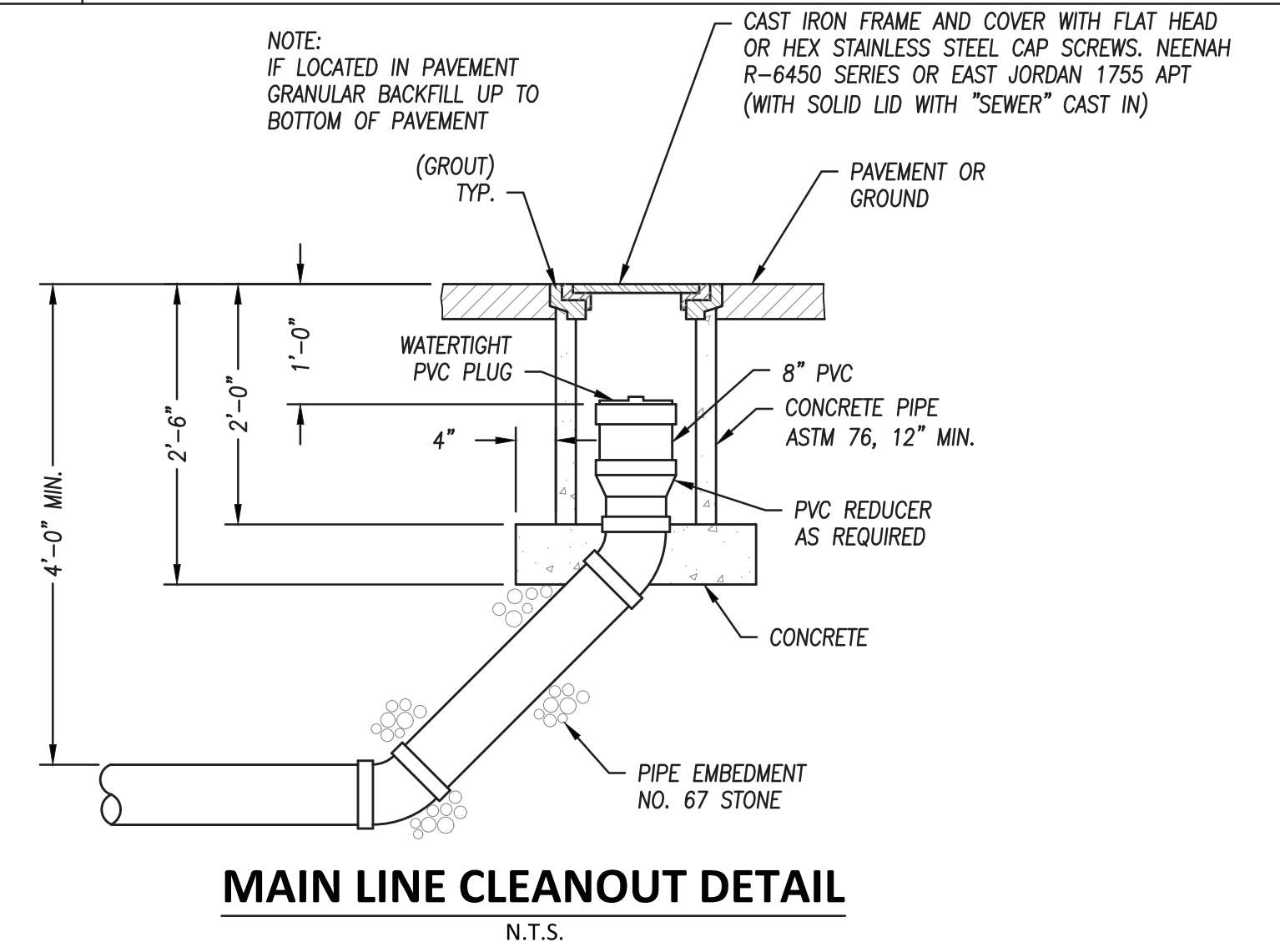
**GRANULAR BACKFILL OF SANITARY SEWER TRENCH ALONG PUBLIC STREET OR ROAD**  
N.T.S.



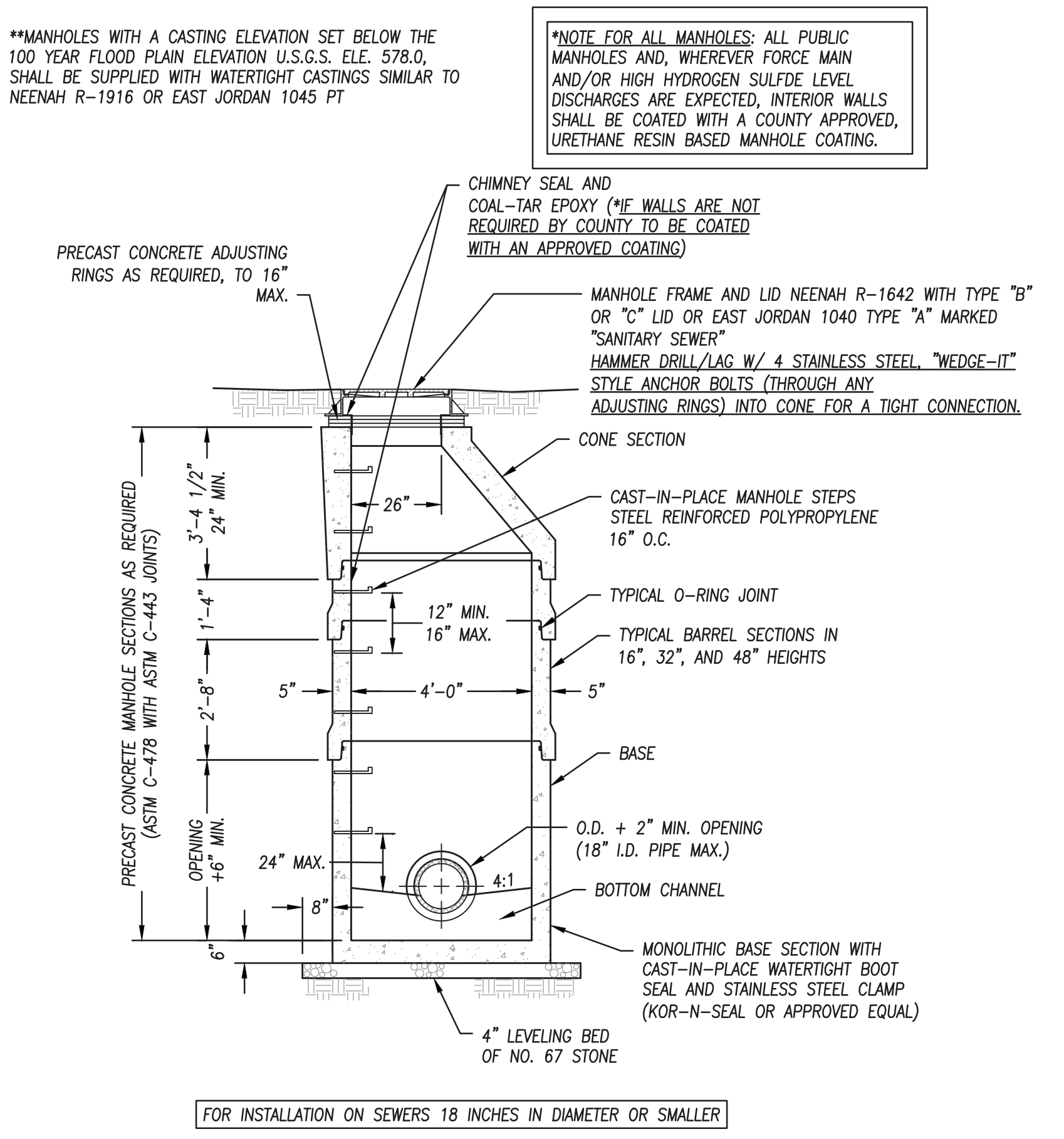
**TRENCH DETAIL IN PAVEMENT**  
N.T.S.



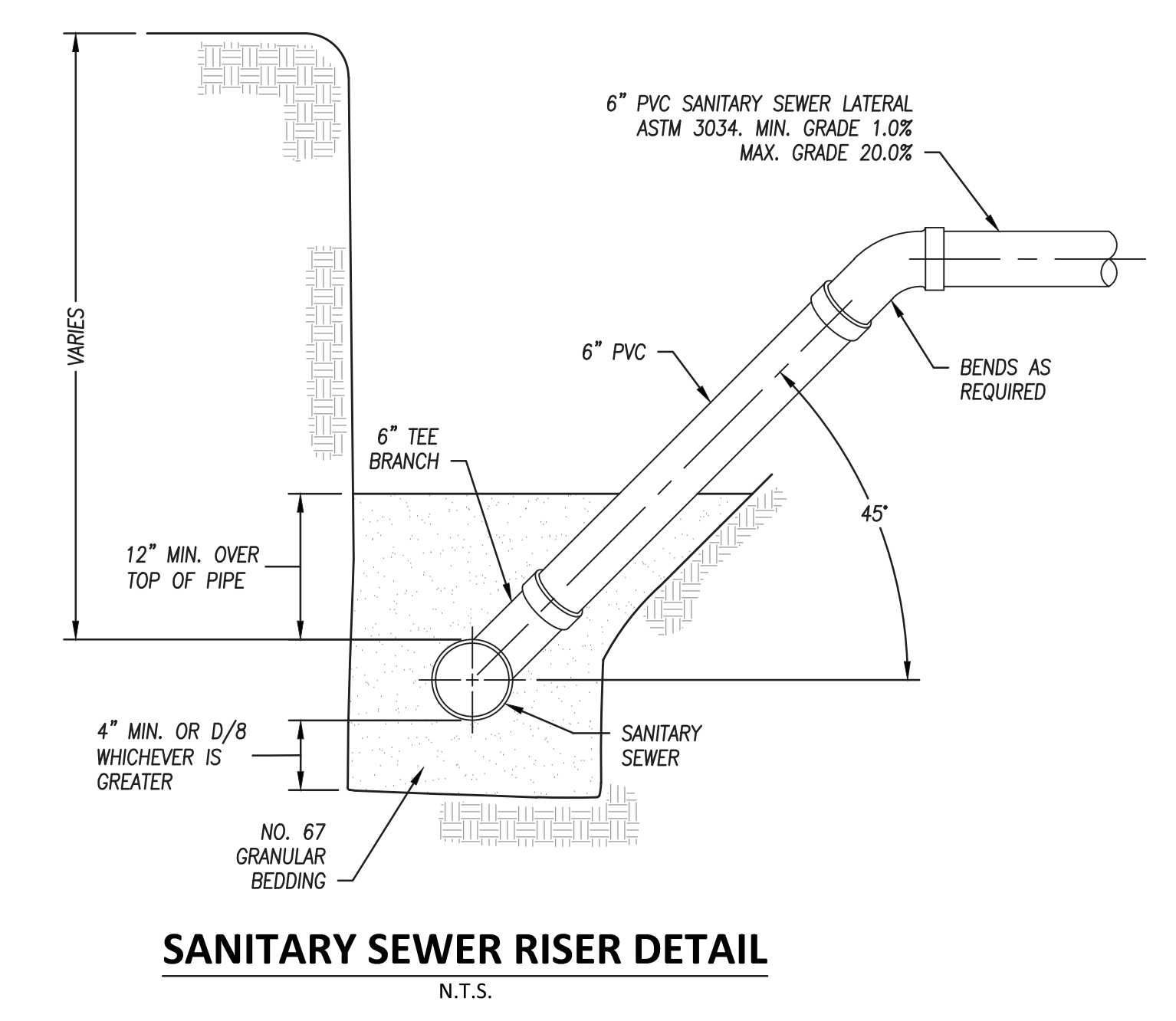
**SANITARY SEWER SERVICE DETAIL**  
N.T.S.



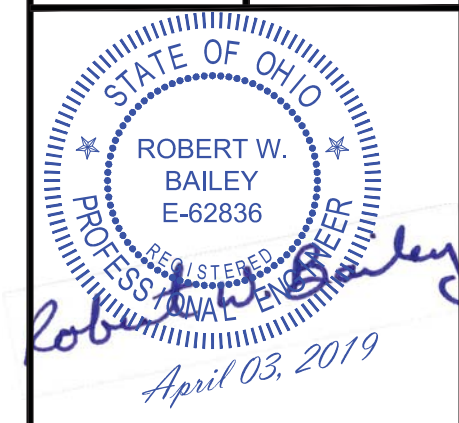
**MAIN LINE CLEANOUT DETAIL**  
N.T.S.



**SANITARY MANHOLE - TYPE I**  
N.T.S.



**SANITARY SEWER RISER DETAIL**  
N.T.S.



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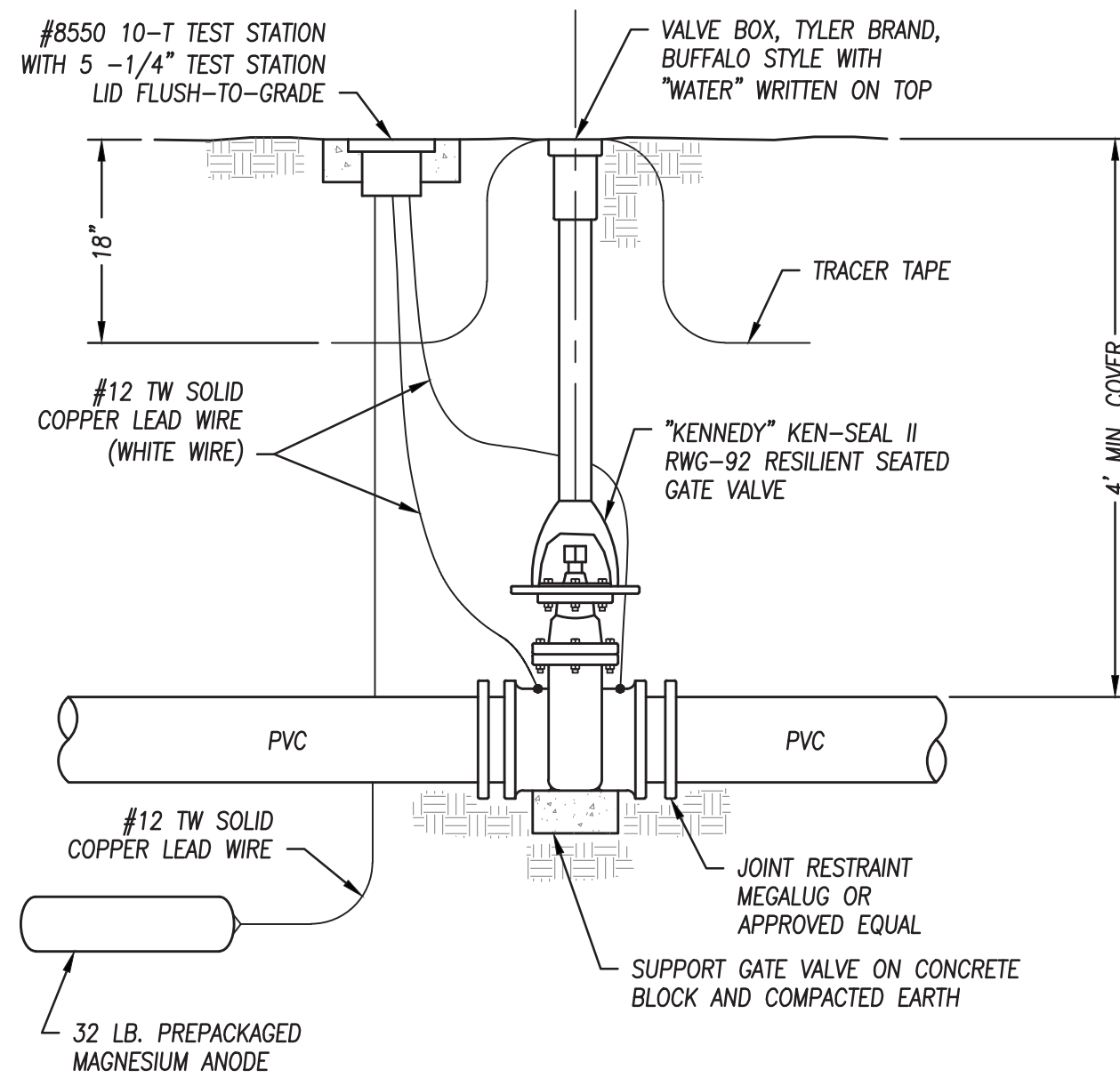
**SAFE HARBOR MARINA SUB.**  
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**C14**

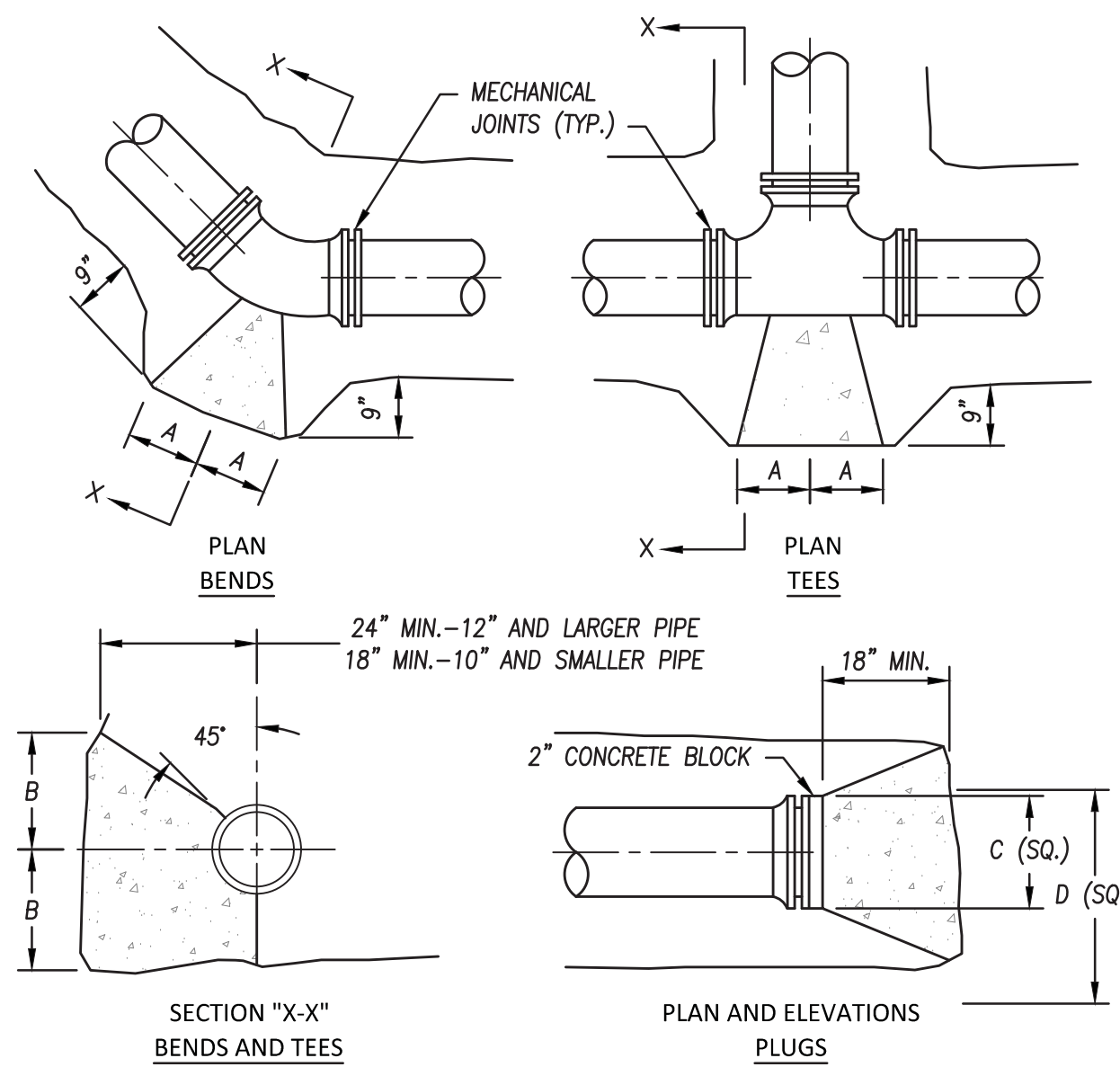
PLOTTED: Apr 03, 2019 - 8:43pm  
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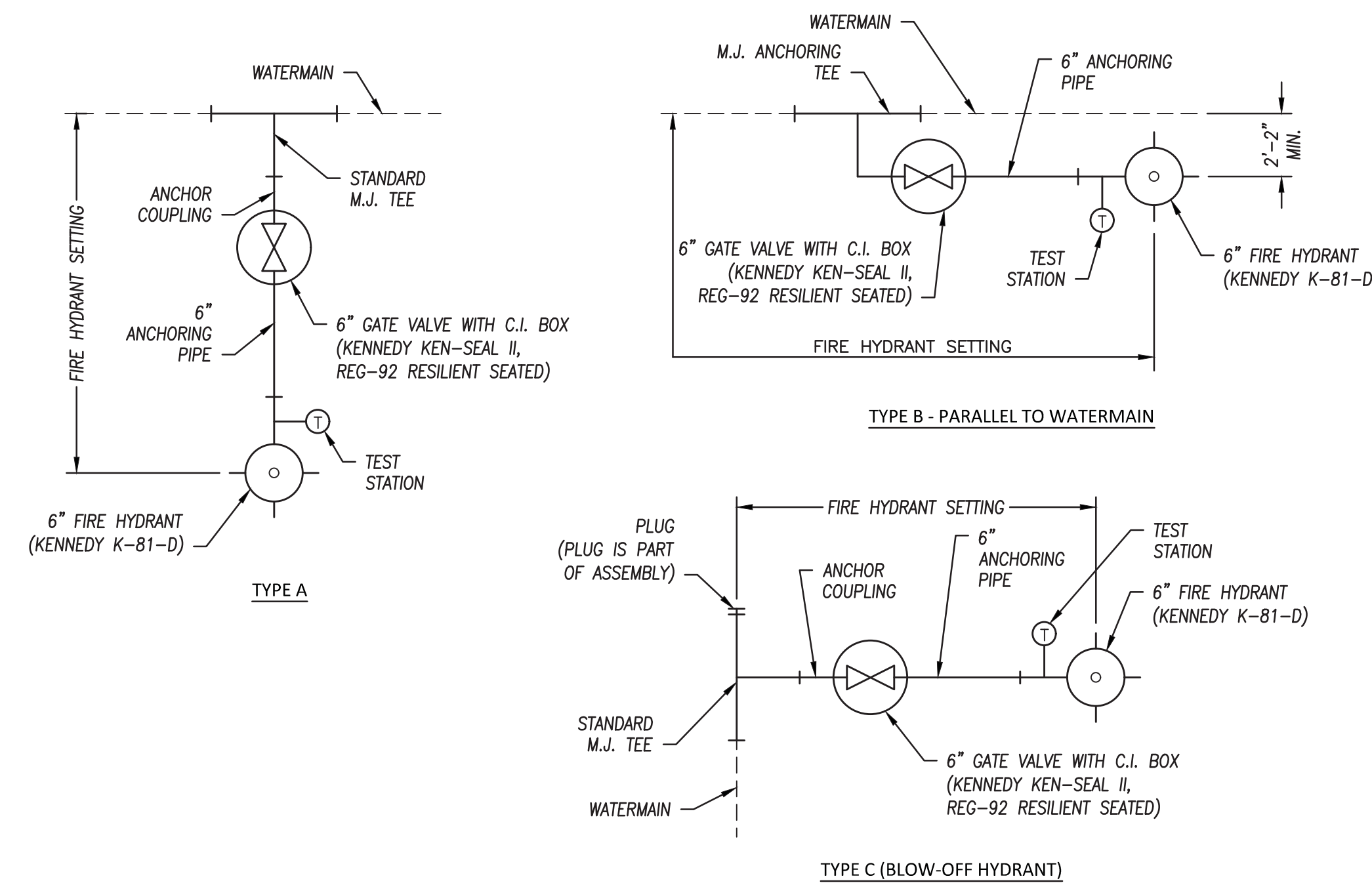
**GATE VALVE AND BOX  
(FOR 3" TO 12" MAINS)**

N.T.S.



