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NOTES
1. J.R. Hoe & Sons Model Hoe-595 grates with 2-1/2" x 2-1/2" x 1/2" angle iron frame or approved equal.
2. Neenah R-4884-A with L 2" x 2" x 1/4" angle iron frame or approved equal. (outside right-of-way only)
3. All concrete shall be Class "A".
4. Designed for a minimum of HS-20 loading.
5. Depth greater than 4'-0" require #4, GR. 60, reinforcing bars on 12" centers each way in both walls and base.
6. A precast unit can be used if in compliance with MSD Standard Specifications and/or pre-approved source list.

TYPICAL SECTION

3/16" Gap

SHOP WELD

3/8" Dia. Rod Anchor @ 12" O.C.

ANCHOR DETAIL

See Table
(Max. Depth = 8"

See Notes ① & ②

FLOW

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<td>2'-4&quot;</td>
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<td>2'-10&quot;</td>
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</tbody>
</table>

Louisville and Jefferson County Metropolitan Sewer District
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-547-6032 — www.msdouky.org

CATCH BASIN TYPE 1

STANDARD DRAWING NO. DC-01-01

APPROVED BY: D. R. Johnson

DATE 9/30/2009
NOTES:
1. Concrete shall be Class "A".
2. Any catch basin exceeding interior dimensions of 2'x3' will require a concrete top slab of appropriately sized thickness and reinforced with an opening (2'x3') to receive frame and grate.
3. For precast basins the opening for the pipe shall be the outside diameter of the pipe plus 3 inches if non-shrink grout is used.
4. Size of basin needs to be checked if pipe is skewed.
5. Use DG-05 or DG-06 Frame and Grate as specified.
6. Depths greater than 4'-0" require #4, Gr. 60 reinforcing bars on 12-inch centers each way in both walls and base.
7. A precast unit can be used if in compliance with MSD Standard Specifications and/or pre-approved source list.
NOTES:
1. Concrete shall be Class "A".
2. For precast basins the opening for the pipe shall be the outside diameter of the pipe plus 3 inches if non-shrink grout is used.
3. Size of basin needs to be checked if pipe is skewed.
4. Formerly City of Louisville single grate street inlet Type T-109.
5. Use Frame and Grate DG-01 or DG-02 as specified.
6. Depth greater than 4'-0" require #4, Gr. 60 reinforcing bars on 12 inch centers each way in both walls and base.
7. A precast unit can be used if in compliance with MSD Standard Specifications and/or pre-approved source list.

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Minimum Depth</th>
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</thead>
<tbody>
<tr>
<td>12&quot;</td>
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<td>2'-5&quot;</td>
</tr>
<tr>
<td>18&quot;</td>
<td>2'-8&quot;</td>
</tr>
</tbody>
</table>
NOTES:
1. Concrete shall be Class "A".
2. For precast basins the opening for the pipe shall be the outside diameter of the pipe plus 3 inches if non-shrink grout is used.
3. Size of basin needs to be checked if pipe is skewed.
4. Formerly City of Louisville double grate street inlet Type T-109.
5. Use DG-03 or DG-04 Frame and Grate as specified.
6. Depths greater than 4'-0" require #4, Gr. 60 reinforcing bars on 12-inch centers each way in both walls and base.
7. A precast unit can be used if in compliance with MSD Standard Specifications and/or pre-approved source list.

<table>
<thead>
<tr>
<th>Pipe Size</th>
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<tbody>
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<td>3'-0&quot;</td>
</tr>
<tr>
<td>24&quot;</td>
<td>3'-3&quot;</td>
</tr>
</tbody>
</table>
1. Concrete shall be Class "A".
2. Reinforcing steel shall be Grade 60.
3. For frame and grate see Std. Dwgs. DG-01 or DG-02.
4. For lower portion of structure see Std. Dwgs. GM-02 or GM-03.
NOTES

1. Concrete shall be Class "A".
2. Reinforcing steel shall be Grade 60.
3. For frame and grate see Std. Dwgs. DG-03 or DG-04.
4. For lower portion of structure see Std. Dwgs. GM-02 or GM-03.
5. Formerly City of Louisville Standard Catch Basin Precast, Type T-107.
6. Design for HS-20 loading.
1. Concrete shall be Class "A".
2. Reinforcing steel shall be Grade 60.
3. For frame and grate see Std. Dwgs. DG–05 or DG–06.
4. For lower portion of structure see Std. Dwgs. GM–02 or GM–03.
5. Formerly City of Louisville Standard Catch Basin Precast, Type T–107.
NOTES:
2. Design for H-20 Loading.
3. HOE-165-A; or approved equal.
4. Minimum Weight:
   Grate = 53lbs., Frame = 85lbs.
5. Not to be used in paved areas.
6. A precast unit can be used in compliance with MSD Standard Specifications and/or pre-approved source list.

18” x 18” YARD DRAIN

DI-06-02

11/19/2012
12" SQUARE HINGED CAST IRON GRATE BY NYLOPLAST USA INC.

CONCRETE COLLAR

2'-0"

2'-0"

1/2"

MIN. DEPTH 32"

4" THRU 12" GASKETED BELL X 10" SPECIAL N-12 ADAPTER BY ADVANCED DRAINAGE SYSTEMS INCORPORATED OR NYLOPAST USA, INC. OR APPROVED EQUAL.

COMPACTED KY. NO. 57 STONE BACKFILL

4" TRHU 12" DIA. NON-PERFORATED N-12 PIPE BY ADVANCED DRAINAGE SYSTEMS INC. OR APPROVED EQUAL

4" THRU 12" DIA. PERFORATED OR NON-PERFORATED HDPE N-12 PIPE BY ADVANCED DRAINAGE SYSTEMS INC. OR APPROVED EQUAL

4" THRU 12" X 4" THRU 36" GASKETED N-12 TEE BY ADVANCED DRAINAGE SYSTEMS INC. OR APPROVED EQUAL

TO BE USED IN NON TRAFFIC AREAS.

12" x 12" YARD DRAIN

STANDARD DRAWING NO. DI-07-00

MSD
Louisville and Jefferson County Metropolitan Sewer District
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-587-0603 - WWW.MSDLOUVY.ORG

APPROVED BY: [Signature]
DIRECTOR OF ENGINEERING
DATE 9/30/2009
NOTES:
1. Material shall be Gray Iron and meet ASTM A–48 Class 35–B Standards.
2. Minimum combined weight shall be 423 LBS.
4. The grates shall be NEENAH R–3157–1 or HOE 445 or approved equal.
5. Fits opening size of 1'-4" x 2'-5".
6. Curb iron must include either environmental message: (1) DUMP NO WASTE...DRAINS TO STREAM (2) NO DUMPING...DRAINS TO STREAM
NOTES

2. Design for HS-20 Loading.
3. NEENAH R-3157-2 with Type "L" vane grate; or approved equal.
4. Curb iron must include either environmental message:
   (1) DUMP NO WASTE...DRAINS TO STREAM
   (2) NO DUMPING...DRAINS TO STREAM
5. Minimum Weights:
   Grate = 95lbs., Frame = 220lbs., Curb Iron = 93lbs
NOTES:
2. Design for HS-20 Loading.
3. NEENAH R-3157-2 w/ SPECIAL 6" HIGH FRAME, TYPE "L" VANE GRATE, AND CURB BOX; or approved equal.
4. Curb iron must include either environmental message:
   (1) DUMP NO WASTE...DRAINS TO STREAM
   (2) NO DUMPING...DRAINS TO STREAM
5. Minimum Weights:
   Grate = 100lbs., Frame = 268lbs., Curb Iron = 75lbs
NOTES:
   Class 35-B.
4. Fits opening size of 2'-0 1/4" x 3'-1".
5. Neenah R-3157-A or Hoe-730 or approved equal.
6. Curb iron must include either environmental message:
   (1) DUMP NO WASTE...DRAINS TO STREAM
   (2) NO DUMPING...DRAINS TO STREAM
NOTES:

3. Fits opening size of 2'-0 1/4" x 3'-1".
4. NEENAH R-3157-A with Type "L" vane grates; or approved equal.
5. Curb iron must include either environmental message:
   (1) DUMP NO WASTE...DRAINS TO STREAM
   (2) NO DUMPING... DRAINS TO STREAM
6. Minimum Weights:
   Grate = 71lbs., Frame = 334lbs., Curb Iron = 190lbs.
NOTES:
   Class 35-B.
3. Fits opening size of 2'-0 1/4" x 3'-1".
4. NEENAH R-3157-A w/ SPECIAL 6" HIGH FRAME, TYPE "L"  
   VANE GRATE, AND CURB BOX; or approved equal.
5. Curb iron must include either environmental message:
   (1) DUMP NO WASTE...DRAINS TO STREAM  
   (2) NO DUMPING... DRAINS TO STREAM
6. Minimum Weights:  
   Grate = 76lbs./ea., Frame = 335lbs., Curb Iron = 115lbs.
NOTES:
   Class 35-B.
3. Designed for HS-20 loading.
4. Fits opening size of 1'-5" x 3'-1".
5. Neenah R-3425-B or Hoe-580 or approved equal.
NOTES:
   Class 35-B.
3. NEENAH R-3425-B w/ TYPE "L" VANE GRATES;
   or approved equal.
4. Minimum Weights:
   Grate = 76lbs., Frame = 362lbs.
NOTES:
2. Minimum Weight:
   Grate = 88 lbs.
NOTES:
2. Design for H-20 Loading.
3. HOE 112 grate; or approved equal.
4. Minimum Weight:
   Grate = 112lbs.
NOTES:
2. Minimum Weight:
   Grate = 112lbs.
NOTES:
2. Design for H-20 Loading.
3. NEENAH R-4990DX with Type A grate; or approved equal.
4. Minimum Weights:
   Frame = 4.5lbs./LF
   Grate = 42lbs./LF
SECTION A–A

NOTES:
1. Concrete shall be Class "A".
2. Reinforcing steel shall be Grade 60.
3. For use with 24" Pipe or smaller (Circular or Non–circular)

ELEVATION
NOTES:
1. All reinforcing steel shall be Grade 60.
2. Concrete shall be Class "A".
3. For use with 24" Pipe or smaller.
   (Circular or Non-circular)
NOTES:
1. All reinforcing steel shall be grade 60.
2. All concrete shall be Class "A".
3. For use with 24" pipe or smaller.
   (Circular or Non-circular)
NOTES

1. PRECAST CONCRETE FLARED END SECTION SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF A.A.S.H.T.O. M-170 CLASS III, WALL B REINFORCED CONCRETE PIPE.

2. CAST-IN-PLACE ANCHOR SHALL BE OF CLASS "A" CONCRETE FOR FULL WIDTH OF FLARED END SECTION.

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Louisville and Jefferson County Metropolitan Sewer District
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-587-0603 – www.msdlovky.org

FLARED END SECTION FOR R.C.P.
STANDARD DRAWING NO. DE-01-01
APPROVED BY: DIRECTOR OF ENGINEERING 9/30/2009

END VIEW
NOTES:
1. TOE PLATE TO BE PUNCHED TO MATCH HOLES IN SKIRT LIP. 3/8" GALV. BOLTS TO BE FURNISHED. LENGTH OF TOE PLATE IS W+10" FOR 12" TO 30" DIA. PIPE AND W+22" FOR 36" TO 60" DIA. PIPE.
2. SKIRT SECTION FOR 12" TO 30" DIA. PIPE TO BE MADE IN ONE PIECE.
3. SKIRT SECTION FOR 36" TO 54" DIA. PIPE MAY BE MADE FROM TWO SHEETS JOINED BY REVITING OR BOLTING ON CENTERLINE, 60" MAY BE CONSTRUCTED IN THREE PIECES.
4. CONNECTOR SECTION, CORNER PLATE AND TOE PLATE TO BE SAME SHEET THICKNESS AS SKIRT
5. END-SECTIONS AND FITTINGS ARE TO BE ALUMINUM ALLOY.

