Standard Construction Drawings

and Procedures

for Sanitary Sewers



Department of Sanitary Sewer Services 1180 South Main St. Akron, Ohio 44301

Ross A. Nicholson P.E.

APPROVED BY Son PE DEPUTY DIRECTOR _{DATE} <u>10/01/24</u>

Ilene Shapiro Summit County Executive

SUMMIT COUNTY DEPARTMENT OF SANITARY SEWER SERVICES

STANDARD CONSTRUCTION DRAWINGS and PROCEDURES for SANITARY SEWERS

INDEX

Sheet Number

(1)	Index					
(2)	General Notes					
(3)	Acceptable Materials and Suppliers					
(4)	Internal Visual Inspection Policy and Procedures					
(5) Infiltration / Exfiltration Test Procedure						
(6)	Low Pressure Air Test Procedure and Sanitary Force Main Testing					
Drawing Number						
(7)	(7) Manhole Frame and Cover					
(8) Standard Manhole with Precast Concrete Base						
(9)	(9) Precast Manhole with Cast in Place Concrete Base					
(10) Shallow Manhole 6'3" and Under						
(11) Manhole with Outside Drop						
(12)	Cylindrical Manhole Sections for Large Diameter Pipe					
(13) Kor-N-Seal Flexible Pipe-To-Manhole Connector						
(14) New Lateral in Existing Sewer						
(15)	(15) Stacks for Sanitary Sewers					
(16) Sloped Laterals						
	date <u>04/18/23</u> sh					

SHEET 1A

(17)	Clean Out for Laterals
(18)	Sanitary Sewer Laterals
(19)	Concrete Cradle - Bedding and Backfilling - Rigid Pipe - Type III
(20)	Concrete Arch - Bedding and Backfilling - Rigid Pipe - Type IV
(21)	Concrete Encasement - Bedding & Backfilling - Rigid Pipe - Type V
(22)	Reinforced Concrete Encasement
(23)	Drive or Street Crossing Detail
(24)	Typical Pavement Replacement
(25)	Tunnel Excavation
(26)	Flexible Pipe - Bedding and Backfilling - Rigid Pipe - Type I
(27)	Bedding and Backfilling - Rigid Pipe - Type II
(28)	Sanitary Lateral - Open Cut Through Existing Pavement
(29)	Sanitary Lateral - Bored Road Crossing with Steel Casing
(30)	Typical Section Culvert Pipe
(31)	Small Diameter Force Main Air Release Assembly
(32)	Small Diameter Force Main Cleanout Detail
(33)	Small Diameter Force Main to Existing Manhole Connection
(34)	Small Diameter Force Main to Lateral Connection
(35)	Force Main Trench Detail
(36)	Standard Soil Classifications
(37)	Aggregate Sizing Standards
	DATE <u>04/18/23</u> SHEET 1B

GENERAL NOTES

PERMISSION TO CONSTRUCT SANITARY SEWERS IS GRANTED BY THE STATE OF OHIO ENVIRONMENTAL PROTECTION AGENCY (O.E.P.A.), THE COUNTY OF SUMMIT DEPARTMENT OF SANITARY SEWER SERVICES (D.S.S.S.) AND THE COUNCIL OF THE COUNTY OF SUMMIT WHEN APPROPRIATE. THE D.S.S.S. HAS AUTHORITY TO STOP ANY SANITARY SEWER CONSTRUCTION NOT IN COMPLIANCE WITH CURRENT REGULATIONS AND STANDARDS.

