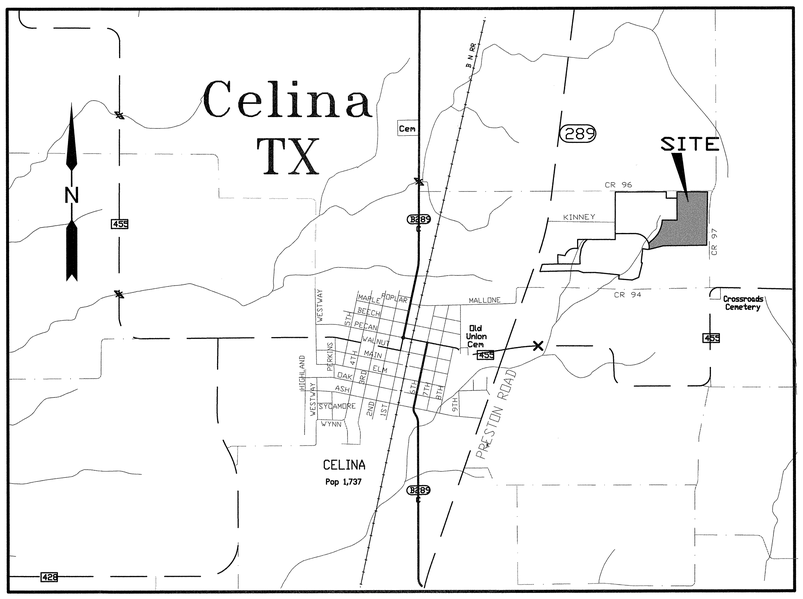
CONSTRUCTION PLANS
FOR
HERITAGE
PHASE 3
CITY OF CELINA
COLLIN COUNTY, TEXAS



LOCATION MAP
NOT TO SCALE

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FOR REFERENCE ONLY

DEVELOPER:
D.R. HORTON - TEXAS, LTD.
4306 MILLER ROAD
SUITE A
ROWLETT, TEXAS 75088
(214) 607-4244

ENGINEER\SURVEYOR
JBI PARTNERS, INC.
16301 QUORUM DRIVE, SUITE 200 B
ADDISON, TEXAS 75001
(972) 248-7676

TEXAS REGISTERED ENGINEERING FIRM F-438

STATE OF TEXAS
ERIK R. HANSEN
106034
LICENSED
PROFESSIONAL ENGINEER
01.25.2013

The seal appearing on this document was authorized by Erik R. Hansen, P.E. 106034. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

FOR CONSTRUCTION

RECORD DRAWINGS
THESE RECORD DOCUMENTS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. JBI PARTNERS, INC. HAS NOT VERIFIED THE ACCURACY AND/OR COMPLETENESS OF THIS INFORMATION. UNLESS OTHERWISE NOTED ON THESE DOCUMENTS, JBI PARTNERS, INC. SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS THAT MAY BE INCORPORATED AS A RESULT OF ERRONEOUS INFORMATION PROVIDED BY OTHERS.
JBI PARTNERS, INC.
BY: 11.19.2013

JBI PROJECT # HOE157

HERITAGE, PHASE 3

JBI PARTNERS, INC.

P-201310-01

BLOCK/LOT	LOT AREA TABLE SQUARE FEET	ACRES
B-12	25,893	0.594
B-13	24,083	0.553
B-14	21,831	0.501
B-15	20,455	0.470
B-16	20,053	0.460
B-17	20,000	0.459
B-18	27,082	0.622
B-19	44,438	1.020
B-20	20,000	0.459
B-21	20,000	0.459
B-22	20,000	0.459
B-23	20,000	0.459
B-24	20,000	0.459
B-25	20,000	0.459
B-26	20,000	0.459
B-27	20,000	0.459
B-28	20,000	0.459
B-29X	7,232	0.166
D-8	7,584	0.174
D-9	7,689	0.177
D-10	7,811	0.179
D-11	7,873	0.181
D-12	7,834	0.180
D-13	7,809	0.179
D-14	7,801	0.179
D-15	9,548	0.219
D-16	8,934	0.205
D-17	7,500	0.172
D-18	7,510	0.172
D-19	7,542	0.173
D-20	7,576	0.174
D-21	7,545	0.173
D-22	7,518	0.173
D-23	7,503	0.172
F-10	7,506	0.172
F-11	7,521	0.173
F-12	7,547	0.173
F-13	7,583	0.174
F-14	7,577	0.174
F-15	7,524	0.173
F-16	7,502	0.172
F-17	8,751	0.201
F-18	8,751	0.201
F-19	7,503	0.172
F-20	7,532	0.173
F-21	7,590	0.174
F-22	7,572	0.174
F-23	7,540	0.173
F-24	7,518	0.173
F-25	7,505	0.172
F-26	7,501	0.172
F-27	7,501	0.172
F-28	7,501	0.172
F-29	7,501	0.172
F-30	7,523	0.173
F-31	7,660	0.176
F-32	7,939	0.182
F-33	8,320	0.191
F-34	11,492	0.264
H-1	11,411	0.262
H-2	8,125	0.187
H-3	9,377	0.215
H-4	11,173	0.256
H-5	7,666	0.176
H-6	7,557	0.173
H-7	7,524	0.173
H-8	7,506	0.172
H-9	7,501	0.172
H-10	7,501	0.172
H-11	7,501	0.172
H-12	7,501	0.172
H-13	7,504	0.172
H-14	7,515	0.173
H-15	7,533	0.173
H-16	7,559	0.174
H-17	7,591	0.174
H-18	7,554	0.173
H-19	7,504	0.172
H-20	8,751	0.201
H-21	8,751	0.201
H-22	7,507	0.172
H-23	7,575	0.174
H-24	7,581	0.174
H-25	7,552	0.173
H-26	7,529	0.173
H-27	7,513	0.172
H-28	7,504	0.172
H-29	7,501	0.172
H-30	7,501	0.172
H-31	7,501	0.172
H-32	7,501	0.172
H-33	7,507	0.172
H-34	7,529	0.173
H-35	7,568	0.174
H-36	7,625	0.175
H-37	10,494	0.241
L-1	23,063	0.529
L-2X	8,467	0.194
L-3	20,000	0.459
L-4	20,000	0.459
L-5	20,000	0.459
L-6	20,000	0.459
L-7	20,000	0.459
L-8	20,000	0.459
L-9	20,000	0.459
L-10	20,000	0.459
L-11	20,000	0.459
L-12	20,000	0.459
L-13	20,000	0.459
L-14	20,000	0.459
L-15	20,000	0.459

CURVE TABLE						
NO.	DELTA	RADIUS	LENGTH	TANGENT	CHORD BEARING	CHORD
C1	83°31'02"	20.00'	29.15'	17.86'	S09°43'37"W	26.64'
C2	28°36'45"	315.00'	157.31'	80.33'	N37°10'45"E	155.68'
C3	22°48'01"	300.00'	119.38'	60.49'	N11°28'22"E	118.60'
C4	0°13'14"	1715.00'	6.60'	3.30'	N89°57'45"E	6.60'
C5	0°02'01"	1590.00'	0.93'	0.47'	N89°44'55"E	0.93'
C6	0°26'40"	1220.00'	9.46'	4.73'	N88°23'33"E	9.46'
C7	33°07'15"	290.00'	167.64'	86.23'	N15°28'17"W	165.32'
C8	40°33'39"	300.00'	212.38'	110.86'	S82°53'16"E	207.97'
C9	13°12'28"	1205.00'	277.77'	139.50'	S83°28'08"W	277.16'
C10	8°48'03"	2180.00'	334.85'	167.76'	N85°40'21"E	334.53'
C11	8°48'03"	405.00'	62.21'	31.17'	S85°40'21"W	62.15'
C12	29°49'42"	300.00'	156.18'	79.90'	S82°30'16"E	154.42'
C13	7°29'29"	1515.00'	198.09'	99.18'	S88°19'37"W	197.95'
C14	8°48'03"	1870.00'	287.24'	143.90'	N85°40'21"E	286.96'
C15	8°48'03"	715.00'	109.83'	55.02'	S85°40'21"W	109.72'
C16	8°27'12"	1560.00'	230.16'	115.29'	N85°29'55"E	229.95'

CURVE TABLE						
NO.	DELTA	RADIUS	LENGTH	TANGENT	CHORD BEARING	CHORD
C17	8°48'03"	1025.00'	157.44'	78.88'	S85°40'21"W	157.29'
C18	7°38'27"	1250.00'	166.70'	83.47'	N84°23'44"E	166.58'
C19	9°29'52"	1335.00'	221.30'	110.90'	S85°19'26"W	221.05'
C20	12°36'44"	1360.00'	299.37'	150.29'	S83°46'00"W	298.77'
C21	8°48'03"	2025.00'	311.05'	155.83'	N85°40'21"E	310.74'
C22	8°48'03"	560.00'	86.02'	43.09'	S85°40'21"W	85.93'
C23	8°34'49"	1715.00'	256.82'	128.65'	N85°33'43"E	256.58'
C24	8°48'03"	870.00'	133.63'	66.95'	S85°40'21"W	133.50'
C25	8°24'48"	1405.00'	206.31'	103.34'	N85°28'49"E	206.13'
C26	8°48'04"	1180.00'	181.26'	90.81'	S85°40'20"W	181.08'
C27	181°54'13"	50.00'	158.74'	3009.59'	N44°32'54"W	99.99'
C28	10°00'27"	455.00'	79.47'	39.84'	N82°29'39"W	79.37'
C29	12°26'13"	545.00'	118.30'	59.38'	S83°42'31"E	118.07'
C30	19°25'07"	455.00'	154.21'	77.85'	N80°13'05"W	153.47'
C31	18°24'56"	760.00'	244.27'	123.20'	S10°09'42"W	243.22'

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N51°29'08"E	14.64'
L2	N01°05'03"E	10.39'
L3	S62°34'27"E	5.48'
L4	S45°56'38"W	7.18'
L5	S89°55'38"E	236.55'
L6	S89°55'38"E	96.86'
L7	S89°55'38"E	101.63'
L8	S89°55'38"E	106.39'
L9	S77°29'26"E	99.99'
L10	S89°55'38"E	305.00'
L11	S70°30'32"E	60.35'
L12	S00°57'14"W	899.70'

NOTES:

1.) "SELLING A PORTION OF THIS ADDITION BY METES AND BOUNDS IS A VIOLATION OF CITY ORDINANCE AND STATE LAW, AND IS SUBJECT TO FINES AND WITHHOLDING OF UTILITIES AND BUILDING PERMITS."

2.) ALL CORNERS ARE ONE-HALF INCH IRON RODS FOUND, UNLESS OTHERWISE SHOWN ON THE PLAT.

