

Engineering Support

Design & Installation Support

- ❑ Detailed manhole installation drawings, including foundation and backfill
- ❑ Structural design details for high-traffic paved areas
- ❑ Best practices for horizontal and vertical alignment in gravity sewer systems
- ❑ Anti-flotation analysis and system design, when required

Submittal & Connection Documentation

- ❑ Custom submittal drawings for each manhole:
 - ❑ Inlet & outlet pipe deflection angles
 - ❑ Overall structure height
 - ❑ Pipe connection details (flexible couplings, adapter couplings, eccentric connections, etc.)
 - ❑ Outside & inside drop connection details
- ❑ CSI-formatted performance specification available for project documentation

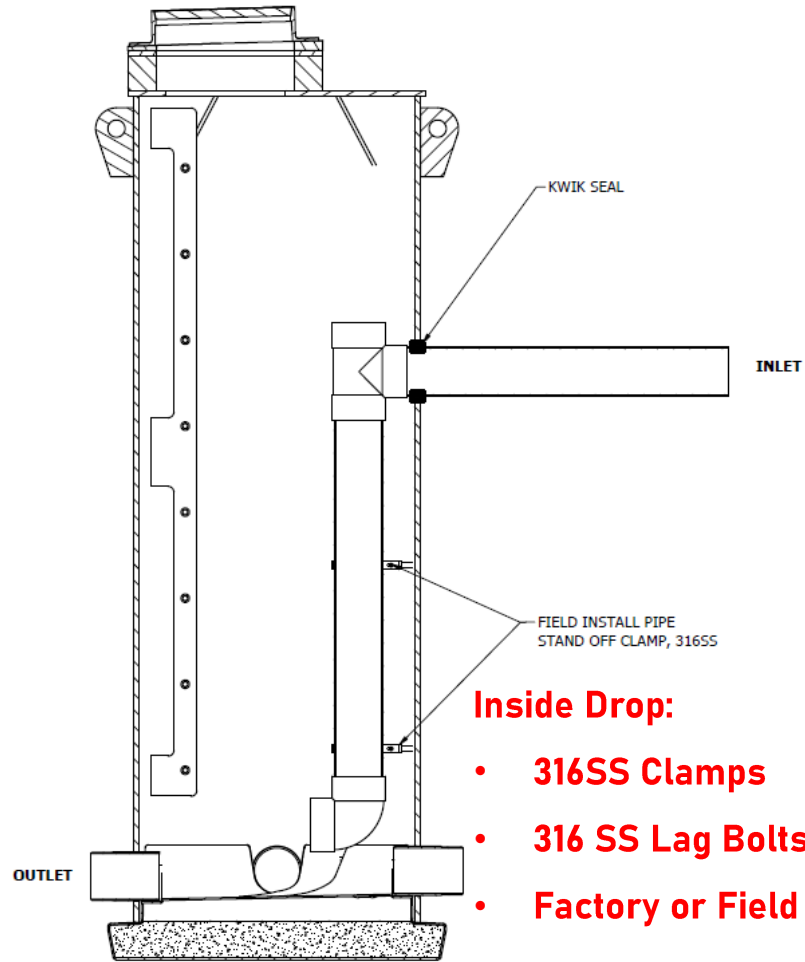
Key Benefit