- 1. The attached standard construction drawings are derived from "Recommended Standards for Wastewater Facilities ", latest edition (known as "The Ten States Standards ") as established by the Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (GLUMRB) and as amended by the Summit County Commissioners Resolution No. 294-75. If no applicable standard is attached, the Ten States Standards will apply.
- 2. All work shall be directed by a competent engineer, licensed by the State of Ohio.
- 3. All construction shall be inspected by the D.S.S.S. and the cost of that inspection shall be borne by the project.
- 4. No sewer construction shall occur prior to the project plan and specification approval by the D.S.S.S., the O.E.P.A. and local regulatory agencies as applicable.
- 5. Any and all plan revisions shall be approved by the D.S.S.S. prior to implementation.
- 6. All sewers 6 through 12 inches in diameter shall be tested by the low pressure air test method as outlined in the applicable ASTM standards. All sewers 15 inches and greater diameter shall be tested by the most practical method. Acceptable test methods are:
 - a. Low Pressure Air Test
 - b. Infiltration Test
 - c. Exfiltration Test

The test method selection shall be based on the existing ground water conditions and other facts pertinent to the particular project and shall be approved by the Engineer .

- 7. Sewers shall be inspected in accordance with the standard for " Internal Video Inspection of Sanitary Sewers " and the cost of that inspection shall be borne by the project.
- 8. No "Permit To Connect " to the project shall be issued prior to the approval by D.S.S.S. of all project work, documentation, testing, inspection and measurement.
- 9. No footer drains, down spouts, sump pumps or other clean water sources shall be connected to the sanitary sewer as prohibited by Summit County Ordinance No. 85-656, as approved October 08, 1985.

date <u>4/18/23</u>

SHEET 2A

10. **DEFLECTION TEST:**

Deflection tests shall be performed on all flexible pipe, and shall be conducted after the final backfill has been in place at least 30 days to permit stabilization of the soil-pipe system, as directed by the Summit County Department of Sanitary Sewer Services (DSSS). Deflection tests shall be performed in the presence of and approved by the DSSS. Deflection tests shall be performed without mechanical pulling devices.

No pipe shall exceed a deflection of 5 percent of the inside diameter. If the deflection exceeds 5 percent the pipe shall be excavated, corrected, and/or replaced as necessary. Replacement and correction of the pipe shall be accomplished in accordance with the County's standard specifications and details at the Contractor's expense.

The rigid ball or mandrel used for the deflection test shall have a diameter not less than 95 percent of the base inside diameter or average inside diameter of the pipe, depending upon which is specified in the ASTM Specification (including appendices) to which the pipe is manufactured. The device used for the deflection test shall be of material and construction appropriate for use with the pipe being tested.

STANDARD DETAIL DWG. NO. <i>2B</i>
DEPARTMENT OF SANITARY SEWER SERVICES
GENERAL NOTES
APPROVED BY
DEPUTY DIRECTOR
DATE 04/18/23 /2B

∖2B

ACCEPTABLE MATERIALS AND SUPPLIERS

ASTM and AWWA Specification numbers refer to the latest version thereof. Other standards shall apply by reference although not specifically stated herein.

- 1. <u>Concrete Pipe ASTM C-76, C-443, C-507, C-655</u>
 - a. Hanson Pipe and PreCast Company
 - b. Independent Concrete Pipe Company
 - c. Superior Concrete Pipe Company

2. Ductile Iron Pipe and Fittings - AWWA C-110, C-115, C-116, C-151; ASTM A-746

- a. American Cast Iron Pipe Company
- b. Clow Corporation
- c. U.S. Pipe Company

3. <u>PVC Pipe and Fittings</u> - ASTM D-3034, F-679, F-789, F-794, F-949

- a. Certain-Teed Products Corporation
- b. Harco Fittings
- c. Heritage Plastics Pipe
- d. JM Eagle
- e. Plastic Trends
- 4. Truss Pipe ASTM D-2680
 - a. Contech
- 5. Vitrified Clay Pipe ASTM C-301, C-425, C-700
 - a. Logan Clay Pipe
 - b. United Pipe Supply
 - c. Superior Clay Products
- 6. Precast Concrete Manholes ASTM C-478, C-497, C-923
 - a. USA Precast Concrete
 - b. Mack Industries Valley City, Ohio
 - c. Migchelbrink Precast Concrete

date <u>04/18/23</u>

SHEET 3A

7. Manhole Frames and Covers - ASTM A-48

- a. EJ Company fka
- b. Neenah Foundry

8. <u>Flexible Pipe Entries - ASTM C-923</u>

- a. Kor N Seal
- b. A Lok Corp

9. Internal Video Inspection

- a. DynAmerican
- b. Great Lakes
- c. Lake County Sewer
- d. United Survey, Incorporated