3.) AS SHOWN THIS PROPERTY IS NOT LOCATED WITHIN THE 100 YEAR FLOOD PLAIN ACCORDING TO FEMA FLOOD INSURANCE RATE MAP 48085C0110 J DATED JUNE 2, 2009.

4.) ALL COMMON AND OPEN SPACES DEDICATED AND MAINTAINED BY THE H.O.A.

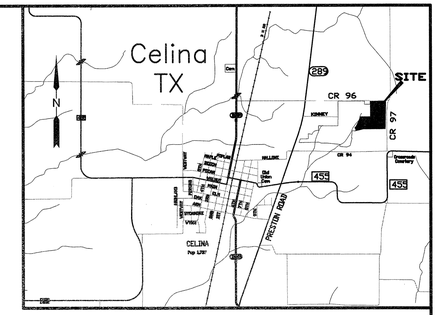
5.) LOTS ABUTTING C.R. 97 & "THE ESTATES ON PRESTON" SHALL BE SINGLE STORY.

6.) DWELLINGS FACING C.R. 96, C.R. 97, & "THE ESTATES ON PRESTON" SHALL BE 100% MASONRY.

7.) CHIMNEYS FOR DWELLINGS ALONG C.R. 96 & C.R. 97 SHALL BE 100% MASONRY.

8.) C.R. 97 ESCROW REQUIREMENTS SHALL BE PROVIDED PRIOR TO CONSTRUCTION OF THIS PHASE.

9.) ALL S.F.M.E. SHALL BE DEDICATED TO THE H.O.A.



LOCATION MAP
NOT TO SCALE

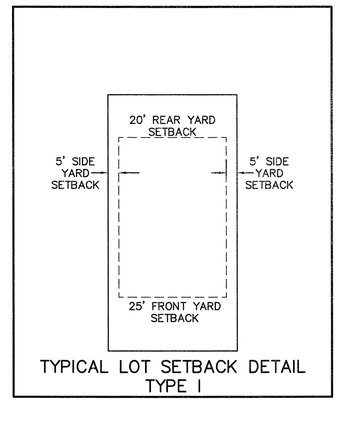
GRAPHIC SCALE

100 0 50 100 200 400

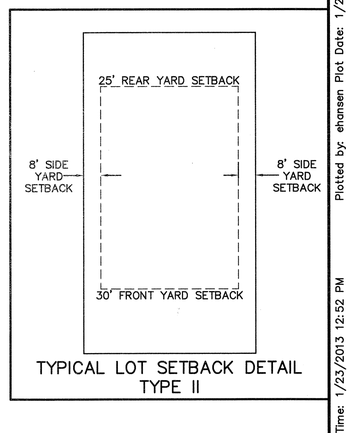
(IN FEET)
1 inch = 100 ft.

LEGEND

P.O.B.	POINT OF BEGINNING
BL	BUILDING LINE
R.O.W.	RIGHT-OF-WAY
D.E.	DRAINAGE EASEMENT
U.E.	UTILITY EASEMENT
S.F.M.E.	SCREENING FENCE MAINTENANCE EASEMENT
W.M.E.	WALL MAINTENANCE EASEMENT



TYPICAL LOT SETBACK DETAIL TYPE I



TYPICAL LOT SETBACK DETAIL TYPE II

CONSTRUCTION PLAT

HERITAGE PHASE 3

109 RESIDENTIAL LOTS AND 2 OPEN SPACES

BEING 39.416 ACRES OF LAND OUT OF THE HUGH C. ROUTH SURVEY, ABSTRACT NO. 765

CITY OF CELINA COLLIN COUNTY, TEXAS

D.R. HORTON - TEXAS, LTD. — OWNER / DEVELOPER
4306 Miller Road, Suite A
Rowlett, Texas 75088
(214) 607-4244

JBI PARTNERS, INC. — SURVEYOR/ENGINEER
16301 Quorum Drive, Suite 200 B
Addison, Texas 75001
(972) 248-7676

Submitted: January 21, 2013

Sheet 1 of 2

Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\XHOE157PT-(PHASE 3).dwg Saved By: ehansen Save Time: 1/23/2013 12:52 PM Plotted by: ehansen Plot Date: 1/24/2013 8:11 AM

P-201310-01

LEGAL DESCRIPTION

WHEREAS, D.R. HORTON – TEXAS, LTD. is the owner of a parcel of land located in the City of Celina, Collin County, Texas, a part of the Hugh C. Routh Survey, Abstract No. 765, and being all of that called 39.416 acre tract of land described in a special warranty deed from Wilbow–Celina Development Corporation to D.R. Horton – Texas, Ltd. as recorded in Document Number 20120611000692070, Collin County Deed Records, and being further described as follows:

BEGINNING at a one–half inch iron rod found at the intersection of the easterly right–of–way line of Bounds Lane (a variable width right–of–way) with the northerly right–of–way line of Missouri Street (a 60 foot wide right–of–way), said point being in the easterly line of Heritage Phase 2, an addition to the City of Celina as recorded in Cabinet P, Page 632, Collin County Plat Records;

THENCE along the easterly line of said Heritage Phase 2 as follows:
Northeasterly, 29.15 feet along a curve to the right which has a central angle of 83 degrees 31 minutes 02 seconds, a radius of 20.00 feet, a tangent of 17.86 feet, and whose chord bears North 09 degrees 43 minutes 37 seconds East, 26.64 feet to a one–half inch iron rod found for corner;
North 51 degrees 29 minutes 08 seconds East, 14.64 feet to a one–half inch iron rod found for corner;
Northeasterly, 157.31 feet along a curve to the left which has a central angle of 28 degrees 36 minutes 45 seconds, a radius of 315.00 feet, a tangent of 80.33 feet, and whose chord bears North 37 degrees 10 minutes 46 seconds East, 155.68 feet to a one–half inch iron rod found for corner;
North 22 degrees 52 minutes 23 seconds East, 357.49 feet to a one–half inch iron rod found for corner;
Northeasterly, 119.38 feet along a curve to the left which has a central angle of 22 degrees 48 minutes 01 seconds, a radius of 300.00 feet, a tangent of 60.49 feet, and whose chord bears North 11 degrees 28 minutes 23 seconds East, 118.60 feet to a one–half inch iron rod found for corner;
North 00 degrees 04 minutes 22 seconds East, 0.28 feet to a one–half inch iron rod found for corner;
South 89 degrees 55 minutes 38 seconds East, 550.54 feet to a one–half inch iron rod found for corner;
Northeasterly, 6.60 feet along a curve to the left which has a central angle of 00 degrees 13 minutes 14 seconds, a radius of 1715.00 feet, a tangent of 3.30 feet, and whose chord bears North 89 degrees 57 minutes 45 seconds East, 6.60 feet to a one–half inch iron rod found for corner;
North 00 degrees 57 minutes 14 seconds East, 125.02 feet to a one–half inch iron rod found for corner;
Northeasterly, 0.93 feet along a curve to the left which has a central angle of 00 degrees 02 minutes 01 seconds, a radius of 1590.00 feet, a tangent of 0.47 feet, and whose chord bears North 89 degrees 44 minutes 55 seconds East, 0.93 feet to a one–half inch iron rod found for corner;
North 00 degrees 04 minutes 22 seconds East, 370.64 feet to a one–half inch iron rod found for corner;
Southwesterly, 9.46 feet along a curve to the right which has a central angle of 00 degrees 26 minutes 39 seconds, a radius of 1220.00 feet, a tangent of 4.73 feet, and whose chord bears South 88 degrees 23 minutes 33 seconds West, 9.46 feet to a one–half inch iron rod found for corner;
North 00 degrees 04 minutes 00 seconds East, 154.84 feet to a one–half inch iron rod found at the southeast corner of a called 1.207 acre tract of land described in a deed to the City of Celina as recorded in Volume 2281, Page 380, Collin County Deed Records,

THENCE North 00 degrees 04 minutes 00 seconds East, 175.20 feet to a "X" in concrete found at the northeast corner of said 1.207 acre tract of land, said point being the northwest corner of said 39.416 acre tract of land and being in County Road 96;

THENCE South 89 degrees 55 minutes 38 seconds East, 848.67 feet along the north line of said 39.416 acre tract of land and along County Road 96 to a one–half inch iron rod found at the northeast corner of said 39.416 acre tract of land;

THENCE South 00 degrees 57 minutes 14 seconds West, 1484.65 along the east line of said 39.416 acre tract of land and along County Road 97 to a one–half inch iron rod found at the southeast corner of said 39.146 acre tract of land, said point being in County Road 97, said point being the northeast corner of The Estates on Preston Phase III, an addition to the City of Celina as recorded in Volume I, Page 527, Collin County Plat Records;

THENCE along the south line of said 39.416 acre tract of land and along the north line of said Phase III as follows:
South 89 degrees 21 minutes 09 seconds West, 1202.98 to a one–half inch iron rod found for corner;
South 75 degrees 55 minutes 27 seconds West, 413.74 feet to a one–half inch iron rod found for corner in the easterly right–of–way line of Missouri Street;

THENCE along the easterly and northerly right–of–way line of Missouri Street as follows:
North 01 degrees 05 minutes 21 seconds East, 10.40 feet to a one–half inch iron rod found for corner;
Northwesterly, 167.64 feet along a curve to the left which has a central angle of 33 degrees 07 minutes 15 seconds, a radius of 290.00 feet, a tangent of 86.23 feet, and whose chord bears North 15 degrees 28 minutes 16 seconds West, 165.32 feet to the POINT OF BEGINNING and containing 1,716,988 square feet or 39.417 acre tract of land.

STATE OF TEXAS ~

COUNTY OF COLLIN ~

NOW THEREFORE KNOW ALL MEN BY THESE PRESENTS:

That D.R. HORTON – TEXAS, LTD., acting herein by and through his (its) duly authorized officer(s), does hereby adopt this plat designating the herein above described property as HERITAGE PHASE 3, an addition to the City of Celina, Texas, and does hereby dedicate, in fee simple, to the public use forever, the streets, rights–of–way, and other public improvements shown thereon. The streets and alleys, if any, are dedicated for street purposes. The easements and public use areas as shown are dedicated for the public use forever for the purposes indicated on this plat. No buildings, fences, trees, shrubs or other improvements or growths shall be constsructed or placed upon, over or across the easements as shown except that landscape improvements may be placed in landscape easements, if approved by the City Council of the City of Celina. In addition, utility easements may also be used for the mutual use and accommodation of all public utilities desiring to use or using the same unless the easement limits the use to particular utilities, said use by public utilities being subordinate to the public's and City of Celina's use thereof. The City of Celina and public utility entities shall have the right to remove and keep removed all or parts of any buildings, fences, trees, shrubs or other improvements or growths which may in any way endanger or interfere with the construction, maintenance, or efficiency of their respective systems in said easements. The City of Celina and public utility entities shall at all times have the full right of ingress and egress to or from their respective easements for the purpose of constructing, reconstructing, inspecting, patrolling, maintaining, reading meters, and adding to or removing all or parts of their respective systems without the necessity at any time procuring permission from anyone.
This plat approved subject to all platting ordinances, rules, regulations and resolutions of the City of Celina, Texas.

