INTRODUCTION

The intent of this Storm Drainage System Study is to review all available information on storm drainage in Center, make an analysis of the existing system, establish a database to be used to prepare a plan, and make recommendations with the cost estimates of the improvements to the existing storm drainage systems within the City.

The topography of Center consists of both level and gently rolling terrain. The majority of the population within the Center city limits is located in relatively rolling areas with deep drainage channels. As a result, localized flooding can be a problem, especially where culvert and drainage ditches are obstructed with vegetation or debris.

To help minimize property damage from flooding during periods of intense rainfall, the drainage system for a community must be addressed, sized and properly maintained. The public has come to expect that no damage will result to property from storm drainage or high water and gives no thought to the location of neighborhoods in relation to ground elevation and drainage flows. All of these factors directly affect the surface storm drainage immediately adjacent to homes and/or business structures. Storm drainage facilities required for a city may include inlets, storm sewers, culverts, bridges, French drains, concrete lined channels, natural drainage channels, overflow swales, creeks, rivers, retention ponds and lakes.

STORM DRAINAGE INVENTORY

No previous studies have been conducted on the City's drainage system. As such, an inventory survey was completed in November of 2003 to determine the present condition of the drainage system and to identify the drainage system in and around the City of Center. The existing storm water facilities in the City of Center were catalogued and are illustrated in Figure 9.1. The approximate length, size and type of all public drainage structures within the city limits have been identified and are detailed in Appendix 9.1

The storm drainage system of Center currently consists of a system of inlets, underground pipe, curb and gutter, ditches, low water crossings, bridges and numerous

culverts. These facilities carry storm water run-off within Center to the eventual terminus outside the city limits.

Annual precipitation is approximately 50 inches per year. The rains are heaviest in spring and fall.

The streets in the City are either curb and gutter or crowned to promote open ditch drainage on each side. Several underground drainage systems exist in the City as illustrated in Figure 9.1. It should be noted that the majority of the underground systems are controlled by the Texas Department of Transportation (TXDOT). However, most maintenance is the responsibility of city, as dictated through maintenance agreements with TXDOT.

The Federal Emergency Management Agency (FEMA) provides flood insurance rate maps that depict the 100-year and 500-year flood plains. These flood plains cover those areas that would most likely be inundated with storm water during the heaviest rains typically occurring in the area over the specified 100 or 500 years. The regulatory 100-year floodway defines the area where buildings are not eligible for flood insurance, while those located in the 100-year floodway fringe are eligible once flood proofing is implemented. The goal of this program is to curtail development in flood plains, thereby reducing damage to structures and minimizing the danger to people during flooding.

The City of Center is a participating city in the National Flood Insurance Program (NFIP) and figure 9.1 illustrates the approximate locations of the flood plains.

While the City of Center is responsible for the maintenance of most of the above drainage features, many in the extraterritorial jurisdiction and along some of the major roadways in and around the City are maintained and controlled by either the County or TXDOT. Because the City's drainage needs are met by multiple organizations, it does not control some of the decisions relating to the type, location, or timing of drainage system improvements; therefore, inter-local cooperation and communication is an important concern.

STORM DRAINAGE ANALYSIS

Several roadways in Center are constructed with concrete curbs and gutters. Each area utilizing this type of drainage system has been illustrated in Figure 9.1.

Although a large percentage of the system utilizes concrete curb and gutter, much of the City relies on storm water drainage to be carried on the surface within bar ditches and well-defined unimproved drainage channels. As mentioned earlier, the drainage pattern varies within Center as some areas of the City are flatter than others.

GENERAL PROBLEMS

Bar Ditches and Water Channels:

A significant portion of the flooding that occurs in the City is associated with man-made bar ditches and water channels being inundated with rainwater flowing off adjacent properties while following the natural topographical lay of the City. Despite the proper construction and operation of the majority of these ditches, some are not able to deal with the intense storm water flows brought on by heavy rains. Additionally, several sections of these drainage ways traverse private property, which are not always properly maintained by the owners. Debris and silt are often allowed to collect, which limits storm water flows, often resulting in standing water in intersections and yards of homes after a hard rain. This water is a breeding ground for mosquitoes, contributes to premature street damage and is a visual blight on the City.

