Firm Name

& Logo

Hidalgo County Drainage District No. 1
Drainage Statement

Subdivision Name
Hidalgo County, Texas

Prepared By:
Firm's Name
Address
City, State, Zip
Telephone
Fax
Email

Date

Professional Engineering Seal

INDEX

DRAINAGE STATEMENT
SUBDIVISION NAME
City/ETJ of

SUBDIVISION NAME is a resubdivision of **20.00** acres of land out of Section 232, TEXAS-MEXICAN RAILWAY COMPANY SURVEY, according to the patent recorded in Volume 4, Pages 142-143, Hidalgo County, Deed Records. This Subdivision is located in the **City of McAllen**, County of Hidalgo, Texas. The tract is currently vacant with a proposed land use for a school campus. This property is located in **Zone "X** on FEMA's Flood Insurance Rate Map, Community Panel No. **480334 0295 D**, Map Revised: **June 6, 2000** Zone "X" is defined as areas determined to be outside 500-year flood-plain.

The soils in this area are mostly sandy clay loam with some clay loam **(Soils 28)**, these soils belong to hydrologic **group "B"**, which have a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission. (See "USDA, NRCS Web Soil Survey" Soils maps and information for the Hidalgo County, Texas.

Surface storm runoff on this tract flows in a southeasterly direction. The pre-development volume of storm runoff is **2.24 cfs** based on the 10-year storm frequency, as per attached calculations. The post-development volume of storm runoff is **21.41 cfs** based on the 50-year storm frequency, as per attached calculations, which is an increase of 19.17 cfs.

In accordance with the City of McAllen's drainage policy, the proposed storm drainage system for this subdivision will consist of surface runoff from the building and walks into the proposed drives and parking lots, and collected by Type "A" and Type "C" inlets located at key points within the subdivision. The pipe size diameters shall range from 12" to 24". The proposed storm system shall discharge into Junction AB, flow through Junction H and outfall into Junction AH of a proposed trunk line along Tres Lagos Boulevard which discharges into the drain ditch located on the south side of the Tres Lagos development. This system is currently under construction and is anticipated to be completed by August 31, 2016. Figure -3 of the Tres Lagos Section -I Master Drainage Study has been included for reference.

The ultimate outfall will be into the J-08 ditch (H.C.D.D. #1), which is located approximately 3.8 miles east from this site. In accordance with the City of McAllen and the Hidalgo County Drainage District policy, the difference between the pre (10-yr) and the post (50-yr) development storm runoff shall not increase. Therefore, as per attached calculations, the required detention of **108,609 cubic feet (2.49 acre-feet)** of storm runoff shall be stored within the onsite detention pond, whose capacity is approximately **110,000 cubic feet** and also in the previously mentioned Tres Lagos Development drain ditch. The finish floor elevation for every building shall be set at 18 inches above the top of curb, measured from the center and at the front of this lot. This lot shall be graded to allow runoff to flow away from every building and towards the internal streets; this measure will avoid the concentration of runoff into other lots and will promote a consistent drainage pattern for the entire development (Also refer 1.2, To the TRES LAGOS Master Planned Community -Section-1- Drainage Statement).

By: _____(signature)_____
Engineer Name Date

Professional Engineering Seal

DRAINAGE REPORT

PROJECT NAME: **IDEA at TRES LAGOS**
PROJECT NUMBER: 15138
DATE: June 6, 2016

I. Existing Condition-10 year

			Int. Coeff. "k"	0.305	Table 3-2
Ex. Area:	871,201.05	sf	Kμ	3.28	
	20.000	ac	Length	1395	ft
Imp.Area:	0.00	sf	Velocity	0.070739	ft/sec
% Imp. :	0.00				
Slope :	0.50%	%	SCS Curve Number:	61	
tc :	328.67	min			
Rainfall Intensity (10yr)			0.938	in/hr	
c factor (from Nomograph)			0.119		
Q peak existing condition:			2.24	cfs	

II. Future Condition-50 year

Future area:	871,201.05	sf			
	20.00	ac			
Estimated Imp. Area:	235,000	sf			
% Imp. :	0.27				
Slope :	0.20%		SCS Curve Number:	71	
tc :	78.42	min			
Rainfall Intensity (50yr)			3.472	in/hr	
c factor (from Nomograph)			0.308		
Q future cond. = Aci = i *	=		21.41	*	0.31
			6.16423458	i	

time min.	time hour	i in/hr	Qin cfs	Vin cf	Qout cfs	Vout cf	REQ'D V cf
5	0.08	13.57	83.65	25095	2.24	672	24422
10	0.17	10.83	66.73	40037	2.24	1344	38693
15	0.25	9.10	56.11	50496	2.24	2016	48480
20	0.33	7.91	48.75	58496	2.24	2688	55808
25	0.42	7.03	43.30	64956	2.24	3360	61595
30	0.50	6.34	39.10	70380	2.24	4033	66347
35	0.58	5.80	35.73	75042	2.24	4705	70337
40	0.67	5.35	32.98	79149	2.24	5377	73772
45	0.75	4.98	30.67	82818	2.24	6049	76769
50	0.83	4.66	28.71	86139	2.24	6721	79418
60	1.00	4.14	25.54	91961	2.24	8065	83895
90	1.50	3.16	19.50	105320	2.24	12098	93222
120	2.00	2.60	16.00	115217	2.24	16130	99087
180	3.00	1.95	12.03	129885	2.24	24196	105690
240	4.00	1.59	9.78	140870	2.24	32261	108609

Storage Required:	108,609	cf
Storage Required:	2.493	Ac.-Ft.
w/ release rate of:	2.24	cfs
Storage / Ac. Development:	0.125	Ac.Ft. per Ac.

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TABLE 3-2: Intercept Coefficients	
Land Cover/ Flow Regime	"k"
Forest with heavy ground litter; hay meadow (overland flow)	0.076
Trash fallow or minimum tillage cultivation; contour or strip cropped; woodland (overland flow)	0.152
Short grass pasture (overland flow)	0.213
Cultivated straight row (overland flow)	0.274
Nearly bare and untilled (overland flow); alluvial fans in western mountain regions	0.305
Grassed waterway (shallow concentrated flow)	0.457
Unpaved (shallow concentrated flow)	0.491
Paved area (shallow concentrated flow); small upland gullies	0.619

TABLE 3-3: Runoff Coefficients	
Type of Drainage Area	Runoff Coefficient "c"
Business	
Downtown Areas	0.70-0.95
Neighborhood Areas	0.50-0.70
Residential	
Single-family areas	0.30-0.50
Multi-units, detached	0.40-0.60
Multi-units, attached	0.60-0.75
Suburban	0.25-0.40
Apartment dwelling areas	0.50-0.70
Industrial	
Light areas	0.50-0.80
Heavy areas	0.60-0.90
Parks, cemetaries	0.10-0.25
Playgrounds	0.20-0.40
Railroad yard areas	0.20-0.40
Unimproved Areas	0.10-0.30
Lawns	
Sandy soil, flat, 2%	0.05-0.10
Sandy soil, average, 2% - 7%	0.10-0.15
Sandy soil, steep, 7%	0.15-0.20
Heavy soil, flat, 2%	0.13-0.17
Heavy soil, average, 2% - 7%	0.18-0.22
Heavy soil, steep, 7%	0.25-0.35
Streets	
Asphaltic	0.70-0.95
Concrete	0.80-0.95
Brick	0.70-0.85
Drives and walks	0.75-0.85
Roofs	0.75-0.95

$C_W=(C_1A_1+C_2A_2+C_3A_3+\ldots C_nA_n) / A_{total}$

C_W = Weighted Runoff Coefficient (Composite Coefficient)

C_n = Runoff Coefficient n-th term

A_n = Area of n-th term

A_{total} = Total Area (acres)

Weighted C Calculation				
Land Use:	"c" value:	Square Footage	Acreage	partial "c"
Buildings/Roofs:	0.75	72,599	1.667	1.250
Playground:	0.2	12,616	0.290	0.058
Park/Soccer fields:	0.1	99,000	2.273	0.227
Drives & walks:	0.75	204,528	4.695	3.521
Sandy soil, avg., 2%-7%	0.1	482,459	11.076	1.108
Total:		871,202	20.000	6.164
Weighted "c":			**0.308**	

TABLE I

TIME OF CONCENTRATION DETERMINATION

IDEA at TRES LAGOS

COMPUTATION POINT	DESCRIPTION OF RUNOFF MEDIUM	OVERLAND FLOW				CHANNEL, PIPE, STREET, ETC. FLOW					
		C	LENGTH (FT.)	GRADE (%)	TIME (MIN)	WIDTH\DIA. (FT)	GRADE (%)	LENGTH (FT)	VELOCITY (FPS)	TIME (MIN)	TOTAL TIME (MIN)
Existing	Overland	0.119	1395		155.0			0			155.0
D.A.#1	Overland & Gutter	0.308	155		17.2			0	0.4	0.0	17.2
D.A.#1-D.A.#2	Pipe Flow	0.308						48	3.0	0.3	17.5
D.A.#2	Overland & Gutter	0.308	155		17.2			0	0.4	0.0	17.2
D.A.#2-D.A.#3	Pipe Flow	0.308						53	3.0	0.3	17.8
D.A.#3	Overland & Gutter	0.308	134		14.9			0	0.4	0.0	14.9
D.A.#3-D.A.#4	Pipe Flow	0.308						44	3.0	0.2	15.1
D.A.#5	Overland & Gutter	0.308	77		8.6			0	0.4	0.0	8.6
D.A.#5-D.A.#4	Pipe Flow	0.308						98	3.0	0.5	18.3
D.A.#4	Overland & Gutter	0.308	126		14.0			0	0.4	0.0	14.0
D.A.#4-D.A.#6	Pipe Flow	0.308						98	3.0	0.5	14.5
D.A.#7	Overland & Gutter	0.308	94		10.4			0	0.4	0.0	10.4
D.A.#7-D.A.#6	Pipe Flow	0.308						144	3.0	0.8	19.1
D.A.#6	Overland & Gutter	0.308	130		14.4			0	0.4	0.0	14.4
D.A.#6-D.A.#8	Pipe Flow	0.308						150	3.0	0.8	15.3
D.A.#9	Overland & Gutter	0.308	122		13.6			0	0.4	0.0	13.6
D.A.#8-D.A.#8	Pipe Flow	0.308						54	3.0	0.3	19.4
D.A.#8	Overland & Gutter	0.308	104		11.6			0	0.4	0.0	11.6
D.A.#10-D.A.#10	Pipe Flow	0.308						138	3.0	0.8	12.3
D.A.#10	Overland & Gutter	0.308	472		52.4			546	0.4	22.8	75.2
D.A.#11-D.A.#11	Pipe Flow	0.308						418	3.0	2.3	77.5
D.A.#11	Overland & Gutter	0.308	500		55.6			0	0.4	0.0	55.6
D.A.#11-Outfall	Pipe Flow	0.308						162	3.0	0.9	78.4

