STANDARD DETAILS
FOR PUBLIC STREET, STORMWATER AND
UTILITY IMPROVEMENT
PROJECTS

Revised
January 2019
STANDARD DETAIL INDEX

SD 8-1 PARKING LOT DETAILS
SD 13-1 LOCAL STREET (ASPHALT)
SD 13-2 COLLECTOR STREET (ASPHALT)
SD 13-2A SERVICE/INDUSTRIAL STREET (ASPHALT)
SD 13-3 ARTERIAL STREET (ASPHALT)
SD 13-4 ARTERIAL STREET PAVEMENT JOINT AND MARKING DETAIL
SD 13-5 TYPICAL MEDIAN (ARTERIAL)
SD 13-6 MONUMENT BOX
SD 13-7 TYPICAL LANE WIDENING
SD 14-1 LOCAL STREET (CONCRETE)
SD 14-2 COLLECTOR STREET (CONCRETE)
SD 14-2A SERVICE STREET (CONCRETE)
SD 14-3 ARTERIAL STREET (CONCRETE)
SD 14-4 CONCRETE PAVING- JOINT TYPE
SD 14-5 CONCRETE PAVING - JOINT SEALING
SD 14-6 CONCRETE PAVING - ISOLATION JOINTS
SD 14-7 CONCRETE PAVING - JOINT LOCATIONS
SD 21-1 TYPE "A" CURB AND GUTTER
SD 21-2 TYPE "B" CURB AND GUTTER
SD 21-3 TYPE "C" CURB & GUTTER
SD 21-4 DOWELED ON CURB
SD 21-5 TYPE "E" CONCRETE MEDIAN CURB & GUTTER
SD 21-6 SIDEWALK
SD 21-7 SIDEPATH
SD 21-8 SIDEWALK WITH ABUTTING RETAINING WALL
SD 21-9A HANDRAIL ON RETAINING WALL
SD 21-9B HANDRAIL ON RETAINING WALL DETAILS
SD 21-9C RETAINING WALL FORMLINER
SD 21-10 TYPE I SIDEWALK RAMP
SD 21-10A TYPE II SIDEWALK RAMP
SD 21-10B TYPE III SIDEWALK RAMP
SD 21-10C TYPE IV SIDEWALK RAMP
SD 21-10D MID-BLOCK SIDEWALK RAMP
SD 21-11 COMMERCIAL & INDUSTRIAL ENTRANCE DRIVE
SD 21-12 RESIDENTIAL DRIVE (TYPE A CURB)
SD 21-13 RESIDENTIAL DRIVE (TYPE B CURB)
SD 21-14 RESIDENTIAL DRIVE AT NON-CURBED STREET
SD 21-15 PARKING LOT CONCRETE CURB
SD 30-1 CONCRETE ENCASEMENT
SD 30-2 CONCRETE CRADLE
SD 30-3 STANDARD DEEP TRENCH SERVICE RISER
SD 30-4 DEEP TRENCH SERVICE RISER (IN ROCK)
SD 30-5  TAPPING SADDLE
SD 30-6  FORCE MAIN AIR/VACUUM VALVE AIR RELEASE MANHOLE (PRECAST)
SD 31-1  PRECAST MANHOLE
SD 31-2  DROP MANHOLE
SD 31-3  SHALLOW MANHOLE
SD 31-4  CONNECTIONS TO NEW PRECAST MANHOLES
SD 31-5  CONNECTIONS TO EXISTING MANHOLES
SD 31-6  STANDARD SANITARY SEWER MANHOLE COVER
SD 31-7  LIFT STATION BAUER CONNECTIONS
SD 31-8  LIFT STATION VALVE VAULT
SD 31-9  GREASE INTERCEPTOR (1,000 GALLON)
SD 40-1  EMBEDMENTS FOR WATER AND SANITARY SEWER PIPE
SD 40-1A EMBEDMENTS FOR STORM SEWER PIPE
SD 40-2  ROADWAY CONDUIT CROSSING
SD 40-3  TRENCHING UNDER FUTURE STREET
SD 40-4  GROUNDWATER BARRIER
SD 50-1  STANDARD CURB INLET
SD 50-1A  STANDARD STORM SEWER MANHOLE COVER
SD 50-2  WALL SECTIONS (CONCRETE CONSTRUCTION)
SD 50-3  STEEL INLET FRAME
SD 50-4  AREA INLET
SD 50-5  STANDARD STORM SEWER JUNCTION BOX
SD 50-5A  STANDARD STORM SEWER PRECAST JUNCTION BOX
SD 50-6  SHALLOW JUNCTION BOX
SD 50-7  GRATE INLET
SD 50-8  HANDRAIL ON CONCRETE HEADWALL
SD 50-9  END SECTION
SD 50-10 UNDERDRAIN
SD 60-A  THRUST RESTRAINT TABLE
SD 60-1  SCREW SHAFT TYPE ADJUSTABLE VALVE BOX
SD 60-2  FIRE HYDRANT INSTALLATION
SD 60-3  FLUSHING ASSEMBLY FOR WATER MAINS
SD 60-4  COMBINATION AIR RELEASE AND VACUUM RELEASE VALVE
SD 60-5  CONCRETE THRUST BLOCKING
SD 60-5A STRADDLE BLOCK
SD 60-5B VERTICAL BEND BLOCKING
SD 60-6  PIPE CASING
SD 60-7  END OF LINE ON CUL-DE-SAC
SD 60-8  DOUBLE CHECK DETECTOR ASSEMBLY
SD 60-9  NON-RESIDENTIAL METERING OPTIONS
SD 60-10 WATER METER COVER
SD 70-1  STREET PATCH
SD 70-2  PRIVATE PAVEMENT PATCH FOR SANITARY SEWERS LESS THAN 8’ DEEP
SD 73-1  EROSION CONTROL ROCK DITCH CHECK
SD 73-2  COMPOST BERM
SD 73-3  STANDARD SEDIMENT FENCE (18”)
SD 73-4  REINFORCED SEDIMENT FENCE (30”)
SD 73-5  SEDIMENT FENCE REPAIR WITH ROCK CHECK
SD 73-6  DROP INLET PROTECTION
SD 73-7  GRAVEL BAG CURB INLET SEDIMENT TRAP
SD 73-8  TEMPORARY DIVERSION DIKE
SD 73-9  TEMPORARY SEDIMENT TRAP
SD 73-10A TEMPORARY SEDIMENT BASIN
SD 73-10B TEMPORARY SEDIMENT BASIN DETAILS
SD 73-11  ROCK CONSTRUCTION ENTRANCE
SD 73-12A RESIDENTIAL LOT EROSION CONTROL EXAMPLE 1
SD 73-12B RESIDENTIAL LOT EROSION CONTROL EXAMPLE 2
SD 73-12C RESIDENTIAL LOT EROSION CONTROL EXAMPLE 3
SD 91-1  PAVEMENT MARKING DETAIL SHEET
**TYPE II**

**TYPE I**

**TYPE III**

**PARALLEL PARKING STALL**

*NOTE: DIMENSIONS BELOW ARE GIVEN IN FEET*

<table>
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**APPROVED:** Jan. 1, 2017

**REVISED:** Feb. 1, 2018

**PARKING LOT DETAILS**

**STANDARD DETAIL 8-1**
LOCAL STREET
(ASPHALT)

STANDARD
DETAIL
13-1

APPROVED:
Jan. 1, 2017

REVISED:
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4:1 RECOMMENDED
3:1 MAX

SLOPE 2% to 4%
TOWARDS CURB

50' MINIMUM R.O.W.

28' B-B

2" ASPH. CONC. SURFACE
(*BM-2 OR BM-2FR)

PROFILE GRADE
TACK COAT
2%

TYPE "A" CURB
(TYPE "B" CURB
OPTIONAL AS APPROVED
BY THE CITY ENGINEER.)

6" ASPH. CONC. BASE
(*BM-2 OR BM-2FR)

9" COMPACTED SUBGRADE **
(95% OF STANDARD MAXIMUM
DENSITY)

5' CONCRETE SIDEWALK

* OR AS DIRECTED BY CITY ENGINEER

** MODIFIED AB-3 (6" MIN. THICKNESS)
OR PORTLAND CEMENT MAY BE USED IN
LIEU OF FLYASH AS APPROVED BY THE
CITY ENGINEER

FOR USE IN SINGLE AND MULTI-FAMILY AREAS
4:1 RECOMMENDED
3:1 MAX

SLOPE 2% TO 4%
TOWARDS CURB

6" ASPH. CONC. SURFACE
(HEAVY DUTY ASPHALT)

60' R.O.W

36' B-B

PROFILE GRADE

TACK COAT

6" ASPH. CONC. BASE
(SUPERPAVE)

1% TO 2%

4" THICKNESS

5' CONCRETE SIDEWALK

5' CONCRETE SIDEWALK ON ONE SIDE
OF STREET FOR INDUSTRIAL ZONING.

** MODIFIED AB-3 (6" MIN. THICKNESS)
OR PORTLAND CEMENT MAY BE USED IN
LIEU OF FLYASH AS APPROVED BY THE
CITY ENGINEER

9" COMPACTED SUBGRADE **
(95% OF STANDARD MAXIMUM
DENSITY)

95% COMPACTION
BEHIND CURB

5' CONCRETE SIDEWALK

SERVICE / INDUSTRIAL
STREET
(ASPHALT)

APPROVED:
Jan. 1, 2017

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Feb. 1, 2018
NOTE: 1. DESIGN GEOMETRIES TO BE APPROVED BY THE CITY ENGINEER FOR EACH INDIVIDUAL PROJECT
2. TYPE “E” C&G USED FOR MEDIAN CONSTRUCTION SHALL BE A DRY GUTTER TIP OUT.

**MODIFIED AB–3 (6” MIN. THICKNESS) OR PORTLAND CEMENT MAY BE USED IN LIEU OF FLYASH AS APPROVED BY THE CITY ENGINEER**
* - Variations in the road width will be added to or subtracted from the outside lanes.
6" CONCRETE CURB Poured monolithically to match height of top of curb and gutter.

*TYPICAL LEFT TURN LANE

*CLAY-FIRED BRICK PAVERS OR COLORED STAMPED CONCRETE

1’-9”

1/2” EXPANSION JOINT

4’-6” MIN.

1’-9”

SECTION A-A

ASPHALTIC CONCRETE BASE (BM-2B)

UNDERDRAIN PER CITY STANDARDS

3000 PSI CONCRETE

SECTION B-B

KNOCKOUT PIPE FOR BREAKAWAY TRAFFIC SIGN

*CLAY-FIRED BRICK PAVERS OR COLORED STAMPED CONCRETE AS DETERMINED BY THE CITY ENGINEER. COLORED CONCRETE PIGMENT SHALL COMPLY WITH FEDERAL STANDARD AMS COLOR CODE 30152. CONTRACTOR SHALL CONSTRUCT A TEST SECTION FOR APPROVAL BY THE CITY ENGINEER BEFORE WORK COMMENCES.

CONTRACTOR WILL SUBMIT BRICK PAVER SAMPLES BEFORE WORK BEGINS.

RUNNING BOND PATTERN WILL BE REQUIRED UNLESS OTHERWISE DIRECTED OR APPROVED BY THE CITY ENGINEER.
Monument Notes:

1. All survey work related to preserving location and establishment of new monument shall be performed under supervision of the construction surveyor, who shall be a land surveyor licensed in the State of Kansas.

2. Construction surveyor is responsible for filing Notice of Endangerment Activity Report and Completion of Endangerment Activity Report with Kansas State Historical Society, Johnson County Engineer, and the City. Reports shall have at least 5 reference ties to points unlikely to be disturbed by construction, or 3 ties & State Plane Coordinates.

3. Stainless steel monument with brass cap will be furnished to the construction surveyor by Johnson County Public Works upon satisfactory review of Notice of Endangerment Activity Report.