10. Pressure Pipe & Fittings - ASTM D-1785, D-2241, AWWA C-900, C-905, C-909

- a. JM Eagle
- b. National Pipe & Plastic

11. <u>PE Pipe and Fittings - ASTM D-1248, D-3350, F-714, F-2736, AWWA C-906</u>

- a. Advanced Drainage Systems
- b. Isco Industries
- c. National Pipe & Plastic

12. <u>Pumps</u>

- a. Flygt
- b. HydroMatic
- c. Myers
- d. Essco

STANDARD					
DEPARTMENT OF					
SANITARY SEWER SERVICES					
ACCEPTABLE MATERIALS					
AND SUPPLIERS					
APPROVED BY					
DEPUTY DIRECTOR					
DATE <u>04/18/23</u> / 3B					

3B

INTERNAL VISUAL INSPECTION POLICY AND PROCEDURES

I. GENERAL

- A. All gravity sanitary sewer extensions, repairs and replacements, 8 inches and larger in diameter, shall be subject to an internal visual inspection after the completion of construction. The internal visual inspection shall document the sewer condition and consist of an audio-visual recording and written report. The recording and report shall be submitted by the internal inspection contractor directly to the Department of Sanitary Sewer Services for review, approval and permanent record. Submittals from developers, engineers or any other contractor associated with the sewer installation shall be rejected.
- B. The condition of a sewer system shall be proven satisfactory by the internal inspection, as well as other tests required by DSSS as stated in the General Notes, prior to its placement into service.
- C. It is suggested that the entire new sewer system be thoroughly cleaned by jetting or other appropriate method immediately prior to the inspection. Should any amount of mud, water, debris, foreign material, identifiable or otherwise, or other obstructions to or the viewing of the sewer be found, the system must be re-cleaned and re-inspected. The Project Inspector Supervisor shall make the determination of the sewer condition, the necessity of repair or replacement of the sewer and the necessity of additional internal inspections.
- D. Under normal circumstances a DSSS Project Inspector need not be present for sewer cleaning or internal inspection. However, the DSSS Project Inspector Supervisor must be notified of the intent to perform the inspection prior to 9:00 a.m. on the day preceding the anticipated inspection.
- E. All lines, strings, ropes, plugs and paraphernalia necessary for the performance of the internal visual inspection shall be removed from the sewer system. Any damage to the new or existing sewers, any loss suffered by a county sewer customer and any other incidental damages resulting from the internal inspection or its paraphernalia shall be remedied by the internal inspection contractor.
- F. All costs of the internal inspection, re-inspection, repairing, cleaning, etc. shall be paid by the sewer installation contractor prior to the sewer system acceptance for ownership by Summit County, including any damage claims per Section I-E.
- G. All internal inspection shall be done by persons or firms qualified and approved by DSSS. Inferior work will be rejected. Multiple rejections will be cause for the suspension of acceptance by DSSS of the firm's work until the correction of the deficiencies has been proven.

DATE 04/18/23

SHEET 4A

H. The use of air, whether pressurized or vacuum, to remove residual water or debris from the sewer cleaning operation is not acceptable.