FORMULA FOR TIME OF CONCENTRATION USING THE RATIONAL METHOD, AS PER "TXDOT BRIDGE HYDRAULIC MANUAL"

$$Tc = \frac{L}{(Vx60)}$$

TABLE IA
FLOWRATE DETERMINATION
IDEA at TRES LAGOS

COMPUTATION POINT	TOTAL DRAINAGE AREA CONTRIBUTING TO POINT (acres)	C	TIME (SEE TABLE 1) (minutes)	RETURN FREQUENCY (years)	INTENSITY (in./hr.)	FLOWRATE (c.f.s.)	PIPE SIZE (inches)	MIN. SLOPE (FT./FT.)
Existing	20.000	0.119	155.0	10	1.644	3.93		
D.A.#1	0.260	0.308	17.2	50	8.523	0.68		
D.A.#1-D.A.#2	0.260	0.308	17.5	50	8.459	0.68	12.00	0.036%
D.A.#2	0.350	0.308	17.2	50	8.523	0.92		
D.A.#2-D.A.#3	0.610	0.308	17.8	50	8.390	1.58	12.00	0.195%
D.A.#3	0.180	0.308	14.9	50	9.134	0.51		
D.A.#3-D.A.#4	0.790	0.308	15.1	50	9.065	2.21	15.00	0.116%
D.A.#5	0.270	0.308	8.6	50	11.478	0.96		
D.A.#5-D.A.#4	0.270	0.308	18.3	50	8.265	0.69	12.00	0.037%
D.A.#4	0.250	0.308	14.0	50	9.395	0.72		
D.A.#4-D.A.#6	1.310	0.308	14.5	50	9.233	3.73	15.00	0.332%
D.A.#7	0.150	0.308	10.4	50	10.641	0.49		
D.A.#7-D.A.#6	0.150	0.308	19.1	50	8.090	0.37	12.00	0.011%
D.A.#6	0.460	0.308	14.4	50	9.262	1.31		
D.A.#6-D.A.#8	1.920	0.308	15.3	50	9.025	5.34	18.00	0.259%
D.A.#9	0.180	0.308	13.6	50	9.532	0.53		
D.A.#8-D.A.#8	0.180	0.308	19.4	50	8.026	0.45	12.00	0.016%
D.A.#8	0.190	0.308	11.6	50	10.212	0.60		
D.A.#10-D.A.#10	2.290	0.308	12.3	50	9.938	7.01	24.00	0.096%
D.A.#10	7.290	0.308	75.2	50	3.571	8.02		
D.A.#11-D.A.#11	9.580	0.308	77.5	50	3.499	10.33	24.00	0.209%
D.A.#11	10.390	0.308	55.6	50	4.355	13.95		
D.A.#11-Outfall	19.970	0.308	78.4	50	3.472	21.37	24.00	0.894%

FORMULA FOR INTENSITY $I = \frac{b}{(Tc + d)^e}$
USING THE RATIONAL METHOD, AS PER
"TXDOT BRIDGE HYDRAULIC MANUAL"

BASIN 1
BASIN 2
BASIN 4
BASIN 5
PARKS
(1) DRAINAGE AREA

LEGEND
PROPOSED STORM LNE
EXISTING FLOW DIRECTION
(A) JUNCTION
PROPOSED DRAIN DITCH

EXIST. DRAIN DITCH

Figure-3
DRAINAGE AREA MAP
TRES LAGOS (SECTION-1)

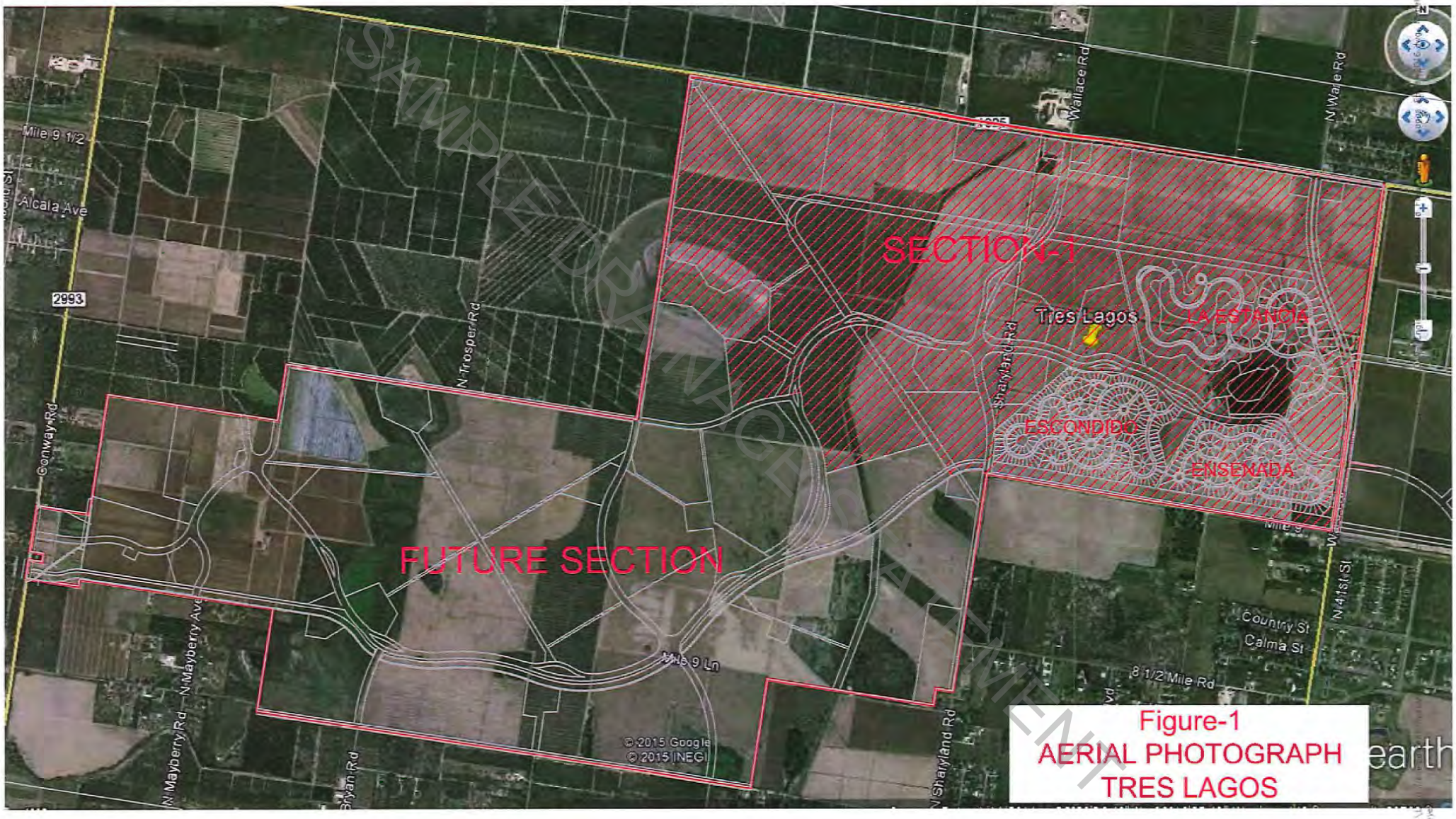


Figure-1
AERIAL PHOTOGRAPH
TRES LAGOS

Appendix 1.0

HIDALGO COUNTY RAINFALL INTENSITY TABLES

based on Weather Bureau (NWS) Technical Paper No. 40 "Rainfall Frequency Atlas of the United States"

formula $I = b/(t_c+d)^e$

TIME	2 yr.	5 yr.	10 yr.	25 yr.	50 yr.	100 yr.
1	10.404	12.626	14.283	16.353	17.386	17.952
2	9.653	11.721	13.281	15.215	16.210	16.793
3	9.012	10.950	12.426	14.244	15.204	15.797
4	8.458	10.286	11.687	13.405	14.333	14.929
5	7.974	9.706	11.042	12.671	13.570	14.165
6	7.546	9.194	10.472	12.023	12.895	13.487
7	7.167	8.740	9.966	11.447	12.294	12.881
8	6.827	8.334	9.512	10.930	11.755	12.336
9	6.520	7.968	9.103	10.464	11.268	11.841
10	6.243	7.636	8.732	10.042	10.825	11.391
11	5.990	7.334	8.394	9.656	10.421	10.979
12	5.758	7.058	8.084	9.303	10.051	10.601
13	5.546	6.804	7.799	8.978	9.710	10.252
14	5.350	6.569	7.536	8.678	9.395	9.928
15	5.169	6.353	7.293	8.400	9.102	9.628
16	5.000	6.151	7.067	8.142	8.831	9.348
17	4.843	5.964	6.856	7.902	8.577	9.087
18	4.697	5.789	6.659	7.677	8.340	8.842
19	4.560	5.625	6.475	7.466	8.117	8.612
20	4.432	5.472	6.302	7.268	7.908	8.396
21	4.311	5.327	6.139	7.082	7.711	8.192
22	4.198	5.191	5.985	6.906	7.525	8.000
23	4.090	5.062	5.840	6.740	7.349	7.817
24	3.989	4.941	5.703	6.583	7.183	7.644
25	3.893	4.825	5.572	6.434	7.025	7.480
26	3.802	4.716	5.449	6.293	6.875	7.324
27	3.715	4.612	5.331	6.158	6.732	7.176
28	3.633	4.513	5.220	6.030	6.596	7.034
29	3.554	4.419	5.113	5.908	6.467	6.899
30	3.480	4.329	5.011	5.792	6.343	6.769
31	3.408	4.244	4.914	5.680	6.224	6.646
32	3.340	4.161	4.821	5.574	6.111	6.527
33	3.275	4.083	4.732	5.472	6.002	6.413
34	3.212	4.008	4.646	5.374	5.897	6.304
35	3.152	3.935	4.564	5.280	5.797	6.199

