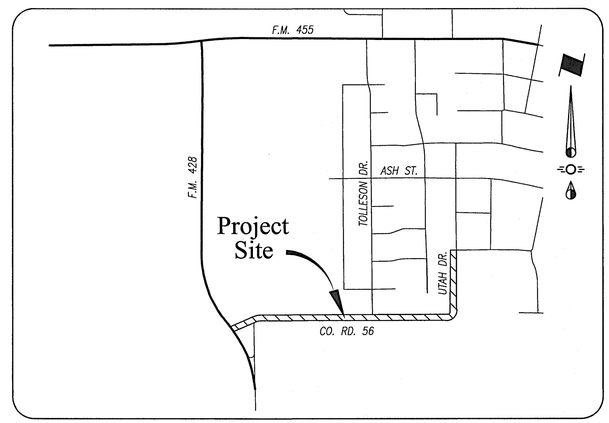
# CONSTRUCTION PLANS
# FOR
# W. SUNSET BLVD./ UTAH DRIVE
## CITY OF CELINA
## COLLIN COUNTY, TEXAS




Vicinity Map
N.T.S.

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| 9 | Erosion Control Plan |
| 10 | Signage & Striping Plan |
| 11 | Traffic Control Plan |
| Det-1 to Det-6 | Standard Details |


PREPARED FOR:

FORESTAR

Forestar Group
14755 Preston Road, Suite 710
Dallas, Texas 75254
Telephone (972) 341-2939
Contact: Randy McCuistion, P.E.

AS-BUILT DRAWINGS
THIS DRAWING HAS BEEN REVISED TO CONFORM TO THE CONSTRUCTION RECORDS PROVIDED BY THE CONTRACTOR. ALIGNMENT AND GRADES SHOWN ON THIS DRAWING WERE NOT FIELD VERIFIED BY THE ENGINEER.

TIM C. SPIARS, P.E.

1/25/16
DATE


spiars ENGINEERING
765 Custer Road, Suite 100 • Plano, TX 75075 • (972) 422-0077 • TBPE No. F-2121


STATE OF TEXAS
TIM C. SPIARS
LICENSED
PROFESSIONAL ENGINEER
1/25/16

13-157 W. SUNSET BLVD. / UTAH DRIVE

~~P-201402-01~~
P-201402-03

City of Celina
CONSTRUCTION GENERAL NOTES -Revised 8/12/2013

GENERAL

1. All construction shall be in accordance with the latest revision of the North Central Texas Council of Governments "Standard Specifications for Public Works Construction" including the Standard Drawings therein and the City of Celina's addendum thereto. Contractor shall have at least one set of approved Engineering Plans and Specifications on-site at all times.

2. Before beginning construction, the contractor shall prepare a construction sequence schedule. The construction schedule shall be such that there is minimum interference with traffic along or adjacent to the project.

3. Construction may not begin earlier than 7:00 A.M. on weekdays nor continue after dark without permission from the City of Celina. Construction on holidays and Saturday must be approved two days in advance. A fee of $300.00 a day for working on holidays and Saturday will be accessed payable to the city before work is performed. Work may not begin before 8:00 A.M. on holidays and Saturday and work on Sunday is prohibited without special permission and payment of fees.

4. Utilities shown on the plans were taken from field surveys and information provided by the utility companies. The completeness and the accuracy of this data is not guaranteed.

The contractor is responsible for verifying the location of all underground utilities and structures and protecting them from damage during construction.

It will be the responsibility of each contractor to protect all existing public and private utilities throughout the construction of this project. Contractor shall contact the appropriate utility companies for line location prior to commencement of construction and shall assume full liability to those companies for any damages caused to their facilities.

| | |
|---|---|
| DIG TESS | 800-DIG-TESS |
| GCEC-TELECOM | 903-482-7274 |
| GCEC-ELECTRIC | 903-821-3007 |
| AT&T | 972-569-3013 |
| ATMOS ENERGY | 972-881-4161 |
| ATMOS ENERGY | 214-341-9900 |
| CROSSTEX ENERGY | 817-570-6753 |
| ONEOK | 903-257-6594 |
| COSERV-ELEC | 940-321-7800 |
| COSERV-GAS | 940-321-7800 |
| CITY OF CELINA | 972-382-2682 |
| TOWN OF PROSPER | 972-347-9969 |
| MARILEE SUD | 972-382-3222 |
| GRANDE | 972-410-0583 |
| SUDDEN LINK | 469-853-0486 |

5. Work may not be backfilled or covered until the City has inspected it.

6. Material testing shall be performed by an independent testing laboratory and paid for by the Contractor. The following material tests shall be provided by the Contractor:

a. Embankment – One soil density test shall be performed at each location for each 500 C.Y. of backfill placed.
b. Pavement Sub grade – One gradation test (where lime stabilized) and one soil density test shall be performed for each 300 linear feet of pavement unless otherwise noted. Gradations must pass 100% through a 1 ¾"sieve and 60% through a #4 sieve.
c. Utility Trench Backfill – One soil density test shall be performed at 300 feet intervals or as directed by the Inspector.
d. Concrete Tests:
(1). Compressive Strength – Four test cylinders shall be taken from a representative portion of the concrete being placed for every 150-cubic yards of concrete pavement placed, but in no case shall less than 2 sets of cylinders be taken from any one day's placement.)
(2). Air, slump, and temperature tests shall be taken for every set of cylinders made. Concrete with a temperature above 95° F will be rejected.
(3). Additional cylinders and/or tests may be required at the Inspector's discretion.

The City shall select the location and depth of each soil density test unless otherwise directed.

7. All excavation on the project is unclassified.

8. Temporary erosion control shall be used to minimize the spread of silt and mud from the project on to existing streets, alleys, drainage ways and public and private property. Temporary erosion controls may include silt fences, rock check dams, stabilized construction entrances, straw bales, berms, dikes, swales, strips of undisturbed vegetation, check dams and other methods as required by the City Manager or his representative and shall conform to the Storm Water Quality Best Management Practices for Construction Activities as published by the North Central Texas Council of Governments and the City of Celina Erosion and Sediment Control Manual.

9. Finished slopes on public rights-of-way and easements shall not be steeper than 4:1. All slopes steeper than 6:1 shall be covered with erosion control matting and are hydro mulched and maintained by the contractor until grass covers all parts of the slope.

10. The contractor shall maintain two-way traffic at all times along the project.

11. Remove, salvage and replace all street and traffic control signs, which may be damaged by the construction of the project.

12. All trenching and excavation shall be performed in accordance with OSHA standards. Trench safety design will be the responsibility of the Contractor. Contractor shall submit a trench safety design approved by a professional engineer to the City for review prior to the start of any underground utility construction.

PAVING

1. All embankments shall be compacted to 95% Standard Proctor density.

2. All streets and alleys shall be placed on lime stabilized sub grade with a lime content of not less than 7%. or as approved by city engineer.

3. The minimum 28 day compressive strength of concrete street paving shall not be less than 3600 psi and shall be air entrained. Water may not be applied to the surface of concrete paving to improve workability.

4. All curb and gutter shall be integral with the pavement.

5. Parabolic crowns are required on all street pavements except on major thoroughfares where straight sections are required.

6. Streets and alleys shall be constructed with provisions for sidewalk ramps at all intersections.

DRAINAGE

1. Storm sewer pipe shall be reinforced concrete, Class III unless otherwise noted.

2. All structural concrete shall be Class "C" (3600 psi compressive strength at 28 days), air entrained.
1.

3. The contractor shall install plugs in storm sewer lines or otherwise prevent mud from entering the storm sewer system during construction.

WATER AND SANITARY SEWER

1. Water mains shall be AWWA C-900 or 905 PVC Class 200 unless otherwise noted. Minimum cover for waterlines is 48" below top of curb, 60" where no curbed street is present or as required to clear existing utilities, whichever is greater. Class B+ embedment unless otherwise noted.

2. All utility trench backfill shall be performed in 12"loose lifts and mechanically compacted with approved vibratory methods.

3. Marking tape shall be installed one foot above and over PVC water lines.

4. Fittings for PVC water lines shall be ductile iron and be encased in a polyethylene sheath.

5. All Mechanical Joints will be restrained. (Mega-Lug etc.)

6. Valves, including tapping valves shall be resilient seat gate valves, unless noted otherwise.

7. All direct burial valves shall be provided with cast iron valve boxes with PVC stacks. Valve stacks shall be vertical and concentric with the valve stem. Stainless steel valve extensions are required on all valves where the operating nut is greater than 4 feet below finished grade.

8. Fire hydrants shall be Waterous or equal as directed or approved by the City of Celina on a case by case basis and field painted silver with bonnet and caps color-coded to pipe size.
a. Six inch line- silver body with RED bonnet and caps.
b. Eight inch line- silver body with BLUE bonnet and caps.
c. Ten inch line- silver body with GREEN bonnet and caps.
d. Twelve inch and larger- silver body with YELLOW bonnet and caps.

9. All exposed bolting on any buried equipment or material shall be stainless steel. Included are:
a. Bonnet and stuffing box bolts on valves.
b. Shoe bolts on fire hydrants.
c. Flange bolts.
d. "Cor-ten" mechanical joint "T" bolts are acceptable for direct burial service.

10. Depending on meter size; meter boxes shall be DFW37C-12-1SAF, DFW38C-14-1SAF, DFW65C-14-1SAF, or approved equal, and shall incorporate the Celina logo in the lid.
11. One sample station shall be provided to the city for every 250 connections.

Sanitary sewer mains shall be DR 35 PVC. Embedment shall be Class H unless otherwise noted.

a. The contractor shall install and maintain watertight plugs in all connections to the City's sanitary sewer system until the City accepts the project.
b. All sanitary sewer lines and manholes shall be leak tested before the project is accepted. Deflection testing of PVC sewer lines is required. Deflection shall be tested with a mandrel for 5% deflection.
c. All sewer lines shall be video inspected with a copy of the video and station report submitted to the Inspector.
d. Mandrel, Air Test, and Video inspection shall not be performed until all utilities are complete, in place, and backfilled.

Specifications are not meant to exclude any other manufacturer. Any specification may be replaced with an approved equal upon approval by the City of Celina.

AS-BUILT DRAWINGS
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TIM C. SPIARS, P.E.
1/25/16
DATE

~~P-201402-01~~

Spiars Engineering
765 Custer Road, Suite 100 • Plano, TX 75075 • (972) 422-0077 • TBPE No. F-2121

STATE OF TEXAS
TIM C. SPIARS
LICENSED PROFESSIONAL ENGINEER
1/25/16

W. SUNSET BLVD. / UTAH DRIVE
CITY OF CELINA
COLLIN COUNTY, TEXAS

GENERAL NOTES

Issue Dates:

Date

Revisions

Scale: NA
Drawn By: RAS
Checked By: JMH
Sheet 1 of 11
SEI No. 13-157

## CAUTION !!!
### EXISTING UTILITIES

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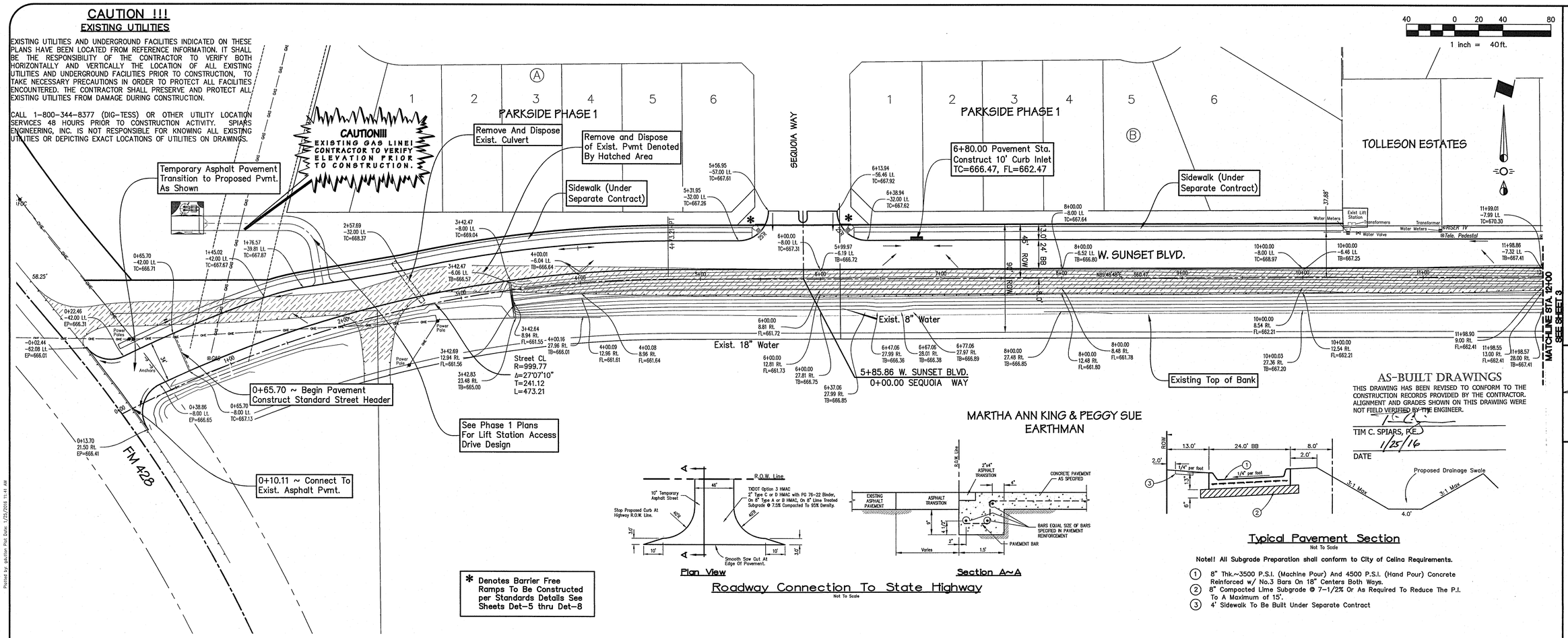


MARTHA ANN KING & PEGGY SUE EARTHMAN




Plan View — Section A~A

Roadway Connection To State Highway
Not To Scale




Typical Pavement Section
Not To Scale

Note!! All Subgrade Preparation shall conform to City of Celina Requirements.

1. 8" Thk.~3500 P.S.I. (Machine Pour) And 4500 P.S.I. (Hand Pour) Concrete Reinforced w/ No.3 Bars On 18" Centers Both Ways.
2. 8" Compacted Lime Subgrade @ 7-1/2% Or As Required To Reduce The P.I. To A Maximum of 15'.
3. 4' Sidewalk To Be Built Under Separate Contract

* Denotes Barrier Free Ramps To Be Constructed per Standards Details See Sheets Det-5 thru Det-8

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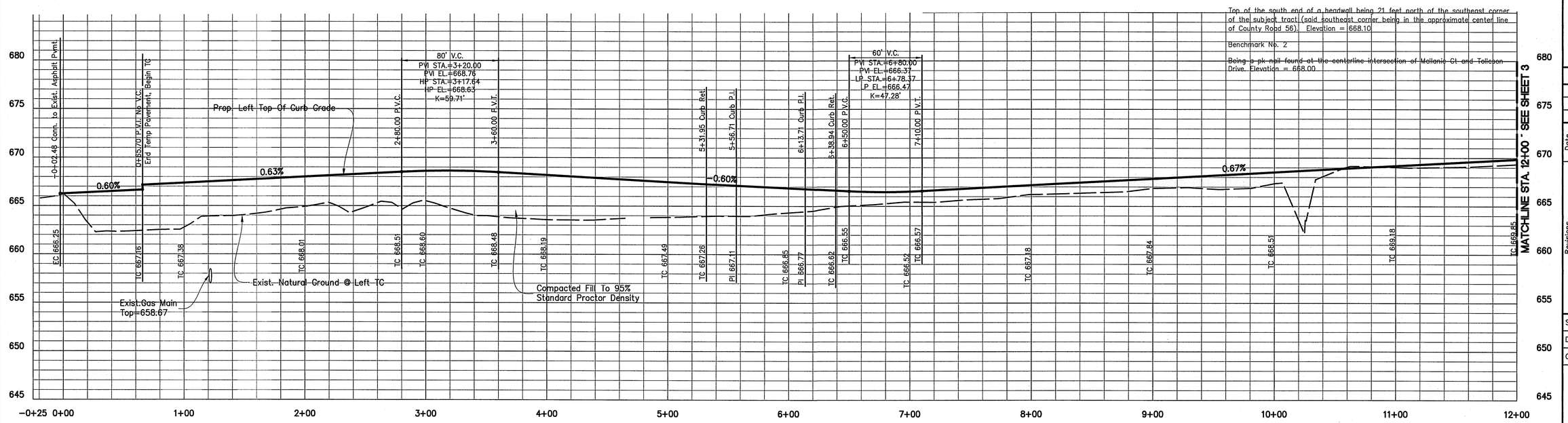
Benchmark No. 1
Top of the south end of a headwall being 21 feet north of the southeast corner of the subject tract (said southeast corner being in the approximate center line of County Road 56). Elevation = 668.10

Benchmark No. 2
Being a pk nail found at the centerline intersection of Mellanic Ct and Tolleson Drive. Elevation = 668.00