II. VIDEO RECORDING

- A. The visual recording shall be in color showing continuous coverage of the sanitary sewer from one manhole to the next manhole. The color shall be a good rendition of the sewer installed in the opinion of DSSS.
- B. The recording shall be in good focus and have <u>adequate</u> but not excessive lighting. The light intensity shall be adjusted to assure a quality viewing of the pipe surface and observation of changes in color and material of the surface. This section does not represent approval of the use of different color pipe.
- C. The recording shall be free of video "noise" in the form of snow, streaks, migrating color or focus patterns or other electronic interference which may hinder observation of the sanitary sewer.
- D. The recording of any sewer inspection shall be continuous with no breaks in the recording operation.
- E. The recording shall show the actual length of the sewer at the top center of the image. Obstruction of the view of the pipe invert shall result in the rejection of the recording.
- F. The camera drag line shall not obstruct the view of the flow line of the pipe.
- G. The view shall be clear and unobstructed by dirt, water, condensation or vapor on the camera lens or in the sewer. See Section I-C for cleaning and re-inspection requirements.
- H. The visual recording shall be augmented with an audio recording of the inspector's narration calling out the nomenclature of the sewer system, the pipe, manholes, wyes, debris, mud, water, bad joints, crack damage or deformed pipe, joints or fittings or any other observation that may be of use to the assessment of the sewer condition. The narration shall be clear, concise, and loud enough to overcome any background noise from machinery or equipment. The narration shall begin with the identification of the pipe, the distance from the downstream manhole of the sewer then the identification of each and every observation. The camera shall stop at each observation at the discretion of the recording firm as to the significance of the observation and its severity (or the inability to identify) to warrant reversing the camera one or more times to provide a better view.

DATE 04/18/23

SHEET 4B

- I. The camera view shall be looking upstream so that the butt-ends of the pipe spigot will show clearly.
- J. The camera direction of travel shall be upstream.
- K. The video inspection sequence shall be from the lowest manhole to the farthest upstream "terminal" manhole. Each subsequent branch shall be recorded from a manhole already recorded to the terminal manhole of the branch.
- L. At each manhole video annotation and audio narration shall be presented identifying in a uniform manner the following :
 - 1) Beginning Manhole Number from the approved construction drawing set
 - 2) Manhole Number to which the camera is about to approach
 - 3) Project Name and Number
 - 4) Street Name
 - 5) Date of recording
 - 6) Size and material of pipe.
- M. Each project or phase shall be recorded separately and supplied to DSSS on separate media. Recordings of the same phase submitted on multiple pieces of media shall be rejected unless the size of the project prevents its submittal on one single piece of media.
- N. Each recording shall be marked with the following :
 - 1) Project Name, Phase and Number
 - 2) Township or City in which the Improvement is located
 - 3) Developer's Name
 - 4) Installation Contractor's Name
 - 5) Internal Inspection Company Name, Address and Telephone Number
 - 6) Date of Submittal and Date of Inspection
 - 7) Number of pieces of media being submitted.
- O. Each recording submittal shall be accompanied with a report describing the media and its contents. See Section III REPORT for requirements.

date <u>04/18/23</u>

SHEET 4C

III. REPORT

- A. Each recording of an internal visual inspection shall be submitted to DSSS with an accompanying report on 8-1/2 by 11 inch paper with a cover sheet.
- B. The report cover sheet for a recording submittal shall include the following :
 - 1) Project Name, Phase and Number
 - 2) Township or City in which the Improvement is located
 - 3) Developer's Name
 - 4) Installation Contractor's Name
 - 5) Internal Inspection Company Name, Address and Telephone Number
 - 6) Date of Submittal and Date of Inspection
 - 7) Number of pieces of media submitted.
- C. The report shall contain a map of the subdivision, streets or easements showing the general layout of the improvement. The map shall include no less than :
 - 1) Project Name, Phase and Number
 - 2) Township or City in which the Improvement is located
 - 3) Developer's Name
 - 4) Street Names and Rights-Of-Way identifications matching the names on the approved construction drawing set.
 - 5) North Arrow
 - 6) Scale
 - 7) Manhole numbers or names from the approved construction drawing set
 - 8) Intended flow directional arrows.
- D. The report shall include a separate sheet for each sewer (manhole to manhole) containing detailed information of that specific sewer. Each sheet shall include no less than :
 - 1) Inspection Company Name
 - 2) Project Name, Phase and Number
 - 3) Township or City in which the Improvement is located
 - 4) Internal Inspection Media
 - 5) Date of the internal inspection
 - 6) Size and material of sewer pipe
 - 7) Inspection beginning and ending construction station numbers
 - 9) Inspection beginning and ending manhole names or numbers, from the map and the approved construction drawing set
 - 10) Total length of the sewer pipe, in feet.