TIME	2 yr.	5 yr.	10 yr.	25 yr.	50 yr.	100 yr.
36	3.095	3.866	4.486	5.189	5.701	6.098
37	3.040	3.799	4.410	5.103	5.608	6.001
38	2.986	3.735	4.337	5.019	5.519	5.908
39	2.935	3.673	4.267	4.939	5.433	5.817
40	2.886	3.614	4.199	4.861	5.350	5.730
41	2.838	3.557	4.134	4.786	5.270	5.646
42	2.793	3.501	4.071	4.714	5.193	5.565
43	2.748	3.448	4.010	4.644	5.118	5.487
44	2.706	3.396	3.951	4.577	5.046	5.411
45	2.665	3.346	3.895	4.511	4.976	5.337
46	2.625	3.298	3.840	4.448	4.908	5.266
47	2.586	3.251	3.786	4.387	4.843	5.197
48	2.549	3.206	3.735	4.328	4.779	5.130
49	2.513	3.162	3.685	4.270	4.717	5.065
50	2.477	3.120	3.636	4.215	4.658	5.002
51	2.443	3.078	3.589	4.161	4.600	4.941
52	2.410	3.038	3.543	4.108	4.543	4.881
53	2.378	2.999	3.499	4.057	4.488	4.824
54	2.347	2.962	3.456	4.007	4.435	4.767
55	2.317	2.925	3.414	3.959	4.383	4.713
56	2.288	2.889	3.373	3.912	4.333	4.659
57	2.259	2.854	3.333	3.867	4.284	4.608
58	2.231	2.821	3.295	3.822	4.236	4.557
59	2.204	2.788	3.257	3.779	4.189	4.508
60	2.178	2.756	3.220	3.737	4.144	4.460
65	2.056	2.607	3.050	3.541	3.933	4.237
70	1.948	2.475	2.899	3.368	3.745	4.038
75	1.852	2.358	2.765	3.212	3.577	3.860
80	1.765	2.252	2.643	3.073	3.426	3.699
85	1.688	2.156	2.533	2.946	3.289	3.554
90	1.617	2.069	2.434	2.831	3.164	3.421
95	1.552	1.990	2.342	2.726	3.050	3.299
100	1.493	1.917	2.258	2.629	2.944	3.187
105	1.439	1.850	2.181	2.540	2.847	3.083
110	1.389	1.788	2.109	2.457	2.757	2.988

where:	2yr	5yr	10yr	25yr	50yr	100yr
e=	0.831	0.795	0.778	0.771	0.749	0.740
b=	74	80	87	98	99	103
d=	9.6	9.2	9.2	9.2	9.2	9.6

Prepared By Melden & Hunt, Inc.

Appendix 1.0 (cont.)

HIDALGO COUNTY RAINFALL INTENSITY TABLES (cont.)

based on Weather Bureau (NWS) Technical Paper No. 40 "Rainfall Frequency Atlas of the United States"

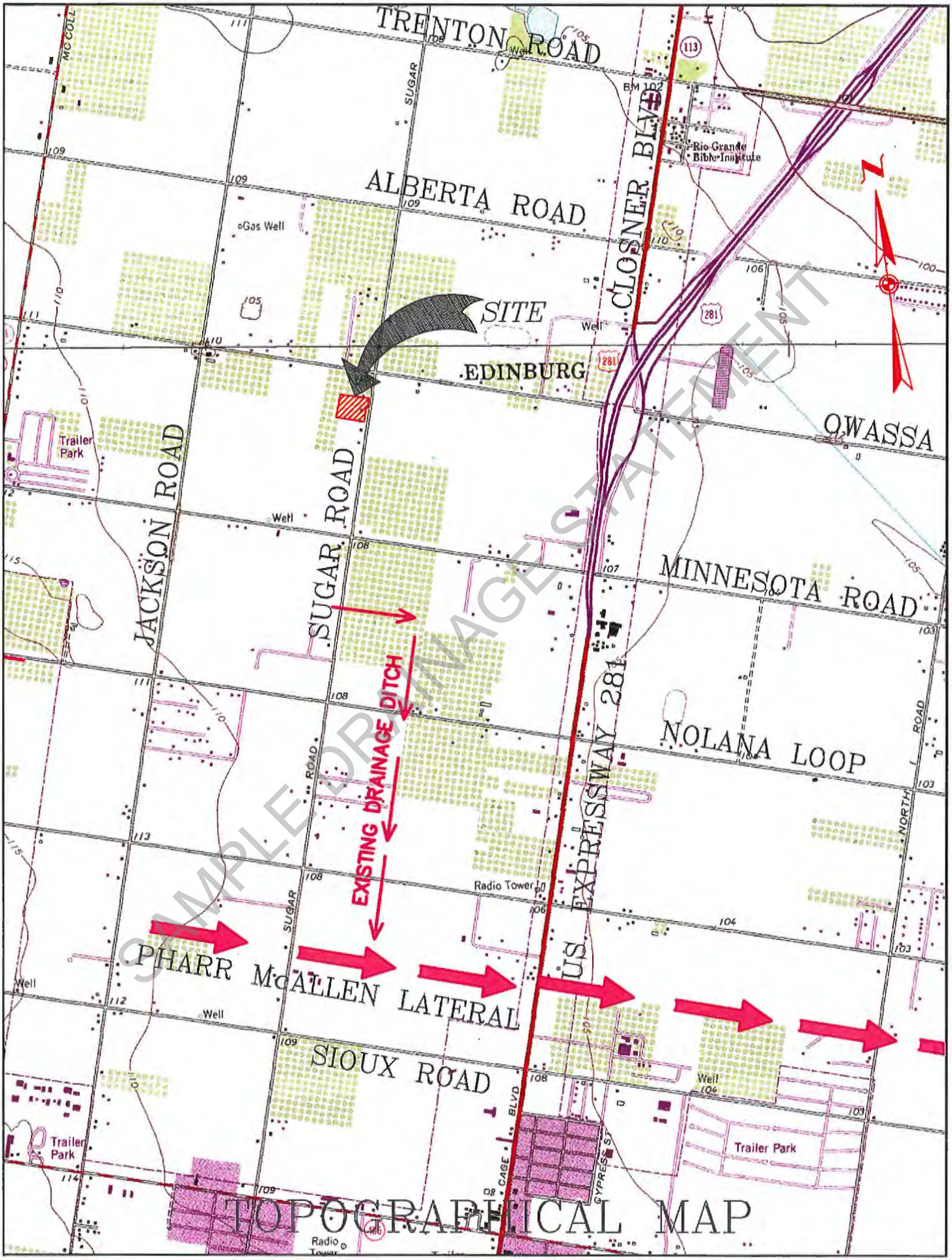
formula $I = b/(t_c+d)^e$

TIME	2 yr.	5 yr.	10 yr.	25 yr.	50 yr.	100 yr.
115	1.342	1.731	2.043	2.380	2.674	2.898
120	1.299	1.677	1.981	2.309	2.596	2.815
125	1.259	1.628	1.924	2.242	2.523	2.737
130	1.221	1.581	1.870	2.180	2.455	2.665
135	1.186	1.537	1.819	2.122	2.391	2.596
140	1.153	1.496	1.771	2.067	2.331	2.532
145	1.122	1.457	1.727	2.015	2.274	2.471
150	1.093	1.421	1.684	1.966	2.220	2.413
155	1.065	1.386	1.644	1.919	2.169	2.359
160	1.039	1.354	1.606	1.876	2.121	2.307
165	1.014	1.323	1.570	1.834	2.075	2.258
170	0.991	1.293	1.536	1.794	2.032	2.211
175	0.968	1.265	1.504	1.757	1.990	2.167
180	0.947	1.239	1.473	1.721	1.951	2.124
185	0.927	1.213	1.443	1.686	1.913	2.084
190	0.907	1.189	1.415	1.654	1.877	2.045
195	0.889	1.166	1.388	1.622	1.842	2.008
200	0.871	1.144	1.362	1.592	1.809	1.972
205	0.854	1.122	1.337	1.564	1.778	1.938
210	0.838	1.102	1.313	1.536	1.747	1.906
215	0.823	1.082	1.290	1.510	1.718	1.874
220	0.808	1.063	1.268	1.484	1.690	1.844
225	0.793	1.045	1.247	1.460	1.663	1.815
230	0.780	1.028	1.227	1.436	1.637	1.787
235	0.766	1.011	1.207	1.413	1.611	1.759
240	0.754	0.995	1.189	1.392	1.587	1.733
245	0.741	0.979	1.170	1.370	1.564	1.708
250	0.729	0.964	1.153	1.350	1.541	1.684
255	0.718	0.950	1.136	1.330	1.519	1.660
260	0.707	0.936	1.119	1.311	1.498	1.637
265	0.696	0.922	1.103	1.293	1.477	1.615
270	0.686	0.909	1.088	1.275	1.458	1.594
275	0.676	0.896	1.073	1.257	1.438	1.573
280	0.666	0.884	1.059	1.241	1.420	1.553
285	0.657	0.872	1.045	1.224	1.402	1.533