Street System:

Manmade structures such as the street system do not lend themselves to adequate drainage since the facilities exist perpendicular to the natural flow lines. This occurrence is evident in throughout the City. This can allow storm water to prematurely damage roadways.

Creeks:

While flooding creeks can pose significant flooding problems, none exist in the City.

Drainage Facilities:

In an attempt to identify problems and make needed recommendations, a complete inventory of drainage facilities within the City of Center was made. As a result, a total of 287 facilities have been identified, 65 of which are 50 per cent or more blocked with siltation, crushed or can be characterized as overgrown with vegetation. These facilities are in need of attention.

In analyzing the drainage system, adequate facilities exist under intersection rights-of-ways throughout the majority of the City.

In regard to the drainage facilities of Center, problems with culverts were identified citywide. **15 percent** are at least 50 percent plugged and/or crushed and need immediate maintenance. For this reason, it is recommended that improvements be made to increase the capacity of these existing facilities in order to expedite run-off past these areas towards the natural drainage ways. This lack of maintenance contributes to localized flooding along many streets and could cause some homes to become inundated with water.

LOCAL PRIORITIZED ACTIONS

1. Implement Maintenance Program: To enable existing and proposed drainage facilities to carry the maximum possible flow without entering into a major capital improvement program, the City should initiate a ditch maintenance program. This program will include the reworking and deepening of existing bar ditches and cleaning out or replacing deteriorated and silted culverts. Great attention should be placed upon this program before each rainy system. As a general rule, bar ditches should be constructed at a 4:1 slope so they can be mowed by individual property owners. The program should also include the routine removal of debris and mowing of bar ditches. Finally, culverts should be cleaned and replaced as necessary. The estimated cost of such a program is $3.00/lf, excluding driveway and drainage pipe.

2. Modify Existing System: In addition to maintaining the existing drainage system, modifications may be necessary to eliminate severe localized flooding. Examples include: the installation of new curb and gutter; the rerouting of storm water flows; and the installation of underground drainage systems.

SPECIFIC PROBLEM AREAS

An analysis of the areas within the community where local flooding has occurred was conducted and the seven (7) areas in the City that seem to have the most significant localized flooding have been illustrated in Figure 9.1. During a hard rain, bar ditches and drainage ways become virtual rivers as extreme water flows rush in. Once there, pools are created as newly arriving water becomes trapped or simply cannot be expelled quickly enough. Much of the problem in these areas is due to improperly functioning drainage ways located on private property.

STORM DRAINAGE PLAN AND RECOMMENDATIONS

Any plan that is developed to improve the drainage in the City must be coordinated with plans to improve the road system. Poor drainage not only causes localized flooding that could threaten some property, but flooding on and near the roadways in the City is responsible for much of the damage that exists in the roadways. Poor drainage or lack of drainage causes the pavement and road base to deteriorate. The weight of normal traffic on the road travels over the weakened areas, breaks down the surface and causes potholes to form. Most cities attempt to patch the potholes for a temporary fix. However, complete reconstruction of roadways that includes new drainage, preferably curb and gutter, is usually required to assure a long life for the roadway.

The primary efforts that can be completed by the City to address local flooding are: constant maintenance to address potholes and pavement surface failures; and drainage ditch maintenance. Through this study and other more extensive studies of the roads and drainage systems, the City can get a good understanding of the costs and construction involved to repair the roadways and drainage systems.

The affect of development on the drainage in the City must be addressed for the future. Since development increases impermeable cover (from structures, roads, driveways, etc.), an acceptable amount of permeable ground cover in the City must be maintained to allow water to be absorbed and minimize run-off. Special bricks or other special construction material may be used and the City can also develop regulations such as a landscape ordinance that requires developments to keep a minimum percentage of the native trees and vegetation or to plant new vegetation. If left unregulated, development could ultimately seal the ground from water absorption, and increase the speed and amount of run-off and the chances for additional flooding.

Several different methods are used in various areas in the state to control streams and areas that are prone to flooding. These methods can either directly control the flooding stream or control drainage ways and creeks that "feed" the major drainage channel, lessening the amount and speed of water.

