
Civil & Survey

RKL Engineering
11 West Main Street
Altoona, Texas 75013
(972) 366-1833

City Athletics

PBK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1252
(972) 233-1375

Landscape

Environ Group
111 Hillside Drive
Hillside, Texas 75057
(972) 371-0278
(972) 438-4915

Structural

Structural Engenuity, Inc.
10001 North Dallas Parkway, Suite 1500
Dallas, TX 75242
(972) 233-2550
(972) 242-9282

M&P

PEB

14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1252
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Food Service

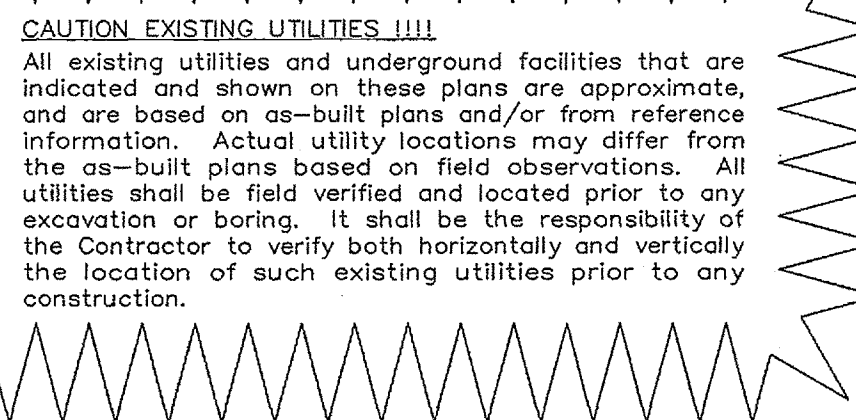
H. G. Rice and Company, Inc.
2655 Villa Creek Drive, Suite 233
Frisco, Texas 75034
(972) 244-5300
(972) 244-5331



14001 N. Dallas Parkway
Suite 400
Dallas, Texas 75240
Phone: 972-233-1323
Fax: 972-233-1373

C 3

GRADING
PLAN



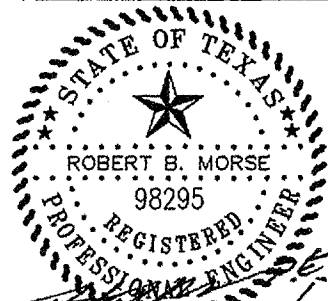
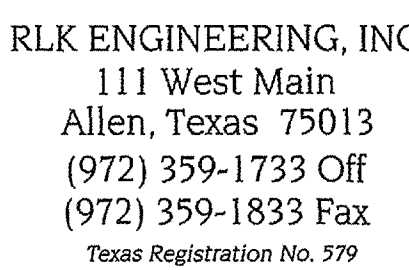
- ## **GRADING NOTES**
1. All materials and construction shall conform to the City of Lucas Standards and Specifications, except as noted herein approved by the City.
 2. Prior to starting construction, the Contractor shall make certain that all required permits and approvals have been obtained. No construction or fabrication shall begin until the Contractor has had all necessary permits and approvals, plans and other documents approved by all of the permitting authorities.
 3. In no event shall any item is not covered in the City's specs, the City Engineer's design requirements.
 4. Contractor shall meet O.S.H.A. requirements for trench safety.
 5. Barricading, traffic control, and project signs shall conform to the City Engineer's design requirements.
 6. The Contractor shall verify the suitability of all existing and proposed site conditions, including grades and dimensions before commencement of any construction. In the event of any discrepancies, and/or if the Contractor deems the construction, immediately notify Engineer. Minor adjustments shall be made to accommodate the existing conditions. If necessary, upon prior approval of Engineer. All paving installed shall "flush out" at any juncture with existing paving.
 7. The locations of underground utilities shown on this plan are based on field survey and local utility company records. It is the Contractor's responsibility to contact the various utility companies to locate their utilities prior to any construction. Any damage to existing utilities is to be repaired at Contractor's expense.
 8. Proposed spot elevations are part of pavement elevations.
 9. Prior to placing fill, the subgrade shall be scarified to a minimum of 4 inches and compacted to a minimum of 95% of Standard Proctor, at or slightly above its optimum moisture content. The subgrade shall be compacted in 6" lifts. Material shall be placed in six to nine lift increments and compacted in a similar manner.
 10. All subgrade preparation shall be as directed in accordance with the referenced Standard. All proposed grades in landscaped areas are finished grade elevations. Contractor to provide all erosion control measures.
 11. Any damage to adjoining property during construction shall be repaired to pre-construction conditions or better at the Contractor's expense.
 12. Erosion control shall be in place prior to the disturbance of any existing surface.
 13. All sidewalk slopes including crosswalks, shall not exceed the following ADA requirements:
1:20 horizontal (slope) and
1:50 per foot transverse (across the walk)
 14. It shall be the Contractor's responsibility to remove excess material from the work area.
 15. If additional earthwork material is required to achieve the grades, it shall be supplied and installed by the Contractor at no additional cost to the owner.
 16. Maximum slope shall not exceed 3:1.

LEGEND

The legend defines the symbols used in the cross-section diagram:

- Proposed Spot Elevation:** Represented by a circle with a dot and the value 14.8.
- Existing Spot Elevation:** Represented by a circle with a dot and the value 14.21.
- Proposed Contour:** Represented by a solid line with the value 14.
- Existing Contour:** Represented by a dashed line with the value 614.
- Direction of Flow:** Represented by a horizontal line with an arrow pointing to the right.
- Drainage Swale:** Represented by a horizontal line with a central V-shaped notch.

REVISION	DATE	DESCRIPTION



GRADING PLAN

WILLOW SPRINGS MIDDLE SCHOOL

CITY OF LUCAS, TEXAS

C 3 15

CONSULTANTS

Civil & Survey
RLK Engineering
111 West Main Street
Allen, Texas 75013
(972) 359-1733
(972) 359-1833

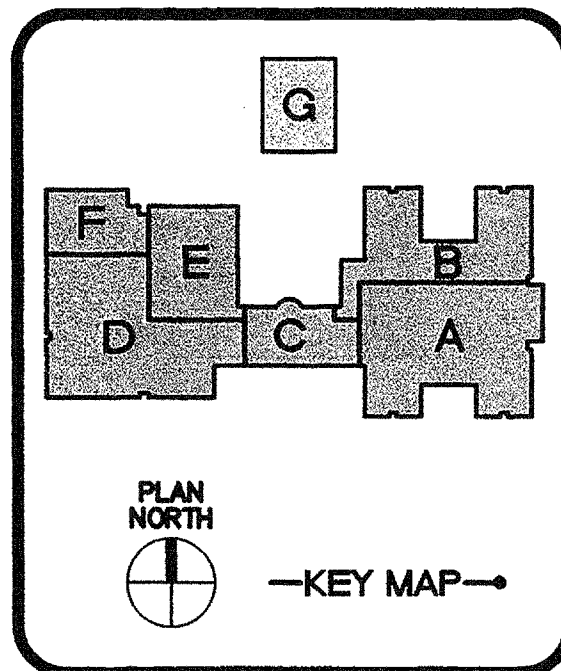
Civil Athletics
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(972) 247-8282

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Food Service
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(972) 245-5351



**NEW
WILLOW SPRINGS
MIDDLE SCHOOL**
Lovejoy Independent School District

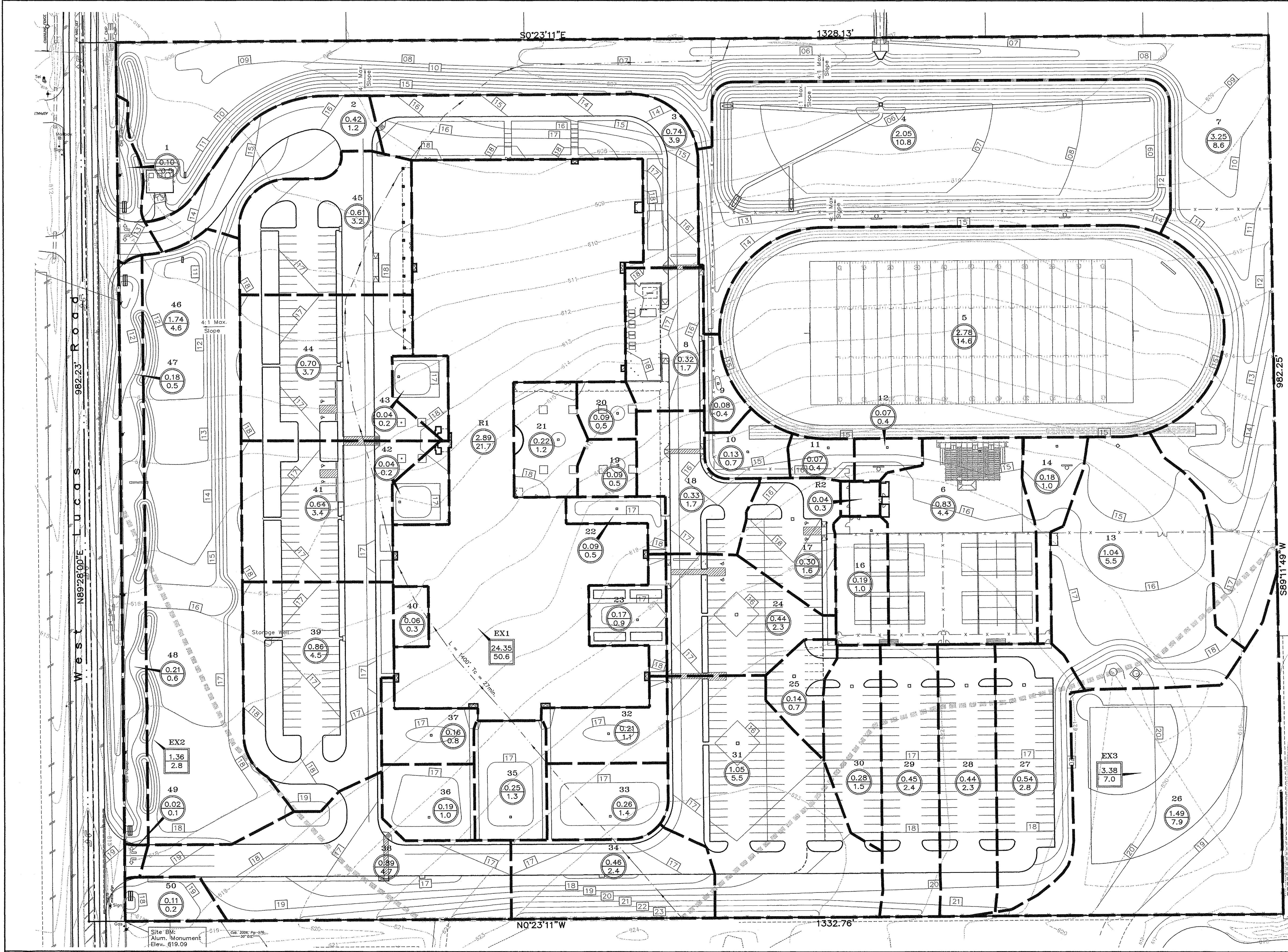


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PROJECT NO. 10/20/10
DATE
DRAWN
CHECKED
REVISIONS

ISSUE FOR PRICING
AND CONSTRUCTION

C 4
DRAINAGE
AREA MAP



DRAINAGE AREA CALCULATIONS

DRAINAGE AREA No.	DRAINAGE AREA (Acres)	C	t _c (min)	i ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)
1	0.10	0.7	15	7.52	0.5
2	0.42	0.7	15	7.52	2.2
3	0.74	0.7	15	7.52	3.9
4	2.05	0.7	15	7.52	10.8
5	2.78	0.7	15	7.52	14.6
6	0.83	0.7	15	7.52	4.4
7	3.25	0.35	15	7.52	8.6
8	0.32	0.7	15	7.52	1.7
9	0.08	0.7	15	7.52	0.4
10	0.13	0.7	15	7.52	0.7
11	0.07	0.7	15	7.52	0.4
12	0.07	0.7	15	7.52	0.4
13	1.04	0.7	15	7.52	5.5
14	0.18	0.7	15	7.52	1.0
15	—	—	—	—	—
16	0.19	0.7	15	7.52	1.0
17	0.30	0.7	15	7.52	1.6
18	0.33	0.7	15	7.52	1.7
19	0.09	0.7	15	7.52	0.5
20	0.09	0.7	15	7.52	0.5
21	0.22	0.7	15	7.52	1.2
22	0.09	0.7	15	7.52	0.5
23	0.17	0.7	15	7.52	0.9
24	0.44	0.7	15	7.52	2.3
25	0.14	0.7	15	7.52	0.7
26	1.49	0.35	15	7.52	3.9
27	0.54	0.7	15	7.52	2.8
28	0.44	0.7	15	7.52	2.3
29	0.45	0.7	15	7.52	2.4
30	0.28	0.7	15	7.52	1.5
31	1.05	0.7	15	7.52	5.5
32	0.21	0.7	15	7.52	1.1
33	0.26	0.7	15	7.52	1.4
34	0.46	0.7	15	7.52	2.4
35	0.25	0.7	15	7.52	1.3
36	0.19	0.7	15	7.52	1.0
37	0.16	0.7	15	7.52	0.8
38	0.89	0.7	15	7.52	4.7
39	0.86	0.7	15	7.52	4.5
40	0.06	0.7	15	7.52	0.3
41	0.64	0.7	15	7.52	3.4
42	0.04	0.7	15	7.52	0.2
43	0.04	0.7	15	7.52	0.2
44	0.70	0.7	15	7.52	3.7
45	0.61	0.7	15	7.52	3.2
46	1.74	0.35	15	7.52	4.6
47	0.16	0.35	15	7.52	0.5
48	0.21	0.35	15	7.52	0.6
49	0.02	0.7	15	7.52	0.1
50	0.11	0.35	15	7.52	0.3
R1	2.89	1.0	15	7.52	21.7
R2	0.04	1.0	15	7.52	0.3
EX1	24.35	0.35	27	5.94	50.6
EX2	1.36	0.35	27	5.94	2.8
EX3	3.38	0.35	27	5.94	7.0

DRAINAGE CRITERIA

Existing: Q = C I A
C = 0.35
I₁₀₀ = 5.94
t_c = 27 min.

Proposed: Q = C I A
C = 0.70
I₁₀₀ = 7.52
t_c = 15 min.

XX — Proposed Drainage Area Number
X.XX — Acres
X.XX — Q₁₀₀ (cfs)

XX — Existing Drainage Area Number
X.XX — Acres
X.XX — Q₁₀₀ (cfs)

— Proposed Drainage Divide Line
- - - Existing Drainage Divide Line
→ Flow Arrows

NOTE:
Prior to beginning any construction or construction staking, it shall be the Contractor's responsibility to contact the civil engineer to insure that all parties are in possession of the most current set of construction documents.

SITE BENCHMARK:
Aluminum monument at northwest corner of school property
Elev. = 619.09

REVISION	DATE	DESCRIPTION

RLK ENGINEERING, INC.
111 West Main
Allen, Texas 75013
(972) 359-1733 Off
(972) 359-1833 Fax
Texas Registration No. 579

DRAINAGE AREA MAP
WILLOW SPRINGS MIDDLE SCHOOL
CITY OF LUCAS, TEXAS

DESIGNED BY: RLK Engineering	TECH REVIEW: RLK	DRAWING FILE: 09002 DAMAP.dwg	DRAWING SCALE: 1"=30'	SHEET: C 4 OF 15
DRAWN BY: RLK Engineering	PEER REVIEW: RLK	DRAWING DATE: 10-20-11	PROJECT NUMBER: RLK 09002	

CONSULTANTS

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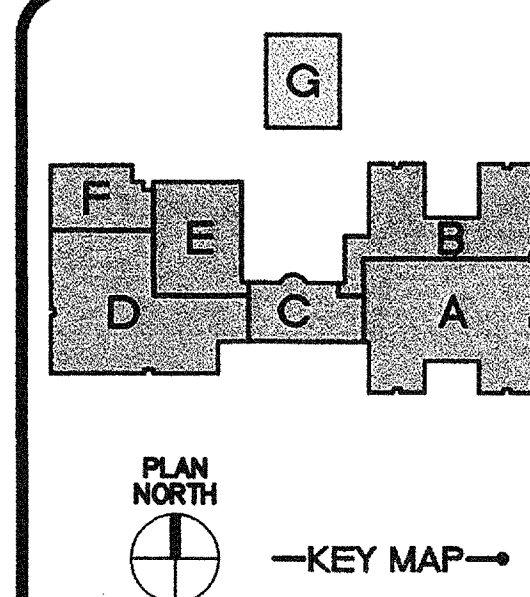
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Farming Branch, Texas 75234
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NEW WILLOW SPRINGS MIDDLE SCHOOL

Lovejoy Independent School District

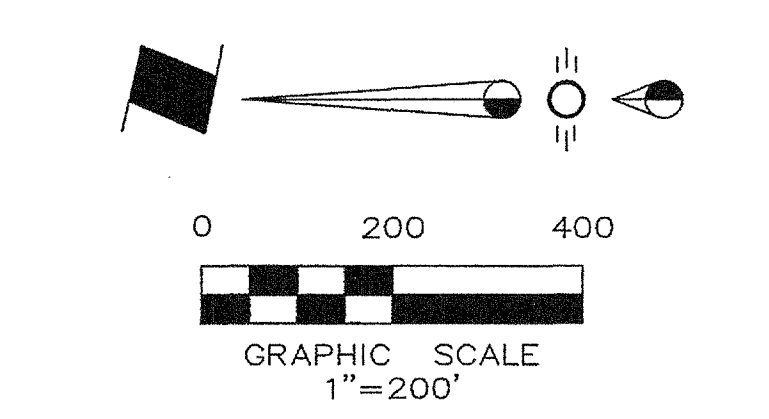
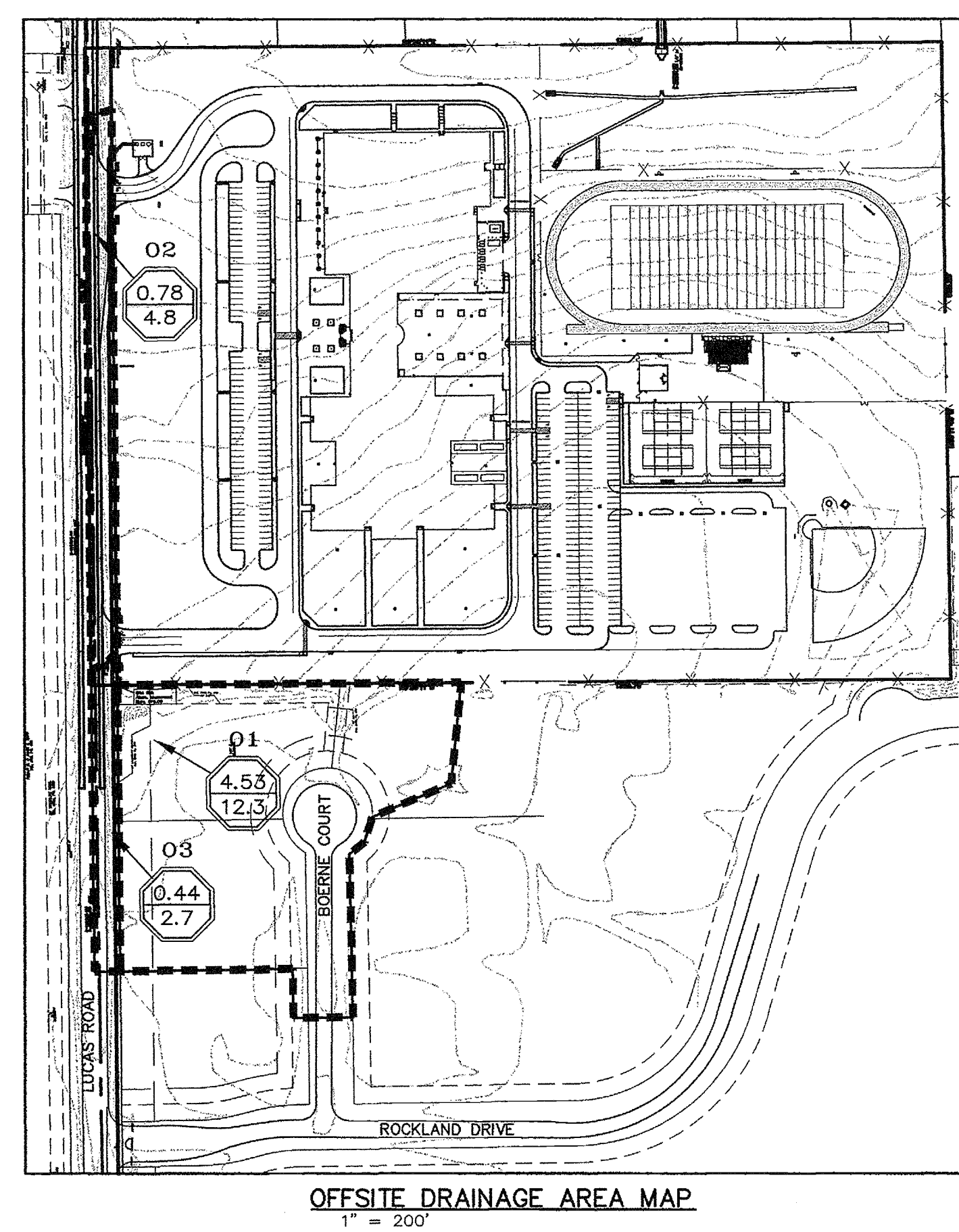
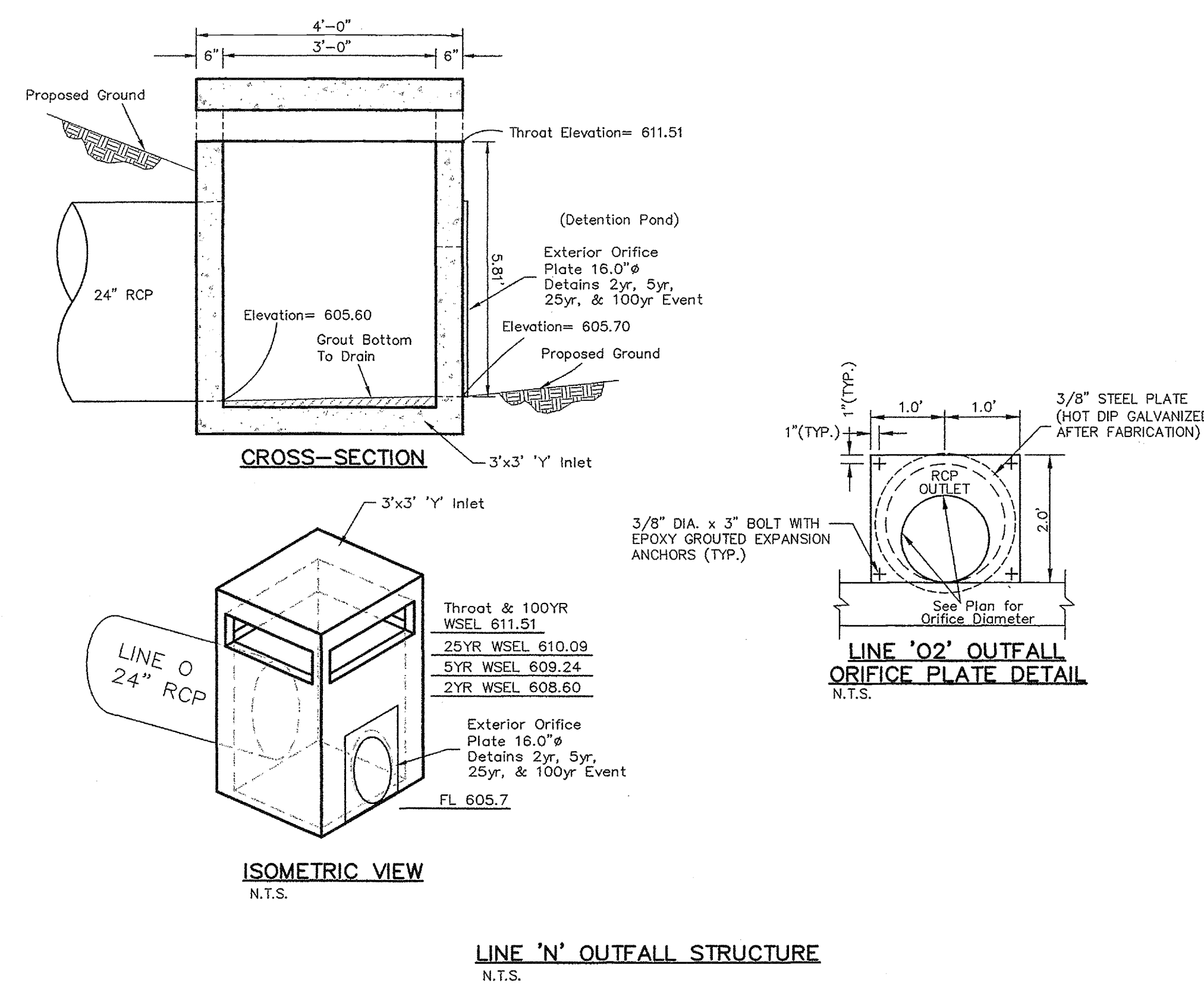


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PROJECT NO.
DATE 10/20/10
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ISSUE FOR PRICING
AND CONSTRUCTION

C 5
DRAINAGE
CALCULATIONS



DRAINAGE AREA No.	DRAINAGE AREA (Acres)	C	t _c (min)	I ₁₀₀ (in/hr)	Q ₁₀₀ (cfs)
01	0.4	15	6.80	12.3	4.8
02	0.78	15	6.80	4.8	2.7
03	0.44	15	6.80	2.7	1.1

DRAINAGE CRITERIA				
OX	Offsite Drainage	Area Number		
X.XX	Area Number	Acres		
X.XX	Q ₁₀₀ (cfs)			

DETENTION CALCULATION SUMMARY - 2 YEAR

PROPOSED CONDITIONS

Area = Ex.1 = 24.35 ac
C = 0.70
T_c = 15 min
I₂ = 4.00 in/hr
Q₂ = 60.2 cfs

EXISTING CONDITIONS

Area = Ex.1 = 24.35 ac
C = 0.35
T_c = 27 min
I₂ = 2.89 in/hr
Q₂ = 24.6 cfs

UNDERTAINED RELEASE

Area = 7, 49, & 50 = 5.17 ac
C = 0.35
T_c = 15 min
I₂ = 4.00 in/hr
Q₂ = 7.2 cfs

Area = 1 & 2 = 0.52 ac
C = 0.7
T_c = 15 min
I₂ = 4.00 in/hr
Q₂ = 1.5 cfs

ALLOWABLE RELEASE FROM POND

EXISTING CONDITIONS -
UNDERTAINED RELEASE =
24.6 - 7.2 - 1.5 = 15.9 cfs

ACTUAL RELEASE FROM POND

As stated with the 100yr Outfall calculations, the release rate was reduced less than the allowable release rate. By using interpolation, the release rate and pond volume for the 2yr storm will be determined.