P-201402-01

P-201402-03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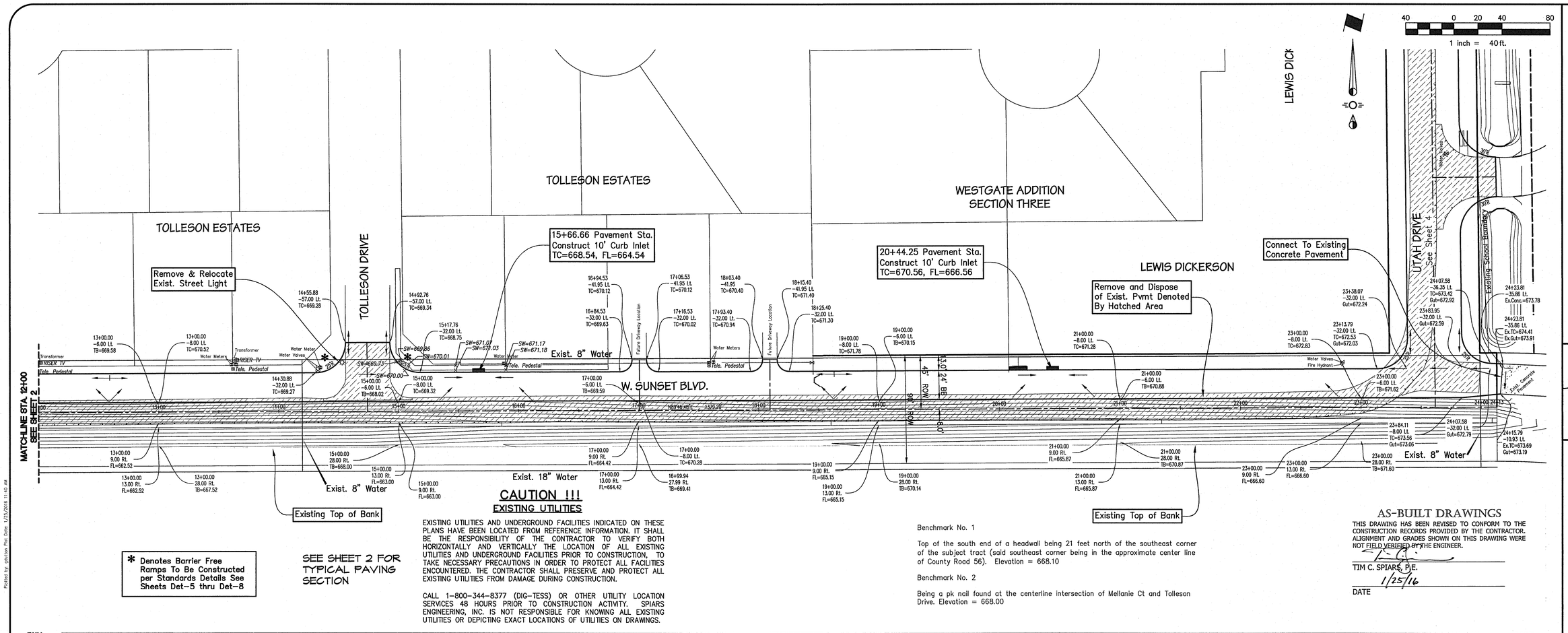
STATE OF TEXAS — TIM C. SPIARS — 84875 — LICENSED PROFESSIONAL ENGINEER — 1/25/16

# W. SUNSET BLVD. / UTAH DRIVE
## CITY OF CELINA
COLLIN COUNTY, TEXAS
## PAVING PLAN

Issue Dates:

| Date | Revisions |
|---|---|

Scale: 1"=40'H, 1"=5' V
Drawn By: RAS
Checked By: JMH
Sheet 2 of 11
SEI No. 13-157




* Denotes Barrier Free Ramps To Be Constructed per Standards Details See Sheets Det-5 thru Det-8

SEE SHEET 2 FOR TYPICAL PAVING SECTION

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1/25/16
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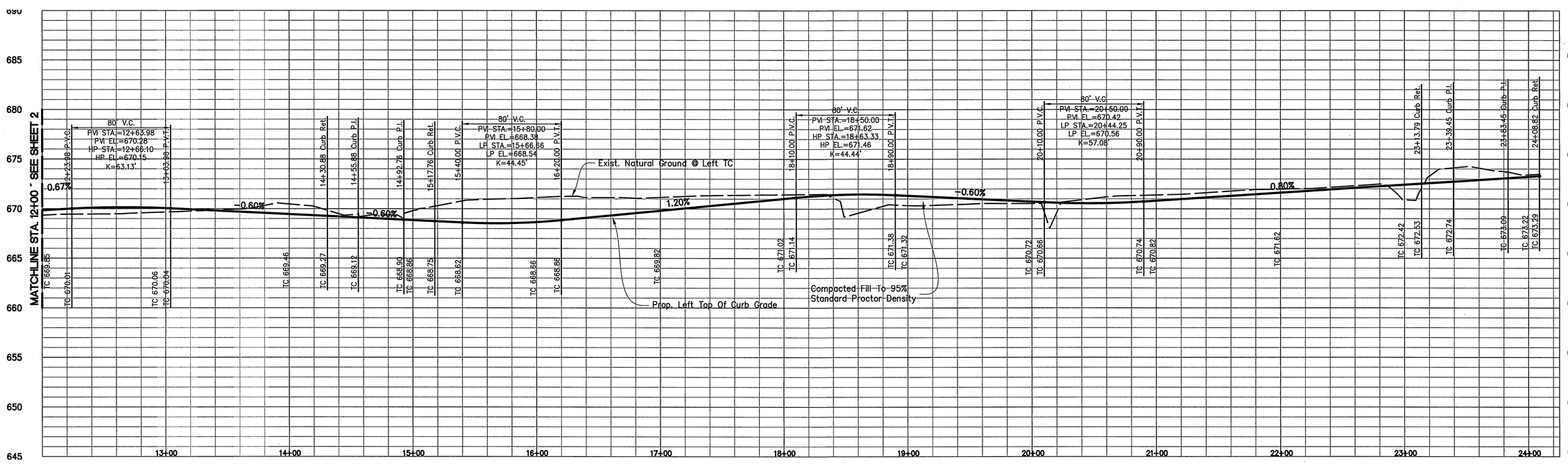


P-201402-01


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STATE OF TEXAS — TIM C. SPIARS — LICENSED PROFESSIONAL ENGINEER — 1/25/16

# W. SUNSET BLVD. / UTAH DRIVE
## CITY OF CELINA
## COLLIN COUNTY, TEXAS
## PAVING PLAN

Issue Dates:

| Revisions | Date |
|---|---|
| Added Driveway Turnouts @ Stations 16+84.53 and 17+93.40 Along North Row Line | 1-29-15 |
| Revised Intersection at Utah and Connection to Existing Pavement | 3-18-15 |

Scale: 1"=40'H, 1"=5' V

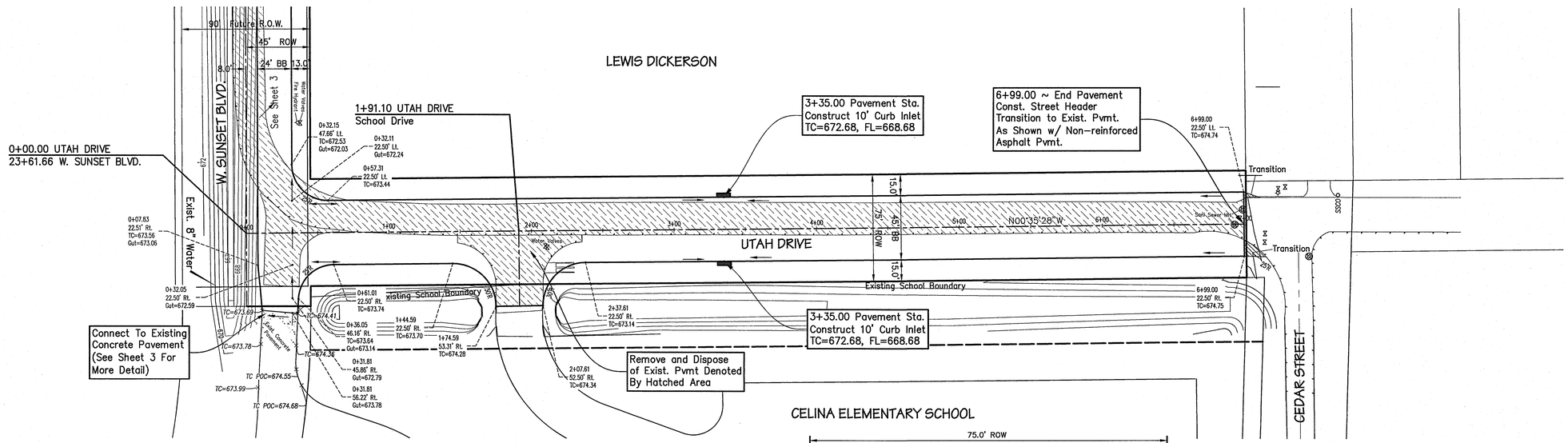
Drawn By: RAS

Checked By: JMH

Sheet 3 of 11

SEI No. 13-157

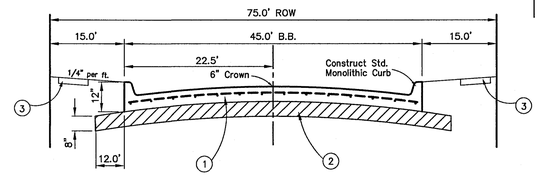
P-201402-03




40 0 20 40 80

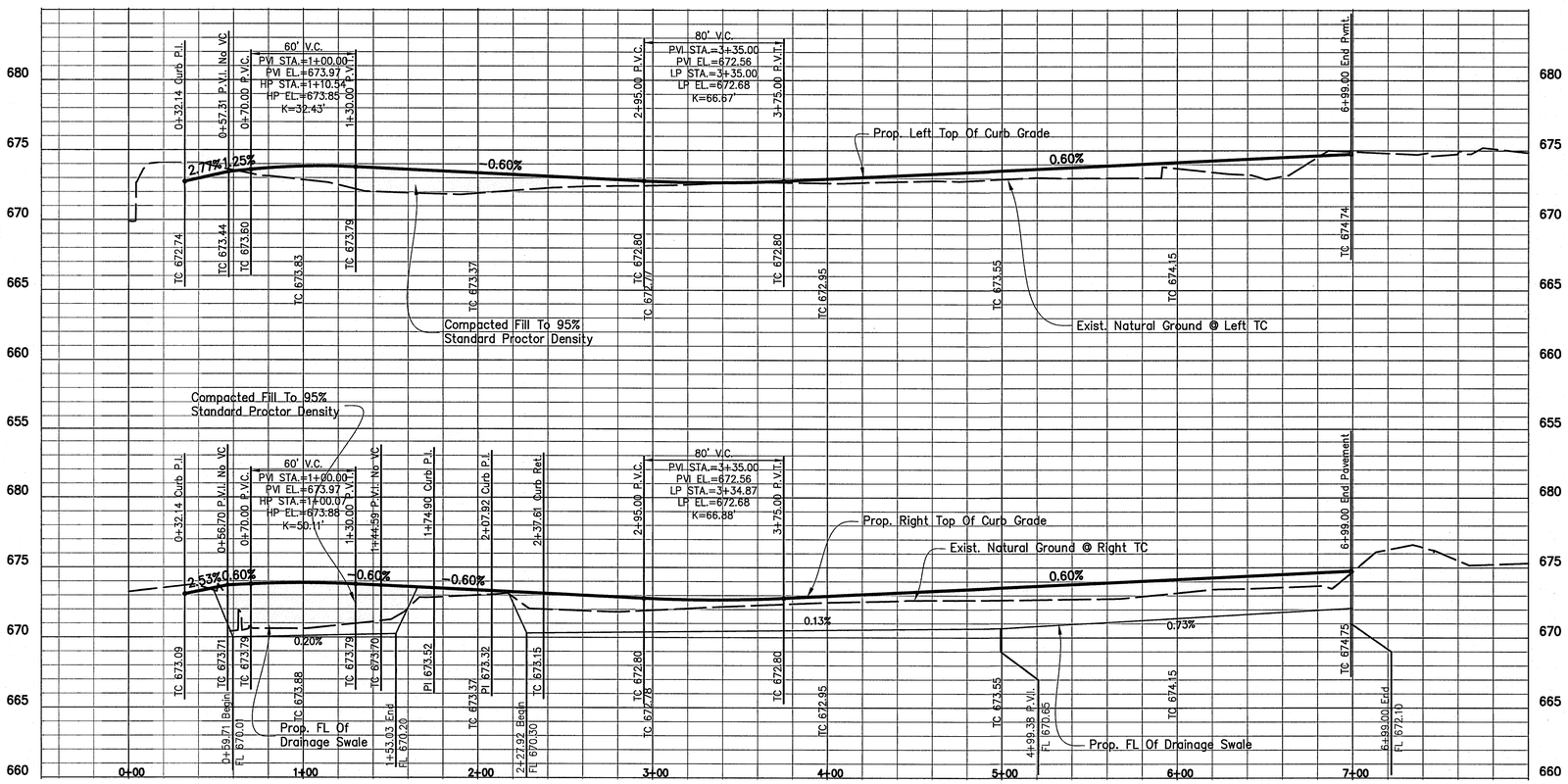
1 inch = 40 ft.

* Denotes Barrier Free Ramps To Be Constructed per Standards Details See Sheets Det-5 thru Det-8




**Note! All Subgrade Preparation shall conform to City of Celina Requirements.**

1. 8" Thk.~3500 P.S.I. (Machine Pour) And 4500 P.S.I. (Hand Pour) Concrete Reinforced w/ No.3 Bars On 18" Centers Both Ways.
2. 8" Compacted Lime Subgrade @ 7-1/2% Or As Required To Reduce The P.I. To A Maximum of 15'.
3. 4' Sidewalk With A Minimum of 4" Thickness And A Minimum Of 3,000 P.S.I.

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1/25/16

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STATE OF TEXAS — TIM C. SPIARS — 84017 — LICENSED PROFESSIONAL ENGINEER — 1/25/16

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## CITY OF CELINA
## COLLIN COUNTY, TEXAS
## PAVING PLAN

Issue Dates:

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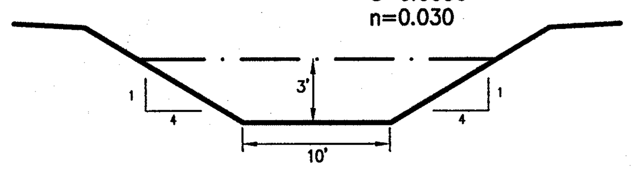
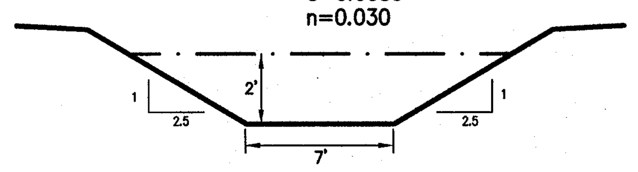
Sheet 4 of 11

SEI No. 13-157

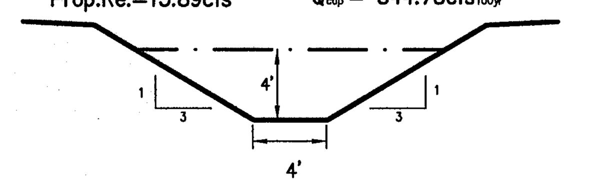
P-201402-03



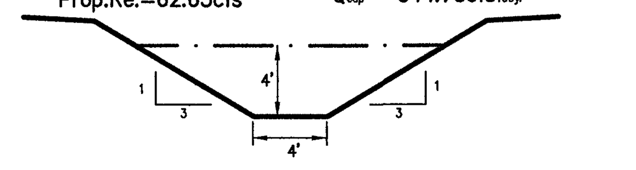

Typical Swale Detail
North of Culvert
Section A–A



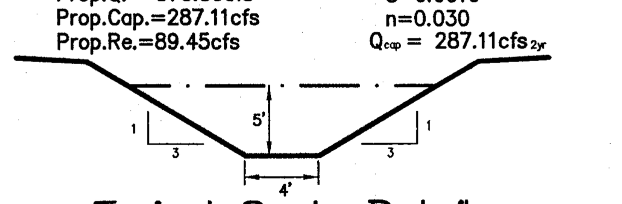

Typical Swale Detail
South of School
Section B–B



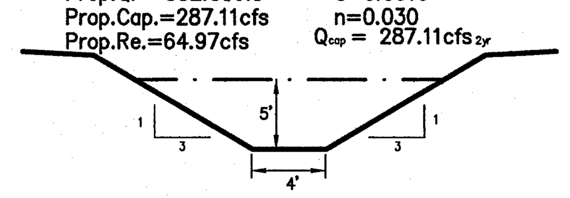

Typical Swale Detail
South of W. Sunset Blvd. (CR56)
Section C–C



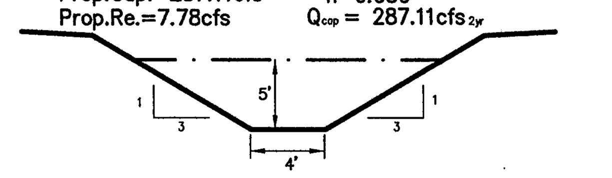

Typical Swale Detail
South of W. Sunset Blvd. (CR56)
Section D–D




Typical Swale Detail
South of W. Sunset Blvd. (CR56)
Section E–E




Typical Swale Detail
South of W. Sunset Blvd. (CR56)
Section F–F




Typical Swale Detail
South of W. Sunset Blvd. (CR56)
Section G–G

## Totals

Total Exist. Released = 267.50cfs
Total Proposed Released = 240.74cfs

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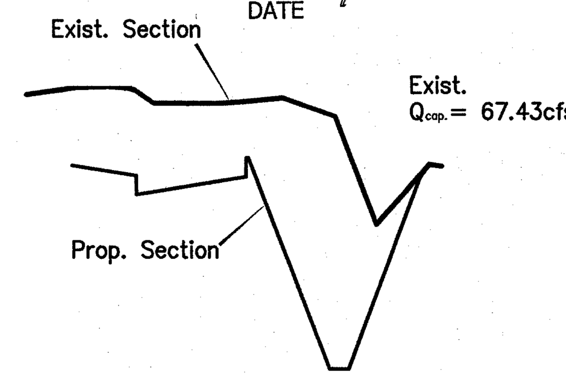
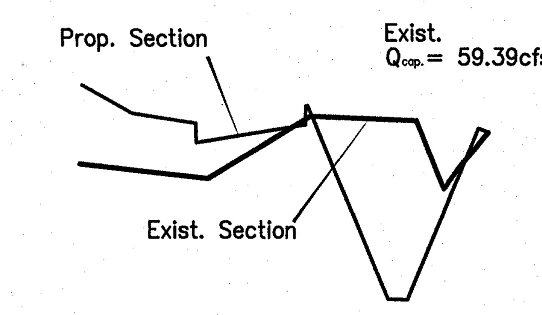
DATE 1/25/16

100 0 50 100 200
1 inch = 100ft.