<table>
<thead>
<tr>
<th>PIPE DIA.</th>
<th>SHEET THICKNESS</th>
<th>A 1&quot;TOL.</th>
<th>B MAX.</th>
<th>H 1&quot;TOL.</th>
<th>L 1 1/2&quot;TOL</th>
<th>W 2&quot;TOL.</th>
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<td>114&quot;</td>
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COMPACTED SUBGRADE OR 6" KTC #57 STONE

ALTERNATE CONNECTION

TYPICAL CROSS-SECTION

ADDITIONAL TOE PLATE

ELEVATION
ELEVATION

NOTES:
1. Pipe shall be Trimmed Flush with End Treatment.
2. Concrete shall receive a light broom finish w/all exposed edges having a 1” Chamfer.
3. Do not elevate top of end treatment above edge of driveway.
NOTES:
1. Sodded or seeded ditches should **not** be used where slopes are 10% or greater or where the velocity is greater than 4 feet per second.
2. Sod shall be placed so that ditches shall be free-draining at the edge of all pavements and driveways.
3. Ditch lining shall be designed for full bank flow.

* Unless otherwise specified
NOTES:
1. Invert may be finished as a radius.
2. Curtain wall shall be constructed at beginning and end of ditch.
3. If a construction joint is used in the placing of the paved ditch, it shall be constructed with a curtain wall as detailed.
4. The ditch shall be Class "A" concrete with polypropylene fiber.
5. Intermediate anchors shall be used on grades 20% or steeper and spaced every 20 feet.
6. Sawed or tooled joints shall be spaced every 20 feet, (max.).
7. Broom finish perpendicular to flow.
LONGITUDINAL SECTION A–A

NOTES:
1. Class A Concrete with Polypropylene Fiber.
2. Curtain Wall shall be constructed at Beginning and End of Ditch.
3. If a Construction Joint is used in the placing of the Ditch, it shall be constructed as Detailed.
4. Intermediate Anchors shall be used on Grades 20% or Steeper and spaced every 20 feet.
5. Tooled Joints shall be placed every 20 feet (Max.)
6. Broom finish perpendicular to flow.
7. All Reinforcing Steel shall be Grade 60.

TYPICAL SECTION

DOWEL DETAIL

MSD
Louisville and Jefferson County Metropolitan Sewer District
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-587-0603 - www.MSDouKY.org

SLOPED BOTTOM PAVED DITCH

STANDARD DRAWING NO. DD-03-01

APPROVED BY:

DATE 9/30/2009
NOTES:
1. Class "A" concrete with polypropylene fiber.
2. Curtain walls shall be used at beginning and end of ditches.
3. Broom finish perpendicular to flow.

SECTION THRU CURTAIN WALL
NOTES:

1. CHANNEL LINING APRON INCREASES THE AMOUNT OF SHEER STRESS THE NATURAL RECEIVING CHANNEL CAN WITHSTAND WITHOUT EROSION.

2. L=20' MINIMUM. RECEIVING CHANNEL SHOULD BE CHECKED TO ENSURE MAXIMUM PERMISSIBLE SHEER STRESS VALUES ARE NOT EXCEEDED.
Paved Channel Outlets

Outlet protection should be installed early during construction activities, but may be added at any time, as necessary.

Installation:

Excavate subgrade below design elevation to allow for thickness of geotextile filter and channel lining. Install channel lining to a minimum thickness 1.5 times the maximum stone diameter.

Compact the fill used in the subgrade to the density of the surrounding undisturbed material. Subgrade should be smooth enough to protect the geotextile blanket from tearing.

Placement of the underlying geotextile blanket should be done immediately after subgrade preparation. The upper and lower ends of the blanket should be buried a minimum of 12-inches deep. Care should be taken not to damage the blanket when placing the channel lining.

Placement of channel lining should follow immediately after placing the geotextile blanket. The channel lining should be placed so that it produces a dense, well-graded mass of stone with minimum voids.

Hand placing the channel lining may be necessary to achieve the required grades and a good distribution of stone sizes.

Immediately following installation, stabilize all disturbed areas with vegetation.

Pipe or channel outlets at the top of cut slopes or on slopes steeper than 10% should not be protected using just outlet protection as a result of the re-concentration and large velocity of flow encountered as the flow leaves the structural apron.

Inspection and Maintenance:

Once properly installed, outlet protection should require little maintenance. However, outlet protection should be inspected periodically to determine if high flow rates have caused erosion and scouring to dislodge any of the stone.

Any necessary repairs should be made promptly.

Do not re-install stones above finished grade.
NOTES:
1. Concrete shall be Class "A".
2. Blocks to be laid on geotextile fabric specified for aggregate channel lining and leveled with KTC #9 or 9M crushed stone.
3. All dimensions shown are nominal.
NOTES:

1. Formwork shall be removed after concrete has met strength requirement.
2. Concrete shall be Class "A" with Polypropylene Fibers. (per standard specifications)
3. Subgrade shall be compacted and low areas filled with KTC #57 crushed stone.
NOTES:

1. Formwork shall be removed after concrete has met strength requirement.

2. Concrete shall be Class "A" with Polypropylene Fibers. (per standard specifications)

3. Subgrade shall be compacted and low areas filled with KTC #57 crushed stone.
APPROVED FIBERGLASS OR 1/4" A36 GALVANIZED STEEL PLATE WITH CONTINUOUS WELDS. BOLTED WITH 1/2" x 2" ANCHOR BOLTS (ALL ANCHOR BOLTS TO BE ZINC COATED IN ACCORDANCE WITH ASTM BS33 ASCI TYPE 111)

NOTE:
1. REQUIRED TO BE USED ONLY ON COMBINED SEWER CONNECTIONS.
2. REFERENCE GM-08-01 FOR AGREEMENT.
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<th>SECTION</th>
<th>DRAWING TITLE</th>
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<td>P.V.C. SLANTING DROP INLET</td>
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<td>GAUGING MANHOLE</td>
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Use Grout Ring when reworking existing manhole

Manhole Barrel Thickness

2 #5 Dowel Bars each side of pipe (Typ)

See Note 1

Base of inlet to rest on undisturbed footing for excavation in earth.

Min. 6" Crushed Stone KTC #57 (Rock section only)

NOTE

1. Sewer Pipe Connection to precast manhole with Positive Seal Gasketing System (A.S.T.M. C-923). Gasket shall be as manufactured by the Press Seal Gasket Co., A-Lok or Kor-N-Seal manhole pipe connectors or approved equal for sanitary sewers.
Use Grout Ring when reworking existing manhole

Manhole Barrel Thickness
(2) #5 Dowel Bars each side of pipe (Typ.)
1/2 Barrel Thickness

45° cut curve to be beveled at spigot

See Vertical Drop Detail

Min 6" Crushed Stone KTC #57
(Rock section only)

No Rock to Project Inside this Line

#5 Dowel Bars

Class "B" Concrete Encasement

NOTE:

1. Sewer pipe connection to precast manhole with Positive Seal Gasketing System (A.S.T.M. C–923). Gasket shall be as manufactured A–lok or Kor–N–Seal Manhole pipe connectors or approved equal for sanitary sewers.
NOTES:

1. Sewer pipe connection to precast manhole with Positive Seal Gasketing System (A.S.T.M. C-923). Gasket shall be as manufactured by A-loc or Kor-N-Seal Manhole gasket pipe connectors or approved equal for sanitary sewers.

2. The minimum diameter will be 5'-0" for an 8-inch sewer. For pipe sizes greater than 8-inches, the manhole diameter will need to be approved by MSD.

3. \( d = 1.1 \times \text{Pipe Diameter} \)

---

**INTERNAL DROP INLET**

Standard Drawing No. SD-05-01

**MSD**

Louisville and Jefferson County Metropolitan Sewer District
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-587-0633 - www.msdlouky.org

Approved by:
Director of Engineering
9/30/2009
Class "B" Concrete
1/2 Pipe O.D. (Min.)

Sheeting (See Note 2)

Class "B" Concrete
Cradle under and opposite Stacks, on pipe sewers 30" or smaller

SECTION "A-A"

UNDISTURBED EARTH

DETAIL "A"

Min. 5" Crushed Stone
KTC #57
(Rock section only)

Base of stack to rest on undisturbed footing for excavation in earth

No rock to project inside this line
Place concrete against rock or earth
Under special conditions, wye branch may be turned upward at an angle if approved by the Engineer.

Extend encasement 2'-6" into undisturbed earth

4-#4 Dowels
Eq. Sp. 3" Clear

NOTES:

1. All rock loosened, shall be removed; voids created by such removal shall be refilled with crushed stone KTC #57.

2. Where concrete is poured against the sheeting or trench box, torred or other suitable paper shall first be attached to the sheeting. The sheeting will not be allowed to be removed until the concrete has sufficiently cured.
**NOTES:**

1. All rock loosened, shall be removed; voids created by such removal shall be refilled with crushed stone KTC #57.

2. Where concrete is poured against the sheeting or trench box, tarred or other suitable paper shall first be attached to the sheeting. The sheeting will not be allowed to be removed until the concrete has sufficiently cured.
1. Property service connections crossing under (over) the storm drain or utility conduit proposed or existing with less than (2) feet of clearance shall be capped (cradled) with 6” Class “B” Concrete in accordance with the typical concrete cap (concrete cradle) detail. The minimum clearance is 6-inches for all utilities and storm drains and 18-inches for water lines.

2. The contractor may install "T" Branches in lieu of "Y" Branches for connecting property service connections to the sewer. The contractor shall use "spurs" in the "T" Branches on all Reinforced Concrete Pipe sanitary sewers.

3. A cleanout will be required on all Siamese and individual connections placed as near as possible to the intersection of the common property line and the R.O.W. or sanitary sewer and drain easement line as shown.

4. The invert of a property service connection at end shall not be lower than crown of sewer pipe, unless approved by the engineer.

5. For a Siamese Connection, the primary service connection pipe shall be at least 6-inches in diameter. All Siamese connections must receive prior approval from M.S.D.

6. Detectable marking tape shall be installed as specified in section 4.3.3.8 of the MSD Specifications.
Pipe Shall Be DR 32.5 HDPE with a 6” inside diameter (IPS) and 0.2” wall thickness.

Compacted Subgrade

Threaded plug

Cleanout Casting

Vault Wall 7/16” ±1/16” Thick.
Polyethylene – ASTM D-1248, Ill A3P33
Polyvinyl Chloride (PVC) – ASTM D-1784, 14114C

Fill With KTC #57 Crushed Stone or Sand

KTC #57 Crushed Stone

45° Ell

45° Wye

Fernco Connector (Typ.)

Use Fernco reducer type connector, if necessary.

Crushed stone cradle per MSD standards KTC #57

See Plans For Size

Flow

Flow

ONE WAY CLEANOUT

STANDARD DRAWING NO. SC-01-02

APPROVED BY: _______________  9/30/2009  DATE
Pipe Shall Be DR 32.5 HDPE with a 6" inside diameter (IPS) and 0.2" wall thickness.

- Vault Wall: 7/16" ±1/16" Thick. Polyethylene - ASTM D-1248, III A3P33
- Polyvinyl Chloride (PVC) - ASTM D-1784, 14114C

See Plans for Size:
- Fill With KTC #57 Crushed Stone or Sand
- KTC #57 Crushed Stone
- 45° Double Wye
- Fernco Connector (Typ.)

Use Fernco reducer type connector, if necessary. Crushed stone cradle per MSD standards KTC #57.
NOTES:
2. Design for H-20 Loading.
3. VESTAL RM-15; or approved equal.
4. Minimum Weights:
   Lid = 13lbs., Frame = 16lbs.
**GREASE TRAP SPECIFICATIONS**

**USE:** The grease trap is to be used as a floating liquid and solid separation unit prior to allowing wastewater containing oils, greases and fats to flow into M.S.D. sewer. Sanitary (human) waste must not flow through the grease trap. Garbage grinders (disposals) should not be on a connection upstream of a grease trap.

**LOCATION:** The inlet end of the trap should be located a distance not more than five (5) feet from the outer perimeter of the structure at a point nearest the area where the separate kitchen line emerges from the building. The effluent line is to be connected to the public sewer. In addition, the tank must be located in a position accessible to vault-cleaning trucks. Both cleanout and outlet port must be fitted with a standard traffic manhole and frame cover.

---

**CONSTRUCTION:** Cast iron, PVC or polyethylene piping shall be used for the influent to the grease trap. PVC shall be a minimum schedule 40 PVC. The effluent pipe to the public sewer may be cast iron or other materials meeting the local and state plumbing code. The joints shall be of watertight construction. Joints to outside of trap may be flexible material.

**STRUCTURAL DESIGN:** It is the responsibility of the applicant to provide structural design (concrete thickness and composition with appropriate reinforcing steel) to meet the anticipated live and dead loads. Minimum of HS20 loading.
NOTES:
1. Sewer pipe connection to precast manhole with Positive Seal Gasketing System (A.S.T.M. C–923). Gasket shall be as manufactured by A–lok or Kor–N–Seal Manhole gasket pipe connectors or approved equal for sanitary sewers.