DETENTION CALCULATION SUMMARY - 5 YEAR

PROPOSED CONDITIONS

Area = Ex.1 = 24.35 ac
C = 0.70
T_c = 15 min
I₂ = 4.91 in/hr
Q₅ = 73.9 cfs

EXISTING CONDITIONS

Area = Ex.1 = 24.35 ac
C = 0.35
T_c = 27 min
I₂ = 3.64 in/hr
Q₅ = 31.0 cfs

UNDERTAINED RELEASE

Area = 7, 49, & 50 = 5.17 ac
C = 0.35
T_c = 15 min
I₂ = 4.91 in/hr
Q₅ = 8.9 cfs

Area = 1 & 2 = 0.52 ac
C = 0.7
T_c = 15 min
I₂ = 4.91 in/hr
Q₅ = 1.8 cfs

ALLOWABLE RELEASE FROM POND

EXISTING CONDITIONS -
UNDERTAINED RELEASE =
31.0 - 8.9 - 1.8 = 20.3 cfs

ACTUAL RELEASE FROM POND

As stated with the 100yr Outfall calculations, the release rate was reduced less than the allowable release rate. By using interpolation, the release rate and pond volume for the 5yr storm will be determined.

DETENTION CALCULATION SUMMARY - 25 YEAR

PROPOSED CONDITIONS

Area = Ex.1 = 24.35 ac
C = 0.70
T_c = 15 min
I₂₅ = 6.42 in/hr
Q₂₅ = 96.7 cfs

EXISTING CONDITIONS

Area = Ex.1 = 24.35 ac
C = 0.35
T_c = 27 min
I₂₅ = 4.81 in/hr
Q₂₅ = 41.0 cfs

UNDERTAINED RELEASE

Area = 7, 49, & 50 = 5.17 ac
C = 0.35
T_c = 15 min
I₂₅ = 6.42 in/hr
Q₂₅ = 11.5 cfs

Area = 1 & 2 = 0.52 ac
C = 0.7
T_c = 15 min
I₂₅ = 6.42 in/hr
Q₂₅ = 2.3 cfs

ALLOWABLE RELEASE FROM POND

EXISTING CONDITIONS -
UNDERTAINED RELEASE =
41.0 - 11.5 - 2.3 = 27.1 cfs

ACTUAL RELEASE FROM POND

As stated with the 100yr Outfall calculations, the release rate was reduced less than the allowable release rate. By using interpolation, the release rate and pond volume for the 25yr storm will be determined.

DETENTION CALCULATION SUMMARY - 100 YEAR

PROPOSED CONDITIONS

Area = Ex.1 = 24.35 ac
C = 0.70
T_c = 15 min
I₁₀₀ = 7.52 in/hr
Q₁₀₀ = 128.2 cfs

EXISTING CONDITIONS

Area = Ex.1 = 24.35 ac
C = 0.35
T_c = 27 min
I₁₀₀ = 5.94 in/hr
Q₁₀₀ = 50.6 cfs

UNDERTAINED RELEASE

Area = 7, 49, & 50 = 5.17 ac
C = 0.35
T_c = 15 min
I₁₀₀ = 7.52 in/hr
Q₁₀₀ = 13.5 cfs

Area = 1 & 2 = 0.52 ac
C = 0.7
T_c = 15 min
I₁₀₀ = 7.52 in/hr
Q₁₀₀ = 2.7 cfs

ALLOWABLE RELEASE FROM POND

EXISTING CONDITIONS -
UNDERTAINED RELEASE =
50.6 - 13.5 - 2.7 = 34.3 cfs

ACTUAL RELEASE FROM POND

In order to reduce possible impact to downstream properties, the runoff release from the pond will be reduced from 34.3 cfs to 13.0 cfs in order to maximize the available volume in the detention pond.

MODIFIED RATIONAL METHOD DETENTION BASIN DESIGN

PROJECT: 09002 LUISD Willow Springs M.S.
December 21, 2010

2 Year Storm Event

Runoff Coefficient C = 0.7
Drainage Area - A = 21.6 acres
Time of Concentration - t_c = 15 minutes
Maximum Outflow Rate - Q = 10.0 cfs

Duration (minutes)	Intensity (inches/hr)	Depth (inches)	Inflow Discharge C _u -C _u	Inflow Volume Cu Ft	Outflow Duration (minutes)	Outflow Volume Cu Ft	Storage Volume Cu Ft
5	6.19	0.51	93.0	22,860	20	6,000	32,900
10	4.82	0.80	72.9	43,727	25	7,500	36,227
15	4.00	1.00	60.5	54,432	30	9,000	45,432
20	3.44	1.15	52.0	62,415	35	10,500	51,915
30	2.71	1.36	41.0	73,753	45	13,500	60,253
40	2.26	1.51	34.2	82,011	55	15,500	66,511
50	1.95	1.63	29.5	88,422	65	17,500	70,922
60	1.72	1.72	26.0	93,623	75	22,500	71,123
120	1.04	2.08	15.7	113,210	135	40,500	72,719
180	0.77	2.31	11.6	125,736	195	58,500	67,236

Required Storage Volume = 72,719 cubic feet
1.67 acre-feet

MODIFIED RATIONAL METHOD DETENTION BASIN DESIGN

PROJECT: 09002 LUISD Willow Springs M.S.
December 21, 2010

5 Year Storm Event

Runoff Coefficient C = 0.7
Drainage Area - A = 21.6 acres
Time of Concentration - t_c = 15 minutes
Maximum Outflow Rate - Q = 11.3 cfs

Duration (minutes)	Intensity (inches/hr)	Depth (inches)	Inflow Discharge C _u -C _u	Inflow Volume Cu Ft	Outflow Duration (minutes)	Outflow Volume Cu Ft	Storage Volume Cu Ft
5	7.21	0.63	109.0	32,763	20	6,804	32,960
10	5.82	0.97	88.0	52,799	25	8,505	44,294
15	4.91	1.23	74.2	66,815	30	10,206	56,609
20	4.29	1.49	64.7	77,686	35	11,907	65,779
30	3.43	1.72	51.9	93,351	45	15,309	78,042
40	2.89	1.93	43.7	104,872	55	18,711	86,161
50	2.51	2.09	38.0	113,854	65	22,115	91,741
60	2.22	2.22	33.6	120,839	75	25,519	95,324
120	1.37	2.74	20.7	149,144	135	45,927	103,217
180	1.02	3.00	15.4	165,592	195	66,339	100,253

Required Storage Volume = 103,217 cubic feet
2.37 acre-feet

MODIFIED RATIONAL METHOD DETENTION BASIN DESIGN

PROJECT: 09002 LUISD Willow Springs M.S.
December 21, 2010

25 Year Storm Event

Runoff Coefficient C = 0.7
Drainage Area - A = 21.6 acres
Time of Concentration - t_c = 15 minutes
Maximum Outflow Rate - Q = 12.9 cfs

Duration (minutes)	Intensity (inches/hr)	Depth (inches)	Inflow Discharge C _u -C _u	Inflow Volume Cu Ft	Outflow Duration (minutes)	Outflow Volume Cu Ft	Storage Volume Cu Ft
5	9.28	0.77	140.3	42,004	20	7,740	34,264
10	7.52	1.26	114.2	68,494	25	9,683	58,811
15	6.42	1.61	97.1	97,363	30	11,619	85,744
20	5.62	1.87	85.0	101,969	35	13,556	88,414
30	4.34	2.27	68.6	123,561	45	17,429	106,132
40	3.85	2.57	58.2	139,709	55	21,302	118,407
50	3.36	2.80	50.8	152,410	65	25,175	127,235
60	3.00	3.00	45.4	163,296	75	29,048	134,248
120	1.80	3.76	28.4	244,654	135	52,236	152,418
180	1.41	4.23	21.3	290,247	195	75,524	154,724

Required Storage Volume = 154,724 cubic feet
3.55 acre-feet

MODIFIED RATIONAL METHOD DETENTION BASIN DESIGN

PROJECT: 09002 LUISD Willow Springs M.S.
December 21, 2010

100 Year Storm Event

Runoff Coefficient C = 0.7
Drainage Area - A = 21.6 acres
Time of Concentration - t_c = 15 minutes
Maximum Outflow Rate - Q = 13.0 cfs

Duration (minutes)	Intensity (inches/hr)	Depth (inches)	Inflow Discharge C _u -C _u	Inflow Volume Cu Ft	Outflow Duration (minutes)	Outflow Volume Cu Ft	Storage Volume Cu Ft
5	10.49	0.87	136.6	47,583	20	7,800	39,783
10	8.74	1.46	132.1	79,289	25	9,750	69,539
15	7.32	1.88	113.7	102,332	30	11,700	90,632
20	6.78	2.26	102.5	123,016	35	13,650	109,366
30	5.74	2.87	86.8	156,220	45	17,550	138,670
40	5.00	3.33	75.6	181,440	55	21,450	159,990
50	4.48	3.71	67.3	201,852	65	25,350	176,502
60	4.00	4.00	60.5	217,728	75	29,250	188,478
120	2.62	5.24	39.6	285,224	135	52,650	232,574
180	1.91	5.73	28.9	311,895	195	76,050	235,845
240	1.65	6.06	17.5	378,847	255	100,450	233,397
300	1.41	6.30	11.1	479,002	315	124,850	193,352

Required Storage Volume = 235,845 cubic feet
5.41 acre-feet

MISC. INFORMATION

NOTE:
Prior to beginning any construction or construction staking, it shall be the Contractor's responsibility to contact the civil engineer to insure that all parties are in possession of the most current set of construction documents.

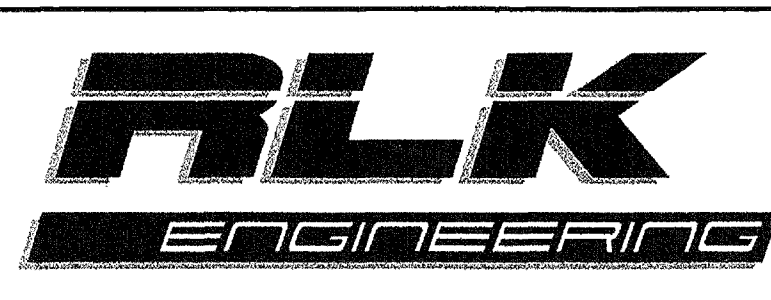
SITE BENCHMARK:

Aluminum monument at northwest corner of school property
Elev. = 619.09

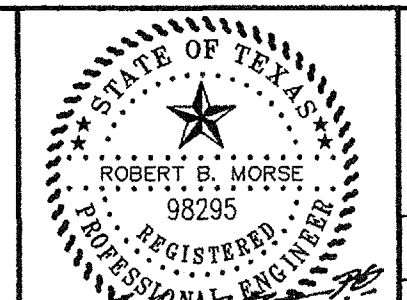
REVISION

REVISION	DATE	DESCRIPTION

DESCRIPTION



RLK ENGINEERING, INC.
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Allen, Texas 75013
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(972) 359-1833 Fax
Texas Registration No. 579



DESIGNED BY:
RLK Engineering

TECH REVIEW:
RLK

DRAWN BY:
RLK Engineering

DRAINAGE CALCULATIONS WILLOW SPRINGS MIDDLE SCHOOL

CITY OF LUCAS, TEXAS

DRAWING FILE:
09002 STM CALCS.dwg

DRAWING DATE:
10-20-11

DRAWING SCALE:
NA

PROJECT NUMBER:
RLK 09002

SHEET:
C 5 OF 15



Request for Information 068

Lovejoy ISD - Willow Springs Middle School
1101 W. Lucas
Lucas, TX 75002

Project # 001619
Tel: 469-525-5208 Fax: 972-529-9401

Pogue Construction Co., LP.

RFI #: 068

Transmitted To:

Brian Van
PBK Architects
14001 North Dallas Parkway
Dallas, Texas 75240
Phone: (972) 233-1323
Fax: (972) 233-1373

Transmitted By:

Stephanie Riddell
Pogue Construction Co., LP.
1512 Bray Central Suite 300
McKinney, TX 75069
Phone: 972-529-9401
Fax: 972-529-9832

CmI

PCI

post x3

Book

Subject: Plumbing Relocation at Boys ADA Shower

Handled out 10-2-12

Please see attached.

Response Required By: 10/5/2012

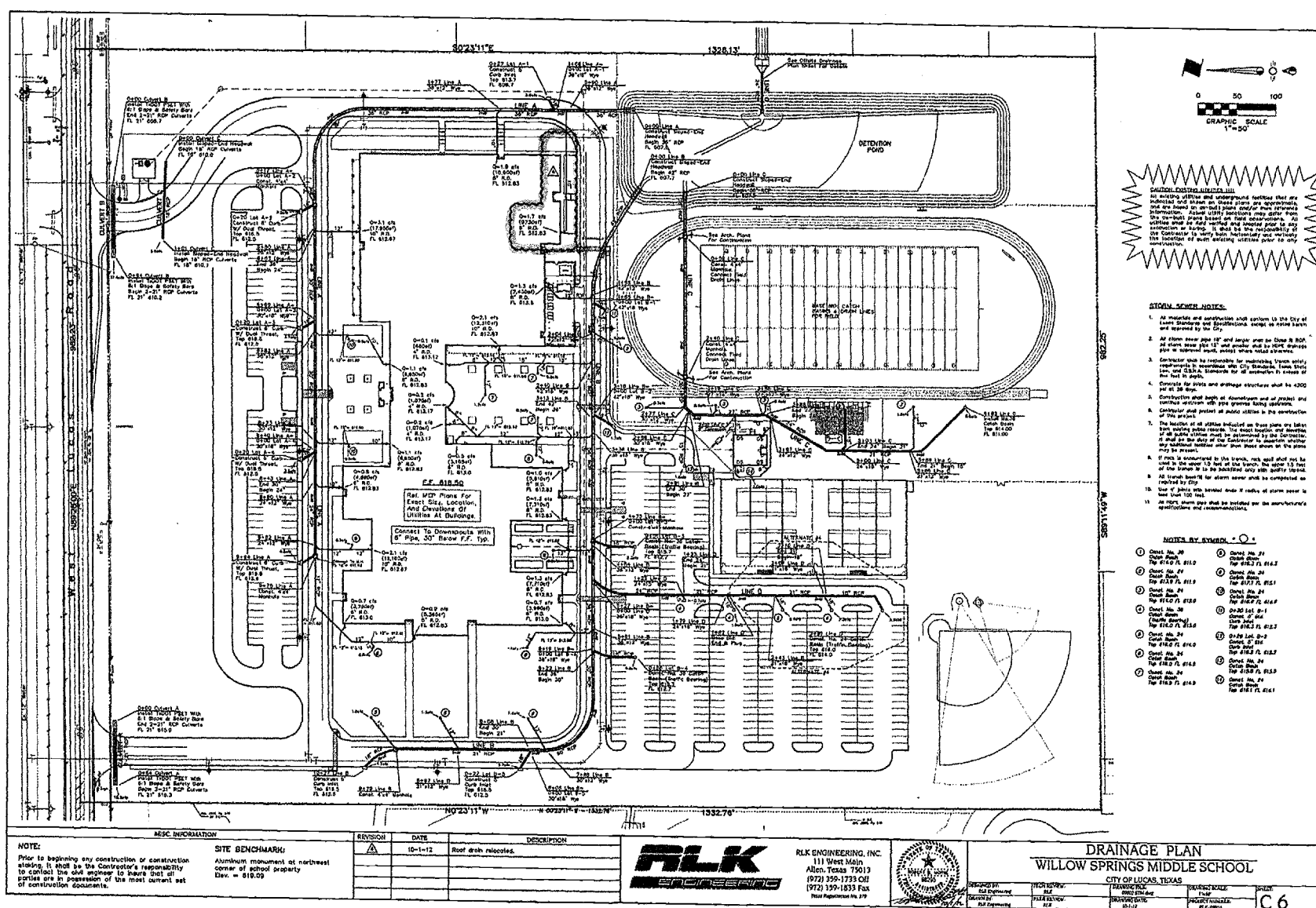
Please respond by required date to prevent schedule delay.

Architect's Response:

The 10" HDPE storm sewer line that connects the roof drain (as shown on the original set of plans) to Storm Line A needs to be extended 100' to the new roof drain location. See attached. A portion of the 10" HDPE already installed may need to be relaid in order to achieve a minimum of 0.6% slope in the additional 100' of 10" line. If you have any questions, please let me know.

Date Signature

RFI 68



CONSULTANTS	
ARCHITECT	PBK ARCHITECTS
ENGINEER	RLK ENGINEERING, INC.
PLUMBER	POGUE CONSTRUCTION CO., LP.
LANDSCAPE ARCHITECT	LOVEJOY INDEPENDENT SCHOOL DISTRICT
UTILITY ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
TRAFFIC ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
ENVIRONMENTAL ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
GEOTECHNICAL ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
SOILS ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
WATER RESOURCES ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
WASTEWATER ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
HAZARDOUS WASTE ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
INDUSTRIAL HYGIENE ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
INDUSTRIAL ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
INSTRUMENTATION ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
LABORATORY ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
MANUFACTURING ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
MATERIALS ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
METALLURGICAL ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
MILITARY ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
MINING ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
NUCLEAR ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
POWER ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
PROCESS ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
PROJECT ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
PRODUCTION ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
QUALITY ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
RESEARCH ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
SALES ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
SENIOR ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
STRUCTURAL ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
SYSTEMS ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
TELECOMMUNICATIONS ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
TRANSPORTATION ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
WATER ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
WASTEWATER ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
WIND ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT
WOOD ENGINEER	LOVEJOY INDEPENDENT SCHOOL DISTRICT

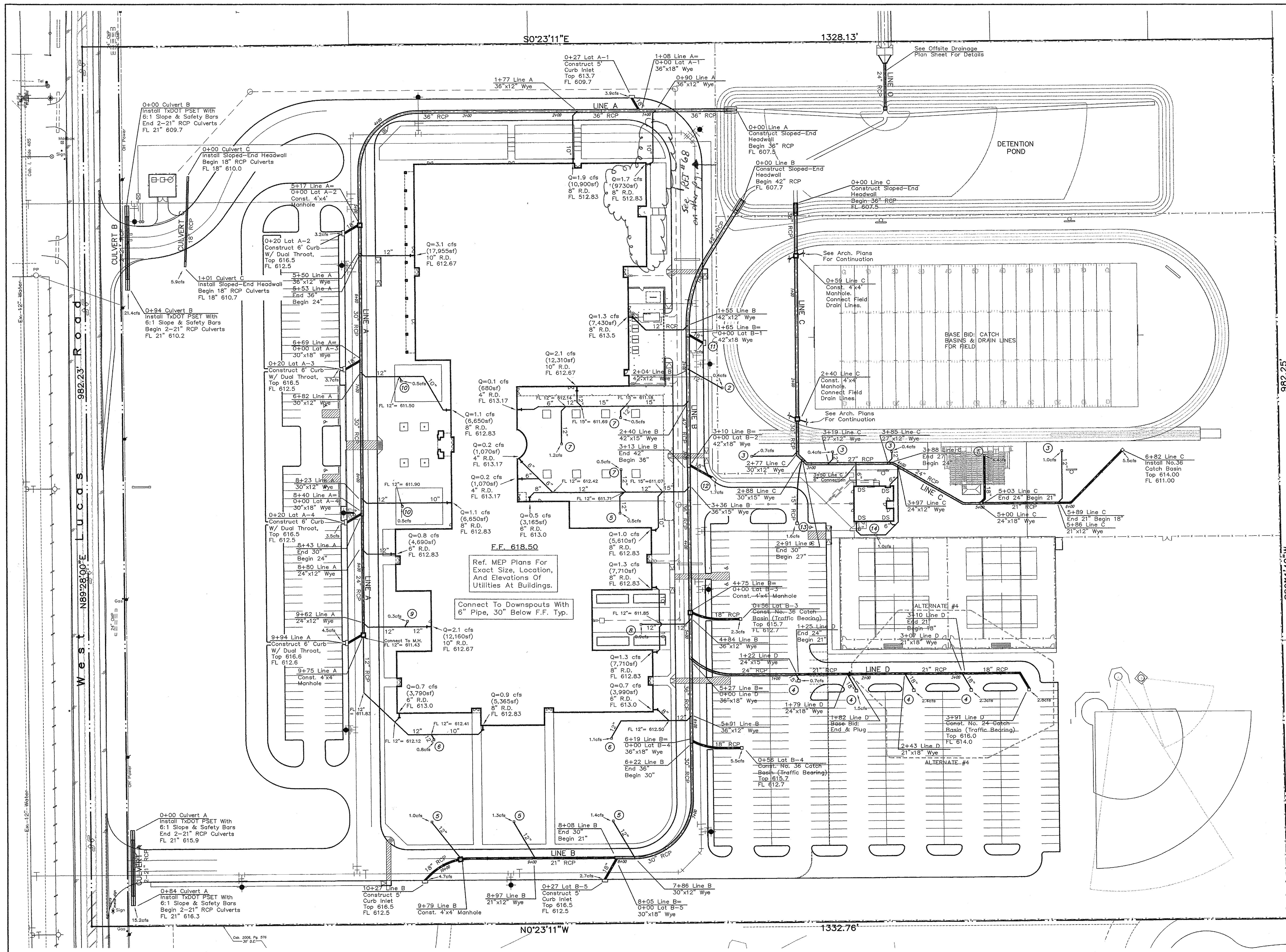


NEW WILLOW SPRINGS MIDDLE SCHOOL
Lovejoy Independent School District



14001 N. Dallas Parkway
Suite 400
Dallas, Texas 75240
Phone 972-233-1323
Fax 972-233-1373

PROJECT NO. 4/27/12
DATE
DRAWN
CHECKED
REVISIONS
C6
DRAINAGE PLAN



CAUTION EXISTING UTILITIES!!!!
 All existing utilities and underground facilities that are indicated and shown on these plans are approximate, and are based on as-built plans and/or from reference information. Actual utility locations may differ from the as-built plans based on field observations. All utilities shall be field verified and located prior to any excavation or boring. It shall be the responsibility of the Contractor to verify both horizontally and vertically the location of such existing utilities prior to any construction.

STORM SEWER NOTES:

1. All materials and construction shall conform to the City of Lucas Standards and Specifications, except as noted herein and approved by the City.
2. All storm sewer pipe 18" and larger shall be Class III RCP. All storm sewer pipe 15" and smaller shall be HDPE drainage pipe or approved equal, except where noted otherwise.
3. Contractor shall be responsible for maintaining trench safety requirements in accordance with City Standards, Texas State Law, and O.S.H.A. Standards for all excavation in excess of five feet in depth.
4. Concrete for inlets and drainage structures shall be 4200 psi at 28 days.
5. Construction shall begin at downstream end of project and continue upstream with pipe grooves facing upstream.
6. Contractor shall protect all public utilities in the construction of this project.
7. The location of all utilities indicated on these plans are taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown on the plans may be present.
8. If rock is encountered in the trench, rock spoil shall not be used in the upper 1.5 feet of the trench. The upper 1.5 feet of the trench is to be backfilled only with quality topsoil.
9. All trench backfill for storm sewer shall be compacted as required by City.
10. Use 4" joints with beveled ends if radius of storm sewer is less than 100 feet.
11. All HDPE storm pipe shall be installed per the manufacturer's specifications and recommendations.