date <u>04/18/23</u>

SHEET 4D

- E. The specific information to be included for each sewer shall be in a columnar tabular form indicating the distance from the previous manhole and a description of each and every observation. These columns shall be marked to indicate each and every observation of the following conditions at a minimum:
 - 1) Beginning manhole identification name or number
 - 2) Service connection called as either left or right or by "o'clock" ONLY
 - 3) Abnormal pipe joints such as open or partially open, cracked, excessive glue, gasket exposure, leaking, defects
 - 4) Abnormal pipe such as cracked, leaking, damaged, deflected
 - 5) Obstructions such as mud, stones, leaves, paper, tools
 - 6) Standing water starting point.
 - 7) Standing water ending point
 - 8) Submergence of camera
 - 9) Blocked pipe preventing camera travel
 - 10) Change of pipe material or color
 - 11) Water vapor (See Section II-G)
 - 12) Other events either ordinary or extra-ordinary
 - 13) Ending manhole identification name or number.

STANDARD DETAIL DWG. NO. <i>4E</i>
DEPARTMENT OF SANITARY SEWER SERVICES
INTERNAL VISUAL
INSPECTION POLICY AND PROCEDURES
APPROVED BY
DATE 04/18/23 4E

4E

INFILTRATION/EXFILTRATION TEST PROCEDURE

The Contractor shall conduct tests to determine the water tightness of the gravity sewer when completed. The tests shall be observed by the Engineer, but the Contractor shall furnish all labor, equipment and materials required in connection herewith.

It is agreed that the sewer shall be tested in sections, each section extending between two adjacent manholes or from the end of the sewer to nearest manhole. The Contractor may elect to use either an infiltration test, an exfiltraton test, or the low pressure air test (see Sheet 6), with the approval of the Summit County Department of Sanitary Sewer Services.

A. Infiltration Test

Each section under test shall be covered with not less than two (2) feet of water above the top of the pipe at the highest point. The infiltration will be measured by means of weir located in the downstream manhole. The above head of two (2) feet shall be maintained for a period of not less that twenty-four (24) hours before the weir measurements are made.

B. Exfiltration Test

The sewer at the upstream side of the lower manhole and the upstream side of the upper manhole in each section shall be closed with a watertight bulkhead and the sewer filled with water until the water elevation in the upstream manhole is not less than two (2) feet above the top of the sewer pipe or two (2) feet above ground water elevation in the trench, whichever is higher. The exfiltration will be determined by measuring the amount of water required to maintain the above stated water elevation for a period of one (1) hour from the start of the test. The entire length of section to be tested shall be filled and maintained full of water for a period of approximately twenty-four (24) hours prior to the start of the test.

STANDARD DETAIL DWG. NO. 5A				
DEPARTMENT OF SANITARY SEWER SERVICES				
INFILTRATION				
EXFILTRATION TEST PROCEDURE				
APPROVED BY				
DEPUTY DIRECTOR				
DATE <u>04/18/23</u> 5A				

5A

C. Allowable Infiltration or Exfiltration

The amount of infiltration or exfiltration shall not exceed 100 gallons per inch of pipe diameter per twenty-four (24) hours per mile of sewer in each and every section tested in accordance with the above.

D. Testing Requirements

In the event the allowable leakage rates are not met, the Contractor shall determine the location(s) where excess water is entering the sewer or leaving the sewer. The sewer and/or the manholes shall be repaired in manner satisfactory to the Summit County Department of Sanitary Sewer Services and retested until the leakage in the sewer is within the allowable limits.

The Contractor shall include in the price bid per lineal foot of sewer, the cost of all bulkheads, plugs, pipe stoppers, pumps, water, weirs, accessories, labor, delay and any other items of cost necessary for the performance and the completion of the required leakage tests and for the cost of the any repairs or adjustments which may be necessary to make the sewer conform to the required allowable leakage rates (for public projects only).

All leakage test shall be conducted under the supervision of the Summit County Department of Sanitary Sewer Services.