2. The minimum diameter will be 5'–0" for a 2–inch thru 6–inch sewer. For pipe sizes greater than 6–inches, the manhole diameter will need to be approved by MSD.

3. \( d = 1.1 \times \) pipe diameter

FORGE MAIN TO MANHOLE

---

**Louisville and Jefferson County Metropolitan Sewer District**
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-587-0003 ~ www.MSDlOUKY.ORG

**FORCE MAIN TO MANHOLE**

STANDARD DRAWING NO. **SF–01–01**

APPROVED BY: [Signature]
DIRECTOR OF ENGINEERING
DATE: 9/30/2009
Forcheda Gaskets or O-Ring or approved equal gaskets, furnished by the manhole manufacturer. A.S.T.M. C443 Latest Revision.

Sewer Pipe Connection to Precast Monitoring Station with Ker-N-Seal or equal Gasket per ASTM C-443 L.C.

DETAIL "A"
WATERTIGHT JOINT

DETAIL "B"
KORBAND

NOTES:

1. APPROVED PRECAST TOP SLAB WITH OFFSET-SET 2'-1" MONITORING STATION ENTRANCE OPENING REQUIRED. (A.S.T.M. C470-L.R)

2. APPROVED RUNG-TYPE STEPS SHALL BE FURNISHED AND PLACED IN THE BARREL BY THE MANUFACTURER ON 12" CENTERS IN A STRAIGHT LINE. (MONITORING STATION STEPS NOT SHOWN)

3. MONITORING STATION SHOULD BE LOCATED OVER A SEWER SECTION THAT IS REASONABLY LEVEL AND AT LEAST TEN DIAMETER SEWER LENGTHS FROM TURNS AND BENDS.

4. FOR VELOCITIES GREATER THAN 2 FEET PER SECOND, IT MAY BE NECESSARY TO INSTALL BAFFLES TO PERMIT A QUIET FLOW FREE FROM DISTURBANCES.

5. MAXIMUM DEPTH 20 FEET WITH EXCEPTIONAL CASE BEING CONSIDERED INDIVIDUALLY.

6. MONITORING STATION TO BE MADE WATERTIGHT.

7. SEE MSD STANDARD DRAWINGS GM-06-00 AND GM-07-00 FOR DETAILS.

MONITORING STATION FOR INDUSTRIAL WASTE (36" SEWER AND UNDER)

STANDARD DRAWING NO. SM-01-02

APPROVED BY: "Signature" 9/30/2009

DIRECTOR OF ENGINEERING
DATE
NOTES:
1) An aluminum 3'-6" square single leaf hinged door (Bilco J-5AL, or equal) shall be installed in the manhole slab top. The hinged side of the square lid is to be oriented parallel to the downstream flow direction.
2) Steps in the barrel section of the Precast manhole are to be installed in alignment with the downstream corner of the square lid on the opposite side from the lid hinge.
3) The concrete pad shall be constructed such that a minimum four foot section is oriented over the inlet pipe.
4) No bends, drop manholes, flow junctions, etc., shall be located within 25 pipe diameters upstream of the center of the manhole.
5) Downstream conduit slope shall be greater than or equal to upstream conduit slope with no obstruction within 10 pipe diameters downstream of the center of the manhole.
6) An appropriately sized flume (Plastifab with integral approach, or equal) shall be installed according to the manufacturer's specifications with the following:
   a) Built-in attachment: one 1/8" stainless steel bubble line; one 3/8" stainless steel sample line; one receptor for an American Sigma Pressure Sensor, or equal with quick disconnect clips for the cable.
   b) A two outlet, GFIC, 110 volt, AC electrical supply shall be supplied for exclusive use by MSD at the concrete pad, or within fifty feet so that the route of an extension cord will not cross a traffic zone.
7) General area lighting shall be provided to illuminate the vicinity of the manhole.
8) 4" diameter PVC conduit, with threaded adaptors and plugs (centered over the inlet channel), shall extend through the manhole slab top.
9) Guard posts Type "A", GG-01, shall be installed as directed by the engineer.
10) Parking shall be provided within 100 feet of the manhole for two MSD confined entry support vans. The route from parking to the manhole, for breathing air lines, shall not cross a traffic zone.
11) All locking mechanisms shall utilize dual locks, one supplied by MSD & the other supplied by the owner.
12) All reinforcing steel shall be Grade 60 and have a minimum cover of 2" on both faces.
13) Lift holes in manholes to be sealed with hydraulic cement.
14) 1' precast manhole section to be set when manhole top is poured.
15) For use in non-traffic areas only.
16) All concrete shall be Class "A".
17) Allowable conduit slope entering and exiting the manhole shall be limited to a specific maximum and minimum as per the following table:

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>MIN. % SLOPE</th>
<th>MAX. % SLOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>2.00</td>
<td>2.20</td>
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<tr>
<td>8&quot;</td>
<td>0.70</td>
<td>2.00</td>
</tr>
<tr>
<td>10&quot;</td>
<td>0.50</td>
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<td>1.40</td>
</tr>
<tr>
<td>21&quot;</td>
<td>0.19</td>
<td>1.40</td>
</tr>
</tbody>
</table>

*10" Conduit not approved for new installations.

MSD
Louisville and Jefferson County Metropolitan Sewer District
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-587-0603 – www.MSDLouisville.org

GAUGING MANHOLE
STANDARD DRAWING NO. SM-02-01
APPROVED BY: [Signature] 9/30/2009
<table>
<thead>
<tr>
<th>SECTION</th>
<th>DRAWING TITLE</th>
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<tbody>
<tr>
<td>MANHOLES</td>
<td>PRECAST MANHOLE - TYPE 1</td>
<td>GM-01-04</td>
</tr>
<tr>
<td></td>
<td>PRECAST MANHOLE - TYPE 2</td>
<td>GM-02-04</td>
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<tr>
<td></td>
<td>PRECAST MANHOLE - TYPE 3</td>
<td>GM-03-04</td>
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<tr>
<td></td>
<td>MANHOLE CHANNELIZATION</td>
<td>GM-04-01</td>
</tr>
<tr>
<td></td>
<td>STANDARD MANHOLE FRAME AND LID</td>
<td>GM-05-03</td>
</tr>
<tr>
<td></td>
<td>WATERTIGHT MANHOLE FRAME AND LID</td>
<td>GM-06-01</td>
</tr>
<tr>
<td></td>
<td>PRECAST CONCRETE COLLAR</td>
<td>GM-07-01</td>
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<tr>
<td></td>
<td>TRAPPED MANHOLE OR CATCH BASIN PRECAST</td>
<td>GM-08-02</td>
</tr>
<tr>
<td></td>
<td>1 1/2&quot; RISER RING</td>
<td>GM-09-01</td>
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<tr>
<td></td>
<td>23 3/4&quot; MACHINED ROUND MANHOLE COVER</td>
<td>GM-10-01</td>
</tr>
<tr>
<td>CRADLES AND ENCASEMENTS</td>
<td>CRUSHED STONE CRADLE</td>
<td>GC-01-01</td>
</tr>
<tr>
<td></td>
<td>CRUSHED STONE ENCASEMENT</td>
<td>GC-02-01</td>
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<tr>
<td></td>
<td>CONCRETE CAP</td>
<td>GC-03-01</td>
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<td></td>
<td>CONCRETE ENCASEMENT</td>
<td>GC-04-01</td>
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<tr>
<td>SIGNS</td>
<td>STORMWATER ADVERTISEMENT SIGN</td>
<td>GS-01-01</td>
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<tr>
<td></td>
<td>WASTEWATER ADVERTISEMENT SIGN</td>
<td>GS-02-01</td>
</tr>
<tr>
<td>GUARD POSTS AND GATES</td>
<td>GUARD POST TYPE A</td>
<td>GG-01-01</td>
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<tr>
<td></td>
<td>GUARD POST TYPE B</td>
<td>GG-02-01</td>
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<tr>
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<td>GUARD POST LAYOUT</td>
<td>GG-03-01</td>
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<td>STANDARD PIPE GATE</td>
<td>GG-04-01</td>
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<tr>
<td>BORE / TUNNEL</td>
<td>BORE / TUNNEL SECTION</td>
<td>GB-01-01</td>
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</tbody>
</table>
NOTES

1. All rock loosened, shall be removed. Voids created by such removal shall be refilled with Crushed Stone KTC #57.

2. Manhole frame and lid shall be MSD Standard unless otherwise noted. Reference Std. Drawings GM-05, GM-06.

3. In lieu of poured Class "A" concrete inverts, precast inverts may be substituted.

4. Sewer pipe connection to precast manhole with positive seal gasketing system (ASTM C-923). Gasket shall be as manufactured by the Press Seal Gasket Co., A-lok, Kor-N-Seal or equal with stainless steel banded manhole pipe connectors for sanitary sewers.

5. Reference MSD Standard Specifications—Section 5.2.9. Steps shall not be placed above pipe larger than 18" diameter.

6. No rock fragments will be allowed within 6-inches of structure.

7. Manhole shall meet all of the requirements of ASTM. C478, C913.

8. Backfill according to MSD Standard Specifications.

9. Total height of all collars shall not exceed 12 inches.

10. 5" for 48" diameter, 6" for 60" diameter and 7" for 72" diameter.

11. Manhole inverts shall have a minimum of 0.10’ fall through the structure unless any line exceeds 10%, at which point the "variable with sewer grade" note applies.

12. Internal mechanical Chimney seals are required on all new MSD manholes. Chemical bonding for chimney seals is to be used only for rehabilitation and only in non-paved areas. At a minimum, the seal will extend from a point 3 inches above the base of the manhole frame to a point 3 inches below the top of the concrete cone or top slab. If grade adjustments collars are used, the seal height will increase proportionally to the collar height. All material and installation procedures for mechanical and chemical seals will conform to Section 5 of MSD’s Standard Specifications.

13. The top of the concrete cone or top slab must have a minimum 3 inch vertical surface that is smooth and free of any form offsets or excessive honeycomb.

14. Install flexible push—on joint 3 feet from manhole to allow for settlement and reduce bending moments.

15. All base sections shall be monolithic.

16. Product not required in all situations. Section 5.3.4 of the MSD Specifications identifies the circumstances where sealant and joint wrap are used.
TYPICAL SECTIONS

1. No Protruding Rock Zone
2. Grout leveling course
3. Variable with sewer grade
4. 2" Min.
5. 1" Wash
6. 6" Dia.
7. Exterior Joint Wrap
8. 3.44"
9. Type B - Butyl Rubber Sealant
10. 3.63"
11. Type B - Butyl Rubber Sealant
12. Chimney Seal
13. Exterior Joint Wrap
14. Springline
15. EARTH ROCK
16. Diameter as required by the Manufacturer.

FOR NOTES SEE STANDARD DRAWINGS
GM-02-04 Page 2 of 2

PRECAST MANHOLE - TYPE 2

STANDARD DRAWING NO.  GM-02-04 Page 1 of 2

APPROVED BY:  DATE 9/30/2009
NOTES

1. All rock loosened, shall be removed. Voids created by such removal shall be refilled with Crushed Stone KTC #57.

2. Manhole frame and lid shall be MSD Standard unless otherwise noted. Reference Std. Drawings GM–05, GM–06.

3. In lieu of poured Class "A" concrete invert, precast invert may be substituted.

4. Sewer pipe connection to precast manhole with positive seal gasketing system (ASTM. C–923). Gasket shall be as manufactured by the Press Seal Gasket Co., A–lok, Kor–N–Seal or equivalent with stainless steel banded manhole pipe connectors for sanitary sewers.

5. Reference MSD Standard Specifications—Section 5.2.9. Steps shall not be placed above pipe larger than 18" diameter.

6. No rock fragments will be allowed within 6-inches of structure.

7. Manhole shall meet all of the requirements of ASTM. C478, C913.

8. Backfill according to MSD Standard Specifications.

9. Total height of all collars shall not exceed 12 inches.

10. 5" for 48" diameter, 6" for 60" diameter and 7" for 72" diameter.

11. Manhole invert shall have a minimum of 0.10' fall through the structure unless any line exceeds 10%, at which point the "variable with sewer grade" note applies.