NOTES BY SYMBOL "O"

- | | |
|--|--|
| 1. Const. No. 36 Catch Basin Top 614.0 FL 611.0 | 6. Const. No. 24 Catch Basin Top 616.3 FL 614.3 |
| 2. Const. No. 24 Catch Basin Top 615.9 FL 611.9 | 7. Const. No. 24 Catch Basin Top 615.9 FL 612.0 |
| 3. Const. No. 24 Catch Basin Top 615.9 FL 612.0 | 8. Const. No. 24 Catch Basin Top 615.9 FL 614.0 |
| 4. Const. No. 36 Catch Basin Top 615.9 FL 613.0 | 9. Const. No. 24 Catch Basin Top 615.9 FL 614.5 |
| 5. Const. No. 24 Catch Basin Top 615.9 FL 614.0 | 10. Const. No. 24 Catch Basin Top 615.9 FL 614.9 |
| 11. 0+20 Lat. B-1 Const. 5" Std. Curb Inlet Top 615.0 FL 612.3 | 12. 0+20 Lat. B-2 Const. 5" Std. Curb Inlet Top 615.2 FL 612.2 |
| 13. Const. No. 24 Catch Basin Top 615.5 FL 613.5 | 14. Const. No. 24 Catch Basin Top 615.1 FL 614.1 |

NOTE:	SITE BENCHMARK:
Prior to beginning any construction or construction staking, it shall be the Contractor's responsibility to contact the civil engineer to insure that all parties are in possession of the most current set of construction documents.	Aluminum monument at northwest corner of school property Elev. = 619.09



RLK ENGINEERING, INC.
 111 West Main
 Allen, Texas 75013
 (972) 359-1733 Off
 (972) 359-1833 Fax
 Texas Registration No. 579



DRAINAGE PLAN WILLOW SPRINGS MIDDLE SCHOOL CITY OF LUCAS, TEXAS			
DESIGNED BY: RLK Engineering	TECH REVIEW: RLK	DRAWING FILE: 09002.DWG	DRAWING SCALE: 1"=20'
DRAWN BY: RLK Engineering	PEER REVIEW: RLK	DRAWING DATE: 10-20-11	PROJECT NUMBER: RLK 09002
			SHEET: C 6 OF 15

CONSULTANTS

Civil & Survey
 RLK Engineering
 111 West Main Street
 Allen, Texas 75013
 (972) 359-1733

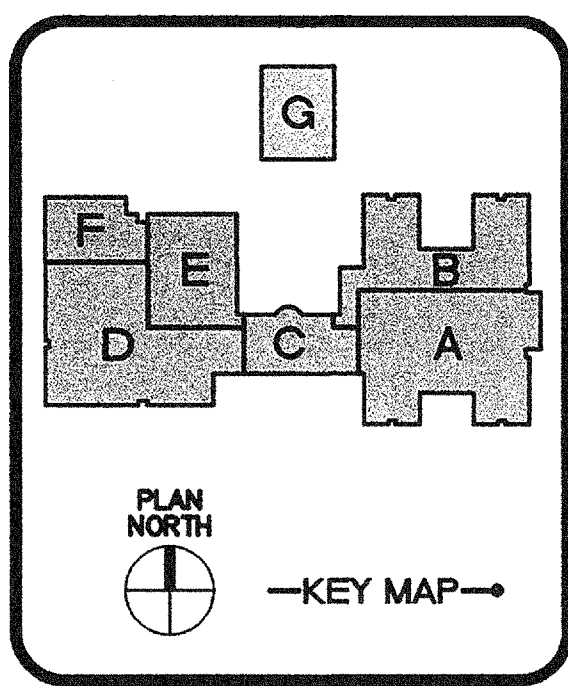
Civil Athletics
 PKK
 14001 North Dallas Parkway, Suite 400
 Dallas, Texas 75240
 (972) 233-1375

Landscape
 Envision Group
 111 Millside Drive
 Lewisville, Texas 75057
 (972) 215-0276

Structural
 Structural Engineering, Inc.
 1010 E. Highway, Suite 1500
 Dallas, TX 75244
 (972) 247-8282

MEP
 PKK
 14001 North Dallas Parkway, Suite 400
 Dallas, Texas 75240
 (972) 233-1375

Food Service
 H. G. Rice and Company, Inc.
 2885 W. Creek Drive, Suite 235
 Farmers Branch, Texas 75234
 (972) 245-8331



**NEW
WILLOW SPRINGS
MIDDLE SCHOOL**
 Lovejoy Independent School District



14001 N. Dallas Parkway
 Suite 400
 Dallas, Texas 75240
 Phone: 972-233-1323
 Fax: 972-233-1373

PROJECT NO.
 DATE 10/20/10
 DRAWN
 CHECKED
 REVISIONS

ISSUE FOR PRICING
 AND CONSTRUCTION

C 6

DRAINAGE
 PLAN

CONSULTANTS

Civil & Survey
RLK Engineering
111 West Main Street
Allen, Texas 75013
(972) 359-1733
(972) 359-1833

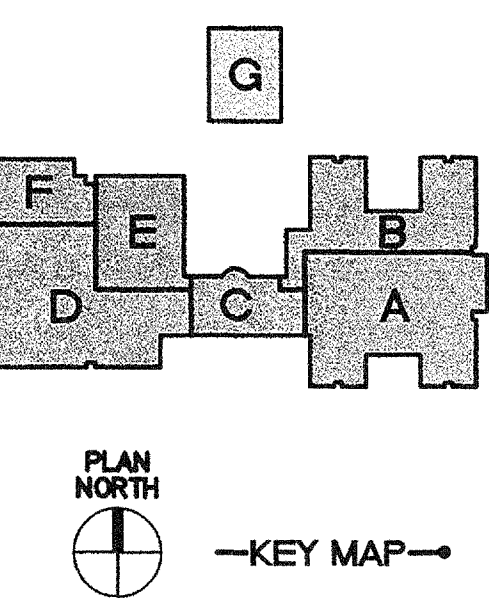
Civil Athletics
PBK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1323
(972) 233-1373

Landscaping
Environ Group
111 Hillside Drive
Lewisville, Texas 74067
(972) 217-0278
(972) 233-1733

Structural
Structural Engineering, Inc.
3010 Line 752229, Suite 1500
Dallas, TX 75229
(972) 247-2504
(972) 247-2522

MEP
PBK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1323
(972) 233-1373

Food Service
T. C. Rice and Company, Inc.
2650 West Creek Drive, Suite 203
Coppell, Texas 75019
(972) 448-3300
(972) 448-3301
(972) 448-3302



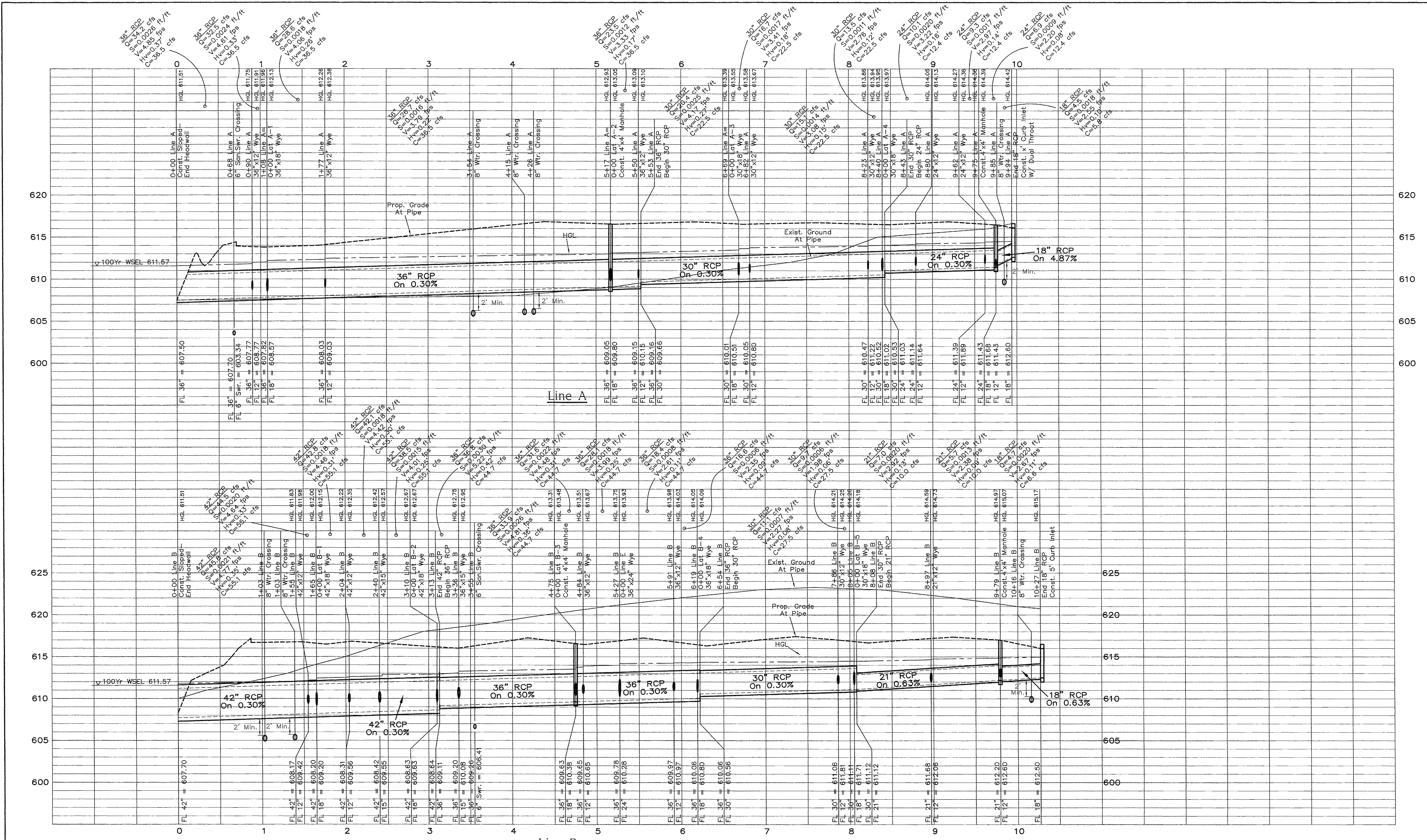
NEW
WILLOW SPRINGS
MIDDLE SCHOOL
Lovejoy Independent School District



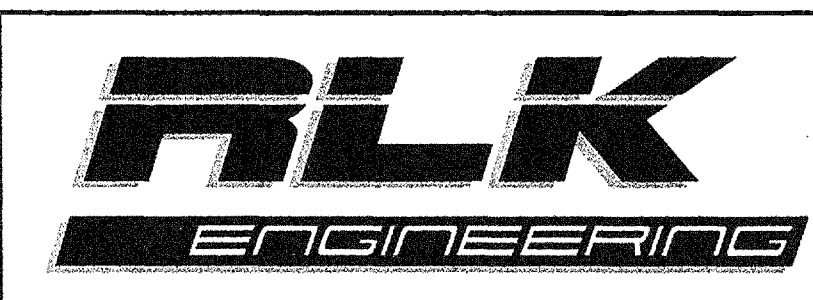
14001 N. Dallas Parkway
Suite 400
Dallas, Texas 75240
Phone: 972-233-1323
Fax: 972-233-1373

PROJECT NO.
DATE 10/20/10
DRAWN
CHECKED
REVISIONS

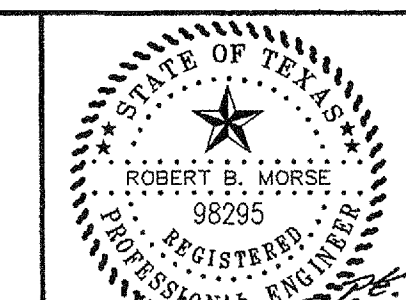
ISSUE FOR PRICING
AND CONSTRUCTION
C 7
STORM
SEWER
PROFILES



MISC. INFORMATION	REVISION	DATE	DESCRIPTION
NOTE: Prior to beginning any construction or construction staking, it shall be the Contractor's responsibility to contact the civil engineer to insure that all parties are in possession of the most current set of construction documents.			
SITE BENCHMARK: Aluminum monument at northwest corner of school property Elev. = 619.09			



RLK ENGINEERING, INC.
111 West Main
Allen, Texas 75013
(972) 359-1733 Off
(972) 359-1833 Fax
Texas Registration No. 579



STORM SEWER PROFILES WILLOW SPRINGS MIDDLE SCHOOL			
CITY OF LUCAS, TEXAS			
DESIGNED BY: RLK Engineering	TECH REVIEW: RLK	DRAWING FILE: 09002 STMPROF.dwg	SHEET: C 7 OF 15
DRAWN BY: RLK Engineering	PEER REVIEW: RLK	DRAWING DATE: 10-20-11	PROJECT NUMBER: RLK 09002

Civil & Survey
RLK Engineering
111 West Main Street
Allen, Texas 75013
(972) 359-1733
(972) 359-1833

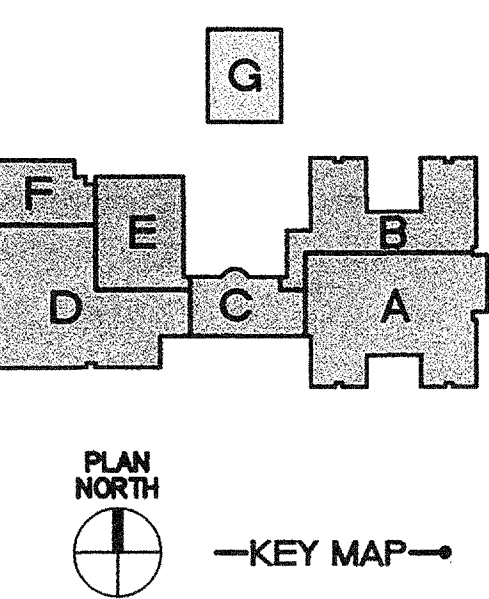
Civil Athletics
PBK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1323
(972) 233-1324

Landscaping
Enviro Group
111 Hillside Drive
Lawrenceville, Georgia 30046
(770) 962-7507
(770) 962-7508
(770) 962-7509

Structural
Structural Engineering, Inc.
3010 Lakewood Drive, Suite 1500
Dallas, Texas 75224
(972) 247-8200
(972) 247-8202

MEP
PBK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1323
(972) 233-1324

Food Service
H. G. Rice and Company, Inc.
2555 Villa Creek Drive, Suite 253
Farmers Branch, Texas 75224
(972) 245-2300
(972) 245-2331



NEW
WILLOW SPRINGS
MIDDLE SCHOOL
Lovejoy Independent School District

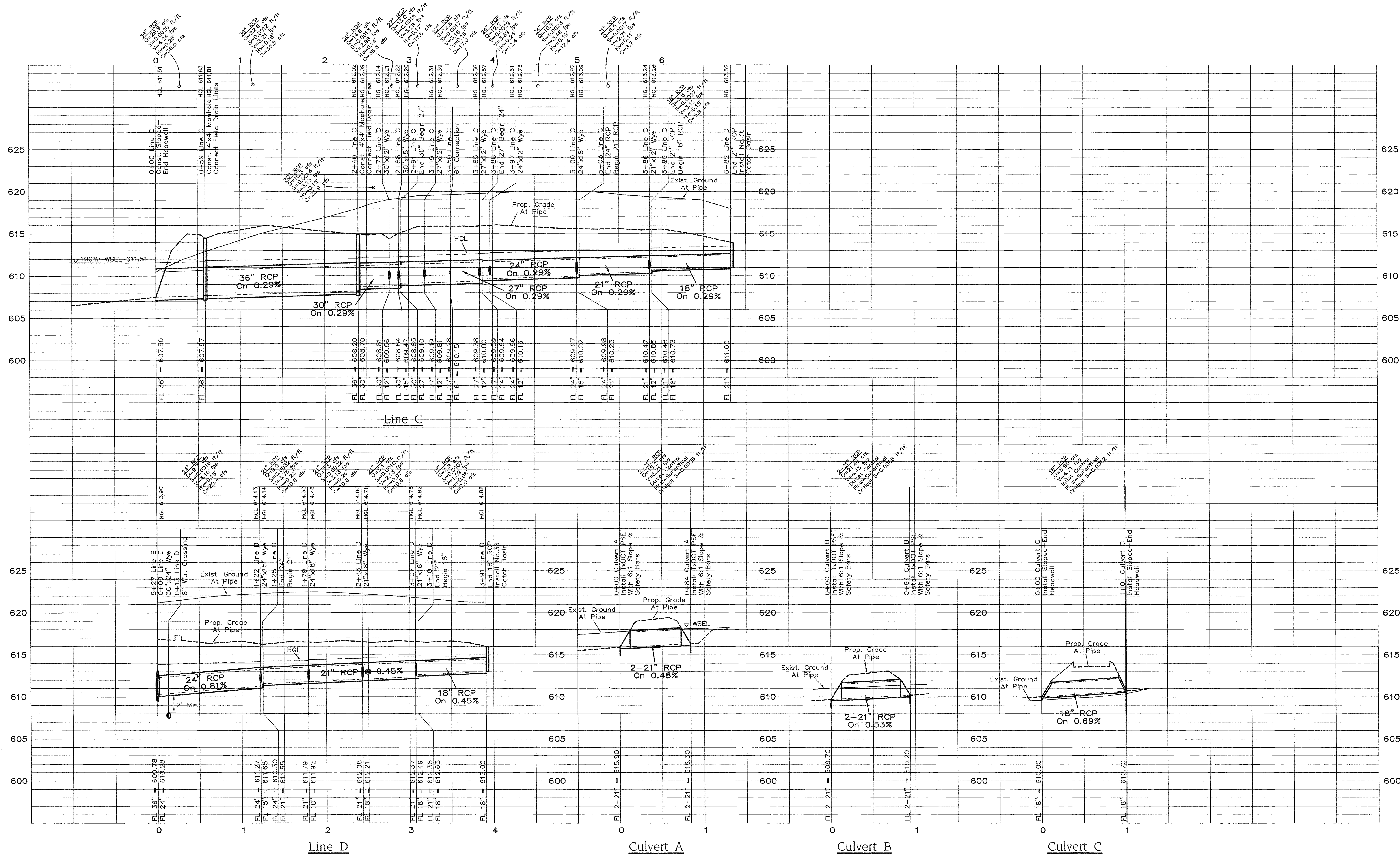


14001 N. Dallas Parkway
Suite 400
Dallas, Texas 75240
Phone: 972-233-1323
Fax: 972-233-1373

PROJECT NO.
DATE 10/20/10
DRAWN
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REVISIONS

ISSUE FOR PRICING
AND CONSTRUCTION

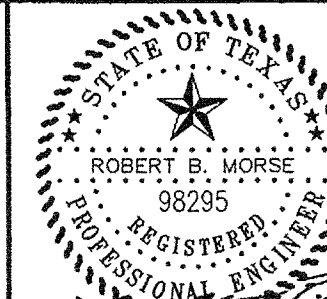
C 8
STORM
SEWER
PROFILES



MISC. INFORMATION		REVISION	DATE	DESCRIPTION
NOTE: Prior to beginning any construction or construction staking, it shall be the Contractor's responsibility to contact the civil engineer to insure that all parties are in possession of the most current set of construction documents.	SITE BENCHMARK: Aluminum monument at northwest corner of school property Elev. = 619.09			



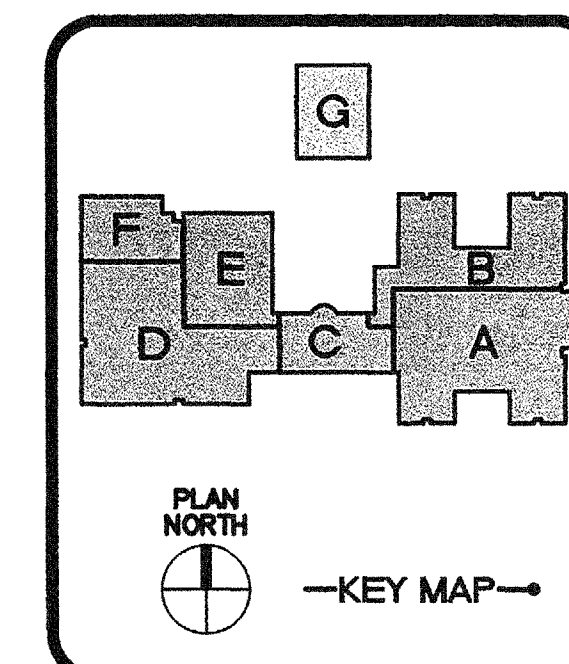
RLK ENGINEERING, INC.
111 West Main
Allen, Texas 75013
(972) 359-1733 Off
(972) 359-1833 Fax
Texas Registration No. 579



STORM SEWER PROFILES
WILLOW SPRINGS MIDDLE SCHOOL

CITY OF LUCAS, TEXAS

DESIGNED BY: RLK Engineering	TECH REVIEW: RLK	DRAWING FILE: 00002 STMPROF 2.dwg	DRAWING SCALE: H: 1"=50' V: 1"=5'	SHEET: C 8 OF 15
DRAWN BY: RLK Engineering	PEER REVIEW: RLK	DRAWING DATE: 10-20-11	PROJECT NUMBER: RLK 00002	



**NEW
WILLOW SPRINGS
MIDDLE SCHOOL**
Lovejoy Independent School District

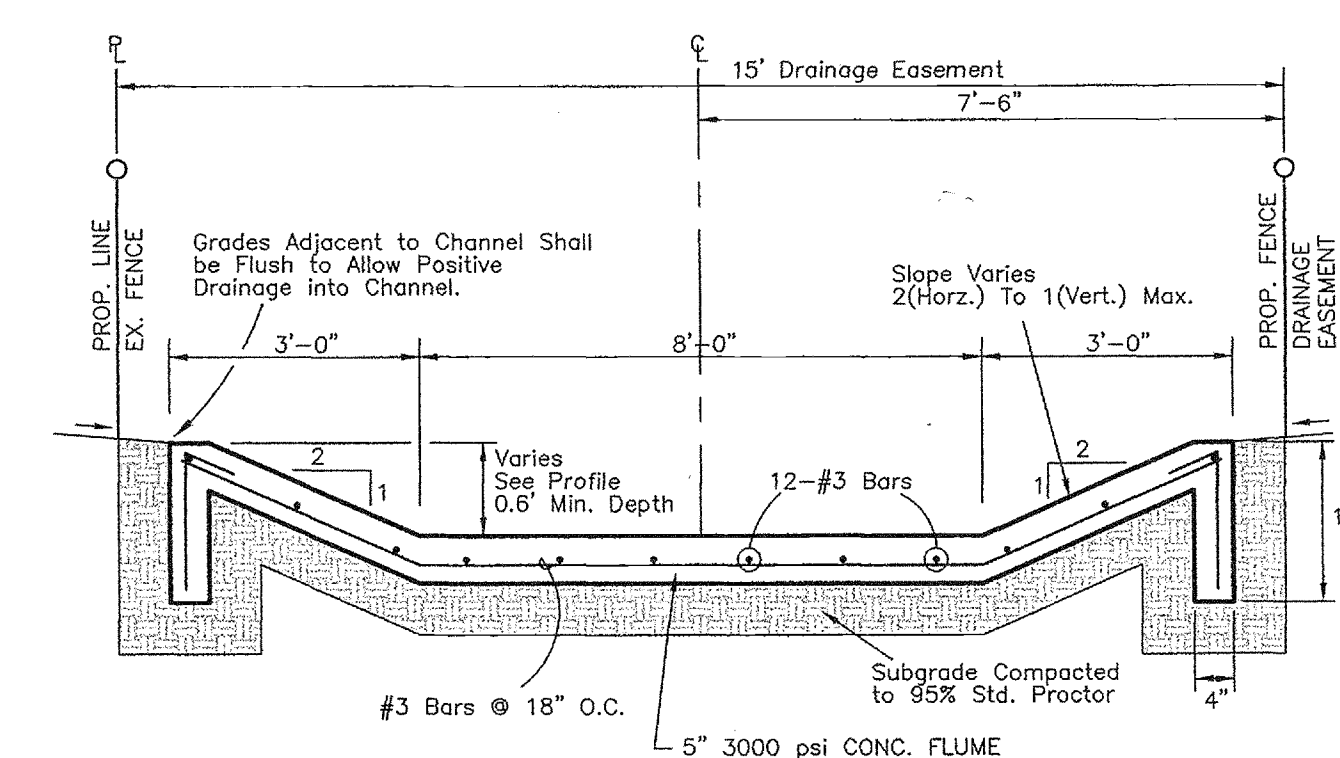
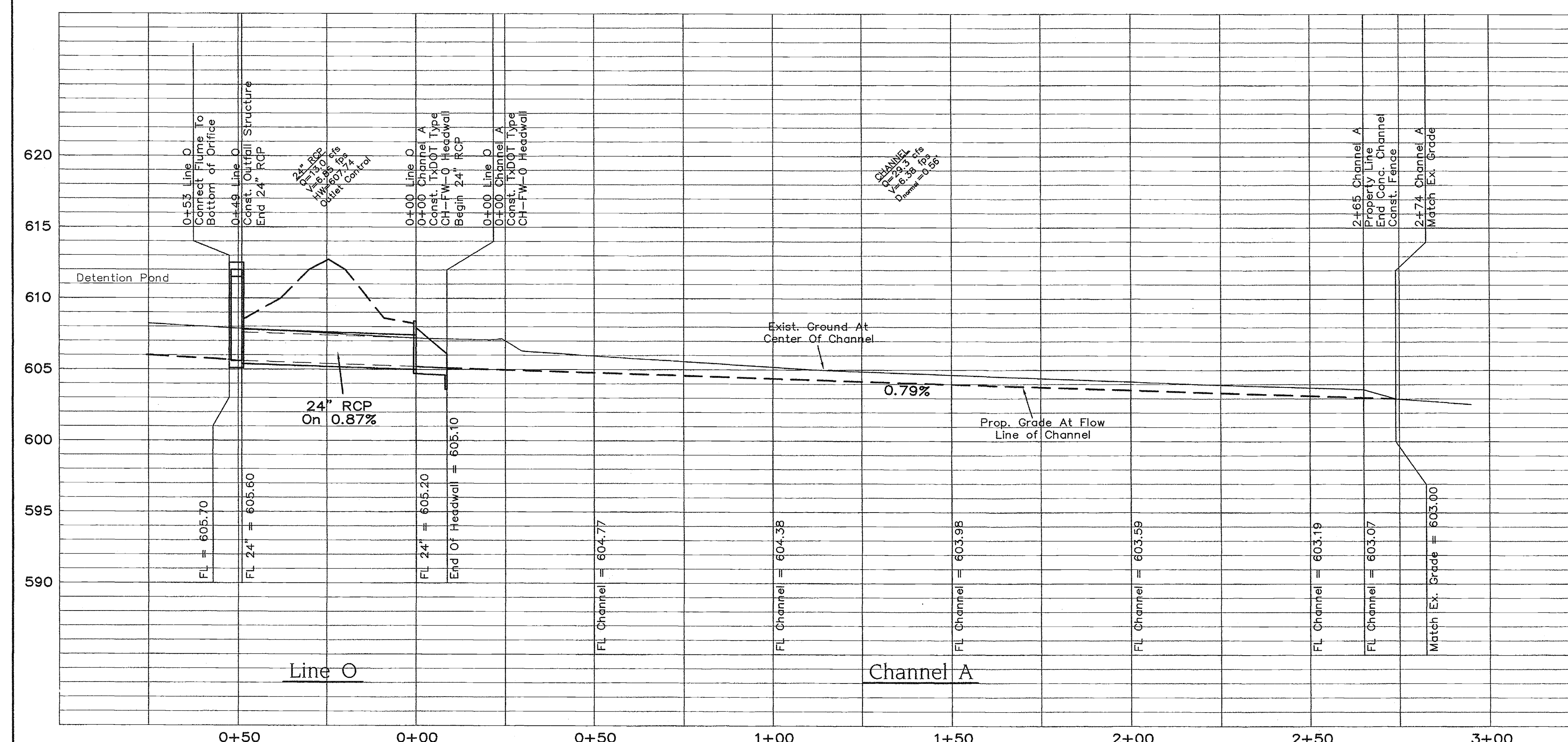
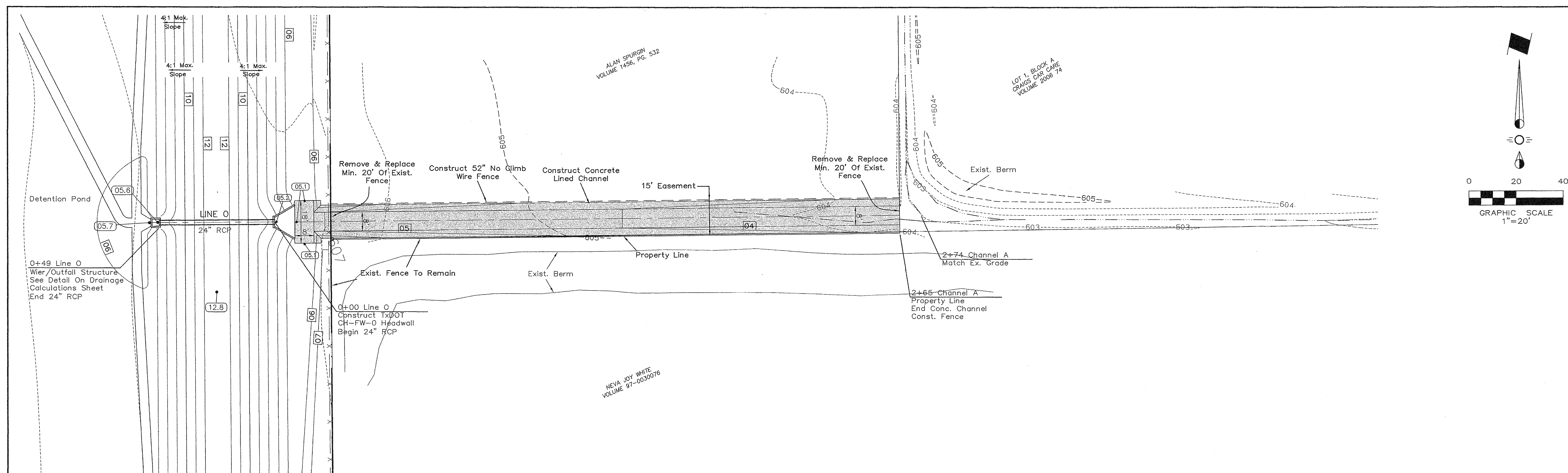


14001 N. Dallas Parkway
Suite 400
Dallas, Texas 75240
Phone: 972-233-1323
Fax: 972-233-1373

PROJECT NO.
DATE 10/20/10
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REVISIONS

ISSUE FOR PRICING
AND CONSTRUCTION

C 9
OFFSITE
DRAINAGE
PLAN



CONCRETE LINED CHANNEL
N.T.S.