It is understood that each section, as above described, must be tested under the supervision of the Summit County Department of Sanitary Sewer Services for conformity to these requirements before such section or sections are included in any current or final estimate for payment to the Contractor, (for public projects only). It is further understood that, if the leakage does not come within the limits specified, the Contractor will be required to do such work as may be necessary in order to insure conformance even to the extent of reconstructing the defective section or sections.

STANDARD DETAIL DWG. NO. <i>5B</i>
DEPARTMENT OF SANITARY SEWER SERVICES
INFILTRATION
EXFILTRATION TEST PROCEDURE
APPROVED BY
DEPUTY DIRECTOR
DATE <u>04/18/23</u> 5B

5B

LOW PRESSURE AIR TEST PROCEDURE

6A

In lieu of performing an infiltration or exfiltration test to determine the water tightness of the sewer, the Contractor may elect to perform a low pressure air test by the Ramseier procedure, as recommended by the National Clay Pipe Institute (NCPI).

Ramseier's method of conducting acceptance tests may be separated into two parts, one having to do with field procedure and the other having to do with the determination of pressure holding time.

Field Procedures

- Clean pipe to be tested by propelling snug fitting inflated rubber ball through the pipe with water, by jetting, or by other method approved by the Summit County Department of Sanitary Sewer Services.
- 2. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
- 3. If the pipe to be tested is submerged in ground water, insert a pipe probe, by boring or jetting, into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to ground water submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.

In ground water conditions, the standard air test is not reliable if adjustments are not made. The following standard should be followed where applicable. For every foot of water over the top of the sanitary sewer 0.4333 PSI should be added to our standard 4.0 PSI.

Where heavy ground water conditions prevail, contractor should be notified that he may air test at 4.0 PSI immediately after a run is completed (M.H. to M.H.), while his pumps are still operating, (holding ground water below sanitary sewer), otherwise, 0.4333 PSI per foot of water above sanitary sewer will be added when air test is performed at a later date.

6A

testing requirements before it is accepted by DSSS and/or, on public projects, is included in any current or final estimate for payment to the Contractor.

SANITARY FORCE MAIN TESTING AND PUMP STATIONS

Sanitary force mains shall be subject to post-construction leakage and pressure tests prior to acceptance by the DSSS. Tests shall conform to appropriate ASTM testing standards based upon system design pressures and operating conditions, and specific force main material type. Necessary repairs and replacements shall be the responsibility of the Contractor.

Site tests for emergency generators, where required, shall include a full rated load test of two (2) hours duration utilizing a resistive load bank furnished by the generator set manufacturer, and conducted by the generator set manufacturer's representative in accordance with the manufacturer's standard procedures and requirements.

2

STANDARD					
DETAIL DWG. NO. 6B					
DEPARTMENT OF					
SANITARY SEWER SERVICES					
LOW PRESSURE AIR TEST					
PROCEDURES AND FORCE					
MAIN TESTING					
APPROVED BY					
PEPLITY DIRECTOR					
DATE 04/18/23 6B					

6B



































TYPICAL PAVEMENT REPLACEMENT

- 1. EXISTING AGGREGATE BASE-CHIP AND SEAL SURFACE
 - a. REPLACE BASE IN KIND OR O.D.O.T. 304 (NO SLAG) AS DIRECTED BY THE ENGINEER.
 - b. SURFACE WITH 2-1/2" O.D.O.T. 448.
- 2. EXISTING AGGREGATE BASE-ASPHALT SURFACE
 a. REPLACE BASE IN KIND OR O.D.O.T. 304 (NO SLAG) AS DIRECTED BY THE ENGINEER.
 b. SURFACE WITH 2-1/2" O.D.O.T. 448.
- EXISTING ASPHALT BASE—ASPHALT SURFACE

 a. REPLACE BASE IN KIND OR O.D.O.T. 448 AS DIRECTED BY THE ENGINEER.
 b. SURFACE WITH 2-1/2" O.D.O.T. 448.
- 4. EXISTING CONCRETE BASE-ASPHALT SURFACE

 a. REPLACE BASE WITH 9"-4,000 POUND CONCRETE AS DIRECTED BY THE ENGINEER.
 b. SURFACE WITH 2-1/2" O.D.O.T. 448.
- 5. EXISTING CONCRETE PAVEMENT a. REPLACE WITH 9"-4,000 P.S.I. CONCRETE AS DIRECTED BY THE ENGINEER.