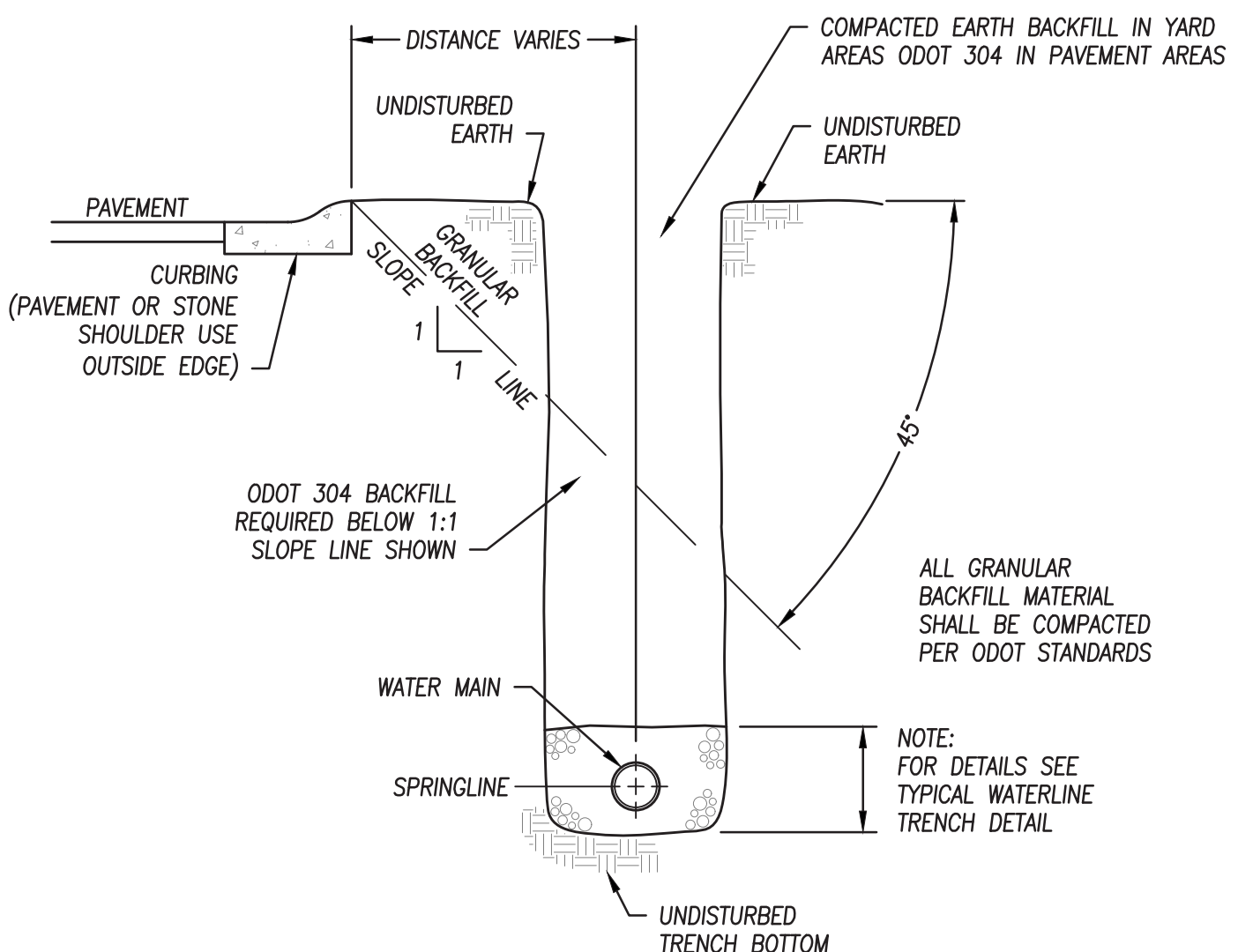
TYPE	SIZE	1/4 BENDS		1/8 BENDS		1/16 BENDS		TEES		PLUGS	
		A	B	A	B	A	B	A	B	C	D
2000 PSF SOIL	3"-6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
	8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
	10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"
	12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
	14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"
	16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"
	20"	46"	36"	25"	36"	15"	30"	30"	39"	24"	68"

NOTE:  
BASED ON 100 P.S.I. STATIC PRESSURE PLUS A.W.W.A. WATER HAMMER.  
ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED SOIL.



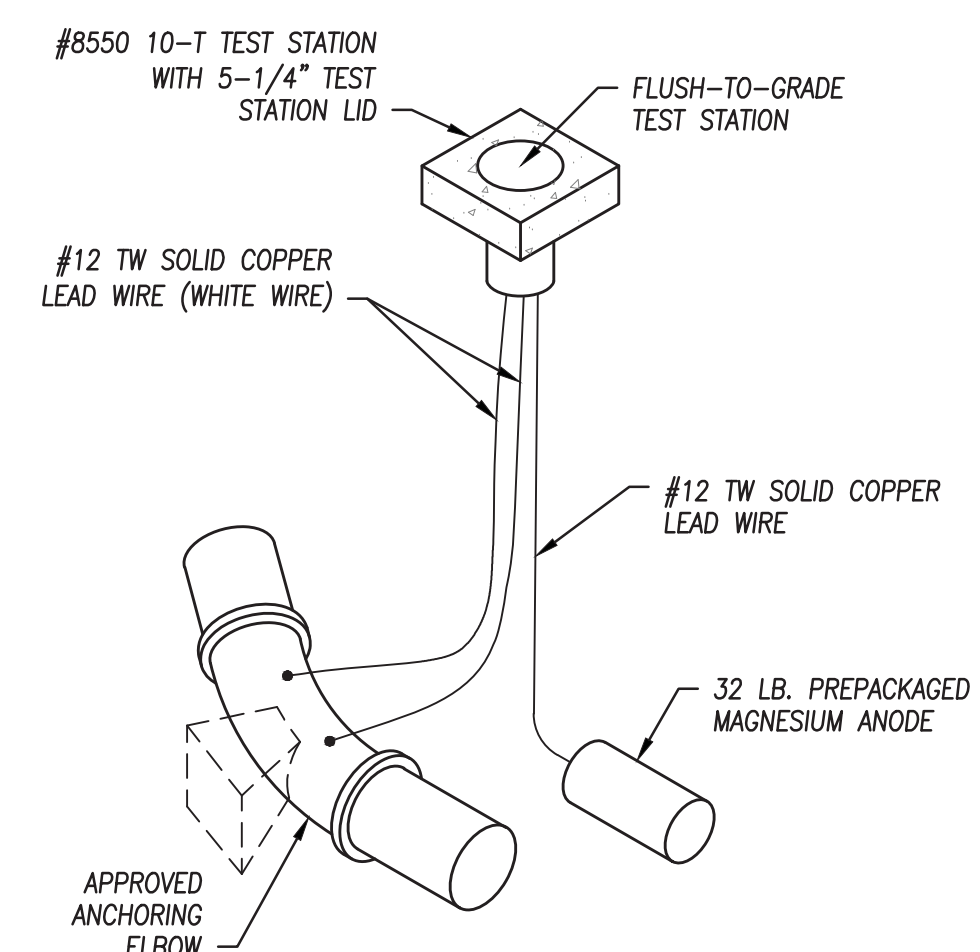
**FIRE HYDRANT SETTING TYPES**

N.T.S.



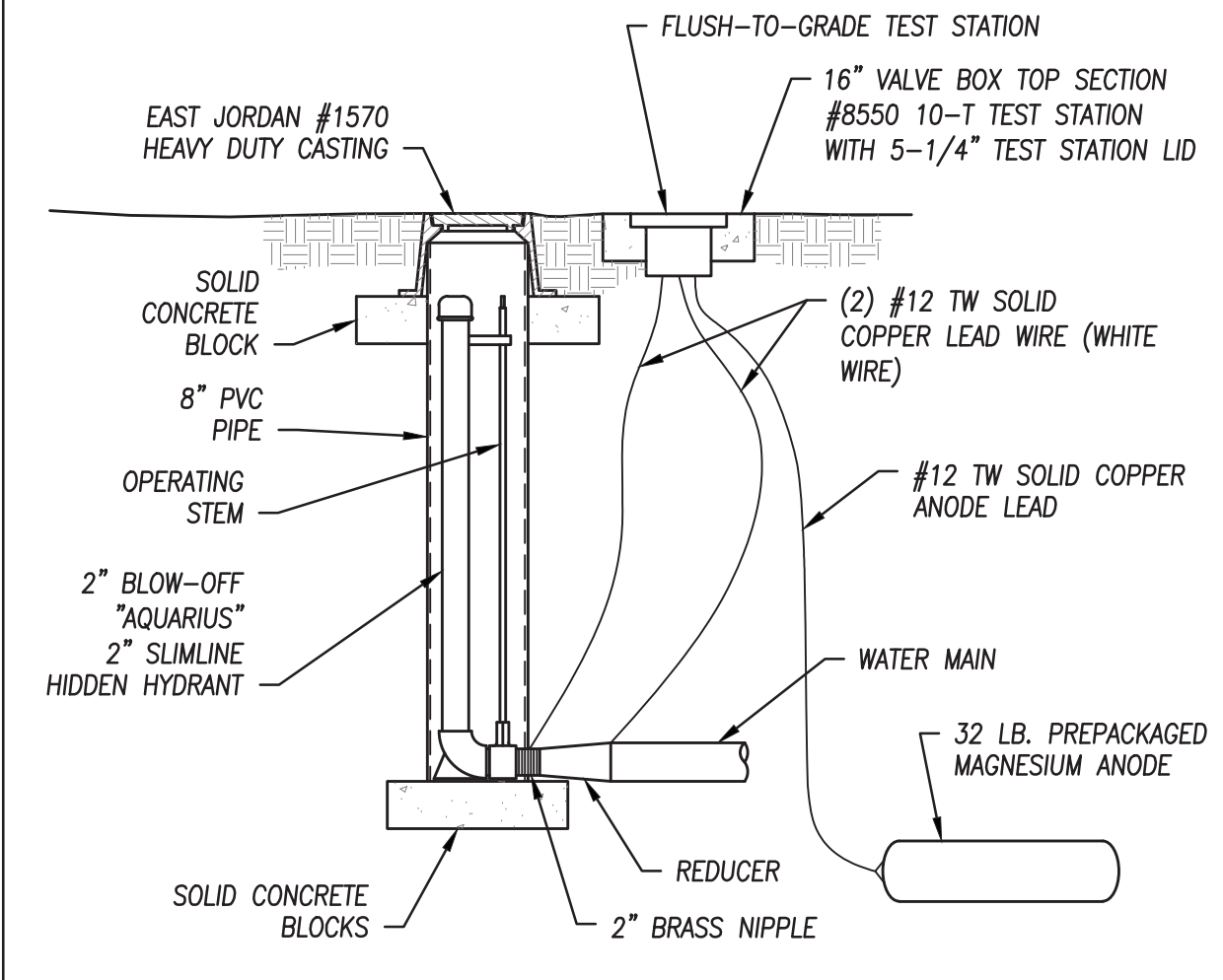
**GRANULAR BACKFILL OF WATERLINE  
TRENCH ALONG PUBLIC STREET OR ROAD**

N.T.S.



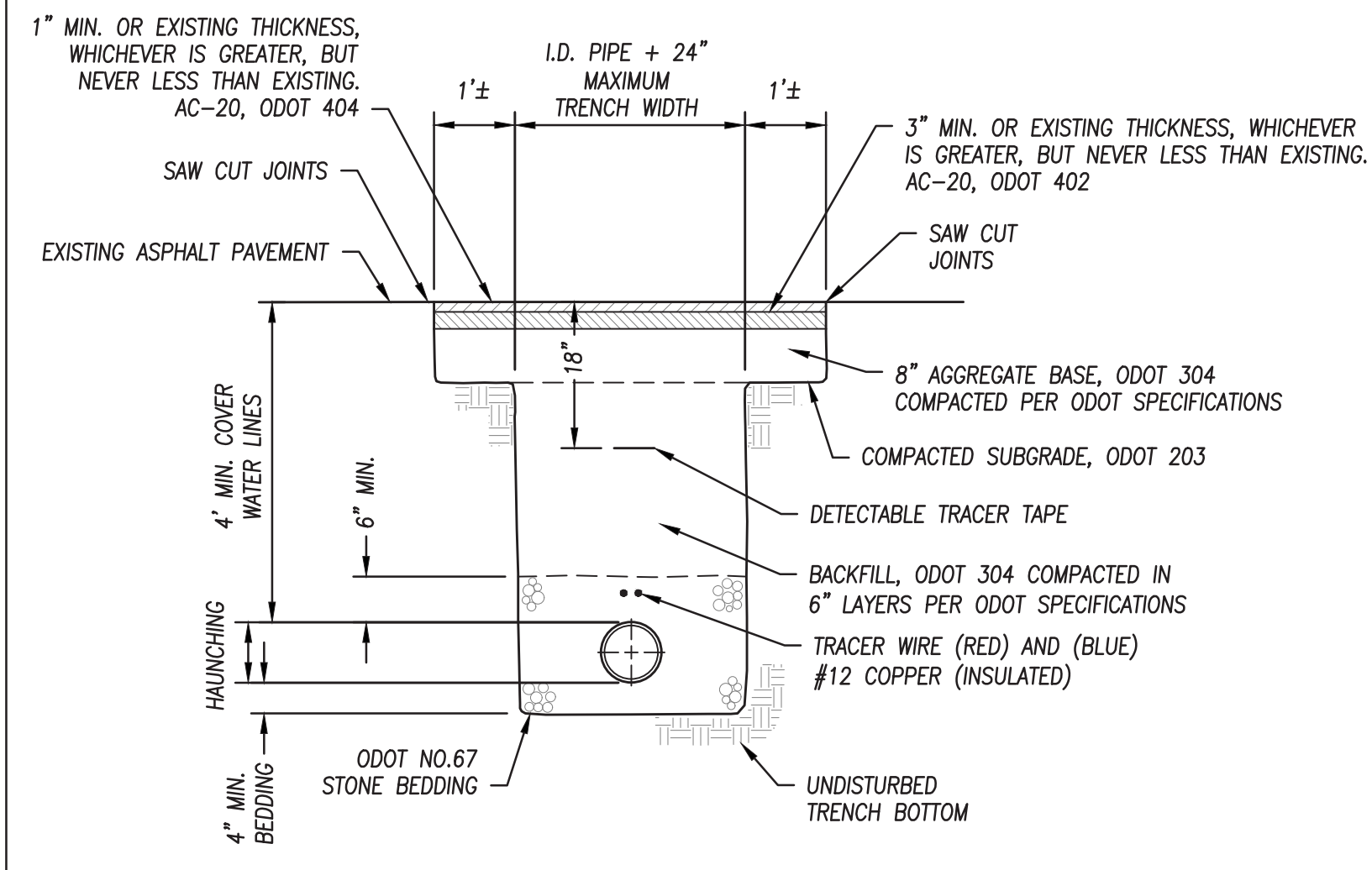
**TYPICAL PIPE BEND**

N.T.S.



**WATER MAIN BLOW-OFF DETAIL**

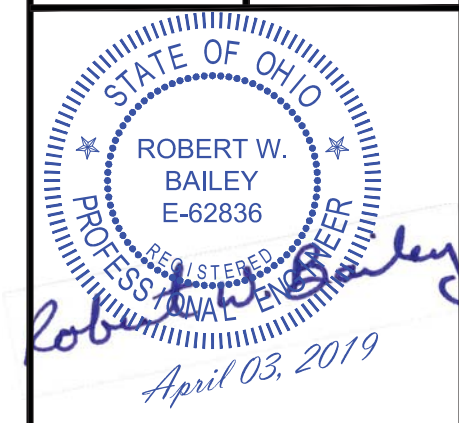
N.T.S.



NOTE:  
IF HYDRO-HAMMERS ARE USED TO PREPARE A BEDDING FOR THE ROAD SURFACE THEY SHOULD NOT BE USED WITHIN 3 FEET OF THE TOP OF PVC PIPE. HYDRO-HAMMERS CAN BE USED AT DISTANCES GREATER THAN 3 FEET ABOVE THE TOP OF PIPE IF THE SOIL DENSITY HAS BEEN PREVIOUSLY COMPACTED TO A MINIMUM 85% STANDARD PROCTOR.

**ASPHALT PAVEMENT REPAIR DETAIL**

N.T.S.