- ❑ Ensures smooth permitting, installation, and long-term performance

HDPE Datasheet

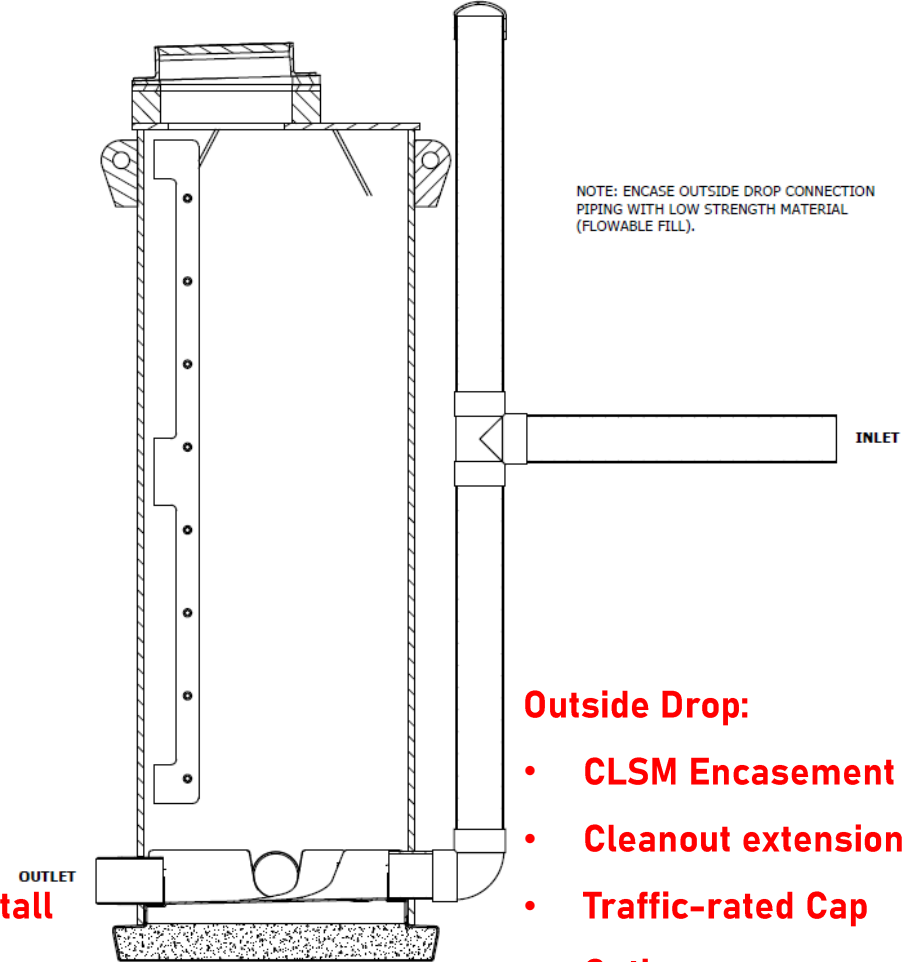
Resin Properties	Typical Value, English Units	Test Based On
Density	0.949 g/cm ³	ASTM D4883
Melt Index (190°C/2.16 kg)	<0.10 g/10 min	ASTM D1238
High Load Melt Index (190°C/21.6 kg)	10 g/10 min	ASTM D1238
Thermal	Typical Value, English Units	Test Based On
Brittleness Temperature	< - 105 °F	ASTM D746
Vicat Softening Temperature	248 °F	ASTM D1525
Molded Properties	Typical Value, English Units	Test Based On
Tensile Strength at Yield	3800 psi	ASTM D638
Flexural Modulus	180000 psi	ASTM D790
Environmental Stress-Crack Resistance 100% Igepal	>800 hr	ASTM D1693
Impact	Typical Value, English Units	Test Based On
Tensile Impact Strength (73°F (23°C))	120 ft-lb/in ²	ASTM D1822

Drop Connections



Inside Drop:

- 316SS Clamps
- 316 SS Lag Bolts
- Factory or Field Install

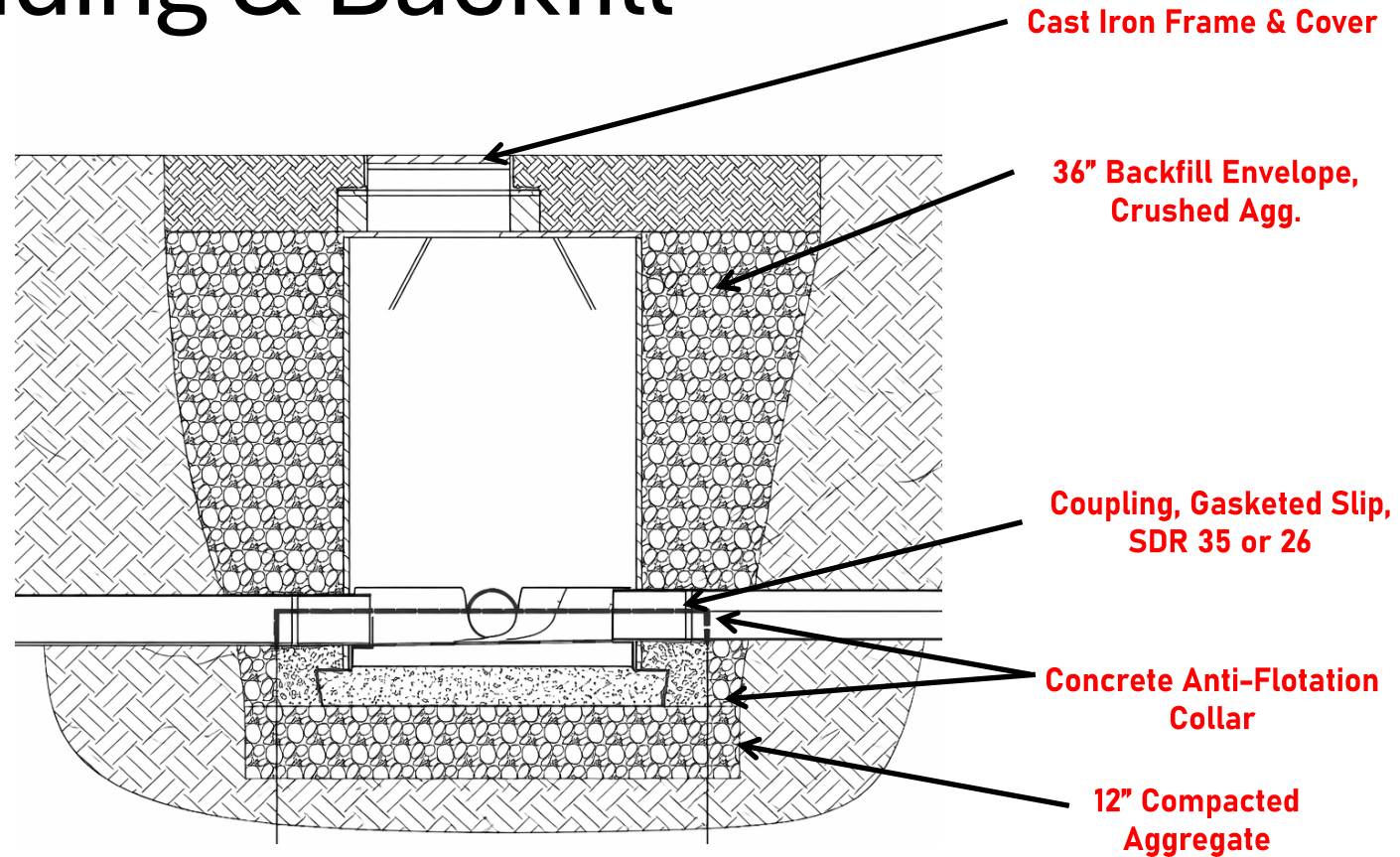


NOTE: ENCASE OUTSIDE DROP CONNECTION PIPING WITH LOW STRENGTH MATERIAL (FLOWABLE FILL).

Outside Drop:

- CLSM Encasement
- Cleanout extension
- Traffic-rated Cap Option

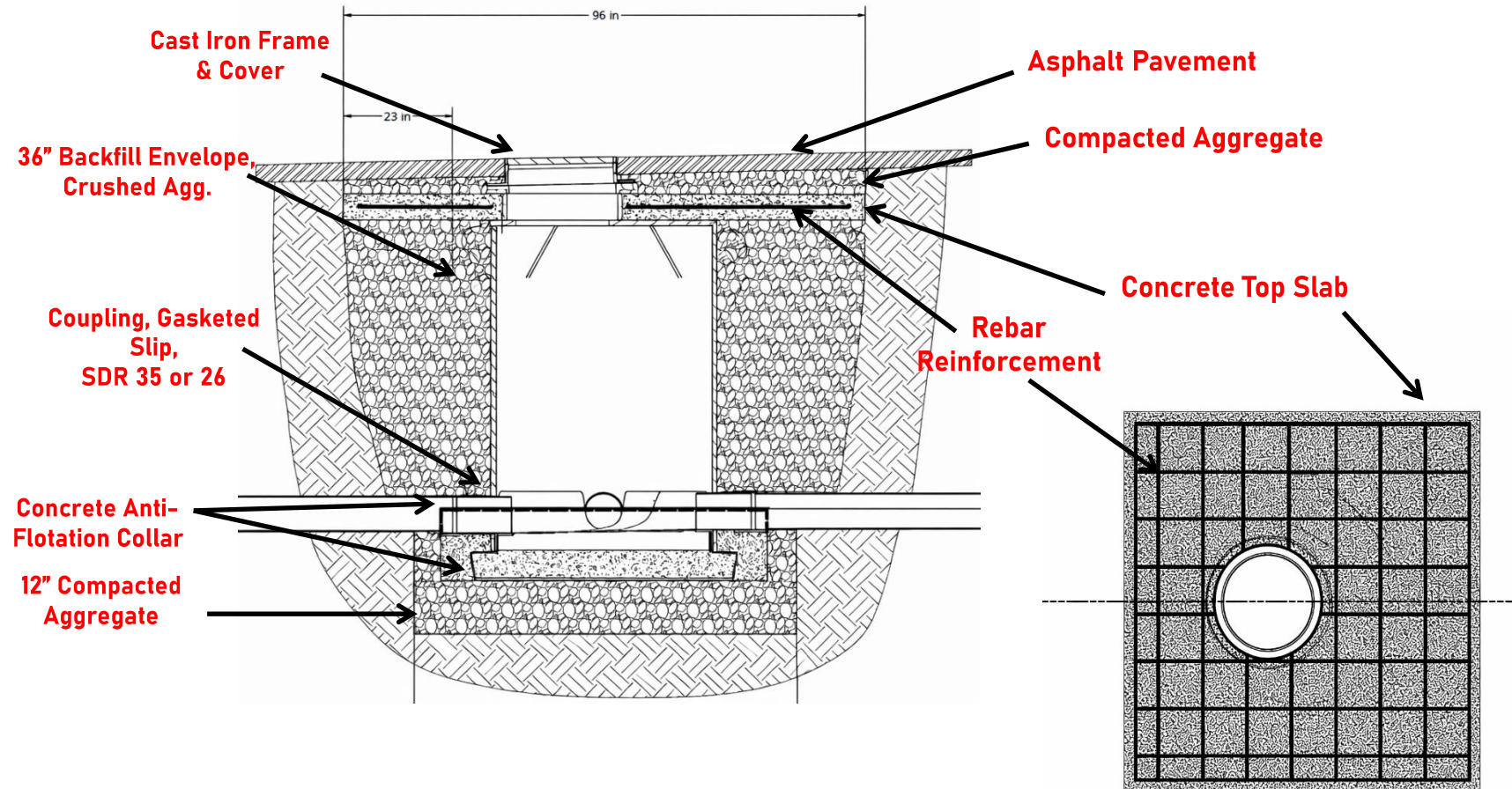
Bedding & Backfill



Backfill & Bedding Standards:

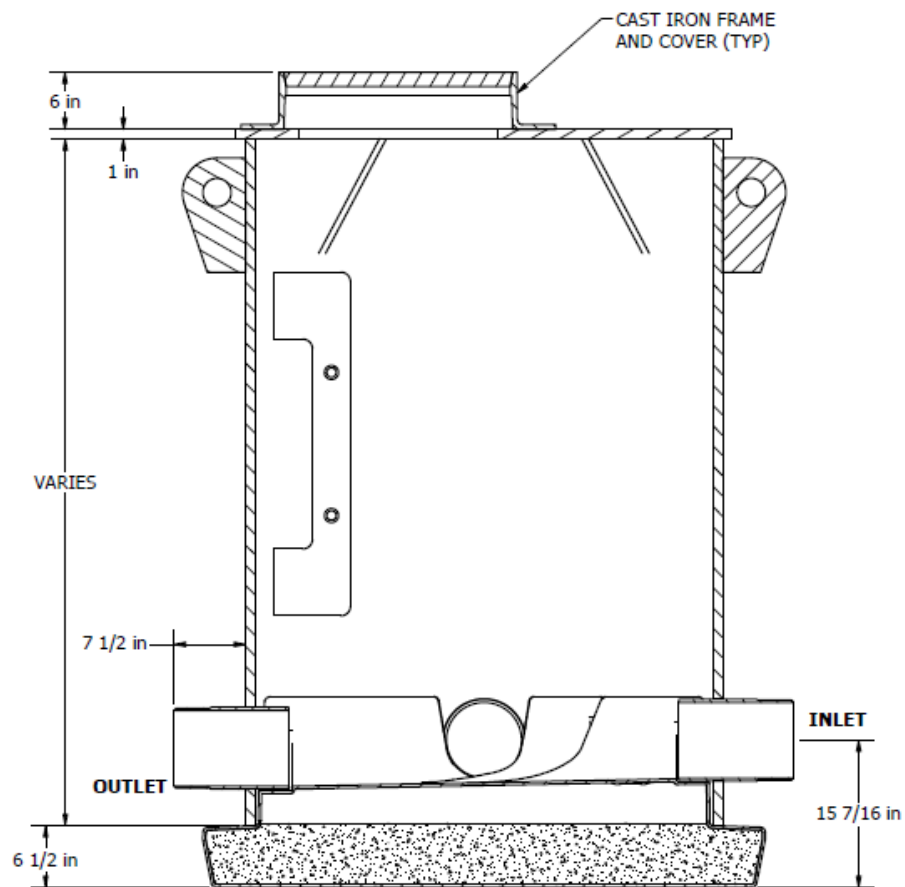
- 12" Compacted Bedding
- ASTM D2321 Standards
- 95% Standard Proctor