Typical Ex./Prop. Swale Detail
South of W. Sunset Blvd. (CR56)
Section 1–1




Typical Ex./Prop. Swale Detail
South of W. Sunset Blvd. (CR56)
Section 2–2

## Legend

Ex.Q = Existing Flow In Drainage Swale
Ex.Cap. = Existing Capacity of the Drainage Swale
Ex.Rel. = Existing Runoff Being Released Out Of The Drainage Swale
Prop.Q = Proposed Flow In Drainage Swale
Prop.Cap. = Proposed Capacity in Drainage Swale
Prop.Rel. = Proposed Runoff Being Released Out Of The Drainage Swale

Benchmark No. 1

Top of the south end of a headwall being 21 feet north of the southeast corner of the subject tract (said southeast corner being in the approximate center line of County Road 56). Elevation = 668.10

Benchmark No. 2

Being a pk nail found at the centerline intersection of Mellanie Ct and Tolleson Drive. Elevation = 668.00

NOTE:
The Proposed Drainage Swale on South side of W. Sunset Blvd. is to be Replaced by a Future Drainage System with the full Development of the South Side of W. Sunset Blvd.

## CAUTION !!!

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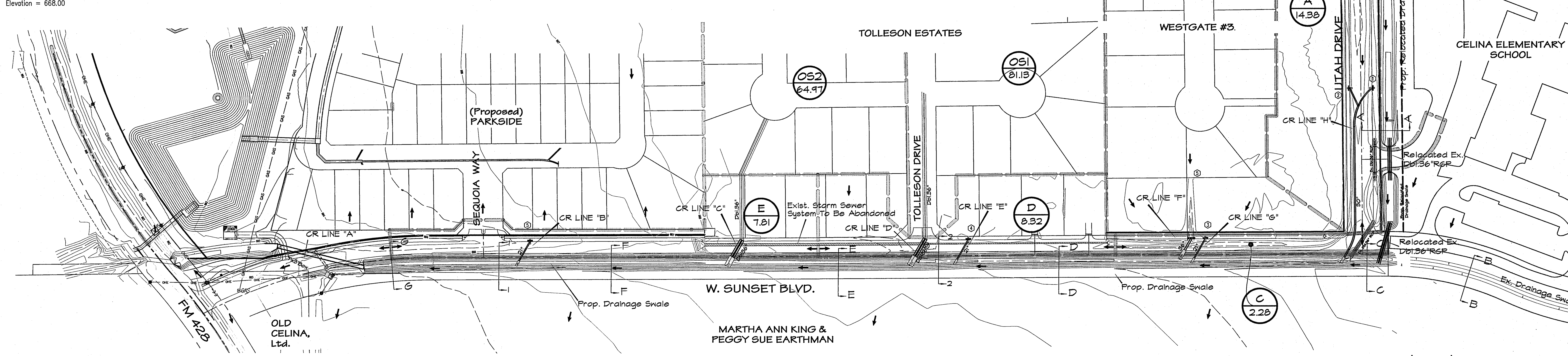


## Storm Sewer Calculations

| RUNOFF COLLECTION POINTS UPSTREAM STATION | DOWNSTREAM STATION | DISTANCE BETWEEN COLLECTION POINT | INCREMENTAL DRAINAGE AREA AREA NO. | TOTAL AREA 'A' (ACRES) | AREA PICKED UP (ACRES) | RUNOFF COEFFICIENT 'C' | TOTAL INCREMENT 'CA' | BYPASS FROM UPSTREAM 'CA' | TOTAL TO COLLECT 'CA' | INCREMENT 'CA' PICKED UP | TOTAL ACCUMULATED 'CA' | ACCUMULATED 'CA' IN SYSTEM | BYPASS 'CA' | TIME AT UPSTREAM STATION (MIN) | DESIGN STORM (YRS.) | INTESITY 'I' (IN/HR) | STORM WATER RUNOFF 'Q' (CFS) | SLOPE OF HYDRAULIC GRADIENT 'S' (FT/FT) | STORM SEWER SIZE (IN) | VELOCITY IN SEWER BETWEEN POINTS 'V' (FPS) | VELOCITY HEAD LOSS (FEET) | FLOW TIME IN SEWER (MIN) | TIME AT DOWN-STREAM STATION (MIN) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LINE A | | | | | | | | | | | | | | | | | | | | | | | |
| 1 + 79.69 | 0 + 0.00 | 179.69 | Multy | 49.68 | 49.70 | 0.60 | 29.81 | 0.00 | 29.81 | 29.82 | 29.81 | 29.82 | -0.01 | 15.00 | 100 | 7.52 | 224.25 | 0.0082 | 7'x3' | 10.70 | 1.78 | 0.28 | 15.28 |
| 0 + 0.00 | | | | | | | | | | | | | | | | | | | | | | | |
| LINE B | | | | | | | | | | | | | | | | | | | | | | | |
| 0 + 46.63 | 0 + 0.00 | 46.63 | E | 1.73 | 1.73 | 0.60 | 1.04 | 0.00 | 1.04 | 1.04 | 1.04 | 1.04 | 0.00 | 15.00 | 100 | 7.52 | 7.82 | 0.0024 | 21 | 3.30 | 0.17 | 0.24 | 15.24 |
| 0 + 0.00 | | | | | | | | | | | | | | | | | | | | | | | |
| LINE C | | | | | | | | | | | | | | | | | | | | | | | |
| 0 + 49.19 | 0 + 0.00 | 49.19 | OS2 | 14.40 | 14.40 | 0.60 | 8.64 | 0.00 | 8.64 | 8.64 | 8.64 | 8.64 | 8.64 | 15.00 | 100 | 7.52 | 64.97 | 0.0095 | 36 | 9.20 | 1.31 | 0.09 | 15.09 |
| 0 + 0.00 | | | | | | | | | | | | | | | | | | | | | | | |
| LINE D | | | | | | | | | | | | | | | | | | | | | | | |
| 0 + 52.39 | 0 + 0.00 | 52.39 | OS1 | 17.98 | 17.98 | 0.60 | 10.79 | 0.00 | 10.79 | 10.79 | 10.79 | 10.79 | 10.79 | 15.00 | 100 | 7.52 | 81.14 | 0.0148 | 36 | 11.50 | 2.05 | 0.08 | 15.08 |
| 0 + 0.00 | | | | | | | | | | | | | | | | | | | | | | | |
| LINE E | | | | | | | | | | | | | | | | | | | | | | | |
| 0 + 47.30 | 0 + 0.00 | 47.30 | D | 1.84 | 1.84 | 0.60 | 1.11 | 0.00 | 1.11 | 1.11 | 1.11 | 1.11 | 0.00 | 15.00 | 100 | 7.52 | 8.35 | 0.0028 | 21 | 3.50 | 0.19 | 0.23 | 15.23 |
| 0 + 0.00 | | | | | | | | | | | | | | | | | | | | | | | |
| LINE F | | | | | | | | | | | | | | | | | | | | | | | |
| 0 + 65.60 | 0 + 0.00 | 65.60 | B | 10.19 | 10.19 | 0.60 | 6.11 | 0.00 | 6.11 | 6.11 | 6.11 | 6.11 | 0.00 | 15.00 | 100 | 7.52 | 45.95 | 0.0047 | 36 | 6.50 | 0.66 | 0.17 | 15.17 |
| 0 + 0.00 | | | | | | | | | | | | | | | | | | | | | | | |
| LINE G | | | | | | | | | | | | | | | | | | | | | | | |
| 0 + 47.32 | 0 + 0.00 | 47.32 | C | 0.51 | 0.51 | 0.60 | 0.30 | 0.00 | 0.30 | 0.30 | 0.30 | 0.30 | 0.00 | 15.00 | 100 | 7.52 | 2.26 | 0.0002 | 21 | 0.90 | 0.01 | 0.88 | 15.88 |
| 0 + 0.00 | | | | | | | | | | | | | | | | | | | | | | | |
| LINE H | | | | | | | | | | | | | | | | | | | | | | | |
| 3 + 60.31 | 3 + 13.99 | 46.32 | 1/2 A | 1.59 | 1.59 | 0.60 | 0.95 | 0.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.00 | 15.00 | 100 | 7.52 | 7.14 | 0.0020 | 21 | 3.00 | 0.14 | 0.26 | 15.26 |
| 3 + 13.99 | 0 + 0.00 | 313.99 | 1/2 A | 1.60 | 1.60 | 0.60 | 0.96 | 0.00 | 0.96 | 0.96 | 1.91 | 1.91 | 0.00 | 15.26 | 100 | 7.49 | 14.31 | 0.0012 | 30 | 2.90 | 0.13 | 1.80 | 17.06 |
| 0 + 0.00 | | | | | | | | | | | | | | | | | | | | | | | |

## Onsite Drainage Data

"I2 yr"= 3.65
" C "=0.60

| Area# | Acres | Tc | " I100 yr." | " C " | "100 yr.CFS" | "2 yr CFS" |
|---|---|---|---|---|---|---|
| A | 3.19 | 15.00 | 7.52 | 0.60 | 14.38 | 6.99 |
| B | 10.19 | 15.00 | 7.52 | 0.60 | 45.99 | 22.32 |
| C | 0.51 | 15.00 | 7.52 | 0.60 | 2.28 | 1.12 |
| D | 1.84 | 15.00 | 7.52 | 0.60 | 8.32 | 4.03 |
| E | 1.73 | 15.00 | 7.52 | 0.60 | 7.81 | 3.79 |

## Offsite Drainage Data

"I2 yr"= 3.65
" C "=0.60

| Area# | Acres | Tc | " I100 yr." | " C " | "100 yr CFS" | "2 yr CFS" |
|---|---|---|---|---|---|---|
| OS1 | 17.98 | 15.00 | 7.52 | 0.60 | 81.13 | 39.38 |
| OS2 | 14.40 | 15.00 | 7.52 | 0.60 | 64.97 | 31.54 |

## Legend

A / 10.69 = Area / $Q_{100}$
= Drainage Area Divide
= Existing Contours
= Direction Of Flow

**Subdivision**

C = 0.60 $I_{100}$ = 7.52 Tc = 15 min.
C = 0.60 $I_{25}$ = 6.25 Tc = 15 min.
C = 0.60 $I_{2}$ = 3.65 Tc = 15 min.

## Inlet Calculations

| INLET LOCATION No. | STREET NAME | Design Storm Frequency (YEARS) | AREA RUNOFF - Q=CIA Time Of "C" (MIN) | Intensity (In/Hr) "I" | Runoff Coefficient "C" | Area In Acres "A" | Runoff (CFS) "Q" | Carry Over From Upstream Inlet (CFS) | Total Gutter Flow (CFS) | Gutter Slope (CFS) | Gutter Capacity To Crown (CFS) | Pavement Capacity To TC (CFS) | Crown Type | SELECTED INLETS Length 'LI' (FEET) | Type | Inlet Capacity (CFS) | Intercepted Flow (CFS) | Carry Over To Downstream Inlet (CFS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3+35.00 Utah Drive | 100 | 15 | 7.52 | 0.6 | 1.53 | 6.88 | 0.00 | 6.88 | Sag | N/A | N/A | 5" Par. | 10 | Curb | 20.00 | 6.88 | 0.00 |
| 2 | 3+35.00 Utah Drive | 100 | 15 | 7.52 | 0.6 | 1.53 | 6.88 | 0.00 | 6.88 | Sag | N/A | N/A | 5" Par. | 10 | Curb | 20.00 | 6.88 | 0.00 |
| 3 | 20+44.09 W. Sunset Blvd. | 100 | 15 | 7.52 | 0.6 | 0.51 | 2.30 | 0.00 | 2.30 | Sag | N/A | N/A | 1/4 per ft | 10 | Curb | 20.00 | 2.30 | 0.00 |
| 4 | 15+66.40 W. Sunset Blvd. | 100 | 15 | 7.52 | 0.6 | 1.84 | 8.30 | 0.00 | 8.30 | Sag | N/A | N/A | 1/4 per ft | 10 | Curb | 20.00 | 8.30 | 0.00 |
| 5 | 6+80.02 W. Sunset Blvd. | 100 | 15 | 7.52 | 0.6 | 1.68 | 7.58 | 0.00 | 7.58 | Sag | N/A | N/A | 1/4 per ft | 10 | Curb | 20.00 | 7.58 | 0.00 |
| 6 | Westgate #3 Flume | 100 | 15 | 7.52 | 0.6 | 10.19 | 45.98 | 0.00 | N/A | N/A | N/A | N/A | N/a | 10 | MOD.Curb | 48.15 | 45.98 | 0.00 |

P-201402-01


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765 Custer Road, Suite 100 • Plano, TX 75075 • (972) 422-0077 • TBPE No. F-2121


STATE OF TEXAS — TIM C. SPIARS — 84017 — LICENSED PROFESSIONAL ENGINEER — 1/25/16

# W. SUNSET BLVD. / UTAH DRIVE
## CITY OF CELINA
## COLLIN COUNTY, TEXAS
## DRAINAGE AREA MAP

Issue Dates:

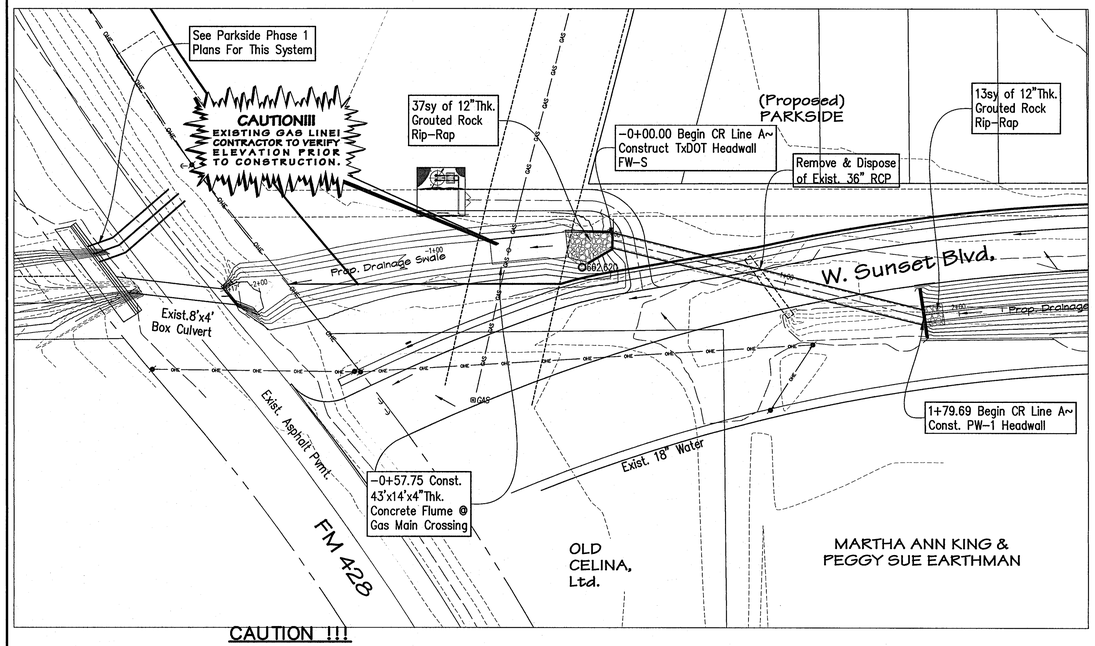
Date

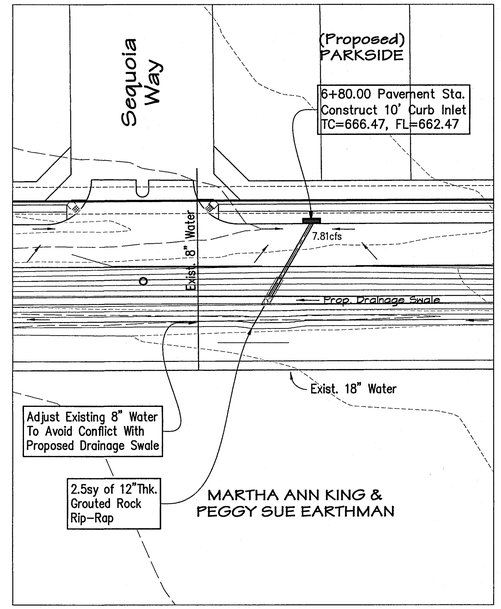
Revisions

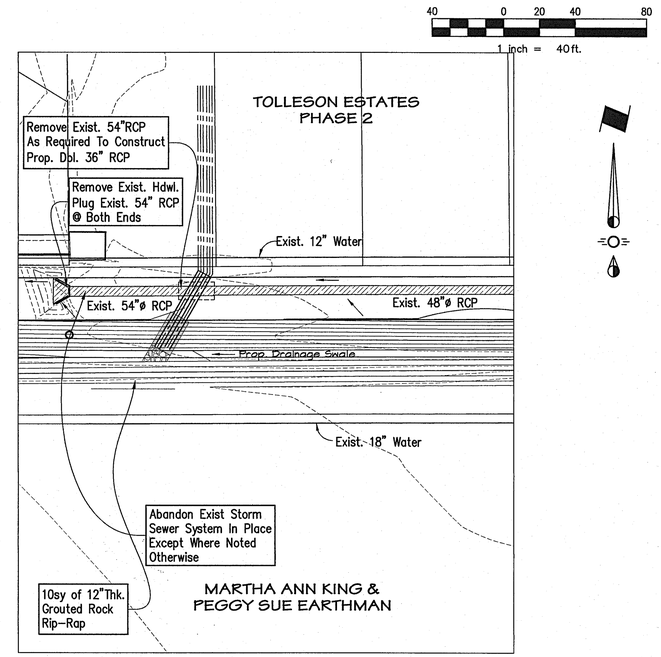
Scale: 1"=100'
Drawn By: RAS
Checked By: JMH