NO	REVISION	DATE
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**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
721 EAST HARBOR ROAD  
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LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP

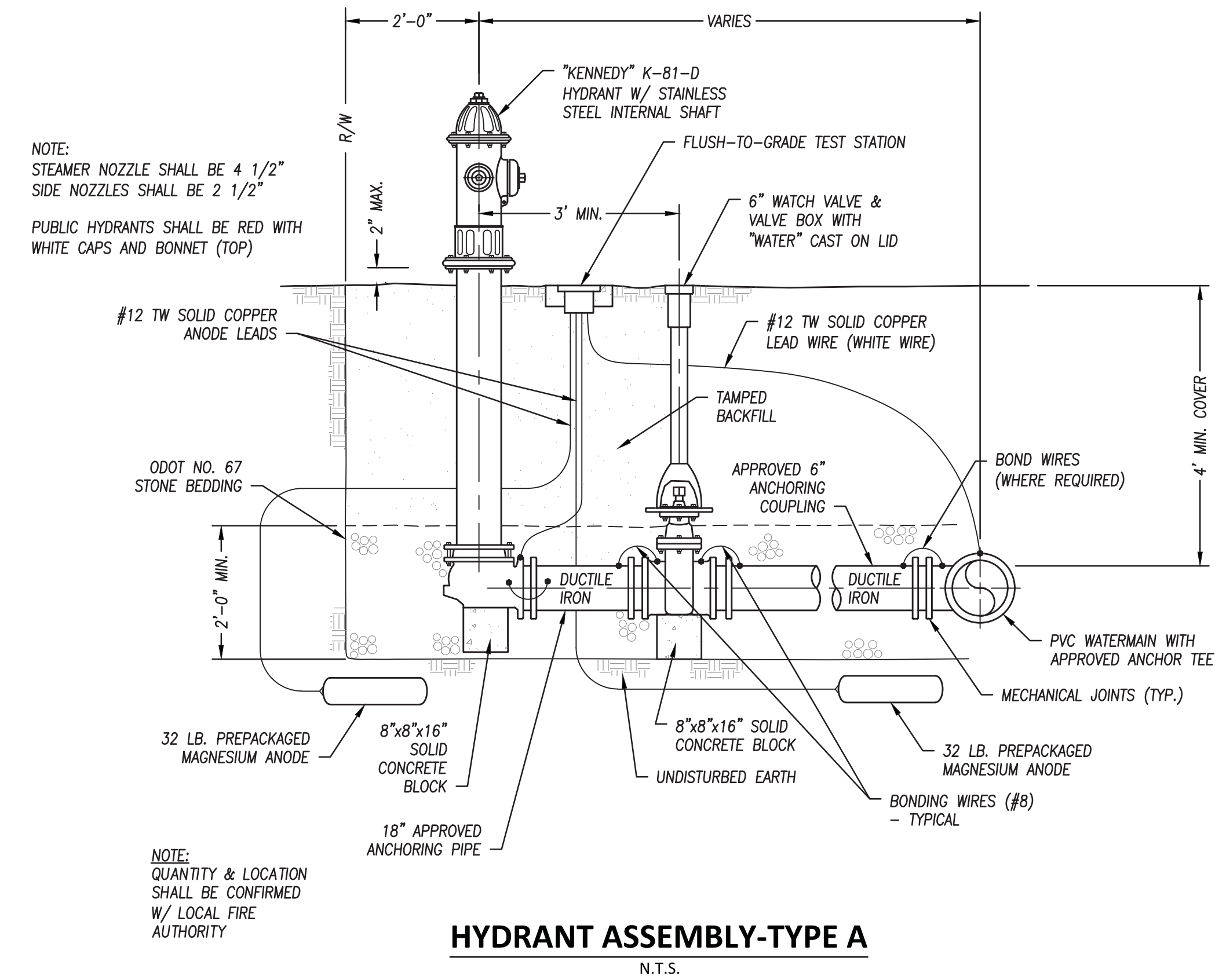
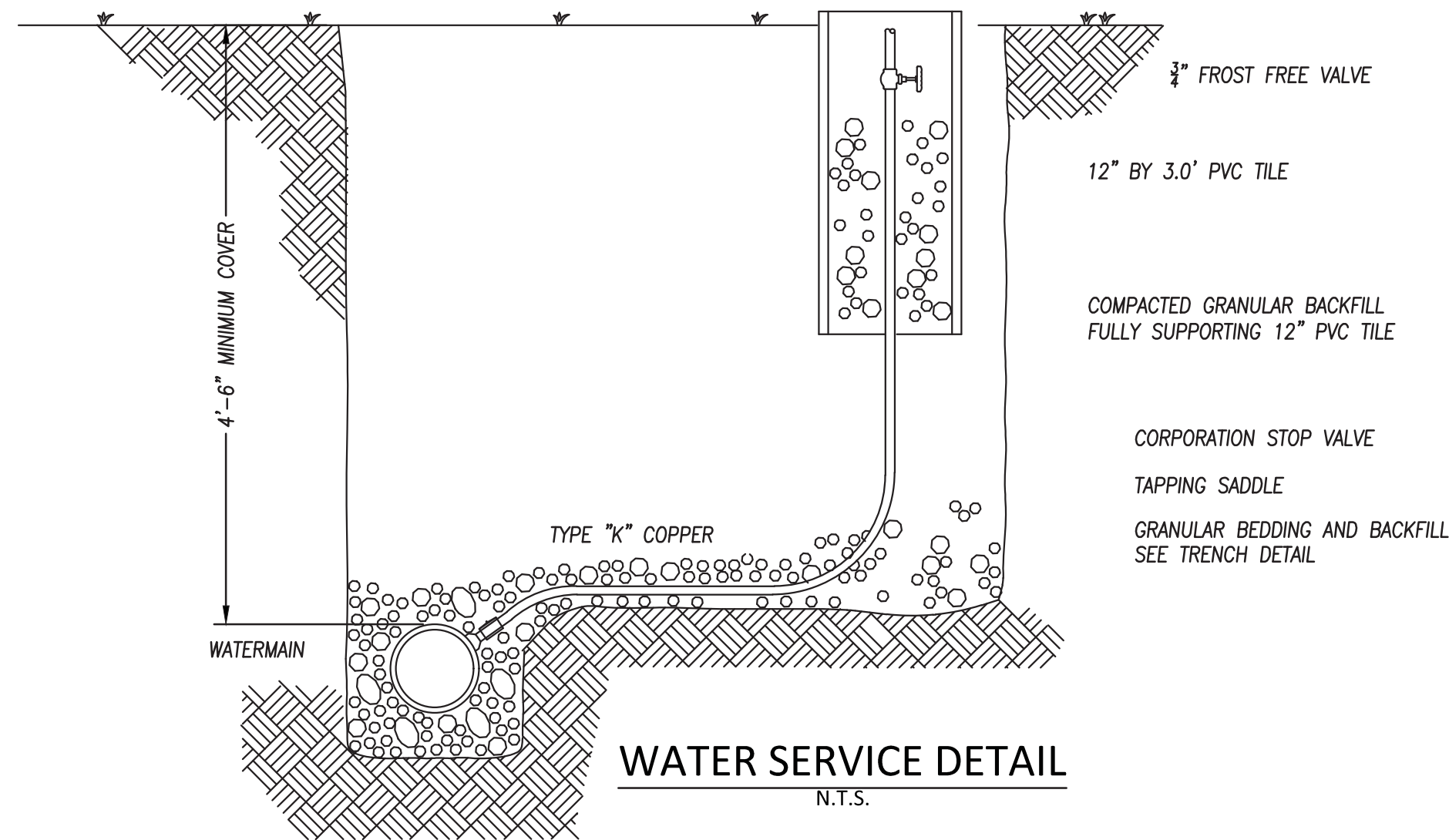
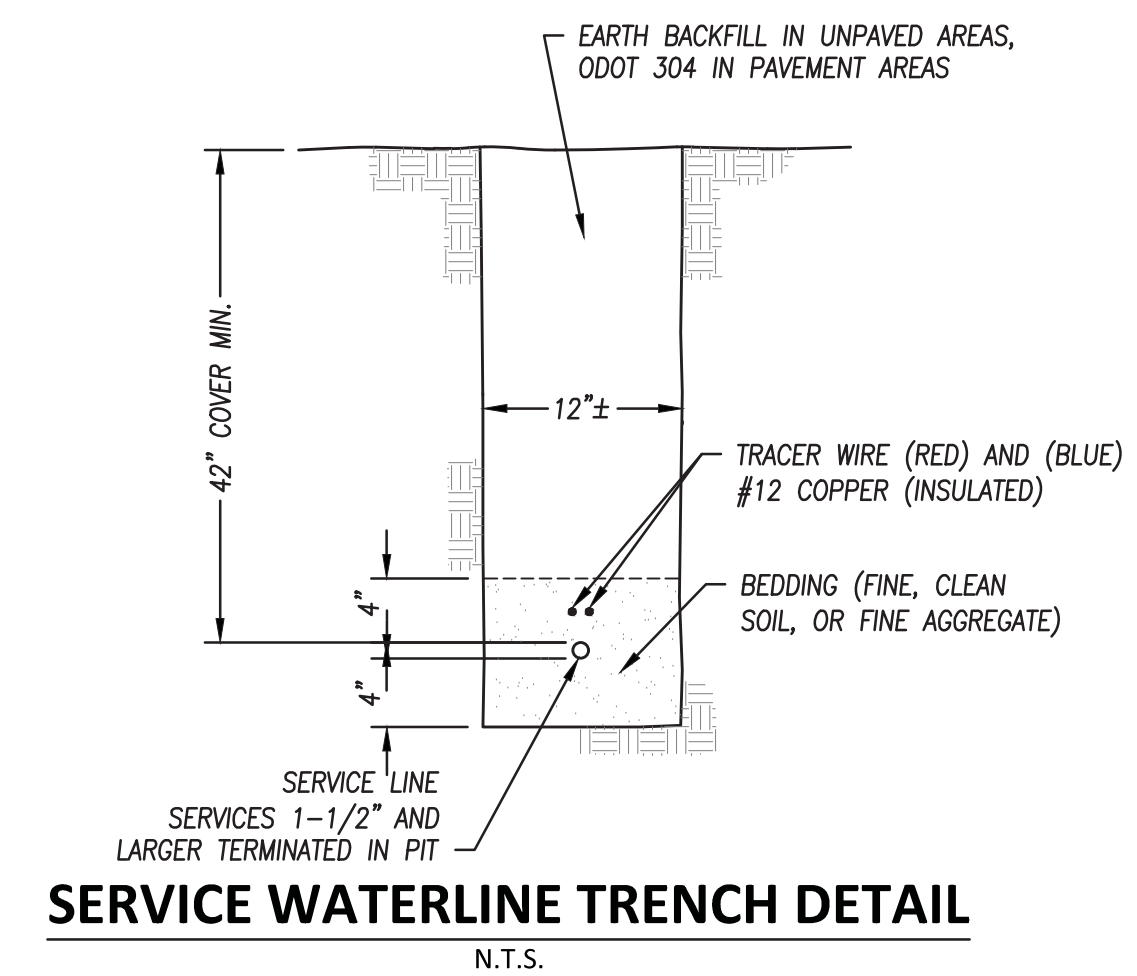
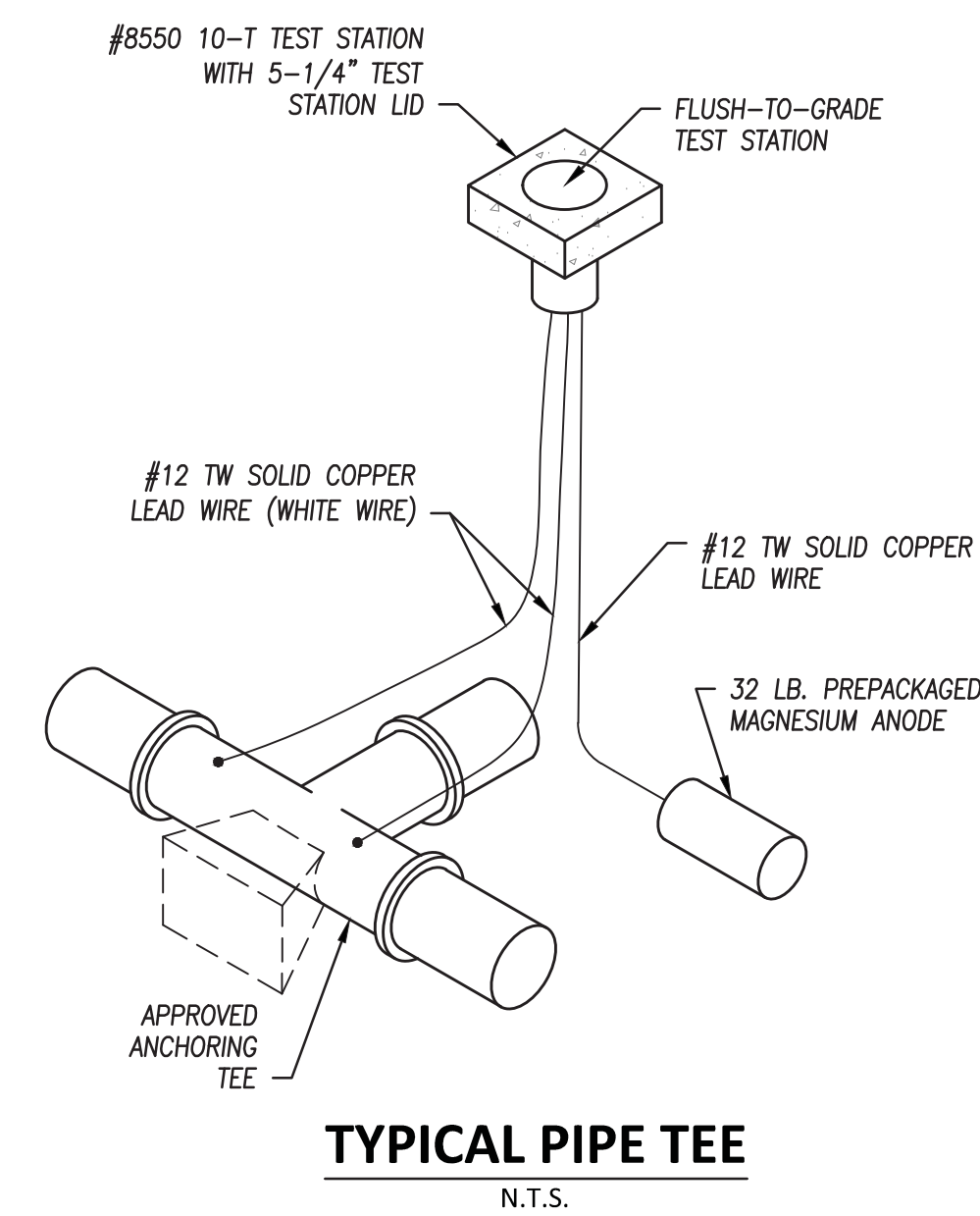
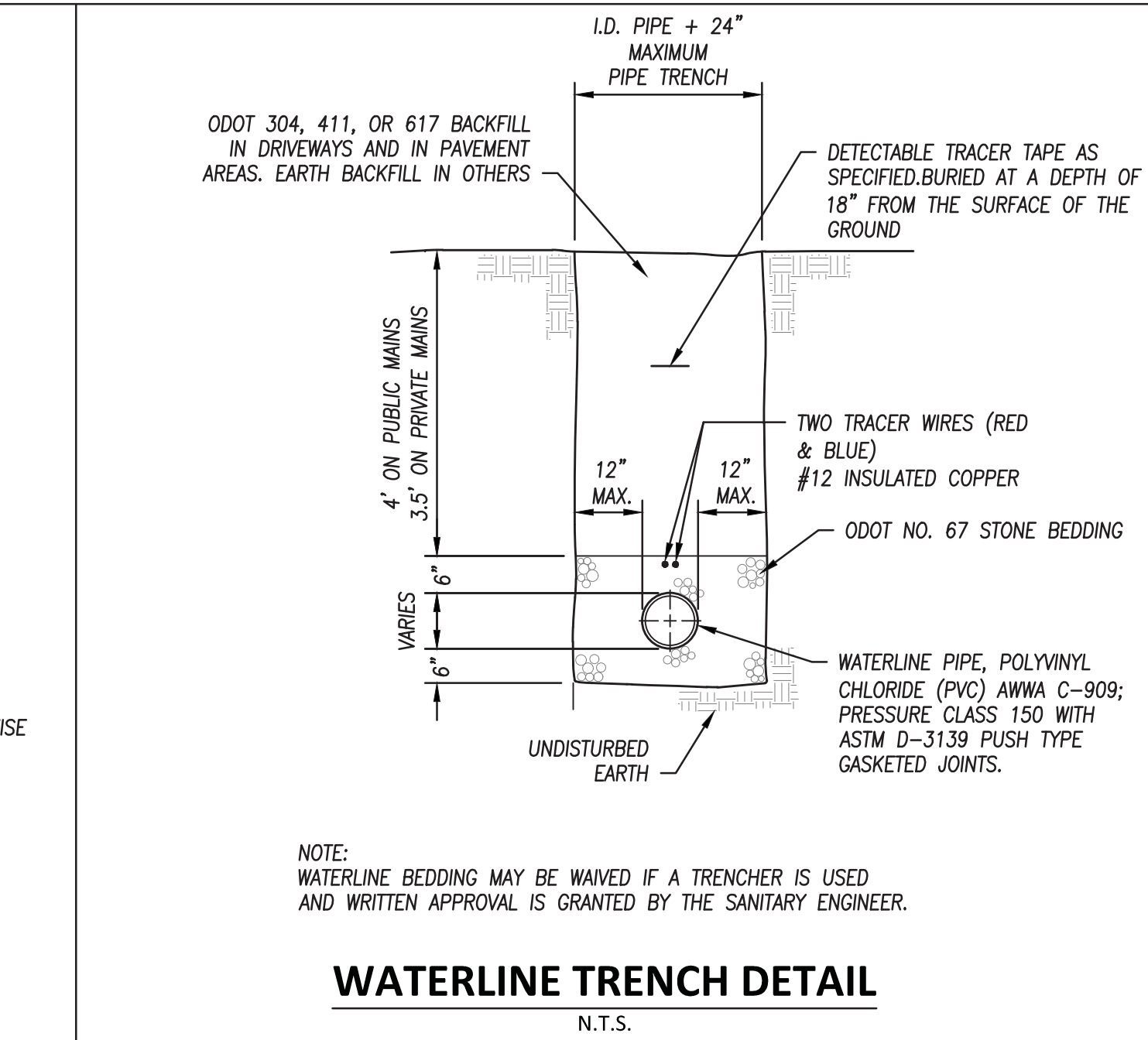
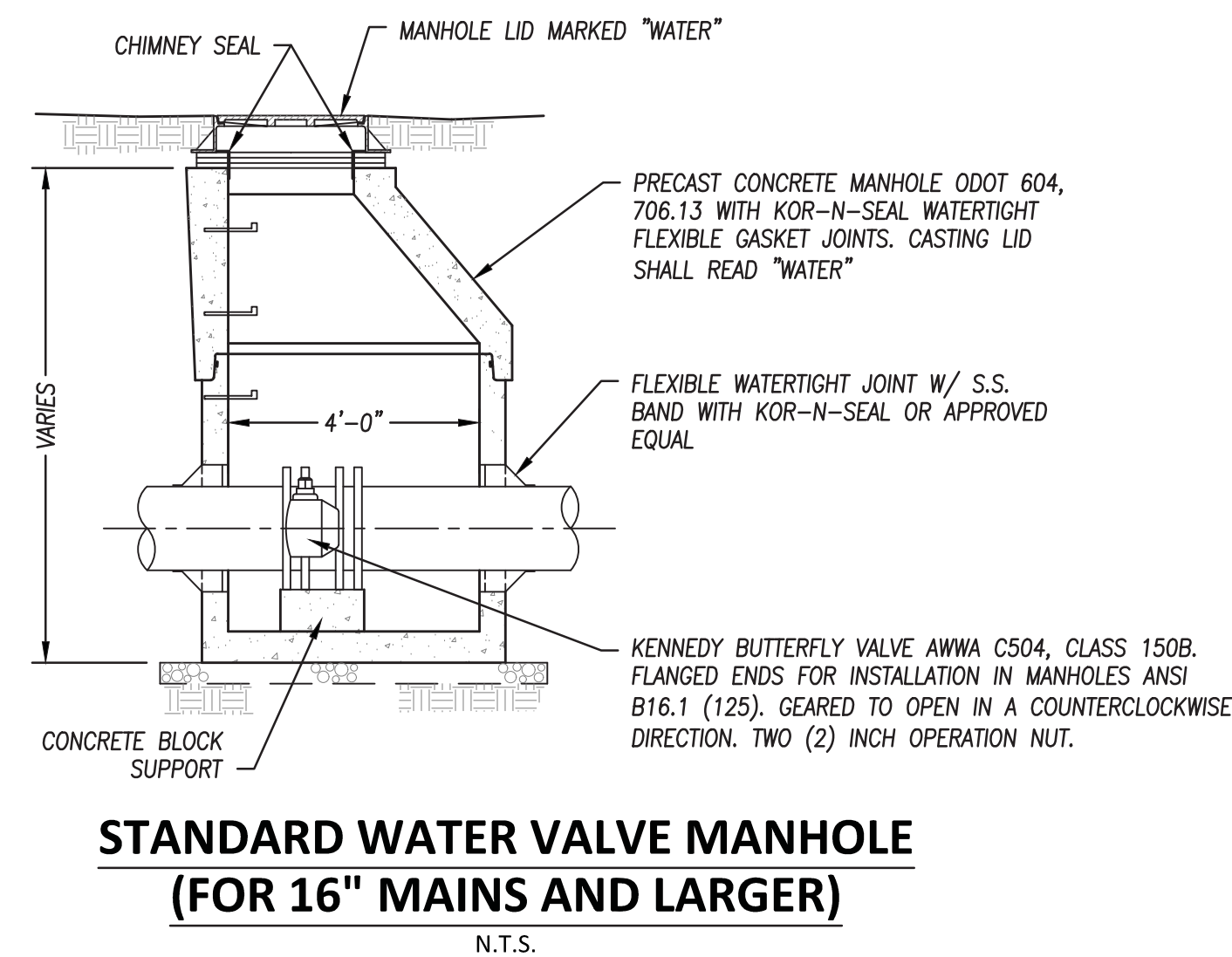
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STATE OF OHIO  
 ROBERT W. BAILEY  
 E-62836  
 PROFESSIONAL ENGINEER  
 CIVIL  
 Robert W. Bailey  
 April 03, 2019