TIME	2 yr.	5 yr.	10 yr.	25 yr.	50 yr.	100 yr.
290	0.647	0.860	1.031	1.209	1.384	1.514
295	0.639	0.849	1.018	1.193	1.367	1.496
300	0.630	0.838	1.005	1.178	1.350	1.478
305	0.622	0.828	0.992	1.164	1.334	1.460
310	0.614	0.817	0.980	1.150	1.319	1.444
315	0.606	0.807	0.969	1.136	1.303	1.427
320	0.598	0.797	0.957	1.123	1.288	1.411
325	0.591	0.788	0.946	1.110	1.274	1.395
330	0.583	0.779	0.935	1.097	1.260	1.380
335	0.576	0.770	0.924	1.085	1.246	1.365
340	0.570	0.761	0.914	1.073	1.233	1.351
345	0.563	0.752	0.904	1.061	1.220	1.337
350	0.556	0.744	0.894	1.050	1.207	1.323
355	0.550	0.736	0.885	1.039	1.195	1.309
360	0.544	0.728	0.875	1.028	1.182	1.296
365	0.538	0.720	0.866	1.017	1.171	1.284
370	0.532	0.713	0.857	1.007	1.159	1.271
375	0.526	0.705	0.849	0.997	1.148	1.259
380	0.521	0.698	0.840	0.987	1.137	1.247
385	0.515	0.691	0.832	0.977	1.126	1.235
390	0.510	0.684	0.824	0.968	1.115	1.224
395	0.504	0.677	0.816	0.958	1.105	1.212
400	0.499	0.671	0.808	0.949	1.095	1.201
405	0.494	0.664	0.800	0.940	1.085	1.191
410	0.489	0.658	0.793	0.932	1.075	1.180
415	0.485	0.652	0.786	0.923	1.066	1.170
420	0.480	0.646	0.779	0.915	1.056	1.160
425	0.475	0.640	0.772	0.907	1.047	1.150
430	0.471	0.634	0.765	0.899	1.038	1.140
435	0.466	0.628	0.758	0.891	1.029	1.131
440	0.462	0.623	0.751	0.883	1.021	1.121
445	0.458	0.617	0.745	0.876	1.012	1.112
450	0.454	0.612	0.739	0.869	1.004	1.103
455	0.450	0.607	0.733	0.861	0.996	1.094
460	0.446	0.602	0.726	0.854	0.988	1.086

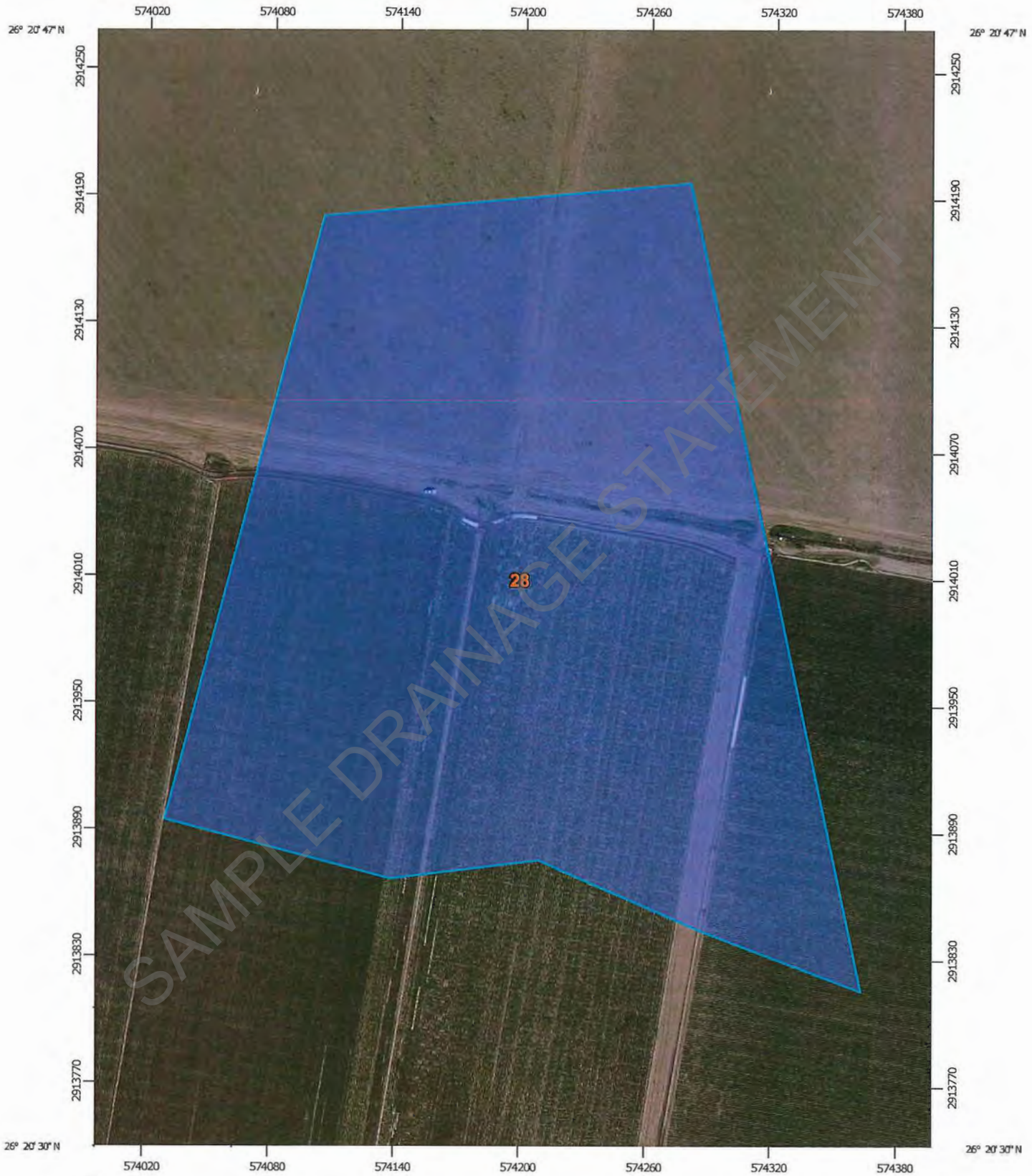
where:	2yr	5yr	10yr	25yr	50yr	100yr
e=	0.831	0.795	0.778	0.771	0.749	0.740
b=	74	80	87	98	99	103
d=	9.6	9.2	9.2	9.2	9.2	9.6

Prepared By Melden & Hunt, Inc.



TOPOGRAPHICAL MAP

Hydrologic Soil Group—Hidalgo County, Texas
(IDEA Tres Lagos)



Map Scale: 1:2,580 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hidalgo County, Texas
Survey Area Data: Version 12, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 8, 2015—Feb 18, 2015

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Hidalgo County, Texas (TX215)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
28	Hidalgo sandy clay loam, 0 to 1 percent slopes	B	20.4	100.0%
Totals for Area of Interest			20.4	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

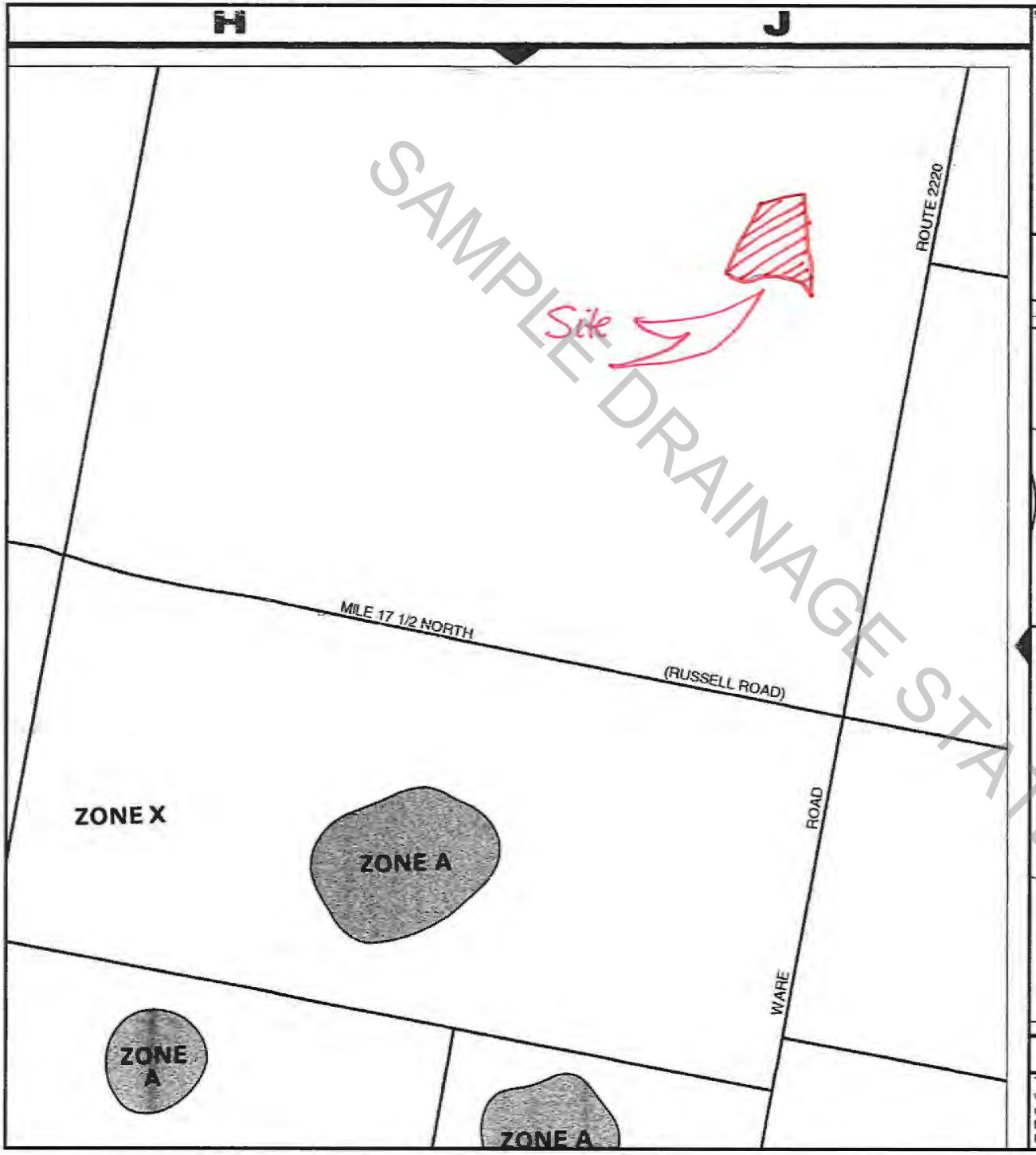
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*



surance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

HIDALGO COUNTY, TEXAS
(UNINCORPORATED AREAS)

