



## **CITY OF HENDERSON**

### **1st Addendum – July 2010**

### **Design and Construction Standards for Wastewater Collection Systems** **2009 Edition**

#### **GENERAL STATEMENT:**

The “Design and Construction Standards for Wastewater Collection Systems” (DCSWCS) addresses the design and construction requirements for wastewater collection systems. Generally, this shall include sewer mains and appurtenances 15-inches in diameter and smaller. For design and construction requirements related to mains larger than 15-inches in diameter, contact the City of Henderson Department of Utility Services, Technical Services Division for specific details.

The intent of this addendum is to clarify specific City of Henderson (City) requirements that may not be fully addressed within the DCSWCS document. Where discrepancies exist between the requirements of DCSWCS and this addendum, this addendum shall apply. If not amended by this addendum, the requirements as specified in DCSWCS shall apply. This 1st addendum, July 2010 supersedes the 2nd addendum, September 2007.

#### **1.5 Right-of-Way**

Unless otherwise allowed by the City, all utility easements in a subdivision, not within a public or private street, shall be within a common element.

#### **1.14 Rules and Regulations**

The City of Henderson’s “rules and regulations” are incorporated in: Title 14 of the Henderson Municipal Code, the City of Henderson Service Rules, this Addendum and the City’s Approved Materials List. Electronic copies are available on the City’s web site ([www.cityofhenderson.com](http://www.cityofhenderson.com)).

#### **2.2 Design Criteria For Gravity Sewers**

##### **2.2.1 Calculation of Peak Wastewater Flow**

Table B of this Addendum shall be used for calculating wastewater flows within the City of Henderson.

##### **2.2.2 Pipe Size Requirements**

The minimum sewer main size may include pipe sizes up to 15-inches in diameter, based on the ultimate sewer system requirements for that area.

### 2.2.3 Pipe Slope Requirements

Engineer shall provide the actual number of contributing equivalent residential units (ERUs) in the calculation to verify the minimum 2 feet per second velocity can be achieved.

Where the minimum flushing velocity (2 fps) cannot be achieved, a minimum slope of 0.006 ft/ft shall be used. Refer to Table "D".

### 2.2.4 Curved Sewers

Lateral connections may be constructed on curved sewer. Tracer wire, locator ribbon and marker balls are required for curved sewer location.

### 2.2.6 Standard Manholes

Terminal manholes are allowed with 2 outlet pipes for maintenance and cleaning purposes.

### 2.2.10 Manhole and Manhole Appurtenances

#### f. Frames and Covers:

Locking manhole covers shall be required as directed within the City.

#### g. Steps:

Steps are not utilized for any sanitary sewer manholes within the City.

#### h. Connections to Manholes:

Where new sewers enter existing manholes, the wall of the manhole shall be core drilled and an appropriate seal boot (Link-Seal or an approved equal) shall be used to positively seal against infiltration and exfiltration. Any remaining annular space shall be filled in with non-shrink grout. In any ground water type application a double seal shall be used. Sewers larger than 15-inches entering an existing manhole will be considered on a case by case basis.

#### i. Corrosion Protection

T-Lock lining is not approved for use within the City of Henderson.

2.2.15 Sewer Line Depths and Alignments

Case II

Minimum 6 feet to top of pipe for 8-inch and 12-inch.

2.2.16 Shallow Mains and Laterals

The City will allow concrete encasement of C900 sewer mains and laterals if no other practical option exists. Structural calculations shall be provided to the City for review and approval if less than 3 feet of cover cannot be maintained. Refer to SD-14 for concrete bedding and reinforced encasement.

2.2.17 Sewer Main Connections

In any ground water type application a double seal shall be used. The manhole base of any modified manhole shall conform to drawing SD-9 after modification..

2.2.20 Commercial Laterals

No lateral shall be constructed at less than a 1% slope.

Clean-outs shall be installed at any change in horizontal or vertical direction and shall be spaced not to exceed 100-feet from clean-out to clean-out.

2.2.21 Water and Sewer Utility Crossings and Clearances

Sewer mains and sewer laterals shall only be considered for concrete encasement on a case-by-case basis

2.2.23 Siphons

Sewer siphons are not allowed in the City of Henderson.

**2.4 Design Criteria For Pumping Stations**

All wastewater pumping stations within the City are reviewed on a case-by-case basis. The City does not accept any standard design for wastewater pumping stations. Refer to the Henderson Utility Guidelines.

**2.5 Design Criteria For Force Mains**

In addition, design of force mains shall conform to Henderson Utility Guidelines. Tracer wire shall also be installed in addition to locator ribbon for all wastewater and reuse/reclaimed mains.

### **3.9 Construction Staking**

In addition, all sewer mains designed at a slope less than 1% shall be staked at an interval not to exceed 25 feet.

### **3.11 Bypass Pumping Requirements**

Reference the online Henderson Utility Guidelines (HUGS) Chapter 9, "Wastewater Bypass Pumping" for requirements.

### **3.12 Agency Pipeline Encroachment – Blasting**

Contact COH Building Department for blasting requirements.

### **3.14 Pipe Installation**

Tracer wire shall also be installed in addition to locator ribbon for all wastewater and reuse/reclaimed mains.

### **3.16 Manhole and Cast-in-Place Structure Installation**

#### **3.16.9 Debris Trap**

During construction of new facilities, the contractor shall, at the request of the City, put plywood in the manhole to protect against debris getting into the invert. A trap or plug must be installed within the manhole immediately upstream of each point of connection to existing mains. This trap must be constructed, installed and maintained such that construction debris is prevented from entering existing mains. The trap shall be relocated to the manhole immediately downstream of each point of connection prior to any flushing and balling operations within the new facilities.