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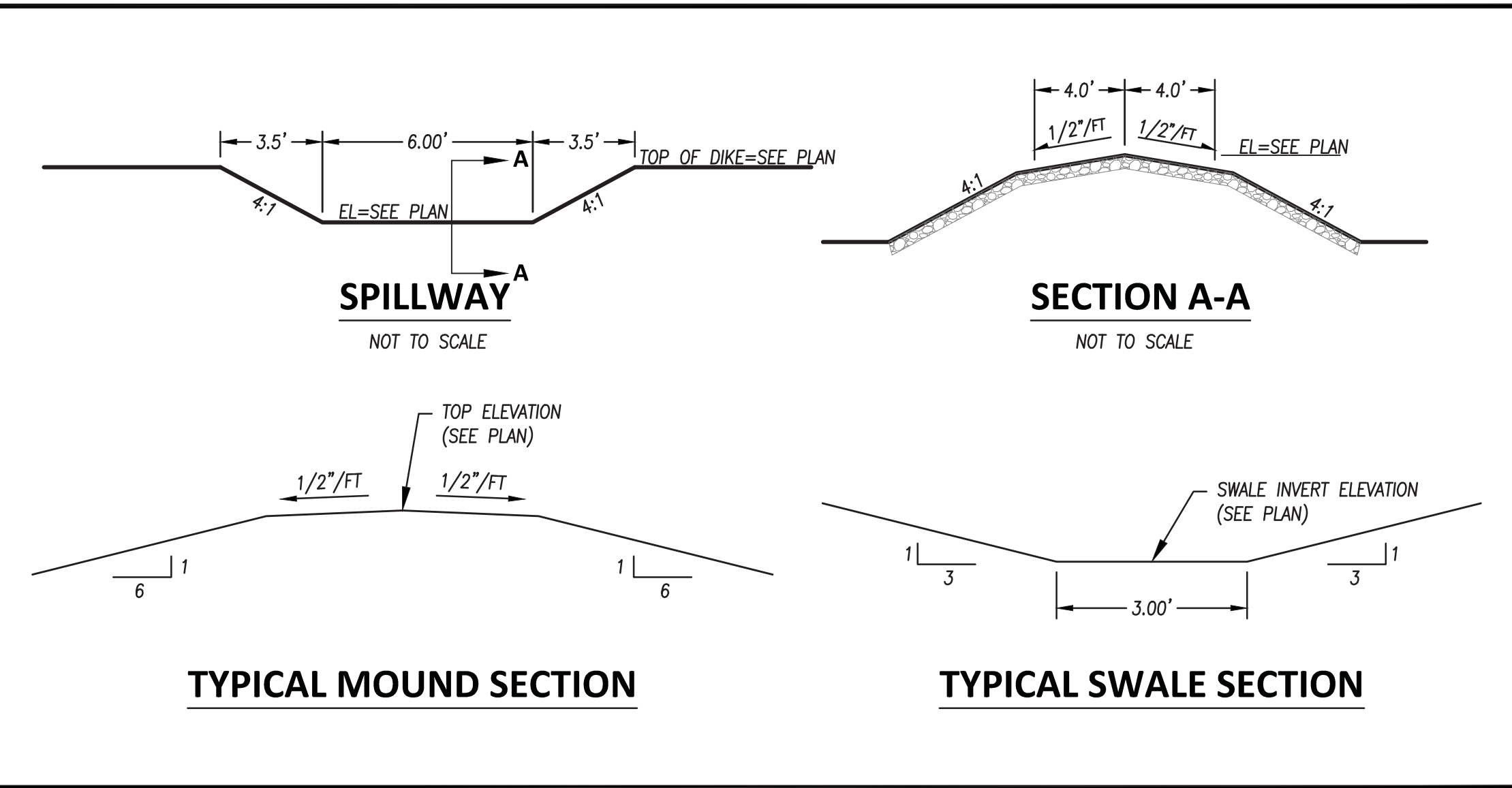
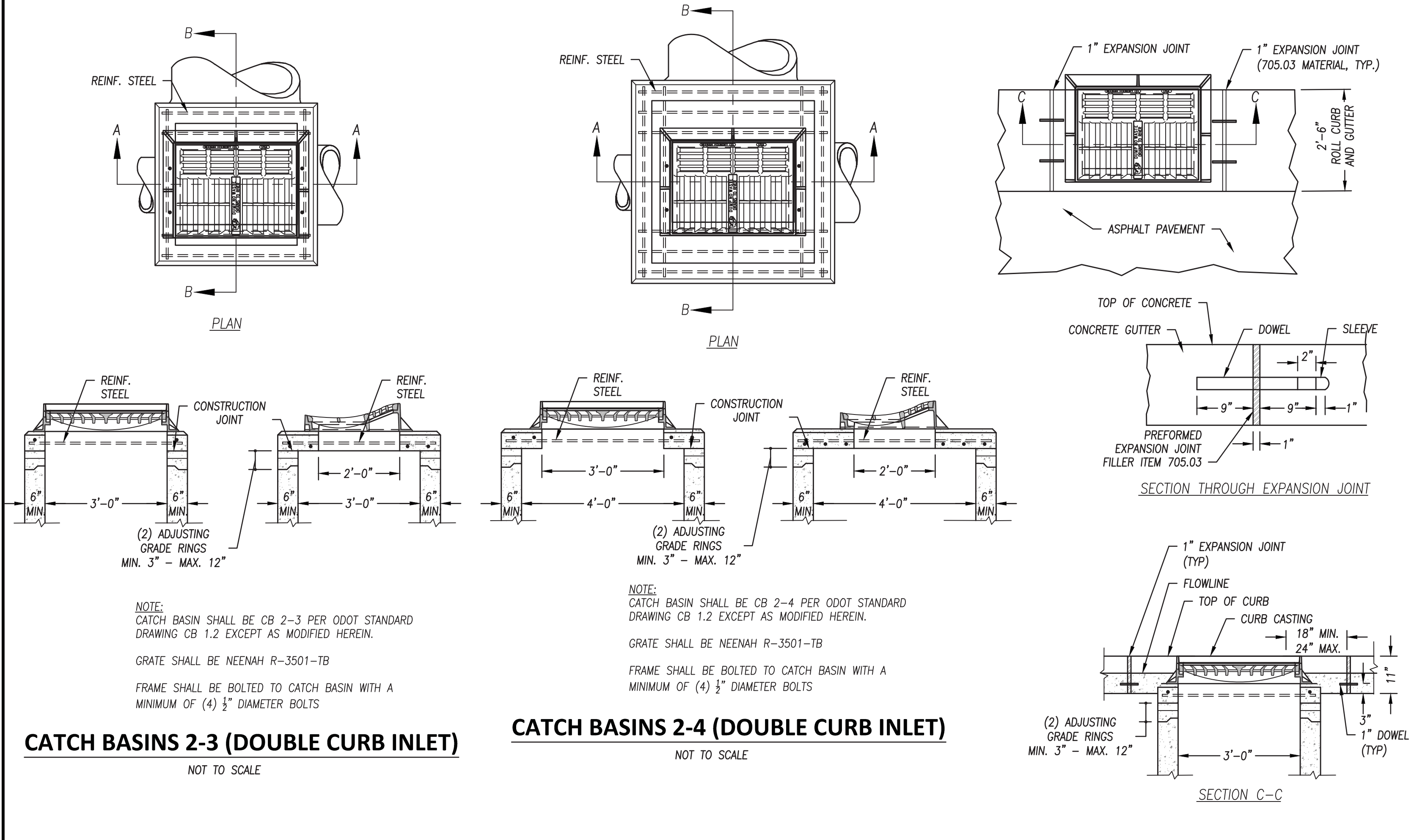
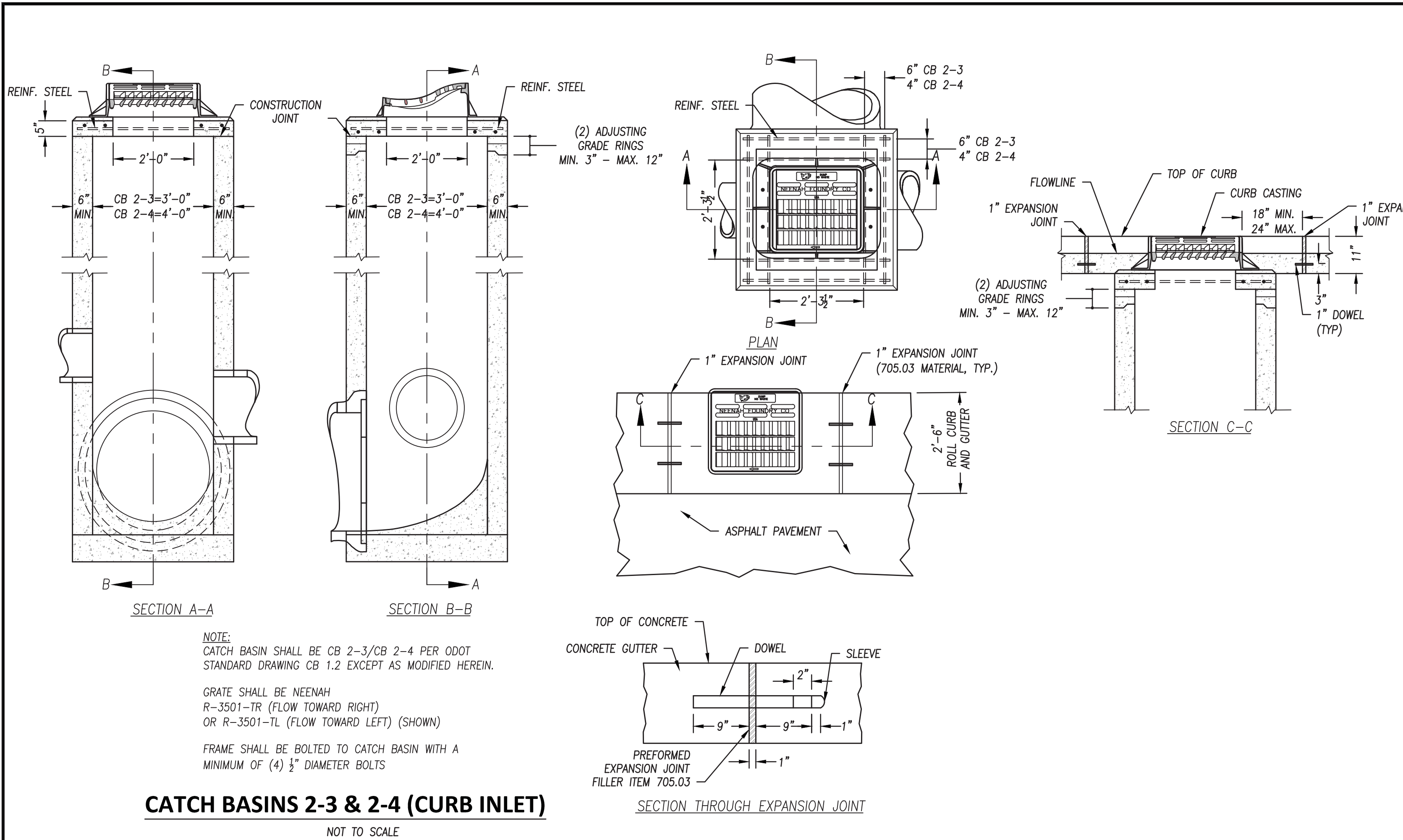
**DGL**  
 DGL CONSULTING ENGINEERS, LLC  
 3455 BRIARFIELD BLVD, SUITE E  
 MAJUMEE, OH 43037  
 PHONE: 419.535.1015  
 www.dgl-td.com

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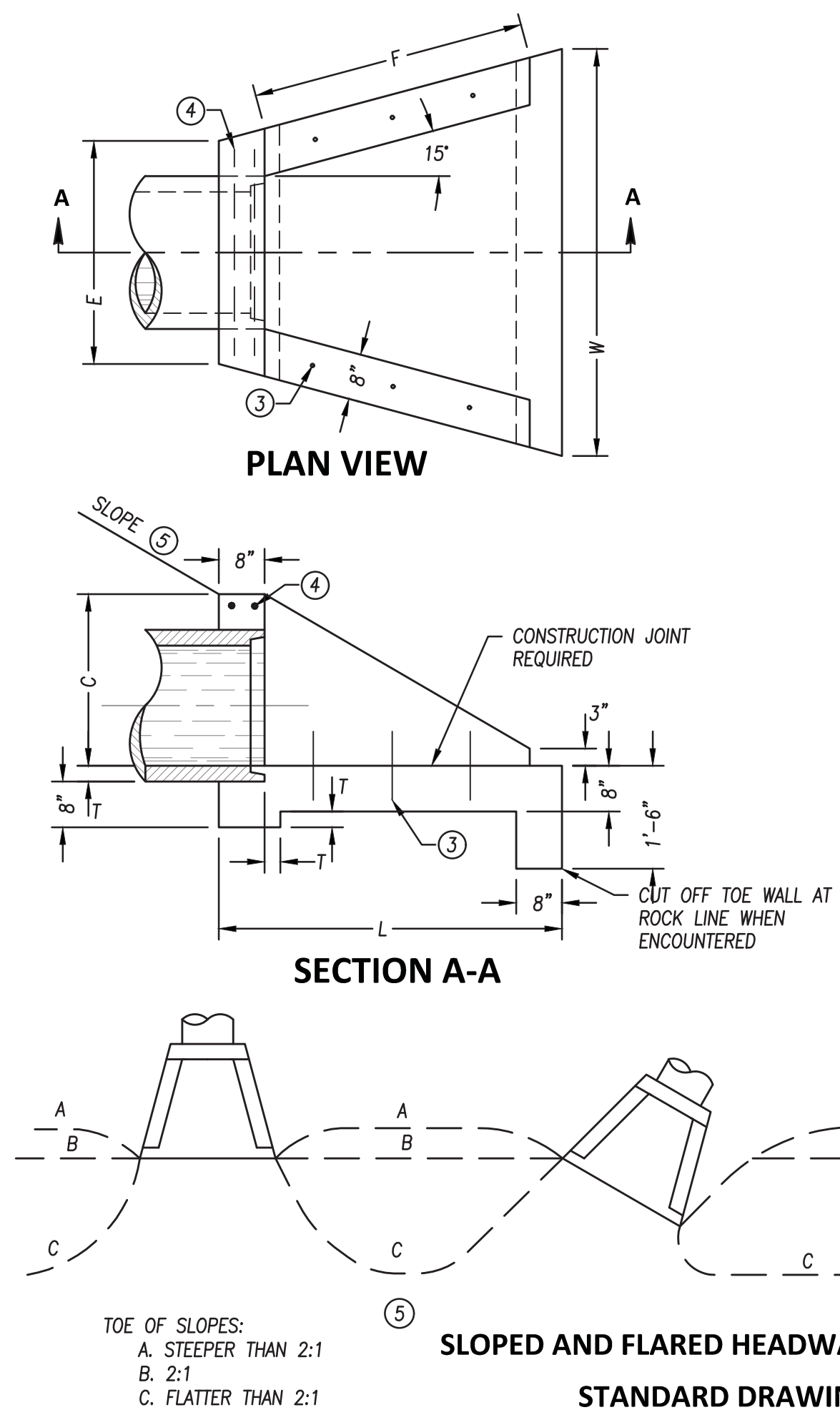
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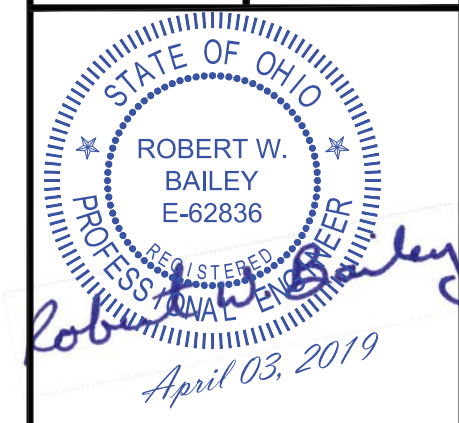




PIPE DIA. OR EQUIV. DIA.	SHAPE ⑨	DIMENSIONS						CLASS A CONC. C.Y.	REINF. STEEL LBS.
		C	E	F	L	W	T		
12"	○	1'-9"	2'-6"	2'-3"	3'-6"	4'-0"	2"	0.58	7
	○	2'-0"	2'-9"	2'-9"	4'-0"	4'-9"	2 1/4"	0.75	
15"	○	1'-9"	3'-0"	2'-6"	3'-6"	4'-9"	2 1/2"	0.68	8
	○	2'-3"	3'-0"	3'-6"	4'-6"	5'-3"	2 3/4"	0.93	
18"	○	2'-0"	3'-6"	3'-0"	4'-0"	5'-6"	2 3/4"	0.89	9
	○	2'-6"	3'-3"	4'-0"	5'-0"	6'-0"	3"	1.14	
21"	○	2'-3"	3'-0"	3'-6"	4'-6"	6'-0"	3"	1.07	8
	○	2'-9"	3'-6"	4'-6"	5'-6"	6'-6"	3 1/4"	1.35	
24"	○	2'-6"	4'-0"	4'-0"	5'-0"	6'-9"	3 1/4"	1.30	9
	○	3'-0"	3'-9"	5'-0"	6'-0"	7'-0"	3 1/2"	1.57	
27"	○	2'-9"	4'-6"	4'-3"	5'-3"	7'-3"	3 1/2"	1.51	10
	○								



- NOTES**
- DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY INSIGNIFICANTLY FOR CORRUGATED METAL PIPE.
  - REINFORCING STEEL : MINIMUM GRADE 40, BARS EVENLY SPACED.
  - 6 - NO. 4 x 1'-0" DOWEL BARS.
  - 2 - NO. 4 x (E DIMENSION MINUS 4").
  - SLOPES SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND/OR NORMAL SLOPE VARIES FROM 2:1.
  - VOLUME DISPLACED BY PIPE COMPUTED USING INSIDE DIAMETER OF PIPE.
  - WING ANGLES AND/OR DIMENSIONS MAY BE ALTERED DURING CONSTRUCTION TO ACCOMMODATE FLOW OF WATER.
  - APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.
  - HEADWALLS ARE FOR CIRCULAR, ARCH, AND HORIZONTAL ELLIPTICAL 12"-27" EQUIVALENT PIPE SIZES.



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**ADVANCED DRAINAGE SYSTEMS, INC.**  
**SC-310 STORMTECH CHAMBER SPECIFICATIONS**

- CHAMBERS SHALL BE STORMTECH SC-310.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLYETHYLENE) OR ASTM F2418-16a (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE SAFETY FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2922 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

**IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310 SYSTEM**

- STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONESHOOTER LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