SEI No. 13-157

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SEE SHEET 5 FOR DRAINAGE SWALE TYPICAL SECTIONS

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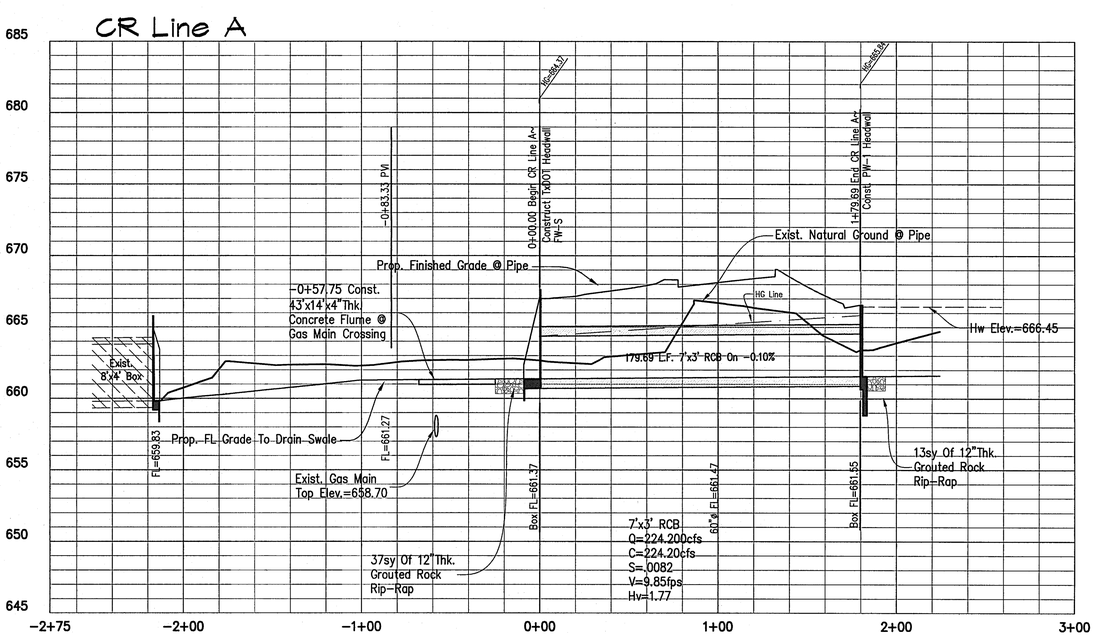
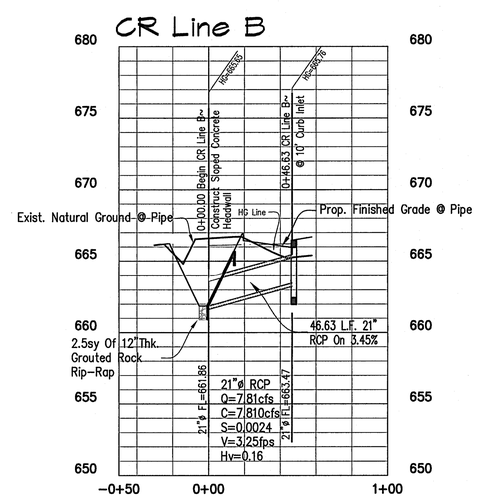
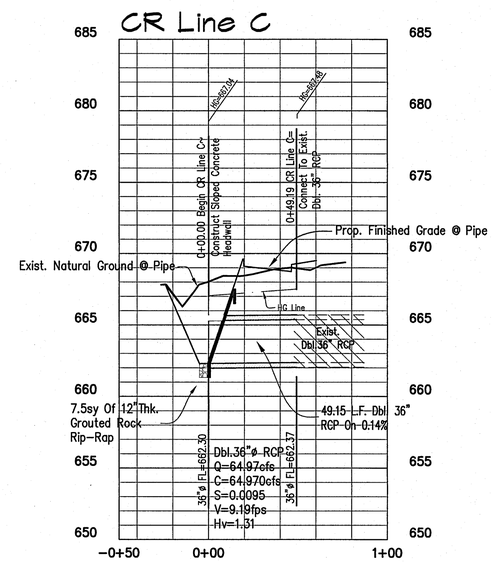
Top of the south end of a headwall being 21 feet north of the southeast corner of the subject tract (said southeast corner being in the approximate center line of County Road 56). Elevation = 668.10

Benchmark No. 2

Being a pk nail found at the centerline intersection of Mellanie Ct and Tolleson Drive. Elevation = 668.00




## Legend

- Barrier Free Ramp
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- Proposed Storm Sewer Manhole With Inlet
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TIM C. SPIARS, P.E.

1/25/16

DATE

~~P-201402-01~~

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765 Custer Road, Suite 100 • Plano, TX 75075 • (972) 422-0077 • TBPE No. F-2121

STATE OF TEXAS — TIM C. SPIARS — 54017 — LICENSED PROFESSIONAL ENGINEER — 1/25/16

# W. SUNSET BLVD. / UTAH DRIVE
## CITY OF CELINA
## COLLIN COUNTY, TEXAS
## STORM SEWER PLAN & PROFILE

Issue Dates:

| Revisions | Date |
|---|---|
| Revised Grading Around Headwall Line A | 1-07-15 |

Scale: 1"=100'

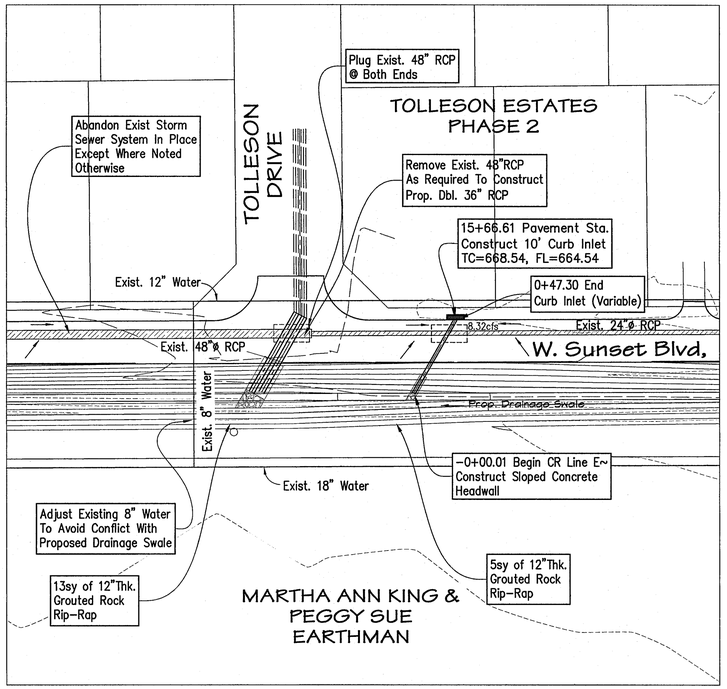
Drawn By: RAS

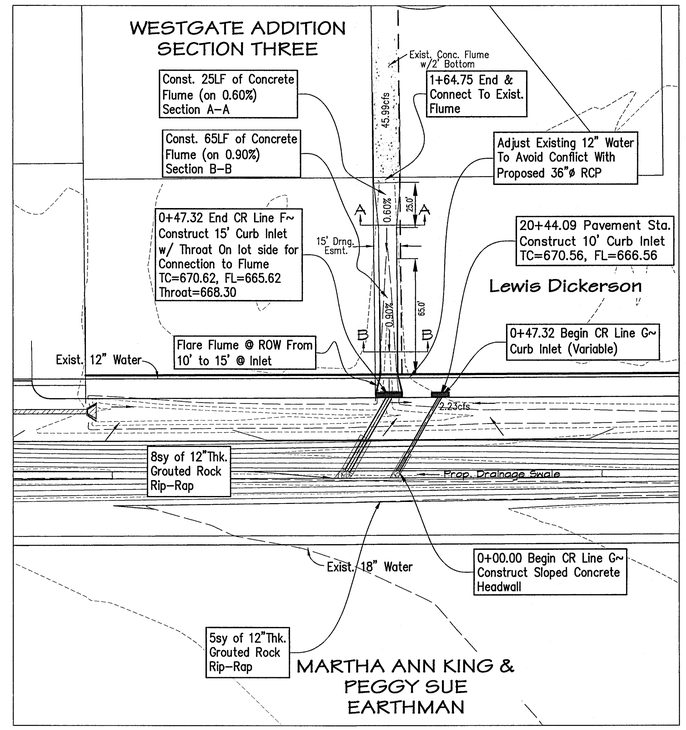
Checked By: JMH

Sheet 6 of 11

SEI No. 13-157

P-201402-03

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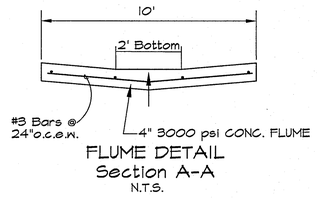
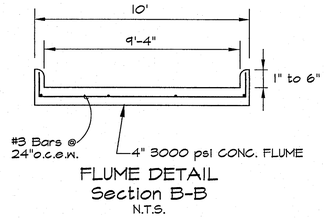
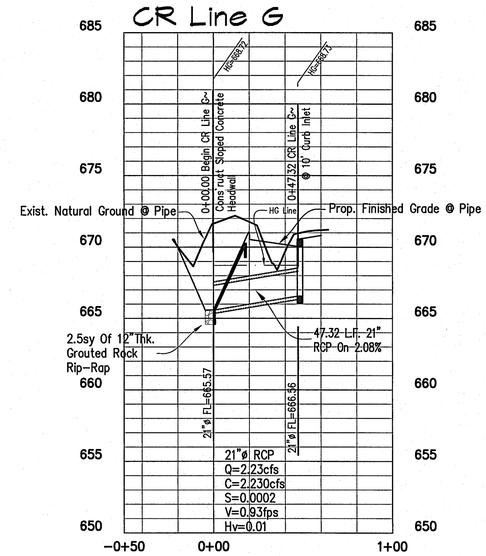
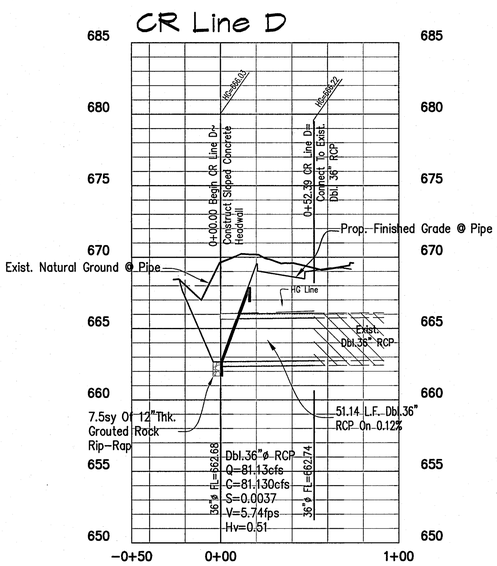


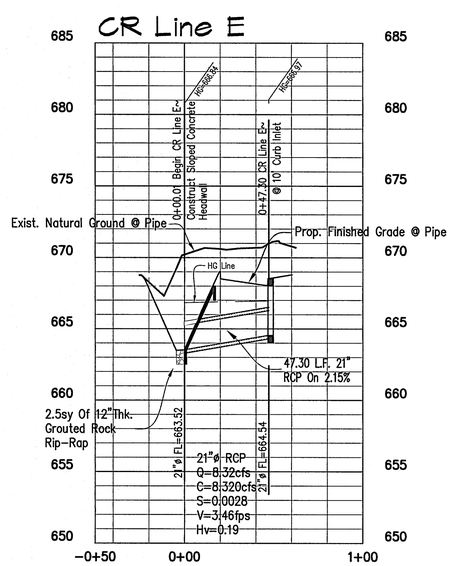

FLUME DETAIL
Section A-A
N.T.S.

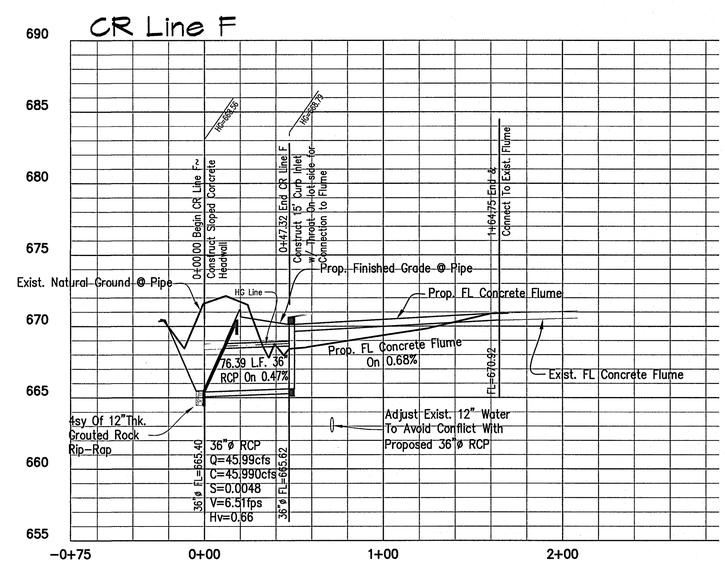



FLUME DETAIL
Section B-B
N.T.S.

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1/25/16

DATE


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STATE OF TEXAS — TIM C. SPIARS — 85908 — LICENSED PROFESSIONAL ENGINEER — 1/25/16

# W. SUNSET BLVD. / UTAH DRIVE
CITY OF CELINA
COLLIN COUNTY, TEXAS
STORM SEWER PLAN & PROFILE

Issue Dates:

Date

Revisions

Scale: 1"=100'

Drawn By: RAS

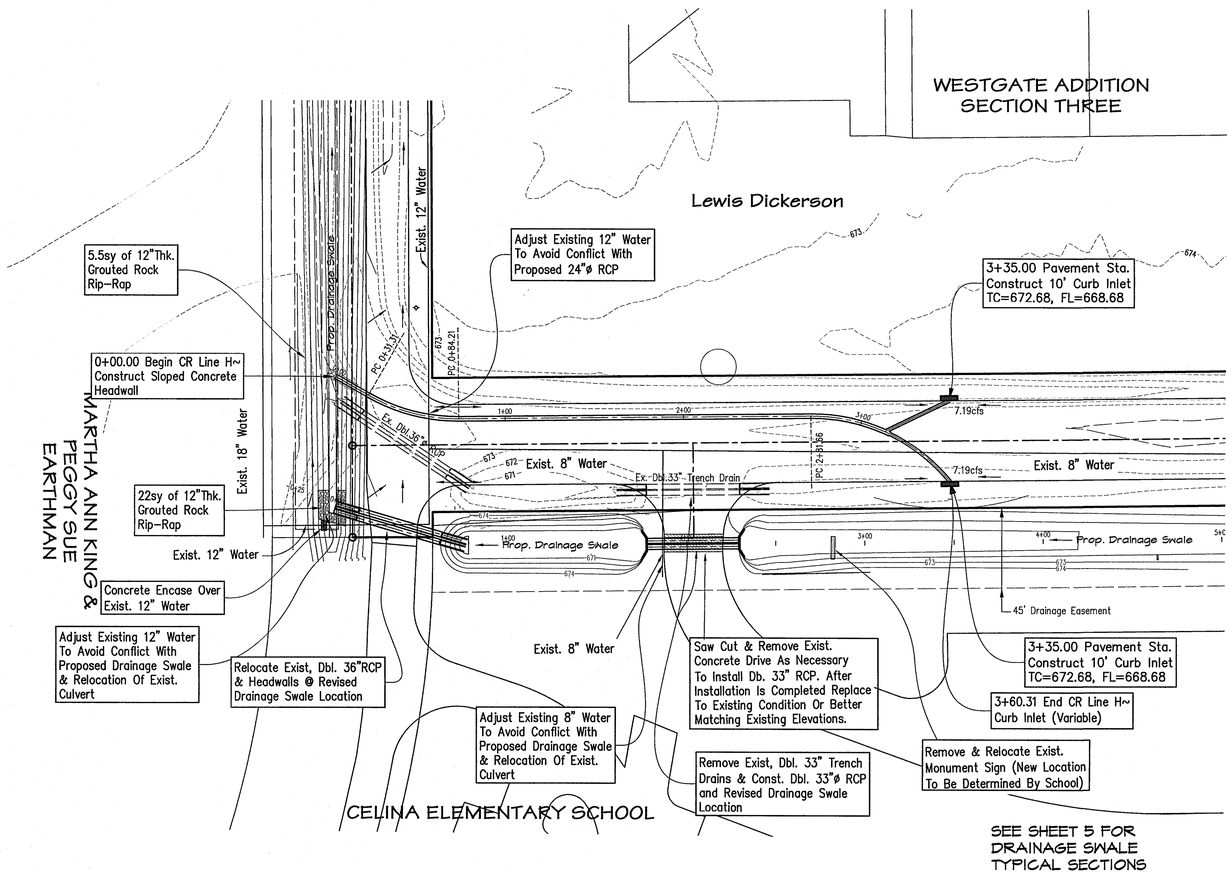
Checked By: JMH

Sheet 7 of 11

SEI No. 13-157

~~P-201402-01~~

P-201402-03

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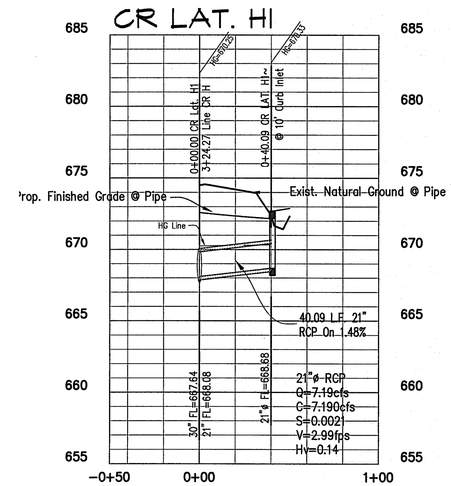