#### **3.19.1.e Sewer Televising**

Prior to sewer televising, a Public Works Quality Control Inspector shall be present. The sewer televising operator shall be PACP certified. Video encoding shall be in the GRANITE XP software format.

### **4.1 Source of Materials and Quality**

Refer to the City of Henderson Department of Utilities' Approved Material List.

### **4.6.2 Ductile Iron Pipe (DIP) and Fittings**

No Ductile Iron Pipe (DIP) shall be used for sewer mains or sewer laterals within the City of Henderson.

### **4.12.3 Marker Balls for Curvilinear Sewers, Stub-Outs and Laterals**

Gravity sewer pipe marker balls shall be liquid-filled and self-leveling.

## **SECTION 5**

### **STANDARD DRAWINGS**

DCSWCS  
Drawing  
No.

Changes/Additions/Deletions

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**No. SD-1A** Only the bottom step is required for any sanitary sewer manhole within the City. No other steps are allowed.

**No. SD-4** Amend Note 2 to read as follows: "Concrete collars shall be required on all sewer manholes."

**No. SD-5** Amend Note 1 to read as follows: "Concrete collars shall be required on all sewer manholes."

**No. SD-16, SD-17, SD-18**

Tracer wire shall also be installed in addition to locator ribbon for all force mains and curved sewers. Valve cans shall be provided for the purpose of tracer wire termination.

**No. 28A** Easements shall not be less than 20 feet in width and shall be contained within a single parcel of land. The easement shall increase by 10 feet in width for each utility main added to the easement beyond a single main. All mains shall be centered in the available easement space. Unless otherwise allowed by the City, all utility easements in a subdivision, not within a public or private street, shall be within a common element. The easement width required may increase with a main deeper than standard.

**Table B, Page T-2 calculating wastewater flows in the City of Henderson.**

<u>UC</u>	<u>CUSTOMER CLASS</u>	<u>ERUs</u>	<u>BILLING</u>
10	Single Family	1.00	Each Unit
11	Townhouse, Condo (indiv. billed)	.70	Each Dwelling Unit
12	Multiple Residential	.70	Each Dwelling Unit
13	Townhouse, Condo (assns billed)	.70	Each Dwelling Unit
14	Trailer Estates	1.00	Each Lot
15	Trailer Estates (assns billed)	1.00	Each Lot
16	Trailer Courts (RV Parks)	.70	Each Space
18	Hotels/Motels	.60	Each Room
	Plus fixtures outside of rooms	1.50	Each Fixture
20	Casinos	1.50	Each Fixture
21	Restaurant (disposal)	1.33	Each Fixture
22	Restaurant (with or without bar)	1.33	Each Fixture
<b>TYPE A - 50</b>			
51	Dry Cleaners	1.00	Each Fixture
52	Markets with disposal	1.00	Each Fixture
53	Bars/Taverns with food facilities	1.00	Each Fixture
55	Motor Vehicles Sales with automated car wash	1.00	Each Fixture
56	Miscellaneous	1.00	Each Fixture
<b>TYPE B - 60</b>			
61	Bars/Taverns without food sales	.65	Each Fixture
63	Service Stations	.65	Each Fixture
64	Misc Business (includes shopping centers)	.65	Each Fixture
66	Retail Sales (includes motor vehicle sales without automated car wash)	.65	Each Fixture
67	Drug Stores	.65	Each Fixture
<b>TYPE C - 70</b>			
71	Offices	.45	Each Fixture
72	Service-Alterations/Dry Cleaner Pickup Stations	.45	Each Fixture
73	Maintenance/Repairs	.45	Each Fixture
74	Theaters	.45	Each Fixture
75	Common areas for TYPE C category	.45	Each Fixture
76	Office/Warehouse	.45	Each Fixture
77	Laundromats	.45	Each Fixture
<b>TYPE D - 80</b>			
81	Beauty/Barber/Nail Shops and Tanning Salons	.25	Each Fixture
82	Medical (M.D.)	.25	Each Fixture
83	Dental (D.D.S.)	.25	Each Fixture
84	Medical/Dental (Physician on staff seeing patients)	.25	Each Fixture
85	Veterinarian	.25	Each Fixture
86	Pet grooming/Common areas for TYPE D	.25	Each Fixture
30	Hospital	1.20	Each Bed
32	Convalescent/Rest Home	.75	Each Bed
34	School (includes day care centers)	.10	Each Student
36	Church	.50	Each Fixture
40	Large Continuous Car Wash	Average ERUs of all similar car washes (for SDAs only)	
40	Car Wash (per bays or stalls)	1.275 ERUs x no. of bays or stalls (for SDAs only) (135,000gal per bay)	
40	(Laundry) (Car Wash) (SDA+SS) (SS only)	(Annual Water Use) x .85 = No. of ERUs 90,000 gallons (Must have meter on all sources of water)	
	Large Commercial (Over 250,000 gallons per day)	(Annual Water Use) = no. of ERUs 90,000 gallons (Must have meter on all sources of water)	
<b>Swimming Pools including nonresidential spas, hot tubs and jacuzzis</b>			
<u>Type</u>	<u>Size in Gallons</u>	<u>ERUs</u>	
1	30,000 gallons and less	.10	(includes nonres decorative fountains)
2	30,001 - 99,999	.25	
3	100,000 - 149,999	.50	
4	150,000 - 199,999	.65	
5	200,000 - 249,999	.85	
6	250,000 - 299,999	1.00	
7	300,000 - or more	1.30	(for each additional 50,000 gal or each fraction thereof add .25 ERUs)

For calculating wastewater flows within the City of Henderson use - one ERU = 250 gpd

**TABLE B**