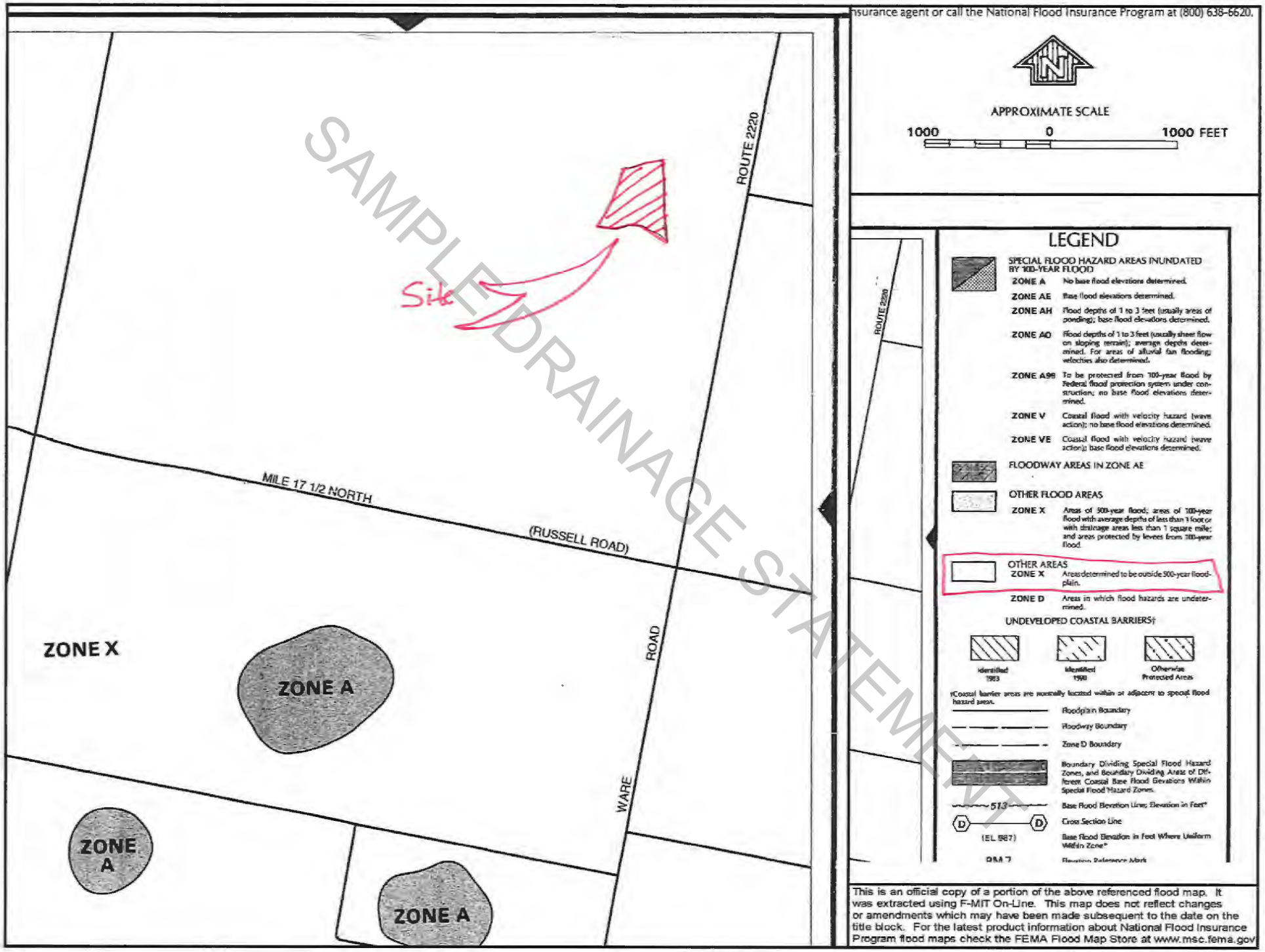
(SEE MAP INDEX FOR PANELS NOT PRINTED)

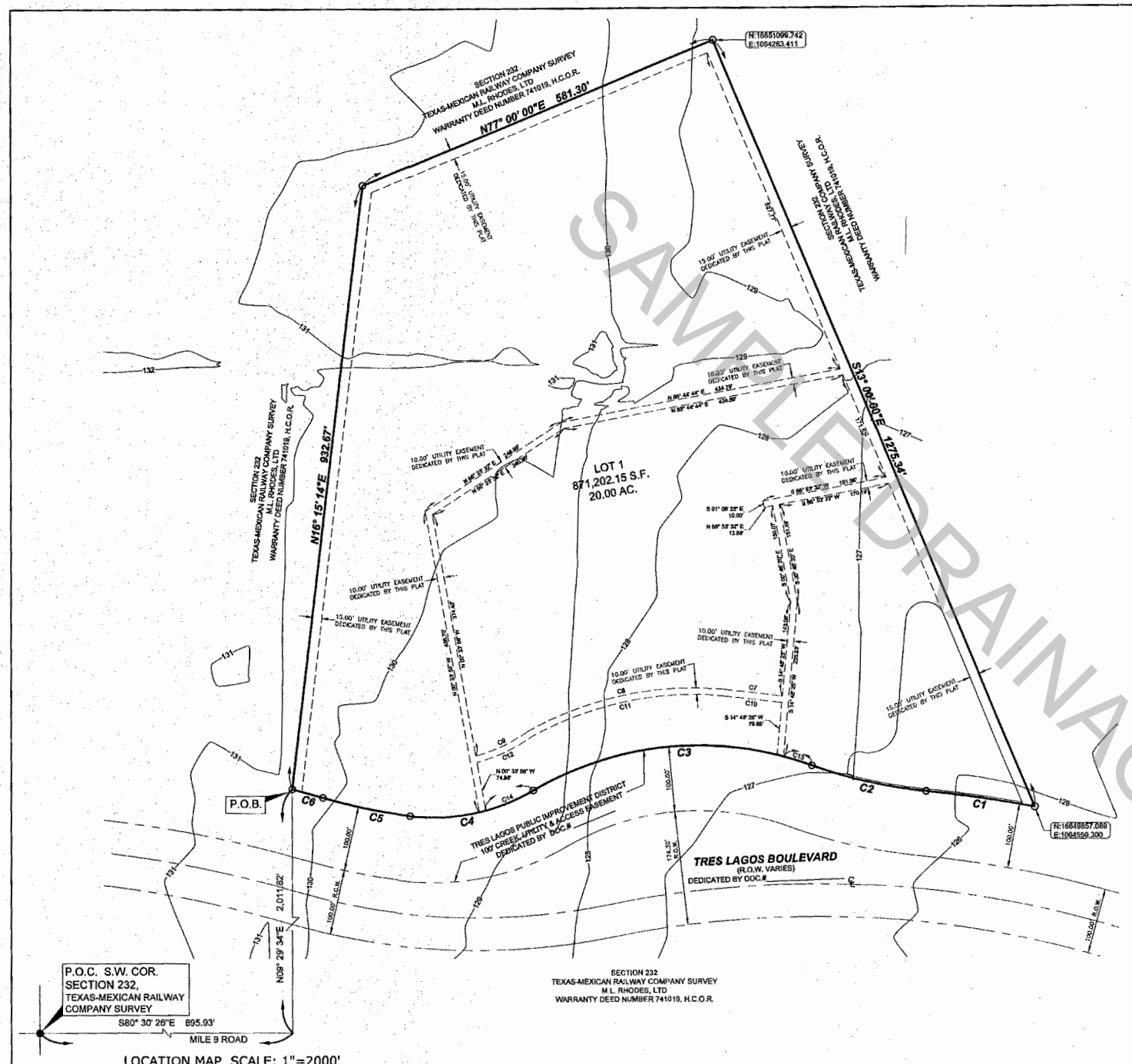
COMMUNITY-PANEL NUMBER
480334 0295 D

MAP REVISED:
JUNE 6, 2000

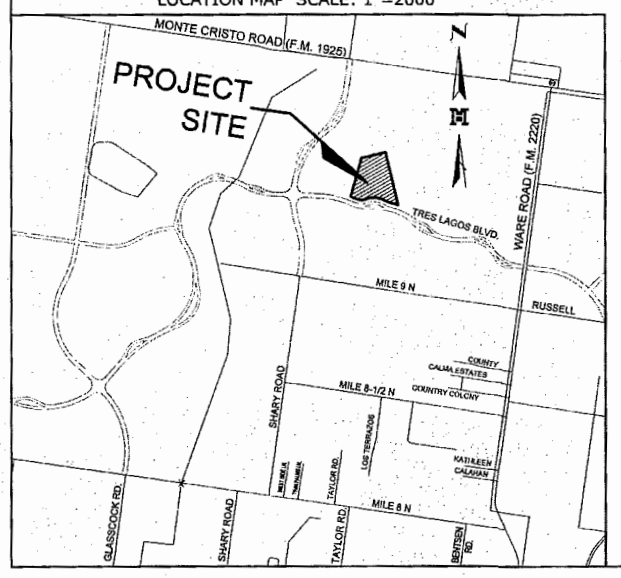
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