**PROPOSED LAYOUT: EAST BED**

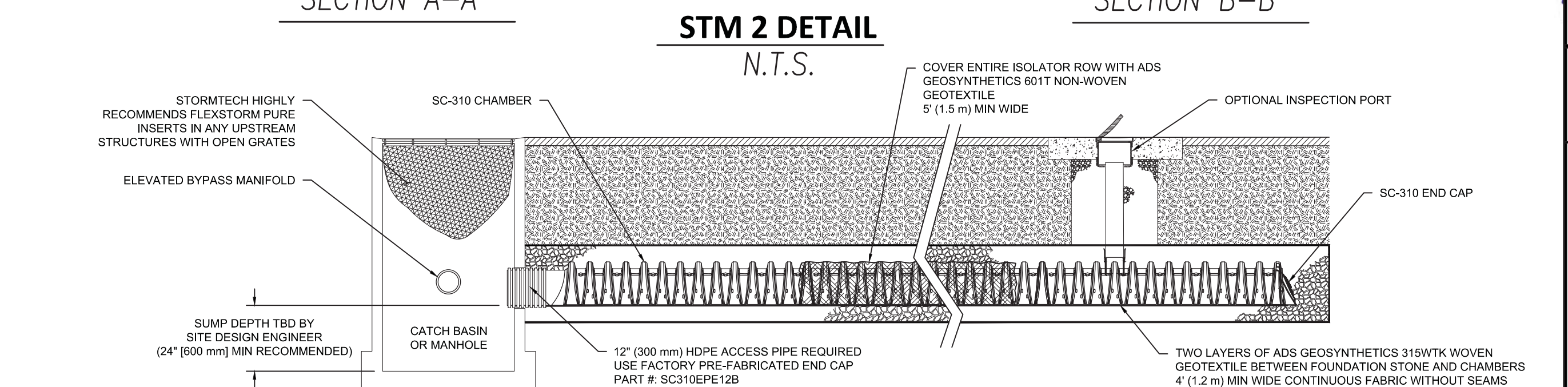
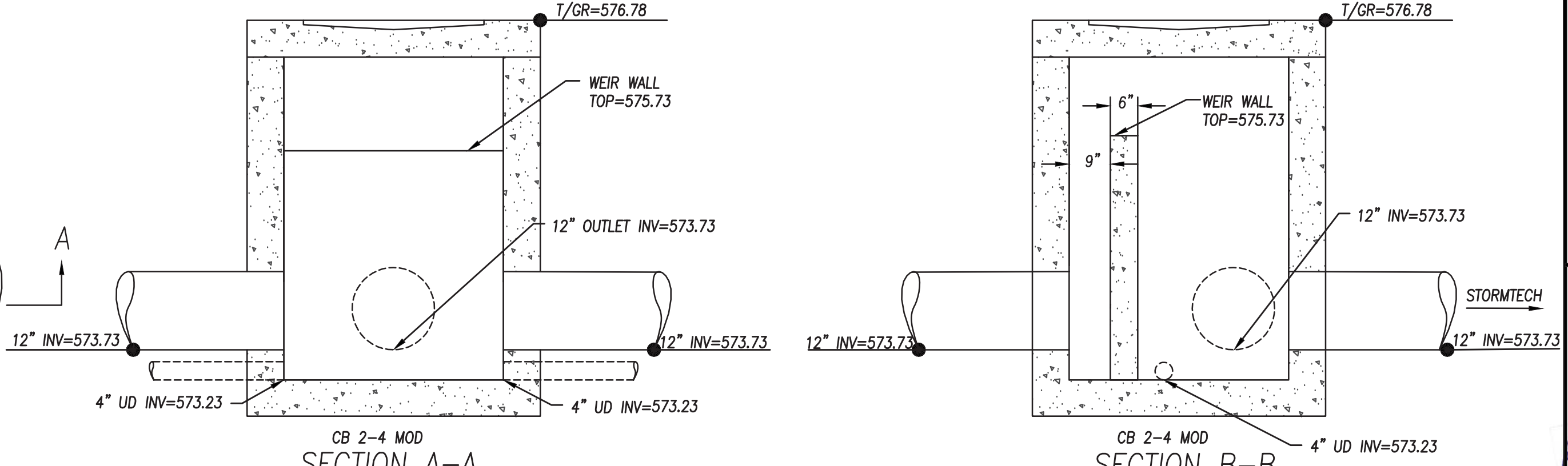
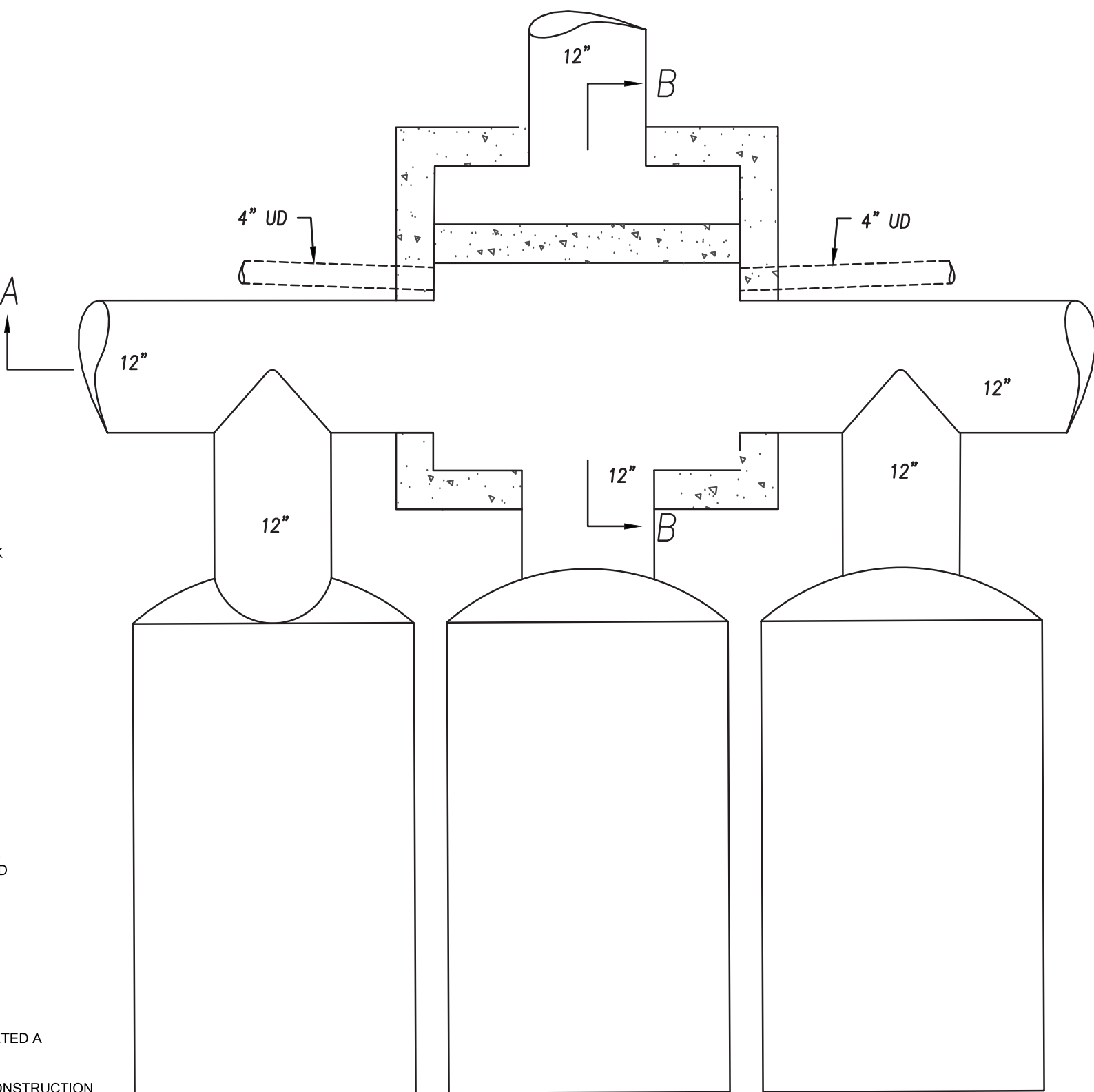
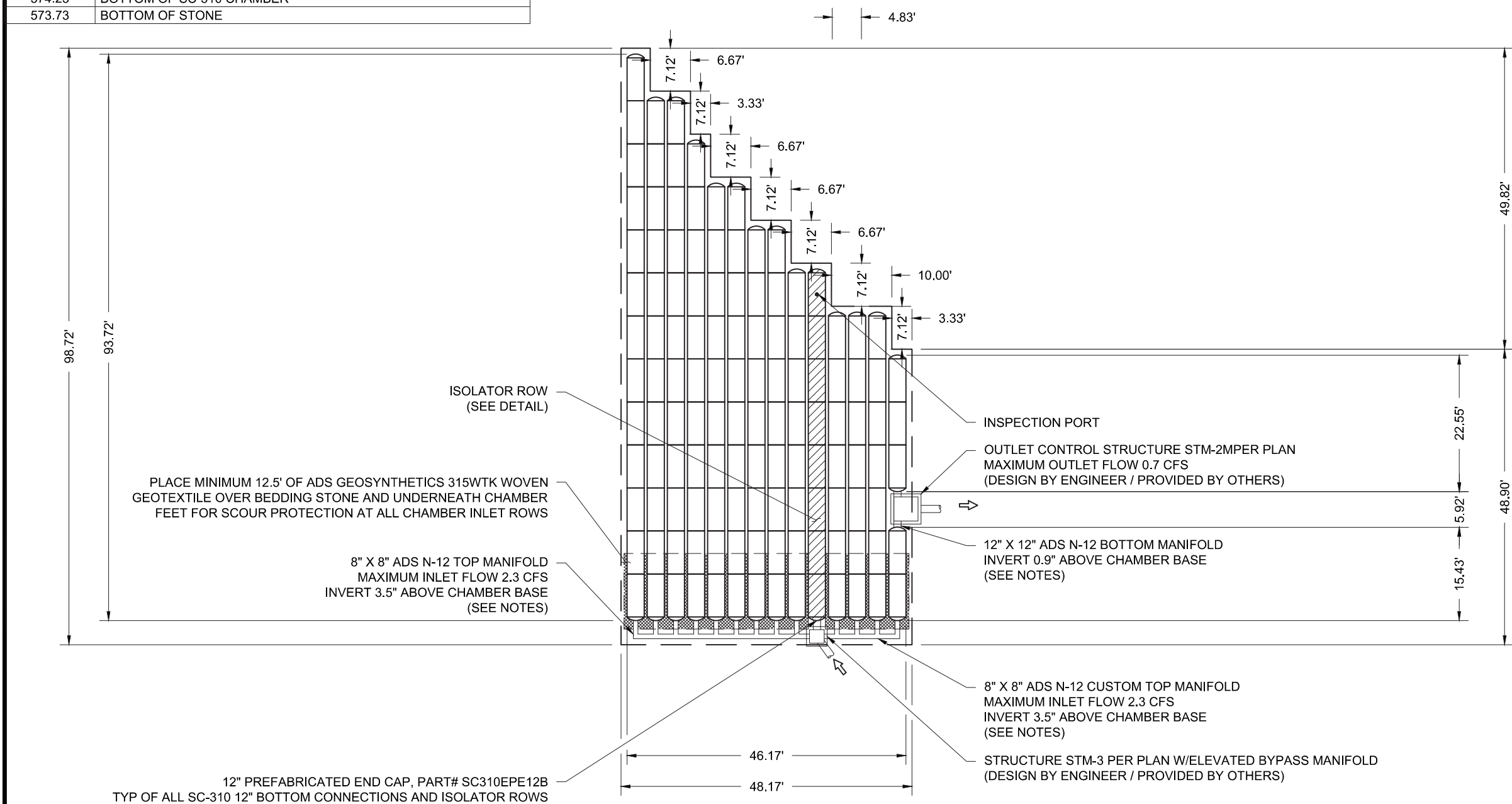
125	STORMTECH SC-310 CHAMBERS
30	STORMTECH SC-310 END CAPS
6	STONE ABOVE (in)
6	STONE BELOW (in)
40	% STONE VOID
4398	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)
3498	SYSTEM AREA (ft <sup>2</sup> )
294	SYSTEM PERIMETER (ft)

**PROPOSED ELEVATIONS: EAST BED**

583.56	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
577.56	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
577.06	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
577.06	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
577.06	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
576.06	TOP OF STONE
575.56	TOP OF SC-310 CHAMBER
574.52	8" TOP MANIFOLD INVERT
574.31	12" ISOLATOR ROW CONNECTION INVERT
574.31	12" BOTTOM MANIFOLD INVERT
574.23	BOTTOM OF SC-310 CHAMBER
573.73	BOTTOM OF STONE

**NOTES**

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.



- INSPECTION & MAINTENANCE**
- STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- INSPECTION PORTS (IF PRESENT)
    - REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
    - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
    - USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
    - LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
    - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2; IF NOT, PROCEED TO STEP 3.
  - ALL ISOLATOR ROWS
    - REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
    - USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
      - MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
      - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
    - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2; IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
  - APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
  - VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

**NOTES**

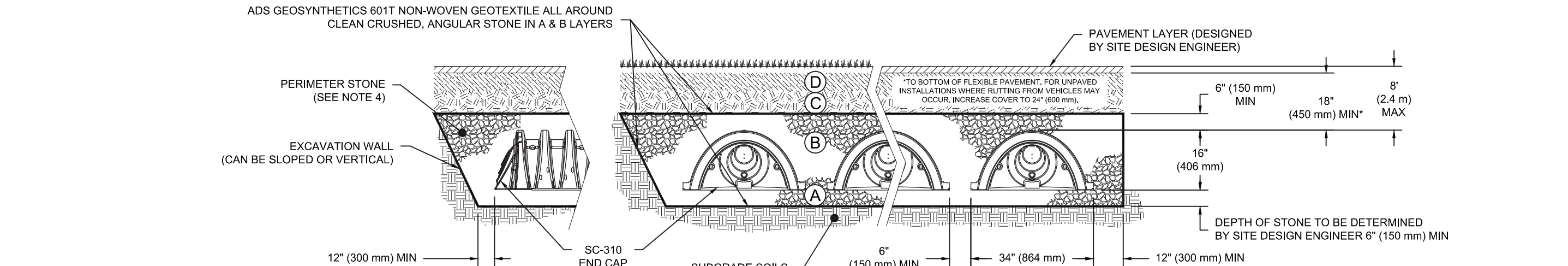
- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
- CONDUCT JETTING AND VACUUMING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

**ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS**

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT	
D	<b>FINAL FILL:</b> FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.	
C	<b>INITIAL FILL:</b> FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. OR MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 <sup>1</sup> A-1, A-2.4, A-3 OR AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 LBS (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 LBS (89 kN).
B	<b>EMBEDMENT STONE:</b> FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.	
A	<b>FOUNDATION STONE:</b> FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>	

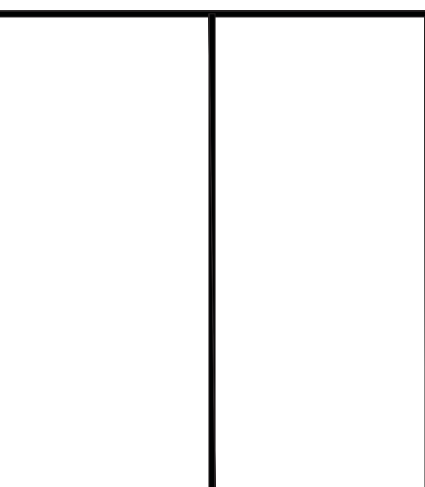
**PLEASE NOTE:**

- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



**NOTES:**

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLYETHYLENE) OR ASTM F2418-16a (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.



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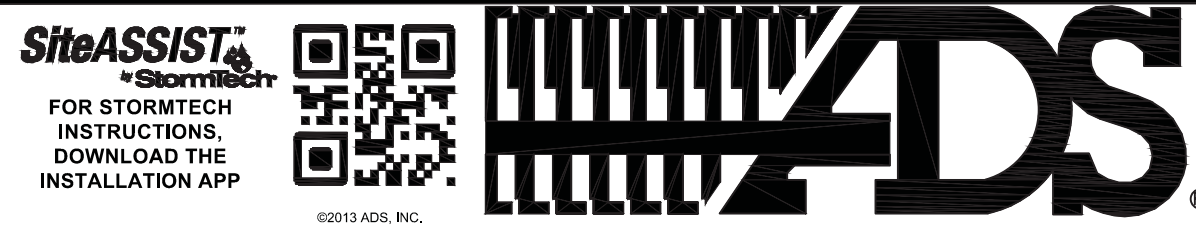
**STORM DETAILS**

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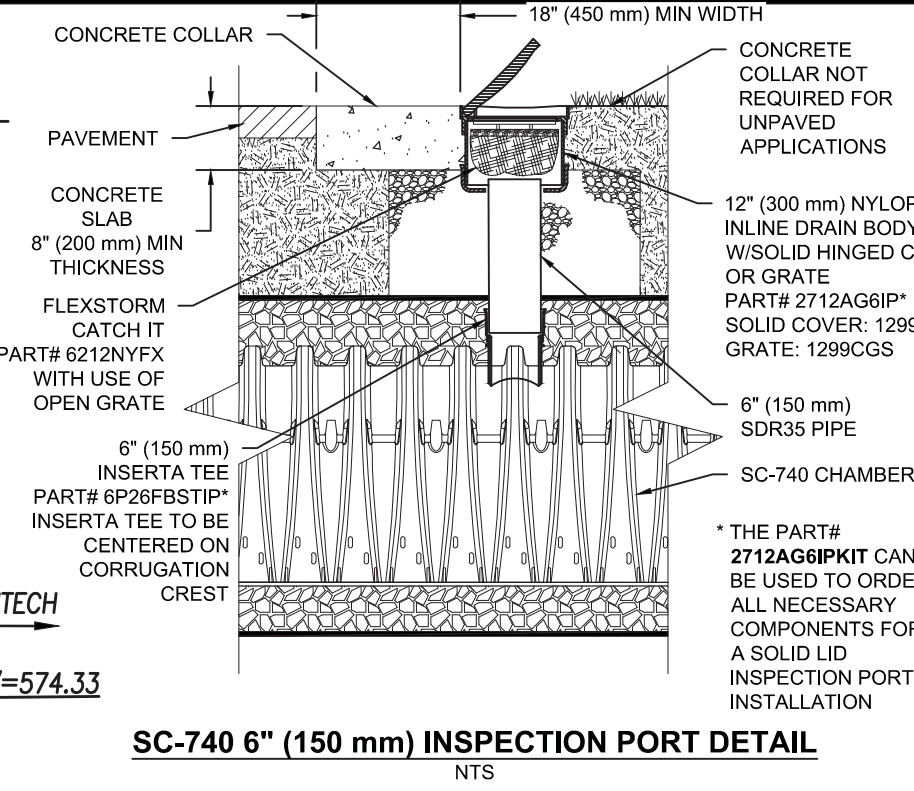
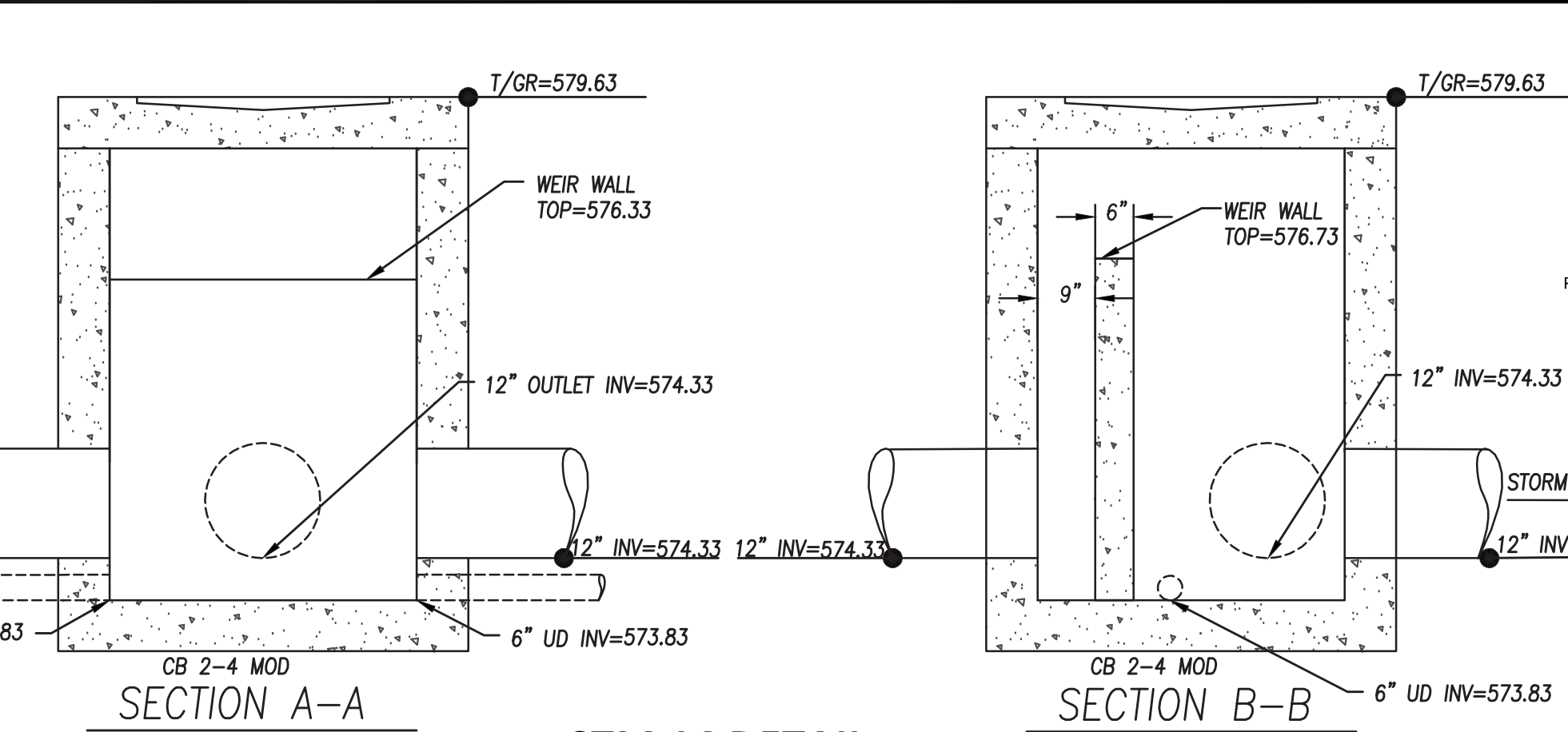
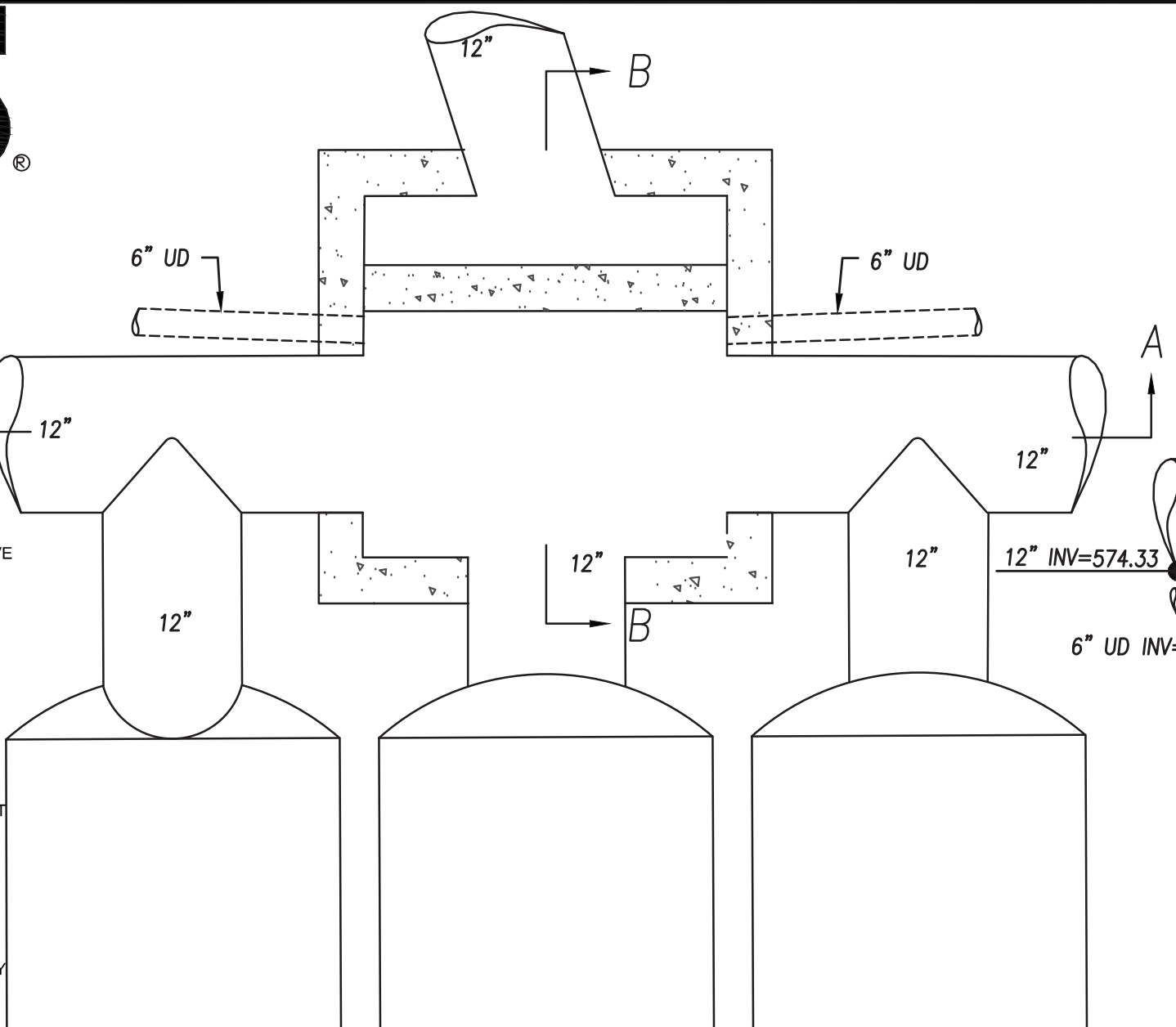
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**ADVANCED DRAINAGE SYSTEMS, INC.**  
**SC-740 STORMTECH CHAMBER SPECIFICATIONS**

- CHAMBERS SHALL BE STORMTECH SC-740.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACES WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.98 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.