Witness, my hand, this the _____ day of _____, 2013.

_____
David L. Booth, an Authorized Agent for D.R. Horton–Texas Ltd.

STATE OF TEXAS ~

COUNTY OF DALLAS ~

BEFORE ME, the undersigned authority, a Notary public in and for the State of Texas, on this day personally appeared **David L. Booth** *Assistant Vice President*, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purpose and considerations therein expressed.

Given under my and seal of office, this ____ day of _____, 2013.

_____
Notary Public in and for the State of Texas

This property is located in the corporate limits of the City of Celina, Collin County, Texas.

_____ _____
Signature of Mayor Date of Approval

ATTEST:

_____ _____
City of Secretary Date

SURVEYOR'S CERTIFICATE

KNOW ALL MEN BY THESE PRESENTS:

THAT I, DAN B. RAMSEY, do hereby certify that I prepared this plat from an actual survey of the land and that the corner monuments shown thereon as "set" were properly placed under my personal supervision in accordance with the Subdivision Ordinance of the City of Celina, Collin County, Texas.

_____
Dan B. Ramsey, R.P.L.S. No. 4172

STATE OF TEXAS ~

COUNTY OF DALLAS ~

BEFORE ME, the undersigned authority in and for the State of Texas, on this day personally appeared Dan B. Ramsey, Registered Public Surveyor, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

Given under my and seal of office, this __ day of _____, 2013.

_____
Notary Public in and for the State of Texas.

This property is located in the corporate limits (or the extraterritorial jurisdiction) of the City of Celina, Collin County, Texas.

_____ _____
Signature of Mayor Date of Approval

ATTEST:

_____ _____
City of Secretary Date

Approved for preparation of final plat following construction of all public improvements (or appropriate sureties thereof) necessary for the subdivision shown on this plat.

RECOMMENDED BY: Planning and Zoning Commision
City of Celina, Texas

_____ _____
Signature of Chairperson Date of Recommendation

APPROVED BY: City Council
City of Celina, Texas

_____ _____
City of Mayor Date of Approval

ATTEST:

_____ _____
City of Secretary Date

CONSTRUCTION PLAT

HERITAGE PHASE 3

109 RESIDENTIAL LOTS AND
2 OPEN SPACES

BEING 39.416 ACRES OF LAND
OUT OF THE
HUGH C. ROUTH SURVEY, ABSTRACT NO. 765

CITY OF CELINA
COLLIN COUNTY, TEXAS

D.R. HORTON – TEXAS, LTD. OWNER / DEVELOPER
4306 Miller Road, Suite A (214) 607–4244
Rowlett, Texas 75088

JBI PARTNERS, INC. SURVEYOR/ENGINEER
16301 Quorum Drive, Suite 200 B (972) 248–7676
Addison, Texas 75001

Submitted: January 21, 2013 Sheet 2 of 2

Plotted by: ehansen Plot Date: 1/21/2013 10:23 AM
Drawing: H:\Projects\H0E157 – Heritage Phase 3 Celina\dwg\XH0E157PT–(PHASE 3).dwg Saved By: ehansen Save Time: 1/21/2013 10:21 AM

City of Celina
CONSTRUCTION GENERAL NOTES

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 continued 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-TELEGRAM	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
COSERVE-ELEC	940-321-7800
COSERVE-GAS	940-321-7800
CITY OF CELINA	972-658-2052
CITY 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 100 linear feet of pavement unless otherwise noted.
   c. Utility Trench Backfill - One soil density test shall be performed as directed by City of Celina.
   d. Concrete Tests:
      (1). Compressive Strength - as specified in the N.C.T.C.O.G. specifications or city specifications.
      (2). Air Content - One test for each 25 C.Y. of concrete or fraction thereof unless otherwise noted.
      (3). Slump - One test for each 9 C.Y. unless otherwise noted.

   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 Administrator 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.

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 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.

PROJECT SPECIFIC NOTE:
The minimum 28 day compressive strength of concrete paving shall be 3500 psi.

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.

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

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

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

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

6. 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.

7. 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.

8. 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.

9. Meter boxes shall approved by the City of Celina.

10. Sanitary sewer mains shall be DR 35 PVC. Class H embedment 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.

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 12/18/12

JBI PARTNERS
Texas Registered Engineering Firm F-438
16301 Quorum Drive
Suite 200 B
Addison, Texas 75001
Main 972.248.7676
Fax 972.248.1414
www.jbipartners.com

GENERAL CONSTRUCTION NOTES

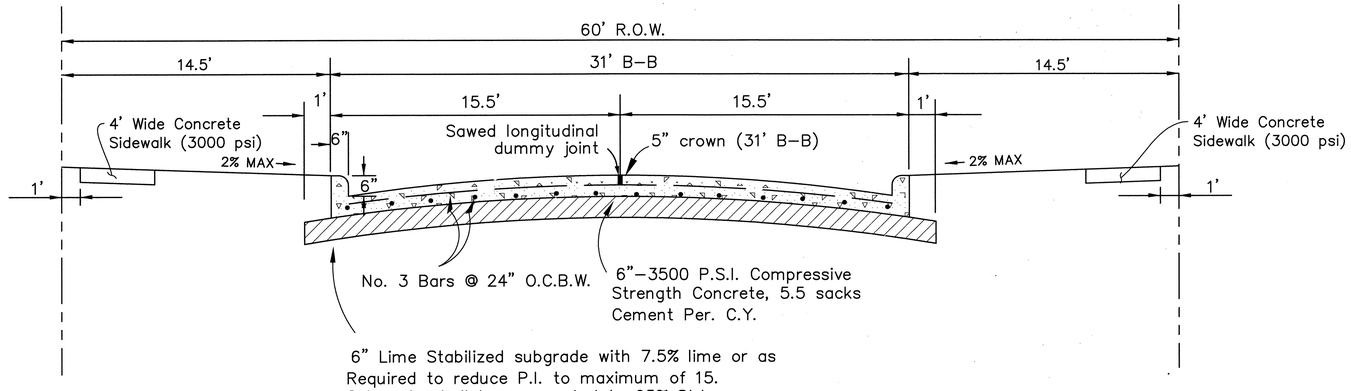
PROJECT NO. H0E157

HERITAGE, PHASE 3

City of Celina, Collin County, Texas

SHEET NO. 4

Plotted by: cfarrow Plot Date: 12/19/2012 6:04 PM
Drawing: H:\Projects\H0E157 - Heritage Phase 3 Celina\dwg\H0E157-DETAILS.dwg Saved By: cfarrow Save Time: 12/18/2012 10:13 AM



STREET PAVEMENT DETAILS

N.T.S.

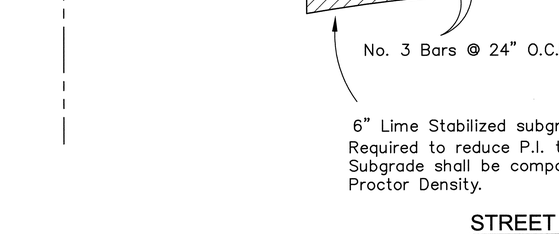
NOTES:

ALL CONSTRUCTION MUST MEET CITY OF CELINA'S ORDINANCES.

SAWED DUMMY JOINTS SHALL BE SPACED AT 15–FEET FOR 6–INCH PAVEMENT AND 20–FEET FOR 8–INCH PAVEMENT.

NOTE: Spacing of Sawed Dummy Joints Shall be 15 Feet for 6" Paving and 20 Feet for 8" Paving.

SAWED DUMMY JOINT



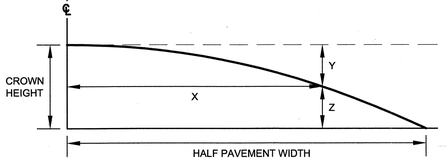
CONSTRUCTION JOINT FOR PAVEMENTS

TRANSVERSE AND LONGITUDINAL JOINTS

NOTE: CONTRACTOR SHALL PROTECT KEYWAY PRIOR TO SECOND POUR. IF LONGITUDINAL KEYWAY IS DAMAGED, CONTRACTOR SHALL REPAIR WITH THE USE OF LONGITUDINAL BUTT JOINT. DRILL DOWELS INTO FIRST POUR.

T = PAVEMENT THICKNESS

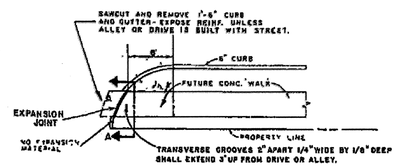
THICKENED EDGES ARE REQUIRED FOR FUTURE WIDENING ONLY.



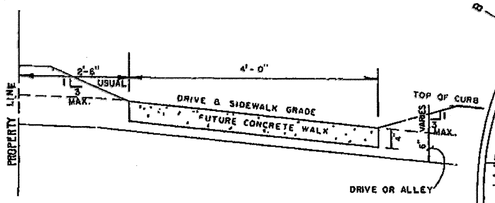
ORDINATES FOR PARABOLIC CROWNS

N.T.S.

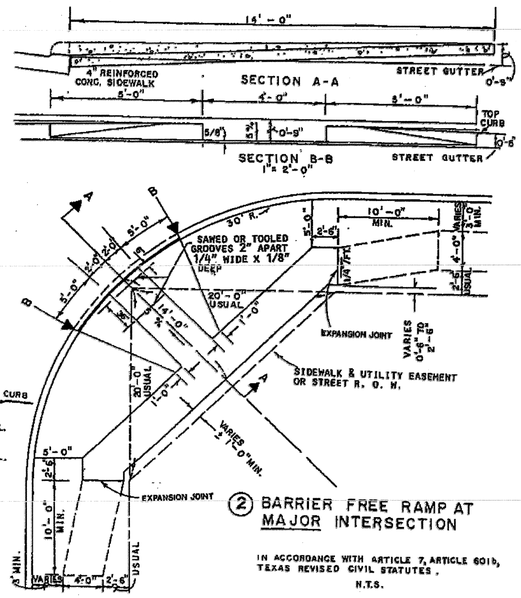
31' ROADWAY (30 F-F)				
5" CROWN = 0.4167'				
X	Y		Z	
Ft.	Feet	Inches	Feet	Inches
0	0.000	0	0.417	5
1	0.002	0 1/32	0.415	4 31/32
2	0.007	0 3/32	0.409	4 29/32
3	0.017	0 3/16	0.400	4 13/16
4	0.030	0 11/32	0.387	4 21/32
5	0.046	0 9/16	0.370	4 7/16
6	0.067	0 13/16	0.350	4 3/16
7	0.091	1 3/32	0.326	3 29/32
8	0.119	1 7/16	0.298	3 9/16
9	0.150	1 13/16	0.267	3 3/16
10	0.185	2 7/32	0.231	2 25/32
11	0.224	2 11/16	0.193	2 5/16
12	0.267	3 3/16	0.150	1 13/16
13	0.313	3 3/4	0.104	1 1/4
14	0.363	4 11/32	0.054	0 21/32
15	0.417	5	0.000	0



① BARRIER FREE RAMP AT DRIVE OR ALLEY

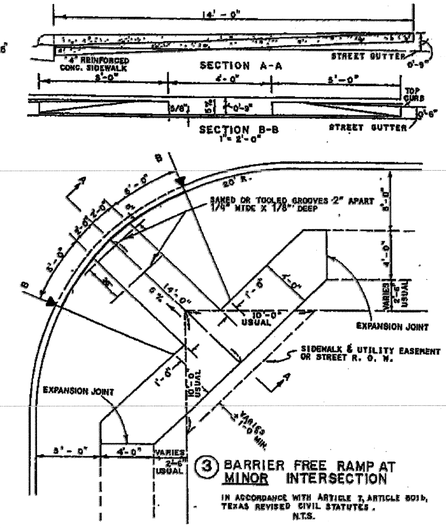


SECTION A-A



② BARRIER FREE RAMP AT MAJOR INTERSECTION

IN ACCORDANCE WITH ARTICLE 7, ARTICLE 6011b, TEXAS REVISED CIVIL STATUTES.
N.T.S.