4. Monument box and other material shall be furnished by Contractor.

5. Brass cap is not pre-punched and after the monument is set in concrete the construction surveyor shall punch brass cap at exact location. No other information shall be punched on the cap by the construction surveyor.

6. Concrete used for pavement repair shall be KCMMB4K.
TYPICAL LANE WIDENING

MATCH EXISTING CURB TYPE

ASPHALT VARIES PER ROADWAY CLASSIFICATION

NOTE: CONTRACTOR SHALL MATCH EXISTING CROSS SLOPE TO THE GREATEST EXTENT PRACTICAL. THE FORMS SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO PLACEMENT OF CONCRETE.

SECTION A-A

MATCH EXISTING CURB TYPE

INSTALL CONCRETE TO WITHIN 2" OF SURFACE.

THICKENED CURB

NOTE: WHEN CONCRETE IS USED IN BASE WIDENING, CONCRETE CURB SHALL BE Poured THICKENED, WITH FACE OF CURB MATCHING THICKNESS OF PAVEMENT SECTION. EXTERNAL THICKNESS OF CURB SHALL BE SUBSIDARY.

SECTION B-B

MATCH EXISTING CURB TYPE

INSTALL CONCRETE TO WITHIN 2" OF SURFACE.

2" ASPHALT

NOTE: CONTRACTOR SHALL MATCH EXISTING CROSS SLOPE TO THE GREATEST EXTENT PRACTICAL. THE FORMS SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO PLACEMENT OF CONCRETE.

TYPICAL LANE WIDENING

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018
Jan. 1, 2019

OLATHE KANSAS

STANDARD DETAIL 13-7
CURB CONSTRUCTION OPTIONS

**NOTE:** DESIGN GEOMETRICS TO BE APPROVED BY THE CITY ENGINEER FOR EACH INDIVIDUAL PROJECT.

**MODIFIED AB-3 (6" MIN. THICKNESS) OR PORTLAND CEMENT MAY BE USED IN LIEU OF FLYASH AS APPROVED BY THE CITY ENGINEER.

**LOCAL STREET (CONCRETE)**

STANDARD DETAIL 14.1

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018

4:1 RECOMMENDED 3:1 MAX

50' MIN. R.O.W.

SLOPE 2% TO 4% TOWARDS CURB

28'-0"

7'-0"

7'-0"

7'-0"

7'-0"

TYPE D JOINT

PROFILE GRADE

2%

9" COMPACTED SUBGRADE ** (95% OF STANDARD MAXIMUM DENSITY)

6" CONCRETE PAVEMENT (KCMB 4K)

2%

SLOPE 2% TO 4% TOWARDS CURB

1% TO 2%

5' CONC. S/W

TYPE "A" CURB & GUTTER

SEE OPTIONS A, B, & C

TYPE "A" CURB & GUTTER

OPTION "A"

OPTION "B"

OPTION "C"

TYPE "A" CURB & GUTTER

INTERGRAL

2"x4" KEYWAY

#5x24" EPOXY COATED REBAR @ 30" CTRS.
COLLECTOR STREET

STANDARD DETAILS

14.2

COLLECTOR STREET

CONCRETE

OST. 612.0 x 792.0

APPROVED: Jan. 1, 2017

REVISED: Feb. 1, 2018

1. 4:1 RECOMMENDED 3:1 MAX

SLOPE 2% TO 4% TOWARDS CURB

2. 1/4 PVMT WIDTH

3. 1/4 PVMT WIDTH

4. 1/4 PVMT WIDTH

5. 1/4 PVMT WIDTH

6. 60' R.O.W.

7. 36'-0"

8. TYPE D JOINT

9. TYPE B OR C JOINT

10. PROFILE GRADE

11. 24"

12. 1% TO 2%

13. 1% TO 2%

14. 24"

15. TYPE "B" CURB & GUTTER

16. 7" CONCRETE PAVEMENT

(KCMMB 4K)

17. 9" COMPACTED SUBGRADE **

(95% OF STANDARD MAXIMUM DENSITY)

18. ** MODIFIED AB-3 (6" MIN. THICKNESS)

OR PORTLAND CEMENT MAY BE USED IN

LIEU OF FLYASH AS APPROVED BY THE

CITY ENGINEER

19. TYPE "B" CURB & GUTTER

20. INTEGRAL

#5x24" EPoxy-

COATED REBAR

21. OPTION "A"

22. 2"x4" KEYWAY

23. OPTION "C"

24. OPTION "B"

CURB CONSTRUCTION OPTIONS

NOTE: DESIGN GEOMETRICS TO BE APPROVED BY THE CITY ENGINEER FOR EACH INDIVIDUAL PROJECT

OLATHE KANSAS

5' CONCRETE SIDEWALK

5' CONCRETE SIDEWALK

5' CONCRETE SIDEWALK

5' CONCRETE SIDEWALK
4:1 RECOMMENDED
3:1 MAX

SLOPE 2% TO 4%
TOWARDS CURB

60' R.O.W.

36'-0"

9'-0"

9'-0"

9'-0"

9'-0"

1% TO 2%

5' CONCRETE CURB & GUTTER

TYPE D JOINT

PROFILE GRADE

2 %

TYPE B OR C JOINT

2 %

7" CONCRETE PAVEMENT
(KOMMB 4K)

9" COMPACTED SUBGRADE **
(95% OF STANDARD MAXIMUM DENSITY)

** MODIFIED AB-3 (6" MIN. THICKNESS)
OR PORTLAND CEMENT MAY BE USED IN
LIEU OF FLYASH AS APPROVED BY THE
CITY ENGINEER

NOTE: DESIGN GEOMETRICS
TO BE APPROVED BY THE
CITY ENGINEER FOR EACH
INDIVIDUAL PROJECT

5' CONCRETE SIDEWALK ON ONE SIDE OF
STREET FOR INDUSTRIAL ZONING.

OPTION "A"

OPTION "B"

OPTION "C"

CURB CONSTRUCTION OPTIONS
ARTERIAL STREET (CONCRETE) STANDARD DETAIL 14.3

NOTE: DESIGN GEOMETRICS TO BE APPROVED BY THE CITY ENGINEER FOR EACH INDIVIDUAL PROJECT

**MODIFIED AB-3 (6” MIN. THICKNESS) OR PORTLAND CEMENT MAY BE USED IN LIEU OF FLYASH AS APPROVED BY THE CITY ENGINEER

CURB CONSTRUCTION OPTIONS

- Type "B" & "E" Curb & Gutter
  - Integral
  - Option "A"
  - Type 5x24" epoxy coated rebar @ 30" ctrs.
- Type "B" & "E" Curb & Gutter
  - Option "B"
  - 2"x4" keyway
- Type "B" & "E" Curb & Gutter
  - Option "C"
EXPANSION JOINT

ALTERNATE EXPANSION JOINT

LONGITUDINAL CONSTRUCTION JOINT

TIED BUTT LONGITUDINAL CONSTRUCTION JOINT

SAWED LONGITUDINAL OR TRANSVERSE

PLANNED TRANVERSE CONSTRUCTION JOINT
(USED AT NORMAL JOINT SPACING)

EMERGENCY TIED TRANSVERSE CONSTRUCTION JOINT
(USED AT MIDDLE THIRD NORMAL JOINT SPACING)

NOTE: ALL DOWELS AND TIE BARS SHALL BE EPOXY COATED.
NOTES:

1. JOINT SEALING MATERIAL SHALL CONFORM TO ASTM D3405 AND SHALL BE APPLIED IN ACCORDANCE WITH MATERIAL MANUFACTURER’S RECOMMENDATIONS.

2. $d =$ DEPTH OF SLAB
NOTE: SEE DETAIL 14-4 FOR JOINT TYPES A–F.

PLANNED END OF DAYS WORK

PLACE 1/2" EXPANSION JOINT FILLER IN TOP OF CURB AT ALL RADIUS POINTS.

NOTE: SKEWED INTERSEC. SHALL NOT BE LESS 75' TO INTERSECTING STREET.

FIRST STREET PAVED

CATCH BASIN

EMERGENCY END OF DAYS WORK

SKEW OR SHIFT JOINTS AS REQ'D.

25' LOCAL
30' COLLECTOR
50' ARTERIAL

28'-52'

DIRECTION OF PAVING HALF WIDTH

28'-36'

B, C OR D

B, C

NOTE: SEE DETAIL 14-4 FOR JOINT TYPES A–F.

CONCRETE PAVING
JOINT LOCATIONS

APPROVED: Jan. 1, 2017

REVISED: Feb. 1, 2018
1. **Expansion Joints** shall be formed by a one-half (1/2) inch thick preformed joint filler, cut to the configuration of the full size of the curb and gutter section and being secured so that they are not moved by depositing and compacting the concrete at these joints. The edges of these joints shall be rounded with an edging tool one-eighth (1/8) inch radius.

2. **Expansion Joints** shall be placed where curb and gutter abuts other structures and at all points of tangents to curbs. Expansion joints shall not be spaced more than 50 feet apart on straight runs for hand laid curb and gutter and not more than 200 feet apart for machine laid curb and gutter provided 3/4 inch thick joint filler is used. All joints shall be formed at right angles to the alignment of the curb and gutter.

3. **Contraction Joints** shall be constructed by sawing through the curb and gutter to a depth of not less than one and one-fourth (1 1/4) inches below the surface and to a width not to exceed three-eighths (3/8) inch or they may be formed by inserting a removable metal template in the fresh concrete, or by other methods approved by the engineer. Sealing of joints is not required. Contraction or construction joints shall be located 10 feet apart.

4. Two 24", #4 smooth dowels shall be used at expansion joint locations. The dowels shall be coated with bond breaker and wrapped or capped with plastic expansion tubes at one end. The dowels shall extend through the joint and overlap the #4 bars a minimum of 6".

5. Rebar is not required for curb construction on a minimum of 3” asphalt.

6. KCMMB4K concrete shall be used throughout and adhere to City of Olathe technical specifications section 2000 and section 2100.

---

**Diagram:**

* For 8" asphalt pavement, concrete face of curb shall be 7\(\frac{1}{2}\)".
NOTE:
1. EXPANSION, CONTRACTION, OR CONSTRUCTION JOINTS ARE TO BE SAME AS NOTED ON TYPE "A" CURB AND GUTTER DETAIL.

2. REBAR IS NOT REQUIRED FOR CURB CONSTRUCTION ON A MINIMUM OF 3” ASPHALT.

3. KCM34K CONCRETE SHALL BE USED THROUGHOUT AND ADHERE TO CITY OF OLATHE TECHNICAL SPECIFICATIONS SECTION 2000 AND SECTION 2100.

* FOR 8” ASPHALT PAVEMENT, CONCRETE FACE OF CURB SHALL BE 7½".
TO BE USED FOR COMMERCIAL ENTRANCES

NOTE: FOR 8" ASPHALT PAVEMENT, CONCRETE FACE OF CURB SHALL BE $7\frac{3}{8}$".
NOTE:

1. EXPANSION, CONTRACTION, OR CONSTRUCTION JOINTS ARE TO BE SAME AS NOTED ON TYPE "A" CURB AND GUTTER DETAIL.

2. KCMMB4K CONCRETE SHALL BE USED THROUGHOUT AND ADHERE TO CITY OF OLATHE TECHNICAL SPECIFICATIONS SECTION 2000 AND SECTION 2100.
NOTE:
1. EXPANSION, CONTRACTION, OR CONSTRUCTION JOINTS ARE TO BE SAME AS NOTED ON TYPE "A" CURB AND GUTTER DETAIL.
2. REBAR IS NOT REQUIRED FOR CURB CONSTRUCTION ON A MINIMUM OF 3" ASPHALT.
3.KCMMB4K CONCRETE SHALL BE USED THROUGHOUT AND ADHERE TO CITY OF OLATHE TECHNICAL SPECIFICATIONS SECTION 2000 AND SECTION 2100.
NOTES:

1. CONTRACTION JOINTS SHALL BE HAND-TOOLED OR SAWS AT RIGHT ANGLES TO THE ALIGNMENT OF THE SIDEWALK WITH THE EXCEPTION THAT SAWSING IS REQUIRED FOR SIDEWALKS OR SIDEATHERS 8 FEET IN WIDTH OR WIDER. LONGITUDINAL JOINT SPACING WILL MATCH THE WIDTH OF THE SIDEWALK (I.E., SIDEWALK 5 FEET WIDE WILL HAVE JOINTS SPACED AT 5 FEET).