LEGEND

The legend defines the symbols used in the cross-section diagram:

- Proposed Spot Elevation:** Represented by a circle with a dot and the value 14.6.
- Existing Spot Elevation:** Represented by a square with a dot and the value 14.21.
- Proposed Contour:** Represented by a solid line with the value 14.
- Existing Contour:** Represented by a dashed line with the value 6.14.
- Direction Of Flow:** Represented by an arrow pointing to the right.
- Drainage Swale:** Represented by a horizontal line with a small vertical tick mark.
- Proposed Concrete Channel:** Represented by a rectangular area with a stippled pattern.

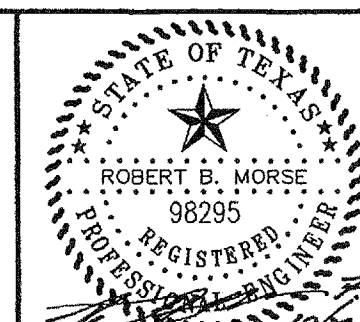
NOTE:

Prior to beginning any construction or construction staking, it shall be the Contractor's responsibility to contact the civil engineer to insure that all parties are in possession of the most current set of construction documents.

SITE BENCHMARK:
Aluminum monument at northwest
corner of school property
Elev. = 619.09

[illegible]

RLK ENGINEERING, INC.
111 West Main
Allen, Texas 75013
(972) 359-1733 Off
(972) 359-1833 Fax
Texas Registration No. 579



OFFSITE DRAINAGE PLAN
WILLOW SPRINGS MIDDLE SCHOOL

DESIGNED BY: RLK Engineering	TECH REVIEW: RLK	DRAWING FILE: 09002 GRAD.dwg	DRAWING SCALE: 1"=20'	SHEET: C 9 OF 15
DRAWN BY: RLK Engineering	PEER REVIEW: RLK	DRAWING DATE: 10-20-11	PROJECT NUMBER: RLK: 09002	

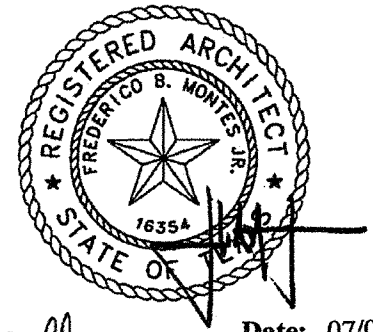
SHEET: C 9 OF 15

PBK

Architectural
Engineering
Planning
Surveying
Interior Design

PBK Architects, Inc.

14001 N. Dallas Parkway
Suite 400
Dallas, Texas 75240
Telephone: 972/233-1323
Fax: 972/233-1373



Bulletin No. 21

Project: Willow Springs Middle School
1101 W. Lucas Rd.
Lucas, Texas 75002

PBK Project No.: 0942

To: Pogue Construction
1512 Bray Central Dr., Suite 300
McKinney, Texas 75069

Attention: Denise Taylor

Date: 07/09/12

Excell

PCI

Book

post x3

Handed out 7-10-12

Change Proposal Request

This is a request for an itemized quotation in the Contract Sum and/or time for the following proposed modifications to the Contract Documents. This request is not an authorization for changes or additional work and it does not revise the contract price.

Minor Change

Minor Changes in the Work do not include an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order, and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

Clarification

Should the Contract Documents disagree in themselves, the Architect will clarify the appropriate method for performing the work with no increase in the Contract Cost. Interpretations by the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings.

Request for Information

This is a Request for Information only. This request is not an authorization for changes or additional work and it does not revise the contract price.

Description of Work:

Fire Sprinkler System Revision

- Delete fire sprinkler system and appurtenances from outdoor concessions building as shown on attached sketches SKP-01 and SKP-02.

Attachments: SKP-01, SKP-02

This change proposal was initiated at the request of the:

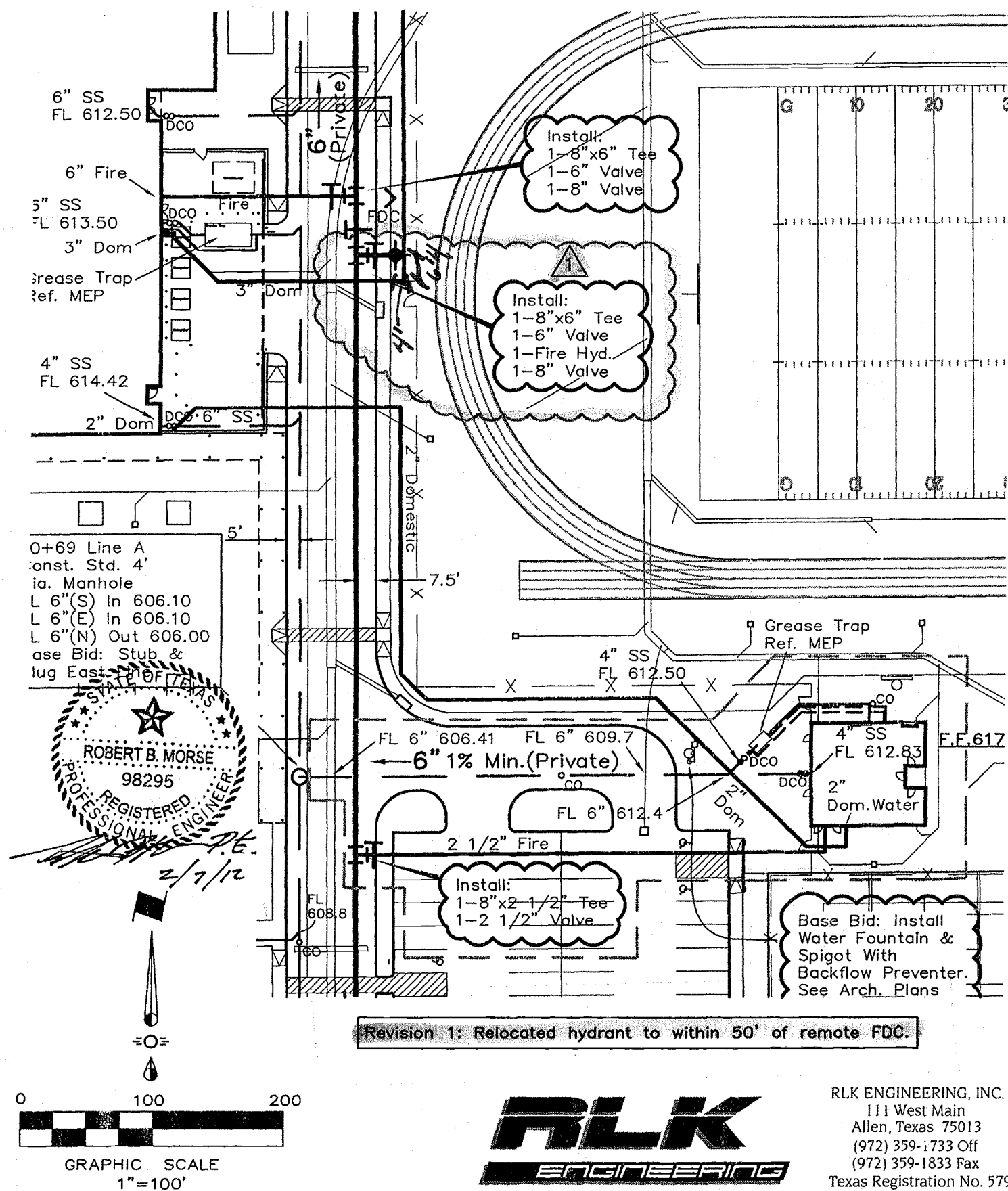
☐ Owner

☒ Architect

☐ Engineer

☐ Construction Manager

CH
Christian Herr, AIA
Associate Principal



Revision 1: Relocated hydrant to within 50' of remote FDC.

RLK
ENGINEERING

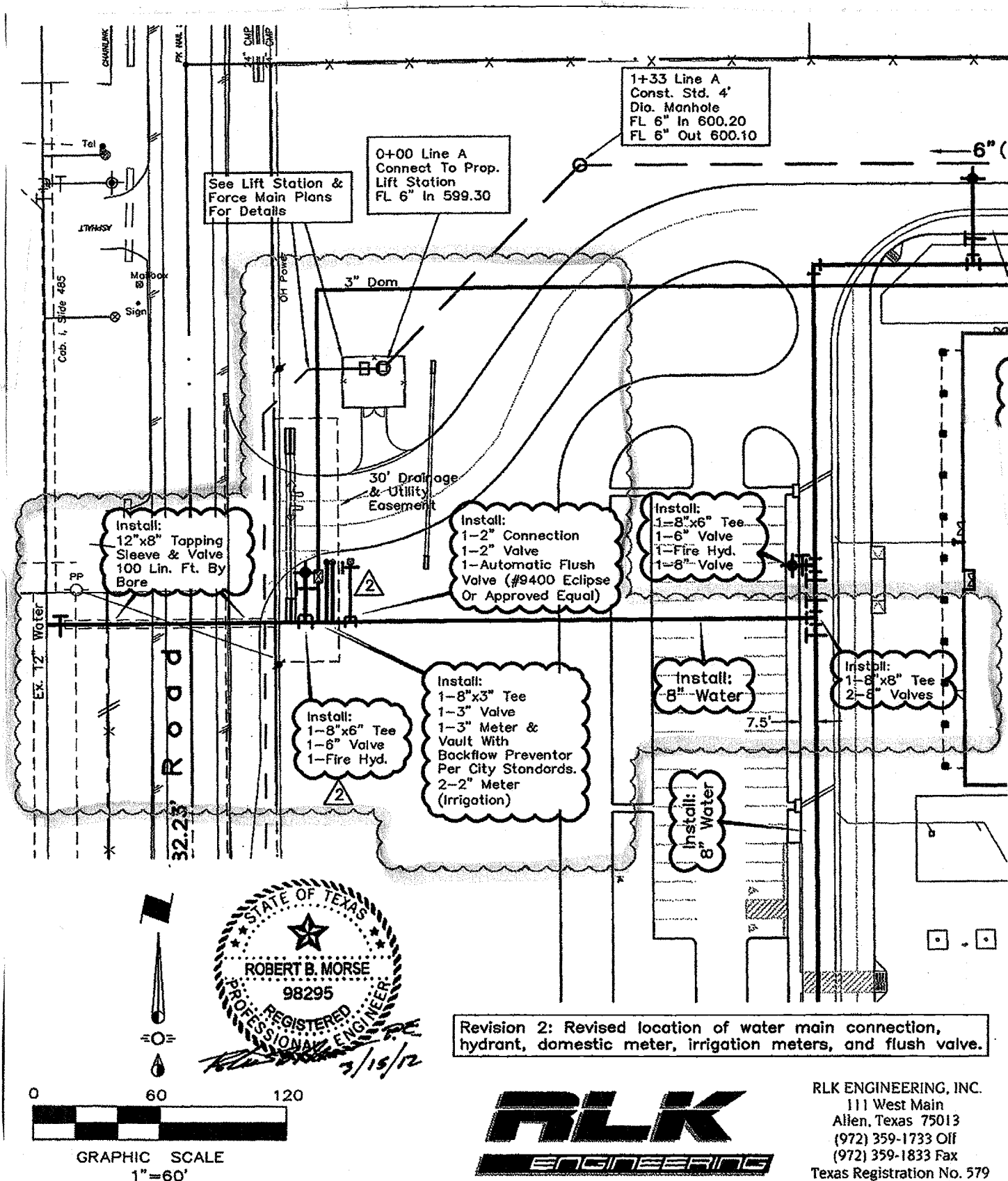
RLK ENGINEERING, INC.
111 West Main
Allen, Texas 75013
(972) 359-1733 Off
(972) 359-1833 Fax
Texas Registration No. 579

PBK Architects, Inc.
Stanford Centre
14001 N. Dallas Parkway
Suite 400
Dallas, Texas 75240
972.233.1323

New Willow Springs Middle School

LOVEJOY ISD

PBK Proj: 0942
Date: 02/7/12
Addendum: -
SDC #: 3
Supplementing Sheet C10



Revision 2: Revised location of water main connection, hydrant, domestic meter, irrigation meters, and flush valve.

RLK
ENGINEERING

RLK ENGINEERING, INC.
111 West Main
Allen, Texas 75013
(972) 359-1733 Off
(972) 359-1833 Fax
Texas Registration No. 579

Bulletin # 5

CONSULTANTS

Civil & Survey
RLK Engineering
 111 West Main Street, Suite 400
 Allen, Texas 75013
 (972) 359-1733
 (972) 359-1833

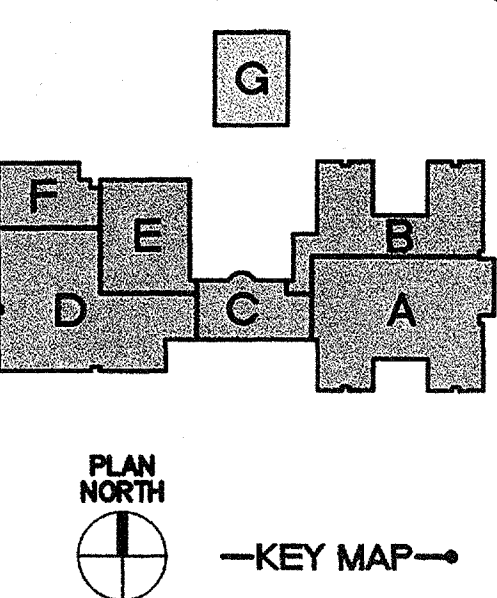
Civil Athletics
RLK
 14001 North Dallas Parkway, Suite 400
 Dallas, Texas 75240
 (972) 233-1322
 (972) 233-1373

Landscaping
Enviro Group
 111 Hillside Drive
 Lewisville, Texas 75057
 (972) 217-0275
 (972) 217-0276

Structural
Structural Engineering, Inc.
 111 Hillside Drive
 Lewisville, Texas 75057
 (972) 217-0275
 (972) 217-0276

MEP
RLK
 14001 North Dallas Parkway, Suite 400
 Dallas, Texas 75240
 (972) 233-1322
 (972) 233-1373

Food Service
H. G. Rice and Company, Inc.
 2505 West Loop South, Suite 200
 Dallas, Texas 75240
 (972) 245-5551



NEW WILLOW SPRINGS MIDDLE SCHOOL

Lovejoy Independent School District

RLK
 Architecture
 Engineering
 Planning
 Facility Consulting

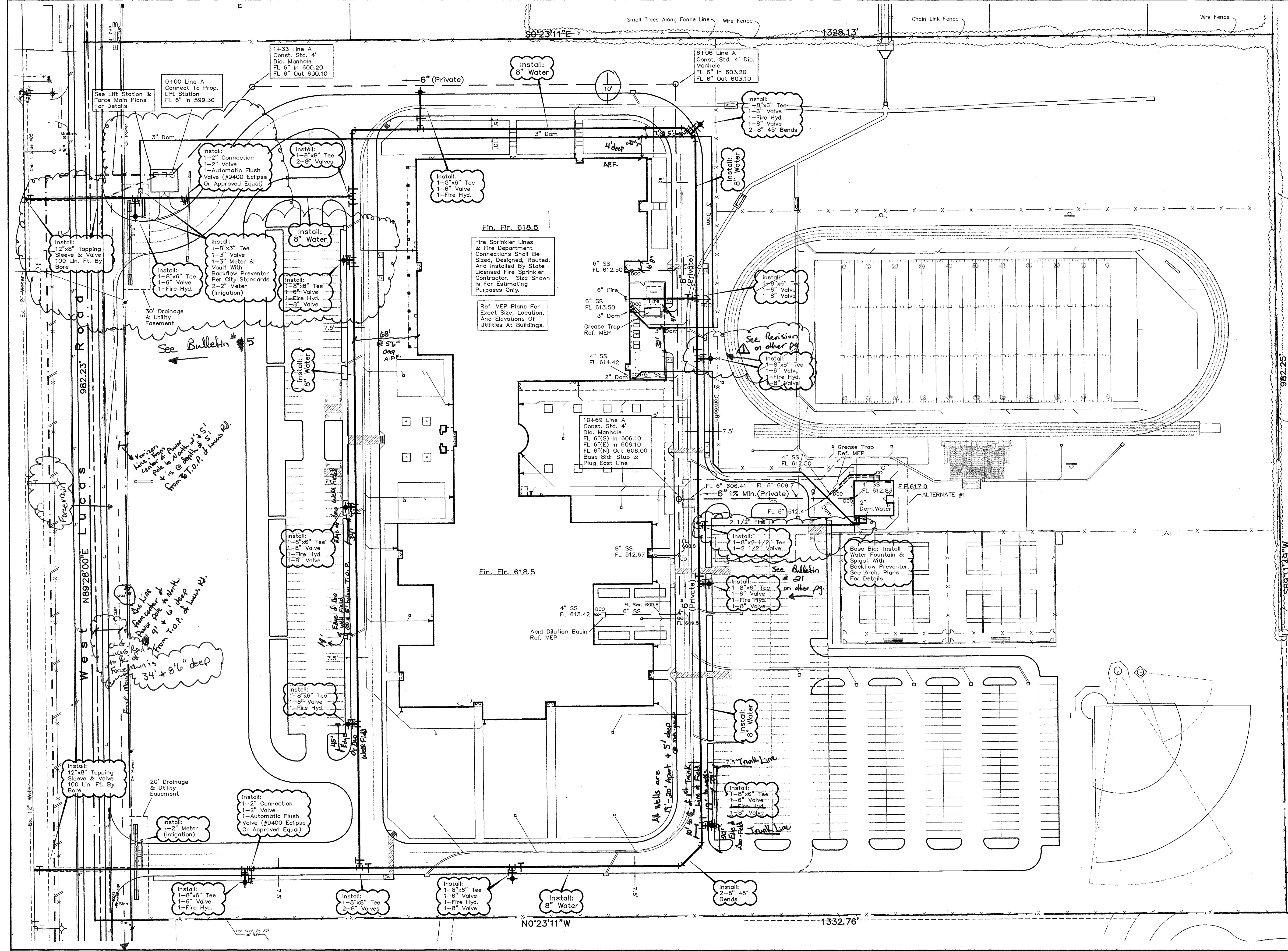
14001 N. Dallas Parkway
 Suite 400
 Dallas, Texas 75240
 Phone: 972-233-1323
 Fax: 972-233-1373

PROJECT NO. 10/20/10
 DATE 10/20/10
 DRAWN
 CHECKED
 REVISIONS

ISSUE FOR PRICING
 AND CONSTRUCTION

C 10

WATER &
 SANITARY
 SEWER PLAN



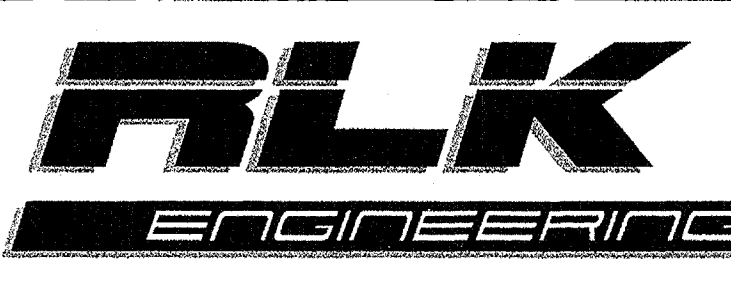
CAUTION - EXISTING UTILITIES
 All existing utilities and underground facilities that are indicated and shown on these plans are approximate, and are based on as-built plans and/or from reference information. Actual utility locations may differ from the as-built plans based on field observations. All utilities shall be field verified and located prior to any excavation or boring. It shall be the responsibility of the Contractor to verify both horizontally and vertically the location of such existing utilities prior to any construction.

- WATER & SEWER NOTES**
- All materials and construction shall conform to the City of Lucas Standards and Specifications, except as noted herein and approved by the City.
 - Contractor shall be responsible for maintaining trench safety requirements in accordance with City Standards, Texas State Law, and O.S.H.A. Standards for all excavation in excess of five feet in depth.
 - The location of all utilities located on these plans are taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown on the plans may be present.
 - It shall be the responsibility of the Contractor to protect all public utilities in the construction of this project.
 - Any utility installed outside of an easement shall be installed by a plumber and inspected by Code Enforcement.
 - Backfill for utility lines should be carefully placed so that the utility will be stable. Where utility lines cross the parking lot, the top 6" should be compacted similarly to the remainder of the lot. Utility ditches should be visually inspected during the excavation process to ensure that undesirable fill is not used.
 - If rock is encountered in the trench, rock spoil shall not be used in the upper 1.5 feet of the trench. The upper 1.5 feet of the trench is to be backfilled only with quality topsoil.
 - All water mains shall be C-900 PVC. Domestic and fire water service lines shall be per City Building Code requirements.
 - All ductile iron fittings shall be of the mechanical joint type or slip joint and shall be Class D, or Class 250 on sizes 12" and smaller in accordance with A.W.W.A. Specification C-110-64 and C-111-64.
 - All water and sanitary sewer mains shall comply with the City of Lucas Design Standards for minimum cover.
 - Fire hydrants shall be placed 4'-7" from back of curb located as shown on the plans.
 - Fire hydrants shall be City approved and color coded.
 - All gate valves shall be City approved.
 - All water and sanitary mains and services shall have a 10' min. lateral separation.
 - Sanitary sewer manholes shall be constructed of cast-in-place concrete or precast concrete with cast iron frames and cover. Concrete blocking shall be provided on water mains at all tees, fire hydrants, and bends per City of Lucas standards. Payment for concrete blocking shall be subsidiary to pipe installation and shall be included in the bid price thereof.
 - The slope for sanitary sewer laterals shall be 2% or 1/4" per foot, or greater.
 - Type "H" Embedment shall be used for PVC water mains.
 - All water meters and fire hydrants shall be protected by curb or bollard.
 - Refer to Mechanical Plans for exact water and sewer service locations.
 - Fire sprinkler line shall be sized and installed by a State Licensed Fire Sprinkler Contractor.

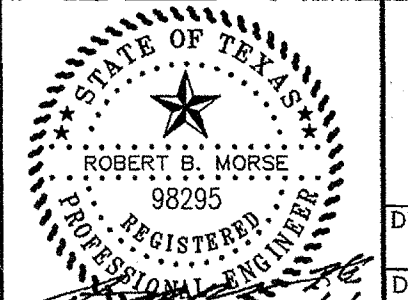
NOTE:
 Prior to beginning any construction or construction staking, it shall be the Contractor's responsibility to contact the civil engineer to insure that all parties are in possession of the most current set of construction documents.

SITE BENCHMARK:
 Aluminum monument at northwest corner of school property
 Elev. = 619.09

REVISION	DATE	DESCRIPTION



RLK ENGINEERING, INC.
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 Allen, Texas 75013
 (972) 359-1733 Off
 (972) 359-1833 Fax
 Texas Registration No. 579



DESIGNED BY: RLK Engineering	TECH REVIEW: RLK	DRAWING FILE: 09002 WS.dwg	DRAWING SCALE: 1"=50'	SHEET: C 10 OF 15
DRAWN BY: RLK Engineering	PEER REVIEW: RLK	DRAWING DATE: 10-20-11	PROJECT NUMBER: RLK 09002	

WATER & SANITARY SEWER PLAN WILLOW SPRINGS MIDDLE SCHOOL

CITY OF LUCAS, TEXAS

CONSULTANTS

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Food Service

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Dallas, Texas 75234
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(972) 242-3300

PLAN NORTH

KEY MAP

NEW WILLOW SPRINGS MIDDLE SCHOOL

Lovejoy Independent School District

EROSION CONTROL PLAN

WILLOW SPRINGS MIDDLE SCHOOL

PROJECT NO. 10/20/10

DATE 10/20/10

DRAWN

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REVISIONS

ISSUE FOR PRICING AND CONSTRUCTION

C 11

EROSION CONTROL PLAN

14001 N. Dallas Parkway Suite 400 Dallas, Texas 75240 Phone: 972-233-1333 Fax: 972-233-1373

PROJECT NO. 10/20/10

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SANDBLASTING WASTE MANAGEMENT

DESCRIPTION

The objective of the management program is to minimize the potential of storm water quality degradation from sandblasting activities at construction sites. The key issues in this program are prudent handling and storage of sandblast media, dust suppression, and proper collection and disposal of spent media. It is not the intent of this program to outline all of the worker safety issues pertinent to this practice. Safety issues should be addressed by construction safety programs as well as local, state, and federal regulations utilized at sites in which Sandblasting waste is present.

INSTALLATION/APPLICATION CRITERIA

Since the media consists of fine abrasive granules, it can be easily transported by running water. Sandblasting activities typically create a significant dust problem which must be contained and collected to prevent off-site migration problem which must be contained and collected to prevent off-site migration or fines.

Operational Procedures

Use only inert, non-degradable sandblast media.
Use appropriate equipment for the job, do not over-blast.
Wherever possible, blast in a downward direction.
Install a wind sock or other wind direction instrument.
Cease blasting activities in high winds or if wind direction could transport grit to drainage facilities.
Install dust shielding around sandblasting areas.
Collect and dispose of all spent sandblast grit, use dust containment fabrics and dust collection hoppers and barrels.
Non-hazardous sandblast grit may be disposed in permitted construction debris landfills or permitted sanitary landfills.
If sandblast media cannot be fully contained, construct sediment traps downstream from blasting area where appropriate.
Use sand fencing where appropriate in areas where blast media cannot be fully contained.
If necessary, install misting equipment to remove sandblast grit from the air - prevent runoff from misting operations from entering drainage systems.
Use vacuum grit collection systems where possible.
Keep records of sandblasting materials, procedures, and weather conditions on a daily basis.
Take all reasonable precautions to ensure that sandblasting grit is contained and kept away from drainage structures.

Educational Issues

Educate all on-site employees of potential dangers to humans and the environment from sandblast grit.
Instruct all on-site employees of the potential hazardous nature of sandblast grit and possible symptoms of overexposure to sandblast grit.
Instruct operators of sandblasting equipment on safety procedures and personal protection equipment.
Instruct operators on proper procedures regarding storage, handling, and containment of sandblast grit.
Instruct operators to recognize unfavorable weather conditions regarding sandblasting activities.
Instruct operators and supervisors on current local, state, and federal regulations regarding fugitive dust and hazardous waste from sandblast grit.
Have weekly meetings with operators to discuss and reinforce proper operational procedures.
Establish a continuing education program to indoctrinate new employees.

Material Handling Recommendations

Sandblast media should always be stored under cover away from drainage structures.
Ensure that stored media or grit is not subject to transport by wind.
Ensure that all sandblasting equipment as well as storage containers comply with local, state, and federal regulations.
Refer to Hazardous Waste BMP fact sheet if sandblast grit is known or suspected to contain hazardous components.
Capture and treat runoff which comes into contact with sandblasting material or waste.
Foreman and/or construction supervisor should monitor all sandblasting activities and safety procedures.

Quality Assurance

Educate, and if necessary, discipline workers who violate procedures.
Take all reasonable precautions to ensure that sandblast grit is not transported off-site or into drainage facilities.

Requirements

Education and awareness program for all employees regarding control of sandblasting and potential dangers to humans and the environment.
Operator and supervisor education program for those directly involved in sandblasting activities - instructions on material handling, proper equipment operation, personal protective equipment, fugitive dust control, record keeping and reporting.
Proper sandblast equipment for the job.
Site-specific fugitive dust control and containment equipment.
Site-specific fugitive dust control procedure.
Compliance by supervisors and workers.