12. Chimney seals, either internally mechanical or chemical, will be required on all new MSD manholes. At a minimum, the seal will extend from a point 3 inches above the base of the manhole frame, to a point 3 inches below the top of the concrete cone or top slab. If grade adjustments collars are used, the seal height will increase proportionally to the collar height. All material and installation procedures for mechanical and chemical seals will conform to Section 5 of MSD's Standard Specifications.

13. The top of the concrete cone or top slab must have a minimum 3 inch vertical surface that is smooth and free of any form offsets or excessive honeycomb.

14. Install flexible push-on joint 3 feet from manhole to allow for settlement and reduce bending moments.

15. All base sections shall be monolithic.

16. Product not required in all situations. Section 5.3.4 of the MSD Specifications identifies the circumstances where sealant and joint wrap are used.
TYPICAL SECTIONS

FOR NOTES SEE STANDARD DRAWINGS
GM-03-04 Page 2 of 2

PRECAST MANHOLE – TYPE 3

STANDARD DRAWING NO. GM-03-04 Page 1 of 2

APPROVED BY: [Signature]
DIRECTOR OF ENGINEERING 9/30/2009
NOTES

1. All rock loosened, shall be removed. Voids created by such removal shall be refilled with Crushed Stone KTC #57.
2. Manhole lid shall be MSD Standard unless otherwise noted. Reference Std. Drawings GM-05, GM-06.
3. In lieu of poured Class "A" concrete inverts, precast inverts may be substituted.
4. Sewer pipe connection to precast manhole with positive seal gasketing system (ASTM. C-923). Gasket shall be as manufactured by the Press Seal Gasket Co., A-lok, Kor-N-Seal or equal with stainless steel banded manhole pipe connectors for sanitary sewers.
5. Reference MSD Standard Specification—Section 5.2.9. Steps shall not be placed above pipe larger than 18” diameter.
6. No rock fragments will be allowed within 6—8 inches of structure.
7. Manhole shall meet all of the requirements of ASTM. C478, C913.
8. Backfill according to MSD Standard Specifications.
9. Total height of all collars shall not exceed 12 inches.
10. 5" for 48” diameter, 6" for 60” diameter and 7" for 72” diameter.
11. Manhole inverts shall have 0.10’ of fall through the structure unless any line exceeds 10%, at which point the “variable with sewer grade” note applies.
12. Install flexible push—on joint 3 feet from manhole to allow for settlement and reduce bending moments.
13. All base sections shall be monolithic.
14. Product not required in all situations. Section 5.3.4 of the MSD Specifications identifies the circumstances where sealant and joint wrap are used.
TYPICAL STRAIGHT FLOW

TYPICAL CURVE FLOW

MINIMUM DISTANCE BETWEEN OPENING FOR PIPE

TYPICAL 4-WAY FLOW

TYPICAL 3-WAY FLOW

TYPICAL CHANNELIZATION DETAILS FOR SANITARY SEWERS

PRECAST BASE

MINIMUM 0.1 FALL THROUGH MANHOLE

TYPICAL CROSS SECTION

CAST-IN-PLACE OR PRECAST INVERT AS REQUIRED

d = 1.1 x pipe diameter
NOTES:
4. Storm Manholes shall contain either of the following environmental messages in 1" raised lettering below "MSD" and above "LOUISVILLE" on a radius to the center point of the lid:
   (A) DUMP NO WASTE ... DRAINS TO STREAM
   (A) NO DUMPING ... DRAINS TO STREAM
5. A fish or other environmental logo may be included on the Storm Manhole Lid at the option of the Manufacturer.
Bolt Lid to frame with 1/2"-13 x 1 3/4" HX HD Stainless Steel Bolts & Stainless Steel Washers with Neoprene washer

2" Flush Letters

1 1/2" Flush Letters

(2) 1 1/4" Concealed Lift holes 180° Apart

(4) 1" Dia. Anchor Bolt Holes 90 Deg. apart on a 31 3/4" Dia. Bolt Circle

Cast groove in frame seat for 1/2" Dia. Neoprene Cord Gasket 40 Durometer

NOTE:
1. Designed for H25 loading.
2. Material: Cast gray iron ASTM A-48 Class 35B.
3. Minimum Weights: Fr. 200 LBS. Lid 134 LBS.
4. Neenah R-1916-D or HOE-345 Wt. or Approved Equal.

WATERTIGHT MANHOLE FRAME AND LID

MSD
Louisville and Jefferson County Metropolitan Sewer District
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-587-0023 - WWW.MSDLOUVY.ORG

STANDARD DRAWING NO.
GM-06-01

APPROVED BY: [Signature] 9/30/2009
DIRECTOR OF ENGINEERING DATE
NOTES:
1. CONCRETE STRENGTH—4500 PSI @ 28 DAYS
3. DESIGN LOAD—ASTM C478 & ASTM C478M (LATEST REVISION) ON MANHOLE ONLY.
4. COLLAR THICKNESS—2", 3", 4", 6", 9" & 12".
4. ALL EDGES HAVE A 3/16" x 45° CHAMFER.
1. For catch basins reference the following MSD Standard Drawings.  

<table>
<thead>
<tr>
<th>TOP SLAB</th>
<th>GRATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI-03</td>
<td>DG-01 \ DG-02</td>
</tr>
<tr>
<td>DI-04</td>
<td>DG-03 \ DG-04</td>
</tr>
<tr>
<td>DI-05</td>
<td>DG-05 \ DG-06</td>
</tr>
</tbody>
</table>

For manholes reference:

GM-01, GM-02, GM-03, GM-05, GM-06 & GM-07

2. Formerly City of Louisville Standard Catch Basin Precast, Type T-108.

3. Structure shall meet all requirements of ASTM C-478.

4. Sewer pipe connection to precast manhole with positive seal gasketing system (ASTM C-923). Gasket shall be as manufactured by the Press Seal Gasket Co., A-lok, Kor-N-Seal or equal with stainless steel band manhole pipe connectors for sanitary sewers or by the use of non-shrink grout when the opening is the diameter of the pipe plus 3-inches.

5. Concrete Encasement will be Class "B" and incidental to the structure unit price. The encasement will extend 1' beyond the trench excavation.

6. No rock fragments will be allowed within six inches of structure. Backfill according to MSD Standard Specifications.

7. Diameter for hole and removable stopper same as for standard 6" Pipe.

8. Incoming pipe inverts to be at or above outlet invert.

9. Reference DT-01 for trap details.

10. Outlet Pipe to be 6" diameter.
NOTES:
2. NEENAH 1979-0145; or approved equal.
NOTES:
3. HOE MC-420; or approved equal.
4. Minimum Weight:
   Lid = 166lbs.
5. All other details shall conform to MSD Standard Drawing GM-05-03.
CRUSHED STONE CRADLE

1. All rock loosened shall be removed: voids created by such removal shall be refilled with Crushed Stone KTC #57.

2. Backfill shall be as noted on the drawings.

3. Remove stone for pipe bails to provide full contact or bedding.

4. If "W" is exceeded, a Concrete Cradle shall be placed at such locations at the Contractor's expense. Applies to excavations in rock or earth.

5. Maximum Trench Width = 12" Above Outside Top of Pipe "D" + 2+2'-2'-8" over 48".
Maximum Allowable Trench Width 12" Above Outside Top of Pipe "W"

<table>
<thead>
<tr>
<th>Width</th>
<th>Diameter of Pipe &quot;D&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>2'-6&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>2'-8&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>2'-10&quot;</td>
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<td>6'-11&quot;</td>
<td>42&quot;</td>
</tr>
<tr>
<td>7'-6&quot;</td>
<td>48&quot;</td>
</tr>
<tr>
<td>D+2t+2'-8&quot;</td>
<td>over 48&quot;</td>
</tr>
</tbody>
</table>

If "W" is exceeded, a Concrete Cradle shall be placed at such locations at the Contractor's expense. Applies to excavations in rock or earth.

NOTES:

1. All rock loosened shall be removed; voids created by such removal shall be refilled with Crushed STone KTC #57.

2. Backfill shall not be noted on the drawings.

3. Remove stone for pipe bells to provide full contact of bedding.
NOTES:
1. All rock loosened shall be removed; voids created by such removal shall be refilled with Crushed Stone KTC #57.
2. If concrete is placed against sheeting, tarred or other suitable paper shall be first attached to the sheeting. The sheeting will not be allowed to be removed until the concrete has sufficiently cured.
3. The concrete cap may be placed against rock, if approved by the engineer.
4. Class "B" concrete shall be used.
5. Backfill shall be as noted on the drawing.
6. Remove stone for pipe bells to provide full contact of bedding.
NOTES:
1. The concrete encasement may be placed against rock, if approved by the engineer.
2. All rock loosened shall be removed; voids created by such removal shall be filled with Crushed Stone KTC #57.
3. Backfill shall be as noted on the drawings.
4. Contractor shall encase pipe a minimum of 6-inches above the pipe or to existing rock line, as shown on drawings.
5. Contractor shall keep pipe from floating during the placement of concrete.
6. If concrete is placed against sheeting, tarred or other suitable paper shall be first attached to the sheeting. The sheeting will not be allowed to be removed until the concrete has sufficiently cured.
7. Class "B" concrete shall be used.
your stormwater fees at work...

PROJECT NAME

cost: $00,000

for information call MSD 587-0603 or XXX-XXXX*

NOTES:
1. Sign will be good quality plywood – 3/4” MDO or equal.
2. Border and letters shall be blue (925 Federal Safety Blue), high gloss by Rustoleum.
3. Background board shall be white, (2766 high gloss white), by Rustoleum.
4. Letters may be painted or vinyl die-cut.
5. Letter type will be Helvetica light italic and Helvetica compact.
6. Mount sign on two 4 x 4 wooden posts painted same white.

* Field Office Telephone Number
your wastewater fees at work...

PROJECT NAME

cost: $00,000

for information call MSD 587-0603 or XXX-XXXX*

* Field Office Telephone Number

NOTES:

1. Sign will be good quality plywood – 3/4” MDO or equal.
2. Border and letters shall be blue (925 Federal Safety Blue), high gloss by Rustoleum.
3. Background board shall be white, (2766 high gloss white), by Rustoleum.
4. Letters may be painted or vinyl die-cut.
5. Letter type will be Helvetica light italic and Helvetica compact.
6. Mount sign on two 4 x 4 wooden posts painted same white.
NOTES:
1. Use in areas where Traffic mainly consist of cars and light trucks.
2. See guard post layout. Standard Drawing No. GG-03
NOTES:
1. Use in areas where Traffic mainly consists of heavy trucks.
2. See guard post layout. Standard Drawing No. GG-03
NOTES:
1. Make certain Guard Post Does Not interfere with Fire Hydrant or Fire Riser Pipe.
2. Refer to Guard Post Type A or B.
NOTES:

1. All pipe shall be Schedule 40 Steel, primed and painted with black enamel.
2. The 4" inner hinge pipe shall be coated with axle grease. The inner hinge pipe shall not be painted.
3. All welds shall be shop welded.
4. All pipe shall have steel caps welded on the ends of exposed pipe.

LOCKING MECHANISM
Steel casing pipe (30-inch minimum inside diameter or 12-inches larger than largest outside carrier pipe diameter) tunnel liner plates (48" inch minimum outside diameter)

See note 3 for backfilling of annular space

8" MINIMUM

4" MINIMUM (Bore or Tunnel)

4" Drain Pipe Required if Grout used to fill annular space

NOTES

1. Carrier pipe shall be blocked or supported within casing as detailed in MSD Specifications.

2. Voids outside casing pipe to be filled with cement grout under pressure.

3. The annular space between the casing/liner and the carrier pipe shall be filled with grout, or with pneumatic backstowed pea gravel or No. 9 crushed stone.

4. See MSD Specifications section 7 for design requirements.
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<td>CONCRETE DRIVEWAY WITH SWALE</td>
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Transition from Roll Curb to Vertical Curb (See Standard Drawing No. PC-03-00)
NOTES:

1. Curb and Gutter shall have a broom finish perpendicular to flow of traffic.

2. See Curb to Catch Basin Transition Detail (Standard Drawing No. PC-03-00)

Class "A" Concrete with Polypropylene Fibers (Per Standard Specifications)
Roll Curb | 5'-0 TRANSITION | CURB IRON | 5'-0 TRANSITION | Roll Curb

PLAN

ELEVATION

TRANSITION - ROLL CURB TO CURB CATCH BASIN

Standard Curb | 5'-0 TRANSITION | CURB IRON | 5'-0 TRANSITION | Standard Curb

TRANSITION - STANDARD CURB TO CURB CATCH BASIN
NOTES

1. The final saw cut shall be made a distance of 12 inches beyond the trench, after trench excavation and backfill are complete, and immediately prior to placing concrete. If the distance from the edge of the trench to an existing break or joint is less than 4 feet, the final saw cut shall be located at the existing break or joint.