**STM 14 DETAIL**  
N.T.S.

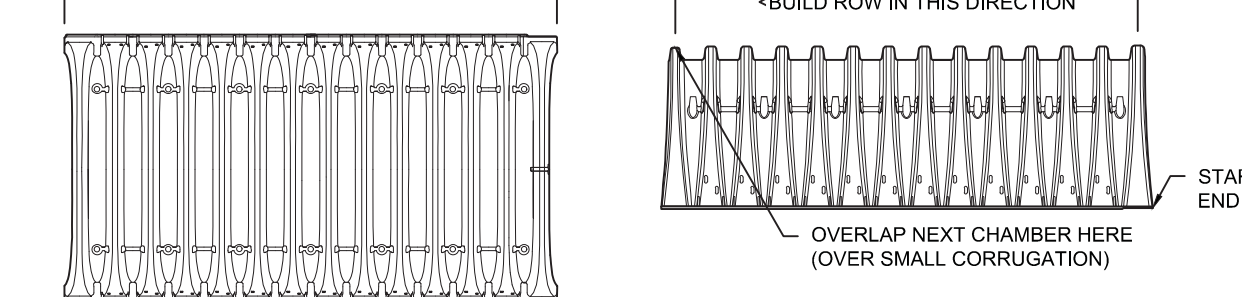
**SC-740 TECHNICAL SPECIFICATION**  
N.T.S.

ALL STUBS, EXCEPT FOR THE SC740EP24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

\* FOR THE SC740EP24B THE 24\"/>

NOTE: ALL DIMENSIONS ARE NOMINAL.

PART #	STUB	A	B	C
SC740EP06T / SC740EP06TPC	6\"/>			



NOMINAL CHAMBER SPECIFICATIONS  
 SIZE (W X H X INSTALLED LENGTH)  
 CHAMBER STORAGE  
 MINIMUM INSTALLED STORAGE\*

\*ASSUMES 6\"/>

PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"  
 PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"  
 PRE-CORED END CAPS END WITH "PC"

**IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM**

- STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONESHOT LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 6\"/>
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2\"/>
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

**NOTES FOR CONSTRUCTION EQUIPMENT**

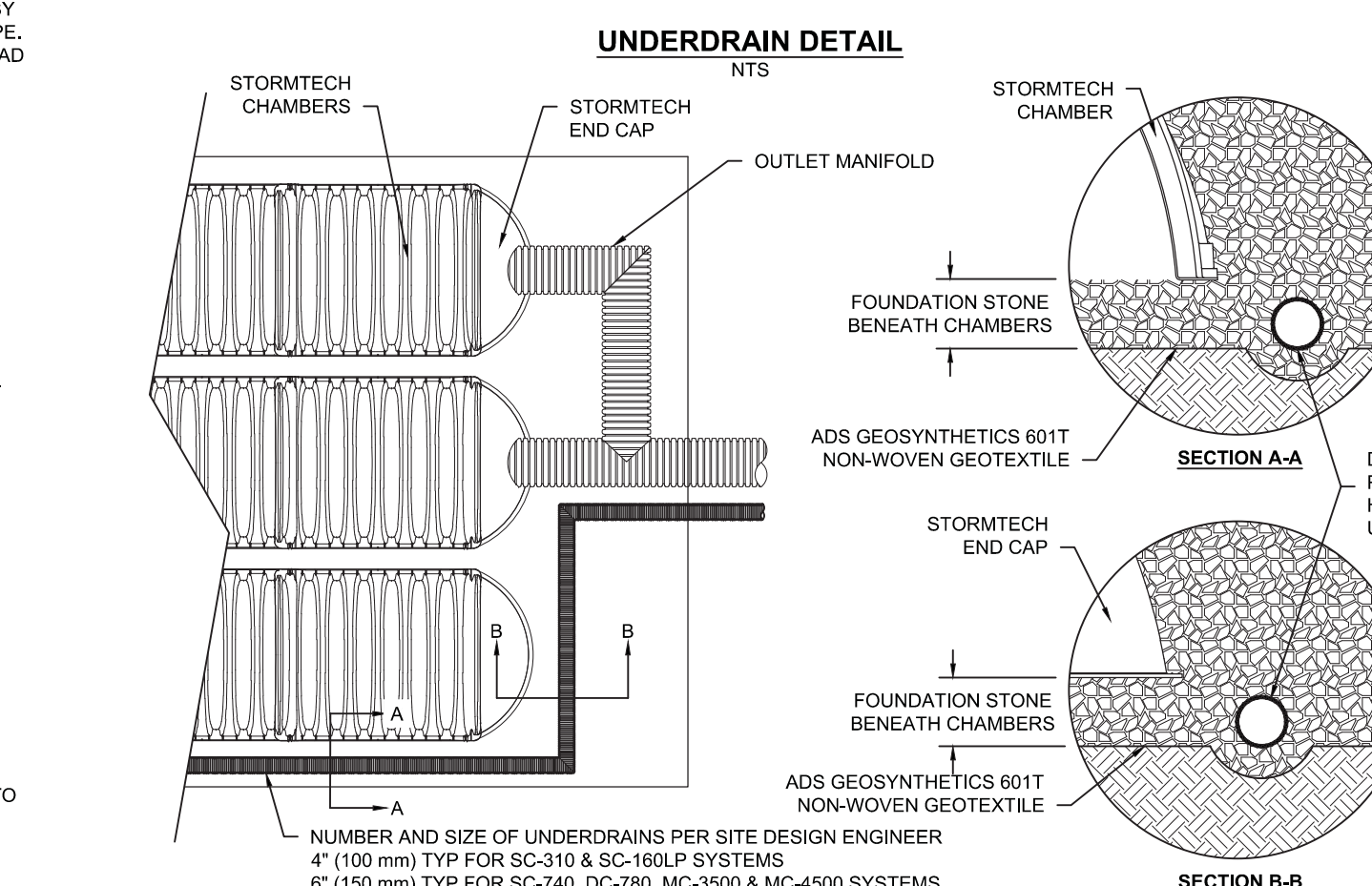
- STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
  - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
  - NO RUBBER TIRE LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
  - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- FULL 36\"/>

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

**NOTES**

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND ADJUST THE PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.

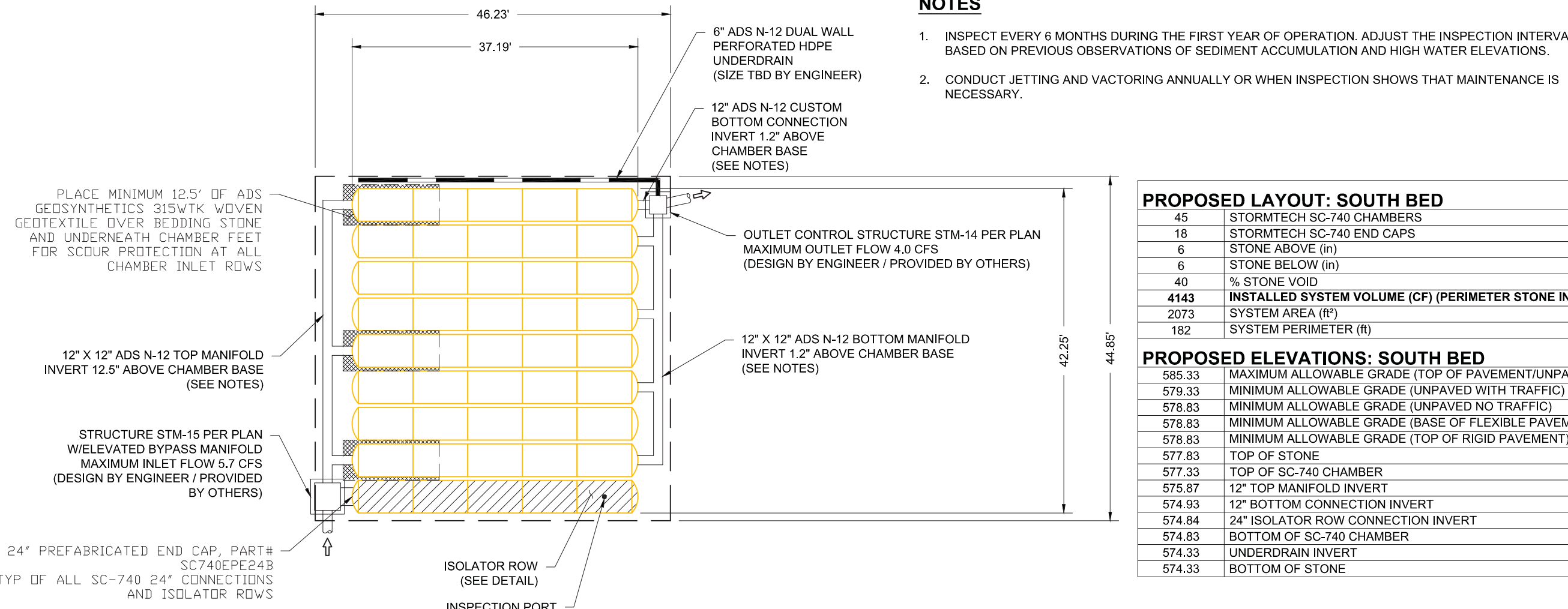


**INSPECTION & MAINTENANCE**

- STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- INSPECTION PORTS (IF PRESENT)
    - REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
    - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
    - USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
    - LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - IF SEDIMENT IS AT, OR ABOVE, 3\"/>
- STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45\"/>
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

**NOTES**

- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
- CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



**PROPOSED LAYOUT: SOUTH BED**

45	STORMTECH SC-740 CHAMBERS
18	STORMTECH SC-740 END CAPS
6	STONE ABOVE (in)
6	STONE BELOW (in)
40	% STONE VOID
4143	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)
2073	SYSTEM AREA (ft²)
182	SYSTEM PERIMETER (ft)

**PROPOSED ELEVATIONS: SOUTH BED**

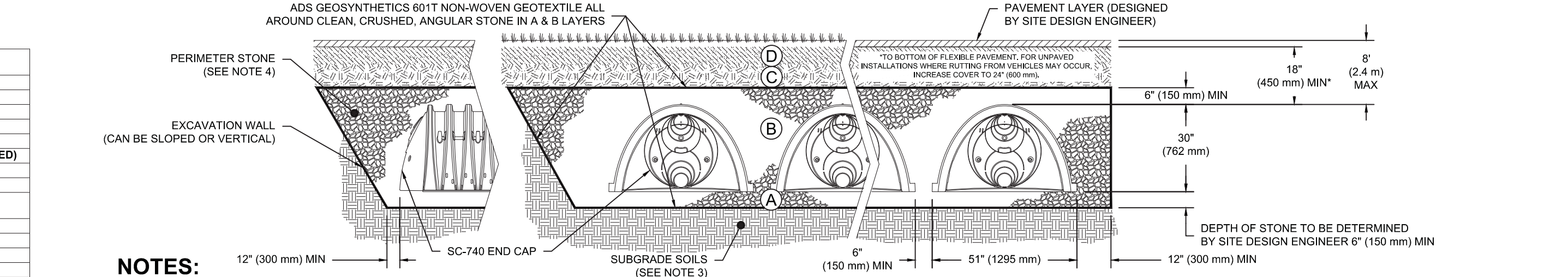
585.33	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
579.33	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
578.83	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
578.83	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
578.83	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
577.83	TOP OF STONE
577.33	TOP OF SC-740 CHAMBER
575.87	12\"/>

**ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS**

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	<b>FINAL FILL:</b> FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	<b>INITIAL FILL:</b> FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18\"/>	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. OR AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12\"/>
B	<b>EMBEDMENT STONE:</b> FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	<b>FOUNDATION STONE:</b> FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>

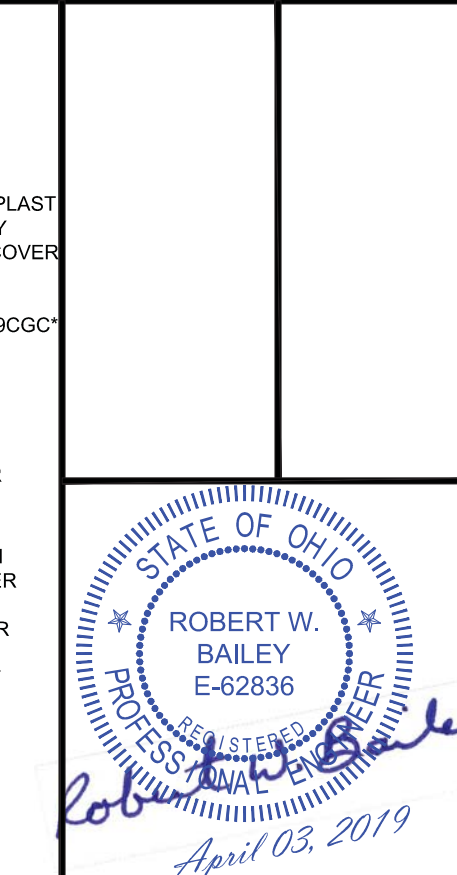
PLEASE NOTE:  
 1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR, FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".  
 2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6\"/>

3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.  
 4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



**NOTES:**

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.



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1	ISSUED FOR PERMITS	04/01/19



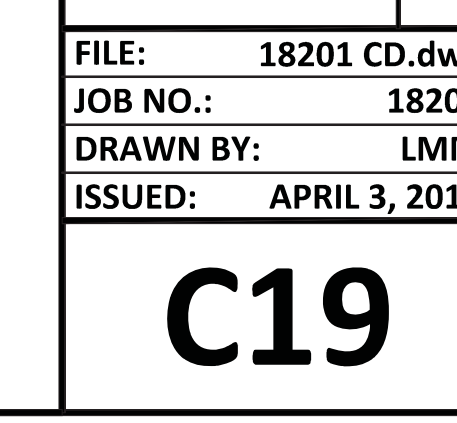
**SAFE HARBOR MARINA SUB.**

**SAFE HARBOR MARINA LTD.**

6721 EAST HARBOR ROAD  
 LAKESIDE MARBLEHEAD, OHIO, 43440  
 OTTAWA COUNTY  
 LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP

**STORM DETAILS**

FILE:	18201 CD.dwg
JOB NO.:	18201
DRAWN BY:	LMM
ISSUED:	APRIL 3, 2019



PLOTTED: Apr 03, 2019 - 8:44pm  
 DRAWING: M:\18201 (Safe Harbor -Snag Harbor)\CIVIL\DWG\18201 CD.dwg: C19 STM DET SAFE HARBOR



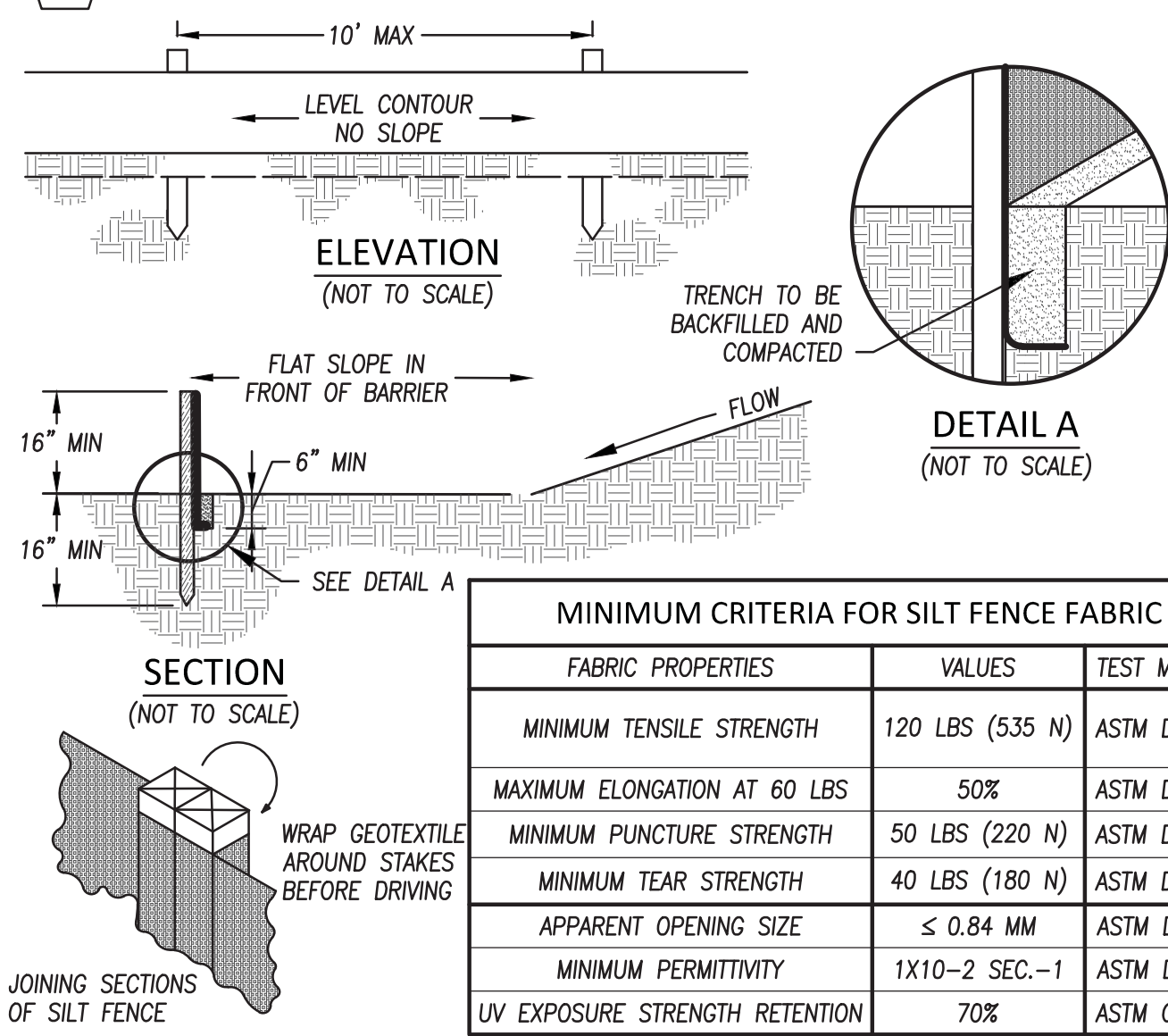
## 2 SEEDING AND MULCHING

SPREAD 4 TO 6 INCHES OF TOPSOIL.  
 FERTILIZE ACCORDING TO SOIL TEST (OR APPLY 10 LB./1000 SQ. FT. OF 20-10-10 OR 10-10-10 FERTILIZER.)  
 SEED WITH AN APPROPRIATE MIX FOR THE SITE (SEE TABLE.) RAKE LIGHTLY TO COVER SEED WITH 1/4" OF SOIL. ROLL LIGHTLY.  
 MULCH WITH STRAW (70-90 LB. OR ONE BALE PER 1000 SQ. FT.)  
 ANCHOR MULCH BY PUNCHING 2 INCHES INTO THE SOIL WITH A DULL, WEIGHTED DISK OR BY USING NETTING OR OTHER MEASURES ON STEEP SLOPES, OR WINDY AREAS. WATER GENTLY EVERY DAY OR TWO TO KEEP SOIL MOIST. LESS WATERING IS NEEDED ONCE GRASS IS 2 INCHES TALL.

TEMPORARY SEEDING SPECIES SELECTION			
SEEDING DATES	SPECIES	LB/1,000 FT <sup>2</sup>	LB/ACRE
MARCH 1 TO AUGUST 15	OATS	3	128 (4 BUSHEL)
	TALL FESCUE	1	40 LB.
	ANNUAL RYEGRASS	1	40 LB.
	PERENNIAL RYEGRASS	1	40 LB.
	TALL FESCUE	1	40 LB.
	ANNUAL RYEGRASS	1	40 LB.
AUGUST 16 TO NOVEMBER 1	ANNUAL RYEGRASS	1.25	55
	PERENNIAL RYEGRASS	3.25	142
	CREeping RED FESCUE	0.4	17
	KENTUCKY BLUEGRASS	0.4	17
	RYE	3	112 (2 BUSHEL)
	TALL FESCUE	1	40 LB.
NOVEMBER 1 TO FEBRUARY 29	ANNUAL RYEGRASS	1	40 LB.
	PERENNIAL RYEGRASS	1	40 LB.
	TALL FESCUE	1	40 LB.
	ANNUAL RYEGRASS	1	40 LB.
	ANNUAL RYEGRASS	1.25	40
	PERENNIAL RYEGRASS	3.25	40
CREeping RED FESCUE	0.4	40	
KENTUCKY BLUEGRASS	0.4	40	

NOTE: OTHER APPROVED SEED SPECIES MAY BE SUBSTITUTED. PERMANENT SEEDING TO BE AS PER LANDSCAPING PLANS.