Some measures that can be used to control flooding include, but are not limited to:

- ✓ Retention Ponds - Permanent walls or earthen berms intended to hold storm water for absorption and evaporation.
- ✓ Detention Ponds - Similar to retention ponds; intended to slow down the runoff of storm water. Designed to hold water from a higher intensity (100-year) flood and release it at the rate of a lower intensity (10-year) flood.
- ✓ Porous Paving - An alternative type of paving that allows for absorption of storm water into the ground instead of forcing it into the City's storm water system.
- ✓ Levees - Similar to retention ponds; a form of terracing that hold storm water for absorption and evaporation.
- ✓ Channelization - Consists of the shaping of a stream, including the potential paving of the banks or entire drainage way to direct the removal of storm water.

One of the most successful measures implemented in the State is the detention pond system. Many municipalities, as a part of flood management, have implemented a detention requirement for sites as small as an acre. However, numerous small detention

facilities can be difficult to construct and maintain or have a significant effect during peak flooding periods. Large, regional detention facilities designed for larger acreage can often prove more efficient. Though technically possible and adequate to reduce the amount of major channel enlargement required to handle a flood, detention ponds are usually not economical and will not solve existing flooding alone. Detention ponds can be detrimental to existing development due to implementation costs, loss of land, maintenance, and health hazards.

Since the major drainage problems in Center cannot be directly addressed by these methods, the City must determine what steps may be taken both currently and in the future for improvement of drainage within the City. In order to address existing problems, the City must develop a program for the increased maintenance of the existing drainage system. Future plans can include the design and construction of drainage facilities.

Certain administrative controls can be implemented which gives the City control over development in flood areas. A flood prevention ordinance preventing construction in the flood plain is one example of a land use control. This ordinance could regulate development that would not allow people to construct buildings, especially homes, in areas prone to flooding in order to protect them from loss of property or loss of life. This type of ordinance would prohibit a building permit for any structure in a flood hazard area. Land subject to flooding could be controlled administratively through zoning for parks, open space or agricultural use.

Another method of regulating land use in flood hazard areas is through the subdivision ordinance. The primary control that may be imposed through the ordinance is to require the installation of an underground storm sewer system that meets minimum City standards for the subdivision. The developer of a proposed subdivision would be required to construct an underground storm sewer system including curb and gutter to protect the new development from local flooding. If each new development within the City and the ETJ is required to install such improvements, the City would then be closer to developing a functional drainage system.

In addition, any proposed residential subdivision would be required to limit the amount of impervious cover in the development (streets, driveways, etc.) in order to regulate the volume of run-off of new development, as compared to the natural runoff rate before the development. This type of control would allow new facilities to be constructed without major modifications to the existing, natural drainage system. In addition, the City may also require all future developments (commercial and industrial as well as residential) to provide sufficient drainage easements to accommodate future runoff and potential facilities.

GOALS AND OBJECTIVES

GOAL 1: PROTECT ALL CITIZENS OF CENTER FROM FLOODING AND HEALTH PROBLEMS CAUSED BY POOR DRAINAGE.

OBJECTIVE 1.1:
Provide all prospective homebuyers and home builders with information from the Federal Emergency Management Agency (FEMA) about flood plains within the City by making FEMA flood rate maps regarding flood plains in the City available at city hall.

OBJECTIVE 1.2:
Before the end of 2005, initiate ditch maintenance program.

OBJECTIVE 1.3:
Ensure drainage system is functioning properly by annually inspecting major drainage facilities.

OBJECTIVE 1.4:
When possible, identify those specific drainage and street improvements, which should be undertaken concurrently to maximize expenditures.

OBJECTIVE 1.5:

Commission engineering study on feasibility of installing underground drainage systems to address areas of localized flooding identified in this study.

GOAL 2: PLAN FOR THE IMPACT OF FUTURE DEVELOPMENT BOTH WITHIN THE CITY AND THE EXTRA-TERRITORIAL JURISDICTION.

OBJECTIVE 2.1:

Document the enforcement of City codes and subdivision ordinances for new development. Through various City restrictions, the City can minimize the impact of new development on future drainage patterns. By requiring plans for runoff control, such as the construction of curb and or retention ponds, the City can ease the pressure on the watershed as the City becomes more developed.