2. Concrete cap to be 8 inches. If the existing pavement section is less than 8 inches thick, excavation of underlying stone base or soil subgrade will be required to provide the specified thickness.

3. Use of compacted KTC No. 57 stone in lieu of sand backfill may be allowed on a case by case basis with prior approval from MSD.

4. In roadway embankment situations when sand backfill is utilized, compacted earth shall be placed in this zone within 5 feet (horizontal distance) of the embankment slope.

5. The Contractor shall be responsible during the ensuing 5 years for proper backfilling and replacement of the surface. During the 5 year period any pavement settlement shall be immediately repaired by the Contractor at the expense of the Contractor.
NOTES

1. The final saw cut shall be made a distance of 12 inches beyond the trench, after trench excavation and backfill are complete, and immediately prior to placing concrete.

2. Concrete cap to be 8 inches thick. If the existing pavement section is less than 10" thick excavation of underlying stone base or soil subgrade will be required to provide the specified thickness.

3. Use of compacted KTC No. 57 stone in lieu of sand backfill may be allowed on a case by case basis with prior approval of M.S.D.

4. Use of processed coal bottom ash that meets the requirements for Type 1A backfill, as described in section 3.2.2 of MSD Standard Specs, in lieu of sand may be allowed on a case by case basis with prior approval of MSD.

5. In roadway embankment situations, when sand backfill is utilized, compacted earth shall be placed in this zone within 5 feet (horizontal distance) of the embankment slope.

6. Tack material consisting of emulsified asphalt SS–1h shall be placed on the surface of the concrete cap at the rate of 0.1 gallon per square yard, and allowed to "break" prior to the placement of the asphalt surface.

7. Pavement joints shall be sealed with an approved joint sealant after placement of asphalt surface.

8. The Contractor shall be responsible during the ensuing 5 years for proper backfilling and replacement of the surface. During the 5 year period any pavement settlement shall be immediately repaired by the Contractor at the expense of the Contractor.
NOTES

1. Thickness of compacted DGA base to be 8". If the existing pavement section is less than 10 inches thick, excavation of underlying stone base or soil subgrade will be required to provide the specified thickness.

2. Tack material consisting of emulsified asphalt SS-1h shall be placed on the surface of the existing asphalt surface and the compacted asphalt binder at the rate of 0.1 gallons per square yard, and allowed to "break" prior to placement of the full width asphalt surface.

3. Use of compacted KTC No. 57 stone in lieu of sand backfill may be allowed on a case by case basis with prior approval of M.S.D.

4. Use of processed coal bottom ash that meets the requirements for Type 1A backfill, as described in section 3.2.2 of MSD Standard Specs, in lieu of sand may be allowed on a case by case basis with prior approval of MSD.

5. The Contractor shall be responsible during the ensuing 5 years for proper backfilling and replacement of the surface. During the 5 year period any pavement settlement shall be immediately repaired by the Contractor at the expense of the Contractor.

6. Use 2 inch thick binder on Subdivision streets. Use 4 inch thick (2-2 inch thick layers) on County through roads.
TRENCH BACKFILL FOR PIPE WITHIN A ROADWAY EMBANKMENT

NOTE
When sand or crushed stone is utilized as trench backfill for pipes crossing a roadway embankment, compacted earth shall be utilized as trench backfill within 5 feet of the embankment sideslope with a minimum the embankment sideslope with a minimum
NOTES:

1. Contractor shall match proposed centerline with existing.
2. All concrete shall be Class "A" with polypropylene fiber.
3. Contraction must be tooled a minimum of 1 1/2". 1 1/2" deep saw cut may be allowed on a case by case bases if beveling is preformed.
4. The concrete shall have a broomed finish perpendicular to the direction of traffic.
5. If there is vehicle tracking outside the existing driveway flare, the flare shall be made one foot wider than the tracked area on both sides of the flare. The total flare shall not be less than 18'-0".
6. Place 1/2-inch thick expansion joint material between the driveway and the sidewalk. Seal joint.
7. Driveway shall have a minimum of 4-inches of compacted Dense Graded Aggregate.
8. If all portions of the pipe are below the bottom of the 6" concrete drive, no thickened section will be required over the pipe; however the contraction joint is still required.
NOTES:

1. Contractor shall match proposed centerline with existing.

2. If there is vehicle tracking outside the existing driveway flare, the flare shall be made one foot wider than the tracked area on both sides of the flare. The total flare shall not be less than 18'-0". 

SECTION A-A

2" Bituminous Concrete Surface (Class "A")

4" Min. at Pipe Bell

Existing Sidewalk

Pipe (See plans for Size)

4" Dense Graded Aggregate

SECTION B-B
NOTES:
1. Contractor shall match proposed driveway centerline with existing.
2. All concrete shall be Class “A” with polypropylene fiber.
3. The concrete shall have a broomed finish perpendicular to the direction of traffic.
4. If there is vehicle tracking outside the existing driveway flare, the flare shall be made one foot wider than the tracked area on both sides of the flare. The total flare shall not be less than 18'-0".
5. Place 1/2-inch thick expansion joint material between the driveway and the sidewalk. Seal joint.
6. Driveway shall have a minimum of 4-inches of compacted Dense Graded Aggregate.
7. The proposed trench drain grate elevation shall be a minimum of 1/2-inch below the sidewalk elevation in all cases.
8. Use this end treatment detail when the trench drain depth at the low end is greater than 12-inches. Cut grate to fit.
9. Use this end treatment detail when the trench drain depth at the low end is 12-inches or less. Cut grate to fit.
10. Trench drain ends shall have angle iron or steel end plates to hold grates within the concrete structure.
11. Location of control joint to be determined by contractor’s paving sequence. Joint to be tooled 1 1/2" deep. May be saw cut if joint beveling follows.

Straight Grade Between Sidewalk And Pavement (See Note 8).

SECTION A-A

CONCRETE DRIVEWAY WITH TRENCH DRAIN

SECTION B-B

MSD
Louisville and Jefferson County Metropolitan Sewer District
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-587-0603 – WWW.MSDLOUKY.ORG

CONCRETE DRIVEWAY WITH TRENCH DRAIN

STANDARD DRAWING NO. PD-03-01

APPROVED BY: 9/30/2009
NOTES:

1. Contractor shall match proposed centerline with existing.
2. All concrete shall be Class "A" with polypropylene fibers.
3. The concrete shall have a broomed finish perpendicular to the direction of traffic.
4. If there is vehicle tracking outside the existing driveway flare, the flare shall be made one foot wider than the tracked area on both sides of the flare, but the total flare shall not be less than 18'-0".
5. Place 1/2-inch thick expansion joint material between the driveway and the sidewalk.
6. Driveways shall have a minimum of 4-inches of compacted Dense Graded Aggregate.
7. Location of control joint to be determined by contractor's paving sequence. Joint to be tooled 1 1/2" deep. May be saw cut if joint beveling follows.

CORNER JOINTS REQUIRED IN ALL SITUATIONS.

* Maximum slope shall be 1"/1' = 8.33%  
** Maximum depth shall be 5"
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NOTES

1. UNCONSOLIDATED MATERIAL IS LOOSE STONE, GRAVEL, SAND, SOIL, OR MUCK NATURALLY DEPOSITED IN THE STREAM BED.

2. STOCKPILE BED MATERIAL AND SOIL IN SEPARATE STOCKPILES.

3. SOIL BACKFILL AND UNCONSOLIDATED BED MATERIAL SHALL BE SAME MATERIAL AS THAT REMOVED DURING EXCAVATION.

4. SOIL BACKFILL SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.

5. EXTEND EACH END OF DRAIN PIPE TO A MINIMUM OF 24 INCHES INTO CRUSHED STONE ENCASTEMENT.

6. 4" DRAIN IS OPTIONAL BASED ON SITE CONDITIONS.
**NOTES**

1. **UNCONSOLIDATED MATERIAL IS LOOSE STONE, GRAVEL, SAND, SOIL, OR MUCK NATURALLY DEPOSITED IN THE STREAM BED.**

2. **STOCKPILE BED MATERIAL SEPARATE FROM SPOIL MATERIAL.**

3. **UNCONSOLIDATED BED MATERIAL SHALL BE SAME MATERIAL AS THAT REMOVED DURING EXCAVATION.**

4. **EXTEND EACH END OF DRAIN PIPE TO A MINIMUM OF 24 INCHES INTO CRUSHED STONE ENCASEMENT.**

5. **4" DRAIN IS OPTIONAL BASED ON SITE CONDITIONS.**
1. USE THIS RESTORATION METHOD ON EXPOSED MONOLITHIC ROCK BEDS AND THOSE WITH LESS THAN 4 INCHES OF UNCONSOLIDATED BED MATERIAL DEPOSITED OVER A MONOLITHIC ROCK BED.

2. MINIMUM THICKNESS OF CAP STONE SHALL BE 8 INCHES.

3. EXTEND EACH END OF DRAIN PIPE A MINIMUM OF 24 INCHES INTO CRUSHED STONE ENCASEMENT.

4. 4" DRAIN IS OPTIONAL BASED ON SITE CONDITIONS.
Dozer treads create cleat imprints parallel to the slope contour.

Should be seeded and stabilized immediately.
TRACKING

Tracking is defined as driving tracked machinery up and down slopes, leaving the cleat imprints parallel to the slope contour.

When and Where to Use It:

To slow erosion, surface roughening by tracking should be done as soon as possible after the vegetation has been removed from the slope.

Tracking can be used with seeding, planting and temporary mulching to stabilize an area.

Tracking should be performed immediately after grading activities have ceased (temporarily or permanently) in an area.

Installation:

It is important to avoid excessive compacting of the soil surface when tracking because soil compaction inhibits vegetation growth and causes higher runoff rates. As few passes as possible should be made with the machinery in order to minimize compaction.

Surface roughened areas by the means of tracking should be seeded and mulched immediately.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24–hours after each rainfall event that produces ½–inches or more of precipitation.

If rills (small watercourses that have steep sides and are usually only a few inches deep) appear, they should be re–graded and re–seeded immediately.
STAIR STEPPING CUT SLOPES

DEBRIS FROM SLOPE ABOVE IS CAUGHT BY STEPS

DRAINAGE

4'

4'

WATER, SOIL, AND FERTILIZER ARE HELD BY STEPS – VEGETATION ESTABLISHES MORE EASILY ON THE STEPS.

SHOULD BE SEEDED AND STABILIZED IMMEDIATELY.

SOURCE: VA. DSWC
STAIR–STEP GRADING

Stair–Step Grading is defined as cutting stair–steps into slopes with each step having a maximum horizontal distance of 4–feet and a maximum vertical distance of 4–feet.

When and Where to Use It

To slow erosion, stair step grading should be done within 7 days after the vegetation has been removed from the slope.

Stair–step grading can be used with seeding, and planting to stabilize an area.

Installation:

Stair–step grading may be carried out on any material soft enough to be moved with a bulldozer. The ratio of vertical cut distance to horizontal distance should not be steeper than 1:1 and the horizontal portion of the “step” should slope towards the vertical wall.

Areas that are graded in this manner should be seeded immediately.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24–hours after each rainfall event that produces ½–inches or more of precipitation.

If rills (small watercourses that have steep sides and are usually only a few inches deep) appear, they should be re–graded and re–seeded immediately.
GROOVING IS CUTTING FURROWS ALONG THE CONTOUR OF A SLOPE. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND PROVIDE SOME COVERAGE OF LIME, FERTILIZER AND SEED.

SHOULD BE SEEDED AND STABILIZED IMMEDIATELY.
SLOPE GROOVING

Slope Grooving is defined by using machinery to create a series of ridges and depressions that run perpendicular to the slope on the contour.

When and Where to Use It:

To slow erosion, slope grooving should be done within 7 days after the vegetation has been removed from the slope.

Slope Grooving can be used with seeding and planting to stabilize an area.