2. CONTRACTION JOINTS WILL BE 1/8" WIDE BY 1" DEEP. IF SIDEWALK THICKNESS IS INCREASED, THE DEPTH OF THE JOINT WILL BE INCREASED PROPORTIONALLY.

3. EXPANSION JOINTS CONSISTING OF 1/2" THICK PREFORMED JOINT FILLER WILL HAVE A MAXIMUM SPACING OF 100 FEET FOR HAND-POURED SIDEWALK AND A MAXIMUM SPACING OF 200 FEET FOR MACHINE-POURED SIDEWALK. EXPANSION JOINTS WILL ALSO BE REQUIRED WHERE THE SIDEWALK ABUTS OTHER STRUCTURES. EXPANSION JOINTS WILL FULLY SEPARATE THE CONCRETE ON EITHER SIDE OF THE JOINT.

4. WHERE SIDEWALK IS INSTALLED ADJACENT TO A STORM SEWER STRUCTURE, THE SIDEWALK WILL BE DOWELED INTO THE STRUCTURE USING #4 REBAR AT 18" CENTERS. EXPANSION MATERIAL IS NOT REQUIRED WHERE DOWELS ARE USED. THE THICKNESS OF THE SIDEWALK WILL BE INCREASED TO 6" TO MAINTAIN 2" COVER FOR THE REBAR.

5. KCMCB 4K CONCRETE IS REQUIRED. SIDEWALK CONSTRUCTION WILL ADHERE TO THE CITY OF OLATHE TECHNICAL SPECIFICATIONS AND DESIGN CRITERIA FOR PUBLIC IMPROVEMENT PROJECTS.

**WHEELCHAIR PASSING SPACE**

* WHEELCHAIR PASSING SPACE TO BE CONSTRUCTED WHERE LENGTH OF 4' WIDE SIDEWALK EXCEEDS 200'.

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018, Jan. 1, 2019
SIDEWALK
STANDARD DETAIL 21-6
NOTES:
1. CONCRETE SHALL BE USED FOR THE CONSTRUCTION OF THE SIDEPATH LOCATED WITHIN CITY STREET R-O-W. AT THE DISCRETION OF THE CITY ENGINEER, A 4" THICK ASPHALT SIDEPATH ON 6" THICK MODIFIED AB-3 BASE MAY BE CONSTRUCTED ON CITY R-O-W NOT ADJACENT TO A STREET.
2. THE CONCRETE SIDEPATH SHALL BE CUT INTO SQUARE PANELS BY SAWING ONLY. SAWS JOINTS SHALL BE 1/8" WIDE BY 1" DEEP.
3. SIDEPATH WIDTH MAY BE REDUCED TO 8' IN AREAS DETERMINED BY THE CITY ENGINEER.
NOTES:

1. DESIGN CALCULATIONS MUST BE SUBMITTED FOR RETAINING WALLS WITH HEIGHTS EXCEEDING 24”.

2. HANDRAIL IS REQUIRED FOR RETAINING WALLS WITH HEIGHTS OF 30” OR GREATER.

3. CONTRACTION JOINTS IN THE SIDEWALK SHALL BE HAND-TOOLED OR SAWS AT RIGHT ANGLES TO THE ALIGNMENT OF THE SIDEWALK WITH A LONGITUDINAL SPACING OF 7 FEET. VERTICAL JOINTS IN THE RETAINING WALL WILL ALIGN WITH THE JOINTS IN THE SIDEWALK.

4. EXPANSION JOINT SPACING IS 100 FEET MAXIMUM. HORIZONTAL AND VERTICAL JOINTS WILL ALIGN WITH EACH OTHER. #5 SMOOTH DOWELS, 24” IN LENGTH, WILL BE REQUIRED AT 12” CENTERS FOR BOTH HORIZONTAL AND VERTICAL JOINTS.

5. ALL VERTICAL JOINTS SHALL HAVE A 1” WIDE PREFORMED CHAMFER. EXPOSED EDGES OF THE WALL SHALL HAVE A 3/4” PREFORMED CHAMFER.

6. PROTECTIVE CAPS SHALL BE PLACED ON ALL VERTICAL STEEL UNTIL CONCRETE IS POURED.

7. KCMB 4K CONCRETE SHALL BE USED THROUGHOUT AND ADHERE TO CITY OF OLATHE TECHNICAL SPECIFICATION SECTIONS 2000 AND 2100.

8. SEE SIDEWALK STANDARD DETAIL FOR ADDITIONAL REQUIREMENTS.

9. SEE UNDERDRAIN STANDARD DETAIL FOR ADDITIONAL UNDERDRAIN REQUIREMENTS. UNDERDRAIN LAYOUT INCLUDING PIPE ELEVATIONS AND INLET CONNECTION POINTS SHALL BE APPROVED BY THE CITY ENGINEER.

10. WALLS PLACED ALONG ARTERIAL ROADWAYS, OR OTHER LOCATIONS DESIGNATED BY THE CITY ENGINEER, SHALL BE POURED IN PLACE WITH DECORATIVE FORMLINER, TO BE SUBMITTED TO CITY ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SEE CITY OF OLATHE APPROVED MATERIALS LIST.
HANDRAIL GENERAL NOTES:

1. GALVANIZE ALL RAIL, POSTS, PICKETS, AND BASE PLATES AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A123. PAINTING SHALL CONSIST OF ONE COAT OF TNEMEC TNEME-ZINC #90-97 AND TWO COATS OF TNEMEC ENDURA-SHIELD II #1075 (GLOSS BLACK) OR APPROVED EQUAL. HANDRAILS SHALL BE PROTECTED FROM ANY DAMAGE TO THE FINISHED SURFACE. NO FIELD GALVANIZING WILL BE ALLOWED.

2. SET RAILS PARALLEL TO THE TOP OF THE WALL. SET POSTS AND PICKETS VERTICAL IN BOTH PLANES OF THE HANDRAIL. SHIMS MAY BE USED BETWEEN CONCRETE AND BASE PLATE OF STEEL POST.

3. GRIND SMOOTH ALL TOP AND BOTTOM RAIL—TO—POST WELDED CONNECTIONS. FIELD WELDING IS NOT PERMITTED. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION OF THE HANDRAIL. FIELD VERIFY AS—BUILT DIMENSIONS AND ELEVATIONS OF RETAINING WALLS, HUBGARDS OR WINGWALLS PRIOR TO FABRICATION OF HANDRAIL. POST SPACING WILL BE REVIEWED DURING THE SHOP DRAWING REVIEW PERIOD TO COORDINATE WITH EXPANSION AND CONTRACTION JOINT SPACING IN THE WALL.

4. FABRICATE HANDRAIL IN LENGTHS TO INCLUDE A MINIMUM OF ONE AND A MAXIMUM OF THREE PANELS.

5. ATTACH TOP RAIL MEMBERS TO AT LEAST TWO POSTS. LOCATE CENTER OF RAIL SPACES 1’—9” FROM CENTERLINE OF POST UNLESS SHOWN OTHERWISE.

6. THE Threaded Rod Concrete Anchors shall be Galvanized and provide a Minimum Pullout Strength of 8000 Pounds on 4000 PSI Concrete. Length of Embedment into Concrete shall Conform to Manufacturer’s Recommendations. After the Holes are Drilled, remove all Loose Material by using a Wire Brush to free the Dust from the Side of the Hole and then Vacuuming to Remove Material and Dust. Place Epoxy Capsule System in the Hole and insert the threaded Rod in accordance with the Manufacturer’s Directions.

7. ALL TOOLS, MATERIALS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK SHALL BE PAID FOR UNDER THE BID ITEM “HANDRAIL”. THE HANDRAIL IS TO BE BID ON A PER LINEAR FOOT BASIS MEASURED FROM END TO END OF HANDRAIL.
HANDRAIL ON RETAINING WALL DETAILS

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018

OLATHE KANSAS

STANDARD DETAIL 21-9B
RETAINING WALL FORMLINER GENERAL NOTES:

1. CONTRACTION JOINTS FOR THE FORMLINER WALL SHALL BE INSTALLED BY USE OF PREFORMED TEMPLATES INSTALLED PRIOR TO CONCRETE PLACEMENT. PREFORMED TEMPLATES MUST BE APPROVED BY THE CITY ENGINEER PRIOR TO USE.

2. FORMLINER PATTERN SHALL BE AS SHOWN ON THE CITY OF OLATHE APPROVED MATERIALS LIST.

3. PENETRATING STAIN AND CORRESPONDING COLORS SHALL BE AS SHOWN ON THE CITY OF OLATHE APPROVED MATERIALS LIST.

4. SUBMITTALS SHALL BE REQUIRED FOR ANY MATERIAL NOT SHOWN ON THE CITY OF OLATHE APPROVED MATERIALS LIST. CONTRACTOR SHALL ADHERE TO MANUFACTURER’S RECOMMENDATIONS FOR ALL APPROVED MATERIALS.

5. SEE SIDEWALK AND SIDEWALK WITH ABUTTING RETAINING WALL STANDARD DETAILS FOR ADDITIONAL REQUIREMENTS.
SIDEWALK & SIDEWALK RAMP NOTES:

1. Curb depression location determined from the intersection of the extension of back of sidewalk and back of curb & gutter.
2. Concrete shall be KCMMB 4K
3. Longitudinal joint spacing to match width of sidewalk.
4. Expansion joints shall be placed between ramp and sidewalk and where sidewalk abuts driveways and similar structures, and 200' centers max.
5. Install 18" tie bars #4 epoxy coated @ 18" o.c.
6. Sidewalk Ramp shall be lengthened to provide ADA compliance slope but need not exceed 15'.
7. ADA maximum ramp slope = 1%/ft. (1:12)
   ADA maximum cross slope = 2.0% (1:50)
8. The curb transitions shall be 2' in length.
9. The flares shall extend 7' beyond the transition area. The width of the flares will vary depending on the slope of the ramp.
10. If distance exceeds 5' from back of curb to leading edge of Detectable Warning, Detectable Warning panels shall be placed at the back of curb as shown.
11. Minimum width at back of ramp is 5'. Transition length is a minimum of 4' if width of existing sidewalk is 4'.

STREET CURB DETAILS AT RAMP

Olathe
KANSAS

TYPE I
SIDEWALK RAMP
STANDARD DETAIL
21-10

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018
Sidewalk & Sidewalk Ramp Notes:

1. Curb depression location determined from the intersection of the extension of back of sidewalk and back of curb & gutter.

2. Concrete shall be KCMMB 4K.

3. Longitudinal joint spacing to match width of sidewalk.

4. Expansion joints shall be placed between ramp and sidewalk and where sidewalk abuts driveways and similar structures, and 200' centers max.

5. Transition area behind detectable warning panels shall match adjacent sidewalk width or 4' minimum. Install 18" tie bars #4 epoxy coated @ 18" o.c.