PROPOSED IMPROVEMENTS

As part of the Drainage Plan, a Five-Year Action Plan listing priorities, estimated costs and possible funding sources has been developed and is presented below. The physical aspects of the plan are graphically presented in Figure 9.2.

Phase I (2004 – 2006)

Clean/Reshape/Replace culverts (#25, 27, 28, 31, 32, 35) and associated drainage ways.

Cost: All work to be performed by City crews

Phase II (2006 – 2008)

Clean/Reshape/Replace drainage ways associated with (facility #74, 75, 178, 182, 183).

Cost: All work to be performed by City crews

The physical aspects of the plan are graphically presented in Figure 9.2.

POSSIBLE FINANCIAL SOURCES:

The City has a limited budget to address drainage problems such as culvert repair and/or replacement. Consequently, monies for these activities are designated for the most significant problem areas.

The following is a listing of sources which may be utilized to assist with future drainage projects:

- ✓ The City's General Fund
- ✓ Bonds
- ✓ Grants through the Office of Rural Community Affairs
- ✓ Drainage fees on utility bills. As the area becomes more developed, proper drainage will become an increasing problem and impact fees normally are not used for street and drainage improvements. Because of drainage problems in other cities, drainage fees to pay for improvements such as channelization have been implemented.
- ✓ City participation
- ✓ Private and/or developer participation
- ✓ Individuals who are required to perform community service can often be utilized to do some of the required labor. Often times, this can be accomplished by participating with local governmental units and the county judicial system.
- ✓ Texas Department of Transportation (TXDOT)
- ✓ Texas Department of Agriculture

APPENDIX 9.1
CITY OF CENTER
EXISTING DRAINAGE FACILITIES

BR = Bridge
CON = Reinforced Concrete Pipe
CMP = Corrugated Metal Pipe
CPP = Corrugated Plastic Pipe
CP = Clay Pipe
PVC = Polyvinly Chloride Pipe
INLET = Concrete opening to drainage way
LW = low water crossing
TXDOT - Facility controlled by the Texas Deparment of Transportation (not included in this study)
UNK = Unknown

Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
1			UNK			Yes			buried under weeds
2	18	100	CON	Yes	Yes	Yes			
3	18	55	CON	Yes	No	Yes			
4	18	55	CON	Yes	No	Yes			
5	18	55	CON	Yes	Yes	No			
6	20	50	CON	Yes	No	No			
7	32	75	CON	Yes	No	No			
8	24	60	CMP	Yes	No	Yes			
9			UNK		No	Yes			
10			INLET		No	No			
11			INLET		No	No			
12			UNK		No	No			could not locate
13	6x6	75	CON	Yes	No	Yes			
14	4x2	75	CON	Yes	Yes	Yes			
15	4x2	75	CON	Yes	Yes	Yes	Yes		
16	24	100	CON	Yes	No	Yes			
17	42	75	CON	Yes	Yes	Yes			
18	4x3		CON		No	No			feeds to underground
19	8"		CON		No	No			feeds to underground

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
20	3x2	60	CON		No	Yes			
21	24		CON	Yes	No	No	No	No	feeds to underground
22	18	20	CON		No	No	Yes	No	
23		20	BR		No	No	No	No	
24	18	24	CON		No	No	Yes	No	
25	36	24	CON		Yes	No	No	No	
26	12	20	CON		No	No	Yes	No	
27	36	20	CON		No	No	No	No	
28	30	20	CON	Yes	No	No	Yes	No	
29	3		LW	No	No	No	No	No	
30	18	30	CON/CMP	No	No	No	No	No	(2) facilities
31	30	24	CON	No	No	No	No	No	
32	24	24	CON	No	No	No	No	No	Partial underground
33	6x5	30	CON	Yes	Yes	Yes	No	No	
34	24	20	CON	No	No	No	No	No	
35	30	24	CMP	No	No	No	Yes	No	
36	18	24	CMP	No	No	No	Yes	No	
37	18	40	CON	Yes	No	No	No	No	
38	18	20	CPP	No	No	No	No	No	(2) facilities
39	48x60	20	CON	Yes	No	No	No	No	(3) facilities