## 4 SILT FENCE



MINIMUM CRITERIA FOR SILT FENCE FABRIC		
FABRIC PROPERTIES	VALUES	TEST METHOD
MINIMUM TENSILE STRENGTH	120 LBS (535 N)	ASTM D 4632
MAXIMUM ELONGATION AT 60 LBS	50%	ASTM D 4632
MINIMUM PUNCTURE STRENGTH	50 LBS (220 N)	ASTM D 4833
MINIMUM TEAR STRENGTH	40 LBS (180 N)	ASTM D 4533
APPARENT OPENING SIZE	≤ 0.84 MM	ASTM D 4751
MINIMUM PERMITTIVITY	1X10 <sup>-2</sup> SEC.-1	ASTM D 4491
UV EXPOSURE STRENGTH RETENTION	70%	ASTM G 4355

- MATERIALS:**
- FENCE POST - THE LENGTH SHALL BE A MINIMUM OF 32 INCHES. WOOD POSTS WILL BE 2-BY-2-IN. NOMINAL DIMENSIONED HARDWOOD OF SOUND QUALITY. THEY SHALL BE FREE OF KNOTS, SPLITS, AND OTHER VISIBLE IMPERFECTIONS THAT WILL WEAKEN THE POSTS. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FT. POSTS SHALL BE DRIVEN A MINIMUM 16 INCHES INTO THE GROUND, WHERE POSSIBLE. IF NOT POSSIBLE, THE POSTS SHALL BE ADEQUATELY SECURED TO PREVENT OVERTURNING OF THE FENCE DUE TO SEDIMENT/WATER LOADING.
  - SILT FENCE FABRIC - SEE CHART.
  - SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
  - ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS THAT MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
  - ENDS OF THE SILT FENCES SHALL BE BROUGHT UPSLOPE SLIGHTLY SO THAT WATER PONDED BY THE SILT FENCE WILL BE PREVENTED FROM FLOWING AROUND THE ENDS.
  - SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
  - WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FEET (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE REESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.
  - THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 16 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
  - THE SILT FENCE SHALL BE PLACED IN AN EXCAVATED OR SLICED TRENCH CUT A MINIMUM OF 6 INCHES DEEP. THE TRENCH SHALL BE MADE WITH A TRENCHER, CABLE LAYING MACHINE, SLICING MACHINE, OR OTHER SUITABLE DEVICE THAT WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
  - THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE. A MINIMUM OF 8 INCHES OF GEOTEXTILE MUST BE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6-INCH DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED ON BOTH SIDES OF THE FABRIC.
  - SEAMS BETWEEN SECTIONS OF SILT FENCE SHALL BE SPliced TOGETHER ONLY AT A SUPPORT POST WITH A MINIMUM 6-IN. OVERLAP PRIOR TO DRIVING INTO THE GROUND, (SEE DETAILS).

### MAINTENANCE:

- SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVER-TOPS THE SILT FENCE, FLOWS UNDER THE FABRIC OR AROUND THE FENCE ENDS, OR IN ANY OTHER WAY ALLOWS A CONCENTRATED FLOW DISCHARGE, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE:
  - 1.1. THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED
  - 1.2. ACCUMULATED SEDIMENT SHALL BE REMOVED
  - 1.3. OTHER PRACTICES SHALL BE INSTALLED
- SEDIMENT DEPOSITS SHALL BE ROUTINELY REMOVED WHEN THE DEPOSIT REACHES APPROXIMATELY ONE-HALF OF THE HEIGHT OF THE SILT FENCE.
- SILT FENCES SHALL BE INSPECTED AFTER EACH RAINFALL AND AT LEAST DAILY DURING A PROLONGED RAINFALL. THE LOCATION OF EXISTING SILT FENCE SHALL BE REVIEWED DAILY TO ENSURE ITS PROPER LOCATION AND EFFECTIVENESS.
- IF DAMAGED, THE SILT FENCE SHALL BE REPAIRED IMMEDIATELY.

### REMOVAL:

- REMOVE SILT FENCE ONCE THE AREA UPSLOPE OF THE SILT FENCE HAS BEEN STABILIZED WITH PERMANENT INSTALLATIONS SUCH AS PAVEMENT, BUILDINGS, LANDSCAPING, OR OTHER VEGETATION.

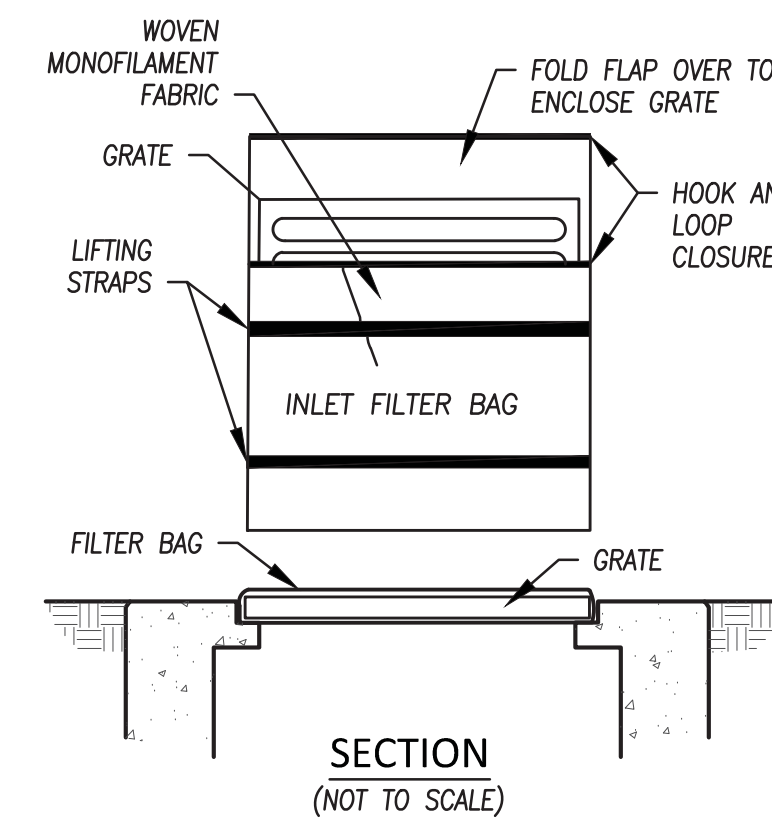
## 7 MANUFACTURED INLET FILTER

**MATERIALS:**

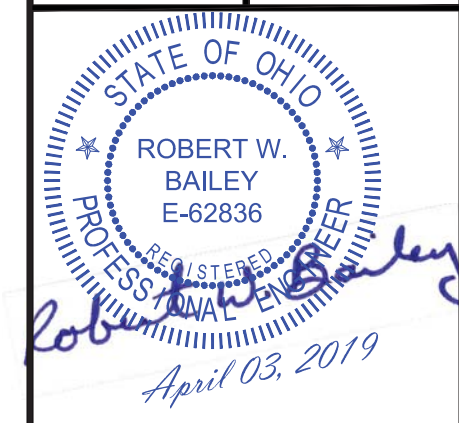
- INLET FILTERS ARE TO BE MANUFACTURED FROM WOVEN MONOFILAMENT FABRIC MATERIALS MEETING THE REQUIREMENTS OF THE TABLE BELOW.

- INSTALLATION:**
- STAND GRATE ON END AND PLACE THE BAG OVER THE GRATE.
  - ROLL THE GRATE OVER SO THAT THE OPEN END IS UP AND PULL UP THE SLACK.
  - TUCK THE FLAP IN AND PRESS THE HOOK AND LOOP STRIPS TOGETHER MAKING SURE THAT THE END OF THE GRATE IS COMPLETELY COVERED BY THE FLAP.
  - CAREFULLY PLACE THE BAG WITH THE GRATE INSERTED INTO THE CATCH BASIN FRAME USING THE LIFTING HANDLES.

- MAINTENANCE:**
- ROUTINELY INSPECT INLET FILTERS AFTER EACH SIGNIFICANT RAIN, MAINTAINING INLET FILTERS IN A FUNCTIONAL CONDITION AT ALL TIMES.
  - REMOVE SILT, SEDIMENT, AND DEBRIS FROM THE SURFACE AND THE VICINITY OF THE UNIT WITH A SQUARE POINT SHOVEL OR STIFF BRISTLE BROOM. REMOVE FINE MATERIAL FROM INSIDE THE FILTER BAG AS NEEDED.
  - KEEP MATERIAL AWAY FROM ENVIRONMENTALLY SENSITIVE AREAS AND WATERWAYS IN A MANNER SATISFACTORY TO THE ENGINEER/INSPECTOR.
  - REPLACE AND DISPOSE OF FILTER BAGS DAMAGED WHICH ARE NO LONGER EFFECTIVE.
  - WHERE THE INLET FILTER DETERIORATES OR FAILS, IT SHALL BE REPAIRED OR REPLACED WITH A MORE EFFECTIVE SOLUTION.
  - REMOVE INLET FILTERS FROM THE SITE WHEN NO LONGER REQUIRED.



INLET FILTER SPECIFICATIONS		
MECHANICAL PROPERTIES	TEST METHOD	MARV
GRAB TENSILE STRENGTH	ASTM D 4632	365 LBS X 200 LBS
GRAB TENSILE ELONGATION	ASTM D 4632	24% X 10%
PUNCTURE STRENGTH	ASTM D 4833	90 LBS
MULLEN BURST STRENGTH	ASTM D 3786	450 PSI
TRAPEZOID TEAR STRENGTH	ASTM D 4533	115 LBS X 75 LBS
UV RESISTANCE	ASTM D 4355	90 %
APPARENT OPENING SIZE	ASTM D 4751	NO 40 (US STD SIEVE)
FLOW RATE	ASTM D 4491	145 GAL./MIN./SQ FT
PERMITTIVITY	ASTM D 4491	2.1/SEC



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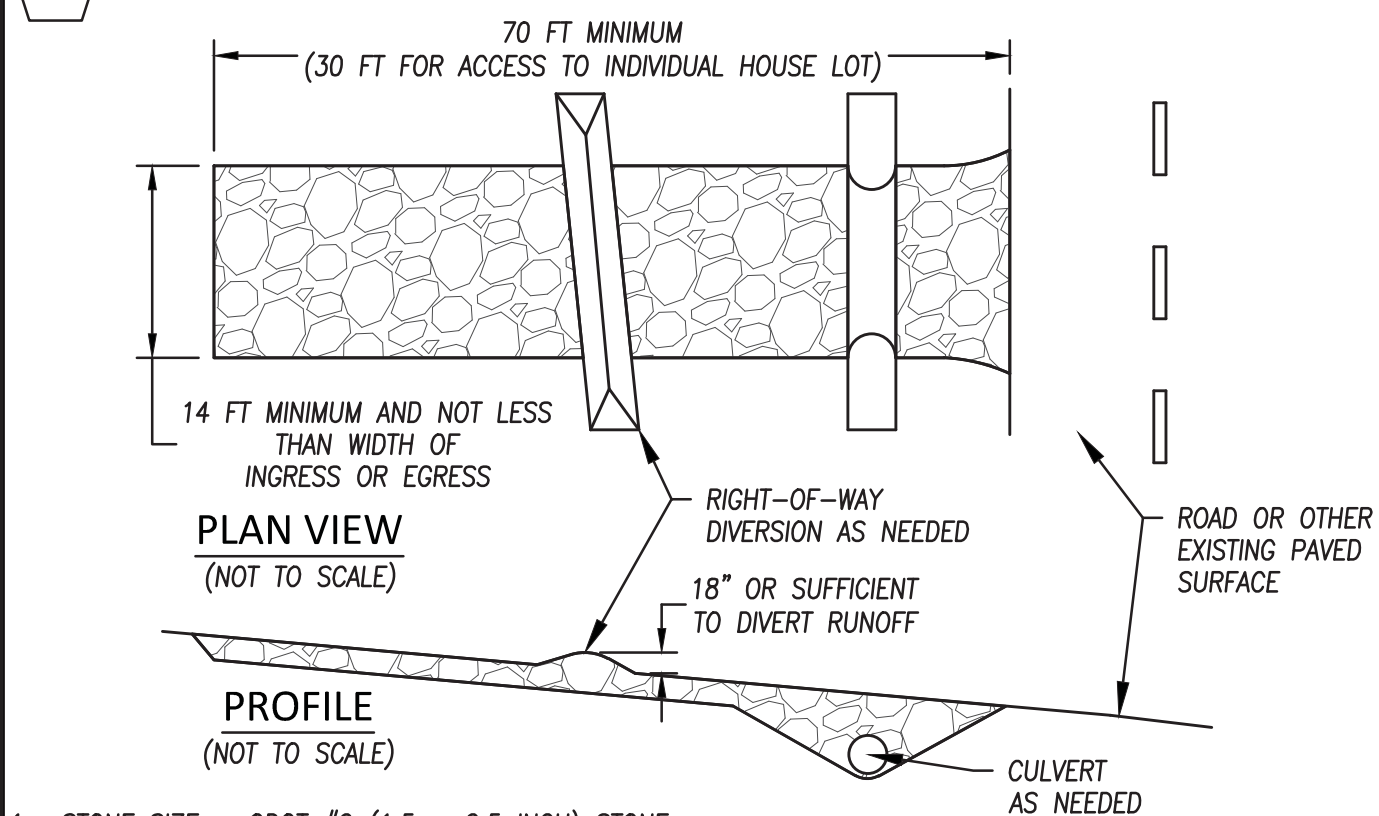


**SAFE HARBOR MARINA SUB.**  
**SAFE HARBOR MARINA LTD.**  
 6721 EAST HARBOR ROAD  
 LAKESIDE MARBLEHEAD, OHIO, 43440  
 OTTAWA COUNTY  
 LOT 20, SECTION 2, FIRELANDS, DANBURY TOWNSHIP

FILE: 18201 CD.dwg  
 JOB NO.: 18201  
 DRAWN BY: LMM  
 ISSUED: APRIL 3, 2019

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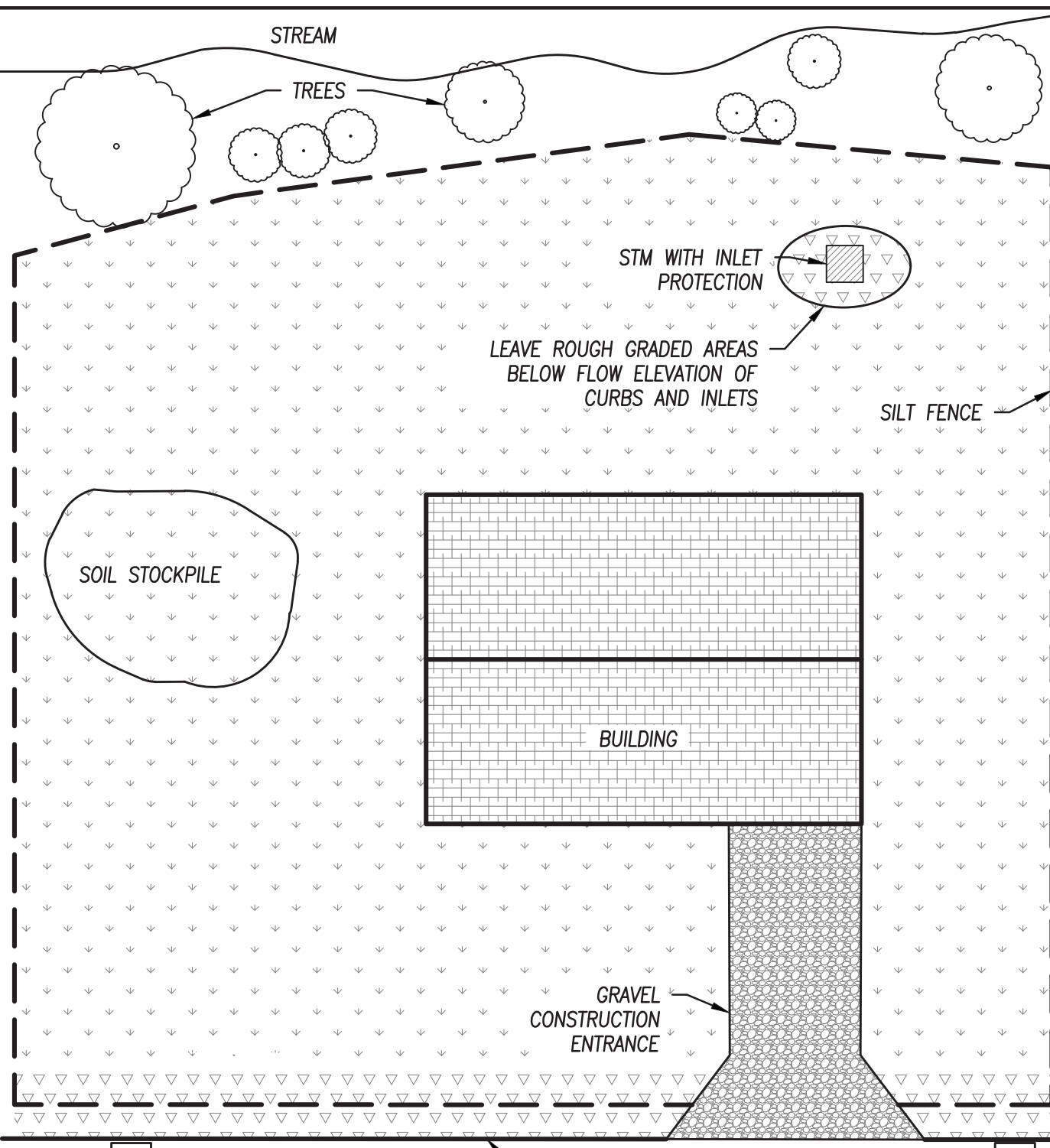
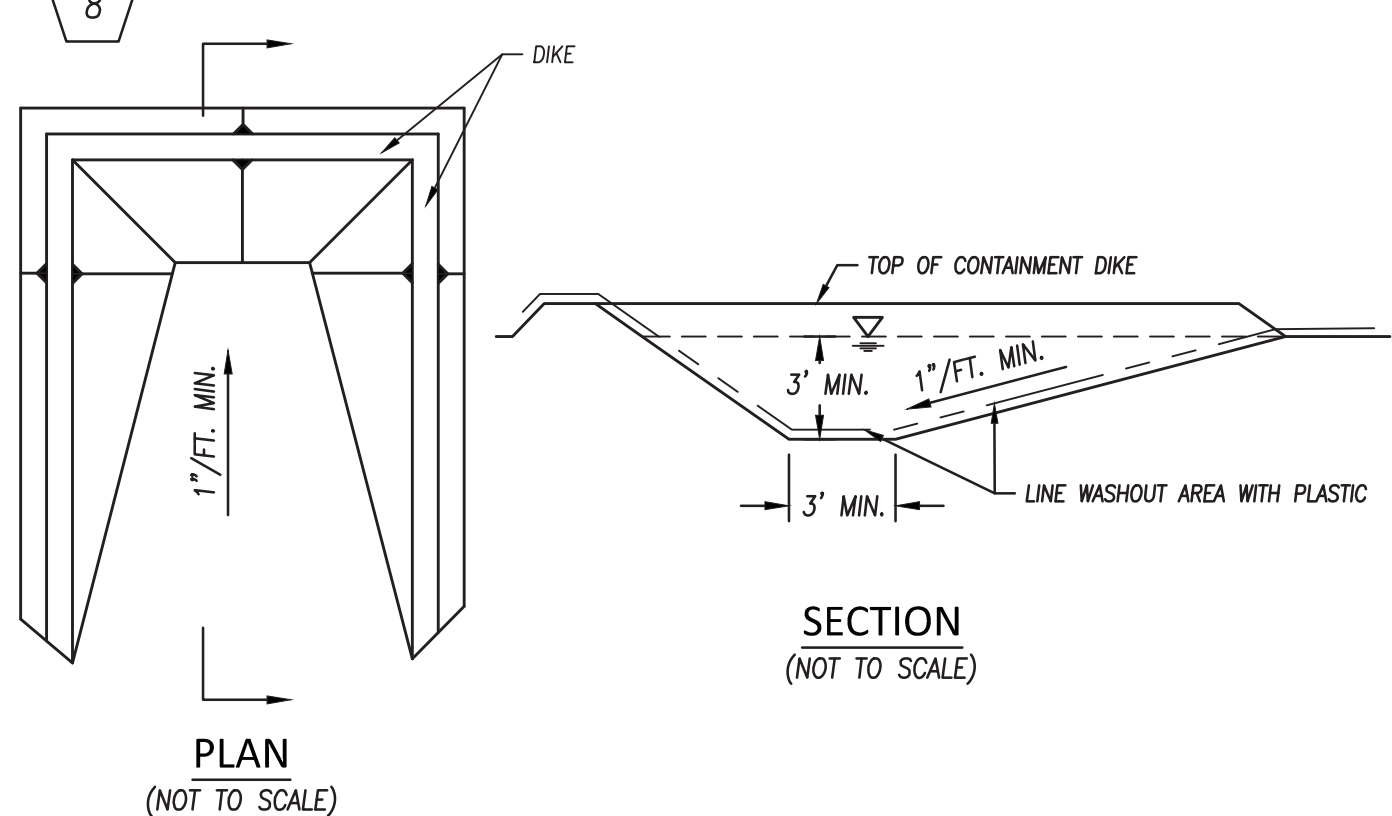
## 3 CONSTRUCTION ENTRANCE



- STONE SIZE - ODOT #2 (1.5 - 2.5 INCH) STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.
- LENGTH - THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 70 FT. (EXCEPTION: APPLY 30 FT. MINIMUM TO SINGLE RESIDENCE LOTS).
- THICKNESS - THE STONE LAYER SHALL BE AT LEAST 6 INCHES THICK FOR LIGHT DUTY ENTRANCES OR AT LEAST 10 INCHES FOR HEAVY DUTY USE.
- WIDTH - THE ENTRANCE SHALL BE AT LEAST 14 FEET WIDE, BUT NOT LESS THAN THE FULL FINAL WIDTH AT POINTS WHERE INGRESS AND EGRESS OCCURS.
- GEOTEXTILE - A GEOTEXTILE SHALL BE LAID OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL BE COMPOSED OF STRONG, ROT-PROOF POLYMERIC FIBERS AND MEET THE FOLLOWING SPECIFICATIONS:
- TIMING - THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SOON AS IS PRACTICABLE BEFORE MAJOR GRADING ACTIVITIES.
- CULVERT - A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OR TO PREVENT RUNOFF FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
- WATER BAR - A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
- MAINTENANCE - TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED, OR TRACKED ONLY PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
- CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
- REMOVAL - THE ENTRANCE SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY OR ENTRANCE.