Installation:

Slope Grooving may be installed with any appropriate implement that can be safely operated on the slope and will not cause undue compaction. Suggested implements include discs, chisel plows and the teeth on a front-end loader bucket. Such grooves should be a minimum of 3-inches deep and no further than 15-inches apart.

Areas that are graded in this manner should be seeded immediately.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24-hours after each rainfall event that produces ½-inches or more of precipitation.

If rills (small watercourses that have steep sides and are usually only a few inches deep) appear, they should be re-graded and re-seeded immediately.
ON STEEP SLOPES, APPLY STRIPS OF NETTING PARALLEL TO THE DIRECTION OF FLOW AND ANCHOR AS PER MANUFACTURER’S SPECIFICATIONS. (SLOPES GREATER THAN 1:1)

IN CHANNELS, APPLY NETTING PARALLEL TO THE DIRECTION OF FLOW.

SHALLOW SLOPE

LAY FROM BOTTOM UP W/ 4" LAP. KEY IN AT TOP OF SLOPE/BERM.

ON SHALLOW SLOPES, STRIPS OF NETTING MAY BE APPLIED ACROSS THE SLOPE. (SLOPES UP TO 1:1)

WHERE THERE IS A BERM AT THE TOP OF THE SLOPE, BRING THE NETTING OVER THE BERM AND ANCHOR IT BEHIND THE BERM.

BRING NETTING DOWN TO LEVEL AREA BEFORE TERMINATING THE INSTALLATION.
ORIENTATION OF NETTING AND MATTING

Installation:

The proper installation of netting and matting is different for each product, therefore the recommended installation procedure from the manufacturer should be followed.

Overlap the edges of each strip at least 4–inches and staple every 3–feet down the center of the overlap when overlapping separate strips of netting and matting.

Bring netting and matting down to a level area before terminating the installation. Turn the ends under at least 6–inches and staple the end of the matting at 12–inch intervals.

Netting and Matting must be applied so that it is in complete contact with the soil. If not, erosion will occur beneath it.

Netting should be securely anchored to the soil as recommended by the manufacturer guidelines.

Mulch binders should be applied at rates recommended by the manufacturer.

Inspection and Maintenance:

Areas protected by netting and matting should be checked for dislocation or failure every seven (7) calendar days and within 24–hours after each rainfall event that produces ½–inches or more of precipitation.

Regular inspections should take place until grasses are firmly established.

If washouts or breakage occurs, re–install netting and matting as necessary after repairing any slope damage.
SHAPE AND SMOOTH SOIL SURFACE TO FINAL GRADE. WORK PRESCRIBED LIME AND FERTILIZER INTO THE SOIL.

LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON’S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.

CORRECT

INCORRECT

BUTTING — ANGLED ENDS CAUSED BY THE AUTOMATIC SOD CUTTER MUST BE MATCHED CORRECTLY.
SODDING STANDARD

Installation:

Shape and smooth the soil surface to final grade in accordance with the approved grading plan.

Add lime to reach a soil pH value required by the specific grass. Fertilize according to a soil test or in the absence of a test use available nitrogen, phosphorous and potash as prescribed for permanent seeding. Work lime and fertilizer into the soil 3–6 inches deep and smooth the surface.

Clear the soil surface of trash, debris, roots, branches, stones and soil clods in excess of 2–inches of length or diameter. Rake soil surface to break crust just before laying sod, or irrigate soil lightly if the soil is dry. Do not install sod on hot, dry soil, compacted clay, frozen soil, gravel, or soil that has been treated with pesticides.

Sod should be harvested, delivered, and installed within a period of 36 hours. Store rolls of sod in the shade during installation. Sod should be free of weeds and be of uniform thickness (approximately 1–inch) and should have a dense root mat for mechanical strength.

Lay strips of sod beginning at the lowest area to be sodded with the longest dimension of the strip perpendicular to the slope, and stagger in a brick-like pattern. Wedge strips securely in place. Square the ends of each strip to provide for a close, tight fit. Match angled ends correctly to prevent voids.

Roll or compact immediately after installation to ensure firm contact with the underlying topsoil.

Irrigate the sod until the soil is wet to a depth of 4–inches, and keep moist until grass takes root.

If placed on steep slopes, sod should be laid with staggered joints and/or be pegged and stapled. In areas such as steep slopes or next to running waterways, chicken wire, jute, or other netting can be placed over the sod for extra protection against lifting.

Inspection and Maintenance:

Watering may be necessary after planting and during periods of intense heat and/or lack of rain (drought). Keep soil moist to a depth of 4–inches until sod is fully rooted.

Mow to a height of 2–3–inches after sod is well-rooted (2–3 weeks). Do not remove more than 1/3 of the shoot in any one mowing.

Permanently, fine turf areas require yearly applications of fertilizer and lime.

Inspect the sod every 7 days after it is first installed, especially within 24 hours of rain events that produce 0.5 inches or more precipitation, until it has established a permanent cover.
FILTER FABRIC INLET PROTECTION

Installation:

Filter fabric is used for inlet protection when storm water flows are relatively small (0.5 cfs or less) with low velocities and where the inlet drains a relatively flat area (slopes no greater than 5%). This practice cannot be used where inlets are paved or where inlets receive concentrated flows such as in streets or highway medians.

Extra-strength filter cloth (50 pounds / linear inch minimum tensile strength) should be used. Filter fabric shall be cut from a continuous roll to avoid joints.

Stakes shall be 2-in. x 4-in. wood with a minimum length of 3-feet. The height of the filter barrier above grade shall be a minimum of 1.5-feet and shall not exceed 2-feet.

Stakes shall be spaced around the perimeter of the inlet a maximum of 3-feet apart and driven into the ground a minimum of 1.5 feet.

A trench shall be excavated 4-inches wide and 8-inches deep around the outside perimeter of the stakes.

The filter fabric shall be stapled to the wooden stakes with staples made of heavy-duty wire at least ½-inch long.

The fabric shall be extended into the trench 8-inches.

The trench should be backfilled with soil or crushed stone and compacted over the filter fabric.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24-hours after each rainfall event that produces ½-inches or more of precipitation. Any needed repairs should be made immediately.

If the fabric becomes clogged, it should be replaced.

Sediment should be removed when it reaches approximately 1/3 the height of the fence. If a sump is used, sediment should be removed when it fills approximately 1/3 the depth of the hole. Maintain the pool area, always providing adequate sediment storage volume for the next storm. Take care not to damage or undercut fabric when removing sediment.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Use appropriate permanent stabilization methods to stabilize bare areas around the inlet.
18-1/2 IN. X 28 IN. WOVEN POLYPROPYLENE BAGS, FILL 1/2 – 2/3 FULL WITH #57 STONE

SURROUND INLET WITH TWO COURSES OF BAGS (MINIMUM)

INTERWEAVE BAG ENDS TO CLOSE GAPS BETWEEN BAGS AND TO SEAL BAGS

12 IN. MINIMUM

NOTE: THE 12-INCH HEIGHT REQUIREMENT IS WAIVED IN CASES WHERE IT WILL CAUSE FLOOD DAMAGE IF THE STONE BAGS ARE OVERTOPPED.

TYPE III STONE BAG SILT CHECK AT CATCH BASINS
NOT TO SCALE
STONE BAG INLET PROTECTION

Installation:

Stone fill bags shall be woven polypropylene bags with approximate dimensions of 18–1/2 inches by 28 inches.

The bags shall be filled ½ to 2/3 full with KTC #57 stone. Tie the ends of filled bags using either draw strings or wire ties.

Interweave the loose ends of the bags so that the gaps between bags are filled and the ends of the bags are sealed.

Completely surround the inlet with a minimum of two (2) rows of bags to a minimum of 12 inches in height.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24–hours after each rainfall event that produces ½–inches or more of precipitation. Any needed repairs should be handled immediately.

If sediment accumulates, remove it from the face of the bags before it accumulates to a height equal to 1/3 the structure height. Any needed repairs should be handled immediately. Take care not to damage or undercut the bags when removing sediment.

Remove and replace any damaged bags and dispose of them properly.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Use appropriate permanent stabilization methods to stabilize bare areas around the inlet.
Purpose:
Install stone bag protection at straight headwall inlets to pool water, providing opportunity for settling sediment before it enters headwall.

Design Criteria:
Bag specifications: Approximately 18 1/2-inch X 28-inch woven polypropylene bags.
Stone: Use KTC No. 57 Stone.
Height of stone bags above culvert inverts: Construct a minimum of two courses of bags. The stone-filled bags shall be stacked to a height equal to 1/2 the diameter of the culvert being protected.

Bid Units:
Installation: "Each"

Bid each stone bag inlet protection structure shown on the Erosion Prevention and Sediment Control Plan as a unit. Do not separate items such as stone and bags.

Maintenance: "Each"

Bid item provides for sediment removal and general upkeep for the life of the project. Replacement of inlet protection structures damaged by storm flows or natural deterioration will be reimbursed at the unit cost established for installation. Replacement of stone bag inlet protection that was damaged by activities incidental to construction will not be reimbursed. Inspect inlet protection every seven (7) days and after every storm event.
Purpose:
Install stone bag protection at winged headwall inlets to pool water, providing opportunity for settling sediment before it enters headwall.

Design Criteria:
Height of stone bags above culvert inverts: Construct a minimum of two courses of bags. The stone-filled bags shall be stacked to a height equal to 1/2 the diameter of the culvert being protected.

Bid Units:
Installation: "Each"

Bid each stone bag inlet protection structure shown on the Erosion Prevention and Sediment Control Plan as a unit. Do not separate items such as stone and bags.

Maintenance: "Each"

Bid item provides for sediment removal and general upkeep for the life of the project. Replacement of inlet protection structures damaged by storm flows or natural deterioration will be reimbursed at the unit cost established for installation. Replacement of stone bag inlet protection that was damaged by activities incidental to construction will not be reimbursed. Inspect inlet protection every seven (7) days and after every storm event.
**Purpose:**
Install stone bag protection at all headwall inlets to pool water, providing opportunity for settling sediment before it enters headwall.

**Design Criteria:**
Height of stone bags above culvert inverts: Construct a minimum of two courses of bags. The stone-filled bags shall be stacked to a height equal to 1/2 the diameter of the culvert being protected.

**Bid Units:**
Installation: "Each"

Bid each stone bag inlet protection structure shown on the Erosion Prevention and Sediment Control Plan as a unit. Do not separate items such as stone and bags.

Maintenance: "Each"

Bid item provides for sediment removal and general upkeep for the life of the project. Replacement of inlet protection structures damaged by storm flows or natural deterioration will be reimbursed at the unit cost established for installation. Replacement of stone bag inlet protection that was damaged by activities incidental to construction will not be reimbursed. Inspect inlet protection every seven (7) days and after every storm event.
SILT FENCE DETAIL

Installation:

The fence should be placed across the slope along a line of uniform elevation (perpendicular to the direction of flow). The fence should be located at least 10–feet from the toe of steep slopes to provide sediment storage and access for maintenance and cleanout.

A flat–bottom trench approximately 4–inches wide and 8–inches deep, or a V–shaped trench 8–inches deep should be excavated. On the downslope side of the trench, drive the 2–in. X 2–in. wood posts at least 18–inches into the ground, spacing them no further than 6–feet apart.

Posts should be installed, with 1– to 2–inches of the post protruding above the top of the fabric and no more than 3–feet of the post should protrude above the ground. The minimum fence height (height of filter fabric above grade) shall be 18–inches. The maximum fence height (height of filter fabric above grade) shall be 24–inches.

The filter fabric should be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter cloth should be wrapped together only at a support post with both ends securely fastened to the post, with a minimum 6–inch overlap.

Extra–strength filter cloth (50 pounds / linear inch minimum tensile strength) should be used. A 2–inch wide lathe shall be stapled over the filter fabric to securely fasten it the to the upslope side of the posts. The staples used should be 1.5–inch heavy–duty wire staples spaced a maximum of 8–inches apart.

Place the bottom 12–inches of the filter fabric into the 8–inch deep trench, extending the remaining 4–inches towards the up–slope side of the trench and backfill the trench with soil or gravel and compact.

Inspection and Maintenance:

Inspect silt fence every seven (7) calendar days and within 24–hours after each rainfall event that produces ½–inches or more of precipitation. Check for areas where runoff has eroded a channel beneath the fence, or where the fence was caused to sag or collapse by runoff overtopping the fence.

If the fence fabric tears, begins to decompose, or in any way becomes ineffective, replace the affected section of fence immediately.