Costs

Minimal cost for training and monitoring.
Potential for significant cost for containment procedures on large jobs.
Potential for significant costs associated with cleanup, correction and remediation if containment occurs.

LIMITATIONS

Site specific solutions to sandblasting problems may be required.
Sandblasting operations on structures known to contain hazardous materials require special procedures not specifically outlined above including professional hazardous waste specialists.
Where hazardous materials are known or suspected, a site assessment and remediation plan may be necessary.

HAZARDOUS WASTE MANAGEMENT

DESCRIPTION

The hazardous waste management BMP addresses the problem of storm water polluted with hazardous waste through spills or other forms of contact. The objective of the Management Program is to minimize the potential of storm water contamination from common construction site hazardous wastes through appropriate recognition, handling, storage, and disposal practices.

It is not the intent of this Management Program to supersede or replace normal site assessment and remediation procedures. Significant spills and/or contamination warrant immediate response by trained professionals. Suspected job-site contamination should be immediately reported to regulatory authorities and protective actions taken. The General Permit requires reporting of significant spills to the National Response Center (NRC) at (800)424-8802.

PRIMARY USE

These management practices along with applicable OSHA and EPA guidelines should be incorporated at all construction sites which use or generate hazardous wastes. Many wastes such as fuel, oil, grease, fertilizer, and pesticide are present at most construction sites.

INSTALLATION, APPLICATION AND DISPOSAL CRITERIA

The hazardous waste management techniques presented here are based on proper recognition, handling, and disposal practices by construction workers and supervisors. Key elements of the management program are education, proper disposal practices, as well as provisions for safe storage and disposal. Following are lists describing the targeted materials and recommended procedures:

Targeted Hazardous Waste Materials

Paints
Solvents
Stains
Wood preservatives
Cutting oils
Greases
Roofing tar
Pesticides
Fuel and lube oils
Lead based paints (Demolition)

Storage Procedures

Wherever possible, minimize use of hazardous materials.
Minimize generation of hazardous waste on the job-site.
Segregate potentially hazardous waste from non-hazardous construction site debris.
Designate a foreman or supervisor to oversee hazardous materials handling procedures.
Keep liquid or semi-liquid hazardous waste in appropriate containers (closed drums or similar) and under cover.
Store waste materials away from drainage ditches, swales, and catch basins.
Use containment berms in fueling and maintenance areas and where the potential for spills is high.
Ensure that adequate hazardous waste storage volume is available.
Ensure that hazardous waste collection containers are conveniently located.
Do not allow potentially hazardous waste materials to accumulate on the ground.
Enforce hazardous waste handling and storage procedures.
Clearly mark on all hazardous waste containers which materials are acceptable for the container.

Disposal Procedures

Regularly schedule hazardous waste removal to minimize on-site storage.
Use only reputable, licensed hazardous waste haulers.

Education

Instruct workers in identification of hazardous waste.
Educate workers of potential dangers to humans and the environment from hazardous wastes.
Instruct workers on safety procedures for common construction site hazardous wastes.
Educate all workers on hazardous waste handling and disposal procedures.
Have regular meetings to discuss and reinforce identification, handling and disposal procedures (incorporate in regular safety seminars).
Establish a continuing education program to indoctrinate new employees.

Quality Assurance

Foreman and/or construction supervisor shall monitor on-site hazardous waste storage and disposal procedures.
Educate, and if necessary, discipline workers who violate procedures.
Ensure that the hazardous waste disposal contractor is reputable and licensed.

Requirements

Job-site waste handling and disposal education and awareness program.
Commitment by management to implement hazardous waste management practices.
Compliance by workers.
Sufficient and appropriate hazardous waste storage containers.
Timely removal of stored hazardous waste materials.

Costs

Possible modest cost impact for additional hazardous storage containers.
Small cost impact for training and monitoring.
Potential cost impact for hazardous waste collection and disposal by licensed hauler - actual cost depends on type of material and volume.

LIMITATIONS

This practice is not intended to address site-assessments and pre-existing contamination.
Major contamination, large spills and other serious hazardous waste incidents require immediate response from specialists.
Demolition activities and potential pre-existing materials, such as asbestos, are not addressed by this program. Site specific information on plans is necessary.
Contaminated soils are not addressed.
One part of a comprehensive construction site waste management program.

SOLID WASTE MANAGEMENT

DESCRIPTION

Large volumes of solid waste are often generated at construction sites including: packaging, pallets, wood waste, concrete waste, soil, electrical wiring, cuttings, and a variety of other materials. The solid waste management practice lists techniques to minimize the potential of storm water contamination from solid waste through appropriate storage and disposal practices.

PRIMARY USE

These practices should be a part of all construction practices. By limiting the trash and debris on site, storm water quality is improved along with reduced clean up requirements at the completion of the project.

APPLICATIONS

The solid waste management practice for construction sites is based on proper storage and disposal practices by construction workers and supervisors. Key elements of the program are education and modification of improper disposal habits. Cooperation and vigilance is required on the part of supervisors and workers to ensure that the recommendations and procedures are followed. Following are lists describing the targeted materials and recommended procedures:

Targeted Solid Waste Materials

Paper and cardboard containers
Plastic packaging
Styrofoam packing and forms
Insulation materials (non-hazardous)
Wood pallets
Wood cuttings
Pipe and electrical cuttings
Concrete, brick, and mortar waste
Shingle cuttings and waste
Roofing tar
Steel (cuttings, nails, rust residue)
Gypsum board cuttings and waste
Sheathing cuttings and waste
Miscellaneous cutting and waste
Food waste
Demolition waste

Storage Procedures

Wherever possible, minimize production of solid waste materials.
Designate a foreman or supervisor to oversee and enforce proper solid waste procedures.
Instruct construction workers in proper solid waste procedures.
Segregate potentially hazardous waste from non-hazardous construction site debris.
Keep solid waste materials under cover in either a closed dumpster or other enclosed trash container that limits contact with rain and runoff.
Store waste materials away from drainage ditches, swales and catch basins.
Do not allow trash containers to overflow.
Do not allow waste materials to accumulate on the ground.
Prohibit littering by workers and visitors.
Police site daily for litter and debris.
Enforce solid waste handling and storage procedures.

Disposal Procedures

If feasible, segregate recyclable wastes from non-recyclable waste materials and dispose of properly.
General construction debris may be hauled to a licensed construction debris landfill (typically less expensive than a sanitary landfill).
Use waste facilities approved by local jurisdiction.
Runoff which comes into contact with unprotected waste shall be directed into structural treatment such as silt fence to remove debris.

Education

Educate all workers on solid waste storage and disposal procedures.
Instruct workers in identification of solid waste and hazardous waste.
Have regular meetings to discuss and reinforce disposal procedures (incorporate in regular safety seminars).
Clearly mark on all solid waste containers which materials are acceptable.

Quality Control

Foreman and/or construction supervisor shall monitor on-site solid waste storage and disposal procedures.
Discipline workers who repeatedly violate procedures.

Requirements

Jobsite waste handling and disposal education and awareness program.
Commitment by management to implement and enforce Solid Waste Management Program.
Compliance by workers.
Sufficient and appropriate waste storage containers.
Timely removal of stored solid waste materials.
Possible modest cost impact for additional waste storage containers.
Small cost impact for training and monitoring.
Minimal overall cost impact.

LIMITATIONS

Only addresses non-hazardous solid waste.
One part of a comprehensive construction site management program.

CONCRETE WASTE MANAGEMENT

DESCRIPTION

Concrete waste at construction sites comes in two forms; 1) excess fresh concrete mix including truck and equipment washing, and 2) concrete dust and concrete debris resulting from demolition and sawing. Both forms have the potential to impact water quality through storm water runoff contact with the waste.

PRIMARY USE

Concrete waste is present at most construction sites. This BMP should be utilized at sites in which concrete waste is present.

APPLICATIONS

A number of water quality parameters can be affected by introduction of concrete - especially fresh concrete. Concrete affects the pH of runoff, causing significant chemical changes in water bodies and harming aquatic life. Suspended solids in the form of both cement and aggregate dust are also generated from both fresh and demolded concrete waste:

Current Unacceptable Waste Concrete Disposal Practices

Dumping in vacant areas on the job-site.

Illicit dumping off-job-site.

Dumping into ditches or drainage facilities.

Recommended Disposal Practices

Avoid unacceptable dumping practices listed above.
Develop predetermined, safe concrete disposal areas.
Provide a washout area with a minimum of 6 cubic feet of containment area volume for every 10 cubic yards of concrete poured.
Never dump waste concrete illicitly or without properly owners knowledge and consent.
Treat runoff from storage area through the use of structural controls as required.

Education

Drivers and equipment operators should be instructed on proper disposal and equipment washing practices (see above).
Supervisors must be made aware of the potential environmental consequences of improperly handling concrete waste.

Enforcement

The construction site manager or foreman must ensure that employees and pre-mix companies follow proper procedures for concrete disposal and equipment washing.
Employees violating disposal or equipment cleaning directives must be reeducated or disciplined if necessary.

Demolition Practices

Monitor weather and wind direction to ensure concrete dust is not entering drainage structures and surface waters.
Where appropriate, construct sediment traps or other types of sediment detention devices downstream of demolition activities.

Requirements

Use predetermined disposal for waste concrete.
Prohibit dumping waste concrete anywhere but predetermined areas.
Assign predetermined truck and equipment washing areas.
Educate drivers and operators on proper disposal and equipment cleaning procedures.

Costs
Minimal cost impact for training and monitoring.
Concrete disposal cost depends on availability and distance to suitable disposal areas.
Additional costs involved in equipment washing could be significant.

LIMITATIONS

This concrete waste management program is one part of a comprehensive construction site management program.

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Structural

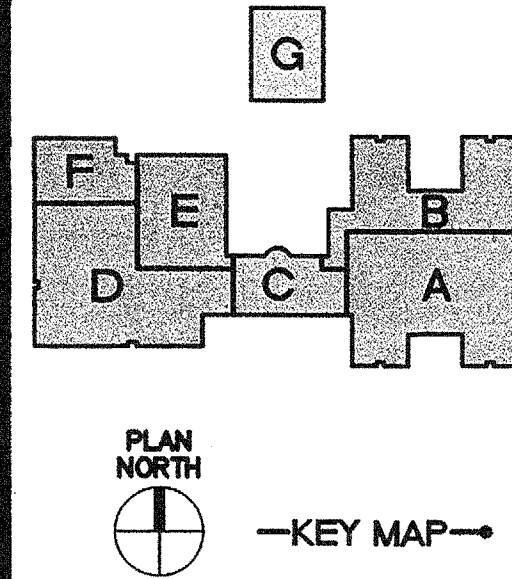
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NEW
WILLOW SPRINGS
MIDDLE SCHOOL
Lovejoy Independent School District

PBK
Architecture
Engineering
Planning
Facility Consulting

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PROJECT NO.
DATE 10/20/10
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AND CONSTRUCTION

C 12
EROSION
CONTROL
NOTES

MISC. INFORMATION

NOTE:
Prior to beginning any construction or construction staking, it shall be the Contractor's responsibility to contact the civil engineer to insure that all parties are in possession of the most current set of construction documents.

SITE BENCHMARK:

Aluminum monument at northwest corner of school property
Elev. = 619.09

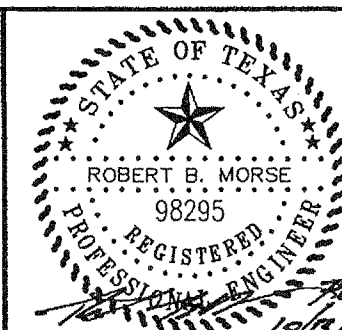
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Texas Registration No. 579



EROSION CONTROL NOTES WILLOW SPRINGS MIDDLE SCHOOL

CITY OF LUCAS, TEXAS

DESIGNED BY: RLK Engineering	TECH REVIEW: RLK	DRAWING FILE: 09002 EC2.dwg	DRAWING SCALE: NA	SHEET: C12 OF 15
DRAWN BY: RLK Engineering	PEER REVIEW: RLK	DRAWING DATE: 10-20-11	PROJECT NUMBER: RLK 09002	

CONSULTANTS

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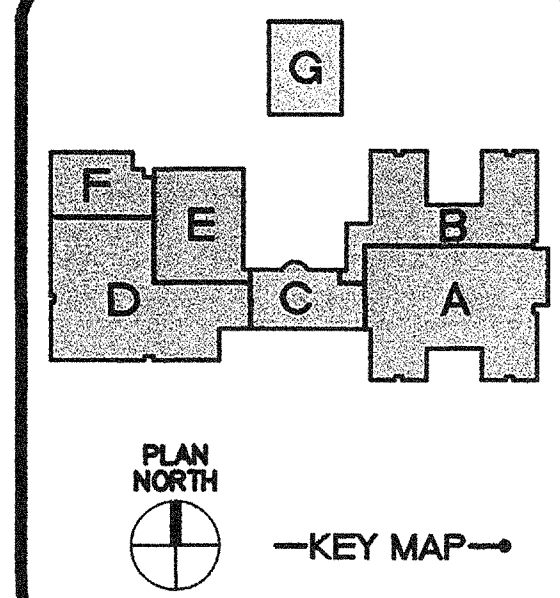
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NEW WILLOW SPRINGS MIDDLE SCHOOL

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Engineering
Planning
Facility Consulting

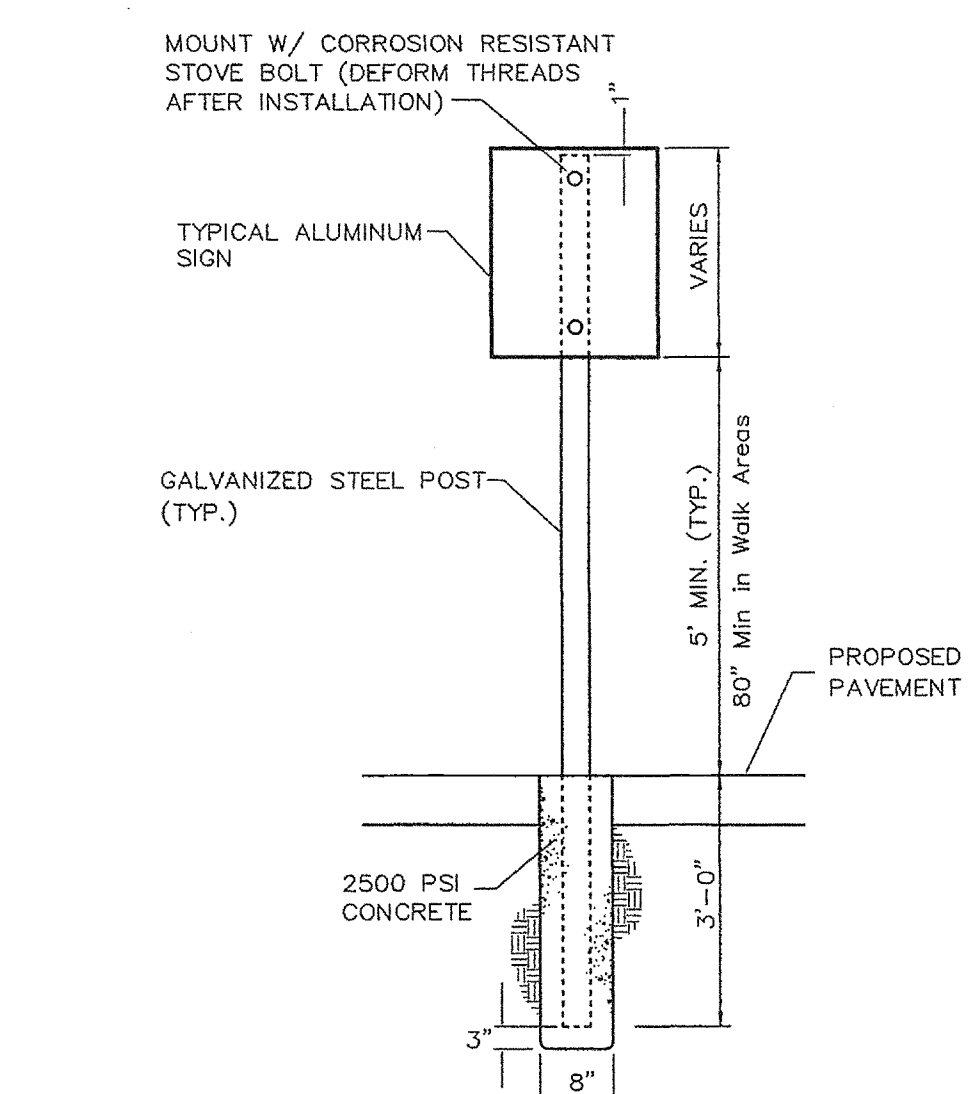
14001 N. Dallas Parkway
Suite 400
Dallas, Texas 75240
Phone: 972-233-1323
Fax: 972-233-1373

PROJECT NO. 10/20/10
DATE
DRAWN
CHECKED
REVISIONS

ISSUE FOR PRICING
AND CONSTRUCTION

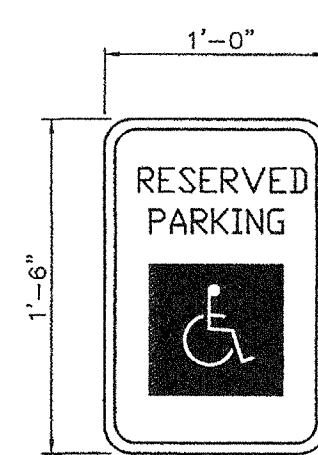
C 13

SITE
DETAILS



TYPICAL SIGNAGE MOUNTING DETAIL

N.T.S.



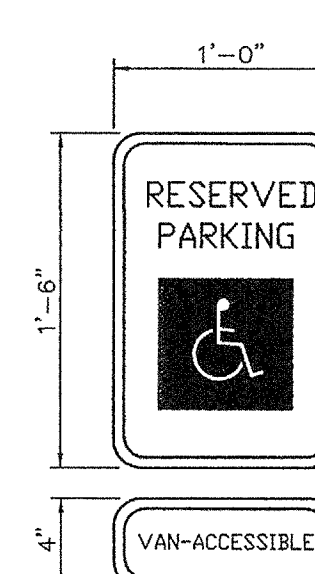
NOTES:

1. SPACING BETWEEN LETTERS, COLORS, AND PROCESSES SHALL CONFORM STANDARD HIGHWAY AND SIGN DESIGNS FOR TEXAS.
2. INSTALL WHERE INDICATED ON PLANS.

TYPICAL SIGNAGE DETAIL

TYPE I

N.T.S.



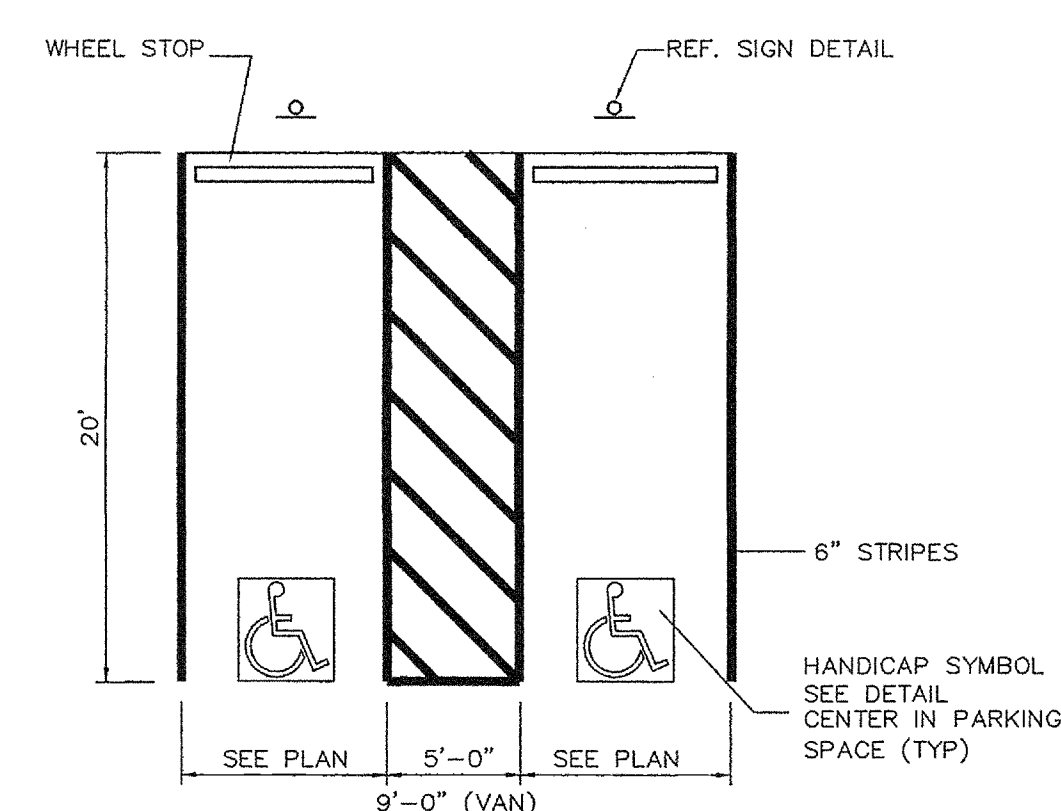
NOTES:

1. SPACING BETWEEN LETTERS, COLORS, AND PROCESSES SHALL CONFORM STANDARD HIGHWAY AND SIGN DESIGNS FOR TEXAS.
2. INSTALL WHERE INDICATED ON PLANS.
3. VAN-ACCESSIBLE SIGNAGE ON VAN SPACES ONLY.

TYPICAL SIGNAGE DETAIL

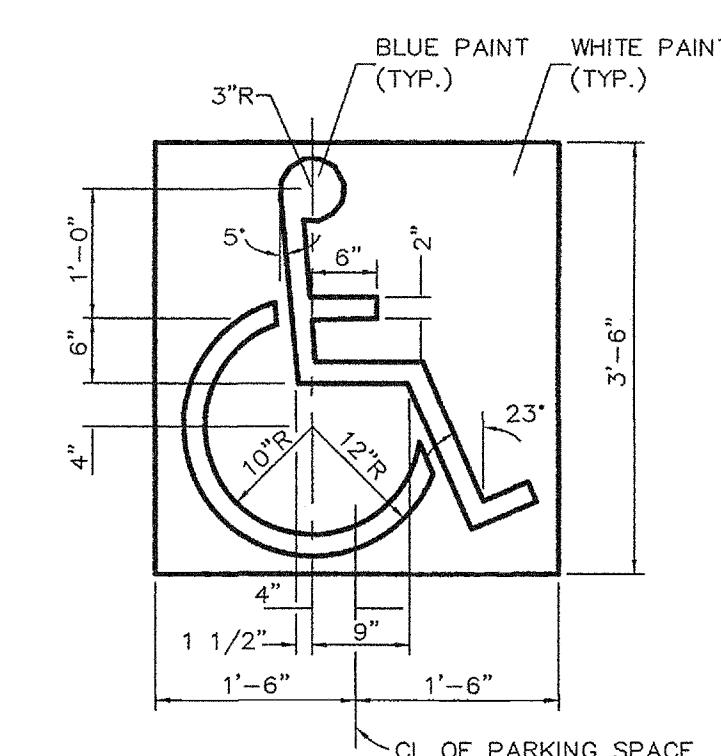
TYPE II

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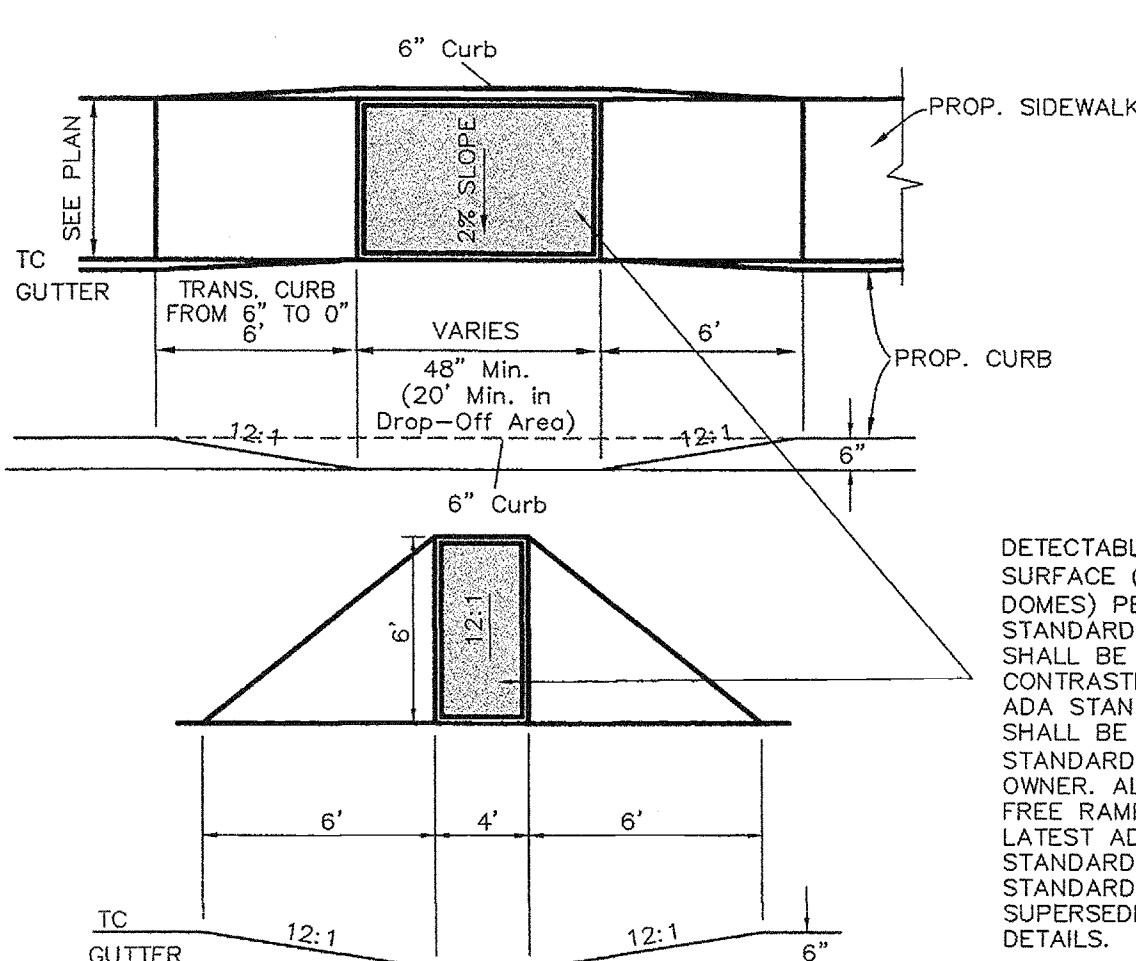
HANDICAP STRIPING DETAIL

N.T.S.