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
40			INLET	No	No	No	No	No	
41			INLET	No	No	No	No	No	
42	18	20	CON	No	No	No	Yes	No	
43	30		CON	No	No	Yes	Yes	No	Partial Underground
44			INLET	No	No	No	No	No	
45			INLET	No	No	No	No	No	
46			INLET	No	No	No	No	No	
47			INLET	No	No	No	No	No	
48			INLET	No	No	No	No	No	
49			INLET	No	No	No	No	No	
50			INLET	No	No	No	No	No	
51	24		CON	No	No	No	No	No	feeds to underground
52	24		TXDOT	No	No	No	No	No	feeds to underground
53			INLET	No	No	No	No	No	
54			INLET	No	No	No	No	No	
55			INLET	No	No	No	No	No	
56			INLET	No	No	No	No	No	
57			INLET	No	No	No	No	No	
58	30	24	CMP	No	No	No	Yes	Yes	
59	30	24	CON	No	No	Yes	Yes	No	

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
60	30	40	CON	No	No	No	No	No	
61			INLET	No	No	No	No	No	
62			INLET	No	No	No	No	No	
63			INLET	No	No	No	No	No	
64	60	20	LW	No	No	No	No	No	
65	18	20	CON	No	No	No	Yes	No	
68	18	24	CON	No	No	No	No	No	
69	72	30	LW	No	No	No	No	No	
70	36	24	LW	No	No	No	No	No	
71	30	24	CMP	Yes	No	No	No	No	
72	24	24	LW	No	No	No	No	No	
73	36	24	LW	No	No	No	No	No	w/ channel
74			INLET	No	No	No	No	No	
75			INLET	No	No	No	No	No	
76	36		LW	No	No	No	No	No	
77	48	40	CMP	No	No	No	No	No	
78			INLET	No	No	No	No	No	
79			INLET	No	No	No	No	No	
80			INLET	No	No	No	No	No	
81			INLET	No	No	No	No	No	

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
82			INLET	No	No	No	No	No	
83			INLET	No	No	No	No	No	
84	72		LW	No	No	No	No	No	
85			INLET	No	No	No	No	No	
86			INLET	No	No	No	No	No	
87			INLET	No	No	No	No	No	
88			INLET	No	No	No	No	No	
89			UNK	No	No	No	No	No	Covered with brush
90			UNK	No	No	No	No	No	Covered with brush
91			INLET	No	No	No	No	No	
92			INLET	No	No	No	No	No	
93			INLET	No	No	No	No	No	
94	12	50	CON	Yes	No	No	No	No	
95	30	24	CON	No	No	No	No	No	
96	12	20	CIP	No	No	No	Yes	No	
97			UNK	No	No	No	Yes	No	Covered with brush
98	3x2	75	CON	Yes	Yes	Yes	Yes	No	
99	24	100	CON	Yes	Yes	Yes	Yes	No	
100	18	20	CIP	No	No	No	No	No	
101	18	30	CON	No	No	No	No	No	

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
102	18	20	CMP	No	No	No	No	Yes	
103	12	20	CON	No	No	No	Yes	No	
104	12	20	PVC	No	No	No	Yes	No	
105	18	20	CMP	No	No	No	Yes	No	
106			INLET	No	No	No	Yes	No	
107			INLET	No	No	No	Yes	No	
108			INLET	No	No	No	Yes	No	
109			INLET	No	No	No	Yes	No	
110			INLET	No	No	No	Yes	No	
111			INLET	No	No	No	Yes	No	
112			INLET	No	No	No	Yes	No	
113			INLET	No	No	No	Yes	No	
114			INLET	No	No	No	Yes	No	
115			INLET	No	No	No	Yes	No	
116			INLET	No	No	No	Yes	No	
117	24		LW	No	No	No	No	No	
118	18	24	CON	Yes	No	No	No	No	w/ (2) inlets
119	18	24	CON	Yes	No	No	No	No	
120			INLET	No	No	No	No	No	
121			INLET	No	No	No	No	No	