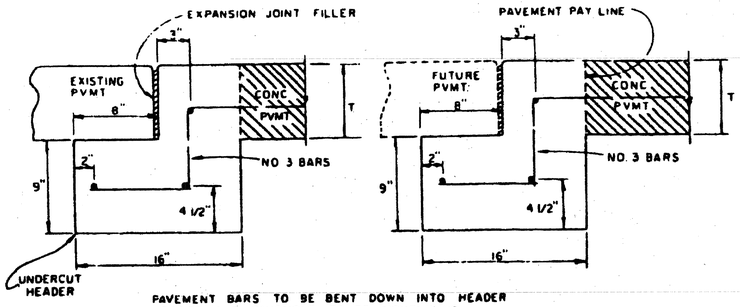
③ BARRIER FREE RAMP AT MINOR INTERSECTION

IN ACCORDANCE WITH ARTICLE 7, ARTICLE 6011b, TEXAS REVISED CIVIL STATUTES.
N.T.S.

BARRIER FREE RAMPS DETAILS

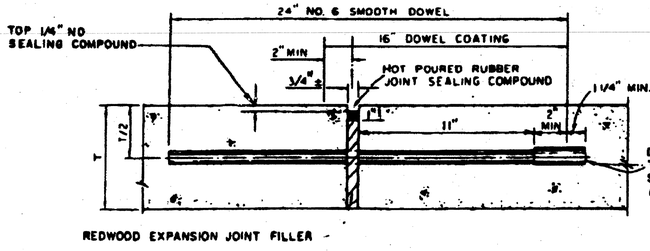
(TAKEN FROM CITY OF PLANO STANDARD DETAILS)

N.T.S.



PAVEMENT BARS TO BE BENT DOWN INTO HEADER HEADER AND PAVEMENT TO BE MONOLITHIC

STREET HEADER



TRANSVERSE EXPANSION JOINT

(SPACED 600 FT. MAXIMUM, LOCATE AT INTERSECTIONS)

T = PAVEMENT THICKNESS

NOTE:
DOWELS & REINFORCING BARS SHALL BE SUPPORTED BY A BASKET OR OTHER APPROVED DEVICE.

RECORD DRAWINGS

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JBI PARTNERS, INC.

BY: _____

DATE: 11.19.2013

BENCHMARKS

1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'

2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
2	PARKWAY MAXIMUM SLOPE REVISED.	ERH	11/13/12
1	SIDEWALK RAMP DETAILS REVISED	ERH	10/22/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ★ ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 12.20.12

The seal appearing on this document was authorized by Erik R. Hansen, P.E. 106034. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.
FOR CITY APPROVAL & CONSTRUCTION

JBI PARTNERS
16301 Quorum Drive
Suite 200 B
Addison, Texas 75001
Main 972.248.7676
Fax 972.248.1414
www.jbipartners.com
Texas Registered Engineering Firm F-438

STANDARD PAVING DETAILS

HERITAGE, PHASE 3

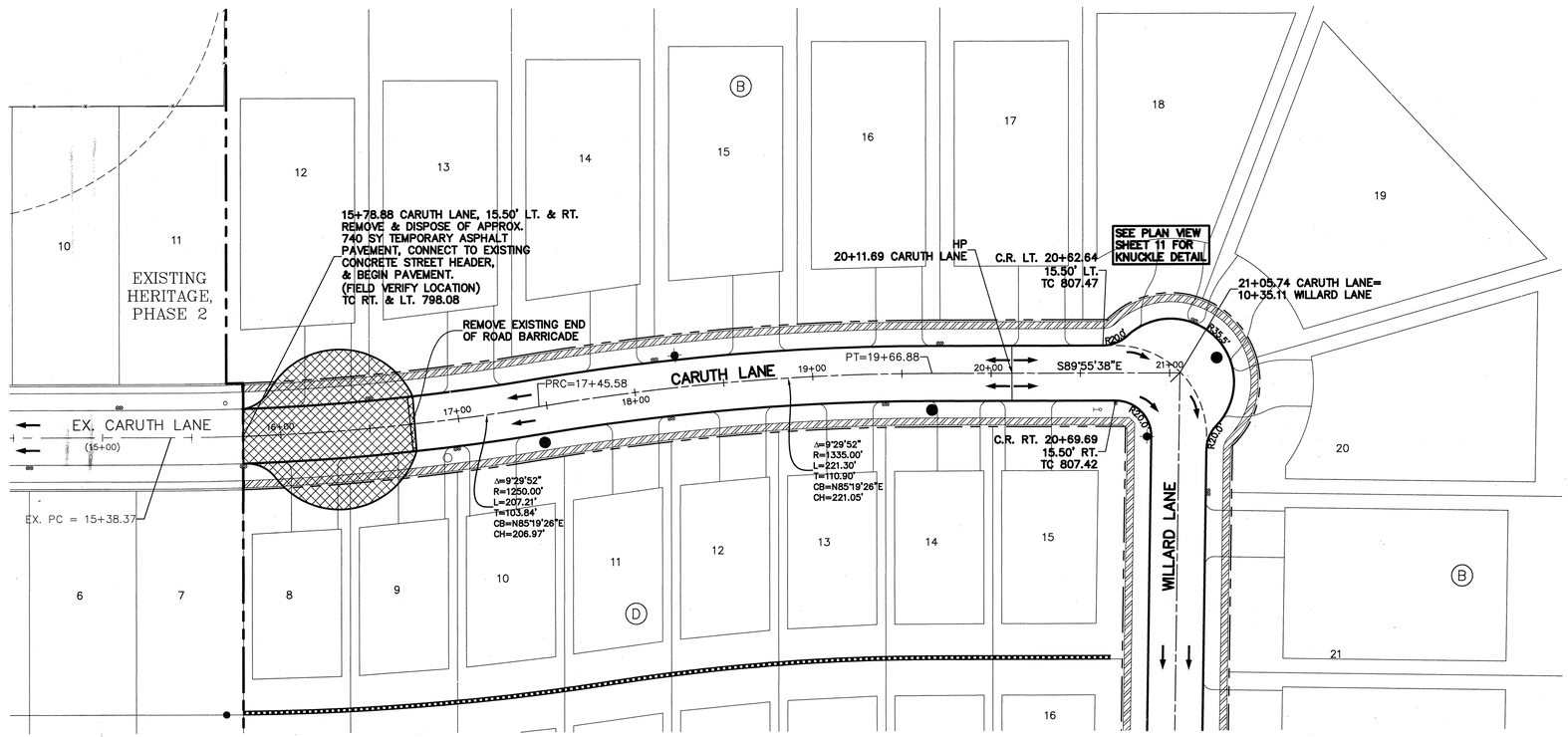
City of Celina, Collin County, Texas

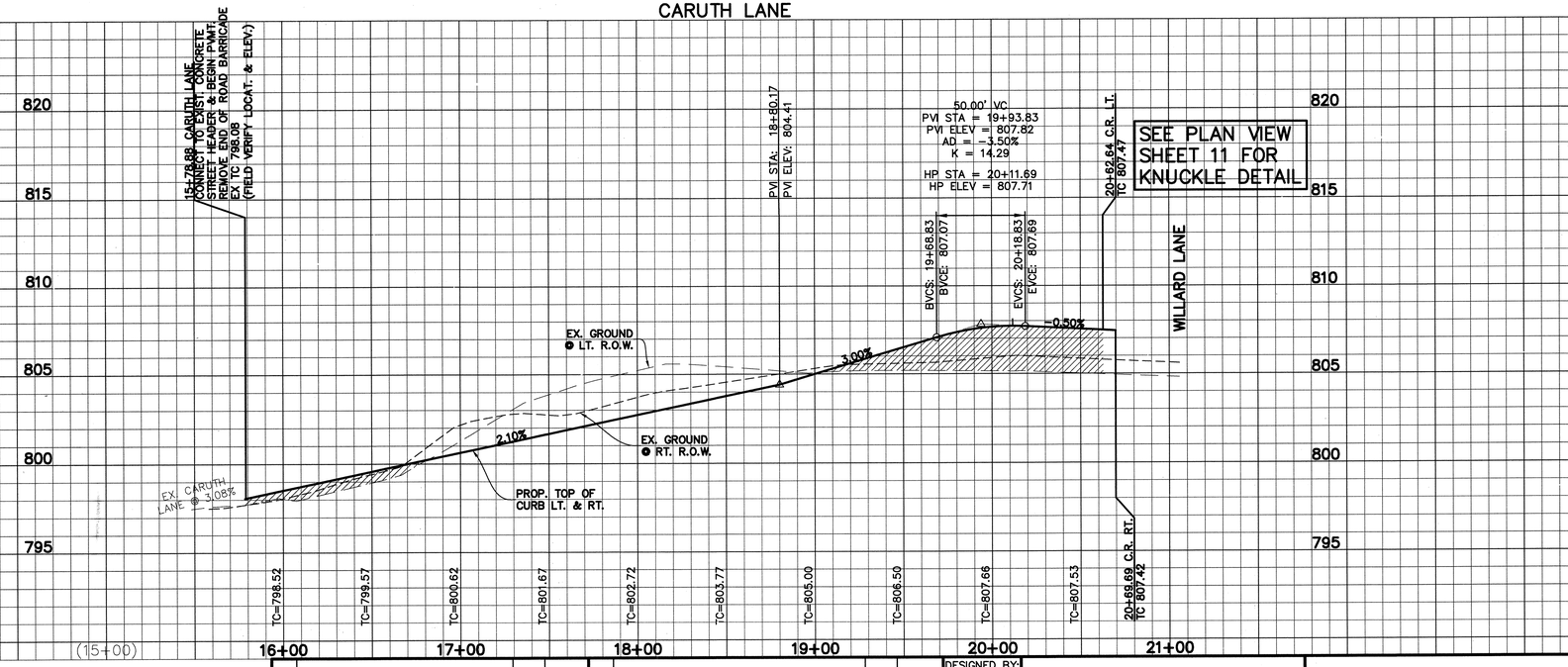
PROJECT NO. HOE157

SHEET NO. 5

P-201310-01

Plotted by: cfarrow Plot Date: 12/20/2012 7:26 AM
Drawing: H:\Projects\HOE157 – Heritage Phase 3 Celina\dwg\HOE157-PV DET.dwg Saved By: ehansen Save Time: 11/13/2012 6:09 PM





CAUTION!!!
Existing underground utilities. Contractor to call for locates (1-800-DIG-TESS) and field verify the location of all existing utilities prior to excavation.