Sediment must be removed when it reaches approximately 1/3 the height of the fence, especially if heavy rains are expected.

Silt fence should be removed within 30 days after final site stabilization is achieved or after temporary BMPs are no longer needed. Trapped sediment should be removed or stabilized on site. Disturbed areas resulting from fence removal shall be permanently stabilized.
REINFORCED SILT FENCE

Installation:

The fence should be placed across the slope along a line of uniform elevation (perpendicular to the direction of flow). The fence should be located at least 10-feet from the toe of steep slopes to provide sediment storage and access for maintenance and cleanout.

A flat-bottom trench approximately 4-inches wide and 8-inches deep, or a V-shaped trench 8-inches deep should be excavated. On the downslope side of the trench, drive the 1.33 lb./linear foot steel posts at least 12-inches into the ground, spacing them no further than 6-feet apart.

Posts should be installed, with 1- to 2-inches of the post protruding above the top of the fabric and no more than 3-feet of the post should protrude above the ground. The minimum fence height (height of filter fabric) above grade shall be 18-inches. The maximum fence height (height of filter fabric) above grade shall be 24-inches.

Fasten the 6-inch by 6-inch 14 gage wire mesh to the upslope side of the posts using heavy duty wire staples at least 1-inch long, tie wires or hog rings. Extend the mesh 6-inches into the trench.

The filter fabric should be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter cloth should be wrapped together only at a support post with both ends securely fastened to the post, with a minimum 6-inch overlap.

Extra-strength filter cloth (50 pounds / linear inch minimum tensile strength) should be used. Use plastic wire ties to attach the fabric to the post and wire. Extend 12-inches of the fabric into the trench.

Place the bottom 12-inches of the filter fabric into the 8-inch deep trench, extending the remaining 4-inches towards the up-slope side of the trench and backfill the trench with soil or gravel and compact.

Inspection and Maintenance:

Inspect silt fence every seven (7) calendar days and within 24-hours after each rainfall event that produces 1/2-inches or more or of precipitation. Check for areas where runoff has eroded a channel beneath the fence, or where the fence was caused to sag or collapse by runoff overtopping the fence.

If the fence fabric tears, begins to decompose, or in any way becomes in effective, replace the affected section of fence immediately.

Sediment must be removed when it reaches approximately 1/3 the height of the fence, especially if heavy rains are expected.

Reinforced silt fence should be removed 30 days after final site stabilization is achieved or after temporary BMPs are no longer needed. Trapped sediment should be removed or stabilized on site. Disturbed areas resulting from fence removal shall be permanently stabilized.
NOTE: SPACE SERIES OF VELOCITY CHECKS ALONG STREAM REACH. USE SPACING "S" SUCH THAT THE CRESTS OF DOWNSTREAM CHECKS ARE THE SAME ELEVATION AS THE TOE OF UPSTREAM CHECKS.

TYPICAL PLAN

18-1/2 IN. X 28 IN. WOVEN POLYPROPYLENE BAGS FILLED WITH KTC NO. 57 STONE

PLACE BAGS UP TO BANK LEVEL

TAMP BAGS TO FILL GAPS BETWEEN BAGS

PLACE BAGS TO PREVENT BANK SCOUR

3 IN. TO 6 IN.

TOP OF BANK

FLOW

STREAM BED

S

S

TYPICAL CROSS SECTION

STONE BAG SILT / VELOCITY CHECK
NOT TO SCALE
STONE BAG CHECK DAM IN SMALL DITCH

When and Where to Use It:

Stone bag checks are to be placed in man-made swales and ditches only. Stone bag check dams should not be built in wetlands, any active or live streams, and in Waters of Commonwealth.

Stone bag check dams are applicable in situations where flow velocities are too high causing channel scour. They should not be used as a primary sediment-trapping device. They should be used as velocity checks only as a short-term temporary solution.

Specific conditions for use include new diversion ditches that will not or cannot be stabilized for several days, and temporary diversion channels that are eroding due to high flow rates or steep slopes.

Installation:

Stone fill bags shall be woven polypropylene bags with approximate dimensions of 18-1/2 inches by 28 inches. The bags shall be filled with KTC No. 57 stone. Tie the ends of filled bags using either draw strings or wire ties.

Stone bag check dams shall span the banks of the ditch or swale.

The height of the dam at the stream centerline shall equal the height noted on the plans, or equal the approximate stage for normal storm flows.

Place bags at the banks to a height at least 6 inches above the center of the check.

Space stone bag ditch checks as shown on the plans, or such that the crest of the downstream check is at the same elevation as the toe of the check located immediately upstream.

Inspection and Maintenance:

Inspect checks every seven (7) calendar days and within 24-hours after each rainfall event that produces ½-inches or more of precipitation. Check for structural damage, channel erosion and sediment deposition. If sediment accumulates, remove it from the upstream face of the check before it accumulates to a height equal to 1/3 the structure height. Make all necessary repairs immediately.

Split the spacing between existing checks with an additional check if stream erosion problems persist within a reach.

Reinforce checks with additional stone bags as required to maintain integrity. Remove and replace any damaged bags and dispose of them properly. Do not leave damaged or empty bags in the ditch at any time.

Remove checks as soon as they are no longer required to control flow velocities and the ditch can be stabilized according to the appropriate stabilization schedule or is taken out of service.
BLOCK AND GRAVEL DROP INLET PROTECTION

Installation:

Block and gravel filters can be used where heavy flows and higher velocities are expected and where an overflow capacity is necessary to prevent excessive ponding around the structure.

Gravel shall consist of KTC #57 Crushed Stone.

Place concrete blocks lengthwise on their side so that the open end faces outward, not upward.

The height of the barrier can be varied, depending upon design needs by stacking a combination of blocks that are 8— and 12—-inches wide.

Wire mesh should be placed over the outside vertical face of the concrete blocks to prevent stones from being washed through the holes in the blocks. Hardware cloth or comparable wire mesh with ½—-inch openings should be used.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24—hours after each rainfall event that produces ½—-inches or more of precipitation. Any needed repairs should be handled immediately.

Sediment should be removed when it reaches approximately 1/3 the height of the blocks. If a sump is used, sediment should be removed when it fills approximately 1/3 the depth of the hole.

If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Stabilize all bare areas immediately.
CROSS SECTION

- Runoff Water with Sediment
- Sediment
- KTC No. 2 Coarse Stone
- 18" Min.
- 12" Min.
- Filtered Water
- Wire Mesh

GRAVEL AND WIRE MESH INLET SEDIMENT FILTER

MSD
Louisville and Jefferson County
Metropolitan Sewer District
700 W. Liberty Street
Louisville, Kentucky 40203-1913
502-587-0003 - WWW.MSD.LOUKY.ORG

STANDARD DRAWING NO. EF-14-01 Page 1 of 2

APPROVED BY: [Signature]
DIRECTOR OF ENGINEERING DATE 9/30/2009
GRAVEL AND WIRE MESH INLET SEDIMENT FILTER

Installation:

Gravel and mesh filters can be used where heavy concentrated flows are expected and subject to disturbance by site traffic. Gravel and mesh filters should not be used where ponding around the structure might cause excessive inconvenience or damage to adjacent structures and unprotected areas. Gravel and mesh filters have no overflow mechanism, therefore ponding is likely especially if sediment is not removed regularly. Gravel and mesh filters must never be used where overflow may endanger an exposed fill slope.

Wire mesh shall be laid over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure. Hardware cloth or comparable wire mesh with ½-inch openings shall be used. If more than one strip of mesh is necessary, the strips shall be overlapped.

KTC No. 2 Coarse Stone shall be placed over the wire mesh as indicated. The depth of stone shall be at least 12-inches over the entire inlet opening. The stone shall extend beyond the inlet opening at least 18-inches on all sides.

If the stone becomes clogged with sediment, the stones must be pulled away from the inlet, cleaned and replaced.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24-hours after each rainfall event that produces ½-inches or more of precipitation. Any needed repairs should be handled immediately.

Accumulated sediment must be removed after every rainfall event.

If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Stabilize all bare areas immediately.
SPACING BETWEEN DITCH CHECK

CROSS SECTION A-A THRU STONE DITCH CHECK

NOTE:
STONE BERM TO BE REMOVED BY GRADING CONTRACTOR AFTER GRASSING IS ESTABLISHED

LENGTH AS REQ'D, IN FIELD TO KEY INTO SIDE OF SLOPES OF DITCH

TYPICAL DITCH CHECK SECTION
ROCK DITCH CHECK

When and Where to Use It

A rock ditch check should be installed in steeply sloped swales, or in swales where adequate vegetation cannot be established. Rock ditch checks should be used only in small open channels. Rock ditch checks should not be placed in waters of the commonwealth (unless approved by state authorities).

Installation:

A geotextile fabric shall be installed over the soil surface where the rock ditch check is to be placed and laid under the KTC #57 crushed stone extending to the downstream slope of the rock check.

The body of the rock ditch check shall be composed of KTC Class II channel lining.

The upstream face of the rock ditch check shall be composed of KTC #57 crushed stone.

Rock ditch checks should not exceed a height of 2-feet at the centerline of the channel.

Rock ditch checks should have a minimum top flow length of 2-feet.

Stone should be placed over the channel banks prevent water from cutting around the ditch check.

The rock must be placed by hand or mechanical placement (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the check is lower than the edges.

The maximum spacing between the dams should be such that the toe of the upstream check is at the same elevation as the top of the downstream check.

Inspection and Maintenance:

Inspect rock ditch checks every seven (7) calendar days and within 24-hours after each rainfall event that produces ½-inches or more of precipitation. Inspect for sediment and debris accumulation. Inspect ditch check edges for erosion and repair promptly as required.

Sediment should be removed when it reaches 1/3 the original check height.

In the case of grass-lined ditches and swales, rock ditch checks should be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4%.

After construction is complete, all stone should be removed if vegetation will be used for permanent erosion control measures.

The area beneath the rock ditch checks should be seeded and mulched immediately after rock check dam removal.
INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.

DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN OR OTHER SEDIMENT TRAPPING STRUCTURE.

COARSE AGGREGATE
KTC NO. 3 STONE
6" MINIMUM DEPTH

UNDERLINING GEOTEXTILE FABRIC

PUBLIC ROAD

100' MIN.

24
STABILIZED CONSTRUCTION ENTRANCE

When and Where to Use It

Stabilized construction entrances should be used at all points where traffic will be leaving a construction site and moving directly onto a public road.

Important Considerations

If washing is used, provisions must be made to intercept the wash water and trap the sediment before it is carried offsite. Washdown facilities shall be required as directed by MSD. Washdown areas in general must be established with crushed gravel and drain into a sediment trap or sediment basin. Construction entrances should be used in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by vehicles.

Installation:

Remove all vegetation and any objectionable material from the foundation area.

Divert all surface runoff and drainage from stones to a sediment trap or basin.

Install a geotextile fabric prior to placing any stone.

Install a culvert pipe across the entrance when needed to provide positive drainage.

The entrance shall consist of KTC #3 stone with a minimum thickness of 6-inches.

Minimum dimensions of the entrance shall be 24-feet wide by 100-feet long, and may be modified as necessary to accommodate site constraints.
STABILIZED CONSTRUCTION ENTRANCE

Inspection and Maintenance:

Inspect entrances every seven (7) calendar days and within 24-hours after each rainfall event that produces 1/2-inches or more of precipitation, or after heavy use. Check for mud and sediment buildups and pad integrity. Make daily inspections during periods of wet weather. Maintenance is required more frequently in wet weather conditions. Reshape the stone pad as needed for drainage and runoff control.

Wash or replace stones as needed and as directed by the inspector. The stone in the entrance should be washed or replaced whenever the entrance fails to reduce mud being carried off-site by vehicles. Frequent washing will extend the useful life of stone.

Immediately remove mud and sediment tracked or washed onto public roads by brushing or sweeping. Flushing should only be used when the water can be discharged to a sediment trap or basin.

Repair any broken pavement immediately.

Inspect and clean sediment traps immediately following each rainfall.

Dispose of sediment in a suitable area in such a manner that it will not erode.

Remove stabilized construction entrances as soon as they are no longer needed to provide access to the site. Bring the disturbed area to grade, and stabilize it using appropriate permanent stabilization methods.
MINIMUM WIDTH BASED ON SIZE OF EQUIPMENT USING CROSSING MINIMUM = 12 FT. MAXIMUM = 20 FT.