HANDICAP SYMBOL DETAIL

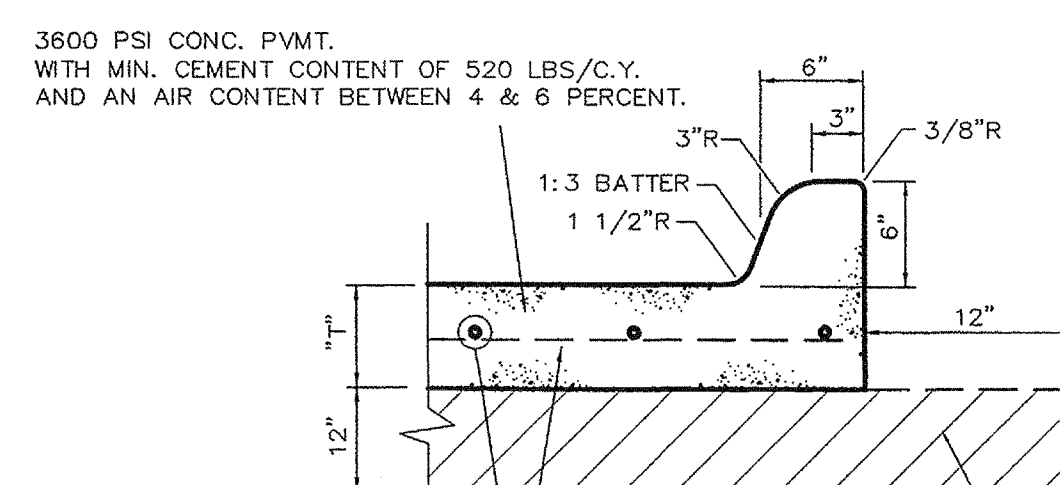
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HANDICAP RAMP DETAILS

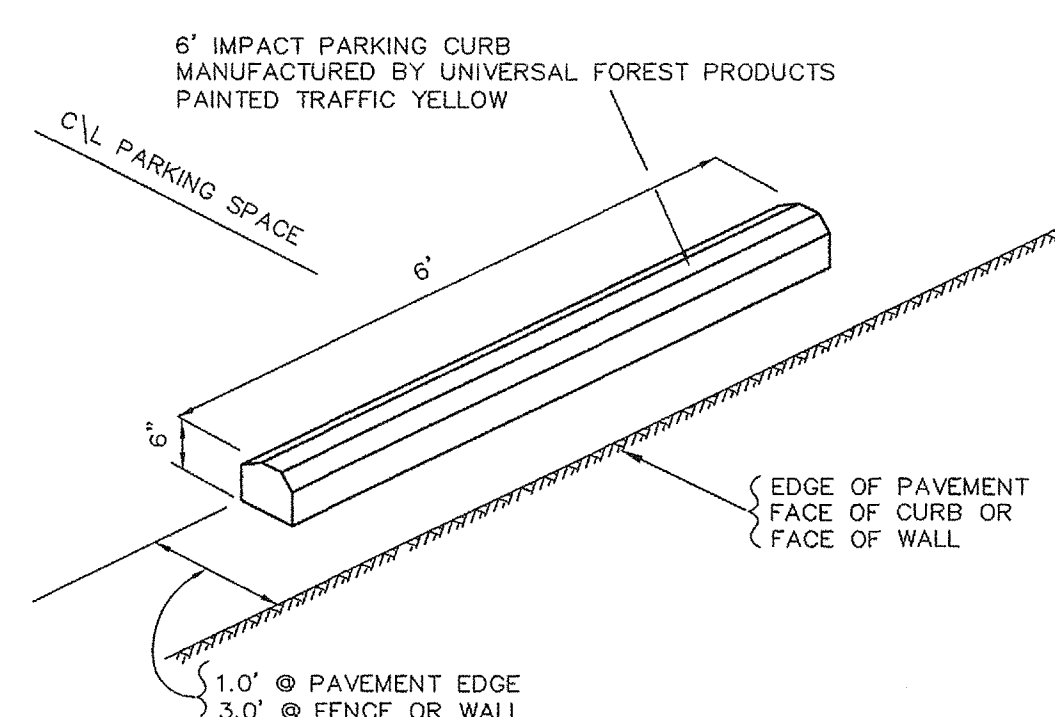
N.T.S.

THIS DETAIL APPLIES TO PRIVATE PROPERTY ONLY.
REF. CITY DETAILS FOR HC RAMP WITHIN CITY R.O.W.



CONCRETE PAVEMENT SECTION

N.T.S.



PRECAST CONCRETE WHEELSTOP

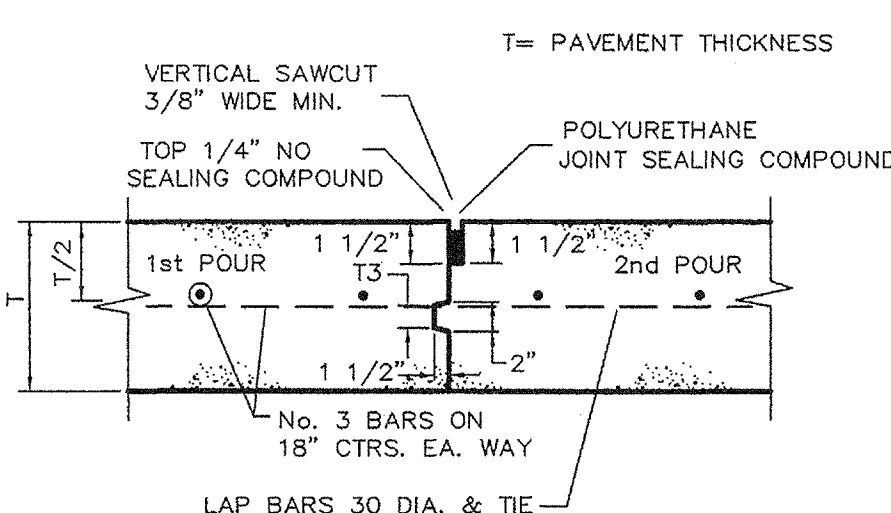
N.T.S.

- CATCH BASIN No. 24 FEATURES:
1. CAST IRON FRAME/GRATE VFG 24"x24"
 2. 4000 PSI CONCRETE
 3. GRADE 60 #3 REBAR 8" O.C.E.W.
 4. ACCOMMODATES 18" I.D. OR SMALLER PIPE
 5. 2 OR 3-WAY THIN WALL K.O.'S

CATCH BASIN No. 24

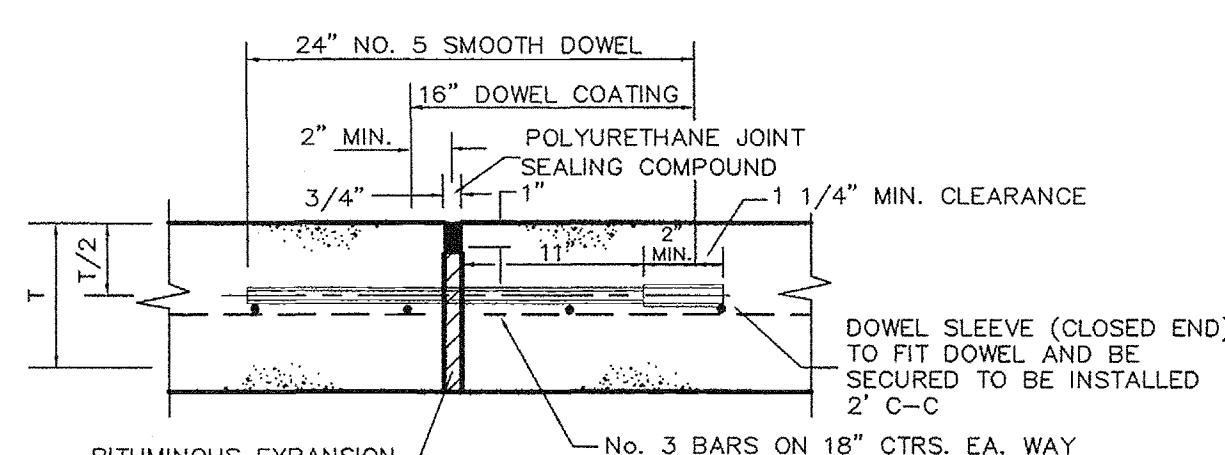
N.T.S.

AMERICAN INDUSTRIAL PRE-CAST
CATCH BASIN No. 24
OR APPROVED EQUAL



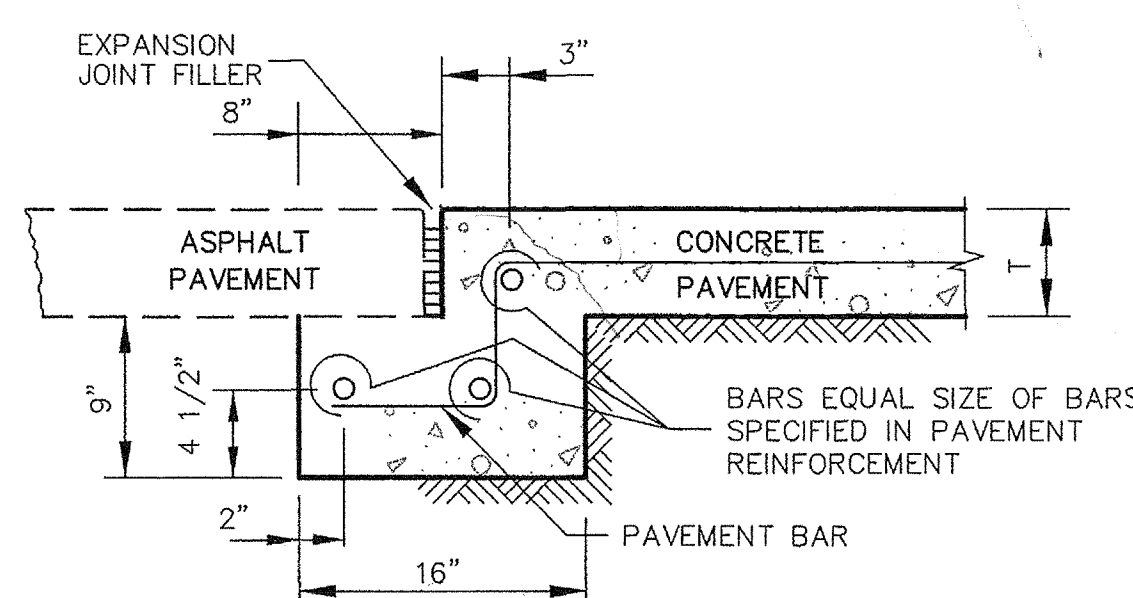
CONSTRUCTION JOINT

N.T.S.



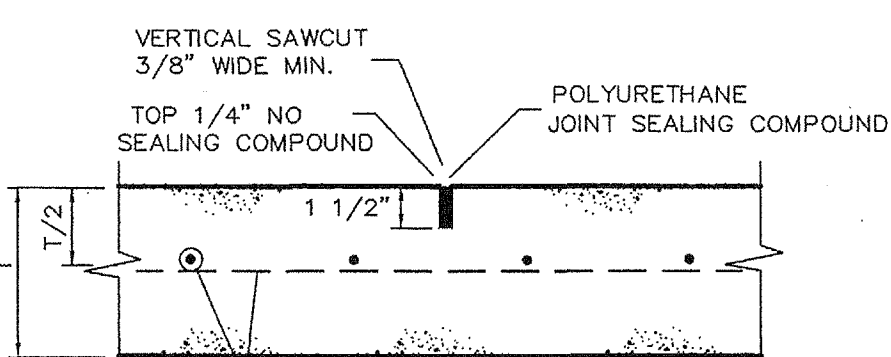
EXPANSION JOINT

N.T.S.



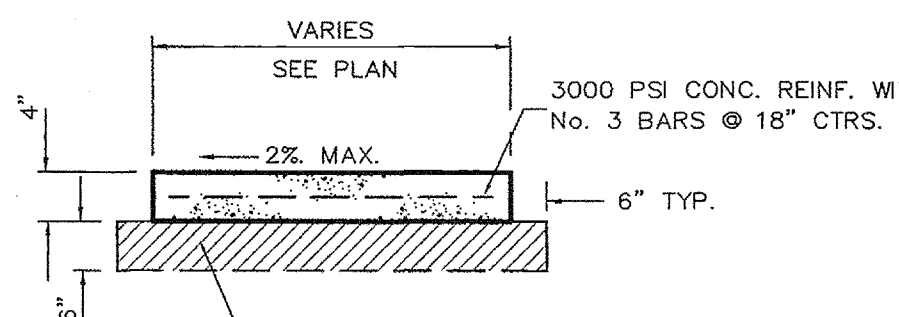
STREET HEADER

N.T.S.



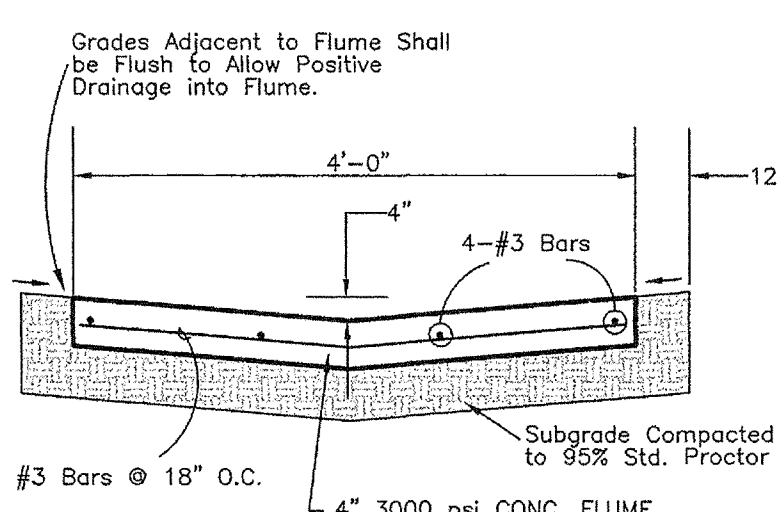
SAWED DUMMY (CONTROL) JOINT

N.T.S.



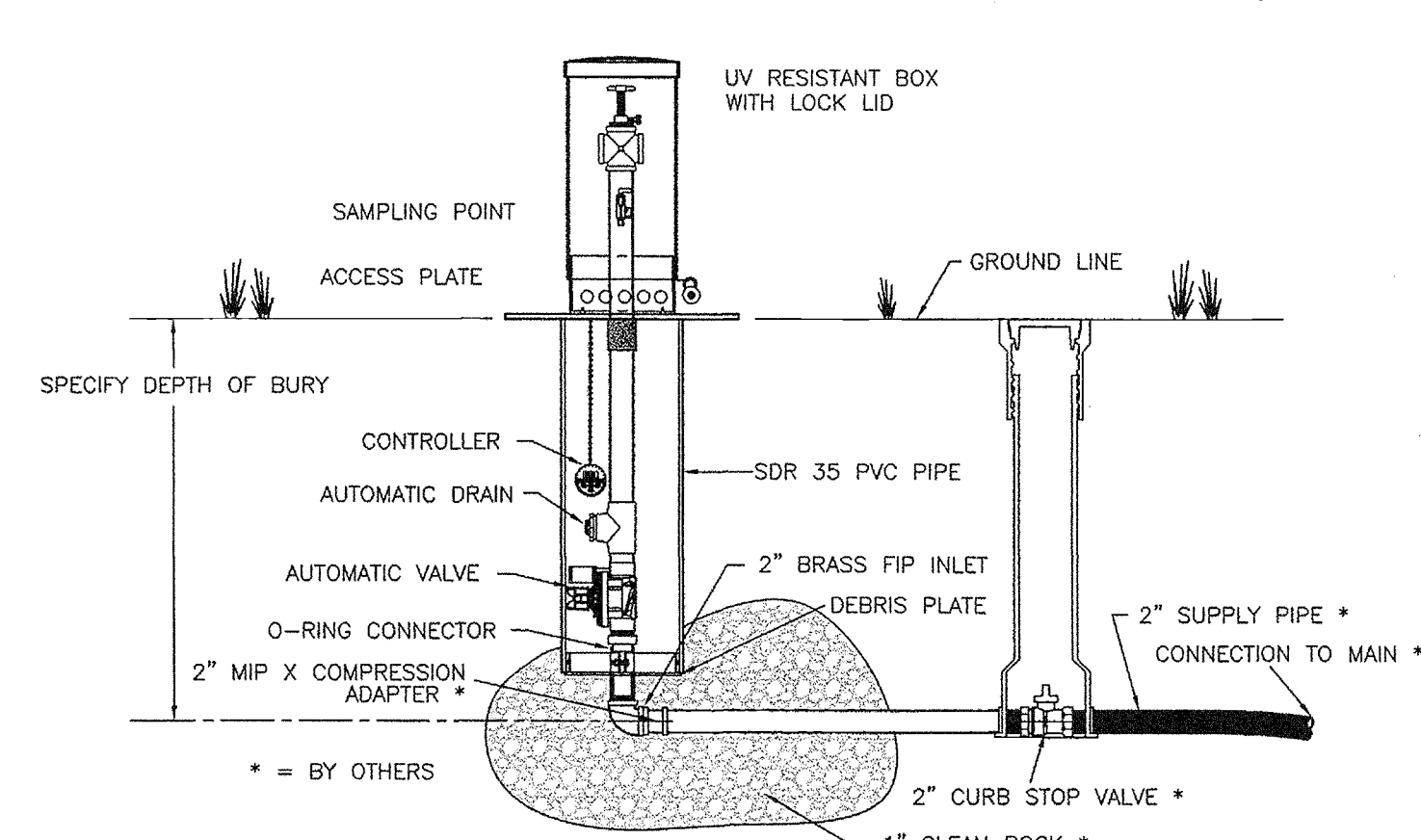
SITE SIDEWALK DETAIL

N.T.S.



LOW FLOW FLUME

N.T.S.



AUTOMATIC FLUSHING DEVICE

ECLIPSE #9400

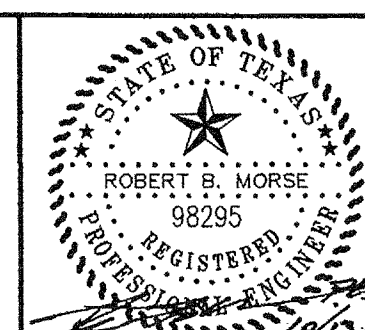
N.T.S.

NOTE:
CITY DETAILS TAKE PRECEDENCE
IN CITY R.O.W.

MISC. INFORMATION	REVISION	DATE	DESCRIPTION
NOTE: Prior to beginning any construction or construction staking, it shall be the Contractor's responsibility to contact the civil engineer to insure that all parties are in possession of the most current set of construction documents.			
SITE BENCHMARK: Aluminum monument at northwest corner of school property Elev. = 619.09			

RLK
ENGINEERING

RLK ENGINEERING, INC.
111 West Main
Allen, Texas 75013
(972) 359-1733 Off
(972) 359-1833 Fax
Texas Registration No. 979



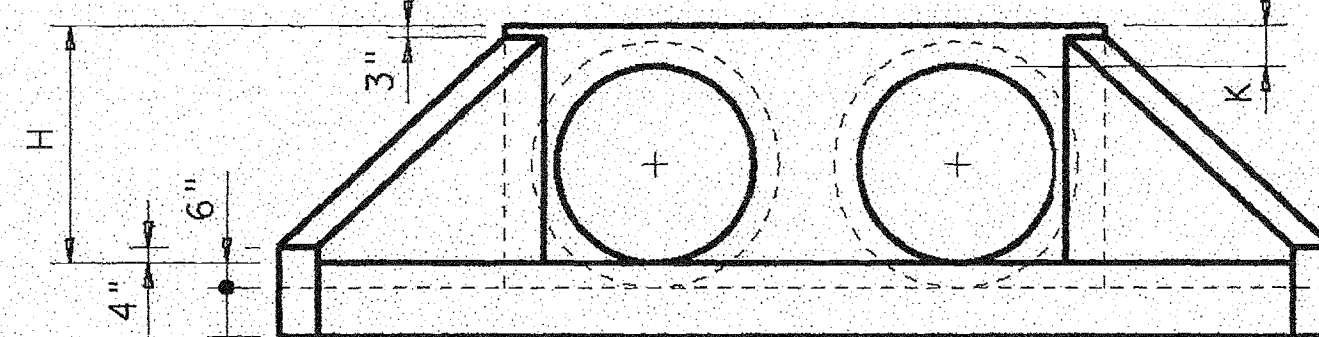
SITE DETAILS			
WILLOW SPRINGS MIDDLE SCHOOL			
CITY OF LUCAS, TEXAS			
DESIGNED BY: RLK Engineering	TECH REVIEW: RLK	DRAWING FILE: 09002 DETAILS.dwg	DRAWING SCALE: NA
DRAWN BY: RLK Engineering	PEER REVIEW: RLK	DRAWING DATE: 10-20-11	PROJECT NUMBER: RLK 09002
			SHEET: C13 OF 15

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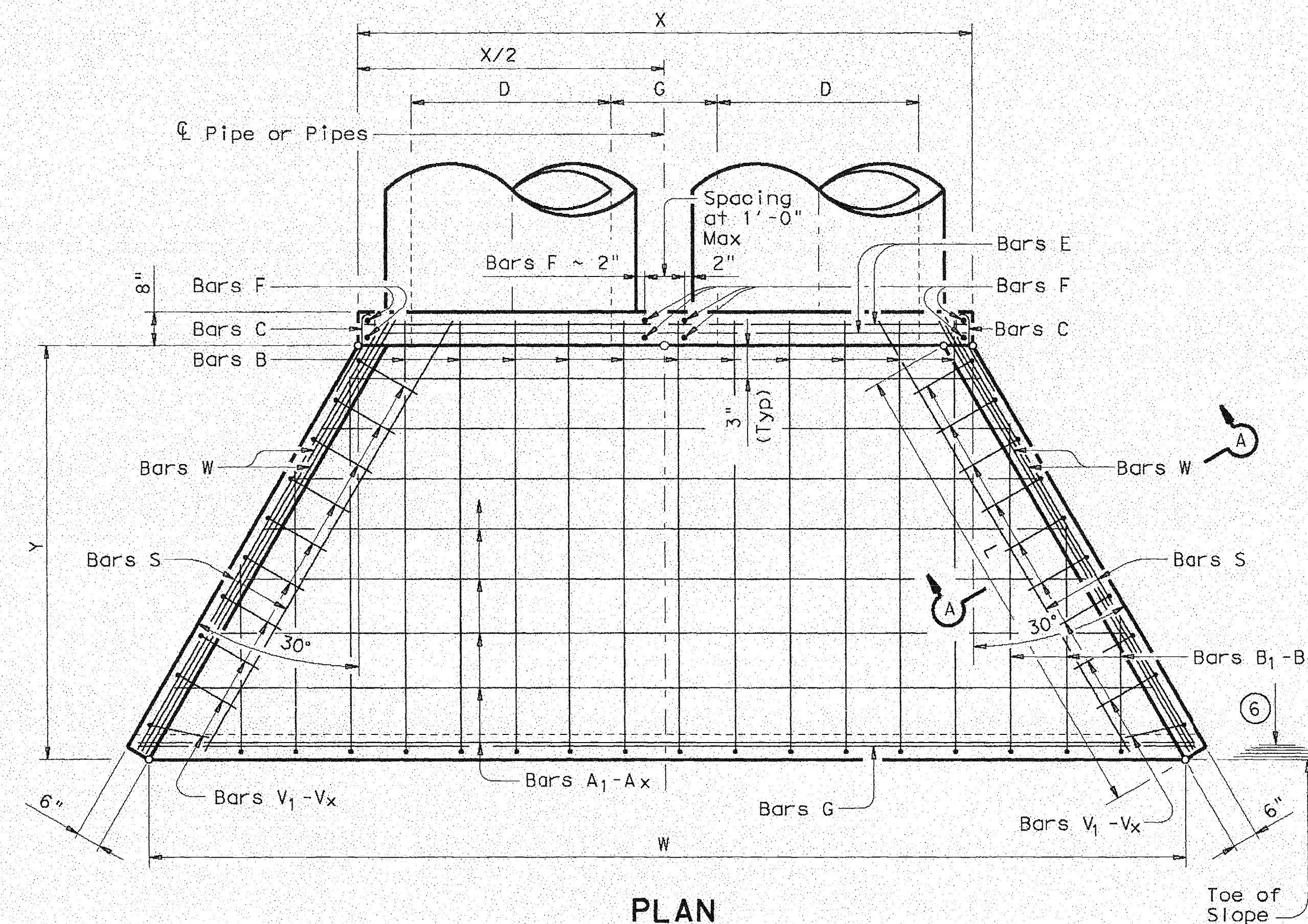
ACC: LEVELS DISPLAYED