6. Sidewalk Ramp shall be lengthened to provide ADA compliance slope but need not exceed 15'.

7. ADA maximum ramp slope = 1"/ft. (1:12)
   ADA maximum cross slope = 2.0% (1:50)

8. The curb transitions shall be 2' in length.
Sidewalk & Sidewalk Ramp Notes:

1. Concrete shall be KCMMC 4K.
2. Transition area behind detectable warning pavers shall match adjacent sidewalk width or 3’ minimum. Install 18” tie bars #4 epoxy coated @ 18” O.C.
3. Sidewalk Ramp shall be lengthened to provide ADA compliance slope but need not exceed 15’.
4. Expansion joints shall be placed between ramp and sidewalk and where sidewalk abuts driveways and similar structures, and 200’ centers max.
5. The curb transitions shall extend the entire length of ramp section.
6. ADA Maximum Ramp Slope = 8.3% (1:12)
   ADA Maximum Cross Slope = 2.0% (1:50)
NOTES:
1. ADA MAXIMUM CROSS-SLOPE = 2.0% (1:50)
2. ADA MAXIMUM RAMP SLOPE = 8.3% (1:12)
3. EXPANSION JOINTS SHALL BE PLACED BETWEEN THE RAMP AND SIDEWALK.
4. INSTALL 18" TIE BARS (#4 EPOXY COATED) @ 18" O.C.
5. CONCRETE SHALL BE KCMMB 4K.

LEGEND:
- R: RAMP
- D: DETECTABLE WARNING SURFACE
- T: TRANSITION

OPTIONAL CURB @ BACK OF SIDEWALK
SEE RAMP CURB DETAIL

CONTRACTION JOINTS

Ramp Curb Detail

PROPOSED CONCRETE SIDEWALK

EXIST OR PROPOSED BACK OF CURB

24" DETECTABLE WARNING SURFACE

18" TIE BAR, TYP.
SEE NOTE #4

Type IV Sidewalk Ramp
MID-BLOCK RAMP DETAIL

NOTES:
1. Ramp cross slope shall transition from street slope to 2% or less at landing.
2. Landing elevation shall be set to limit maximum ramp slope @ 8.3% (1:12).
3. If sidewalk running slope is 3% or less, use 1 square of sidewalk on either side of the landing to transition from running slope to landing slope.
4. Install 18" tie bars (#4 epoxy coated) @ 18" O.C.
5. Concrete shall be kommb 4K.
6. ADA maximum ramp slope is 8.3% (1:12). ADA maximum cross slope is 2.0% (1:50).

SECTION A-A

NOTES:
1. Ramp cross slope shall transition from street slope to 2% or less at landing.
2. Landing elevation shall be set to limit maximum ramp slope @ 8.3% (1:12).
3. If sidewalk running slope is 3% or less, use 1 square of sidewalk on either side of the landing to transition from running slope to landing slope.
4. Install 18" tie bars (#4 epoxy coated) @ 18" O.C.
5. Concrete shall be kommb 4K.
6. ADA maximum ramp slope is 8.3% (1:12). ADA maximum cross slope is 2.0% (1:50).
** See City of Olathe Design Criteria Table DC7-002-02

---

** Joint Details

- Type B Curb & Gutter
- Type B Joint
- Detectable Panels shall be installed at Signalized Intersections.
- 2-#4 Smooth Epoxy Coated Bars

** Section A-A

- Plan (Not to Scale)
- Commercial & Industrial Entrance Drive
- Curb Transition
- Type A or B Curb & Gutter

** Detail B

- Not to Scale
- Type A or B Curb & Gutter
- Transition, Curb & Gutter

---

** Joint Details

- Type A (Contraction)
- R=3/4"
- 1/2" non-extruding filler

- Type B (Isolation)
- 1/8" to 1/4" per ft

- Type C (Construction)
- R=3/4"
- 1/8" non-extruding filler

---

** Annotations

- R/W
- Varies

---

** Approved

Jan. 1, 2017

** Revised

Feb. 1, 2018
Jan. 1, 2019

COMMERCIAL & INDUSTRIAL ENTRANCE DRIVE

STANDARD DETAIL 21-11

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- 7" min. KCMB4K Concrete
- Type A Joint
- Type B Joint
- Type A or B Curb & Gutter
- Type A or B Joint (Typ.)
- Type B Joint
- Type A or B Curb & Gutter

---

** Notes

- 2-#4 Bars
- R=3/4"
- 1/2" min. KCMB4K Concrete
- 1/2" to 1/4" per ft
- Commercial Entrance
- Street Surface
- Impervious Material
- Type B Joint
- Type B Joint
- Type B Joint
- Type B Joint

** Details

- Type A or B Curb & Gutter
- Type C Curb & Gutter

---

** Definitions

- * KCMB4K Concrete shall be used throughout and adhere to City of Olathe Technical Specifications Section 2000 and Section 2100.
RESIDENTIAL DRIVE (TYPE B CURB)

NOTES:

1. KCMB4K CONCRETE WITH 6.5% AIR ENTRAINTMENT REQUIRED PER CITY OF OLATHE TECHNICAL SPECIFICATIONS SECTION 2000 AND SECTION 2100. DRIVE APPROACHES WITH NO CONNECTING SIDEWALK WILL SLOPE 1% TO 2% FROM THE R.O.W. TO THE PT WHERE THE WINGS CONNECT.

2. THE DRIVE APPROACH WILL HAVE A 5 FOOT WING ON EACH SIDE FOR DRIVeways 10 FOOT OR LESS IN WIDTH.

3. DRIVeways ALONG ARTERIAL ROADWAYS WILL HAVE A MINIMUM WIDTH OF 16' AT THE RIGHT OF WAY. WINGS WILL BE 5' IN WIDTH.

GUTTER LINE

8.3%

6" MIN. POURED CONC.

SECTION D-D

NOTES:

2 - #4 REBAR TO BE PLACED THROUGH GUTTER SECTION IF EXISTING CURB DID NOT REST ON ASPHALT BASE.
NOTE:
1. EXPANSION, CONTRACTION, OR CONSTRUCTION JOINTS ARE TO BE SAME AS NOTED ON TYPE "A" CURB AND GUTTER DETAIL.
2. ALL CURBS MUST BE CAST IN PLACE.
3. KCMMB4K CONCRETE SHALL BE USED THROUGHOUT AND ADHERE TO CITY OF OLATHE TECHNICAL SPECIFICATIONS 2000 AND 2100.
FOR USE ONLY WHERE INDICATED ON PLANS
THE CONCRETE ENCASEMENT SHALL CONFORM TO TECHNICAL
SPECIFICATION 3000, WITH A MINIMUM THICKNESS ON ALL
SIDES OF 6".

1. 8" DIA. = .11 C.Y. OF CONCRETE PER LINEAL FT.
2. 10" DIA. = .12 C.Y. OF CONCRETE PER LINEAL FT.
3. 12" DIA. = .14 C.Y. OF CONCRETE PER LINEAL FT.
4. 15" DIA. = .15 C.Y. OF CONCRETE PER LINEAL FT.
FOR USE ONLY WHERE INDICATED ON PLANS. THE CONCRETE SHALL CONFORM TO TECHNICAL SPECIFICATION 3000. THE MINIMUM THICKNESS, ON THE SIDES AND BOTTOM SHALL BE 6". THE TOP OF THE CONCRETE SHALL BE AT LEAST TO THE CENTER OF THE PIPE.
NOTES:

1. THE DEEP SERVICE RISER IS ONLY AVAILABLE WHERE THE SERVICE LATERAL IS TO BE LAID ENTIRELY IN ROCK, WITH THE RECOMMENDATION OF THE DESIGN ENGINEER AND APPROVAL BY THE CITY ENGINEER.

2. WHEN PVC PIPE IS USED FOR THE DROP PIPE, PB–2 MAY BE SUBSTITUTED FOR THE CONCRETE ENCASEMENT AROUND THE DROP PIPE AND FITTINGS.
NOTES:

ALL TAPS INTO SANITARY SEWER MUST BE "CLEAN CUT" BY DRILLING OR SAWING. NO "BREAK IN" TAPS WILL BE ALLOWED.

GLUED OR CEMENTED SADDLES WILL NOT BE ALLOWED.

A MINIMUM OF 2 STAINLESS STEEL (SERIES 300 or EQUAL) STRAPS CAPABLE OF A MINIMUM OF 60 LBS. TORQUE SHALL BE USED TO SECURE SADDLE TO SANITARY SEWER.

SADDLES SHALL BE GASKETED P.V.C. WITH 2 STAINLESS STEEL BANDS

SADDLES SHALL BE DESIGNED TO BE USED ON THE OUTSIDE DIAMETER OF THE PIPE ENCOUNTERED.

24" MINIMUM DISTANCE BETWEEN SERVICE CONNECTIONS.
NOTES:

1. FORCE MAIN 4" DIA. AND SMALLER TO BE ONE FULL JOINT OF D.I.P. THRU AIR RELEASE MANHOLES.

2. PRECAST MANHOLE – 4’-0" I.D. (FOR DEPTHS UP TO 10’)
   PRECAST MANHOLE – 5’-0" I.D. (FOR DEPTHS OVER 10’).

3. REINFORCEMENT IN ALL PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478 REQUIREMENTS.
1. PRECAST CONCRETE MANHOLES SHALL CONFORM TO ASTM C478 EXCEPT AS MODIFIED BY THE SPECIFICATIONS. WALL THICKNESS NOT LESS THAN 1/12 OF MANHOLE INSIDE DIAMETER "PLUS" ONE-INCH, OR FIVE INCHES, WHICHEVER IS GREATER.

2. MANHOLE MAY BE TRANSITIONED TO 4'-0" DIA., 8' ABOVE F.L. OF OUTFALL FOR 5'-0" AND 6'-0" MANHOLES.

3. THE BOTTOM SECTION OF ALL PRECAST MANHOLES NOT BUILT MONOLITHIC WITH THE BASE SHALL BE SET INTO A STEEL REINFORCED POURED CONCRETE BASE A MINIMUM OF 4". (#4 @ 6" E.W.). IN THIS CASE, THE BASE THICKNESS SHALL BE INCREASED TO 12".

4. ADJUSTMENT RINGS AND MANHOLE JOINTS BELOW GRADE SHALL BE SEALED WITH TAPE THAT COMPLIES WITH ASTM C877, TYPE III. USE TAPE WITH A MINIMUM 8-INCH WIDTH TO COVER JOINTS AND ENTIRE SURFACE OF THE ADJUSTMENT RINGS, OVERLAPPING ONTO THE MANHOLE RING 4 TO 6 INCHES.

5. THE COMpressive STRENGTH OF CONCRETE USED IN THE CONSTRUCTION OF PRECAST REINFORCED CONCRETE MANHOLES SHALL NOT BE LESS THAN 4000 PSI.

6. ONLY ECCENTRIC MANHOLE CONES WILL BE ALLOWED.

7. GRADE RING(S) SHALL PROVIDE A MAXIMUM ADJUSTMENT OF 9", IN ANY COMBINATION OF A MAXIMUM OF 3 RINGS.
#4 REBAR @ 6" CTRS EACH WAY

NOTES:
1. SEE STANDARD DETAIL 31-1 FOR GENERAL NOTES.
2. FLOWABLE FILL SHALL BE IN ACCORDANCE WITH SECTION 4000.
NOTES:

1. SEE STANDARD DETAIL 31-1 FOR GENERAL NOTES.
SECTION VIEW
FOR PIPE SLOPES:
LESS THAN OR EQUAL TO 15%

SECTION VIEW
FOR PIPE SLOPES:
GREATER THAN 15%

NOTES:
1. FLEXIBLE CONNECTOR SHALL BE CAST INTO ALL PRECAST MANHOLES AND SHALL CONFORM TO ASTM C923.
2. PRECAST MANHOLE MANUFACTURER SHALL INSTALL CONNECTORS PER MANUFACTURER’S INSTRUCTIONS.
1. A pipe to manhole connector using an ASTM C923 resilient device that provides a positive, flexible watertight seal for pipes entering existing manholes shall be installed by the contractor from outside the manhole.

2. All openings to accommodate these connectors shall be core-drilled.
NOTES
ALL MANHOLE COVER AND FRAMES TO BE HINGED, WITH PLASTIC PLUG TO PREVENT INFILTRATION. IN FLOODPLAIN, A CAM LOCKING MECHANISM IS REQUIRED. ENSURE CLEAR OPENING OF 24"
**NOTES:**

1./extensions shall attach to the actuator and extend to 3 ft. above the top slab. Gear and handwheel operator shall be mounted to the top of the extension and shall include a locking device.