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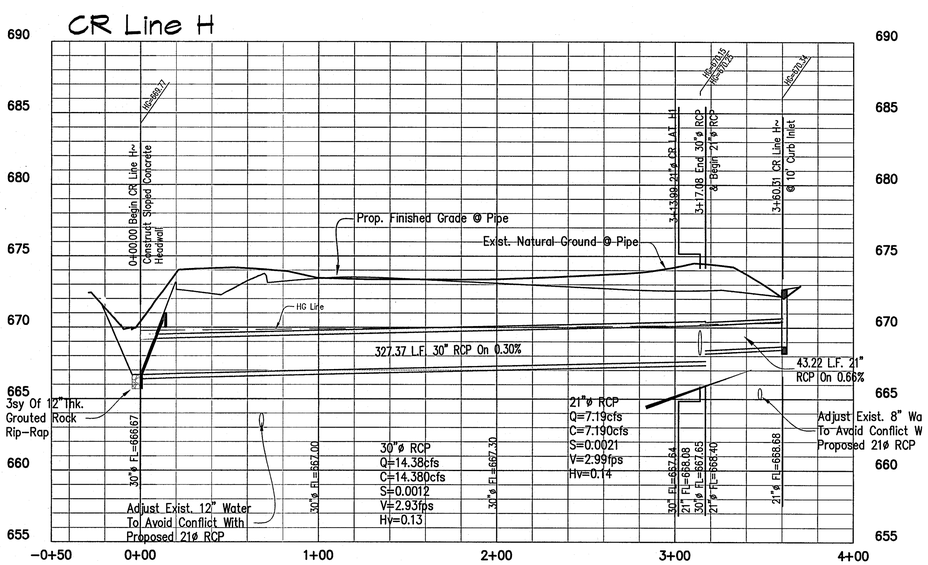
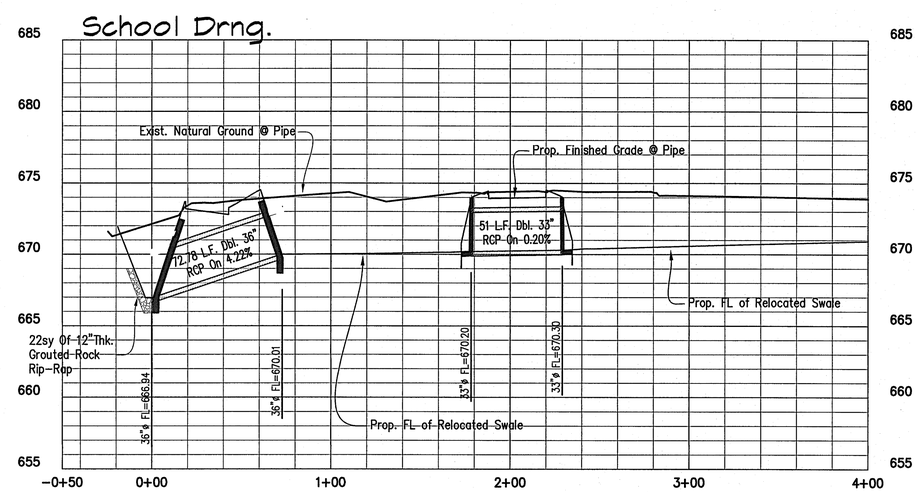
1/25/16

DATE





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STATE OF TEXAS
TIM C. SPIARS
LICENSED PROFESSIONAL ENGINEER
1/25/16

# W. SUNSET BLVD./UTAH DRIVE
CITY OF CELINA
COLLIN COUNTY, TEXAS
STORM SEWER PLAN & PROFILE

Issue Dates:

| Date | Revisions |
|---|---|

Scale: 1"=100'
Drawn By: RAS
Checked By: JMH
Sheet 8 of 11
SEI No. 13-157

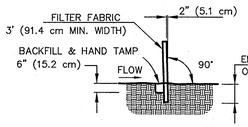
~~P-201402-01~~
P-201402-03

## STORM WATER POLLUTION PREVENTION GENERAL NOTES

1. All operators and/or contractors shall conform to the terms and conditions of the National Pollution Discharge Elimination Systems (NPDES) General Permit as published in the Federal Register, Vol. 57, No. 175, September 9, 1992, by the Environmental Protection Agency (EPA).
2. The Notice of Intent (NOI), as required by the General Permit, must be properly displayed on site at all times by each operator.
3. All releases of reportable quantities of hazardous substances shall be reported immediately to the facility operator and EPA.
4. Qualified operator personnel must inspect the site at least once every fourteen days and within 24 hours of a 1/2 – inch or greater rainfall event. The inspector shall document the results.
5. Modifications to the Storm Water Pollution Prevention Plan shall be implemented and be in–place within a seven calendar day period.
6. If any contractor sees a violation by an operator or another contractor, he shall notify the operator and contractor in violation, as well as the facility operator.
7. Erosion control shall be installed prior to any grading.
8. Accumulated silt deposits shall be removed from silt fences and hay bale dikes when silt depth reaches six inches. Removal of silt deposits by the contractor shall be incidental to the performance of the contract and a separate bid item shall not be included.
9. The contractor shall add or delete erosion protection at the request and direction of the Operator or the City.
10. After installation of pavement, final lot benching and general cleanup, the Paving Contractor shall establish grass groundcover in all street parkways, lots and all other disturbed areas. Materials shall be as specified in Item 2.15 and seeding shall be in accordance with Item 3.10 of the NCTCOG Standard Specifications.
11. It shall be the contractor's responsibility to control and limit silt and sediment leaving the site. Specifically, the contractor shall protect all public streets, alleys, streams and storm drainage systems from erosion deposits.
12 It shall be the contractor's responsibility to provide a dumpster (or equal) to collect solid waste materials during construction.
13. The attached Drainage Area Map, as prepared by Spiars Engineering, Inc., specifically for this project, shall be made part of the Storm Water Pollution Prevention Plan.
14. It is anticipated that the following non–storm water discharges will be associated with this project. These discharges are authorized through the construction general permit:

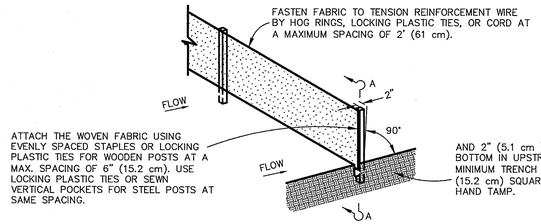
A. Fire hydrant flushings
B. Water used to wash vehicles and to control dust
C. Potable water sources including waterline flushings
D. Irrigation drainage
E. Pavement washdown
F. Uncontaminated ground water
G. Construction water

15. Construction waste disposal containers shall be provided on the site for disposal of all non–hazardous construction waste materials. The containers shall be hauled to landfill by the Contractor.
16. All hazardous materials shall be handled and disposed of by the Contractor in accordance with Federal, State and Local regulations.
17. Contractor shall Police Site regularly and keep Site free of trash and construction debris.
18. Contractor is required to repair and/or replace Damaged Erosion Control Devices.



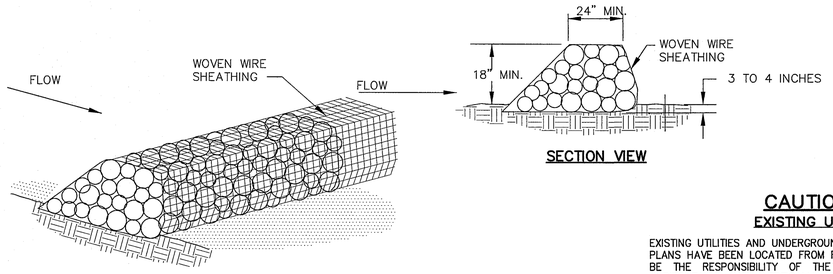

SECTION A–A

STEEL OR WOOD POSTS SPACED AT 6' MAX. (1.8 m), SOFTWOOD POSTS SHALL BE 3" (7.6 cm) MIN. IN. DIA. OR NOMINAL 2"x4" (5.1 cm x 10.2 cm). HARDWOOD POSTS SHALL HAVE A MIN. CROSS SECTION OF 1.5"x1.5" (3.8 cm x 3.8 cm). NO STEEL POST TO BE USED IN CITY R.O.W.




## SILT FENCE DETAIL

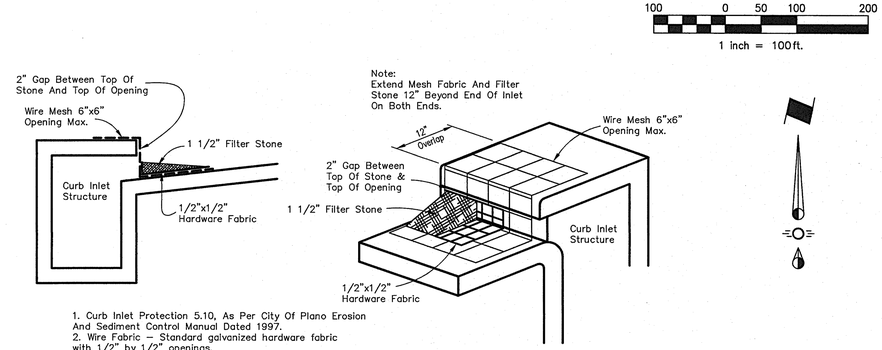
Not to Scale




SECTION VIEW

## ROCK CHECK DAM

Not to Scale




1. Curb Inlet Protection 5.10, As Per City Of Plano Erosion And Sediment Control Manual Dated 1997.
2. Wire Fabric – Standard galvanized hardware fabric with 1/2" by 1/2" openings.
3. Filter Stone – NCTCOG Specification 2.1.8.(e)
4. Wire Mesh – welded wire fabric conforming to NCTCOG Specifiaction 2.2.7 maximum opening 6"x6".

## TYPE A CURB INLET PROTECTION

Not to Scale

100 0 50 100 200

1 inch = 100ft.

### CAUTION !!!

**EXISTING UTILITIES**

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CALL 1–800–344–8377 (DIG–TESS) OR OTHER UTILITY LOCATION SERVICES 48 HOURS PRIOR TO CONSTRUCTION ACTIVITY. SPIARS ENGINEERING, INC. IS NOT RESPONSIBLE FOR KNOWING ALL EXISTING UTILITIES OR DEPICTING EXACT LOCATIONS OF UTILITIES ON DRAWINGS.

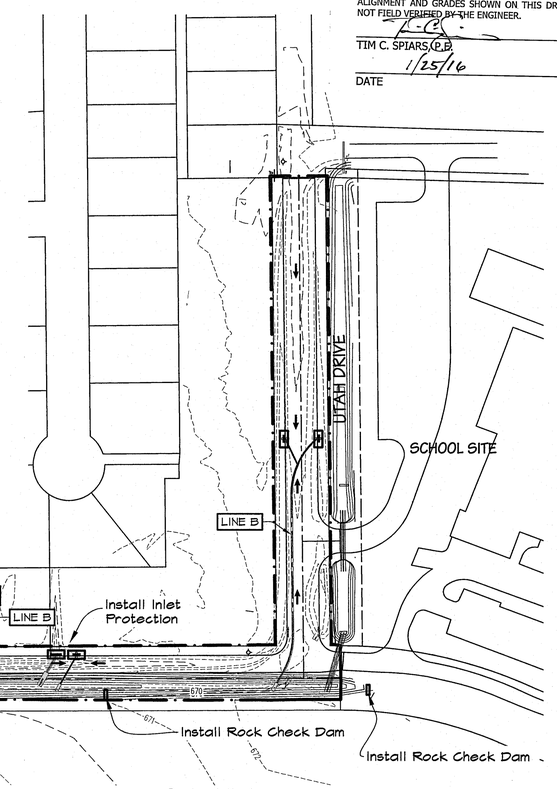
AS-BUILT DRAWINGS

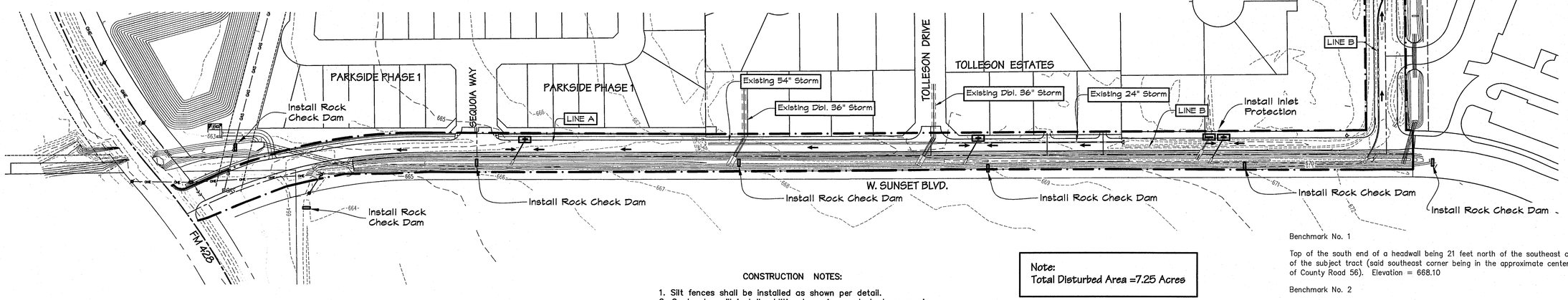
THIS DRAWING HAS BEEN REVISED TO CONFORM TO THE CONSTRUCTION RECORDS PROVIDED BY THE CONTRACTOR. ALIGNMENT AND GRADES SHOWN ON THIS DRAWING WERE NOT FIELD VERIFIED BY THE ENGINEER.

TIM C. SPIARS, P.E.

1/25/16

DATE




Benchmark No. 1

Top of the south end of a headwall being 21 feet north of the southeast corner of the subject tract (said southeast corner being in the approximate center line of County Road 56). Elevation = 668.10

Benchmark No. 2

Being a pk nail found at the centerline intersection of Mellanie Ct and Tolleson Drive. Elevation = 668.00

**CONSTRUCTION NOTES:**

1. Silt fences shall be installed as shown per detail.
2. Contractor will install additional erosion control where erosion protection is needed as per the owners engineers, or the City inspector.
3. The existing vegetation along existing parkways and medians shall be replaced to its original condition or better.
4. All drainage swales shall be grassed as per City Standards, prior to the City acceptance of project.
5. All construction erosion control shall meet City Ordinance.
6. Erosion construction shall be completed in the following PHASES:

PHASE 1 (Prior To Start Of Rough Grading)

1. Silt fence shall be placed as shown per detail.

PHASE 2 (After utility construction & prior to paving const.)

1. Inlet protection shall be placed at all inlets per detail to prevent erosion material from entering storm sewer system.

Note:
Total Disturbed Area =7.25 Acres

**Legend**

~ Phase 1 Silt Fence

~ Phase 2 Inlet Protection

Note: Silt Fence Shall Be Placed Around The Perimeter of All Stock Piled Material.


spiars ENGINEERING
765 Custer Road, Suite 100 • Plano, TX 75075 • (972) 422-0077 • TBPE No. F-2121


STATE OF TEXAS — TIM C. SPIARS — 84043 — LICENSED PROFESSIONAL ENGINEER — 1/25/16

W. SUNSET BLVD. / UTAH DRIVE
CITY OF CELINA
COLLIN COUNTY, TEXAS

# EROSION CONTROL

Issue Dates:

| Date | Revisions |
|---|---|
| | |

Scale: 1"=100'

Drawn By: RAS

Checked By: JMH

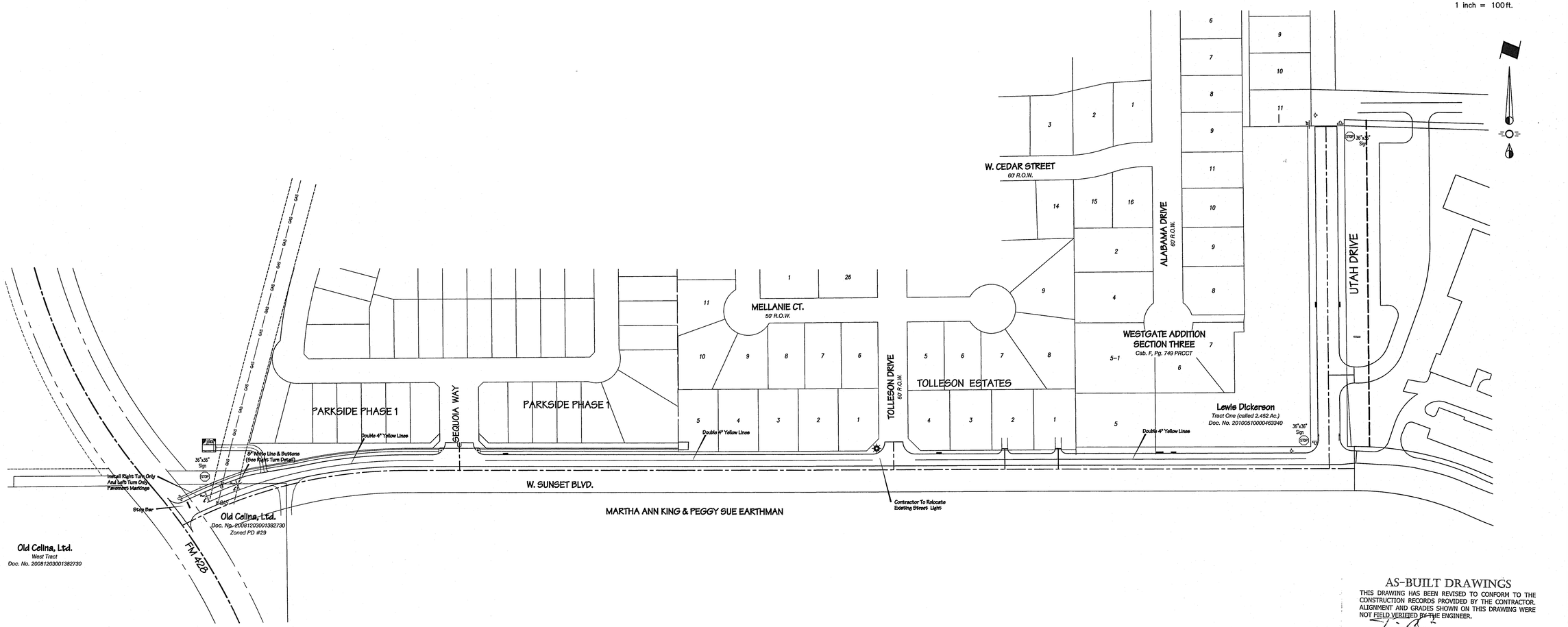
Sheet 9 of 11

SEI No. 13–157

P-201402-01

P-201402-03

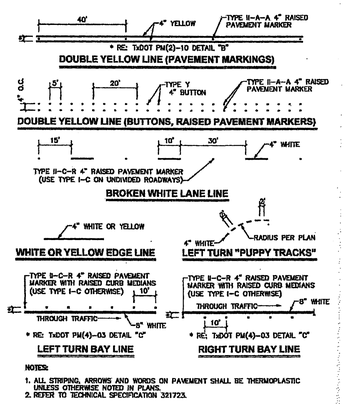

Drawing: G:\2013 JOBS\13-157 Park Place Celina\CIVIL-157-cp06 utah drive.dwg Saved By: Gustavo Save Time: 3/20/2015 10:42:08 AM
Plotted by: gustavo Rod Date: 1/25/2016 11:34 AM




## Legend

- ~ Denotes Proposed Street Name Sign Location
- ~ Denotes Exist. Street Light Standard Location
- ~ Denotes Proposed Street Light Standard Location
- ~ Denotes Proposed Stop Sign As Per City Standards, Unless Shown Otherwise On Plan
- ~ Denotes Street Name Blade Block Number

Note!!
Proposed Light To Be 12' American Style Pole, Black In Color w/Acorn Luminaire w/Reflective Globes, 100 Watts HPS (Match Style, Color and Size From Phase I).