nsurance agent or call the National Flood Insurance Program at (800) 638-6620.
APPROXIMATE SCALE
1000 0 1000 FEET
SAMPLE DRAINAGE STATEMENT
Site
ROUTE 2220
MILE 17 1/2 NORTH
(RUSSELL ROAD)
WARE ROAD
ZONE X
ZONE A
ZONE A
ZONE A
LEGEND
SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD
ZONE A No base flood elevations determined.
ZONE AE Base flood elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.
ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.
FLOODWAY AREAS IN ZONE AE
OTHER FLOOD AREAS
ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.
OTHER AREAS
ZONE X Areas determined to be outside 500-year floodplain.
ZONE D Areas in which flood hazards are undetermined.
UNDEVELOPED COASTAL BARRIERS†
Identified 1983
Identified 1990
Otherwise Protected Areas
†Coastal barrier areas are normally located within or adjacent to special flood hazard areas.
Floodplain Boundary
Floodway Boundary
Zone D Boundary
Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
513
Base Flood Elevation Line; Elevation in Feet*
D D
(EL 987)
Cross Section Line
Base Flood Elevation in Feet Where Uniform Within Zone*
DM 7
Elevation Reference Mark
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



LOCATION MAP SCALE: 1"=2000'



LEGEND & ABBREVIATIONS

- ● FOUND # 4 REBAR
- ○ SET # 4 REBAR
- P.O.B. - POINT OF BEGINNING
- P.O.C. - POINT OF COMMENCEMENT
- H.C.O.R. - HIDALGO COUNTY DEED RECORDS
- R.O.W. - RIGHT-OF-WAY
- S.W. COR. - SOUTHWEST CORNER
- S.F. - SQUARE FEET
- AC. - ACRES
- L - LEFT

DRAWN BY: J. d. Z. / FM DATE 04-18-2016
SURVEYED, CHECKED BY: [illegible] DATE 7-12-16
FINAL CHECK_____DATE_____

SURVEYOR

CURVE TABLE

Curve #	Length	Radius	Delta	Chord Direction	Chord Length	Tangent
C1	167.22'	1,750.00'	005° 28' 29"	N72° 06' 38"W	167.16'	83.67'
C2	179.37'	700.00'	014° 40' 55"	N67° 30' 26"W	178.88'	90.18'
C3	441.91'	500.00'	050° 38' 22"	N85° 29' 09"W	427.67'	236.56'
C4	196.09'	300.00'	037° 26' 40"	S87° 55' 00"W	192.59'	101.67'
C5	136.31'	850.00'	009° 11' 17"	N68° 46' 01"W	136.16'	68.30'
C6	49.89'	1,950.00'	001° 28' 12"	N64° 53' 28"W	49.89'	24.45'
C7	92.90'	3,303.39'	001° 36' 41" L	N73° 47' 37"W	92.90'	46.45'
C8	309.72'	520.51'	033° 45' 48"	S87° 35' 39"W	302.30'	157.99'
C9	90.12'	285.22'	018° 28' 04"	S74° 08' 16"W	89.68'	45.50'
C10	92.92'	3,293.39'	001° 37' 00" L	N73° 47' 22"W	92.92'	46.46'
C11	300.21'	516.51'	033° 41' 34"	S87° 37' 12"W	295.90'	154.59'
C12	93.93'	275.22'	019° 33' 15"	S74° 17' 53"W	93.47'	47.43'
C13	45.33'	500.00'	005° 11' 41"	N82° 45' 48"W	45.32'	22.68'
C14	79.24'	300.00'	015° 08' 01"	N76° 45' 41"E	79.01'	39.85'

MAP OF
IDEA TRES LAGOS

BEING A SUBDIVISION OF 20.00 ACRES [871,202.15 SF]
OUT OF SECTION 232,
TEXAS-MEXICAN RAILWAY COMPANY SURVEY,
ACCORDING TO THE PATENT RECORDED
IN VOLUME 4, PAGES 142-143,
HIDALGO COUNTY DEED RECORDS,
CITY OF McALLEN, HIDALGO COUNTY, TEXAS

SCALE:
1" = 100'

METES AND BOUNDS DESCRIPTION:

A TRACT OF LAND CONTAINING 20.00 ACRES [871,202.15 S.F.] SITUATED IN THE CITY OF MCALLEN, HIDALGO COUNTY, TEXAS, SAID 20.00 ACRES [871,202.15 S.F.] BEING A PART OR PORTION OUT OF SECTION 232, TEXAS-MEXICAN RAILWAY COMPANY SURVEY, ACCORDING TO THE PATENT ISSUED BY THE STATE OF TEXAS RECORDED IN VOLUME 4, PAGES 142-143, HIDALGO COUNTY DEED RECORDS, SAID 20.00 ACRES [871,202.15 S.F.] ALSO BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A NO. 4 REBAR FOUND AT THE SOUTHWEST CORNER OF SAID SECTION 232 AND BEING WITHIN THE EXISTING RIGHT-OF-WAY OF MILE 9 ROAD;

THENCE, S 80° 30' 26" E ALONG THE SOUTH LINE OF SAID SECTION 232 AND BEING WITHIN THE EXISTING RIGHT-OF-WAY OF MILE 9 ROAD, A DISTANCE OF 895.93 FEET;

THENCE, N 09° 29' 34" E A DISTANCE OF 2011.62 FEET TO A NO. 4 REBAR SET FOR THE POINT OF BEGINNING AND THE SOUTHWEST CORNER OF THIS TRACT;

1. THENCE, N 16° 15' 14" E A DISTANCE OF 932.67 FEET TO A NO. 4 REBAR SET FOR THE NORTHWEST CORNER OF THIS TRACT;
2. THENCE, N 77° 00' 00" E A DISTANCE OF 581.30 FEET TO A NO. 4 REBAR SET (NORTHING: 16651099.742 EASTING: 1064263.411) FOR THE NORTHEAST CORNER OF THIS TRACT;
3. THENCE, S 13° 00' 00" E A DISTANCE OF 1275.34 FEET TO A NO. 4 REBAR SET (NORTHING: 16649857.089 EASTING: 1064550.300) FOR THE SOUTHEAST CORNER OF THIS TRACT;
4. THENCE, ALONG A CURVE TO THE LEFT, WITH A CENTRAL ANGLE OF 05° 28' 29", A RADIUS OF 1750.00 FEET, AN ARC LENGTH OF 167.22 FEET, A TANGENT OF 83.67 FEET, AND A CHORD THAT BEARS N 72° 06' 38" W, A DISTANCE OF 167.16 FEET TO A NO. 4 REBAR SET FOR THE POINT OF TANGENCY OF SAID CURVE TO THE LEFT AND FOR THE POINT OF CURVATURE FOR A CURVE TO THE RIGHT;
5. THENCE, ALONG SAID CURVE TO THE RIGHT, WITH A CENTRAL ANGLE OF 14° 40' 55", A RADIUS OF 700.00 FEET, AN ARC LENGTH OF 179.37 FEET, A TANGENT OF 90.18 FEET, AND A CHORD THAT BEARS N 67°30' 26" W, A DISTANCE OF 178.88 FEET TO A NO. 4 REBAR SET FOR THE POINT OF TANGENCY OF SAID CURVE TO THE RIGHT AND FOR THE POINT OF CURVATURE FOR A CURVE TO THE LEFT;
6. THENCE, ALONG SAID CURVE TO THE LEFT, WITH A CENTRAL ANGLE OF 50° 38' 22", A RADIUS OF 500.00 FEET, AN ARC LENGTH OF 441.91 FEET, A TANGENT OF 236.56 FEET, AND A CHORD THAT BEARS N 85°29' 09" W, A DISTANCE OF 427.67 FEET TO NO. 4 REBAR SET FOR THE POINT OF TANGENCY OF SAID CURVE TO THE LEFT AND FOR THE POINT OF CURVATURE FOR A CURVE TO THE RIGHT;
7. THENCE, ALONG SAID CURVE TO THE RIGHT, WITH A CENTRAL ANGLE OF 37° 26' 40", A RADIUS OF 300.00 FEET, AN ARC LENGTH OF 196.09 FEET, A TANGENT OF 101.67 FEET, AND A CHORD THAT BEARS S 87°55' 00" W, A DISTANCE OF 192.59 FEET TO A NO. 4 REBAR SET FOR THE POINT OF TANGENCY OF SAID CURVE TO THE RIGHT AND FOR THE POINT OF CURVATURE FOR A CURVE TO THE RIGHT;
8. THENCE, ALONG SAID CURVE TO THE RIGHT, WITH A CENTRAL ANGLE OF 09° 11' 17", A RADIUS OF 850.00 FEET, AN ARC LENGTH OF 136.31 FEET, A TANGENT OF 68.30 FEET, AND A CHORD THAT BEARS N 68°46' 01" W, A DISTANCE OF 136.16 FEET TO A NO. 4 REBAR SET FOR THE POINT OF TANGENCY OF SAID CURVE TO THE RIGHT AND FOR THE POINT OF CURVATURE FOR A CURVE TO THE LEFT;
9. THENCE, ALONG SAID CURVE TO THE LEFT, WITH A CENTRAL ANGLE OF 01° 28' 12", A RADIUS OF 1950.00 FEET, AN ARC LENGTH OF 49.89 FEET, A TANGENT OF 24.45 FEET, AND A CHORD THAT BEARS N 64° 53' 28" W, A DISTANCE OF 49.89 FEET TO THE POINT OF BEGINNING, AND CONTAINING 20.00 ACRES [871,202.15 S.F.] OF LAND, MORE OR LESS.