2. Plug valve shall be installed on it's side so plug rotates to the top of pipeline when open.

3. The design engineer may be required to furnish a surge analysis.

4. All pipe penetrations shall require a cast-in-place wall fitting.

5. Install a flanged coupling adaptor (FCA) between valve and wall with a minimum of 9" between end of FCA and wall.

6. To drain discharge pipe, tap suction & discharge pipes & connect with 1" k copper tubing. Install a ball valve in the drain that can be operated from top of vault.
NOTES:

1. Extensions shall attach to the actuator and extend to 3 ft. above the top slab. Gear and handwheel operator shall be mounted to the top of the extension and shall include a locking device.

2. Plug valve shall be installed on its side so plug rotates to the top of pipeline when open.

3. The design engineer may be required to furnish a surge analysis.

4. All pipe penetrations shall require a cast-in-place wall fitting.

5. Install a flanged coupling adaptor (FCA) between valve and wall with a minimum of 9" between end of FCA and wall.

MINIMUM 6" OF ¼" CRUSHED ROCK ON UNDISTURBED EARTH OR COMPACTED TO 95% STD. PROCTOR, 12" DEEP.

2" SCHEDULE 40 P.V.C. FLOOR DRAIN WITH TRAP TO WET WELL

ALLEMINIUM HATCH. POSITION AT THIS LOCATION

PLUG VALVE

TEE

PUMP DISCHARGE

FLOOR DRAIN

SEE NOTE 5

TYPICAL 2 PLACES

ALUMINUM HATCH

DAVIT ARM BASE FOR CONFINED SPACE ENTRY

TYPICAL FOR ALL OUTSIDE EDGE OF PIPE TO WALL DIMENSIONS ARE:

4" Diam. Pipe = 18"
6" Diam. Pipe = 21"
8" Diam. Pipe = 24"
12" Diam. Pipe = 30"

PLAN VIEW

SECTION VIEW
ALT PIPE ENTRY

ALT PIPE EXIT

* SHOW ONLY PIPE ARRANGEMENT REQUIRED FOR SPECIFIC PROJECT INSTALLATION.

NOTE: PIPE ENTRY/EXIT SHALL MATCH CITY OF OLATHE PERMITTED SITE PLAN.

CLEANOUT

SEE NOTE 3

ITEM DESCRIPTION
1. 4" SCH. 40 PVC INLET PIPE*
2. 4"x4"x2" TEE WITH 2" PIPE TO BUILDING VENT*
3. THREADED C/O CAP
4. CONCRETE PAD
5. 4"x4"x4" TWO-WAY CLEANOUT TEE*
6. 4" SCH. 40 PVC OUTLET*
7. 4" - 6" GRAVEL BEDDING
8. HEAVY-DUTY CAST IRON FRAME AND COVER
9. CONCRETE ADJUSTMENT RINGS
10. REINFORCE AS REQUIRED FOR SERVICE CONDITIONS
11. 4" SCH. 40 PVC 90° ELBOW*
12. 4" SCH. 40 PVC TEE*
13. PIPE/WALL CONNECTOR
14. 2" VENT PIPE

* PIPE MAY BE SUBSTITUTED TO MATCH UPSTREAM PIPE DIAMETER.

NOTES:
1. TWO COVERS AND RISERS CENTERED OVER UPPER TWO BAFFLES.
2. INTERCEPTOR SIZE - 1000 GAL MINIMUM (REVISE THE SIZE DIMENSIONS, AS NEEDED, FOR LARGER CAPACITY INTERCEPTORS)
3. ALL JOINTS AT THE FRAME & COVER*, CONCRETE ADJUSTMENT RINGS AND THE LID OF THE INTERCEPTOR SHALL BE SEALED WITH A MINIMUM OF TWO (2) ROWS OF 3/4 TO 1 INCH PREFORMED BITUMASTIC JOINT SEALER AND TAPE THAT COMPLIES WITH ASTM C877, TYPE III, ALSO BEING MINIMUM 8-INCH IN WIDTH.
4. PIPING SHALL BE PER CURRENT IPC.
5. GREASE INTERCEPTOR SHALL BE VACUUM TESTED FOR WATER TIGHTNESS AFTER THE BACKFILL OPERATIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH CITY OF OLATHE TECHNICAL SPECIFICATIONS.
6. GREASE INTERCEPTOR SHALL MEET ASTM C1613-10 STANDARDS
1. GRANULAR EMBEDMENT MATERIAL SHALL BE KDOT PB-2 AS SPECIFIED IN SECTION 4000. GRANULAR EMBEDMENT SHALL BE COMPACTED TO 85% MAXIMUM DENSITY AS DETERMINED BY ASTM D698.

2. TRENCH OUTLINES DO NOT INDICATE ACTUAL TRENCH EXCAVATION SHAPE, SOIL CONDITIONS OR PRESENCE OF SHEETING LEFT IN PLACE. EMBEDMENT AND BACKFILL MATERIAL SHALL EXTEND THE FULL WIDTH OF THE ACTUAL TRENCH EXCAVATION.

3. TRENCH WIDTHS SHALL BE LIMITED BELOW AN ELEVATION OF ONE (1) FOOT ABOVE THE TOP OF THE INSTALLED PIPE AS FOLLOWS: NOT LESS THAN FIFTEEN (15) INCHES NOR MORE THAN TWENTY-FOUR (24) INCHES GREATER THAN THE OUTSIDE DIAMETER OF THE PIPE.

NOTES:

REFER TO PLANS AND TECHNICAL SPECIFICATIONS FOR SURFACE RESTORATION REQUIREMENTS

UNDISTURBED SOIL

TRENCH BACKFILL SHALL BE AS SPECIFIED IN SECTION 4000

EMBEDMENT DEPTH BELOW PIPE "A"

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>MIN. SOIL</th>
<th>MIN. ROCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 27&quot;</td>
<td>4&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>30&quot; TO 60&quot;</td>
<td>6&quot;</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>
TRENCH CROSS SECTION
HDPE PIPE

TRENCH CROSS SECTION
CONCRETE PIPE

NOTES:
1. GRANULAR EMBEDMENT SHALL BE KNOCKED OUT OR REPLACED WITH AGGREGATE FOR CONCRETE, WASHED STONE, OR GRAVEL MEETING THE FOLLOWING CONDITIONS:

<table>
<thead>
<tr>
<th>SIEVE SIZE</th>
<th>RETAINED PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-inch</td>
<td>0</td>
</tr>
<tr>
<td>1/2-inch</td>
<td>0-20</td>
</tr>
<tr>
<td>1/4-inch</td>
<td>40-70</td>
</tr>
<tr>
<td>No. 4</td>
<td>75-100</td>
</tr>
<tr>
<td>No. 8</td>
<td>95-100</td>
</tr>
</tbody>
</table>

GRANULAR EMBEDMENT FROM THE TOP OF PIPE DOWN SHALL BE COMPACTED TO 85% MAXIMUM DENSITY AS DETERMINED BY ASTM D 698.

GRANULAR EMBEDMENT ABOVE TOP OF PIPE SHALL BE AN UN-COMPACTED LAYER FOR ALL INSTALLATIONS.

2. TRENCH OUTLINES DO NOT INDICATE ACTUAL TRENCH EXCAVATION SHAPE, SOIL CONDITIONS, OR PRESENCE OF SHEETING LEFT IN PLACE. EMBEDMENT MATERIAL SHALL EXTEND THE FULL WIDTH OF THE ACTUAL TRENCH EXCAVATION.

3. TRENCH WIDTHS SHALL BE LIMITED BELOW AN ELEVATION OF ONE (1) FOOT ABOVE THE TOP OF THE INSTALLED PIPE AS PERMITTED NOT LESS THAN FIFTEEN (15) INCHES, NOT MORE THAN TWENTY-FOUR (24) INCHES GREATER THAN THE nominal BORE DIAmETER OF THE PIPE.

LEGEND

<table>
<thead>
<tr>
<th>D</th>
<th>NOMINAL PIPE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>EMBEDMENT BELOW PIPE</td>
</tr>
</tbody>
</table>

- GRANULAR EMBEDMENT
- SELECT BACKFILL MATERIAL

TABLE OF EMBEDMENT DEPTH BELOW PIPE

<table>
<thead>
<tr>
<th>D</th>
<th>MIN SOIL</th>
<th>MAX BOCk</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESS THAN 60&quot;</td>
<td>4&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>60&quot; OR LARGER</td>
<td>8&quot;</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018

EMBEDMENTS FOR STORM SEWER PIPE

OLATHE KANSAS
STANDARD DETAIL
40-1A
NOTES:

1. DEPTH SHOWN BELOW THE EXISTING PAVEMENT REPRESENTS MINIMUM DISTANCE ALLOWED. CONTRACTOR MAY NEED TO INCREASE THIS DISTANCE DEPENDING ON CONDITIONS AND SIZE OF CONDUIT. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE RESULTING FROM HIS OPERATION. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY SETTLEMENT, HEAVING, OR DAMAGE THAT OCCURS WITHIN 2 YEARS OF INSTALLATION.

2. FOR THE PUNCH METHOD, THE COMPACTATION HEAD SIZE IS LIMITED TO 4" DIAMETER.

3. CONDUIT SIZE FOR DIRECTIONAL DRILLING IS LIMITED TO 8" DIAMETER.

4. CASING PIPE WILL BE REQUIRED FOR WATER AND SEWER MAINS, AND CONDUITS GREATER THAN 8" IN DIAMETER. THE CASING PIPE AND INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF TECHNICAL SPECIFICATION SECTION 4000.
FUTURE STREET TRENCHING UNDER

NOTES:

1. Flowable Fill is required for trench backfill above the pipe embedment for all trenches that are less than 7 feet in depth as measured from the top of the pipe to the bottom of the future pavement. Flowable Fill shall conform to Technical Specification 4000.

2. For trenches 7 feet or greater in depth, flowable fill or PB-2 is required above the pipe embedment to the depth at which a slope of 1:1 can be achieved on the trench layback. An exception is that PB-2 will not be allowed within 5 feet of the bottom of the future pavement. Above this elevation, backfill shall be flowable fill or a combination of flowable fill and select backfill. Select backfill material shall require the approval of the City Engineer before backfilling operations will be permitted. Backfilling and compaction operations shall comply with Technical Specification 4000.
NOTE: IF THE CONTRACTOR USES BLASTING AS A MEANS OF EXCAVATION THE CONTRACTOR SHALL REMOVE ALL FRACTURED MATERIALS TO THE LIMITS OF WHERE MATERIAL IS UNDISTURBED BEFORE INSTALLING IMPERVIOUS DITCH CHECK.

IMPERVIOUS MATERIAL SHALL EXTEND TO ELEVATIONS NOTED ON THE PLANS OR 2 FT. BELOW FINISHED GRADE

STABLE FOUNDATION MATERIAL

FLOWABLE FILL CONFORMING TO TECHNICAL SPECIFICATION 4000.

UNDISTURBED EXCAVATION

2’ MIN.

TOP OF PIPE

REGULAR BACKFILL

ELEV. SHOWN ON PLANS

NOTE:

1. IMPERVIOUS DITCH CHECKS SHALL BE PLACED WHERE SHOWN ON THE PLANS. LENGTH SHALL BE A MINIMUM OF 4 LIN. FT. FLOWABLE FILL SHALL CONFORM TO TECHNICAL SPECIFICATION 4000.

2. REGULAR BACKFILL (ABOVE DITCH CHECK) SHALL BE TOP SOIL.

3. TOP OF IMPERVIOUS MATERIAL SHALL BE A MINIMUM OF 2’—0” BELOW FINISHED GRADE.
GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE STEPS SPACED AT 1'-6" O.C. WHERE INLET OR MANHOLE DEPTH IS GREATER THAN 4'-0". INSTALL AS NEEDED WHERE INLET OR MANHOLE DEPTH IS LESS THAN 4'-0".