GEOTEXTILE SPECIFICATION FOR CONSTRUCTION ENTRANCE	
MINIMUM TENSILE STRENGTH	200 LBS.
MINIMUM PUNCTURE STRENGTH	80 PSI.
MINIMUM TEAR STRENGTH	50 LBS.
MINIMUM BURST STRENGTH	320 PSI.
MINIMUM ELONGATION	20%
EQUIVALENT OPENING SIZE	EOS < 0.6 MM.
PERMITTIVITY	1x10 <sup>-3</sup> CM/SEC.

## 8 CONCRETE TRUCK WASHOUT



- TEMPORARY SEED AND MULCH APPLIED TO ROUGH GRADED AREAS AND STOCKPILES
- ROUGH GRADE AREA NEAR CATCH BASIN TO ALLOW SETTLING BELOW GRATE ELEVATION

### SMALL CONSTRUCTION SITE CONTROLS

- CLEARING SHALL BE DONE SO ONLY ACTIVE WORKING AREAS ARE BARE. PRE-EXISTING VEGETATION SHALL BE RETAINED ON IDLE PORTIONS OF THE BUILDING LOT FOR AS LONG AS CONSTRUCTION OPERATIONS ALLOW.
- TEMPORARY SEED AND/OR MULCH SHALL BE APPLIED WITHIN 7 DAYS TO AREAS THAT ARE BARE AND WILL NOT BE DISTURBED FOR 14 DAYS OR MORE. DISTURBED AREAS WITHIN 50' OF A SURFACE WATER OF THE STATE MUST BE STABILIZED WITHIN 2 DAYS.
- STOCKPILES CREATED FROM BASEMENT EXCAVATION AND GRADING SHALL BE SITUATED AWAY FROM STREETS, SWALES, OR WATERWAYS AND SHALL BE SEED AND/OR MULCHED IMMEDIATELY.
- SILT FENCE OR OTHER SEDIMENT BARRIERS SHALL CONTROL SHEET FLOW RUNOFF FROM THE BUILDING LOT. THESE SHALL NOT BE CONSTRUCTED IN CHANNELS OR AREAS OF CONCENTRATED FLOW. OTHER SEDIMENT CONTROLS SUCH AS SEDIMENT TRAPS AND INLET PROTECTION SHALL ALSO BE USED AS NEEDED TO CONTROL SEDIMENT RUNOFF. SEDIMENT CONTROL PRACTICES SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EACH RAIN EVENT OF 0.5 INCHES WITHIN A 24 HOUR PERIOD, AND BE MAINTAINED IN GOOD WORKING CONDITION.
- CONSTRUCTION VEHICLE ACCESS SHALL BE LIMITED TO ONE ROUTE, TO THE GREATEST EXTENT PRACTICAL. THE ACCESS SHALL BE GRAVEL OR CRUSHED ROCK UNDERLAIN WITH GEOTEXTILE. SEE CONSTRUCTION ENTRANCE DETAIL FOR SPECIFICATIONS.
- MUD TRACKED ONTO STREETS OR SEDIMENT SETTLED AROUND CURB INLET PROTECTION SHALL BE REMOVED DAILY OR AS NEEDED TO PREVENT ACCUMULATION. IT SHALL BE REMOVED BY SHOVELING AND SCRAPING AND SHALL NOT BE WASHED OFF PAVED SURFACES OR INTO STORM DRAINS. SEDIMENT REMOVED SHALL BE PLACED WHERE IT WILL NOT BE SUBJECT TO EROSION OR CONCENTRATED RUNOFF.

PLOTTED: Apr 03, 2019 - 8:44pm  
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**SEDIMENT AND EROSION CONTROL**

- CONTRACTOR SHALL CONFORM WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND ALL PLANS AND SPECIFICATIONS REGARDING SOIL EROSION/SEDIMENTATION CONTROL REQUIREMENTS.
- CONTRACTOR SHALL IMPLEMENT ALL SOIL AND EROSION CONTROL PRACTICES AS PER THE PLAN AND AS REQUIRED BY OTTAWA COUNTY AND THE OHIO ENVIRONMENTAL PROTECTION AGENCY. THE EROSION CONTROL MEASURES SHALL BE INSTALLED PER THE CURRENT EDITION OF THE OHIO DEPARTMENT OF NATURAL RESOURCES RAINWATER AND LAND DEVELOPMENT HANDBOOK AND TO THE SATISFACTION OF OTTAWA COUNTY.
- CONTRACTOR SHALL NOTIFY OTTAWA COUNTY THREE (3) DAYS PRIOR TO STARTING CONSTRUCTION FOR PURPOSES OF MONITORING SOIL EROSION AND BMP MEASURES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND UPDATING THE SWP3 THROUGHOUT CONSTRUCTION PER THE NPDES PERMIT.
- THE PLANS HEREIN CONTAIN THE INFORMATION REQUIRED TO MEET OTTAWA COUNTY SWP3 REQUIREMENTS, HOWEVER, UNLESS OTHERWISE PROVIDED BY THE OWNER, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THAT THIS PLAN MEETS THE SWP3 REQUIREMENTS OF THE OHIO EPA NPDES PERMIT AND PROVIDING ADDITIONAL DETAILS AND INFORMATION IF REQUIRED.
- BORROW AND WASTE DISPOSAL AREAS SHALL BE SELECTED WITH FULL CONSIDERATION FOR SOIL EROSION AND SEDIMENT CONTROL. ALL BORROW AND WASTE DISPOSAL AREAS ARE INCLUDED IN THE NPDES PERMIT AND ARE REQUIRED TO BECOME A PART OF THE SWP3.
- ANY PARTY (INCLUDING, BUT NOT LIMITED TO, THE GENERAL CONTRACTOR) WHO HAS DAY-TO-DAY OPERATIONAL CONTROL OF ACTIVITIES AT THIS PROJECT, WHICH ARE NECESSARY TO ENSURE COMPLIANCE WITH THE SWP3 FOR THE SITE, OR OTHER CONDITIONS AS SET FORTH IN THE PERMIT, MUST FILE A CO-PERMITTEE NOTICE OF INTENT (NOI) WITH THE OHIO EPA. THIS IS THE SOLE RESPONSIBILITY OF THE CO-PERMITTEE AND SHOULD BE DONE 21 DAYS BEFORE GROUND IS BROKEN.
- SEDIMENT AND EROSION CONTROLS SHALL BE INSPECTED BY A QUALIFIED INSPECTOR ONCE EVERY SEVEN (7) DAYS AND WITHIN 24 HOURS OF EVERY 0.5" OR GREATER RAINFALL. A WRITTEN LOG OF THESE INSPECTIONS SHALL BECOME PART OF THE SWP3. THIS LOG SHOULD INDICATE THE DATE OF INSPECTION, NAME OF INSPECTOR, WEATHER CONDITIONS, OBSERVATIONS, ACTIONS TAKEN TO CORRECT ANY PROBLEMS AND THE DATE ACTION WAS TAKEN. FURNISH THE OWNER, OWNER'S REPRESENTATIVE, AND ENGINEER WITH WRITTEN REPORTS UNLESS OTHERWISE DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE. INSPECTION RECORDS SHALL BE KEPT FOR A PERIOD OF 3 YEARS AFTER TERMINATION OF CONSTRUCTION ACTIVITIES.
- THE PROJECT HAS BEEN DESIGNED TO CONTROL EROSION AND PREVENT DAMAGE TO OTHER PROPERTY. ALL STRIPPING, EARTHWORK, AND GRADING SHALL BE PERFORMED TO MINIMIZE EROSION. NATURAL VEGETATION SHALL BE RETAINED WHEREVER POSSIBLE. THE PROPOSED PLAN WILL ALLOW MOST ERODED MATERIALS TO BE RETAINED ON SITE.
- SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT OPERATIONS WHICH PROMOTE EROSION.
- THE CONTRACTOR IS TO IMPLEMENT BEST MANAGEMENT PRACTICES (BMP) INCLUDING, BUT NOT LIMITED TO, EROSION CONTROL MEASURES AS SHOWN IN THE DRAWINGS. EROSION CONTROL MEASURES MAY BE IMPLEMENTED AND LOCATIONS ADJUSTED AS NEEDED TO FACILITATE CONSTRUCTION PROVIDED THE SWP3 PLAN IS UPDATED ACCORDINGLY AND THE INTENT OF THE PLAN IS MET.
- SOLID, SANITARY AND TOXIC WASTE MUST BE DISPOSED OF IN A PROPER MANNER IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. IT IS PROHIBITED TO BURN, BURY OR POUR INTO THE GROUND OR INTO STORM SEWERS ANY SOLVENTS, PAINTS, STAINS, GASOLINE, DIESEL FUEL, USED MOTOR OIL, HYDRAULIC FUEL, ANTIFREEZE, CEMENT CURING COMPOUNDS, AND OTHER SUCH TOXIC OR HAZARDOUS WASTES.
- WASH OUT OF CEMENT TRUCKS SHOULD OCCUR IN A DIKED, DESIGNATED AREA OR INTO PORTABLE MANUFACTURED WASHOUT BAGS SUCH AS THE LINED READY MIX BAGS MANUFACTURED BY ENVIRO SYSTEMS, INC., OR EQUIVALENT, WHERE THE WASTEWATER CAN BE COLLECTED AND DISPOSED OF PROPERLY AFTER IT HARDENS.
- STORAGE TANKS SHOULD BE LOCATED IN DIKED AREA WHICH HOLDS A MINIMUM VOLUME OF 110% OF THE LARGEST TANK OR OTHER APPROVED METHODS USED SUCH AS DOUBLE WALLED TANKS OR STORAGE BINS.
- LOCATION OF THE DUMP/WASH LOCATION AND CONTRACTOR PROCEDURES ARE SUBJECT TO SUPERVISION BY THE FEDERAL, STATE, AND OTTAWA COUNTY CODE..
- DUMPING OR DISCHARGE OF ANY HAZARDOUS WASTE MATERIALS TO ANY STORM OR SANITARY SEWERS IS PROHIBITED.
- CONTRACTOR SHALL DESIGNATE A SITE DUMP/WASH AREA PRIOR TO STARTING CONSTRUCTION FOR SUCH PURPOSES AS WASHING OUT CONCRETE TRUCKS AND DUMPING NON-HAZARDOUS WASTE MATERIALS.
- HAZARDOUS WASTES ARE TO BE REMOVED OFF SITE AND PROPERLY DISPOSED OF CONSISTENT WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.
- ALL CATCH BASINS AND INLETS NEAR DISTURBED AREAS SHALL HAVE TEMPORARY INLET PROTECTION SEDIMENT BARRIERS PLACED AND MAINTAINED THROUGHOUT CONSTRUCTION TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEMS WHETHER SHOWN IN THE DRAWINGS OR NOT.
- SOIL EROSION AND SEDIMENTATION BMP MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION AND SHALL BE MAINTAINED AT ALL TIMES UNTIL CONSTRUCTION HAS BEEN COMPLETED, INCLUDING GRASS BEING WELL ESTABLISHED AND/OR PERMANENT EROSION AND SEDIMENTATION BMP MEASURES INSTALLED AND OPERATIONAL. ALL BMP MEASURES SHALL BE TO THE SATISFACTION OF OTTAWA COUNTY.
- ANY DETENTION OR RETENTION AREAS AND ANY PERIMETER CONTROLS SHALL BE IMPLEMENTED WITHIN SEVEN (7) DAYS OF FIRST GRUBBING AND SHALL REMAIN FUNCTIONAL UNTIL THE UP-SLOPE DEVELOPMENT AREA IS STABILIZED.
- STOCKPILED SOILS SHALL BE LEGALLY REMOVED FROM THE SITE OR COVERED WITH TEMPORARY SEED AND MULCH WITHIN SEVEN (7) DAYS AND SURROUNDED WITH SILT FENCE UNTIL SUCH TIME THAT IT CAN BE REUSED ON THE SITE.
- ALL AREAS AT FINAL GRADE OR WHERE CONSTRUCTION ACTIVITY HAS TEMPORARILY CEASED FOR FOURTEEN (14) DAYS OR LONGER SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OF ACTIVITY.
- ALL GRASS AREAS ARE TO BE SEEDED AND STRAW MULCHED WITHIN SEVEN (7) DAYS AFTER FINAL GRADE IS REACHED.
- STRUCTURAL PRACTICES SHALL BE USED TO CONTROL EROSION AND TRAP SEDIMENTS FROM ALL SITES REMAINING DISTURBED FOR MORE THAN FOURTEEN (14) DAYS.
- SEED AND MULCH ALL AREAS NOT SHOWN AS BUILDING OR PAVEMENT AND ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES UNLESS OTHERWISE NOTED IN THE PLANS.
- ALL STREETS MUST BE MAINTAINED DURING CONSTRUCTION. STREETS SHALL BE KEPT FREE OF MUD, DIRT, AND CONSTRUCTION DEBRIS. CONTRACTOR SHALL PROVIDE ROUTINE STREET SWEEPING TO ENSURE MINIMAL EROSION INTO THE PUBLIC STORM SEWER SYSTEM AND ROADWAY.
- CLEANUP SHALL BE CONDUCTED IN A MANNER TO ENSURE THAT EROSION MEASURES ARE NOT DISTURBED.
- OTTAWA COUNTY MAY REQUIRE WORK TO BE STOPPED AND THE STORM DRAINAGE OUTLET TO BE PLUGGED IF CONDITIONS BECOME UNSATISFACTORY.
- CONSTRUCTION SCHEDULE

- INSTALL TEMPORARY SEDIMENT BASIN AND PERIMETER EROSION CONTROL MEASURES INCLUDING CONSTRUCTION ENTRANCES AND TEMPORARY DIVERSION BERMS- APRIL 2019
  - STRIP TOPSOIL, CONSTRUCT DETENTION BASIN, AND BEGIN FILLS - APRIL TO MAY 2019
  - INSTALL UNDERGROUND UTILITIES - MAY TO JULY 2019
  - INSTALL EROSION CONTROL MEASURES IN SWALES AND AT STORM STRUCTURES AS CONSTRUCTED.
  - INSTALL ROADWAY - JULY TO AUGUST 2019
  - FINISH GRADING AND FINAL STABILIZATION - SEPTEMBER 2019
  - REMOVE TEMPORARY EROSION CONTROL MEASURES WHEN GROUND IS STABILIZED.
  - CONSTRUCTION COMPLETE - SEPTEMBER 2019
- ONCE CONSTRUCTION HAS BEEN COMPLETED AND THE SITE STABILIZED, ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES ARE TO BE REMOVED. THE OWNER SHALL THEN PERFORM PERIODIC VISUAL INSPECTIONS OF THE STORM SEWERS, DETENTION BASIN, AND DETENTION OUTLET STRUCTURE FOR ANY SIGNS OF SEDIMENT AND DEBRIS ACCUMULATION, DISTRESS, OR FAILURE. OWNER SHALL CLEAN OUT SEDIMENT AND DEBRIS AND MAKE REPAIRS AS NECESSARY. IT IS RECOMMENDED THAT VISUAL INSPECTIONS BE DONE AT 3 MONTHS, 9 MONTHS, AND THEN ANNUALLY AFTER CONSTRUCTION IS COMPLETE.
  - SPILLS OF HAZARDOUS MATERIALS WHICH ARE LESS THAN 25 GALLONS (INCLUDING PETROLEUM BASED AND CONCRETE CURING COMPOUNDS) SHALL BE CONTAINED AND REMOVED FROM THE SITE AND TREATED OR DISPOSED OF ACCORDING TO FEDERAL, STATE, AND LOCAL REGULATIONS.
  - OHIO EPA (800) 282-9378, THE LOCAL FIRE DEPARTMENT, AND THE LOCAL EMERGENCY PLANNING COMMITTEE SHALL ALL BE NOTIFIED WITHIN 30 MINUTES OF ALL SPILLS OF HAZARDOUS MATERIALS WHICH ARE GREATER THAN 25 GALLONS.
  - THE SITE SHALL BE SUFFICIENTLY WATERED DURING CONSTRUCTION ACTIVITIES TO LIMIT THE AMOUNT OF DUST RELEASED INTO THE AIR, BUT NOT TO ENCOURAGE TRANSPORT OFF SITE BY TRACKING OR EROSION.
  - TEMPORARY SEDIMENT BASINS ARE TO BE CLEANED OUT WHEN THE SILT OCCUPIES 40 PERCENT OR MORE OF THE SEDIMENT STORAGE ZONE (APPROXIMATELY 1/2 OF THE DEPTH OF THE SEDIMENT STORAGE ZONE DEPTH).
  - AT THE TIME THAT CONSTRUCTION IS COMPLETED AND THE TEMPORARY SEDIMENT BASIN IS BEING CONVERTED FROM A TEMPORARY CONSTRUCTION SEDIMENT BASIN TO A POST-CONSTRUCTION WATER QUALITY/DETENTION BASIN, ANY SEDIMENTS WHICH HAVE ACCUMULATED IN THE BASIN SHALL BE REMOVED AND THE PROPOSED GRADES RE-ESTABLISHED AND STABILIZED.



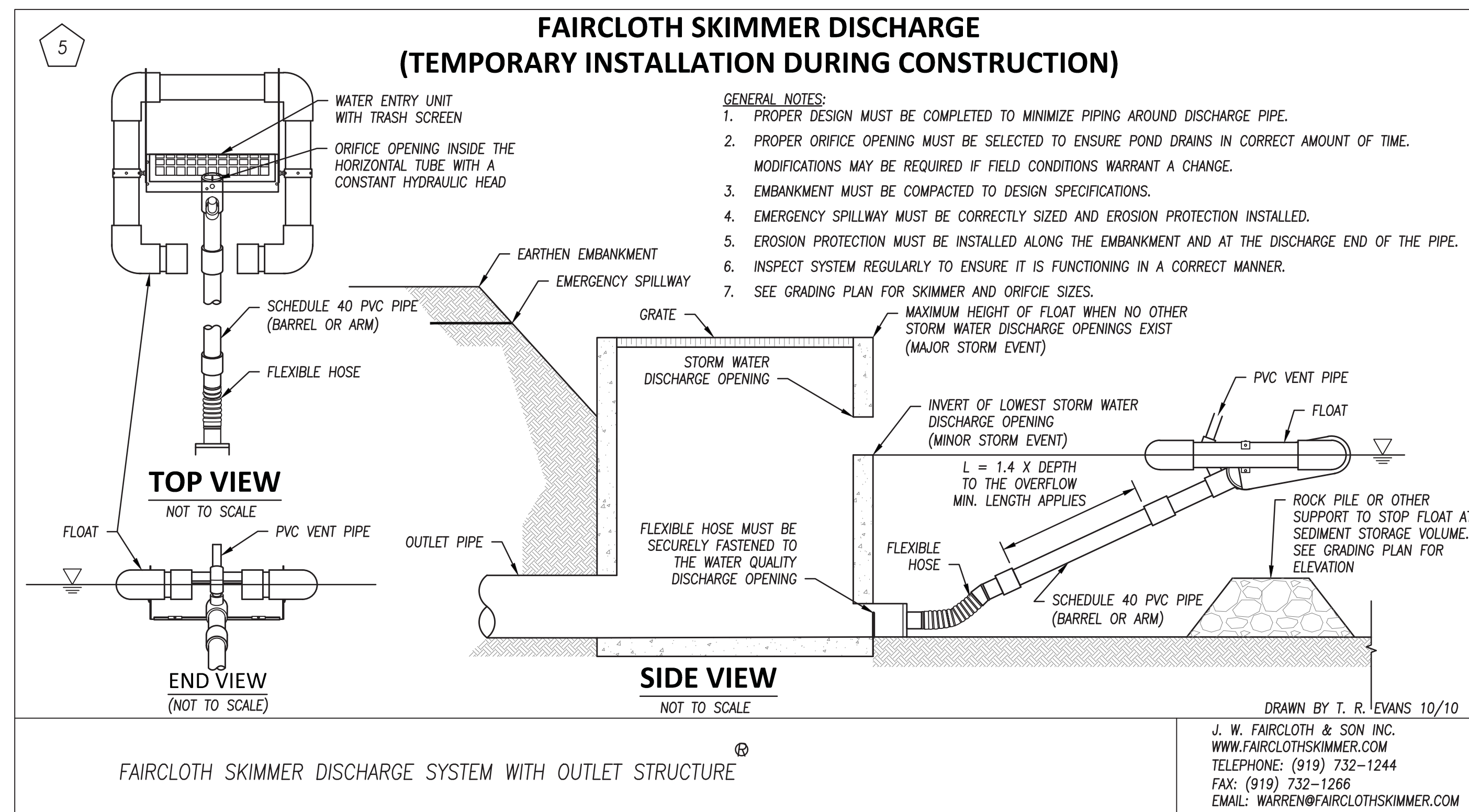
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**EROSION CONTROL NOTES**

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