GENERAL NOTES :

1. THIS SUBDIVISION IS LOCATED IN ZONE "A" UNSHADED ON FEMA'S FLOOD INSURANCE RATE MAP. AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOODPLAIN; COMMUNITY PANEL NUMBER 480334 0295 D MAP REVISED: JUNE 06, 2000
2. MINIMUM FINISH FLOOR ELEVATION NOTE:
   MINIMUM FINISH FLOOR ELEVATION SHALL BE 18" ABOVE TOP OF CURB ALONG TRES LAGOS BOULEVARD MEASURED AT THE FRONT-CENTER OF THE LOT.
3. SETBACK:
   FRONT: TRES LAGOS BOULEVARD - 50 FT, OR GREATER FOR APPROVED SITE PLAN OR EASEMENTS
   REAR: IN ACCORDANCE WITH THE ZONING ORDINANCE, OR GREATER FOR APPROVED SITE PLAN OR EASEMENT
   SIDES: IN ACCORDANCE WITH THE ZONING ORDINANCE, OR GREATER FOR APPROVED SITE PLAN OR EASEMENT
4. THE REQUIRED STORM RUNOFF DETENTION FOR THIS SUBDIVISION SHALL BE AS PER MASTER DRAINAGE REPORT FOR TRES LAGOS DEVELOPMENT. AN ENGINEERED DRAINAGE DETENTION PLAN APPROVED BY THE ENGINEERING DEPARTMENT OF THE CITY OF MCALLEN IS REQUIRED PRIOR TO ISSUANCE OF A BUILDING PERMIT.
5. SITE BENCHMARK: TOP OF SANITARY SEWER MANHOLE AT THE NORTHEAST CORNER OF WARE ROAD & RUSSELL ROAD, GEODETIC G.P.S. TEXAS STATE PLANE GRID COORDINATE SYSTEM, NAD 83 TEXAS SOUTH 4205 ELEVATION PER NAVD 88 (GEOID 2003) N=16647390.7390, 1067447.0830, ELEV.=118.73

   CITY OF McALLEN BENCHMARK: MC 23 ELEVATION 128.79 NAVD 88 (GEOID 1999): 30" ALUMINUM PIPE WITH A 3 ½" BRASS MONUMENT CAP ON TOP, LOCATED AT NORTHWEST CORNER OF THE INTERSECTION OF FM 2220 AND FM 1926 N=16652949.4951, 1067206.2941, ELEVATION 128.79
6. NO BUILDING ALLOWED OVER ANY EASEMENT.
7. SITE PLAN APPROVAL BY THE CITY OF McALLEN IS REQUIRED PRIOR TO BUILDING PERMIT ISSUANCE.
8. THERE ARE IRRIGATION VENTS AND DRAIN DITCHES LOCATED UPON SUBJECT TRACT. UNITED IRRIGATION DISTRICT WAS CONTACTED AND THERE ARE NO PIPELINES AND NO EASEMENTS LOCATED UPON SUBJECT TRACT THAT BELONG TO UNITED IRRIGATION DISTRICT. IRRIGATION VENTS APPEAR TO BE PRIVATE. THERE ARE NO RECORDED DOCUMENTS FOUND FOR THESE IRRIGATION VENTS. DRAIN DITCHES APPEAR TO BE PRIVATE. DRAINAGE DISTRICT No. 1'S MAP DOES NOT SHOW ANY EXISTING DRAIN DITCHES UPON SUBJECT TRACT. NO RECORDED DOCUMENTS FOUND FOR THESE DRAINAGE DITCHES.
9. TERMS AND CONDITIONS AND RESERVATION OF TECHNOLOGY EASEMENTS DATED AUGUST 13, 2015, FILED NOVEMBER 25, 2015, BETWEEN HIDALGO COUNTY HIDALGO TEXAS CORPORATION, INC., TO ML RHODES LTD. A TEXAS LIMITED PARTNERSHIP, RECORDED UNDER CLERK'S FILE No. 2985226, OFFICIAL RECORDS OF HIDALGO COUNTY, TEXAS. EASEMENT PROPERTY DESCRIBED IN SAID DOCUMENT IS INCOMPLETE. EASEMENT PERTAINS TO AND IS FOR THE BENEFIT OF THE OWNER/RESEVOR. NO WIDTH SPECIFIED FOR EASEMENT. THE ACTUAL EASEMENT BOUNDARY IS NOT DESCRIBED, BUT IS WITHIN THE EASEMENT PROPERTY WHICH IS INCOMPLETE. EASEMENT MAY BE REVOKED OR AMENDED BY OWNER/RESVOR AND IS EXCLUSIVE.
10. 4' WIDE MINIMUM SIDEWALK REQUIRED ALONG TRES LAGOS BOULEVARD.
11. 6' OPAQUE BUFFER REQUIRED FROM ADJACENT/ BETWEEN MULTI-FAMILY RESIDENTIAL AND COMMERCIAL OR INDUSTRIAL ZONES/USES.
12. 6' MASONRY WALL REQUIRED BETWEEN SINGLE FAMILY RESIDENTIAL AND COMMERCIAL, INDUSTRIAL, OR MULTI-FAMILY RESIDENTIAL ZONES/USES.

BY:_____ DEPUTY

PLAT SHEET 1 OF 1

MATCH LINE A - A

MATCH LINE A - A

TEXAS

WARRA

FUTURE PHASE II PARKING LOT

FUTURE PHASE I ACADEMY BUILDING

PHASE I
COLLEGE PREP
FF 130.00

PROP. DRIVE ENTRANCE (BY OTHERS)

PROP. DRIVE ENTRANCE (BY OTHERS)

PROP. CREEK

PROP. CREEK

PROP. CREEK

PROP. TY "A" INLET TOP 127.00 (BY OTHERS)

TRES LAGOS BOULEVARD (F.D.R. VARIES)

PROP. TY "C" GRATE INLET TOP 129.00 FL 125.72

PROP. TY "C" GRATE INLET TOP 129.00 FL 125.57

PROP. TY "C" GRATE INLET TOP 126.75 FL 125.65

PROP. TY "C" GRATE INLET TOP 127.75 S FL 124.55

PROP. TY "C" GRATE INLET TOP 127.40 FL 124.35

PROP. CONC. CHUTE

PROP. CONC. CHUTE

PROP. 24" CONC. FLUME FL 127.60

PROP. 24" CONC. FLUME FL 124.60

PROP. DISCHARGE STRUC. FL 124.60

PROP. TY "C-C" TOP 123.50 FL 120.71

PROPOSED DETENTION AREA SIDES SLOPES 4:1 MAX. DEPTH 2.5 FEET (64,500 C.F.)

TEXAS-MEXICAN M.

WARRANTY DE

OUT

SCALE:
1 INCH = 40 FEET

N 10648857.089
E 1064550.500

SAMPLE RELEASE STATEMENT

LEGEND

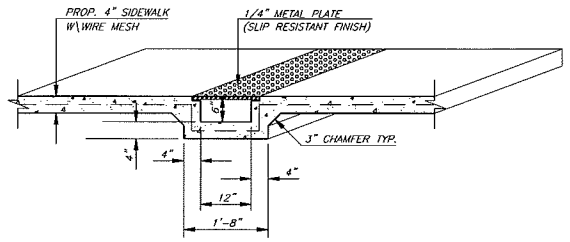
FFE XXX.XX	FINISH FLOOR ELEVATION
SW XXX.XX	TOP OF SIDEWALK ELEVATION
TC XXX.XX	TOP OF CURB ELEVATION
FL XXX.XX	FLOW LINE ELEVATION
TP XXX.XX	TOP OF PAVEMENT ELEVATION
FG XXX.XX	PROPOSED FUTURE GRADE ELEVATION

REVISION | DATE | BY

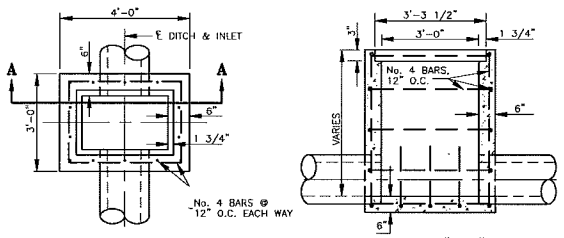
IDEA TRES LAGOS
McALLEN, TEXAS

PAVING & GRADING PLAN

SHEET 7 OF 11



SIDEWALK CHUTE DETAIL
N.T.S.