2. THE FIRST DIMENSION IN THE PLAN NOTATIONS REFERS TO THE "L" DIMENSION; I.E., TYPE VI DENOTES L=6'-0". THE SECOND DIMENSION IN THE PLAN NOTATIONS REFERS TO THE "W" DIMENSION.

3. CURB CONTRACTOR SHALL HAND FORM AND FINISH GUTTER WITHIN THE INLET THROAT TO THE REAR OF FRONT INLET WALL AT THE TIME THE FINISHING OF NORMAL CURB IS ACCOMPLISHED.

4. CONCRETE USED FOR THE CONSTRUCTION OF CURB INLETS SHALL CONFORM TO SECTION 2000, CONCRETE CONSTRUCTION.

5. THE INVERT SHALL HAVE A TROWEL FINISH TO SECURE SMOOTH INVERT SLOPING TO OUTLET PIPE.

6. OUTLET OR INLET PIPE SHALL BE PLACED AS SPECIFIED OR AS DIRECTED BY THE CITY ENGINEER. REINFORCING STEEL SHALL BE BENT AROUND PIPE.

7. USE KOMMBEK CONCRETE FOR ALL Poured IN PLACE CONCRETE TOPS. NO PRECAST TOPS ALLOWED.

8. CONTRACTOR SHALL OBTAIN "NO DUMPING, DRAINS TO STREAM" MARKER FROM CITY. CONTRACTOR TO SUPPLY ADHESIVE FOR INSTALLATION, WIRE BRUSHING AND CLEANING OF THE CONCRETE SURFACE WILL BE REQUIRED PRIOR TO APPLICATION OF THE ADHESIVE.

9. ANY INLET, YARD INLET, OR JUNCTION BOX OVER 10 FT. IN LENGTH, 8 FT. IN WIDTH, OR 12 FT. IN DEPTH SHALL BE CONSIDERED NON-STANDARD AND A DETAIL SHALL BE SHOWN. ANY SUCH DETAIL SHALL BE SEATED BY A STRUCTURAL ENGINEER, AND APPROVED BY THE CITY ENGINEER.

10. CURB CONTRACTOR SHALL HAND FORM AND FINISH GUTTER WITHIN THE INLET THROAT TO THE REAR OF FRONT INLET WALL AT THE TIME THE FINISHING OF NORMAL CURB IS DONE.
NOTES:

1. APPLIES TO DETAILS 50-1, 50-4, 50-5, 50-5A, AND 50-6
NOTES:

1. SEE STANDARD DETAIL 50–1 FOR GENERAL NOTES.

2. CONCRETE USED FOR THE CONSTRUCTION OF WALL SECTIONS SHALL CONFORM TO SECTION 2000, CONCRETE CONSTRUCTION.

3. USE KCMMB4K CONCRETE FOR ALL Poured–in–Place CONCRETE TOPS. NO PRE–CAST TOPS ALLOWED.
NOTES:
1. SEE STANDARD DETAIL 50-1 FOR GENERAL NOTES.
2. SPACER SHALL BE PLACED AT EQUAL INTERVALS ACCORDING TO THE FOLLOWING: L = 4’-0”, 2 SPACES; L = 5’-0”, 2 SPACES; L = 6’-0”, 2 SPACES; L = 7’-0”, 2 SPACES; L = 8’-0”, 3 SPACES; L = 10’-0”, 3 SPACES.
3. ALL METAL SURFACES, AFTER BEING CLEANED OF ALL DUST, MILL SCALE AND WELD SCALE SHALL BE ZINC COATED BY THE HOT-DIP PROCESS CONFORMING TO ASTM A123-89.
NOT TO SCALE

CONTRACTOR TO INSTALL "NO DumpING, Drains to Stream" MARKER

LOCATIONS SHOWN ON CONSTRUCTION PLANS ARE CENTER OF STRUCTURE.

OUTSIDE EDGE OF CONCRETE FOOTING

INSIDE WALL

STEEL INLET FRAME (SEE STEEL FRAME DETAIL)

MANHOLE RING AND LID (SEE NOTE #3)

NO. 4 BARS PLACED AT 45° ANGLE

NOTES:
1. SEE STANDARD CURB INLET DETAIL 50-1 FOR GENERAL NOTES.
2. SEE WALL SECTIONS DETAIL 50-2.
LOCATIONS SHOWN ON CONSTRUCTION PLANS ARE CENTER OF STRUCTURE.

4'-0" MIN.

NO. 4 BARS PLACED AT 45° ANGLE (TYPICAL)
INSIDE WALL
RING AND U.D.
OUTSIDE EDGE OF CONCRETE FOOTING

PLAN
NOT TO SCALE

ELEVATIONS SHOWN ON CONSTRUCTION PLANS ARE TOP CENTER OF CASTINGS. TIP CASTING TO MATCH SLOPE OF PROPOSED GRADE.

ADJUSTMENT RINGS

STEPS (SEE NOTE #1 STANDARD DETAIL 50-1)

NO. 4 BARS Ø 6" CTRS. (BOTH WAYS)

NO. 4 BARS Ø 12" CTRS. (BOTH WAYS) (ALL WALLS)

CONCRETE FOOTING

NO. 4 BARS Ø 6" CTRS. (BOTH WAYS)

SECTION A-A
NOT TO SCALE

STANDARD JUNCTION BOX

NOTES:
1. SEE STANDARD CURB INLET DETAIL 50-1 FOR GENERAL NOTES.
2. ADJUSTMENT RINGS SHALL PROVIDE A MINIMUM ADJUSTMENT OF 1 1/2" AND A MAXIMUM ADJUSTMENT OF 9". A MAXIMUM NUMBER OF RINGS USED FOR EACH STRUCTURE SHALL BE 3.
3. SEE WALL SECTION DETAIL 50-2
4. PRE-CAST TOP IS PERMITTED WHEN CONCRETE TOP IS BELOW FINISHED GRADE.
NOTES:
1. CONTRACTOR SHALL PROVIDE STEPS SPACED AT 1'-4" O.C. WHERE INLET OR MANHOLE DEPTH IS GREATER THAN 4'-0" INSTALL AS NEEDED WHERE INLET OR MANHOLE DEPTH IS LESS THAN 4'-0".

2. PRECAST CONCRETE MANHOLES SHALL CONFORM TO ASTM C478 EXCEPT AS MODIFIED BY THE SPECIFICATIONS.

3. MANHOLE MAY BE TRANSITIONED TO 4'-0" DIA., 8' ABOVE F.L. OF OUTFALL FOR 5'-0" AND 6'-0" MANHOLES.

4. THE BOTTOM SECTION OF ALL PRECAST MANHOLES NOT BUILT MONOLITHIC WITH THE BASE SHALL BE SET INTO A STEEL REINFORCED Poured CONCRETE BASE A MINIMUM OF 8". (#4 @ 6" E.W.)

5. THE CONCRETE FOR THE BASE SHALL CONFORM TO SECTION 2000, CONCRETE CONSTRUCTION.

6. ONLY ECCENTRIC MANHOLE CONES WILL BE ALLOWED UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.

7. ADJUSTING RING(S) SHALL PROVIDE A MINIMUM ADJUSTMENT OF 1 1/2" AND A MAXIMUM ADJUSTMENT OF 9" A MAXIMUM NUMBER OF RINGS USED FOR EACH STRUCTURE SHALL BE 3.
#5 BARS AT 6" ON CENTERS EACH WAY

RING AND LID (CAST IN MANHOLE TOP).

DIAMETER SHALL BE AS REQ'D. IN STD. PRECAST MANHOLE

9" COMPACTED EARTH (LOOSE OR STANDARD MAXIMUM DENSITY)

#4 @ 6" E.W.

NOTES:

1. IF LIFTING LOOPS ARE LOCATED ON THE TOP OF THE INLET TOPS, A MINIMUM OF 2" COVER IS REQUIRED OVER THE LIFTING LOOPS.

2. USE OF A STANDARD LID AND RING WILL BE ALLOWED WHERE GRADE PERMITS.

3. CONTRACTOR SHALL PROVIDE STEPS SPACED AT 1'-4" O.C. WHERE INLET OR MANHOLE DEPTH IS GREATER THAN 4'-0". INSTALL AS NEEDED WHERE INLET OR MANHOLE DEPTH IS LESS THAN 4'-0".

4. CONCRETE USED FOR THE CONSTRUCTION OF JUNCTION BOXES SHALL CONFORM TO SECTION 2000, CONCRETE CONSTRUCTION.

5. SEE WALL SECTION DETAIL 50-2.

6. PRE-CAST TOP IS PERMITTED WHEN CONCRETE TOP IS BELOW FINISHED GRADE.
CONTRACTOR TO INSTALL "NO DUMPING, DRAINS TO STREAM" MARKER

#4 @ 6" CTRS. (EACH WAY)

SLOPE CONCRETE TOP TO DRAIN TO GATE

NOTE:
1. CONCRETE SHALL CONFORM TO SECTION 2000—CONCRETE CONSTRUCTION.
2. USE KCMMB4K CONCRETE FOR ALL POURED-IN-PLACE CONCRETE TOPS. NO PRECAST TOPS ALLOWED.
3. SEE WALL SECTION DETAIL 50–2.
4. GRATE INLET ONLY ALLOWED IF SPECIAL CONDITIONS ALLOWED BY CITY ENGINEER.
TYPICAL METAL HANDRAIL ELEVATION
ON CONCRETE HEADWALL & WINGWALL

HANDRAIL GENERAL NOTES:

1. GALVANIZE ALL RAIL, POSTS, PICKETS, AND BASE PLATES AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A123. PAINTING SHALL CONSIST OF ONE COAT OF TNEMEC TNEME-ZINC #90-97 AND TWO COATS OF TNEMEC ENOUIRA-SHIELD II #1075 (GLOSS BLACK) OR APPROVED EQUAL. HANDRAILS SHALL BE PROTECTED FROM ANY DAMAGE TO THE FINISHED SURFACE. NO FIELD GALVANIZING WILL BE ALLOWED.

2. SET RAILS PARALLEL TO THE TOP OF THE WALL. SET POSTS AND PICKETS VERTICAL IN BOTH PLANES OF THE HANDRAIL. SHIMS MAY BE USED BETWEEN CONCRETE AND BASE PLATE OF STEEL POST.

3. GRIND SMOOTH ALL TOP AND BOTTOM RAIL-TO-POST WELDED CONNECTIONS. FIELD WELDING IS NOT PERMITTED. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION OF THE HANDRAIL. FIELD VERIFY AS-BUILT DIMENSIONS AND ELEVATIONS OF RETAINING WALLS, HUBGUARDS OR WINGWALLS PRIOR TO FABRICATION OF HANDRAIL. POST SPACING WILL BE REVIEWED DURING THE SHOP DRAWING REVIEW PERIOD TO COORDINATE WITH EXPANSION AND CONTRACTION JOINT SPACING IN THE WALL.

4. FABRICATE HANDRAIL IN LENGTHS TO INCLUDE A MINIMUM OF ONE AND A MAXIMUM OF THREE PANELS.

5. ATTACH TOP RAIL MEMBERS TO AT LEAST TWO POSTS. LOCATE CENTER OF RAIL SPLICES 1'-9" FROM CENTERLINE OF POST UNLESS SHOWN OTHERWISE.

6. THE THREADED ROD CONCRETE ANCHORS SHALL BE GALVANIZED AND PROVIDE A MINIMUM PULLOUT STRENGTH OF 8000 POUNDS ON 4000 PSI CONCRETE. LENGTH OF EMBEDMENT INTO CONCRETE SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS. AFTER THE HOLES ARE DRILLED, REMOVE ALL LOOSE MATERIAL BY USING A WIRE BRUSH TO FREE THE DUST FROM THE SIDE OF THE HOLE AND THEN VACUUMING TO REMOVE MATERIAL AND DUST. PLACE EPSOY CAPSULE SYSTEM IN THE HOLE AND INSERT THE THREADED ROD IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS.