## STRIPING DETAILS

AS-BUILT DRAWINGS
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TIM C. SPIARS, P.E.
1/25/16
DATE

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## CAUTION !!!
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~~P-201402-01~~


spiars ENGINEERING
765 Custer Road, Suite 100 • Plano, TX 75075 • (972) 422-0077 • TBPE No. F-2121


STATE OF TEXAS
TIM C. SPIARS
84076
LICENSED PROFESSIONAL ENGINEER
1/25/16

# W. SUNSET BLVD. / UTAH DRIVE
## CITY OF CELINA
## COLLIN COUNTY, TEXAS
## SIGNAGE & STRIPING PLAN

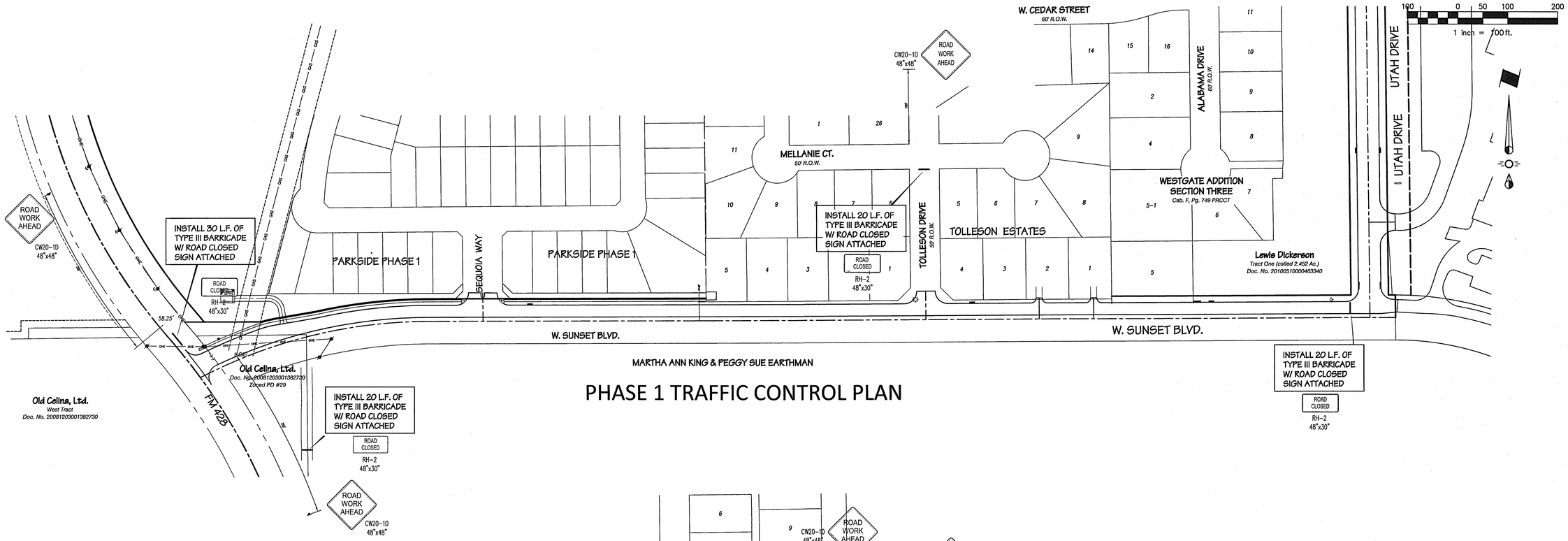
Issue Dates:

| Date | Revisions |
|---|---|
| | |

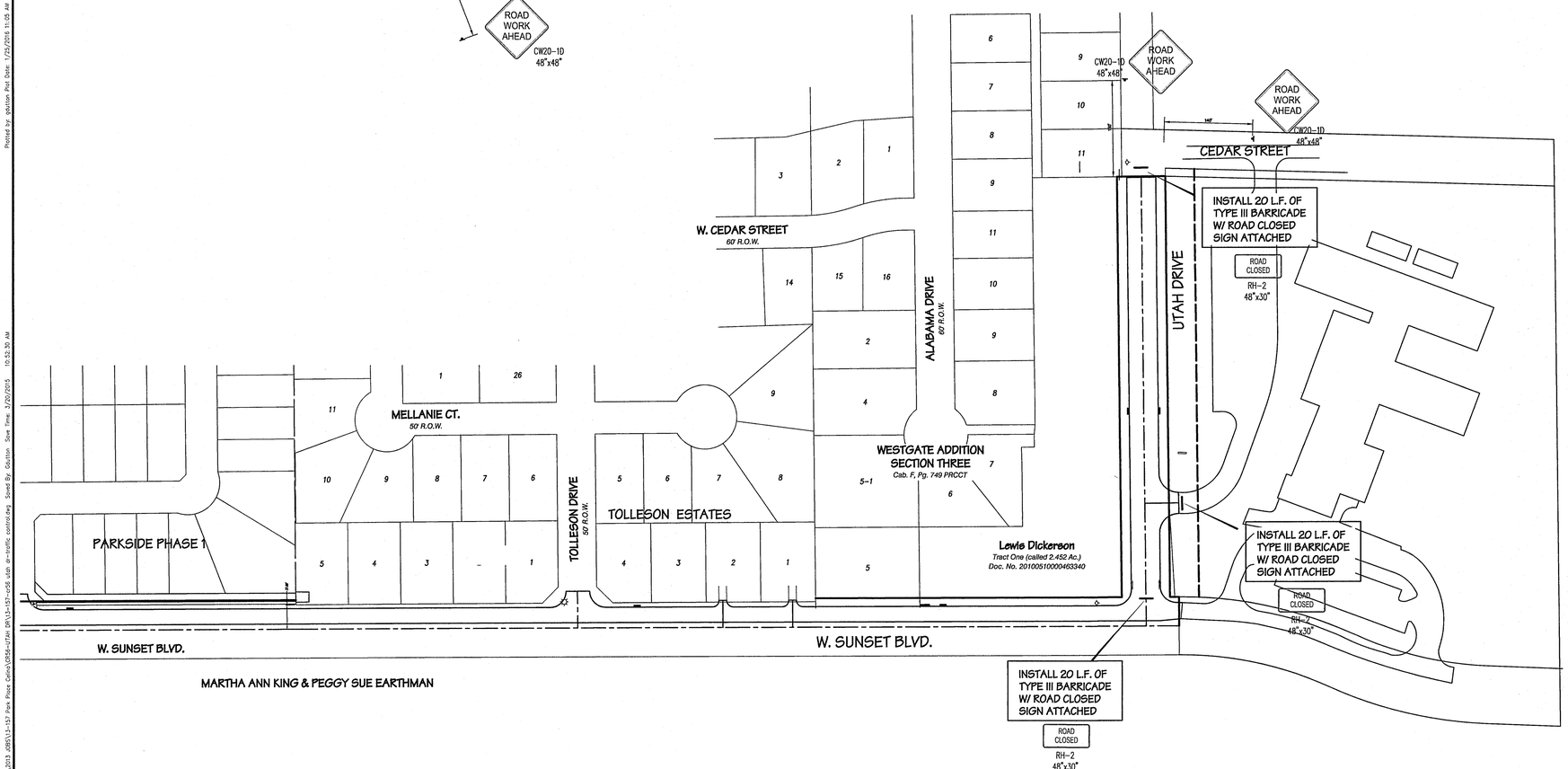
Scale: 1"=100'
Drawn By: RAS
Checked By: JMH
Sheet 10 of 11
SEI No. 13-157

P-201402-03

Plotted by: sdutton Plot Date: 1/25/2016 11:32 AM
Drawing: G:\2013 JOBS\13-157 Bois Place Celina\DRW-UTAH WAYS-157-cd5.dwg Saved By: Sdutton Save Time: 1/25/2016 11:32:17 AM




PHASE 1 TRAFFIC CONTROL PLAN




PHASE 2 TRAFFIC CONTROL PLAN

## AS-BUILT DRAWINGS

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TIM C. SPIARS, P.E.

1/25/16

DATE

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~~P-201402-01~~


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765 Custer Road, Suite 100 • Plano, TX 75075 • (972) 422-0077 • TBPE No. F-2121


STATE OF TEXAS
TIM C. SPIARS
84027
LICENSED PROFESSIONAL ENGINEER
1/25/16

# W. SUNSET BLVD. / UTAH DRIVE
## CITY OF CELINA
## COLLIN COUNTY, TEXAS
## TRAFFIC CONTROL

Issue Dates:

| Date | Revisions |
|---|---|
| | |

Scale: 1"=100'

Drawn By: RAS

Checked By: JMH

Sheet 11 of 11

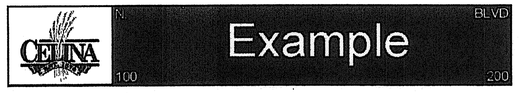
SEI No. 13-157

P-201402-03

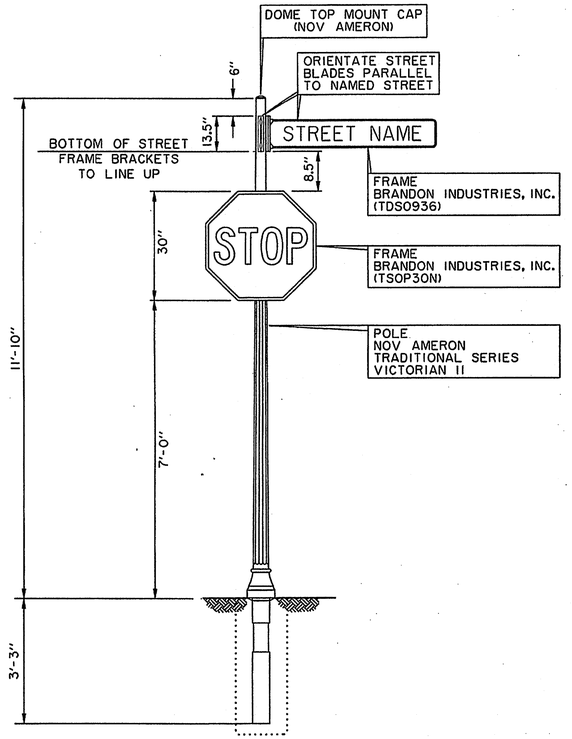
## Celina Street Sign Example

Street Name: 6" initial uppercase letter followed by 4.5" lowercase letters
Must meet 2009 (or latest) MUTCD requirements
9" flat blank, high intensity prismatic

**Front:**
(Left to Right)

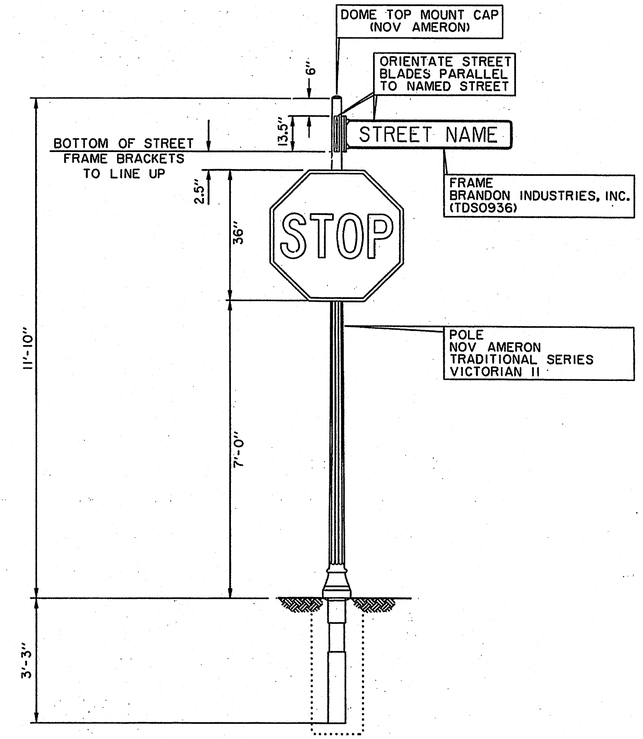



**Back:**
(Left to Right)



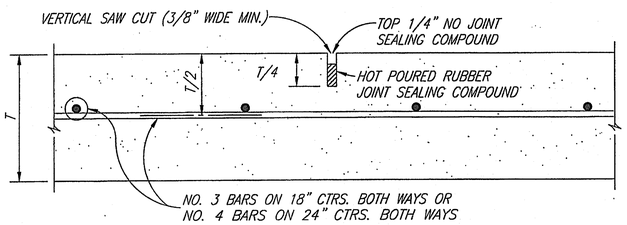

TYPICAL SIGN & POLE DETAIL
30" STOP SIGN
NTS

NOTE:
USE MANUFACTURERS
INSTALLATION GUIDELINES
AND PROCEDURES.
(PER CITY APPROVAL)




TYPICAL SIGN & POLE DETAIL
36" STOP SIGN
(Primrose Way At Light Farms Way)
NTS

NOTE:
USE MANUFACTURERS
INSTALLATION GUIDELINES
AND PROCEDURES.
(PER CITY APPROVAL)

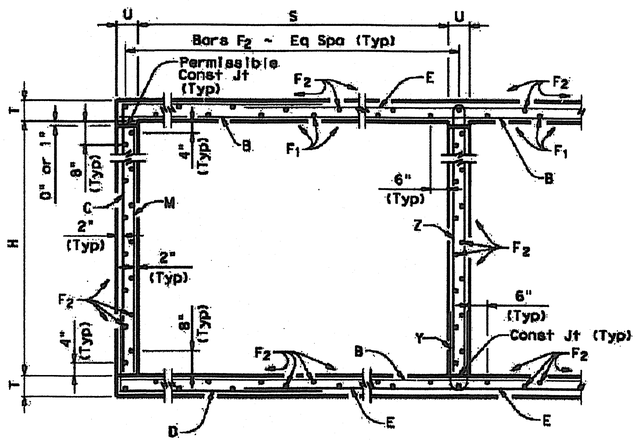



TRANSVERSE JOINTS SPACED 15 FT. C.-C. (MAX.)
LONGITUDINAL JOINTS SPACED 20 FT. C.-C. (MAX.)

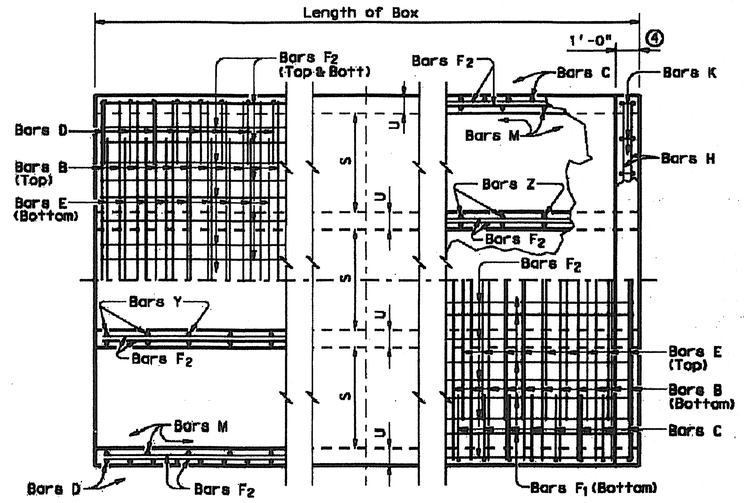
SAWED DUMMY JOINT

~~P-201402-01~~ Det-1

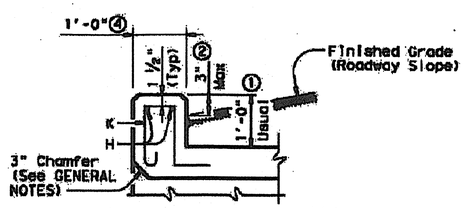
P-201402-03




## TYPICAL SECTION

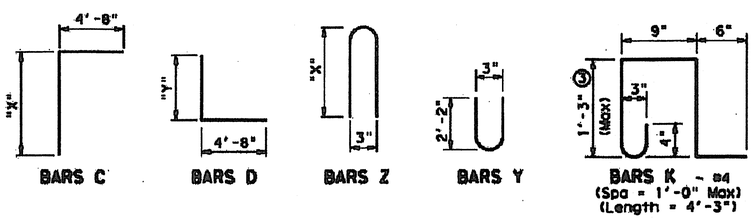



## PART PLANS




## SECTION THRU CURB

| H | Bar Dimensions | |
|---|---|---|
| | "X" | "Y" |
| 2'-0" | 2'-5" | 2'-2" |
| 3'-0" | 3'-5" | 2'-2" |
| 4'-0" | 4'-5" | 2'-2" |
| 5'-0" | 5'-5" | 2'-2" |
| | | |




① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

② For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs shall project no more than 3" above finished grade.
- For structures with bridge rail, curbs shall be flush with finished grade.
Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

③ For curbs less than 1'-0" high, tilt bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, bars K may be omitted.