NOTE:

- a. ANY EXISTING PAVEMENT NOT LISTED ABOVE WILL BE REPLACED AS DIRECTED BY THE ENGINEER OR AS REQUIRED BY THE LOCAL AUTHORITY.
- b. THE REPLACEMENTS LISTED ABOVE MAY VARY AS DIRECTED BY THE ENGINEER OR AS REQUIRED BY THE LOCAL AUTHORITY.
- c. DRIVEWAY REPLACEMENT WILL BE IN KIND OR AS DIRECTED BY THE ENGINEER.
- d. THE CONTRACTOR MUST FAMILIARIZE HIMSELF WITH LOCAL REQUIREMENTS NOT LISTED ABOVE.

STANDARD DETAIL DWG. NO. 24
DEPARTMENT OF SANITARY SEWER SERVICES
TYPICAL
PAVEMENT REPLACEMENT
APPROVED BY
DEPUTY DIRECTOR DATE 07/24/23 24

24























		DESCRIPTION OF EMBEDMENT MATERIAL CLASSIFICATION				
		SOIL CLASS	SOIL TYPE	DESCRIPTION OF MATERIA	L CLASSIFICATION	
		CLASS I SOILS *		Manufactured angular, granular mat inches (6 to 40 mm) size, includin regional significance such as crush coral, cinders, or crushed shells.	erial, 1/4 to 1 1/2 ng materials having ed stone or rock, broken	
		CLASS II SOILS**	GW GP	Well—graded gravels and gravel—sar fines. 50% or more retained on No retained on No. 200 sieve. clean. Poorly graded gravels and gravel—s fines. 50% or more retained on No	nd mixtures, little or no o. 4 sieve. more than 95% and mixtures, little or no o. 4 sieve. More than 95%	
			SW	retained on No. 200 sieve. Clean. Well-graded sands and gravelly sar than 50% passes No. 4 sieve. More	nds, little or no fines. More e than 95% retained on	
			SP	No.200 sleve. Clean. Poorly graded sands and gravelly s More than 50% passes No. 4 sieve on No. 200 sieve. Clean.	ands, little or no fines. . More than 95% retained	
		CLASS III SOILS***	GM	Silty gravels, gravel—sand mixtures. on No. 4 sieve. More than 50% rel Clayey gravels, gravel—sand—clay m	50% or more re- tained tained on No. 200 sieve. ixtures. 50% or more	
			SW	retained on No. 4 sieve. More than 50% retained on No. 200 sieve. Silty sands, sand—silt mixtures. More than 50% passes No. 4		
			SC	Clayey sands, sand-clay mixtures. 4 sieve. More than 50% retained o	More than 50% passes No. n No.200 sieve.	
		CLASS IV SOILS	ML	Inorganic silts, very fine sands, roc sands. Liquid limit 50% or less. 50 200 sieve.	k flour, silty or clayey fine % or more passes No.	
			CL	Inorganic clays of low to medium p sandy clays, silty clays, lean clays. 50% or more passes No. 200 sieve	blasticity, gravelly clays, Liquid limit 50% or less. e.	
			CH	silts, elastic silts. Liquid limit great passes No. 200 sieve. Inorganic clays of high plasticity, fo	er than 50%. 50% or more at clays. Liquid limit	
				greater than 50%. 50% or more po	asses No. 200 sieve.	
		CLASS V SOILS	OL OH PT	Organic silts and organic silty clays limit 50% or less. 50% or more pa Organic clays of medium to high p greater than 50%. 50% or more pa Peat, muck and other highly organi	s of low plasticity. Liquid Isses No. 200 sieve. Iasticity. Liquid limit Isses No. 200 sieve. Ic soils.	
* Soils det	fined as	Class I mat	terials are	not defined in ASTM D2487.	STANDARD DETAIL DWG. NO. 36	
 In accordance with ASTM D2487, less the second ance with ASTM D2487, more Soils with 5% to 12% pass No. 200 side classification, e.g., GP-GC. 				than 5% pass No. 200 sieve. than 12% pass No. 200 sieve. eve fall in borderline	DEPARTMENT OF SANITARY SEWER SERVICES	
					STANDARD	
Note: Aggregate sizing standard will be per ODOT latest construction and material specifications. CLASSIFICATIO					APPROVED BY	2/1
					2	
DATE07/24/23						