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL ④

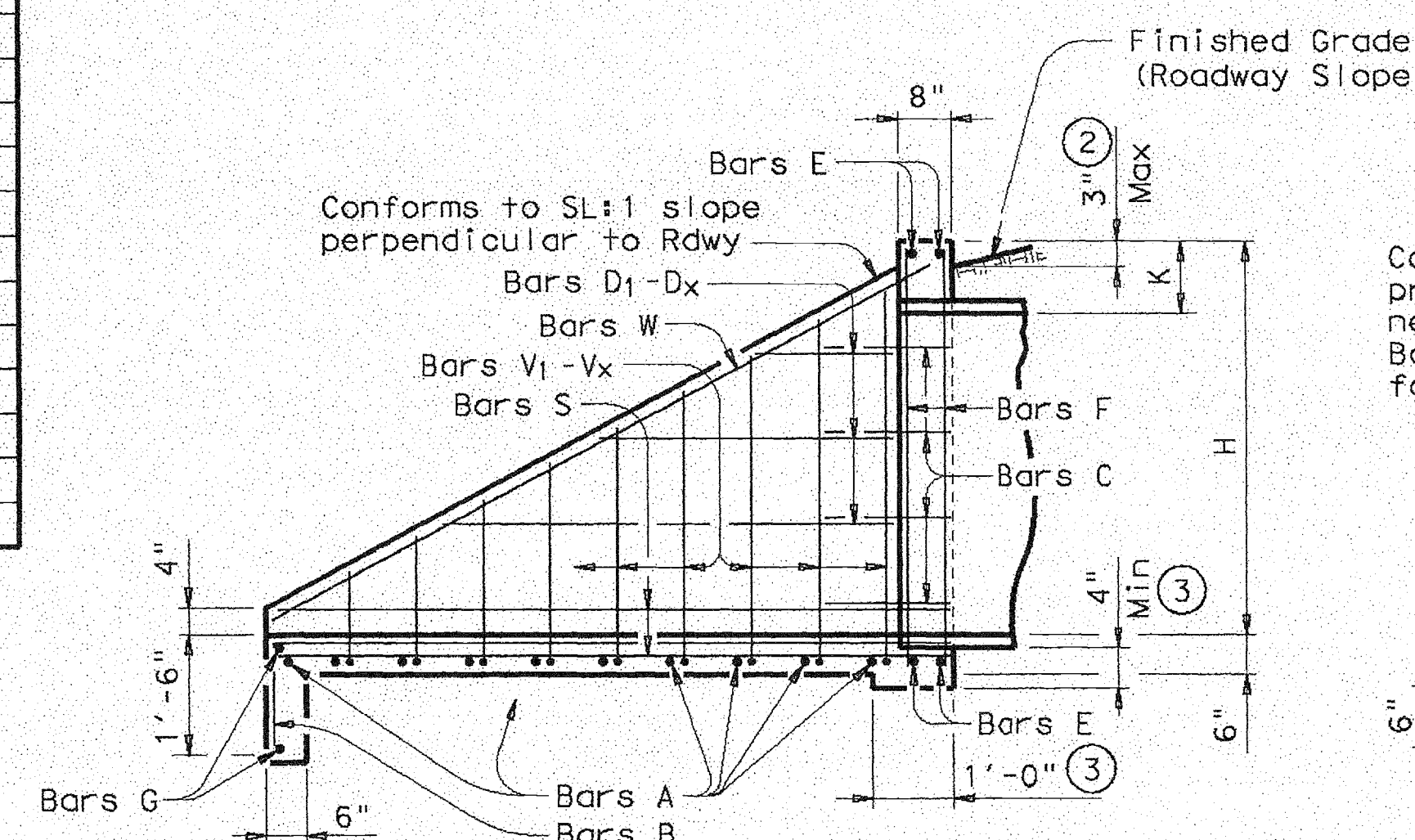
SLOPE	DIA. OF PIPE, D	Values for one Pipe					Values to be added for each add'l Pipe			
		W	X	Y	L	Reinf (Lbs)	Conc (CY)	X and W	Reinf (Lbs)	Conc (CY)
2:1	12"	4'-7 1/2"	2'-6"	2'-10"	3'-3 1/4"	84	0.6	1'-9"	20	0.2
	15"	5'-5 3/4"	2'-9 1/2"	3'-4"	3'-10 1/4"	99	0.7	2'-2"	24	0.3
	18"	6'-4 1/4"	3'-1"	3'-10"	4'-5"	120	0.9	2'-8"	32	0.3
	21"	7'-2 3/4"	3'-4 1/2"	4'-4"	5'-0"	137	1.1	3'-1"	43	0.4
	24"	8'-2 1/2"	3'-9 1/2"	4'-10"	5'-7"	158	1.3	3'-7"	50	0.5
	27"	9'-1"	4'-1"	5'-4"	6'-2"	173	1.5	3'-11"	56	0.6
	30"	9'-11 1/2"	4'-4 1/2"	5'-10"	6'-8 3/4"	197	1.7	4'-4"	65	0.8
	33"	10'-10"	4'-8"	6'-4"	7'-3 3/4"	216	2.0	4'-8"	71	0.9
	36"	11'-8 1/4"	4'-11 1/2"	6'-10"	7'-10 3/4"	241	2.2	5'-1"	81	1.0
	42"	13'-5 1/4"	5'-6 1/2"	7'-10"	9'-0 1/2"	290	2.8	5'-10"	97	1.3
	48"	15'-9"	6'-1 1/2"	9'-4"	10'-9 1/4"	350	3.8	6'-7"	117	1.7
	54"	17'-5 3/4"	6'-8 1/2"	10'-4"	11'-11 1/4"	415	4.5	7'-6"	151	2.1
3:1	60"	19'-2 3/4"	7'-3 1/2"	11'-4"	13'-1"	469	5.3	8'-3"	174	2.5
	66"	20'-11 1/2"	7'-10 1/2"	12'-4"	14'-3"	530	6.2	8'-9"	194	2.9
	72"	22'-8 1/2"	8'-5 1/2"	13'-4"	15'-4 3/4"	587	7.1	9'-4"	213	3.3
	12"	6'-3"	2'-6"	4'-3"	4'-11"	114	0.8	1'-9"	22	0.2
	15"	7'-5"	2'-9 1/2"	5'-0"	5'-9 1/4"	133	1.1	2'-2"	28	0.3
	18"	8'-6 3/4"	3'-1"	5'-9"	6'-7 3/4"	166	1.3	2'-8"	37	0.5
	21"	9'-8 3/4"	3'-4 1/2"	6'-6"	7'-6"	189	1.6	3'-1"	48	0.6
	24"	11'-0"	3'-9 1/2"	7'-3"	8'-4 1/2"	221	2.0	3'-7"	58	0.7
	27"	12'-2"	4'-1"	8'-0"	9'-2 3/4"	245	2.3	3'-11"	67	0.8
	30"	13'-4"	4'-4 1/2"	8'-9"	10'-1 1/4"	287	2.7	4'-4"	77	1.0
	33"	14'-5 3/4"	4'-8"	9'-6"	10'-11 3/4"	310	3.1	4'-8"	84	1.2
	36"	15'-7 3/4"	4'-11 1/2"	10'-3"	11'-10"	343	3.5	5'-1"	96	1.4
4:1	42"	17'-11 1/2"	5'-6 1/2"	11'-9"	13'-6 3/4"	424	4.5	5'-10"	119	1.7
	48"	21'-1 3/4"	6'-1 1/2"	14'-0"	16'-2"	527	6.1	6'-7"	146	2.3
	54"	23'-5 1/2"	6'-8 1/2"	15'-6"	17'-10 3/4"	588	7.3	7'-6"	186	2.9
	60"	25'-9 1/4"	7'-3 1/2"	17'-0"	19'-7 1/2"	707	8.7	8'-3"	219	3.4
	66"	28'-1"	7'-10 1/2"	18'-6"	21'-4 1/4"	797	10.1	8'-9"	242	3.9
	72"	30'-4 3/4"	8'-5 1/2"	20'-0"	23'-1 1/4"	910	11.7	9'-4"	272	4.4
	12"	7'-10 3/4"	2'-6"	5'-8"	6'-6 1/2"	144	1.1	1'-9"	24	0.3
	15"	9'-4"	2'-9 1/2"	6'-8"	7'-8 1/2"	177	1.5	2'-2"	32	0.4
	18"	10'-9 1/2"	3'-1"	7'-8"	8'-10 1/4"	217	1.9	2'-8"	42	0.5
	21"	12'-2 3/4"	3'-4 1/2"	8'-8"	10'-0"	254	2.3	3'-1"	57	0.7
	24"	13'-9 1/2"	3'-9 1/2"	9'-8"	11'-2"	295	2.8	3'-7"	67	0.9
	27"	15'-3"	4'-1"	10'-8"	12'-3 3/4"	328	3.3	3'-11"	77	1.0
6:1	30"	16'-8 1/4"	4'-4 1/2"	11'-8"	13'-5 3/4"	379	3.8	4'-4"	89	1.3
	33"	18'-1 3/4"	4'-8"	12'-8"	14'-7 1/2"	417	4.5	4'-8"	101	1.4
	36"	19'-7"	4'-11 1/2"	13'-8"	15'-9 1/4"	464	5.1	5'-1"	115	1.7
	42"	22'-5 3/4"	5'-6 1/2"	15'-8"	18'-1"	575	6.5	5'-10"	141	2.1
	48"	26'-6 1/4"	6'-1 1/2"	18'-8"	21'-6 3/4"	720	8.9	6'-7"	175	2.8
	54"	29'-5"	6'-8 1/2"	20'-8"	23'-10 1/4"	863	10.7	7'-6"	226	3.6
	60"	32'-3 3/4"	7'-3 1/2"	22'-8"	26'-2"	984	12.7	8'-3"	264	4.3
	66"	35'-2 1/2"	7'-10 1/2"	24'-8"	28'-5 3/4"	1126	14.9	8'-9"	300	4.9
	72"	38'-1 1/4"	8'-5 1/2"	26'-8"	30'-9 1/2"	1283	17.3	9'-4"	334	5.6
	12"	11'-2"	2'-6"	8'-6"	9'-9 3/4"	220	1.9	1'-9"	28	0.4
	15"	13'-2 1/4"	2'-9 1/2"	10'-0"	11'-6 1/2"	264	2.5	2'-2"	37	0.5
	18"	15'-2 1/2"	3'-1"	11'-6"	13'-3 1/4"	326	3.2	2'-8"	50	0.7
	21"	17'-2 3/4"	3'-4 1/2"	13'-0"	15'-0 1/4"	381	3.9	3'-1"	69	0.9
	24"	19'-4 1/2"	3'-9 1/2"	14'-6"	16'-9"	447	4.8	3'-7"	80	1.2
	27"	21'-4 3/4"	4'-1"	16'-0"	18'-5 3/4"	506	5.7	3'-11"	96	1.4
	30"	23'-5 1/4"	4'-4 1/2"	17'-6"	20'-2 1/2"	587	6.7	4'-4"	110	1.7
	33"	25'-5 1/2"	4'-8"	19'-0"	21'-11 1/4"	667	7.8	4'-8"	127	2.0
	36"	27'-5 3/4"	4'-11 1/2"	20'-6"	23'-8"	727	9.0	5'-1"	144	2.3
	42"	31'-6 1/4"	5'-6 1/2"	23'-6"	27'-1 1/2"	914	11.5	5'-10"	179	3.0
	48"	37'-3 1/2"	6'-1 1/2"	28'-0"	32'-4"	1181	15.9	6'-7"	231	4.0
	54"	41'-4 1/4"	6'-8 1/2"	31'-0"	35'-9 1/2"	1412	19.2	7'-6"	300	5.0
	60"	45'-4 3/4"	7'-3 1/2"	34'-0"	39'-3"	1619	22.9	8'-3"	353	6.0



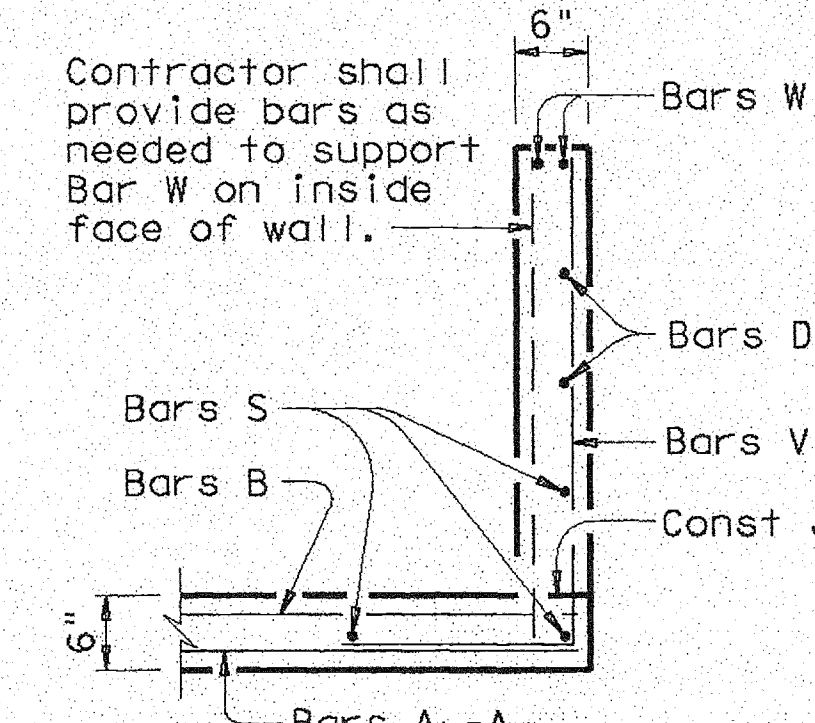
ELEVATION
Showing dimensions



PLAN



TYPICAL WING ELEVATION



SECTION A-A

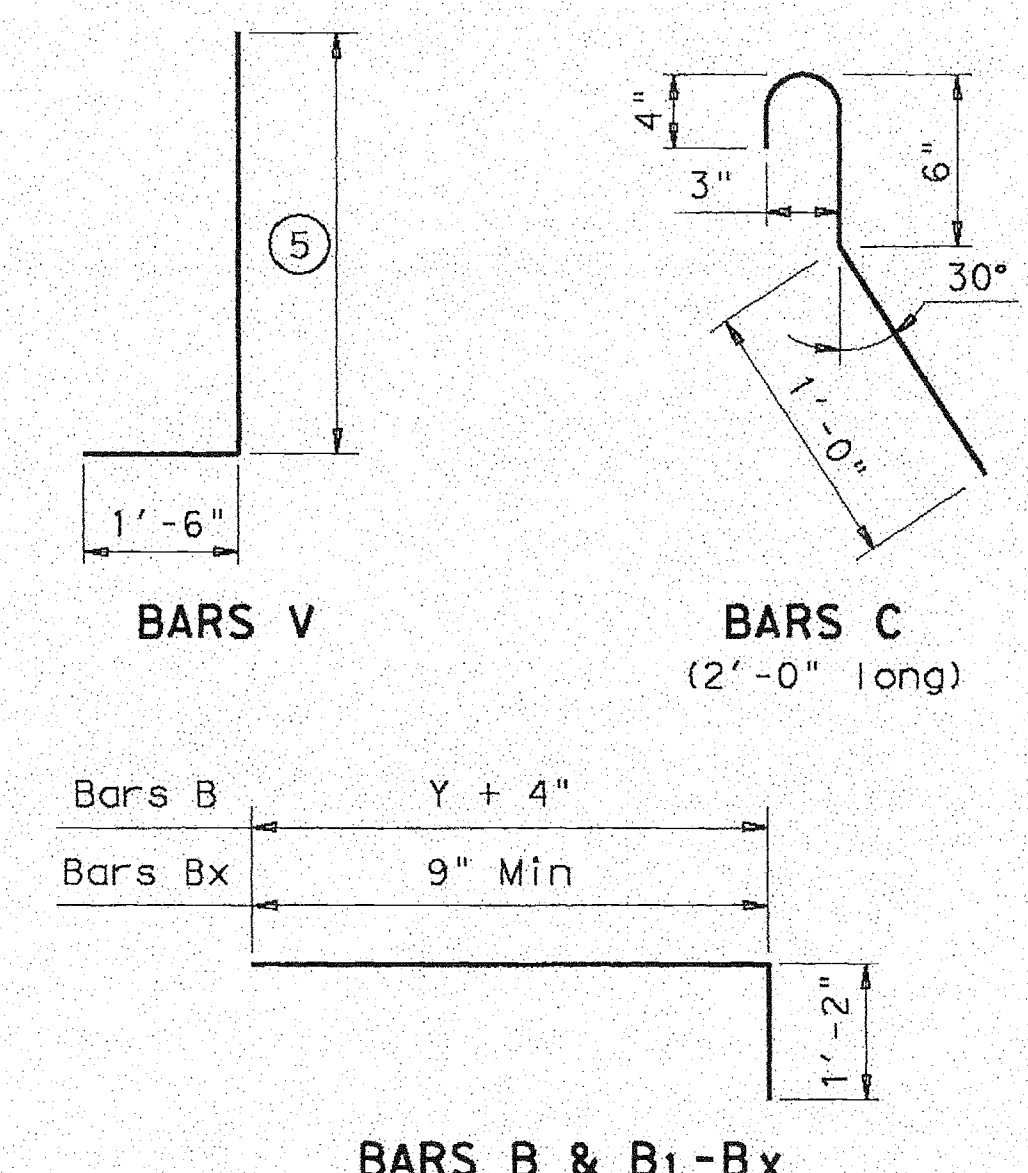
- Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Provide a 1'-0" footing as shown where required to maintain 4" Min cover for pipes.
- Quantities shown are for one structure end only (one headwall).
- Min Length = 6" + 3" x $\left(\frac{12 \times H - 7}{12 \times L}\right)$
Max Length = 12 x H - 3" x $\left(\frac{12 \times H - 7}{12 \times L}\right) - 1"$
- Lengths of wings based on SL:1 Slope along this line.

TABLE OF REINFORCING STEEL ④

Bar	Size	Spa	No.
A	# 4	1'-0"	~
B	# 3	1'-6"	~
C	# 4	1'-0"	~
D	# 3	1'-0"	~
E	# 5	~	4
F	# 5	~	~
G	# 3	~	2
S	# 4	~	6
V	# 4	1'-0"	~
W	# 5	~	4

TABLE OF CONSTANT DIMENSIONS

DIA. OF PIPE, D	G	K	H
12"	9"	1'-0"	2'-0"
15"	11"	1'-0"	2'-3"
18"	1'-2"	1'-0"	2'-6"
21"	1'-4"	1'-0"	2'-9"
24"	1'-7"	1'-0"	3'-0"
27"	1'-8"	1'-0"	3'-3"
30"	1'-10"	1'-0"	3'-6"
33"	1'-11"	1'-0"	3'-9"
36"	2'-1"	1'-0"	4'-0"
42"	2'-4"	1'-0"	4'-6"
48"	2'-7"	1'-0"	5'-3"
54"	3'-0"	1'-0"	5'-9"
60"	3'-3"	1'-0"	6'-3"
66"	3'-3"	1'-0"	6'-9"
72"	3'-4"	1'-0"	7'-3"



GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
No bridge rails of any type may be mounted directly to these culvert headwalls.

Texas Department of Transportation
Bridge Division

CONCRETE HEADWALLS WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS

CH-FW-0

FILE: chfw00se.dgn	DN: TXDOT	CK: TXDOT	DN: TXDOT	CK: GAF
© TXDOT February 2010	DISTRICT	FEDERAL AID PROJECT	SHEET	
REVISIONS	COUNTY	CONTROL	SECT	JOB HIGHWAY

CONSULTANTS

Civil & Survey
RLK Engineering
111 West Main Street
Arlene, Texas 75010
(972) 358-1233
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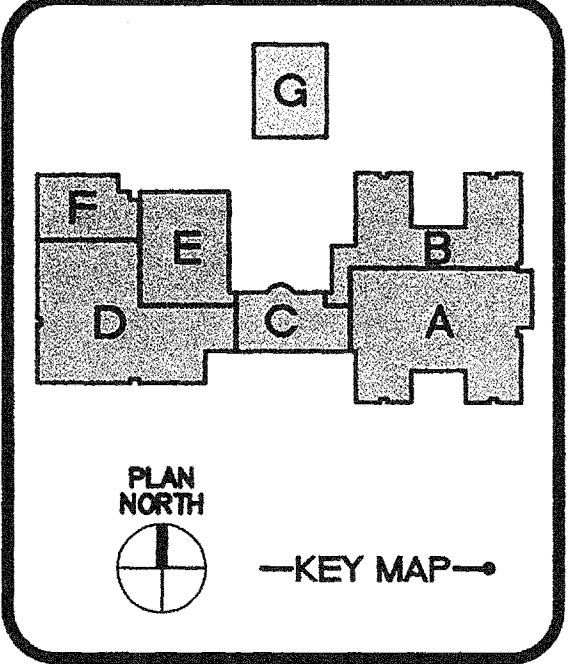
Civil Athletics
PBK
4001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1373
(972) 233-1375

Landscapes
Environ Group
111 Hillside Drive
Coppell, Texas 75010
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(972) 433-9715

Structural
Structural Engenuity, Inc.
3010 LBJ Freeway, Suite 1500
Dallas, TX 75244
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Food Service
H. G. Rice and Company, Inc.
2606 Villa Creek Drive, Suite 255
Farming Branch, Texas 75234
(972) 245-8331



NEW
WILLOW SPRINGS
MIDDLE SCHOOL
Lovejoy Independent School District

PBK
Architecture
Engineering
Planning
Facility Consulting

14001 N. Dallas Parkway
Suite 400
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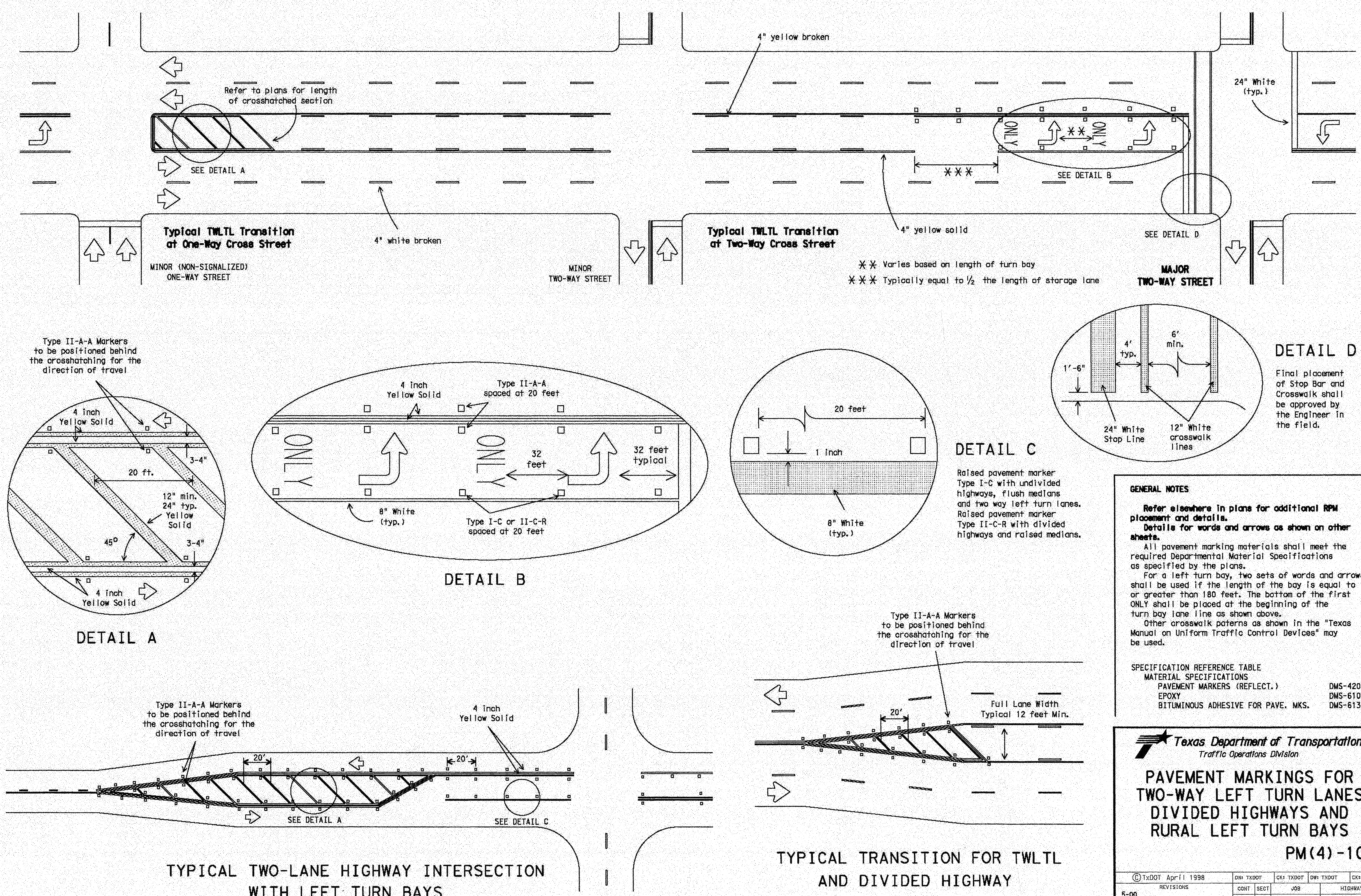
PROJECT NO. 10/20/10
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C 14
HEADWALL
DETAIL

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DATE: FILE:



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111 West 2nd Street
Austin, Texas 78701
(972) 359-1233
(972) 359-1855

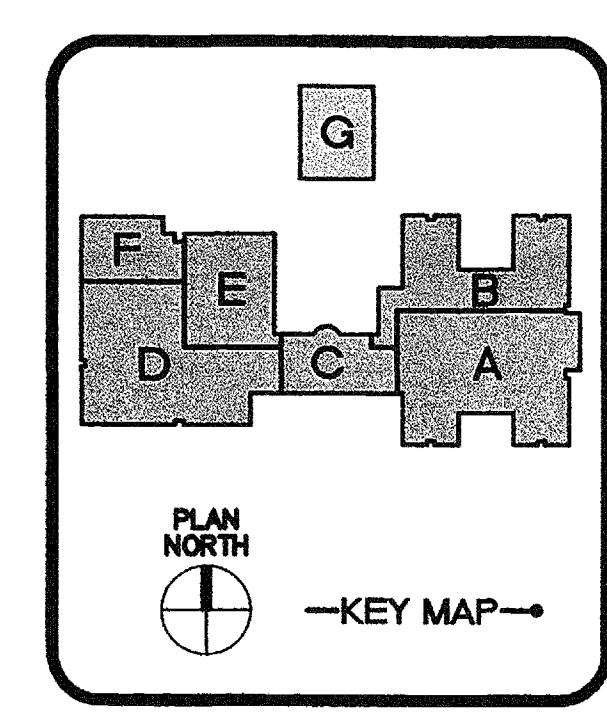
Civil & Structural
PBK
14001 North Dallas Parkway, Suite 400
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(972) 233-1393

Landscaping
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(972) 436-8715

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2010 I-81 Freeway, Suite 1500
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(972) 247-9252

MEP
PBK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
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(972) 233-1393

Food Service
H. C. Rice and Company, Inc.
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Forsyth, Texas 75055
(972) 245-5300
(972) 245-5351



NEW
WILLOW SPRINGS
MIDDLE SCHOOL
Lovejoy Independent School District

PBK
Architecture
Engineering
Planning
Facility Consulting

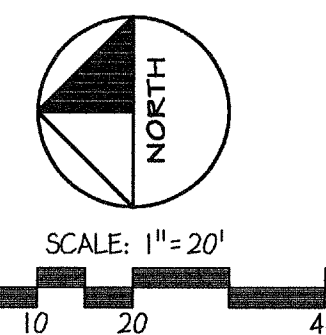
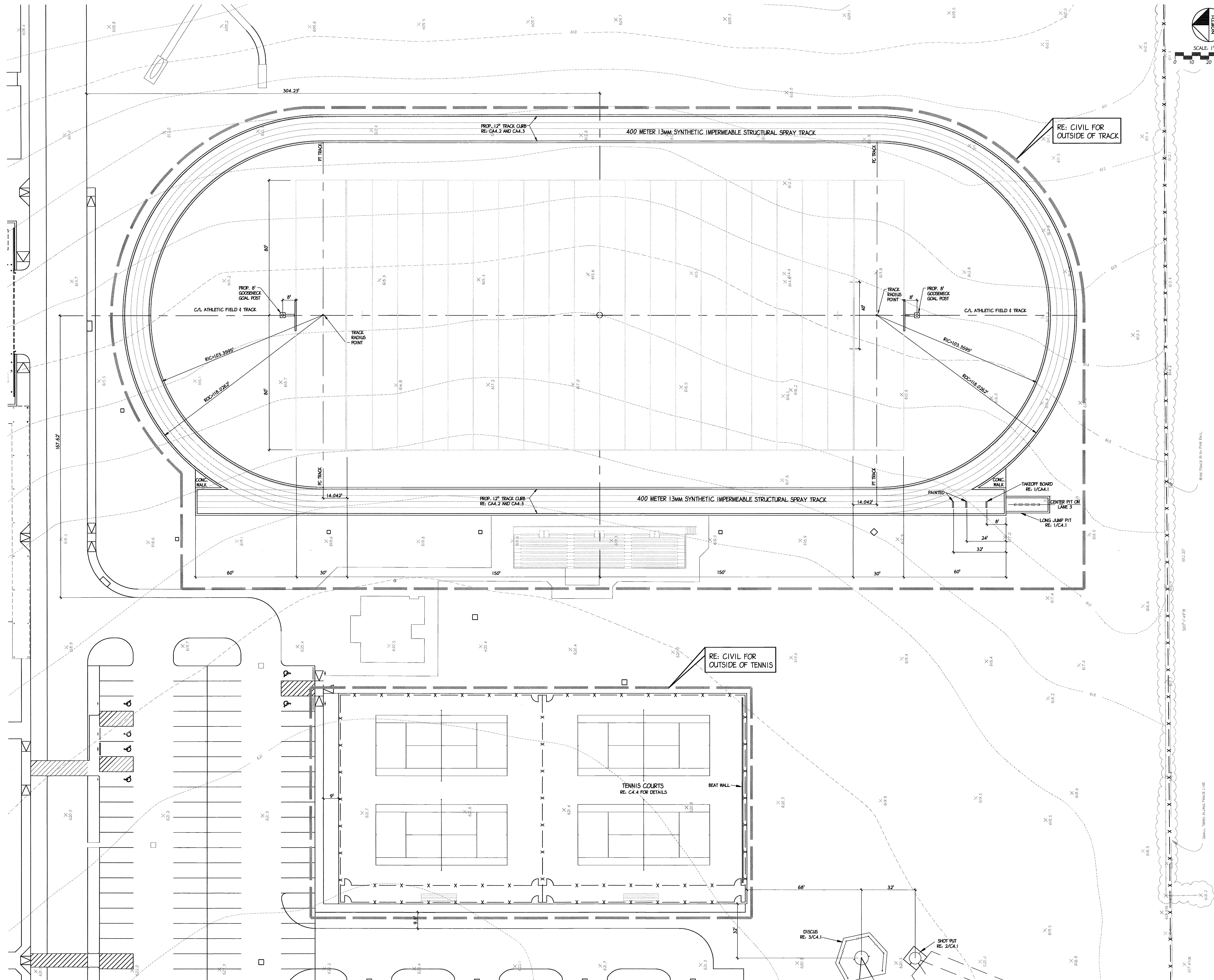
14001 N. Dallas Parkway
Suite 400
Dallas, Texas 75240
Phone: 972-233-1323
Fax: 972-233-1373