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
122	30	20	CMP	No	No	No	No	No	
123	18	24	CON	No	No	Yes	No	No	
124	UNK	20	UNK	No	No	No	No	No	Covered with brush
125	30	30	CON	No	No	Yes	No	No	
126	48		LW	No	No	No	No	No	
127	18	24	CON	No	No	Yes	No	No	
128			INLET	No	No	No	No	No	
129			INLET	No	No	No	No	No	
130	36		LW	No	No	No	No	No	
131			INLET	No	No	No	No	No	
132			INLET	No	No	No	No	No	
133	18	24	CMP	No	No	No	Yes	Yes	
134	18	20	CMP	No	No	Yes	No	Yes	
135	18	20	CMP	No	No	Yes	No	No	
136			INLET	No	No	No	No	No	
137			INLET	No	No	No	No	No	
138			INLET	No	No	No	No	No	
139			INLET	No	No	No	No	No	
140	72		LW	No	No	No	No	No	
141	48		LW	No	No	No	No	No	

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
142	72		LW	No	No	No	No	No	
143	36		LW	No	No	No	No	No	
144			INLET	No	No	No	No	No	
145			INLET	No	No	No	No	No	
146			INLET	No	No	No	No	No	
147			INLET	No	No	No	No	No	
148			INLET	No	No	No	No	No	
149			INLET	No	No	No	No	No	
150			INLET	No	No	No	No	No	
151	36		LW	No	No	No	No	No	
152			INLET	No	No	No	No	No	
153			INLET	No	No	No	No	No	
154	18	20	CON	No	No	No	No	No	
155	18	20	CON	No	No	Yes	No	No	
156	24	75	CON	No	Yes	Yes	No	No	
157	18	20	CON	No	No	No	No	No	
158	18	20	CMP	No	No	No	Yes	No	
159	24	UNK	CON	No	No	No	Yes	No	
160	18	30	CON	No	No	No	No	No	
161	18	24	CON	No	No	No	No	No	

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UNK = Unknown

Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
162	36		LW	No	No	No	No	No	
163	36		LW	No	No	No	No	No	
164	18	24	CON	No	No	No	No	No	
165	18	24	CON	No	No	No	No	No	
166	12	20	CON	No	No	No	No	No	
167	24	40	CON	Yes	No	No	Yes	No	
168	24	40	CON	Yes	No	No	No	No	
169	24	40	CON	Yes	No	No	No	No	
170			INLET	No	No	No	No	No	
171	24	UNK	CON	Yes	Yes	No	Yes	No	
172			INLET	No	No	No	No	No	
173			INLET	No	No	No	No	No	
174			INLET	No	No	No	No	No	
175	18	24	CON	No	No	Yes	No	No	
176	18	24	CON	No	No	Yes	Yes	No	
177	18	30	CP	No	No	No	Yes	No	
178	3x3	50	CON	Yes	No	No	No	No	
179	6		CH	No	No	No	No	No	
180			INLET	No	No	No	No	No	
181			INLET	No	No	No	No	No	

APPENDIX 9.1
CITY OF CENTER
EXISTING DRAINAGE FACILITIES

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
182			INLET	No	No	No	No	No	
183			INLET	No	No	No	No	No	
184			INLET	No	No	No	No	No	
185			INLET	No	No	No	No	No	
186			INLET	No	No	No	No	No	
187			INLET	No	No	No	No	No	
188			INLET	No	No	No	No	No	
189			INLET	No	No	No	No	No	
190			INLET	No	No	No	No	No	
191	36		LW	No	No	No	No	No	
192			INLET	No	No	No	No	No	
193			INLET	No	No	No	No	No	
194	36		LW	No	No	No	No	No	
195	36		LW	No	No	No	No	No	
196	48		LW	No	No	No	No	No	
197	18	24	CMP	No	No	No	No	No	
198	18	20	CMP	No	No	Yes	No	No	
199		15	BR	No	No	No	No	No	
200		15	BR	No	No	No	No	No	
201		15	BR	No	No	No	No	No	