7. ALL TOOLS, MATERIALS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK SHALL BE PAID FOR UNDER THE BID ITEM "HANDRAIL". THE HANDRAIL IS TO BE BID ON A PER LINEAR FOOT BASIS MEASURED FROM END TO END OF HANDRAIL,
NOTE:
1. CONCRETE USED FOR THE CONSTRUCTION OF END WALLS SHALL CONFORM TO SECTION 2000, CONCRETE CONSTRUCTION.
UNDERDRAIN

1'-0" MIN.

1'-0"

6'' TYPICAL

12'' OVERLAP

KDOT BD-1

FLOW LINE—DRAIN TO INLET, JUNCTION BOX OR CHANNEL.

6'' PERFORATED P.V.C., SDR 35, WITH ½" DIA. HOLES SPACED AT 4' ON 12:00, 4:00, AND 8:00 POSITIONS. (1% MIN. SLOPE)

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018

50-10

STANDARD DETAIL
THrust Restraint for Ductile Iron Mains, Fittings and Gaskets

The thrust restraint tables are based upon the following criteria:

1. Horizontal fittings only
2. Type No. 4 laying conditions:
   * Flat bottom trench
   * 4" compacted granular material under pipe
   * compacted granular material to top of pipe
3. Clay No. 1 soil conditions:
   * Clay to medium to low plasticity
4. All main to be polywrapped
5. Depth of cover 3.5 feet
6. Design pressure 180 psi
7. Safety factor of 1.5 times

Please note:

Any trench, soil depth or pressure conditions which deviate from the above listed criteria should be reviewed by the city engineer for an alternative solution.

### Table of Pipe Footages Required to Restrain Fittings by Size

<table>
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<tr>
<th>Fitting</th>
<th>4&quot;</th>
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<th>8&quot;</th>
<th>10&quot;</th>
<th>12&quot;</th>
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<th>16&quot;</th>
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<tbody>
<tr>
<td>11 1/4&quot; Bend</td>
<td>2&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
<td>5&quot;</td>
<td>6&quot;</td>
<td>7&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>22 1/2&quot; Bend</td>
<td>4&quot;</td>
<td>6&quot;</td>
<td>8&quot;</td>
<td>10&quot;</td>
<td>12&quot;</td>
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<td>32'</td>
<td>42'</td>
<td>51'</td>
<td>61'</td>
<td>70'</td>
<td>79'</td>
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<tr>
<td>Dead End</td>
<td>23'</td>
<td>33'</td>
<td>44'</td>
<td>54'</td>
<td>64'</td>
<td>74'</td>
<td>84'</td>
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### Table of Thrust Restraint for Tees

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<td>33'</td>
<td>43'</td>
<td>53'</td>
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### Table of Thrust Restraint for Reducers by Size

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<tbody>
<tr>
<td>Large End</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>16&quot;</td>
<td>19'/22'</td>
<td>36'/47'</td>
<td>50'/78'</td>
<td>61'/118'</td>
<td>71'/178'</td>
<td></td>
</tr>
<tr>
<td>14&quot;</td>
<td></td>
<td>19'/22'</td>
<td>35'/48'</td>
<td>48'/81'</td>
<td>59'/130'</td>
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</tr>
<tr>
<td>12&quot;</td>
<td></td>
<td></td>
<td>19'/22'</td>
<td>34'/49'</td>
<td>46'/88'</td>
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<td></td>
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<td>17'/25'</td>
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</table>

**Example:** 16" x 12" reducer requires the following: 36"-47"
Length of restrained joint piping for the large side of reducer 36".

**Note:** If the straight run of pipe on the small side of reducer exceeds 47 feet then no restrained joints are necessary.
NOTE:

1. SET CARSONITE "BLUE" BOUNDARY MARKER 3'-0" ABOVE FINISHED GRADE AND WITHIN 1'-6" OF VALVE BOX IN AREAS WHERE CONCRETE OR ASPHALT MATERIALS DON'T ENCOMPASS VALVE BOX. MARKERS ARE TO BE PURCHASED FROM THE CITY OF OLATHE PUBLIC WORKS DEPARTMENT – 1385 S. ROBINSON DRIVE.

2. CITY INSPECTOR SHALL REMOVE THE MARKER WHEN THE LOT HAS BEEN DEVELOPED.
NOTE:

1. ALL PIPING/FITTINGS SHALL BE RESTRAINED JOINT PIPE.

2. ALL NUTS/BOLTS BURIED SHALL BE 316 STAINLESS STEEL.

FIRE HYDRANT INSTALLATION

STANDARD DETAIL 60-2
PERMANENT FLUSHING ASSEMBLY

NOTE:
USE WHERE APPROPRIATE FIRE HYDRANT SPACING ALLOWS FOR PERMANENT INSTALLATION.

DEAD END TEMPORARY ASSEMBLY

NOTE:
USE WHERE FIRE HYDRANT SPACING IS NOT APPROPRIATE FOR PERMANENT INSTALLATION.
COMBINATION AIR RELEASE & VACUUM RELIEF VALVE

NOTES:

1. FOR MANUALLY OPERATED VALVES ONLY.
2. PROVIDE #24–MESH NON–CORRODIBLE SCREEN OVER END OF VENT PIPE
3. BOLLARDS SHALL BE REQUIRED FOR PROTECTION OF VENT PIPE IF LOCATED IN RIGHT–OF–WAY. BOLLARDS SHALL BE SET IN CONCRETE AS SHOWN IN DETAIL.
4. AIR RELEASE VALVES SHALL NOT BE INSTALLED UNDER PAVEMENT OR DRIVEWAYS.

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018
Jan. 1, 2019

OLATHE KANSAS

STANDARD DETAIL 60-4
<table>
<thead>
<tr>
<th>BENDS</th>
<th>R</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>BENDS</th>
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<th>C</th>
<th>D</th>
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<td>6&quot; 11 1/4 DEG</td>
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<td>15&quot;</td>
<td>12&quot;</td>
<td>24&quot;</td>
<td>12&quot;</td>
<td>6&quot; 45 DEG.</td>
<td>8&quot;</td>
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<td>24&quot;</td>
<td>13&quot;</td>
<td>6&quot; 90 DEG.</td>
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CONCRETE THRUST BLOCKING

Olathe KANSAS

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018

STANDARD DETAIL

60-5
NOTE:
CONCRETE BLOCKING WILL ONLY BE NECESSARY WHERE THERE IS NO CONTACT WITH
UNDISTURBED SOIL ON LOWER BENDS.
NOTES:

1. FILL ALL VOID SPACES OUTSIDE THE CASING PIPE WITH CONTROLLED LOW-STRENGTH MATERIAL (CLSM).

2. SEE SECTION 6000 FOR CORROSION PROTECTION REQUIREMENTS. THERMITE WELD CONNECTIONS SHALL BE MADE WITH 12 A.W.G. GROUNDING WIRE IN ANODE PACKAGE. ANODE LOCATIONS SHALL BE GPS LOCATED IN STATE PLANE KANSAS NORTH. NORTHING AND EASTING SHALL BE PROVIDED ON THE CONSTRUCTION RECORD DRAWINGS.

3. DESIGN ENGINEER SHALL OBTAIN SPACING RECOMMENDATION FROM SPACER MANUFACTURER FOR EACH SPECIFIC SITUATION.

4. REFER TO TECHNICAL SPECIFICATION SECTION 4000 FOR CASING REQUIREMENTS.
NOTES:

1. ALIGNMENT OF D.I.P. WATER LINE AROUND CUL-DE-SAC VARIES TO MAINTAIN CLEARANCE FROM SAN. SEWER.

2. MAIN TO BE EXTENDED TO INSURE D.I.P. WATER LINE IS LOCATED ON PROPERTY LINE FOR FUTURE TAPPING PURPOSES

3. FOR FIRE HYDRANT ASSEMBLY DETAILS SEE STD. DETAIL 60–2

4. FOR FLUSHING ASSEMBLY DETAILS SEE STD. DETAIL 60–3.
2 1/2 INCH OR LARGER
DOUBLE CHECK DETECTOR
ASSEMBLY (DCDA) W/MIU
FOR FIRE SERVICE

NOTES:
1. THIS DRAWING IS ONE EXAMPLE OF A VAULT SHOWING CLEARANCES AROUND
THE DCDA AND IS NOT TO BE CONSIDERED A CITY OF OLATHE STANDARD.
2. VAULT, COVER AND LADDER SHALL BE DESIGNED BY OWNER/AGENT.
3. REQUIREMENTS AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT
NOTICE.
NON-SEWER BILLABLE WATER BACK FLOW DEVICES AS REQUIRED

METERS "A" & "B" ARE TO BE SIZED BASED ON FLOW REQUIREMENTS. (GPM)

STANDARD METER FEES APPLY FOR BOTH METERS.

NOTE: CITY OF OLATHE TO MAINTAIN TO 3 FT. OUTSIDE OF METER PIT "A" ON THE CUSTOMER SIDE

OPTION #1

NON-SEWER BILLABLE WATER BACK FLOW DEVICES AS REQUIRED

METER "B" READS NON-SEWER BILLABLE WATER. WATER SDF ONLY BASED ON METER SIZE

METER "A" READS SEWER BILLABLE WATER. WATER & SEWER SDF APPLY

PUBLIC MAIN

OPTION #2
WATER METER LID

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018

WATER METER LID
STANDARD DETAIL 60-10
NOTE:

1. GRANULAR EMBEDMENT MATERIAL SHALL ADHERE TO CITY OF OLATHE TECHNICAL SPECIFICATION SECTION 4000.

2. THE 1 FT. ON EITHER SIDE OF ACTUAL TRENCH WIDTH SHALL NOT BE REMOVED UNTIL THE TRENCH HAS BEEN FILLED AND COMPACTED.

3. ALL TEMPORARY SURFACING PLACED IN PUBLIC STREETS SHALL CONSIST OF COLD MIX ASPHALT AT A MINIMUM.

4. HIGH EARLY STREET PATCH SHALL ONLY BE OPENED TO LIGHT TRAFFIC AFTER 72 HOURS OR 75% OF THE MIX DESIGN STRENGTH ACHIEVED. STEEL PLATING MAY BE REQUIRED BY THE CITY ENGINEER.

5. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMpressive STRENGTH OF 4000 PSI AND ADHERE TO CITY OF OLATHE TECHNICAL SPECIFICATION 2000.

6. ASPHALT SHALL ADHERE TO OLATHE TECHNICAL SPECIFICATION 1300.
PRIVATE DRIVE/PARKING LOT

COMPACTED SOIL

12"+O.D.+12"

36" MIN

KDOT GRAD F 4.0 AE
8" CONCRETE

8’ MAX.