LEGEND

- SIDEWALK TO BE CONSTRUCTED BY HOME BUILDER (CONSTRUCTION PER CITY STANDARD DETAILS).
- BARRIER FREE RAMPS TO BE CONSTRUCTED BY HOMEBUILDER PER DETAIL SHEET 5
- PROPOSED FIRE HYDRANT
- PROPOSED MANHOLE
- PROPOSED INLET
- PROPOSED WATER METER
- PROPOSED SEWER CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING MANHOLE

GRAPHIC SCALE 1"=40'
40 0 40 80

NOTE
ALL BARRIER FREE RAMPS TO BE CONSTRUCTED BY HOMEBUILDER UNLESS OTHERWISE NOTED.

SEE SHEET 5 FOR TYPICAL PAVEMENT SECTION.

NOTES
SIDEWALKS TO BE BUILT BY HOMEBUILDER UNLESS OTHERWISE NOTED.

NOTES:
1. ✱ DENOTES HOMEBUILDER TO CONSTRUCT ADA COMPLIANT CURB RAMP. (SEE SHEET 5).
2. ALL INTERSECTION RADII ARE BACK OF CURB UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY: [signature]
DATE: 11-14-2013

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
1	PADS & DRIVEWAYS ADDED. END OF ROAD BARRICADE CALLOUT ADDED.	CSF	12/21/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 12-21-12

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FOR CITY APPROVAL

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16301 Quorum Drive
Suite 200 B
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Main 972.248.7676
Fax 972.248.1414
www.jbipartners.com
Texas Registered Engineering Firm F-438

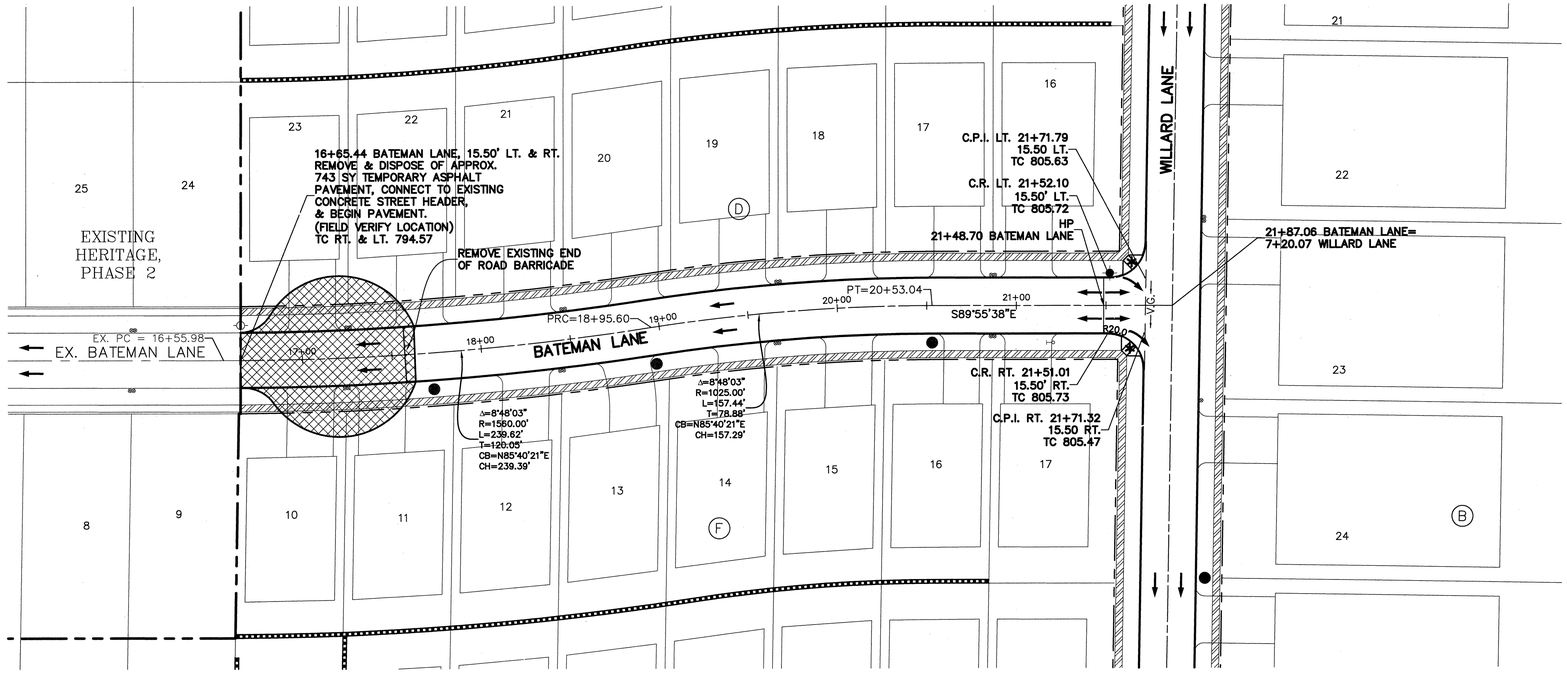
PAVING PLAN & PROFILE
CARUTH LANE
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 6

Plotted by: cfarrow Plot Date: 12/21/2012 9:00 AM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-PV.dwg Saved By: cfarrow Save Time: 12/21/2012 8:52 AM

P-201310-01

CAUTION!!!
Existing underground utilities. Contractor to call for locates (1-800-DIG-TESS) and field verify the location of all existing utilities prior to excavation.



LEGEND

	SIDEWALK TO BE CONSTRUCTED BY HOME BUILDER (CONSTRUCTION PER CITY STANDARD DETAILS).
	BARRIER FREE RAMPS TO BE CONSTRUCTED BY HOMEBUILDER PER DETAIL SHEET 5
	PROPOSED FIRE HYDRANT
	PROPOSED MANHOLE
	PROPOSED INLET
	PROPOSED WATER METER
	PROPOSED SEWER CLEANOUT
	EXISTING FIRE HYDRANT
	EXISTING MANHOLE

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SEE SHEET 5 FOR TYPICAL PAVEMENT SECTION.

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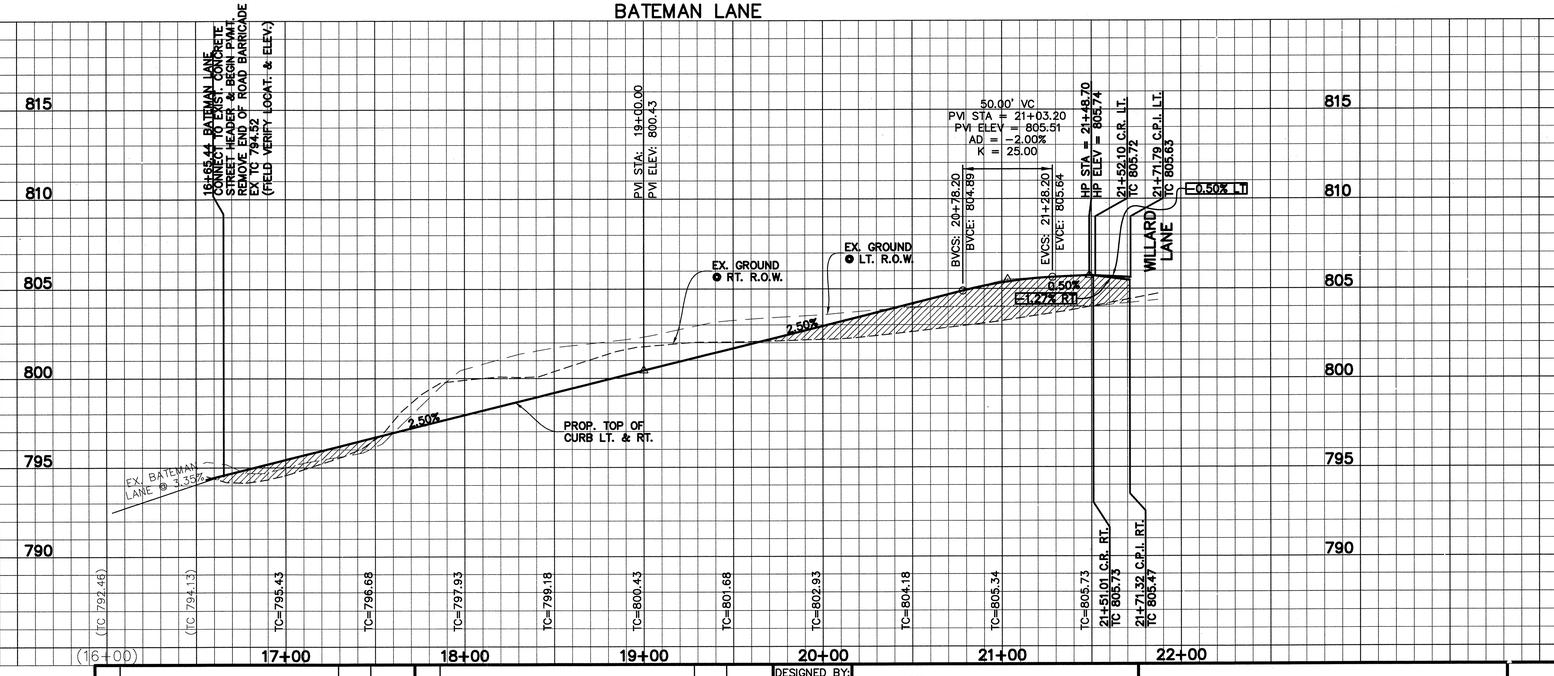

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 11.19.2013

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NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
1	PADS & DRIVEWAYS ADDED.	CSF	12/21/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS
ERIK R. HANSEN
106034
LICENSED
PROFESSIONAL ENGINEER
12.21.12

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Fax 972.248.1414
www.jbipartners.com
Texas Registered Engineering Firm F-438

PAVING PLAN & PROFILE
BATEMAN LANE
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 7

Plotted by: cfarrow Plot Date: 12/21/2012 9:01 AM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-PV.dwg Saved By: cfarrow Save Time: 12/21/2012 8:52 AM

P-201310-01

CAUTION!!!
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SIDEWALKS TO BE BUILT BY HOMEBUILDER UNLESS OTHERWISE NOTED.