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
202	42	40	CON	Yes	No	No	No	No	w/ (2) inlets
203			INLET	No	No	No	No	No	
204			INLET	No	No	No	No	No	
205			INLET	No	No	No	No	No	
206			INLET	No	No	No	No	No	
207			INLET	No	No	No	No	No	
208		15	BR	No	No	No	No	No	
209			INLET	No	No	No	No	No	
210			INLET	No	No	No	No	No	
211			INLET	No	No	No	No	No	
212			INLET	No	No	No	No	No	
213			INLET	No	No	No	No	No	
214			INLET	No	No	No	No	No	
215			INLET	No	No	No	No	No	
216			INLET	No	No	No	No	No	
217			INLET	No	No	No	No	No	
218			INLET	No	No	No	No	No	
219			INLET	No	No	No	No	No	
220			INLET	No	No	No	No	No	
221			INLET	No	No	No	No	No	

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
222	48		LW	No	No	No	No	No	
223	36	40	CMP	No	Yes	Yes	Yes	No	
224	24	40	CON	No	No	Yes	No	No	
225	36	20	CMP	No	No	No	No	No	
226			INLET	No	No	No	No	No	
227	48		LW	No	No	No	No	No	
228			INLET	No	No	No	No	No	
229			INLET	No	No	No	No	No	
230	18	20	CON	No	No	No	No	No	
231			INLET	No	No	No	No	No	
232			INLET	No	No	No	No	No	
233	18	50	CON	No	Yes	No	No	No	
234		50	BR	No	Yes	No	No	No	
235			INLET	No	No	No	No	No	
236	72		LW	No	No	No	No	No	
237			INLET	No	No	No	No	No	
238			INLET	No	No	No	No	No	
239			INLET	No	No	No	No	No	
240			INLET	No	No	No	No	No	
241	18	30	CP	No	No	No	No	No	

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
242	24	24	CMP	No	No	No	No	No	
243	24	24	CON	No	No	No	No	No	
244			INLET	No	No	No	No	No	
245			INLET	No	No	No	No	No	
246			INLET	No	No	No	No	No	
247			INLET	No	No	No	No	No	
248			INLET	No	No	No	No	No	
249	42	30	CON	No	No	No	No	No	REMOVED
250	32	30	CON	No	No	Yes	No	No	
251			INLET	No	No	No	No	No	dumps into drainage way
252	36		LW	No	No	No	No	No	
253	36		LW	No	No	No	No	No	w/ inlet
254			INLET	No	No	No	No	No	
255			INLET	No	No	No	No	No	
256			INLET	No	No	No	No	No	
257			INLET	No	No	No	No	No	
258	48		LW	No	No	No	No	No	
259			INLET	No	No	No	No	No	
260			INLET	No	No	No	No	No	
261	48		LW	No	No	No	No	No	with concrete channel

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
262	48		LW	No	No	No	No	No	
263	24	24	CIP	No	No	No	No	No	w/ (2) inlets
264	48		LW	No	No	No	No	No	w/ (1) inlet
265	24	30	CON	Yes	No	No	No	No	w/ (2) inlets
266	24	30	CON	Yes	No	No	No	No	w/ (2) inlets
267			INLET	No	No	No	No	No	dumps into drainage way
268			INLET	No	No	No	No	No	low water crossing also
269	12	24	CMP	No	No	No	Yes	Yes	
270	24		LW	No	No	No	No	No	
271	48		LW	No	No	No	No	No	
272	48	24	CON	Yes	No	No	No	No	
273	120		LW	No	No	No	No	No	
274	3x2		CON	Yes	No	No	No	No	
275			INLET	No	No	No	No	No	
276	24	30	CP	No	No	No	No	No	partially broken w/ (1) inlet
277			INLET	No	No	No	No	No	
278			INLET	No	No	No	No	No	
279			INLET	No	No	No	No	No	
280			INLET	No	No	No	No	No	
281				No	No	No	No	No	

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Number	Size	Length	Type	Headwall	Water	Weeds	Plugged	Crushed	Comment
282				No	No	No	No	No	
283				No	No	No	No	No	
284	UNK	UNK	UNK	No	No	No	Yes	Yes	
285	24		LW	No	No	No	No	No	
286	32	50	CMP	No	No	No	No	No	
287	32	30	CMP	No	No	No	No	No	Collapsed Road
288	18	20	CON	No	No	No	No	No	
289			TXDOT	No	No	No	No	No	