Traffic Bearing Top Details



- 4000 PSI
- #4 Rebar @ 13" O.C.
- HS-25 / H-20 Capability

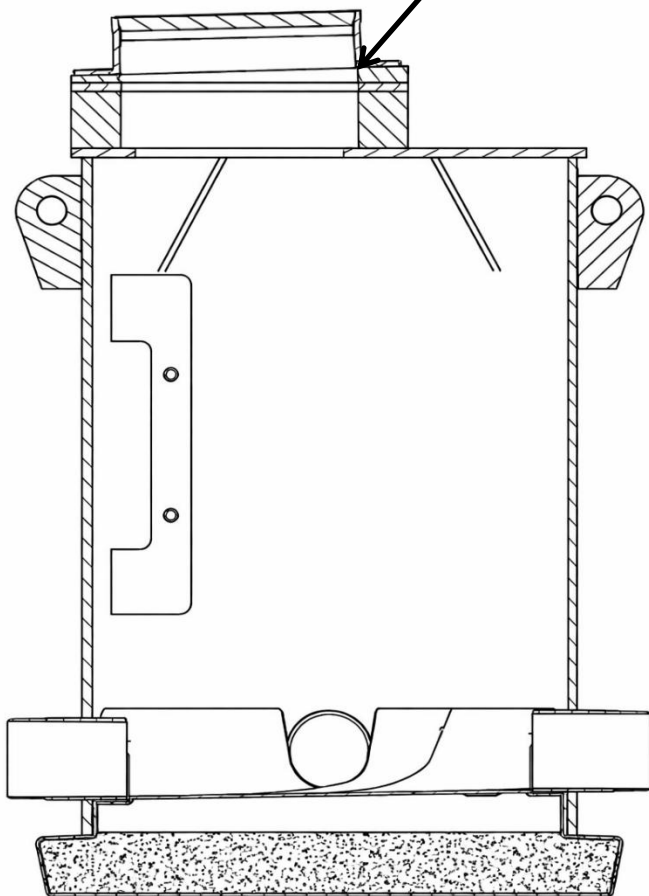
Direct Frame & Cover Mount



- ❑ **Frame & cover bolts directly to the flat HDPE top**
- ❑ **No Riser rings required**
- ❑ **Simplest and fastest installation**
- ❑ **Used when you have luxury to massage the grade:**
 - ❑ **Greenfield installations**
 - ❑ **Undeveloped open land**
 - ❑ **Rural gravity sewer**
 - ❑ **Areas where final grade can be shaped to the structure**

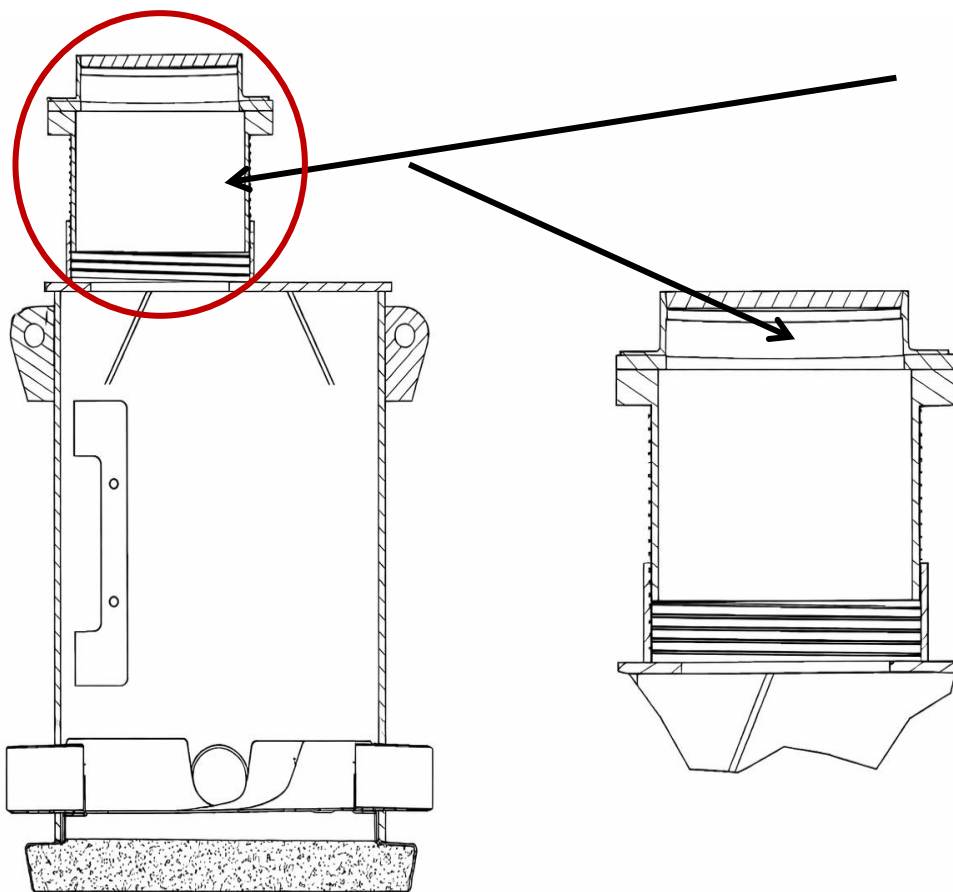
12 INSTALLATION DETAIL: NO RISER
VIEW:SECTION D:D SCALE:3/4" = 1'