④ 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

Deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be used to replace conventional reinforcement shown at the Contractor's option. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes.

Example Conversion: Replacement of No. 6 Gr 60 at 6" Spacing with WWR.
WWR required = (0.44 sq in/ 0.5') x (60 ksi/70 ksi) = 0.754 sq in/ft.
If D30.6 wire is used to meet the 0.754 sq in/ft requirement in this example, the required spacing = (0.306 sq in/ 0.754 sq in/ft) x 12 in/ft = 4.87" Max spacing.
Required lap length for the provided D30.6 wire is 2'-2" (Lap required for uncoated No. 5 bars, as shown in Item 440).

## GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.
Designed to the maximum fill height shown.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" with these exceptions: use Class "S" for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.
Class "C" concrete shall have a minimum compressive strength of 3,600 psi. Class "S" concrete shall have a minimum compressive strength of 4,000 psi.
The use of permanent forms is not allowed.
The bottom edge of the top slab shall be chamfered 3" at the entrance.
Reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
Construction joints shown at the flow line may be raised a maximum of 6" at the Contractor's option. If this option is used, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.
See standard MC-MD for skewed ends, angle sections and lengthening details.

HL93 LOADING — SHEET 1 OF 2

Texas Department of Transportation
Bridge Division

# MULTIPLE BOX CULVERTS CAST-IN-PLACE 5'-0" SPAN 0' TO 20' FILL

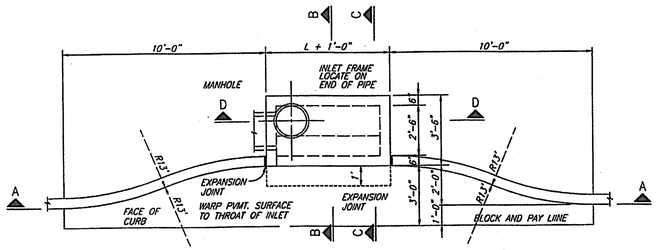
## MC-5-20

| FILE: mc520sts.dgn | DGN: GAF | CK: LMW | DW: BRH/TxDOT | CK: GAF |
|---|---|---|---|---|
| © TxDOT February 2010 | DISTRICT | FEDERAL AID PROJECT | | SHEET |
| REVISIONS 10-12: Added WWR. | COUNTY | CONTROL | SECT | JOB | HIGHWAY |

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

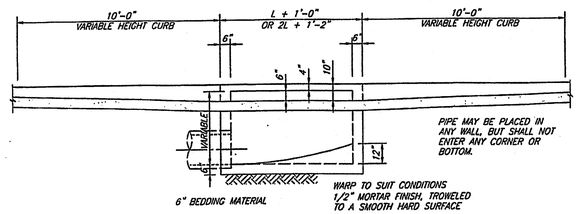
LEVELS DISPLAYED | ACCS

~~P-201402-01~~ Det-2
P-201402-03




## PLAN – RECESSED INLET

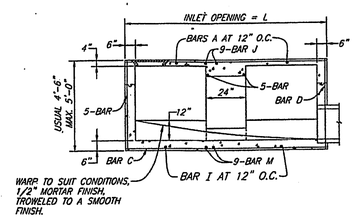
(REC-INT1)




## SECTION A–A–RECESSED AND STANDARD INLETS

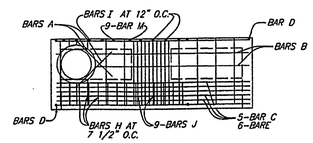
## 4, 6, 8, AND 10 FOOT INLETS

(PLAN-10)



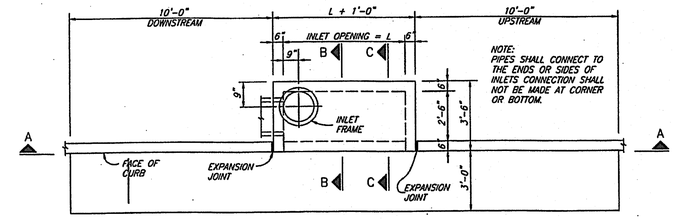

## SECTION A–A – STANDARD AND RECESSED INLETS

(SECT_A-A1)




## PLAN – STANDARD INLET

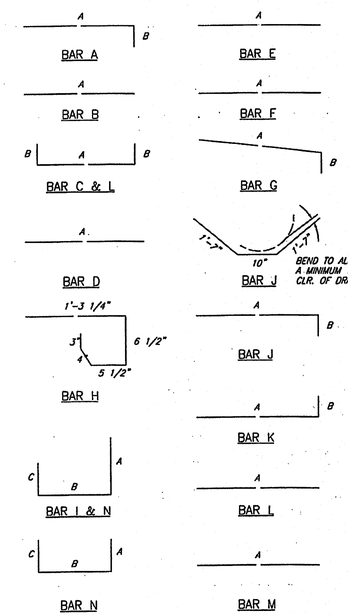
(PLAN_STDINL)




## PLAN – STANDARD INLET

## 4, 6, 8 AND 10 FOOT INLETS

(STDINLT1)




## BAR DIAGRAMS

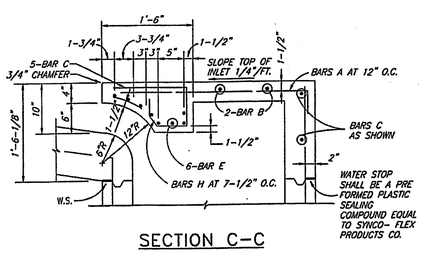
(BARDIAG)

## REINFORCING STEEL SCHEDULE

DIMENSIONS SHOWN ARE FOR MAXIMUM SIZE INLETS

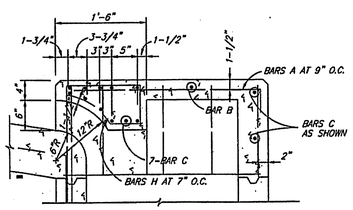
| INLET LENGTH | BAR TYPE | BAR DIA. (1/8 IN.) | NO. REQ'D | BAR DIMENSIONS | | |
|---|---|---|---|---|---|---|
| | | | | A | B | C |
| 4 | A | 3 | 6 | 3'-2" | 0'-3" | – |
| | B | 3 | 1 | 2'-10" | – | – |
| | C | 4 | 15 | 4'-8" | 0'-6" | – |
| | D | 4 | 5 | 4'-8" | – | – |
| | F | 4 | 1 | 3'-2" | – | – |
| | G | 3 | 5 | 2'-0" | 1'-3" | – |
| | H | 3 | 6 | * | * | * |
| | N | 3 | 3 | 3'-2" | 3'-2" | 3'-2" |
| 6 | A | 3 | 9 | 3'-2" | 0'-3" | – |
| | B | 3 | 1 | 4'-10" | – | – |
| | C | 4 | 15 | 6'-8" | 0'-6" | – |
| | D | 4 | 5 | 4'-8" | – | – |
| | F | 4 | 1 | 3'-2" | – | – |
| | G | 3 | 5 | 2'-0" | 1'-3" | – |
| | H | 3 | 9 | * | * | * |
| | N | 3 | 3 | 3'-2" | 3'-2" | 3'-2" |
| 8 | A | 3 | 12 | 3'-2" | 0'-3" | – |
| | B | 4 | 1 | 6'-10" | – | – |
| | C | 4 | 15 | 8'-8" | 0'-6" | – |
| | D | 4 | 5 | 4'-8" | – | – |
| | F | 4 | 1 | 3'-2" | – | – |
| | G | 3 | 5 | 2'-0" | 1'-3" | – |
| | H | 3 | 12 | * | * | * |
| | N | 3 | 3 | 3'-2" | 3'-2" | 3'-2" |
| 10 | A | 3 | 13 | 3'-2" | 0'-3" | – |
| | B | 3 | 2 | 8'-10" | – | – |
| | C | 4 | 16 | 10'-8" | 0'-6" | – |
| | D | 4 | 4 | 4'-8" | – | – |
| | E | 5 | 6 | 10'-8" | – | – |
| | G | 3 | 5 | 2'-0" | 1'-3" | – |
| | H | 3 | 14 | * | * | * |
| | I | 4 | 8 | 4'-8" | 3'-2" | 3'-2" |
| | L | 4 | 5 | 4'-3" | – | – |

* SEE DIAGRAM FOR DIMENSIONS. 4', 6', 8' AND 10' INLETS




## SECTION C–C

(SECT_C-C)




NOTE: FOR ADDITIONAL INFORMATION SEE SECTION C–C

## SECTION E–E

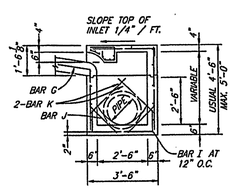
(SECT_E-E)

NOTES:

THE FLOOR OF THE EXCAVATION FOR INLET BOX MUST PROVIDE A FIRM, LEVEL BED FOR THE BASE SECTION TO REST UPON.

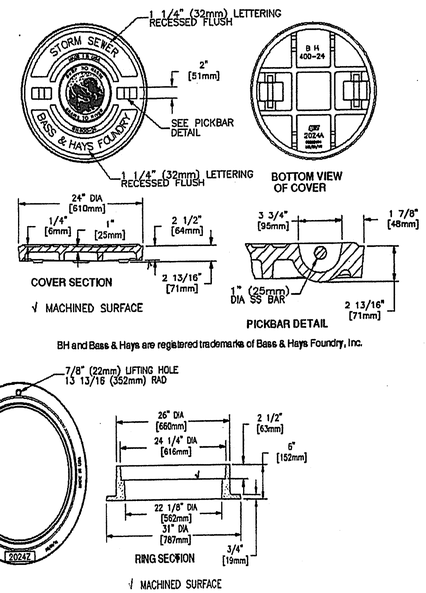
A MINIMUM OF 6 INCHES OF 1" DIAMETER (MAXIMUM) ROCK OR GRAVEL SHALL BE USED TO PREPARE THE BEDDING TO FINAL GRADE OR LIEU OF THIS, AT LEAST 6 INCHES OF 2-SACK CEMENT STABILIZED SAND SHALL BE USED TO PREPARE THE BEDDING TO GRADE. CEMENT STABILIZED-SAND SHALL BE ALLOWED TO SET BY KEEPING HOLE PUMPED DRY.

AFTER CASING HAS BEEN INSTALLED ON THE PROPER BEDDING, THE BACKFILL MATERIAL, WHICH IS FREE FLOWING AND CLEAR OF ROCKS, IN EXCESS OF 4" DIAMETER AND OTHER LUMPS WHICH WOULD PROHIBIT PROPER COMPACTION, SHALL BE COMMENCED IN LIFTS OF NO MORE THAN 18". THE MATERIAL USED FOR BACKFILL SHOULD BE A TYPE SUITABLE TO OBTAIN THE DENSITY REQUIREMENTS FOR THE SPECIFIC JOB.



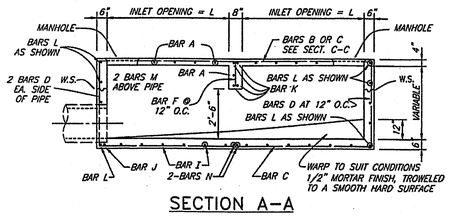

## SECTION B–B

(SECT_B-B)




P-201402-01 Det-3

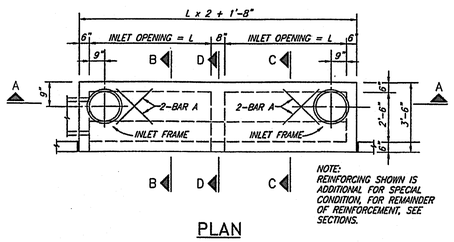
P-201402-03




## SECTION A–A

## 12, 14, 16 AND 20 FOOT INLETS

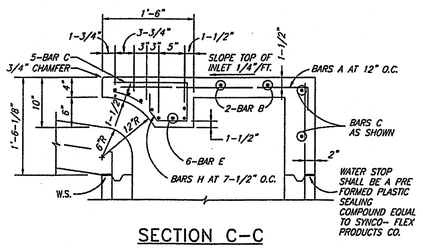
(SECT_A–A)




## PLAN

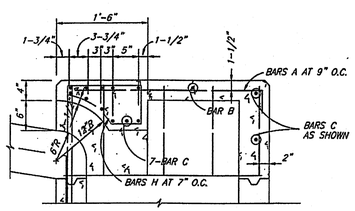
## 20 FOOT INLETS

(PLAN_20)




## SECTION C–C

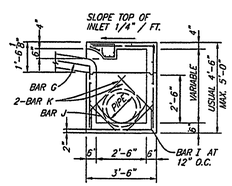
(SECT_C–C)




NOTE: FOR ADDITIONAL INFORMATION SEE SECTION C–C

## SECTION D–D

(SECT_D–D)




## SECTION B–B

(SECT_B–B)

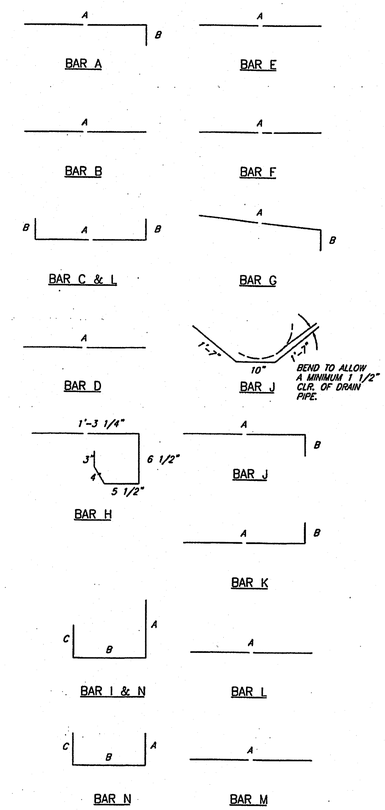
### DOUBLE INLETS

DIMENSIONS SHOWN ARE FOR MAXIMUM SIZE INLETS

| INLET LENGTH | BAR TYPE | BAR DIA. (1/8 IN.) | NO. REQ'D | BAR DIMENSIONS A | B | C |
|---|---|---|---|---|---|---|
| 6 FT. | A | 3 | 15 | 3'-2" | 0'-6" | – |
| | B | 3 | 2 | 11'-6" | – | – |
| | C | 4 | 16 | 13-4" | 0'-6" | – |
| | D | 4 | 9 | 4'-8" | – | – |
| | E | 5 | 6 | 13-4" | – | – |
| | F | 4 | 5 | 1'-2" | – | – |
| | G | 3 | 12 | 2'-0" | 1'-3" | – |
| | H | 3 | 26 | * | * | * |
| | I | 4 | 12 | 4'-8" | 3'-2" | 3'-2" |
| | J | 5 | 1 | * | * | * |
| | K | 5 | 6 | 3'-2" | 0'-6" | – |
| | L | 4 | 11 | 3'-2" | 0'-6" | – |
| | M | 4 | 2 | 3'-0" ** | – | – |
| | N | 4 | 2 | 4'-8" | 3'-2" | 4'-8" |
| | | | | | | |
| 7 FT. | A | 3 | 17 | 3'-2" | 0'-6" | – |
| | B | 3 | 2 | 13'-6" | – | – |
| | C | 4 | 16 | 15'-4" | 0'-3' | – |
| | D | 4 | 9 | 4'-8" | – | – |
| | E | 5 | 6 | 15'-4" | – | – |
| | F | 4 | 5 | 1'-2" | – | – |
| | G | 3 | 15 | 2'-0" | 1'-3" | – |
| | H | 3 | 32 | * | * | * |
| | I | 4 | 14 | 4'-8" | 3'-2" | 3'-2" |
| | J | 5 | 1 | * | * | * |
| | K | 5 | 6 | 3'-2" | 0'-6" | – |
| | L | 4 | 11 | 3'-2" | 0'-6" | – |
| | M | 4 | 2 | 3'-0" ** | – | – |
| | N | 4 | 2 | 4'-8" | 3'-2" | 4'-8" |
| | | | | | | |
| 8 FT. | A | 3 | 19 | 3'-2" | 0'-6" | – |
| | B | 3 | 2 | 15'-6" | – | – |
| | C | 4 | 16 | 17'-4" | 0'-6" | – |
| | D | 4 | 9 | 4'-8" | – | – |
| | E | 5 | 6 | 17'-4" | – | – |
| | F | 4 | 5 | 1'-2" | – | – |
| | G | 3 | 12 | 2'-0" | 1'-3" | – |
| | H | 3 | 26 | * | * | * |
| | I | 4 | 16 | 4'-8" | 3'-2" | 3'-2" |
| | J | 5 | 1 | * | * | * |
| | K | 5 | 6 | 3'-2" | 0'-6" | – |
| | L | 4 | 11 | 3'-2" | 0'-6" | – |
| | M | 4 | 2 | 3'-0" ** | – | – |
| | N | 4 | 2 | 4'-8" | 3'-2" | 4'-8" |
| | | | | | | |
| 10 FT. | A | 3 | 23 | 3'-2" | 0'-6" | – |
| | B | 3 | 2 | 19'-6" | – | – |
| | C | 4 | 16 | 21'-4" | 0'-6" | – |
| | D | 4 | 9 | 4'-8" | – | – |
| | E | 5 | 6 | 21'-4" | – | – |
| | F | 4 | 5 | 1'-2" | – | – |
| | G | 3 | 15 | 2'-0" | 1'-3" | – |
| | H | 3 | 32 | * | * | * |
| | I | 4 | 20 | 4'-8" | 3'-2" | 3'-2" |
| | J | 5 | 1 | * | * | * |
| | K | 5 | 6 | 3'-2" | 0'-6" | – |
| | L | 4 | 11 | 3'-2" | 0'-6" | – |
| | M | 4 | 2 | 3'-0" ** | – | – |
| | N | 4 | 2 | 4'-8" | 3'-2" | 4'-8" |