SEE SHEET 5 FOR TYPICAL PAVEMENT SECTION.

LEGEND
- SIDEWALK TO BE CONSTRUCTED BY HOME BUILDER (CONSTRUCTION PER CITY STANDARD DETAILS).
- BARRIER FREE RAMPS TO BE CONSTRUCTED BY HOMEBUILDER PER DETAIL SHEET 5
- PROPOSED FIRE HYDRANT
- PROPOSED MANHOLE
- PROPOSED INLET
- PROPOSED WATER METER
- PROPOSED SEWER CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING MANHOLE

EXISTING HERITAGE, PHASE 2

EXISTING BOUNDS LANE (NB)

1+00.00 CLAYTON LANE= 6+33.87 NB BOUNDS LANE

1+31.80 CLAYTON LANE, 15.50' LT. & RT. REMOVE EX. END OF ROAD BARRICADE, CONNECT TO EXISTING CONCRETE STREET HEADER & BEGIN PAVEMENT. (FIELD VERIFY LOCATION) TC RT. & LT. 777.33

1+56.76 CLAYTON LANE CONST. 10' C.I. "F2" TC 777.63 FL 773.63

1+57.07 CLAYTON LANE CONST. 10' C.I. "F1" TC 776.63 FL 773.63

3+67.13 CLAYTON LANE CONST. 14' C.I. "F3" TC 780.15 FL 776.15

3+67.19 CLAYTON LANE CONST. 14' C.I. "F4" TC 779.15 FL 776.15

EX. PC = 1+16.57

PRC=2+75.18

PT=4+73.27

PC=7+09.82

PRC=9+97.06

PT=11+06.88

S89°55'38"E

CLAYTON LANE

Δ=30°17'30" R=300.00' L=158.61' T=81.20' CB=S82°16'22"E CH=156.77'

Δ=7°29'29" R=1515.00' L=198.09' T=99.18' CB=N86°19'37"E CH=197.95'

Δ=8°48'03" R=715.00' L=109.83' T=55.02' CB=N85°40'21"E CH=109.72'

Δ=8°48'03" R=1870.00' L=287.24' T=143.90' CB=N85°40'21"E CH=286.96'

C.P.I. LT. 12+20.87 15.50 LT. TC 804.05

C.R. LT. 12+01.17 15.50' LT. TC 804.14

OVERALL HP 12+00.12 CLAYTON LANE

C.R. RT. 12+00.08 15.50' RT. TC 804.15

C.P.I. RT. 12+20.39 15.50 RT. TC 803.86

12+36.13 CLAYTON LANE= 4+10.04 WILLARD LANE

WILLARD LANE

GRAPHIC SCALE 1"=40'
40 0 40 80

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY: _____
DATE: 10/13/2015

Plotted by: ehansen Plot Date: 1/23/2013 10:48 AM

CLAYTON LANE

150.00' VC
PVI STA = 6+50.00
PVI ELEV = 786.05
AD = 3.00%
K = 50.00

100.00' VC
PVI STA = 8+00.00
PVI ELEV = 793.85
AD = -3.20%
K = 31.25

100.00' VC
PVI STA = 10+00.00
PVI ELEV = 797.85
AD = 2.50%
K = 40.00

100.00' VC
PVI STA = 11+32.50
PVI ELEV = 803.81
AD = -4.00%
K = 25.00

BVCS: 5+75.00 BVCE: 784.40
EVCS: 7+25.00 EVCE: 789.95
BVCS: 7+50.00 BVCE: 791.25
EVCS: 8+50.00 EVCE: 794.85
BVCS: 9+50.00 BVCE: 796.85
EVCS: 10+50.00' EVCE: 800.10
BVCS: 10+82.50' BVCE: 801.56
EVCS: 11+82.50' EVCE: 804.06

HP STA = 12+00.12 HP ELEV = 804.15
12+01.17 C.R. LT. TC 804.14
12+20.87 C.P.I. LT. TC 804.05
HP STA = 12+00.12 HP ELEV = 804.18
12+00.08 C.R. RT. TC 804.15
12+20.39 C.P.I. RT. TC 803.86

EX. GROUND @ LT. R.O.W.
EX. GROUND @ RT. R.O.W.
PROP. TOP OF CURB LT. & RT.
1.20% 2.20% 3.20% 2.00% 0.50% 4.50% 2.00% 0.50% -1.43%

TC=777.55 TC=778.15 TC=778.75 TC=779.35 TC=779.95 TC=780.55 TC=781.65 TC=782.75 TC=783.85 TC=785.01 TC=786.61 TC=788.71 TC=791.25 TC=793.45 TC=794.85 TC=795.85 TC=796.85 TC=798.16 TC=800.10 TC=802.29 TC=803.69 TC=804.15

(1+00) 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

BENCHMARKS
1. "⊏" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "⊏" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
2	STORM LINES SHOWN	ERH	01/23/13
1	STORM INLETS ADDED. STREET GRADES REVISED.	CSF	12/21/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 01-23-2013

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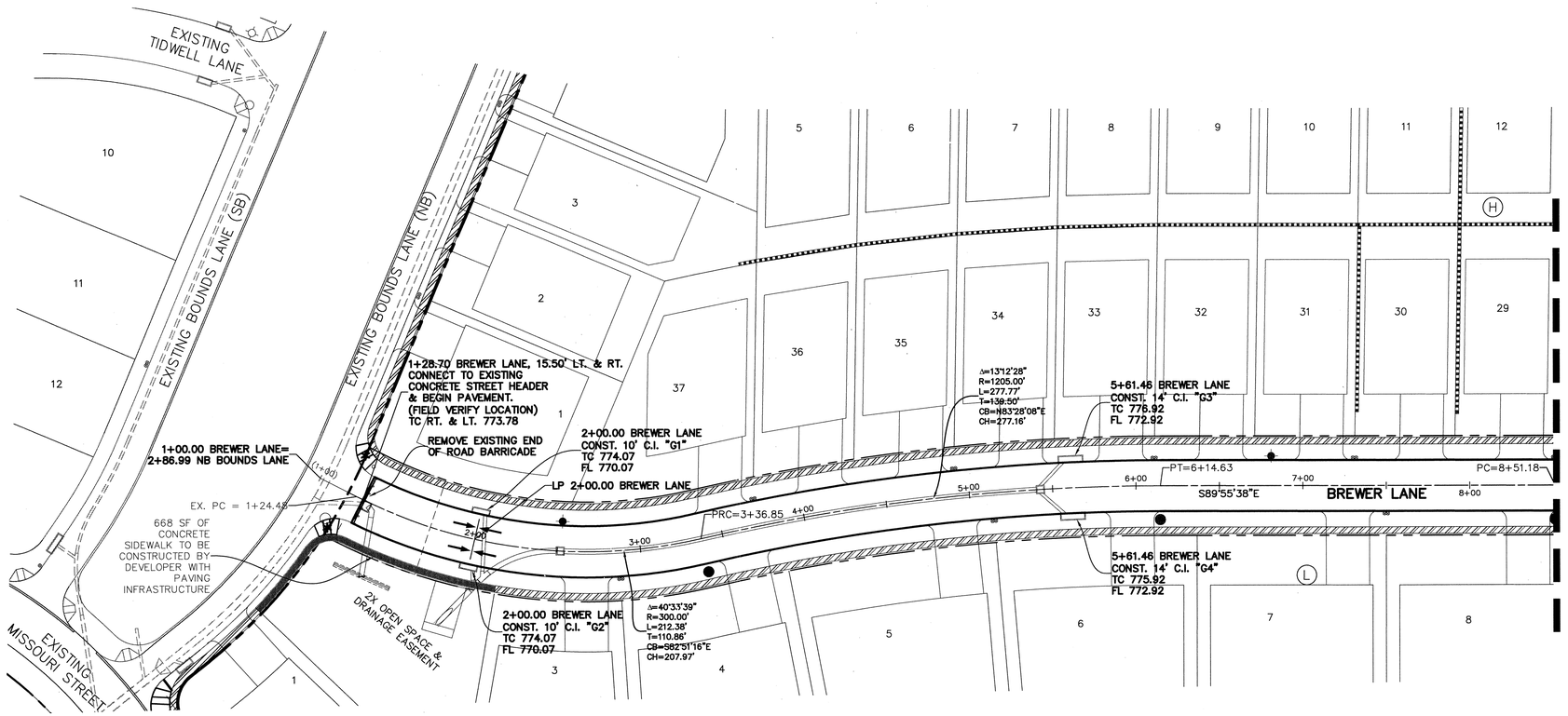
www.jbipartners.com
Texas Registered Engineering Firm F-438

PAVING PLAN & PROFILE
CLAYTON LANE
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 8

Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-PV.dwg Saved By: cfarrow Save Time: 1/16/2013 8:14 AM

P-201310-01



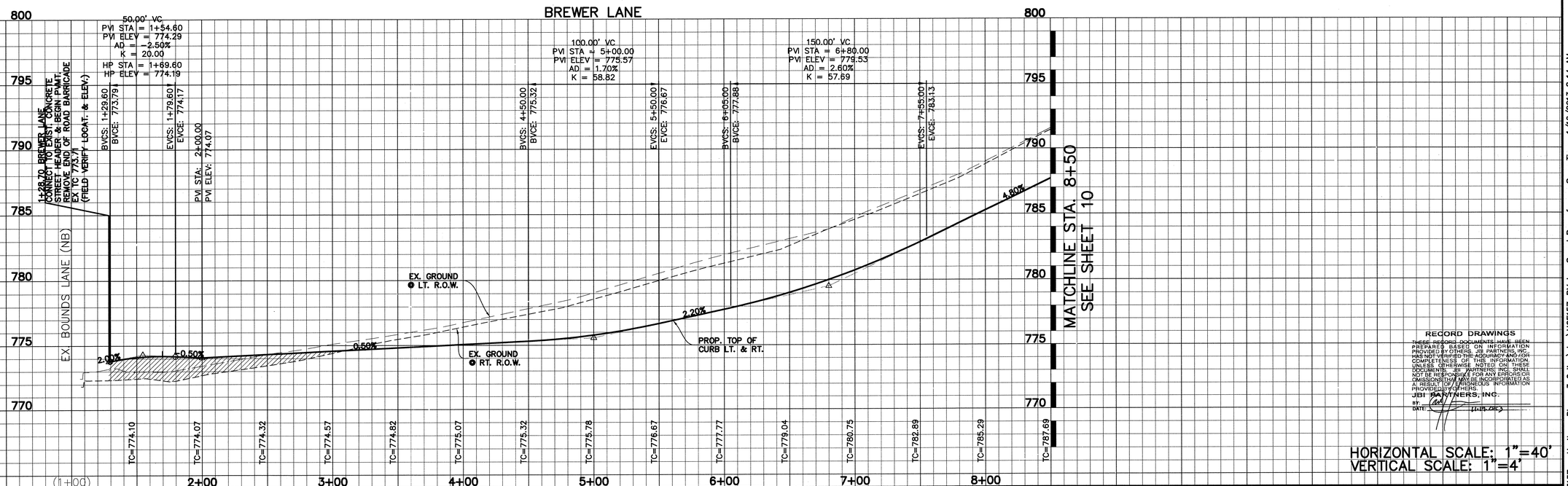
LEGEND
SIDEWALK TO BE CONSTRUCTED BY HOME BUILDER (CONSTRUCTION PER CITY STANDARD DETAILS).
BARRIER FREE RAMPS TO BE CONSTRUCTED BY HOMEBUILDER PER DETAIL SHEET 5
PROPOSED FIRE HYDRANT
PROPOSED MANHOLE
PROPOSED INLET
PROPOSED WATER METER
PROPOSED SEWER CLEANOUT
EXISTING FIRE HYDRANT
EXISTING MANHOLE

NOTE
ALL BARRIER FREE RAMPS TO BE CONSTRUCTED BY HOMEBUILDER UNLESS OTHERWISE NOTED.