PROJECT NO.
DATE 10/20/10
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TxDOT
PM(4)-10
DETAIL



CONSULTANTS

Civil & Survey
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(972) 436-9715

Structural
Structural Engenuity, Inc.
3010 LBJ Freeway, Suite 1500
Dallas, TX 75235
(972) 247-9250
(972) 436-9252

MEP
PBK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1323
(972) 233-1373

Food Service
H. G. Rice and Company, Inc.
2858 Villa Creek Drive, Suite 200
Farmers Branch, Texas 75234
(972) 245-5300
(972) 245-5331

NEW
WILLOW SPRINGS
MIDDLE SCHOOL
Lovejoy Independent School District

PBK
Architecture
Engineering
Planning
Facility Consulting

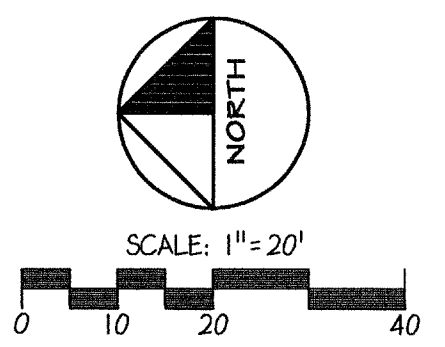
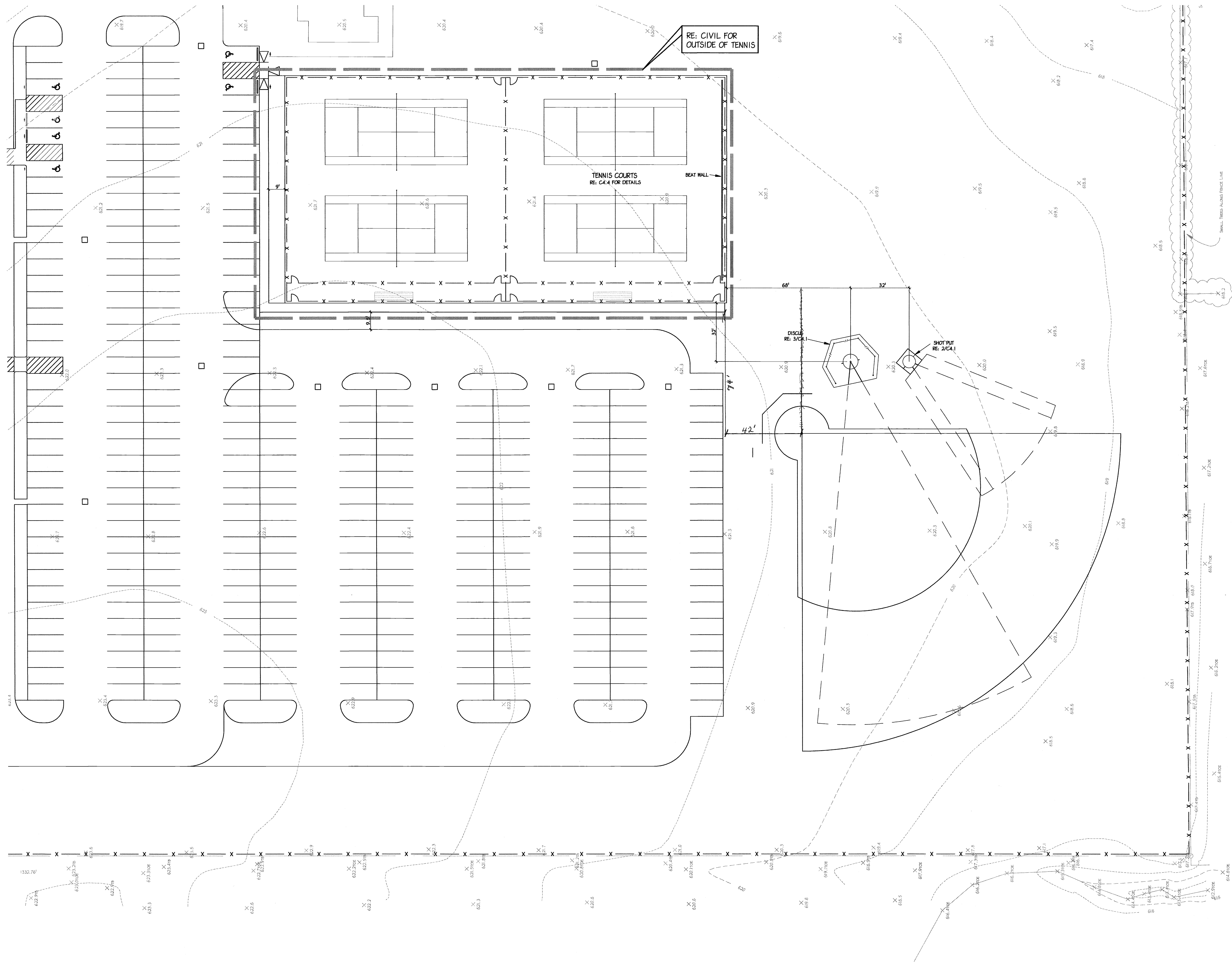
Matthew D. Morgan
MATTHEW D. MORGAN
95529
LICENSED PROFESSIONAL ENGINEER
EXPIRATION DATE 10/20/11

14001 North Dallas Parkway
Suite 400
Dallas, Texas 75240
Phone: 972-233-1323
Fax: 972-233-1373
TX FPM F-3709

PROJECT NO. 0942
DATE 10/20/11
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CHECKED CMO
REVISIONS

ISSUE FOR PRICING
AND CONSTRUCTION

CA 1.1
DIMENSIONAL
CONTROL PLAN



CONSULTANTS

Civil & Survey
RLK Engineering
111 West Bell Street
Allen, Texas 75013
(972) 358-1733
(972) 358-1833

Civil Athletics
PKK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1323
(972) 233-1375

Landscaping
Enviro Group
111 Hillside Drive
Lewisville, Texas 75057
(972) 317-0276
(972) 436-9715

Structural
Structural Engenuity, Inc.
9010 Lakewood Drive, Suite 1500
Dallas, TX 75224
(972) 247-2550
(972) 247-8282

MEP
PKK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1323
(972) 233-1375

Food Service
H. O. Rice and Company, Inc.
2855 Wiley Creek Drive, Suite 230
Dallas, Texas 75234
(972) 245-3300
(972) 245-8331

NEW
WILLOW SPRINGS
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Facility Consulting

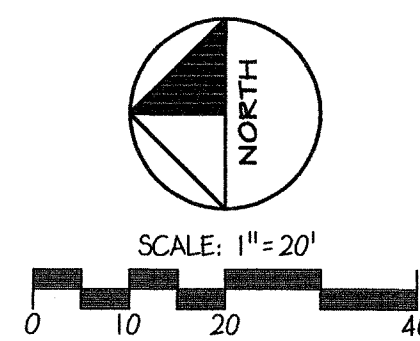
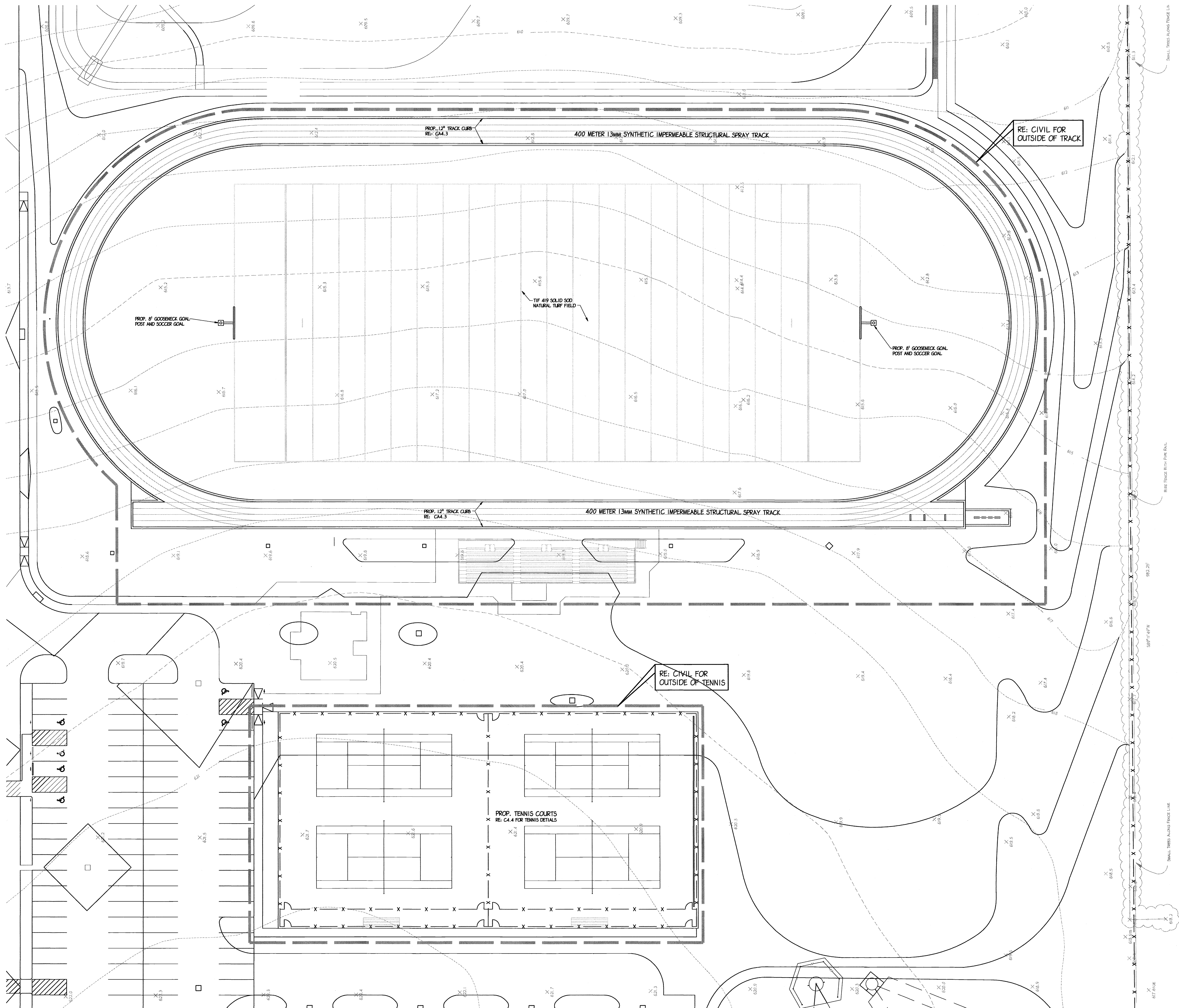
MATTHEW D. MORGAN
96329
10/20/11

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Fax 972-233-1375
TX REG F-3709

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AND CONSTRUCTION

CA 1.2
DIMENSIONAL
CONTROL PLAN



CONSULTANTS

Civil & Survey
RLK Engineering
111 West Main Street
Arlene, Texas 75013
(972) 355-1233

Civil Athletics
PBK
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Dallas, Texas 75240
(972) 233-1323

Landscape
Enviro Group
111 Millside Drive
Cockfield, Texas 75067
(972) 311-2276
(972) 435-9715

Structural
Structural Integrity, Inc.
3010 LBJ Freeway, Suite 1500
Dallas, TX 75235
(972) 242-9250
(972) 242-9252

MEP
PBK
14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1323

Food Service
H. Q. Rice and Company, Inc.
2850 Villa Creek Drive, Suite 255
Farmers Branch, Texas 75234
(972) 245-3350
(972) 245-3331

NEW
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Planning
Facility Consulting

14001 North Dallas Parkway
Suite 400
Dallas, Texas 75240
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Fax: 972-233-1373
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CA 1.4
ATHLETIC SITE
PLAN
(NATURAL TURF)

Bulletin # 37

1/4 MILE PERIMETER

1/2 MILE PERIMETER

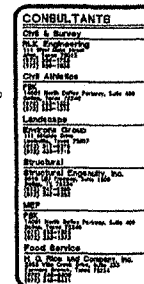
3/4 MILE PERIMETER

1/4 MILE WIDE AREA

1/4 MILE PERIMETER

RE: CIVIL FOR OUTSIDE OF TRACK

RE: CIVIL FOR OUTSIDE OF TENNIS



**NEW
WILLOW SPRINGS
MIDDLE SCHOOL**
Lovejoy Independent School District

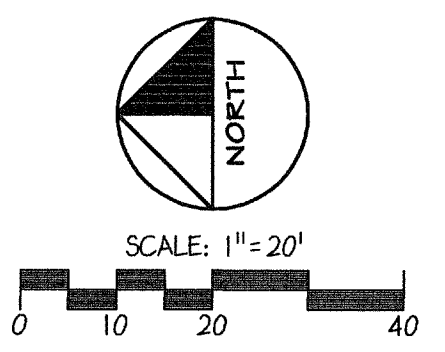
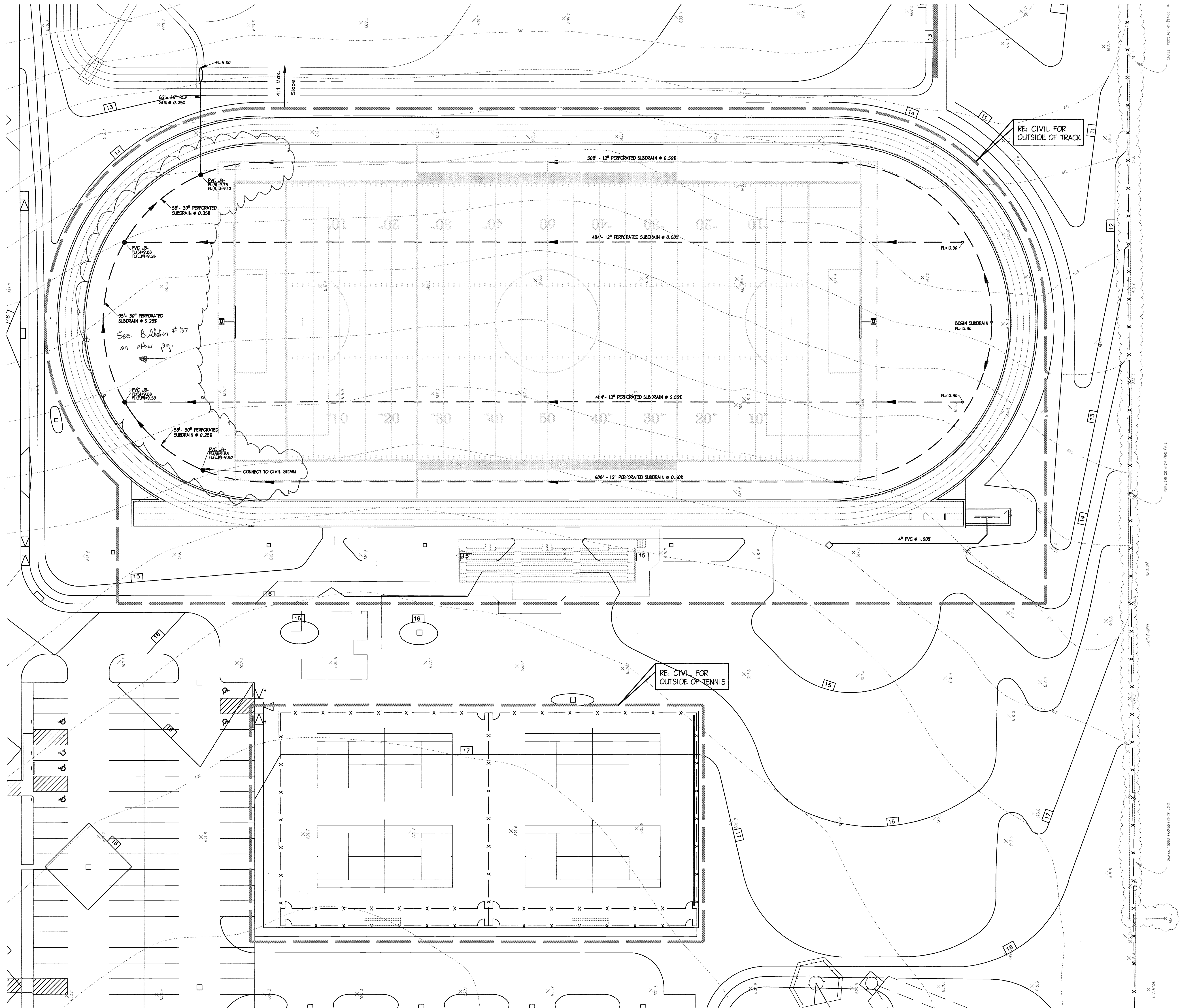


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ISSUE FOR PRICING AND CONSTRUCTION

CA 2.1R

DRAINAGE AND
UTILITY PLAN
(SYNTHETIC TURF)



CONSULTANTS

Civil & Survey
RLK Engineering
111 West Main Street
Allen, Texas 75013
(972) 358-1533
(972) 358-1533

Civil Athletics
PEK
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Dallas, Texas 75240
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(972) 233-1373

Landscape
Environ Group
111 Hillside Drive
Dallas, Texas 75207
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(972) 436-9716

Structural
Structural Engenuity, Inc.
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(972) 436-9716

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PEK
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Food Service
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(972) 245-5331

NEW
WILLOW SPRINGS
MIDDLE SCHOOL
Lovejoy Independent School District

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Facility Consulting

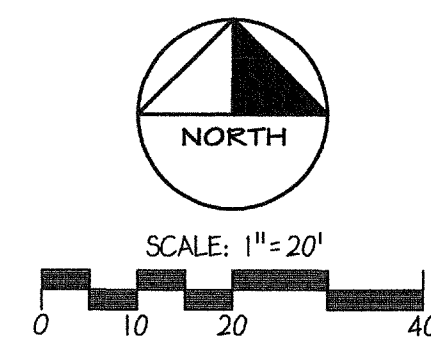
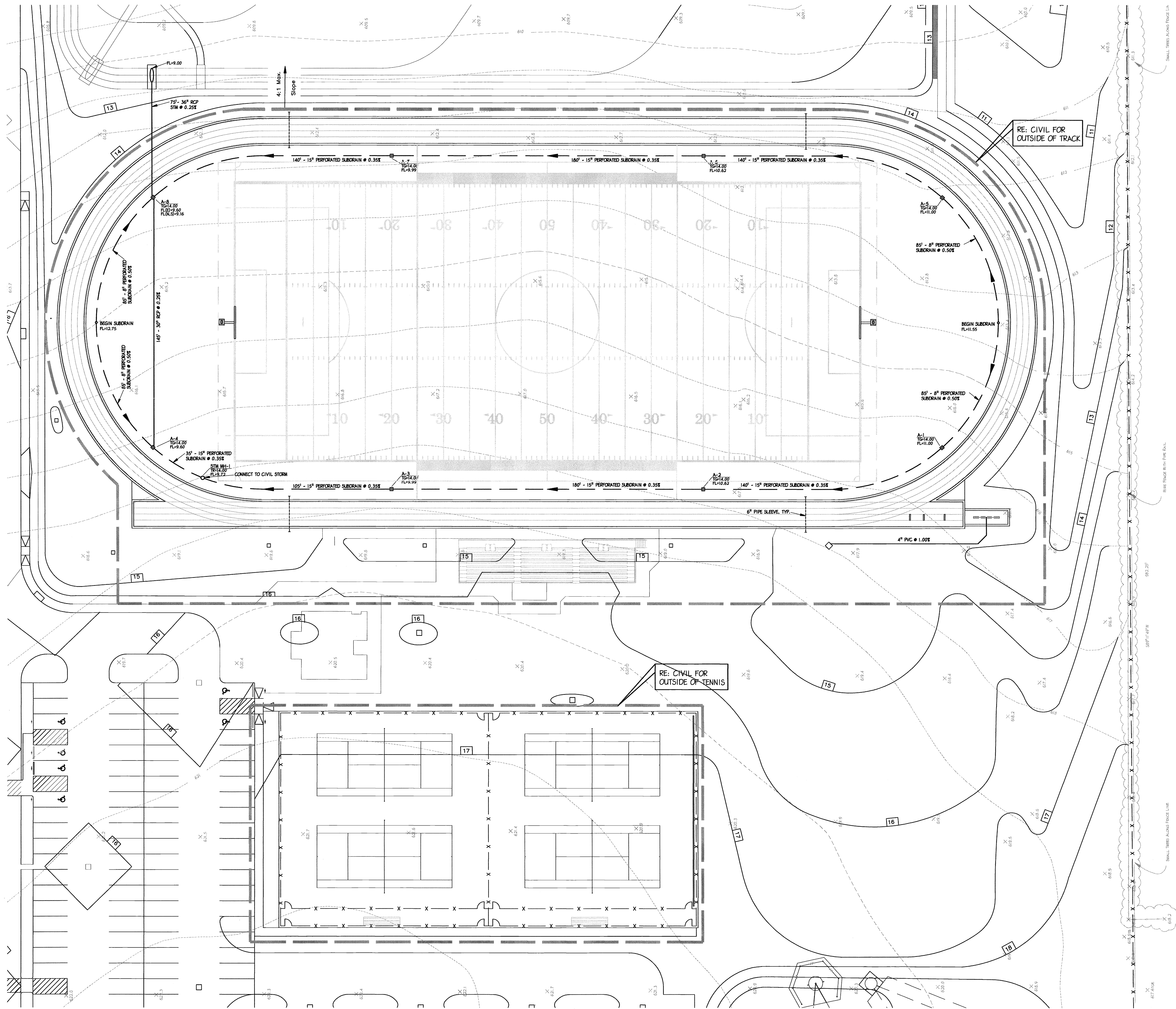
Matthew D. Morgan
MATTHEW D. MORGAN
68029
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10/20/11

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TX P.E. F-5709

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AND CONSTRUCTION

CA 2.1
DRAINAGE AND
UTILITY PLAN
(SYNTHETIC TURF)



CONSULTANTS

Civil & Survey
RLK Engineering
111 West Main Street
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(972) 358-1853

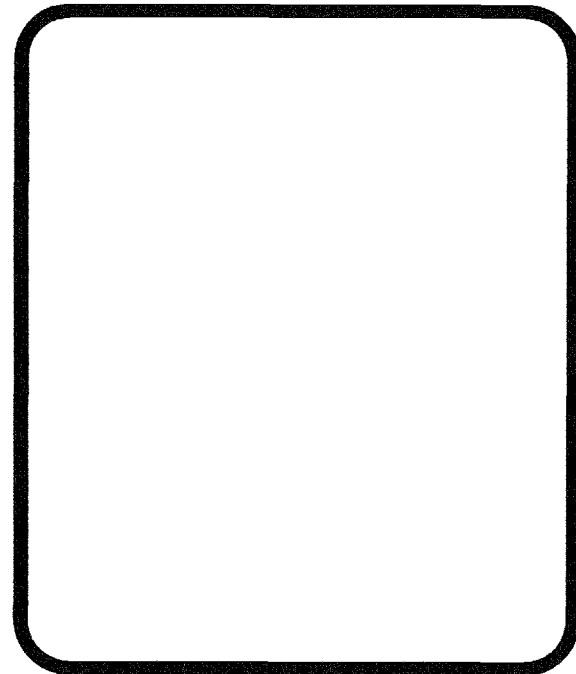
Civil Athletics
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14001 North Dallas Parkway, Suite 400
Dallas, Texas 75240
(972) 233-1333
(972) 233-1373

Landscape
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111 Hillside Drive
Lawrenceville, Texas 75057
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(972) 247-8252

MEP
PBK
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Dallas, Texas 75240
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(972) 233-1373

Food Service
H. Q. Rice and Company, Inc.
2885 Villa Creek Drive, Suite 233
Ft. Worth, Texas 76124
(972) 245-3331
(972) 245-3331



NEW
WILLOW SPRINGS
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Lovejoy Independent School District

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Planning
Facility Consulting

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Dallas, Texas 75240
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Fax: 972-233-1373
TX FPM F-3709

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AND CONSTRUCTION

CA 2.2
DRAINAGE AND
UTILITY PLAN
(NATURAL TURF)

CONSULTANTS

Civil & Survey
H. A. Chisholm, Inc.
1150 West 2nd Street
878 331-1871

Civil Architects
F. M. Smith, Inc.
1000 North Dakota Parkway, Suite 400
North Dakota 58104
878 331-1871

Landscaping
H. A. Chisholm, Inc.
1150 West 2nd Street
878 331-1871

Structural
Structural Engineering, Inc.
1000 North Dakota Parkway, Suite 400
North Dakota 58104
878 331-1871

Water
F. M. Smith, Inc.
1000 North Dakota Parkway, Suite 400
North Dakota 58104
878 331-1871

Pond Service
S. A. Ross and Company, Inc.
1000 North Dakota Parkway, Suite 400
North Dakota 58104

**NEW
WILLOW SPRINGS
MIDDLE SCHOOL**
Lovejoy Independent School District

PRK
Architecture
Engineering
Planning
Facility Consulting

Handwritten signature: M. J. Morgan
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06329
REGISTERED PROFESSIONAL ENGINEER
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Fax 972-233-1373
TX 00000000

PROJECT NO.	084
DATE	10/20/11
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AND CONSTRUCTION

CA 3.1F
SUBGRADE
GRADING PLAN
(SYNTHETIC TURF)