* SEE DIAGRAM FOR DIMENSIONS.
** FIELD CUT AS REQUIRED TO ACCOMMODATE DRAIN PIPE 16" AND 20" INLETS

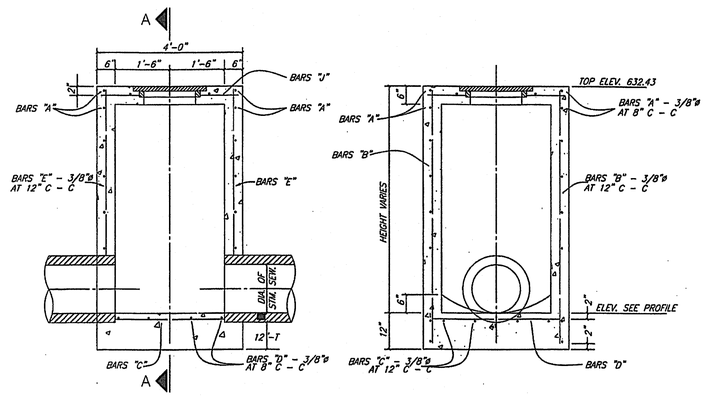
## REINFORCING STEEL SCHEDULE




△ BEND TO ALLOW A MINIMUM 1 1/2" CIR. OF DRAIN PIPE
* SEE DIAGRAMS FOR DIMENSIONS
** FIELD CUT AS REQUIRED TO ACCOMODATE DRAIN PIPE

## BAR BENDING DIAGRAMS

Drawing: C:\2013 JOBS\13-137 Park Place Cedar\DCS6-ctrl\14 DR\13-137-rc06 sinks a-drinks.dwg Saved By: fgoldson Save Time: 7/22/2014 11:25:35 AM
Plotted by: fgoldson Plot Date: 7/22/2014 3:15 PM



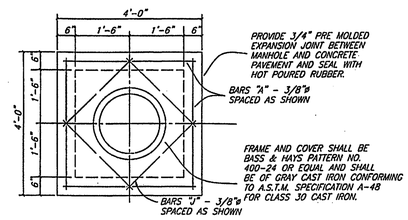

ELEVATION

SECTION A–A

## STORM SEWER TYPE A MANHOLE

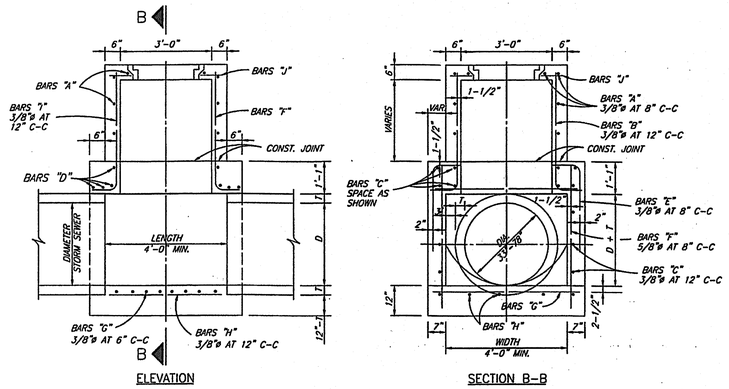
MAX. PIPE SIZE 30"

(TYPEAMH)




TOP PLAN
TYPE A & TYPE B
STORM SEWER MANHOLE

(MH_TOP)



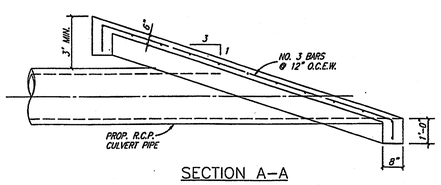

ELEVATION

SECTION B–B

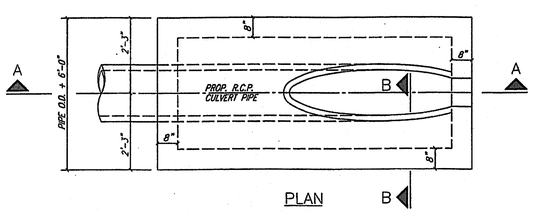
## TYPE B STORM SEWER MANHOLE

MAX. PIPE SIZE 78"

(TYPEBMH)

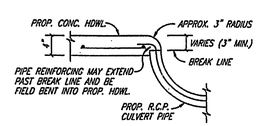



SECTION A–A

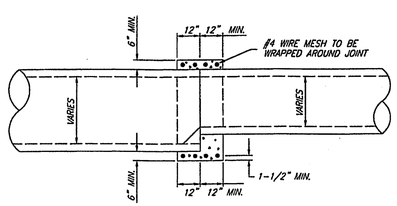



## SLOPED CONCRETE HEADWALL

(SLOPEHWL)



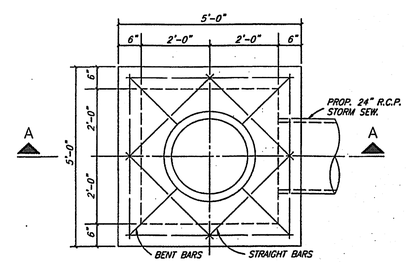

SECTION B–B



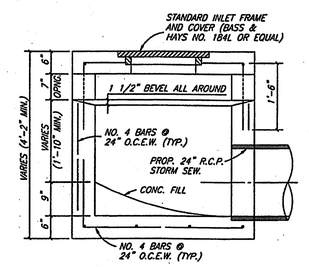

## DETAIL OF CONCRETE COLLAR
## FOR R.C.P. OR R.C.A.P. CONNECTIONS

INSIDE JOINT SHALL BE CONCRETE MORTAR

(CONCCOL)




PLAN




SECTION A–A

## STANDARD DROP INLET

(DROPINLET)

~~P-201402-01~~ Det-5

P-201402-03

Drawing: G:\2013 JOBS\13-157 Park Place Cabins\DPSE-13164 DRV\13-157-c04 site dr-bldlu.dwg Saved By: Gbatlin Save Time: 7/22/2014 11:25:35 AM Plotted by: gbatlin Plot Date: 7/22/2014 3:16 PM

## TABLE OF DIMENSIONS & REINFORCING STEEL
(Wings for One Structure End)

| Dimensions | | | | | Variable Reinforcing | | | | Estimated Quantities per ft of wing length (2-Wings) ③ | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Bars J1 | | Bars J2 | | | |
| Maximum Wingwall Height Hw | W | X | Y | Z | Size | Spa | Size | Spa | Reinf (Lb/Ft) | Conc (CY/Ft) |
| 2'-6" | 2'- 5" | 1'- 0" | 9" | 7" | #4 | 1'-0" | #4 | 1'-0" | 33.73 | 0.248 |
| 3'-0" | 2'- 5" | 1'- 0" | 9" | 7" | #4 | 1'-0" | #4 | 1'-0" | 37.07 | 0.261 |
| 3'-6" | 2'- 5" | 1'- 0" | 9" | 7" | #4 | 1'-0" | #4 | 1'-0" | 37.74 | 0.273 |
| 4'-0" | 2'- 5" | 1'- 0" | 9" | 7" | #4 | 1'-0" | #4 | 1'-0" | 38.41 | 0.285 |
| 4'-6" | 3'- 2" | 1'- 6" | 1'- 0" | 7" | #4 | 1'-0" | #4 | 1'-0" | 41.75 | 0.330 |
| 5'-0" | 3'- 2" | 1'- 6" | 1'- 0" | 7" | #4 | 1'-0" | #4 | 1'-0" | 45.09 | 0.343 |
| 5'-6" | 3'- 2" | 1'- 6" | 1'- 0" | 7" | #4 | 1'-0" | #4 | 1'-0" | 45.75 | 0.355 |
| 6'-0" | 3'- 2" | 1'- 6" | 1'- 0" | 7" | #4 | 1'-0" | #4 | 1'-0" | 46.42 | 0.367 |
| 7'-0" | 3'- 8" | 1'- 9" | 1'- 3" | 7" | #4 | 1'-0" | #4 | 1'-0" | 52.77 | 0.414 |
| 8'-0" | 4'- 2" | 2'- 0" | 1'- 6" | 8" | #5 | 1'-0" | #4 | 1'-0" | 60.19 | 0.486 |
| 9'-0" | 4'- 8" | 2'- 3" | 1'- 9" | 8" | #4 | 6" | #4 | 6" | 81.49 | 0.535 |
| 10'-0" | 5'- 2" | 2'- 6" | 2'- 0" | 8" | #5 | 6" | #4 | 6" | 97.25 | 0.584 |
| 11'-0" | 5'- 8" | 2'- 9" | 2'- 3" | 8" | #6 | 6" | #5 | 6" | 133.65 | 0.634 |
| 12'-0" | 6'- 2" | 3'- 0" | 2'- 6" | 9" | #7 | 6" | #5 | 6" | 162.29 | 0.721 |
| 13'-0" | 6'- 8" | 3'- 3" | 2'- 9" | 11" | #7 | 6" | #5 | 6" | 178.80 | 0.856 |
| 14'-0" | 7'- 2" | 3'- 6" | 3'- 0" | 1'- 0" | #8 | 6" | #5 | 6" | 216.78 | 0.959 |
| 15'-0" | 7'- 8" | 4'- 0" | 3'- 0" | 1'- 1" | #9 | 6" | #6 | 6" | 283.06 | 1.068 |
| 16'-0" | 8'- 2" | 4'- 6" | 3'- 0" | 1'- 3" | #9 | 6" | #6 | 6" | 297.02 | 1.234 |

## TABLE OF WINGWALL REINFORCING (2-Wings)

| Bar | Size | No. | Spa |
|---|---|---|---|
| DL | #5 | ~ | 1'-0" |
| DS | #5 | ~ | 1'-0" |
| E | #4 | ~ | 1'-0" |
| F | #4 | ~ | 1'-0" |
| G | #6 | 4 | ~ |
| M | #4 | 4 | ~ |
| P | #4 | ~ | 1'-0" |
| RS | #5 | 3 | ~ |
| RL | #5 | 3 | ~ |
| V | #4 | ~ | 1'-0" |

## TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

| Bar | Size | No. | Spa |
|---|---|---|---|
| L | #4 | ~ | 1'-6" |
| Q | #4 | 1 | ~ |
| Reinf (Lb/Ft) | | | 2.45 |
| Conc (CY/Ft) | | | 0.037 |

## WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

Hw = H + T + C - 0.250'

A = (Hw - 0.333') (SL)

B = (A) [Tangent (θ + 15°)]

Lw = (A) ÷ [Cosine (θ + 15°)]

For Cast-in-place culverts:

Ltw = [(N) (S) + (N + 1) (U)] ÷ (Cosine θ)

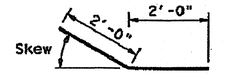
For Precast culverts:

Ltw = [(N) (2U + S) + (N - 1) (0.500')] ÷ (Cosine θ)

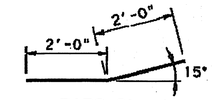
Total Wingwall Area (Two Wings ~ S.F.) =
(0.5) (Hw + 0.333') (Lw + A)

Hw = Height of Wingwall
SL:1 = Side Slope Ratio (Horizontal:1 Vertical)
A = Length of Short Wingwall
Lw = Length of Long Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans
θ = Culvert Skew

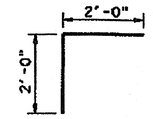
See applicable box culvert standard for H, S, T, and U values.



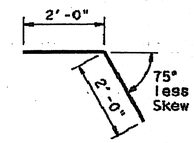

BARS DS
(Short Wing)




BARS DL
(Long Wing)

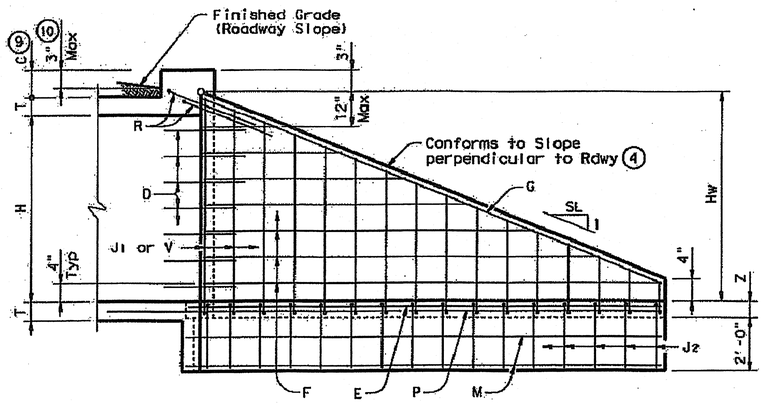



BARS RS
(Short Wing)

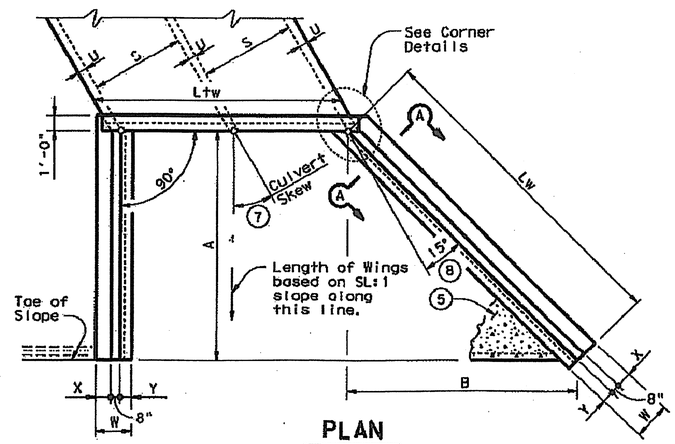



BARS RL
(Long Wing)

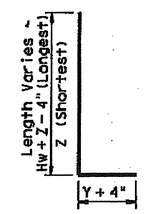
1. Extend Bars P 3'-0" minimum into bottom slab of Box Culvert.
2. Adjust to fit as necessary to maintain 1 ¼" clear cover and 4" minimum between bars.
3. Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings multiply the tabulated values by 0.5 x (A+Lw).
4. Recommended values of Slope are: 2:1, 3:1, 4:1, & 6:1.
5. When shown elsewhere on the plans, a 5" deep concrete riprap shall be constructed. Payment for riprap shall be as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, the riprap shall have a 6" wide by 1'-6" deep reinforced concrete toewall along all edges adjacent to natural ground; the toewall shall be reinforced by extending typical riprap reinforcing into the toewall; construction joints or grooved joints, oriented in the direction of flow, shall extend across the full distance of the riprap, at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
6. At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing from that shown as necessary.
7. Applicable values of of Skew are: 15°, 30°, and 45°.
8. Typical wingwall angle for all skews.
9. 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
10. For vehicle safety, curb heights and wall heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.



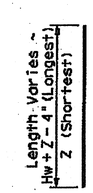

## INSIDE ELEVATION
(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)



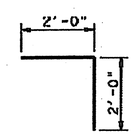

## PLAN
(Showing dimensions and 30° Skew.)



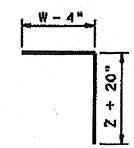

BARS J1




BARS V



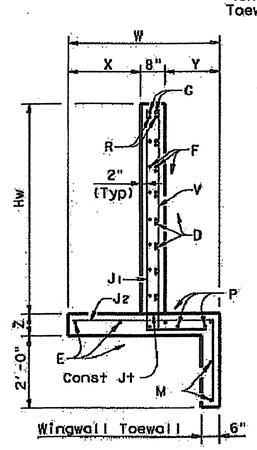

BARS L



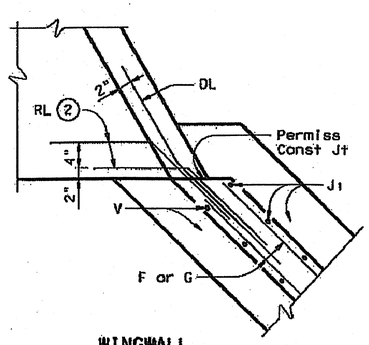

BARS J2

**GENERAL NOTES:**

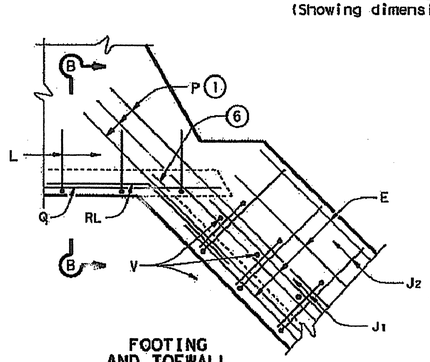
Designed according to AASHTO LRFD Specifications.
All reinforcing steel shall be Grade 60.
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
All reinforcing bars shall be adjusted to provide a minimum of 1 ¼" clear cover.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See BCS sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.




## SECTION A-A

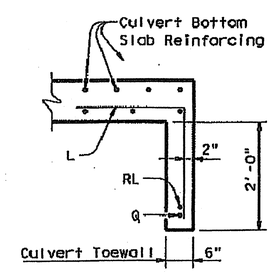



WINGWALL




FOOTING AND TOEWALL

## CORNER DETAILS
(Culvert and Culvert Toewall reinforcing not shown for clarity.)




## SECTION B-B ⑤

Texas Department of Transportation — Bridge Division Standard

# CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS

## FW-S

| FILE: fw-sstde.dgn | DN: GAF | CK: CAT | DW: TxDOT | CK: GAF |
|---|---|---|---|---|
| ©TxDOT February 2010 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS 11-10: Add note for synthetic fibers. | DIST | | COUNTY | SHEET NO. |

FILE:

P-201402-01 Det-6

P-201402-03