12” MIN

8”

EXISTING PIPE BEDDING

EXISTING PIPE

FOR SANITARY SEWERS LESS THAN 8’ DEPTH

APPROVED: Jan. 1, 2017
REVISED: Feb. 1, 2018

PRIVATE PAVEMENT
PATCH FOR SANITARY
SEWERS LESS THAN
8’ DEEP

STANDARD
DETAIL
70-2
ROCK DITCH CHECK

ELEVATION AT END POINTS "A" MUST BE MINIMUM 6" HIGHER THAN ELEVATION OF FLOW LINE AT POINT "B"

PLACE DOWNSTREAM STRUCTURE SUCH THAT POINT "B" IS APPROXIMATELY LEVEL WITH THE TOE ELEVATION OF THE UPSTREAM STRUCTURE

SPACING BETWEEN CHECK DAMS

NOTE:
1. ROCK CHECK DAMS SHALL BE USED ONLY FOR DRAINAGE AREAS LESS THAN 10 ACRES UNLESS APPROVED BY THE CITY ENGINEER.
2. SEDIMENT SHOULD BE REMOVED WHEN IT REACHES ONE HALF OF THE ORIGINAL HEIGHT OF THE DAM.
NOTES:

1. THE EROSION CONTROL BERM SHALL BE PLACED, UNCOMPACTED, IN A WINDROW AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

2. PARALLEL TO THE BASE OF THE SLOPE, OR AROUND THE PERIMETER OF OTHER AFFECTED AREAS, CONSTRUCT A COMPOST BERM. FOR MAXIMUM WATER FILTRATION ABILITY OR FOR STEEP SLOPES, CONSTRUCT A TRAPEZOIDAL MULCH BERM. IN EXTREME CONDITIONS AND WHERE SPECIFIED BY THE ENGINEER, A SECOND BERM SHALL BE CONSTRUCTED AT THE TOP OF THE SLOPE. (THE ENGINEER SHALL SPECIFY BERM REQUIREMENTS).

3. IF THE BERM IS TO BE LEFT AS A PERMANENT FILTER OR PART OF THE NATURAL LANDSCAPE, THE "COMPOST MULCH BERM" MAY BE SEEDED DURING APPLICATION FOR PERMANENT VEGETATION. THE ENGINEER SHALL SPECIFY SEED REQUIREMENTS.

4. DO NOT USE MULCH BERMS IN ANY RUNOFF CHANNELS.
1. Stakes spaced @ 6’ maximum on open runs and 3’ in ditches and installed on a slight angle toward the anticipated runoff source. Use 2” x 2” wood or equivalent steel stakes.

2. Sediment fence must be placed at level existing grade. Both ends of the barrier must be extended at least 8 feet up slope at 45 degrees to the main barrier alignment.

3. Attach fabric to upstream side of posts.

4. Sediment must be removed when accumulations reach 1/2 the above ground height of the fence and shall be uniformly distributed on the source area prior to topsoiling.

5. Any section of sediment fence which has been undermined or topped must be immediately replaced with a rock filter outlet.

6. The maximum drainage area for overland flow to a silt fence shall not exceed 1/4 acre per 100 feet of silt fence. Filter fence shall have downsloped ends tapered to a j-hook on a downhill slope.

7. The maximum slope length behind the silt fence is 100 feet; and the maximum gradient behind the silt fence is 50% (2:1).

8. The fence shall be placed along the site contours. Under no circumstance should silt fences be constructed in streams, swales, or ditches where flows are likely to exceed 1 cubic foot per second (CFS).
NOTES:

1. STAKES SPACED @ 6’ MAXIMUM ON OPEN RUNS AND 3’ IN DITCHES AND INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. USE 2” X 2” WOOD OR EQUIVALENT STEEL STAKES.

2. SEDIMENT FENCE MUST BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.

3. ATTACH FABRIC TO UPSTREAM SIDE OF POSTS.

4. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE AND SHALL BE UNIFORMLY DISTRIBUTED ON THE SOURCE AREA PRIOR TO TOPSOILING.

5. ANY SECTION OF SEDIMENT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.
NOTE:
SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.
SILT FENCE BOX OPTION

GRAVEL FILTER OPTION

GENERAL NOTES:
1. INLET PROTECTION AT AREA INLETS SHALL BE INSTALLED WITHIN 48 HOURS OF POURING INLET.
2. OTHER AREA INLET PROTECTION METHODS WILL BE ALLOWED IF ACCEPTED BY THE CITY.
3. SILT FENCE BOX OPTION SHALL NOT BE USED WHEN PONDING BEHIND THE SEDIMENT CONTROL MAY CAUSE STREET OR STRUCTURE FLOODING.

MAINTENANCE NOTES:
1. THE CONTRACTOR SHALL INSPECT INLET PROTECTION AFTER EACH RAIN EVENT OF 1/2 INCH OR GREATER AND REPAIRS MADE AS NEEDED.
2. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH REACHES 1/2 OF THE DESIGN DEPTH.
3. TO PREVENT CLOGGING, FILTER FABRIC OR GRAVEL FILTERS SHOULD BE CLEANED OR REPLACED PERIODICALLY.
4. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED.
5. WHEN INLET PROTECTION AT AREA INLETS ARE REMOVED, THE DISTURBED AREA SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER ACCEPTED BY THE CITY.
GRAVEL BAG CURB INLET SEDIMENT TRAP

GRAVEL FILTER BAGS
(Typical At Every Inlet)
(Not to Scale)

NOTE:
AFTER CONSTRUCTION OF INLETS, FILTER BAGS
SHALL BE PLACED AROUND PROPOSED INLETS.
TEMPORARY DIVERSION DIKE

NOTES:

1. TEMPORARY DIVERSION DIKES MUST BE INSTALLED AS A FIRST STEP IN THE LAND-DISTURBING ACTIVITY AND MUST BE FUNCTIONAL PRIOR TO UPSLOPE LAND DISTURBANCE.
2. THE DIKE SHOULD BE ADEQUATELY COMPACTED TO PREVENT FAILURE.
3. TEMPORARY OR PERMANENT SEEDING AND MULCH SHALL BE APPLIED TO THE DIKE IMMEDIATELY FOLLOWING ITS CONSTRUCTION.
4. THE DIKE SHOULD BE LOCATED TO MINIMIZE DAMAGES BY CONSTRUCTION OPERATIONS AND TRAFFIC.
SEDIMENT TRAP NOTES:
1. USE ONLY IF THE CONTRIBUTING DRAINAGE AREA TO THE TRAP IS 3 ACRES OR LESS.
2. USE ONLY FOR TREATMENT OF ONSITE RUNOFF.
3. NEVER CONSTRUCT A SEDIMENT TRAP ON A FLOWING STREAM OR IN WETLANDS.
4. A RECTANGULAR AND SHALLOW TRAP, WITH A LENGTH-TO-WIDTH RATIO OF 2:1 OR GREATER IS RECOMMENDED.
5. FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER VEGETATION, ORGANIC MATERIAL, LARGE STONES, AND OTHER OBJECTIONABLE MATERIAL.
6. INLETS TO SEDIMENT TRAP SHALL ENTER AT THE FURTHEST DISTANCE TO OUTLET DESIGNED SO AS NOT TO ERODE SIDE SLOPES OF SEDIMENT BASIN.

INSTALLATION NOTES:
1. SEDIMENT TRAPS, ALONG WITH OTHER PERIMETER CONTROLS, SHALL BE INSTALLED BEFORE ANY LAND DISTURBANCE TAKES PLACE IN THE DRAINAGE AREA.
2. THE AREA UNDER THE EMBANKMENT SHALL BE CLEARED AND STRIPPED OF ANY VEGETATION AND ROOTS.
3. A GEOTEXTILE SHOULD BE PLACED AT THE STONE-SOIL INTERFACE TO ACT AS A SEPARATOR.

MAINTENANCE NOTES:
1. SEDIMENT SHALL BE REMOVED FROM THE TRAP WHEN THE WET STORAGE VOLUME IS REDUCED BY HALF. SEDIMENTS REMOVED MUST BE PROPERLY DISPOSED.
2. THE CONTRACTOR SHALL INSPECT SEDIMENT TRAP EVERY TWO WEEKS AND AFTER ANY SIGNIFICANT STORM EVENT; ROCKS CLOGGED WITH SEDIMENT SHALL BE CLEANED OR REPLACED.
3. SEDIMENT TRAPS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREAS ARE STABILIZED AND ACCEPTED BY THE CITY.
4. IF SEDIMENT TRAPS ARE REMOVED, THE DISTURBED AREA SHALL BE SEEDED, CRIMPED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER ACCEPTED BY THE CITY.
SEDIMENT BASIN NOTES:

DESIGN REQUIREMENTS:

1. THE PLAN AND PROFILES ARE SCHEMATIC IN NATURE. CONSTRUCTION PLANS MUST PROVIDE SPECIFIC SITE CONSTRUCTION ARRANGEMENTS. DETAILS GIVEN IN THESE DRAWINGS SHALL BE USED UNLESS ALTERNATE DETAILS ARE SHOWN IN PLAN AND APPROVED BY THE CITY.

2. IF THE LENGTH TO WIDTH RATIO IS LESS THAN 2, INTERIOR SEDIMENT FENCE BAFFLES SHALL BE PROVIDED TO REDUCE SHORT-CIRCUITING OF THE BASIN.

3. EMERGENCY SPILLWAYS TO BE LOCATED IN A NON-FILL LOCATION WHEN FEASIBLE AND SHALL BE LINED WITH A NON-ERODIBLE MATERIAL SUCH AS RIPRAP OR TURF REINFORCEMENT MATT.

MAINTENANCE/SAFETY REQUIREMENTS:

4. THE PERMIT HOLDER SHALL CLEAN OUT DEPOSITED SEDIMENT WHEN SEDIMENT STORAGE HAS BEEN REDUCED BY 20% OF THE ORIGINAL DESIGN STORAGE VOLUME. THE CLEANOUT LEVEL SHALL BE INDICATED ON THE RISER PIPE WITH PAINTED RED HORIZONTAL LINE.

5. SEDIMENT BASINS SHALL BE FENCED USING CONSTRUCTION FENCE OR OTHER MATERIAL FOR SAFETY REASONS AND INCLUDE WARNING SIGNS, READING: "DANGER - KEEP OUT".

6. SEDIMENT BASINS SHALL BE FITTED WITH SKIMMERS AS DETAILED IN 73-11B.
**Corrugated Metal Anti-Seeage Collar Detail**

1. Connections between the anti-seeage collar and the barrel must be watertight.
2. \( P = \) vertical projection distance of collar, sized as required to achieve at least 10x increase in seepage length.
3. \( 14P = \) max. spacing between collars.
4. Collars shall generally be placed in the middle third of the embankment, and within the saturated zone.
5. All materials to be in accordance with construction material specifications.
6. When specified on the plans, coating of collars shall be in accordance with construction material specifications.
7. Unassembled collars shall be marked by painting or tagging to identify matching pairs.
8. The lap between the two half sections and between the pipe and connecting band shall be caulked with asphalt mastic at the time of installation.
9. Each collar shall be furnished with two (2) \( \frac{3}{4} \)" diameter rods with standard tank lugs for connecting the collars to the pipe.
10. For bands and collars, modification of the details shown may be used providing equal water tightness is maintained and detailed drawings are submitted and approved by the engineer prior to delivery.
11. Two other types of anti-seeage collars are:
   - Corrugated metal, similar to above, except shop welded to a 4 ft. section of the pipe and connected to the pipe with connecting bands.
   - Concrete, 6 inches thick, formed around the pipe with \( \#3 \) rebar spaced 15".

**SKIMMER DETAIL (TYP.)**

* Designer to provide specific details per application (e.g., pipe sizes, screen sizes, perforation, etc.) as required.
NOTES:
1. INSTALL PRIOR TO START OF GRADING.
2. USE 3 TO 5 INCH AGGREGATE STONE FOR COMMERCIAL APPLICATIONS AND 2 TO 3 INCH FOR RESIDENTIAL APPLICATIONS.
3. DRIVE MUST BE AT LEAST 20 FEET WIDE AND 50 FEET LONG (MINIMUM) OR THE DISTANCE TO THE FOUNDATION, WHICHEVER IS LESS.
4. REPLACE AS NEEDED TO MAINTAIN 6 INCH DEPTH OVER GEOTEXTILE.
5. REMOVE MUD OR SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROAD IMMEDIATELY.
LEGEND

X — SEDIMENT BARRIER

--- --- LIMITS OF DISTURBANCE

--- --- DIRECTION OF SURFACE WATER RUNOFF
LEGEND

- X - X - SEDIMENT BARRIER
- - - LIMITS OF DISTURBANCE

DIRECTION OF SURFACE WATER RUNOFF