

# **CHAPTER 6 STORM DRAIN**

(Updated 3-6-18)

## **SECTION 6.1 GENERAL**

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#### **A. Storm Water Pollution Prevention Plan:**

1. Shall be required for all construction activities as required under the Utah Pollutant Discharge and Elimination System (UPDES) permits and the following:
  - a) Construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale.
  - b) Any construction activity the City Engineer or Designee deems to pose a unique threat to water quality, air quality, or public health or safety.
2. SWPPP shall be managed through the South Jordan City online storm water management system.
  - a) All BMP's covering a storm drain inlet must contain an overflow feature for high volume rain/runoff events. Reference chapter 9 for acceptable inlet protection.

#### **B. Storm Drain pipe in public right of way shall be minimum 18" RCP Class III or HDPE.**

1. Storm Drain lines shall be TV'ed by the contractors hired firm after placement and compaction of road base and prior to placing asphalt. This TV'ed disk shall be reviewed by the City designated Inspector. All areas found defective shall be repair to the satisfaction of the City Inspector before placing asphalt.
2. Storm drain caution tape shall be place and centered 1' above the pipe.
3. Storm Drain lines will be TV'ed again, by City personnel prior to final bond release. All lines shall be cleaned by Developer prior to City performing the work. Any damaged pipe sections shall be repaired or replaced prior to final bond release.

#### **C. Mirafi filter fabric may be required depending on the presence of groundwater, as determined by the City Engineer.**

- D. Storm Drain manhole lid specifications: ASTM A 48-93, Class 35B Cast iron construction, machined flat bearing surface, removable lid with cleated surface and pick holes, H-20 highway load rating; lid molded with South Jordan City name and logo imprinted on lid; Provide Model A-1180 manufactured by D & L Supply., or acceptable equal. (See drawings section for detail.)
- E. Developments must provide theft-resistant permanent installation of a City-approved storm drain marker at each storm water inlet. The marker item number is SD-SP, a stainless steel, painted blue, matte finish, embossed, fish symbol, optional serialization, 30 year warranty, with ¼” square hole made by Almetek Industries, Inc. Installation requires drive rivet and approved adhesive.  
Lettering on the marker as appropriately follows:  
  
“Only Rain in the Drain” markers installed anywhere storm water discharges to a retention or detention pond. (See drawings section for detail.)
- F. A cleanout box with 24” silt trap is required before a private storm water system enters the City’s storm drain system. All private storm drainage conveyance systems shall also have a snout in place or an oil water separator system, approved by the City Engineer, before it discharges into the city system
- G. Silt traps are required for all catch basins, inlets, manholes etc. Silt traps shall be 12” deep, measured from invert of lowest pipe to bottom of box.
- H. Boxes: Grout Boxes inside and out, and strip the forms from inside and outside of the boxes. Clean all dirt, rocks and debris from inside of the boxes. If using a pre-cast box, make sure to form a 6” collar around the outside of box with soil below pipe dug down and formed, and poured with concrete to engineering inspectors discretion. Before pouring concrete collar, contractor shall give engineering inspector 24-hour prior notice.
- I. All onsite retention and detention ponds shall be designed for a 100 year 24 hour storm event. Calculations and storm intensities used in obtaining this must be shown. All calculations must be stamped and signed by a registered professional engineer.

## **SECTION 6.2 REINFORCED CONCRETE PIPE**

### **6.2.1 DESCRIPTION**

See the South Jordan City Standard Notes and the latest edition of the APWA Manual of Standard Specifications and Manual of Standard Plans.

**SECTION 6.3**  
**HIGH DENSITY POLYETHYLENE (HDPE)**  
**WATER TIGHT SMOOTH-LINED**  
**THERMOPLASTIC PIPE**

**6.3.1 DESCRIPTION**

This item shall govern for the furnishing and installing of all High Density Corrugated Polyethylene (HDPE) Smooth Lined Pipe and / or materials for constructing of culverts, side road pipes, storm sewers, stubs, and all related connections and fittings, all of which shall conform to ASTM F 2306, latest edition.

**6.3.2 MATERIALS**

Unless otherwise specified on the plans or herein, thermoplastic pipe and joint fittings shall conform to the following:

- A. High Density Polyethylene (HDPE) Smooth Lined Pipe & Fittings shall be manufactured in accordance with requirements of ASTM F 2306, latest edition.  
Type S: This pipe shall have a full circular cross section, with an outer corrugated pipe wall and a smooth inner wall per AASHTO M294-07, section 4.1.2.
- B. High Density Polyethylene (HDPE) Smooth Lined Pipe shall be manufactured from virgin PE compounds which conform to the requirements of cell class 335400C as defined and described in ASTM D 3350.
- C. Minimum Pipe Stiffness (PS) at five percent deflection shall be as described in ASTM F 2306, Section 6.3 when tested in accordance with ASTM D 2412.
- D. All HDPE pipe shall be third party certified by either the Plastic Pipe Institute (PPI) or the National Transportation Product Evaluation Program (NTPEP).
  - 1. Installation – Installation shall be in accordance with ASTM D 2321, “Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications”.
    - a. General Installation Requirements - Thermoplastic pipe shall be unloaded and handled with reasonable care.
    - b. Bedding and Backfill – Backfill in the trench zone shall meet the requirements of AASHTO M145 A-1-a to A-2-7 and be a 2” maximum granular material. Stable and uniform bedding shall be provided for the pipe. The middle of the bedding equal to 1/3<sup>rd</sup> of the pipe O.D. may be loosely placed, while the remainder shall be compacted to a minimum 96% of maximum density (Modified Proctor). A minimum of 4” of ¾ minus gravel shall be provided prior to placement of the pipe, unless an unyielding material (rock cuts) is present

in the trench bottom, then a 6" cushion of bedding is recommended. Bedding shall be placed in layers 8" loose lift thickness and brought up evenly and simultaneously on both sides of the pipe to an elevation not less than one foot (1') above the top of the pipe. Backfill must be worked into the haunches area and compacted by hand. Backfill shall be compacted to a minimum compaction level of 96% Density (Modified Proctor).