PLACE AS MANY PIPES AS POSSIBLE WITHIN THE STREAM BANKS
OFFSET SUFFICIENT DISTANCE FROM CENTERLINE OF SEWER TO PROVIDE AMPLE WORK AREA FOR SEWER CONSTRUCTION
TEMPORARY LOW WATER CROSSING SHALL BE CONSTRUCTED ENTIRELY WITHIN THE TEMPORARY CONSTRUCTION EASEMENT

CENTERLINE OF PROPOSED SEWER
STREAM BANK

PLAN VIEW

20 FT. MIN. APPROACH LENGTH
TOP OF ROADWAY
12 IN. MIN. TO 18 IN. MAX. FILL DEPTH OVER PIPES
6 IN. MIN. DEPTH
EXISTING GRADE
INSTALLED NON-WOVEN GEOTEXTILE FABRIC BENEATH APPROACHES
ELEVATION

24 IN. DIAMETER
INSTALL NUMBER OF PIPES REQUIRED TO SPAN CHANNEL
5 FT. MAXIMUM FILL HEIGHT MEASURED FROM LOW POINT OF ORIGINAL CHANNEL
12 IN. MAX. CLEARANCE BETWEEN PIPES
CLEAN ROCK ONLY—NO SOIL ALLOWED

NOTES:
1. INITIATE PUMP-AROUND DIVERSION PRIOR TO ANY EXCAVATION IN A STREAM.
2. DO NOT EXCAVATE STREAMS WITH ROCK Bottoms IN ORDER TO PLACE ALL PIPES AT THE SAME LEVEL AS THE LOW POINT OF THE STREAM. PLACE AS MANY PIPES AS PRACTICAL WITHIN THE LOW AREA OF THE STREAM.
TEMPORARY STREAM LOW WATER CROSSING

Prior to constructing a temporary stream crossing, the owner/ person financially responsible for the project must submit an Application for Permit to Construct Across or Along a Stream to the Kentucky Division of Water (KDOE). Temporary stream crossings require a Section 404 Permit from the Corps of Engineers. If the crossing creates more than 200 linear feet of fill or more than 1/3 acre of fill, a 404 permit may be necessary.

Installation:

Crossings shall be installed prior to any other activities within the stream.

Pump-around diversions shall be installed and maintained prior to any excavation and during the installation of the crossing.

Crossings shall be placed in temporary construction easements only.

The temporary waterway crossing shall be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15 degrees from a line drawn perpendicular to the centerline of the stream at the intended crossing location. However every effort shall be taken to install the crossing perpendicular to the stream. All fill materials associated with the roadway approach shall be limited to a maximum height of two feet above the existing flood plain elevation.

Streambank clearing shall be kept to a minimum. Do not excavate rock bottom streambeds to install the crossing. Place geotextile fabric directly on streambed prior to placing pipes and stone. Lay the culvert pipes on the streambed "as is" when applicable. Place as many pipes as possible within the low area of the stream.

The maximum number of pipes possible should be placed within the stream banks with a maximum spacing of 12-inches between pipes. The pipe culvert shall be 24-inches.

The length of the culvert shall be adequate to extend the full width of the crossing, including side slopes.

Coarse aggregate with KTC No. 3 stone or greater will be used to form the crossing. The depth of stone cover over the culvert shall be equal to ½ the diameter of the culvert or 12-inches, whichever is greater but no greater than 18-inches.
TEMPORARY STREAM LOW WATER CROSSING

Installation:

All fill materials associated with the roadway approach shall be limited to a maximum height of 2-feet above the existing flood plain elevation.

The approaches to the structure shall consist of clean stone or concrete fill only with a minimum thickness of 6-inches. The minimum approach length shall be 20-feet and the width shall be equal to the width of the structure.

Inspection and Maintenance:

Inspect crossings every seven (7) calendar days and within 24-hours after each rainfall event that produces ½-inches or more of precipitation. Check the structure integrity and for excessive sediment deposition and replace fill stone as needed.

Clean mud and/or sediment from the roadway and do not allow it to enter the stream.

The structure shall be removed when it is no longer required to provide access to the construction area. During removal, leave stone and geotextile fabric for approaches in place. Place fill over the approaches as part of the stream bank restoration operation.

A temporary culvert crossing should be in place no longer than 24 months.
STREAM CROSSINGS USING WATER-INFLATABLE CHECK DAMS  
(WATER STRUCTURES)  
1. WATER-INFLATABLE CHECK DAMS SHALL BE WATER STRUCTURES AS MANUFACTURED/DISTRIBUTED BY SUNSHINE SUPPLIES, INC., BIRMINGHAM, ALABAMA OR ITS EQUIVALENT. THE CHECK DAMS CONSIST OF TWO INNER TUBES CONSTRUCTED USING 15 MIL REINFORCED VINYL THAT ARE SURROUNDED WITH A MASTER TUBE CONSTRUCTED FROM WOVEN GEOTEXTILE FABRIC. THE WATER STRUCTURES USED IN THIS APPLICATION SHALL BE THE OPEN ENDED SYSTEM, HAVE AN INFLATED HEIGHT OF 3 FT. AND MEET THE FOLLOWING SPECIFICATIONS: 

| MASTER TUBE:   | WOVEN GEOTEXTILE |
| INNER TUBES:  | POLYETHYLENE     |
| APPROX. INFLATED HEIGHT: | 3 FT. |
| FILL CAPACITY: | 135 GAL/FT. |
| APPROX. WIDTH: | 6.5 FT. |
| END TREATMENT: | OPEN ENDED |
| MINIMUM FREEBOARD | 1.0 FT. |

2. CHECK DAMS SHALL BE INSTALLED ACROSS THE STREAM BOTH UPSTREAM AND DOWNSTREAM OF THE SEWER ALIGNMENT WITHIN THE TEMPORARY CONSTRUCTION EASEMENT AS SHOWN ON THE PLAN GIVEN IN THE STREAM CROSSING DETAIL ON THIS SHEET PRIOR TO ANY EXCAVATION ACROSS THE STREAM.

3. REMOVE ANY DEBRIS SUCH AS WIRE, GLASS, BRANCHES, STONES, ETC. THAT COULD PUNCTURE A WATER STRUCTURE FROM THE AREA IN WHICH WATER STRUCTURES ARE TO BE INSTALLED PRIOR TO INSTALLATION OF THE STRUCTURES.

4. CHECK DAMS SHALL BE INSTALLED ONLY DURING LOW FLOW CONDITIONS WHEN THE REQUIRED MINIMUM FREEBOARD CAN BE MAINTAINED.

5. CLOSE THE INFLATED ENDS OF THE STRUCTURE USING EMBOSSED POLYETHYLENE BINDING STRAPS. SECURE THE EXCESS WATER STRUCTURE LEFT ON THE ROLL TO THE STREAMBANK USING WOODEN STAKES. (DO NOT PUNCTURE THE WATER STRUCTURE.) PLACE SAND BAGS ON THE INLET END OF THE WATER STRUCTURES TO HOLD THEM IN PLACE ON TOP OF THE BANK.

6. FOLLOW THE MANUFACTURER’S INSTALLATION PROCEDURES, APPLICABLE OSHA SAFETY REGULATIONS AND THE MANUFACTURER’S SAFETY PRECAUTIONS. FOLLOW THE MANUFACTURER’S MAINTENANCE PROCEDURES.

7. PUMP STREAMFLOW AROUND THE CONSTRUCTION AREA AS DEPICTED IN THE PLAN SHOWN IN THE STREAM CROSSING DETAIL ON THIS SHEET. PUMPING MUST MAINTAIN A MINIMUM OF 1 FT. FREEBOARD (OR STRUCTURE HEAD) ON THE STRUCTURES. PROTECT AREAS AT THE PUMP DISCHARGE FROM SCOUR BY THE DISCHARGE.

8. PUMP WATER FROM THE WORK AREA BETWEEN THE STRUCTURES TO THE SILT TRENCH. ALSO USE THIS PUMP TO PUMP DOWN WATER IN THE TRENCH DURING EXCAVATION AND SEWER CONSTRUCTION OPERATIONS. WATER PUMPED FROM THE TRENCH MUST ALSO BE DISCHARGED INTO THE SILT TRENCH.

9. PROCEED WITH CONSTRUCTION OF SEWER LINE ACROSS THE STREAM.

10. WHEN SEWER LINE CONSTRUCTION ACROSS THE STREAM IS COMPLETE, STABILIZE THE DISTURBED STREAMBANK FROM THE TOE OF THE SLOPE TO A LEVEL NO LESS THAN 2 FT ABOVE THE WATER LEVEL IN THE STREAM.

11. PUMP WATER FROM THE STREAM TO THE AREA BETWEEN THE CHECK DAMS TO EQUALIZE WATER LEVELS ON THE SIDES OF THE STRUCTURES BEFORE THEIR REMOVAL.

12. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED SUCH THAT STREAM CROSSINGS ARE COMPLETED WITHIN ONE WORKDAY. IF THE CROSSING IS NOT COMPLETED IN ONE WORKDAY, PUMPING OPERATIONS MUST BE MAINTAINED AROUND THE CLOCK WHILE THE CHECK DAMS ARE IN PLACE. A WORK FORCE SHALL REMAIN ON SITE THAT IS SUFFICIENT TO MAINTAIN PUMPING OPERATIONS AND ALERT THE ENGINEER IF PROBLEMS ARISE.

13. REMOVE BINDING STRAPS BEFORE REMOVING WATER STRUCTURES FROM THE STREAM.

14. FOLLOW THE MANUFACTURER’S PROCEDURES FOR REMOVAL OF THE WATER STRUCTURES FOR REUSE. FLATTEN AND STRAIGHTEN THE MASTER TUBE AND INNER TUBE BEFORE REWRAPPING THE STRUCTURES. USE AN AIR BLOWER TO FACILITATE THE STRAIGHTENING OF TUBES THAT HAVE BEEN KINKED OR TWISTED.

BINDING STRAP SPECIFICATIONS  
BINDING STRAP AND BUCKLES SHALL MEET THE FOLLOWING SPECIFICATIONS:  

| MATERIAL:          | EMBOSSED POLYETHYLENE  |
| BURST STRENGTH:   | 800 LB.                |
| WIDTH:            | XX                     |
| THICKNESS:        | XX                     |
| BUCKLE TYPE:      | WIRE                   |
| BUCKLE EFFICIENCY:| 50%                    |

MSD  
Louisville and Jefferson County  
Metropolitan Sewer District  
700 W. Liberty Street  
Louisville, Kentucky 40203-1913  
502-587-0603 – www.msdloky.org  
PUMP AROUND FLOW DIVERSION  
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APPROVED BY:  
9/30/2009  
DIRECTOR OF ENGINEERING  
DATE
NOTE:
1. This typical section is used to divert upslope runoff from flowing across construction areas.
2. The channel shown may not be required if the upslope runoff is minimal. In such case, the topsoil berm will serve as temporary topsoil storage until final grading/restoration operations.
TEMPORARY DIVERSION CHANNEL & TOPSOIL BERM

1. The contractor shall install a temporary diversion channel and topsoil berm along the upslope side of the disturbed area or temporary construction easement.

2. The berm shall be constructed of stripped topsoil not mixed with other materials.

3. The purpose of the temporary diversion channel and topsoil berm is to direct clear water runoff from the undisturbed upslope area to a location where it can be collected and piped across the width of construction in a controlled manner that does not interfere with construction and minimizes the potential for addition of sediment to the clear water within the limits of the temporary construction easement prior to its release.

4. The contractor shall:
   
   4.1. Provide a topsoil berm of sufficient height to prevent overland or shallow concentrated runoff into the construction area by directing the upslope flow to a collection point into a 12-inch (minimum) diameter pipe (capable of withstanding construction traffic) laid through the construction area for the clear water flow to pass through it rather than across the construction area. The pipes that carry upslope clear water runoff through the construction area shall be located at all existing, defined, channels and at intermediate intervals, as needed.

   4.2. At the discharge point, provide for positive drainage away from the construction area.

   4.3. Maintain all diversion measures until such time as construction areas have been stabilized sufficiently to receive pre-construction runoff.

   4.4. Remove the temporary diversion channel and topsoil berm prior to final project close-out.

5. For bidding purposes the cost to install, maintain, and remove the temporary diversion channel and topsoil berm, and related control features, shall be incidental to the sewer line installation cost and shall not be priced as a separate item (unless erosion control features are specifically included as a bid item).