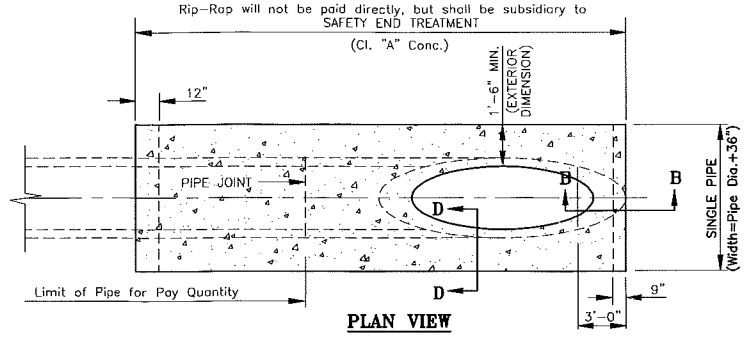
TOP VIEW OF INLET

SECTION "A–A"

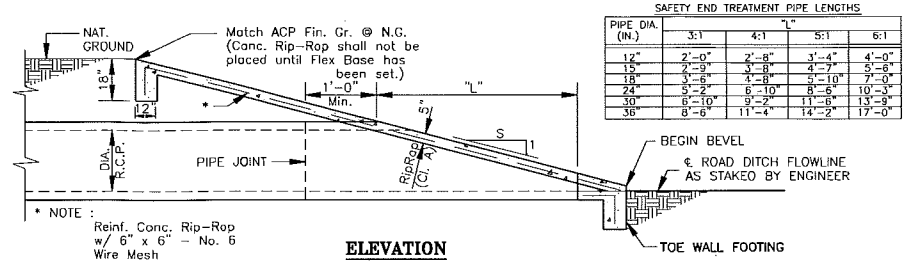
TOP VIEW OF GRATE

SECTION "B–B"

TYPE "C" GRATED INLET



PLAN VIEW



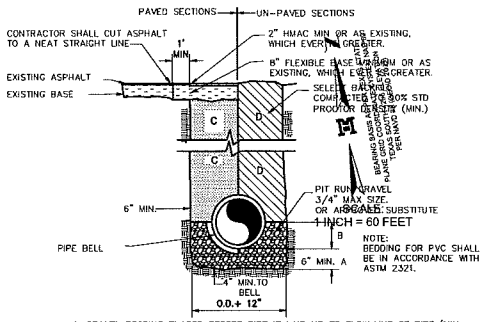
ELEVATION

SAFETY END TREATMENT–TYPE "C"

SAFETY END TREATMENT PIPE LENGTHS

PIPE DIA. (IN.)	"L" 3:1	4:1	5:1	6:1
12"	2'-0"	2'-8"	3'-4"	4'-0"
15"	2'-9"	3'-8"	4'-7"	5'-8"
18"	3'-6"	4'-8"	5'-10"	7'-0"
24"	5'-2"	6'-10"	8'-6"	10'-3"
30"	6'-10"	9'-2"	11'-5"	13'-9"
36"	8'-6"	11'-4"	14'-2"	17'-0"

SAFETY END TREATMENT – (Type "C") DETAILS
N.T.S.



A. GRAVEL BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE (MIN. THICKNESS =6") PIT RUN GRAVEL 3/4" MAX SIZE.

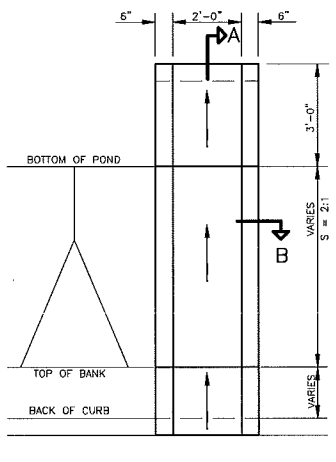
B. GRAVEL PLACED AFTER PIPE IS LAID, FROM BOTTOM OF PIPE TO THE SPRING LINE. PIT RUN GRAVEL 3/4" MAX. SIZE OR APPROVED SUBSTITUTE.

C. CITY STREETS PARKING AREA, DRIVEWAYS: SELECT EXCAVATED BACK FILL COMPACTED 95% SPD, 8" LIFTS, MECHANICAL COMPACTION.

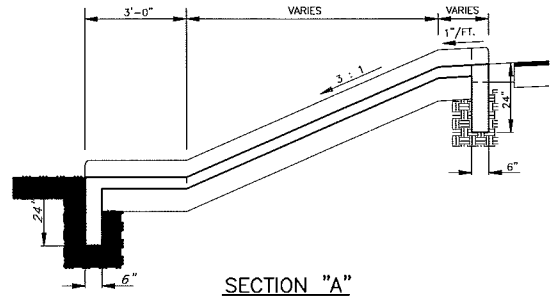
STATE MAINTAINED ROADWAYS: COMPACTED SAND/CEMENT STABALIZED BACK FILL 7% PORTLAND CEMENT COMPACTED AS PER ASTM D-4253 AND ASTM D-698

D. SELECT EARTH BACKFILL COMPACTED TO 90% PROCTOR DENSITY (12 LIFTS, MECHANICAL COMPACTION) FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE. BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO 95% STD. PROCTOR DENSITY (USE RELATIVE DENSITY TEST PER ASTM D-4253 & ASTM D-698). THE THICKNESS OF EACH LOOSE LAYER SHALL NOT EXCEED 8". STRUCTURE BACK FILL MATERIAL SHALL BE SAND, EXCAVATED MATERIAL, OR OTHER APPROVED SUBSTITUTE. PI FOR SELECT BACK FILL SHALL BE 7–22, AND EXCAVATED LESS THAN 30.

PIPE BEDDING DETAILS
N.T.S.



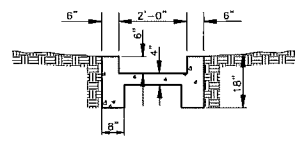
PLAN VIEW



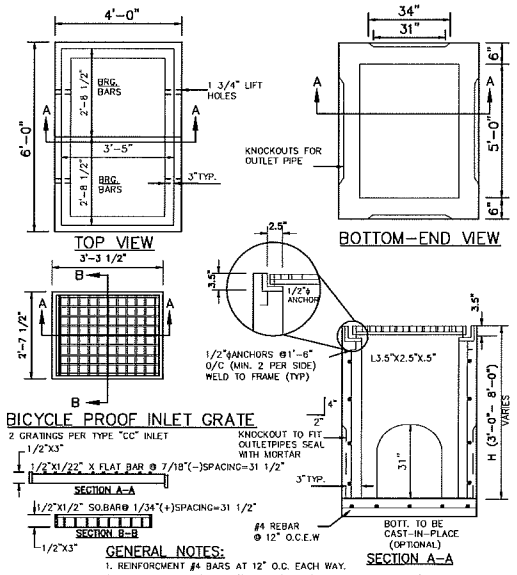
SECTION "A"

GENERAL NOTES :
1. CONCRETE SHALL HAVE 3,500 P.S.I. AT MINIMUM 28 DAYS COMPRESSION STRENGTH.
2. 6"x6" No. 6 WIRE MESH OR EQUAL LAPPED 6".
3. ALL STEEL TO HAVE 4,000 P.S.I. YIELD STRENGTH.

CONCRETE FLUME DETAIL



SECTION "B"



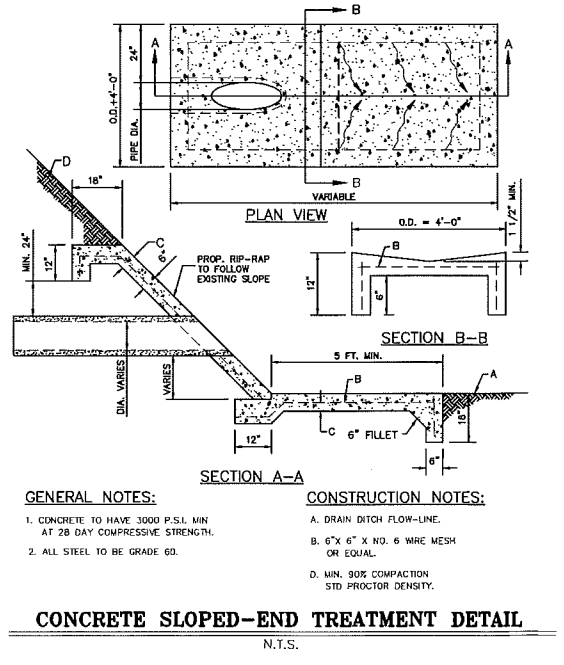
BICYCLE PROOF INLET GRATE

2 GRATINGS PER TYPE "CC" INLET

GENERAL NOTES:
1. REINFORCEMENT #4 BARS AT 12" O.C. EACH WAY.
2. CONCRETE TO HAVE A MIN. 28 DAY COMPRESSIVE STRENGTH OF 3000 P.S.I.
3. 'H' DIMENSION AVAILABLE IN 6" INCREMENTS FROM 3'–0" TO 8'–0"
4. INLETS SAHLL BE COMPOSED OF PRE–CAST SECTIONS, CAST IN PLACE OR A COMBINATION OF BOTH.
5. 6" GRAVEL BEDDING IS REQUIRED IF UNSTABLE SOIL OR GROUND WATER IS FOUND.

SECTION A–A

TYPE "CC" INLET
N.T.S.

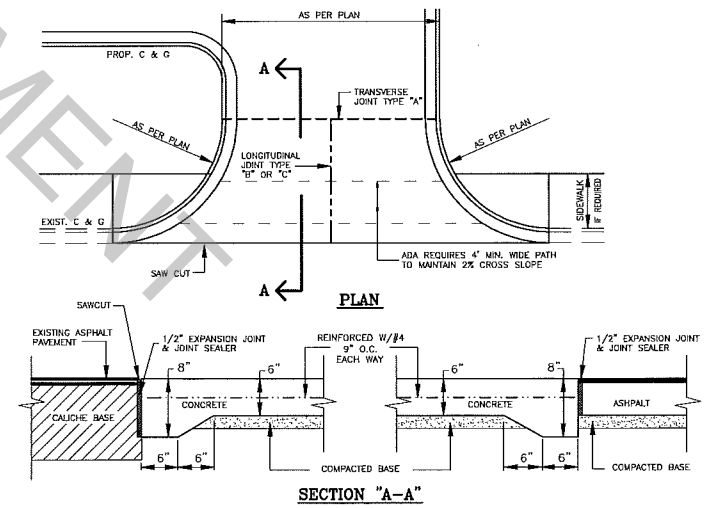


SECTION A–A

GENERAL NOTES:
1. CONCRETE TO HAVE 3000 P.S.I. MIN AT 28 DAY COMPRESSIVE STRENGTH.
2. ALL STEEL TO BE GRADE 60.

CONSTRUCTION NOTES:
A. DRAIN DITCH FLOW–LINE.
B. 6"x 6" X NO. 6 WIRE MESH OR EQUAL.
D. MIN. 90% COMPACTION STD PROCTOR DENSITY.

CONCRETE SLOPED–END TREATMENT DETAIL
N.T.S.



SECTION "A–A"

CONCRETE APRON AT ENTRANCE DETAIL
TXDOT

TYPICAL STORM SEWER DETAILS