- c. Trench Widths - Trench width shall be in accordance with ASTM D2321 and shall be sufficient to ensure working room properly and safely to place and compact haunches and other backfill materials. Minimum trench width shall not be less than 1.25 times the pipe outside diameter plus 12 inches. (1.25 x O.D. + 12")
- d. Minimum Cover - The minimum cover is one foot (1.0') for HS-25 Live Loads (18"-48" Diameters) and two feet (2.0') for larger diameter structures (60" Diameter); however, care should be taken when heavy construction equipment loads cross the pipe trench during construction. If the passage of construction equipment over an installed pipeline is necessary during project construction, compacted fill in the form of a ramp shall be constructed to a minimum elevation of one extra foot of cover in addition to the above minimum cover over the top of the pipe. Any damaged pipe shall be replaced at the contractor's expense.
- e. Joints shall be installed that the connection of pipe sections will form a continuous line free from irregularities in the flow line. Joints shall meet the following:
  - i. Watertight joints must meet a 74kPa (10.8 psi) laboratory test per ASTM D3212 and utilize a bell and spigot design with a gasket meeting ASTM F477.
  - ii. Do not exceed a deflection angle of 1 degree.

**SECTION 6.4**  
**STORM DATA AND IDF CURVE**

**South Jordan City**

Storm Data at 10600 South and Redwood Road  
2, 10, 100 Year Storm

Time (min)	Intensity (in/hr)			Amount (in)		
	2-yr	10-yr	100-yr	2-yr	10-yr	100-yr
5	1.992	3.504	5.256	0.166	0.292	0.438
10	1.540	2.736	4.300	0.257	0.456	0.717
15	1.192	2.144	3.556	0.298	0.536	0.889
16	1.145	2.061	3.440	0.305	0.550	0.917
17	1.105	1.989	3.340	0.313	0.564	0.946
18	1.070	1.915	3.239	0.321	0.575	0.972
19	1.034	1.853	3.140	0.327	0.587	0.994
20	1.003	1.794	3.053	0.334	0.598	1.018
21	0.978	1.745	2.970	0.342	0.611	1.040
22	0.953	1.695	2.898	0.349	0.622	1.063
23	0.931	1.652	2.827	0.357	0.633	1.084
24	0.912	1.613	2.760	0.365	0.645	1.104
25	0.891	1.579	2.700	0.371	0.658	1.125
26	0.875	1.544	2.640	0.379	0.669	1.144
27	0.859	1.511	2.587	0.387	0.680	1.164
28	0.842	1.480	2.534	0.393	0.691	1.183
29	0.828	1.450	2.485	0.400	0.701	1.201
30	0.812	1.422	2.436	0.406	0.711	1.218
31	0.795	1.391	2.380	0.411	0.719	1.230
32	0.778	1.360	2.320	0.415	0.725	1.237
33	0.761	1.330	2.260	0.419	0.732	1.243
34	0.743	1.300	2.200	0.421	0.737	1.247
35	0.730	1.272	2.148	0.426	0.742	1.253
36	0.714	1.245	2.111	0.428	0.747	1.267
37	0.700	1.219	2.074	0.432	0.752	1.279
38	0.683	1.192	2.038	0.433	0.755	1.290
39	0.671	1.170	2.001	0.436	0.761	1.301
40	0.659	1.147	1.964	0.439	0.765	1.309
41	0.647	1.122	1.927	0.442	0.767	1.317
42	0.634	1.102	1.890	0.444	0.771	1.323
43	0.622	1.081	1.854	0.446	0.775	1.328
44	0.611	1.063	1.817	0.448	0.780	1.332
45	0.601	1.045	1.780	0.451	0.784	1.335
46	0.591	1.029	1.756	0.453	0.789	1.346
47	0.582	1.012	1.733	0.456	0.793	1.357
48	0.572	0.995	1.709	0.458	0.796	1.367
49	0.565	0.981	1.685	0.461	0.801	1.376
50	0.558	0.969	1.661	0.465	0.808	1.384
51	0.550	0.955	1.638	0.468	0.812	1.392
52	0.544	0.942	1.614	0.471	0.816	1.399
53	0.538	0.931	1.590	0.475	0.822	1.405

54	0.532	0.920	1.566	0.479	0.828	1.410
55	0.528	0.912	1.543	0.484	0.836	1.414
56	0.521	0.901	1.519	0.486	0.841	1.418
57	0.519	0.894	1.495	0.493	0.849	1.420
58	0.515	0.887	1.472	0.498	0.857	1.422
59	0.511	0.880	1.447	0.502	0.865	1.423
60	0.509	0.874	1.424	0.509	0.874	1.424
120	0.325	0.550	0.845	0.650	1.100	1.690
180	0.245	0.410	0.599	0.735	1.230	1.797
360	0.146	0.231	0.317	0.876	1.386	1.902
720	0.088	0.139	0.190	1.056	1.668	2.280
1440	0.049	0.079	0.109	1.176	1.896	2.616