SEE SHEET 5 FOR TYPICAL PAVEMENT SECTION.

NOTES
SIDEWALKS TO BE BUILT BY HOMEBUILDER UNLESS OTHERWISE NOTED.

NOTES:
1. ✱ DENOTES HOMEBUILDER TO CONSTRUCT ADA COMPLIANT CURB RAMP. (SEE SHEET 5).
2. ALL INTERSECTION RADII ARE BACK OF CURB UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.



RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 1/16/2013

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
4	ADDED STORM PIPES FOR ALL PAVING SHEETS.	CSF	01/15/13
3	REVISED STREET GRADES, DIMENSIONED INLETS.	CSF	12/21/12
2	BLOCK NUMBER INCLUDED ON THE SOUTH SIDE OF BREWER LANE.	ERH	11/13/12
1	STORM INFORMATION SHOWN IN BACKGROUND	ERH	10/22/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ★ ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 01-22-2013

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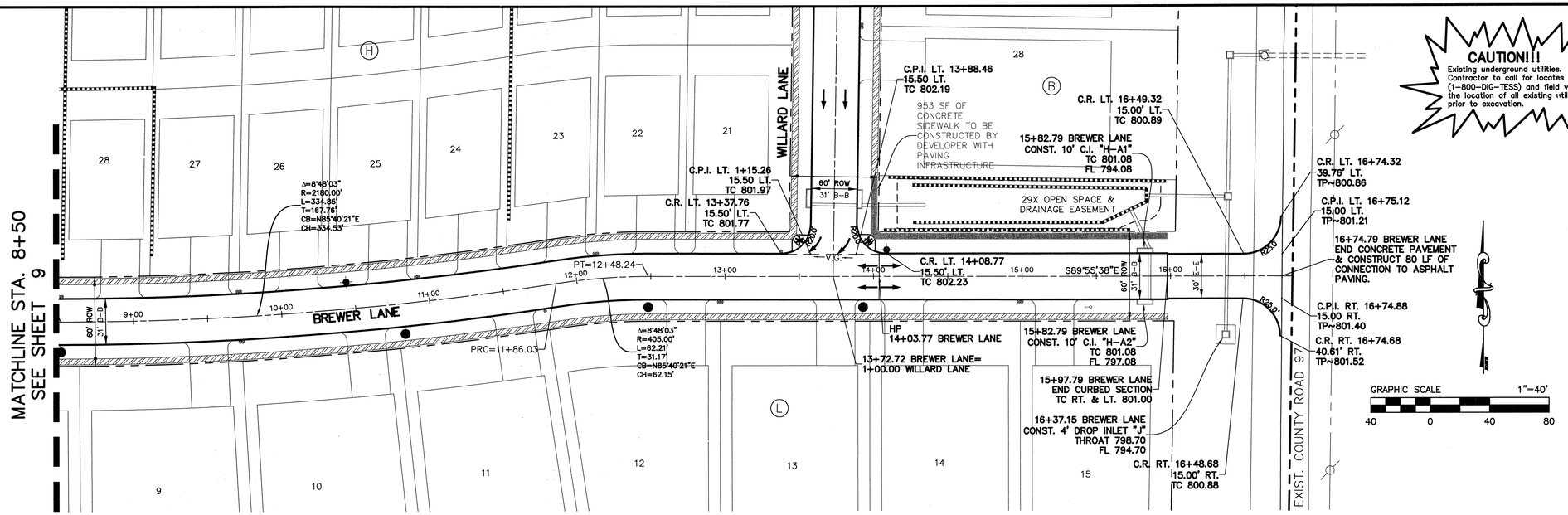
Texas Registered Engineering Firm F-438

PAVING PLAN & PROFILE
BREWER LANE (STA. 1+00 TO 8+50)
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 9

Plotted by: ehansen Plot Date: 1/23/2013 10:39 AM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-PV.dwg Saved By: cfarrow Save Time: 1/16/2013 8:14 AM



CAUTION!!!
Existing underground utilities. Contractor to call for locates (1-800-DIG-TESS) and field verify the location of all existing utilities prior to excavation.

LEGEND

- SIDEWALK TO BE CONSTRUCTED BY HOME BUILDER (CONSTRUCTION PER CITY STANDARD DETAILS).
- SIDEWALK TO BE CONSTRUCTED BY DEVELOPER (CONSTRUCTION PER CITY STANDARD DETAILS).
- BARRIER FREE RAMPS PER TXDOT PED(05) DETAILS
- PROPOSED FIRE HYDRANT
- PROPOSED MANHOLE
- PROPOSED INLET
- PROPOSED WATER METER
- PROPOSED SEWER CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING MANHOLE

NOTE
ALL BARRIER FREE RAMPS TO BE CONSTRUCTED BY HOMEBUILDER UNLESS OTHERWISE NOTED.

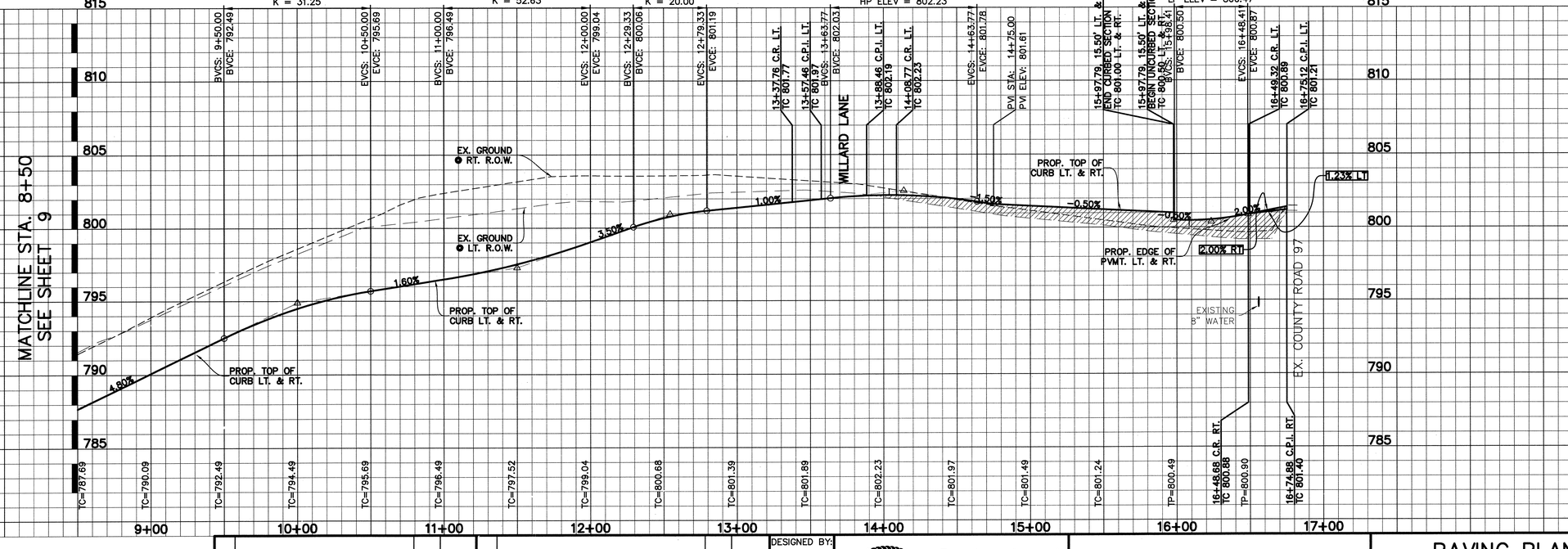
SEE SHEET 5 FOR TYPICAL PAVEMENT SECTION.

NOTES
SIDEWALKS TO BE BUILT BY HOMEBUILDER UNLESS OTHERWISE NOTED.

NOTES:
1. ✱DENOTES HOMEBUILDER TO CONSTRUCT ADA COMPLIANT CURB RAMP. (SEE SHEET 5).
2. ALL INTERSECTION RADII ARE BACK OF CURB UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.