37 to 30 No.16 No.50 No.100 Å 10 IGIT NUMBERS ARE SPECIFIED. THE SPECIFIED GRADATION MAY BE OBTAINED PROPORTIONING DEVICE WHICH HAS A SEPARATE COMPARTMENT FOR EACH Ś ŝ 5 þ 0 0 ŝ S S 10 10 weight 9 5 5 2 5 SIEVE SERIES SCREENINGS. 0 0 0 40 0 0 10 10 30 S 10 S 43 ЪV No.8 ഗ 0 to 0 to 5 þ 0 to þ ę 85 to 100 10 to percentage SIZES OF COARSE AGGREGRATE (AASHO M 0 0 ŝ 0 10 to 30 55 85 to 100 to 15 25 25 10 0 to 10 S S S S i 4 0 to 0 to 20 to No. 0 to 5 0 to 5 to 5 to 0 0 to 100 to 100 75 55 65 20 30 15 15 S STANDARD sieve (square openings), S 3/8 40 to 40 to 20 to ç 100 100 2 ç \$ 0 to to ЗQ 0 0 0 85 0 90 35 60 to 100 to 100 55 30 10 S ŝ THE UNITED STATES 1/2 ţ 100 100 5 5 \$ \$ с I <u>ç</u> 15 25 0 0 20 0 -90 90 0 COMBINING THE APPROPRIATE SINGLE STANDARD SIZE AGGREGATES BY A SUITABLE PROPORTIONING COARSE AGGREGATE COMBINED. THE BLENDING SHALL BE DONE AS DIRECTED BY THE LABORATORY DIGIT NUMBERS 100 70 55 75 to 100 to 15 I to 100 10 S S 3/4 35 to 5 100 100 ç 5 2 ç 5 20 0 6 0 0 90 90 0 90 100 100 100 Р to 70 55 15 each laboratory THOSE (THREE D SUITABLE 00 100 100 <u>ç</u> to to ę <u>ç</u> 9 35 20 0 90 90 95 i to 100 SIEVES ARE ЯO to 100 1 - 1/260 20 15 15 1 100 ç 100 100 9 BY TWO 5 ţ, 35 25 90 0 0 95 1 to 100 to 100 20 NUMBERED DESIGNATED than 100 100 6 2 35 95 ł 95 Amounts finer to 100 90 to 100 INDICATED. 60 2 - 1/2COARSE AGGREGATE E SINGLE STANDARD ç 00 00 25 90 OTHERWISE IN INCHES, EXCEPT WHERE OTHERWISI WHERE STANDARD SIZES OF COARSE COMBINING THE APPROPRIATE SINGLE I 100 100 Μ STANDARD DETAIL DWG. NO. 37 100 3-1/2 DEPARTMENT OF ç SANITARY SEWER SERVICES 90 STANDARD 100 4 SOIL Vominal size open 3-1/2to1-1/2 2-1/2 to 3/4 1-1/2 to 3/4 1-1/2 to No.4 2-1/2to1-1/2 No.4 to No.16 to No.16 3/8 to No.8 3/4 to No.8 to No.4 No.4 to 0(2) 3/4 to 3/83/4 to No.4 to No.8 1 to 3/8 2 to No.4 0 1 to No.4 CLASSIFICATIONS 1 to 1/2 to 1 square ings APPROVED BY 2 1/2 1/2 3/8 DEPUTY DIRECTOR No. 24 467 357 1 5 56 57 67 2 4 68 8 89 9 10 Μ 37 07/24/23 DATE