Grade Adjustment Ring System



- ❑ **Cretex / Ladtech style adjustment rings**
- ❑ **Stackable configuration**
- ❑ **Accommodates angle rings for sloped pavement**
- ❑ **Flexible final elevation control**
- ❑ **When Used:**
 - ❑ **Fine finished grading areas**
 - ❑ **Controlled landscape restoration**
 - ❑ **Minor elevation corrections required**
 - ❑ **Up to 24" adjustments**

Screw-Top Adjustable Riser System



- ❑ 8" threaded vertical adjustment
- ❑ Rapid fine-tuning in field
- ❑ 2" minimum thread engagement
- ❑ SikaFlex 221 sealing
- ❑ Can be combined with adjustment rings
- ❑ When Used:
- ❑ Urban installations
- ❑ Pavement areas
- ❑ Highly controlled final grade
- ❑ Precision elevation adjustments required

Technical Standards & Compliance

Core Manhole Standard

- ❑ **ASTM F1759** – *Design of High-Density Polyethylene (HDPE) Manholes for Subsurface Applications*
- ❑ **Material Requirements (HDPE Resin)**
- ❑ **ASTM D3350** – *Polyethylene Plastics Pipe and Fittings Materials*
- ❑ **Installation & Backfill**
- ❑ **ASTM D2321** – *Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications*

Gaskets / Seals

- ❑ **ASTM F477** – *Elastomeric Seals (Gaskets) for Joining Plastic Pipe*
- ❑ **Acceptance Testing (Sanitary)**
- ❑ **ASTM F1417** – *Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air*

Frequently used for sanitary sewer air testing.

HDPE Pipe Connections & Fittings (Sanitary Sewer)

Butt Fusion Fittings

- ❑ **ASTM D3261** – *Butt Heat Fusion Polyethylene Fittings*
- ❑ **Fabricated Fittings**
- ❑ **ASTM F2206** – *Fabricated Fittings of Butt-Fused Polyethylene*
- ❑ **Electrofusion**
- ❑ **ASTM F1055** – *Electrofusion Type Polyethylene Fittings*
- ❑ **Fusion Procedures**
- ❑ **ASTM F2620** – *Heat Fusion Joining of Polyethylene Pipe and Fittings*

Manhole Steps / Interior Hardware (if specified)

- ❑ **ASTM C478** – *Precast Reinforced Concrete Manhole Sections*
- Commonly referenced for dimensional/step spacing requirements even in non-concrete manholes.

Cast Iron Frames & Covers (Sanitary Manholes – 48")

For roadway sanitary manholes, these are the primary ASTM material standards:

- ❑ **ASTM A48/A48M** – *Gray Iron Castings*
- ❑ **Bolted / Watertight Covers (if required)**
- ❑ **ASTM F1143** – *Bolted, Raised, Oiltight and Watertight Manhole Cover Assembly*

Commonly Referenced but Non-ASTM

- ❑ **AASHTO M306** – Frames and Covers
- ❑ **AASHTO H-20 / HL-93 Load Rating**
- ❑ **ANSI Z245.30** – Manhole steps