Plotted by: ehansen Plot Date: 1/23/2013 10:44 AM

BREWER LANE



BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	ADDED STORM PIPES FOR ALL PAVING SHEETS.	CSF	01/15/13
2	REVISED STREET GRADES	CSF	12/13/12
1	STORM INFORMATION SHOWN IN BACKGROUND	ERH	10/22/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ★ ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 01-25-2013

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RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 11.19.2013

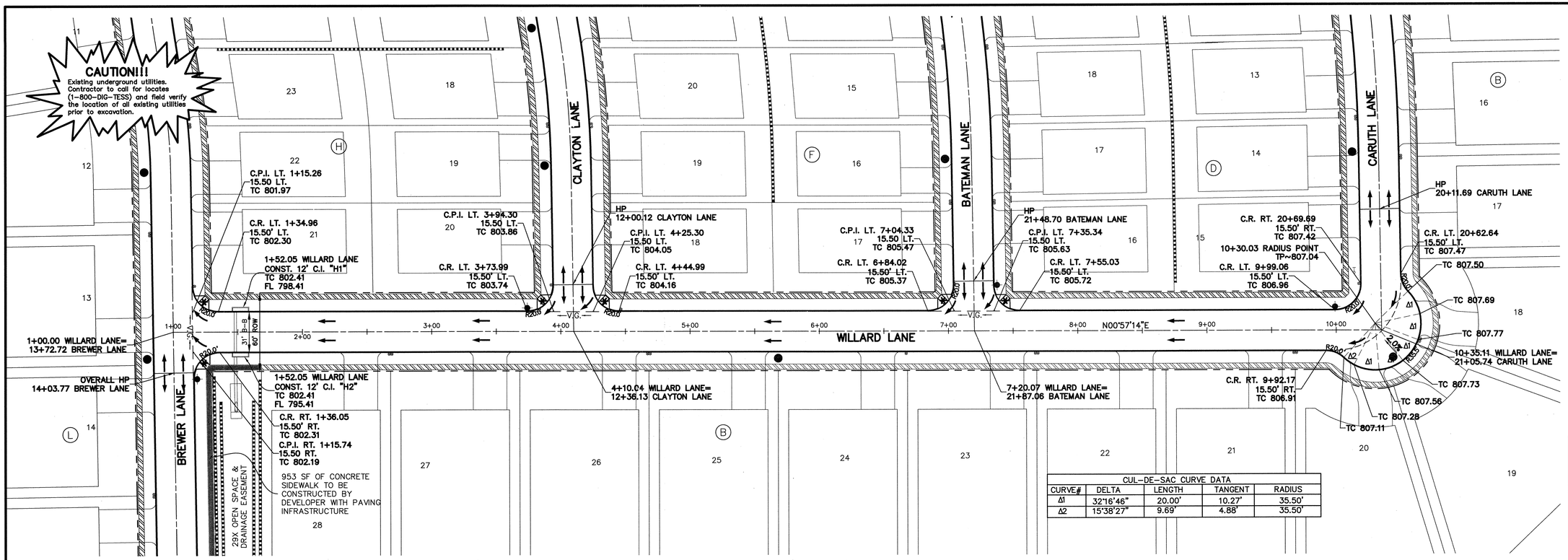
PAVING PLAN & PROFILE
BREWER LANE (STA. 8+50 TO 15+98)
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 10

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-PV.dwg Saved By: cfarrow Save Time: 1/16/2013 8:14 AM

P-201310-01



CUL-DE-SAC CURVE DATA				
CURVE#	DELTA	LENGTH	TANGENT	RADIUS
Δ1	32°16'46"	20.00'	10.27'	35.50'
Δ2	15°38'27"	9.69'	4.88'	35.50'

LEGEND

- SIDEWALK TO BE CONSTRUCTED BY HOME BUILDER (CONSTRUCTION PER CITY STANDARD DETAILS).
- SIDEWALK TO BE CONSTRUCTED BY DEVELOPER (CONSTRUCTION PER CITY STANDARD DETAILS).
- BARRIER FREE RAMPS PER TXDOT PED(05) DETAILS
- PROPOSED FIRE HYDRANT
- PROPOSED MANHOLE
- PROPOSED INLET
- PROPOSED WATER METER
- PROPOSED SEWER CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING MANHOLE

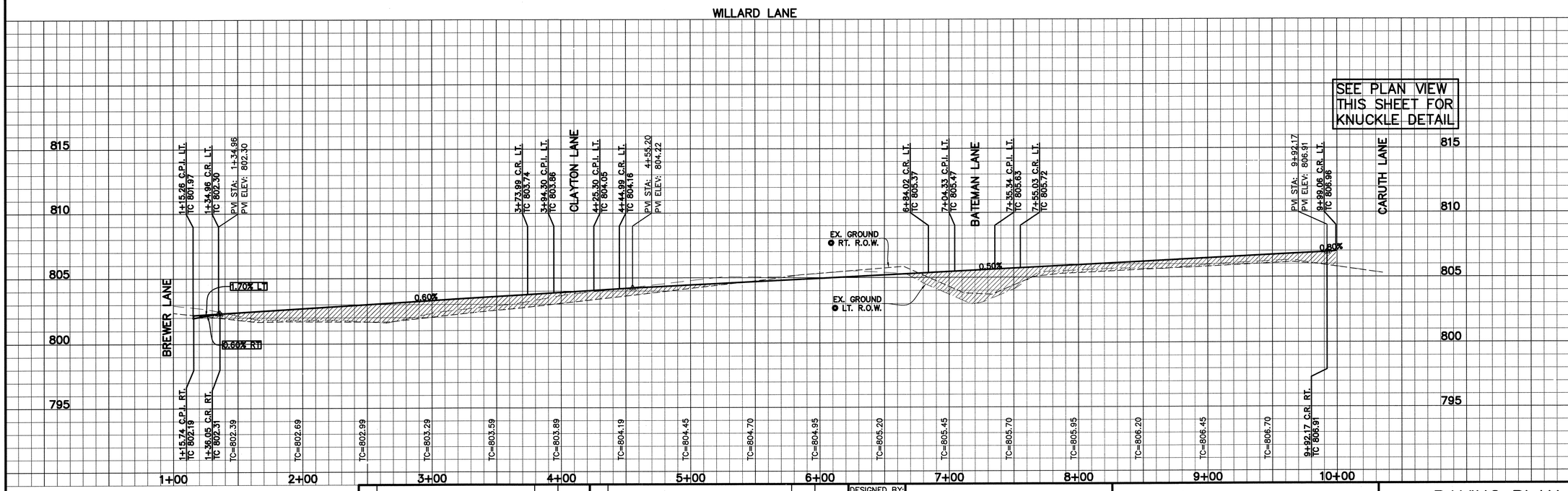
GRAPHIC SCALE 1"=40'
40 0 40 80

NOTE
ALL BARRIER FREE RAMPS TO BE CONSTRUCTED BY HOMEBUILDER UNLESS OTHERWISE NOTED.

SEE SHEET 5 FOR TYPICAL PAVEMENT SECTION.

NOTES
SIDEWALKS TO BE BUILT BY HOMEBUILDER UNLESS OTHERWISE NOTED.

NOTES:
1. ✱ DENOTES HOMEBUILDER TO CONSTRUCT ADA COMPLIANT CURB RAMP. (SEE SHEET 5).
2. ALL INTERSECTION RADII ARE BACK OF CURB UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.



RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 10.9.2013

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	ADDED STORM PIPES TO ALL PAVING PLAN SHEETS.	CSF	01/15/13
2	REVISED STREET GRADES	CSF	12/13/12
1	STORM INFORMATION SHOWN IN BACKGROUND	ERH	10/22/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ★ ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 01-23-2013

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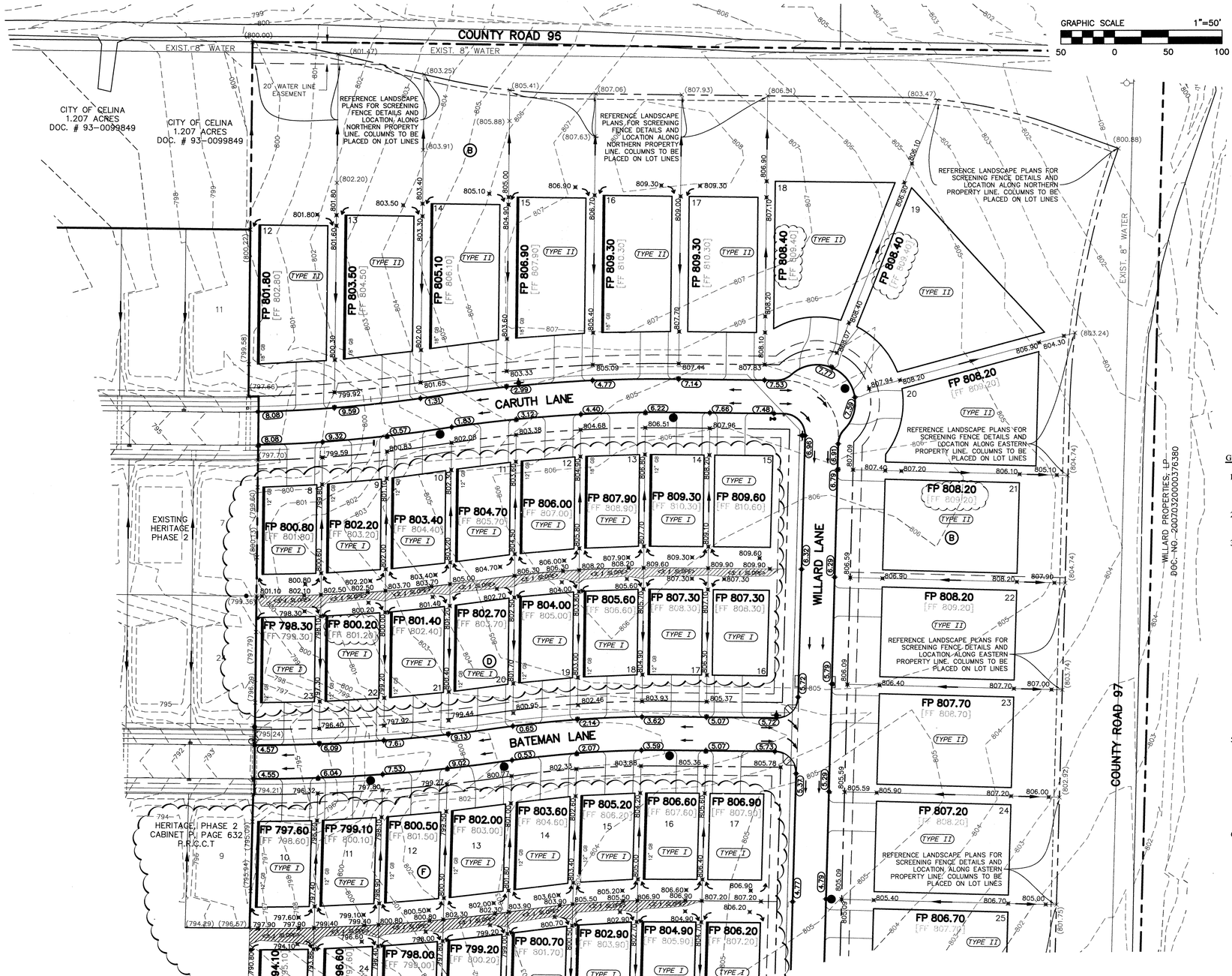
Texas Registered Engineering Firm F-438

PAVING PLAN & PROFILE
WILLARD LANE
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

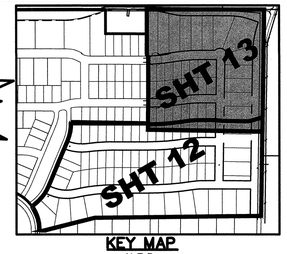
PROJECT NO. HOE157
SHEET NO. 11

Plotted by: ehansen Plot Date: 1/23/2013 10:45 AM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-PV.dwg Saved By: cfarrow Save Time: 1/16/2013 8:14 AM

P-201310-01



CAUTION!!!
Contractor to call for locates (1-800-DIG-TESS) and field verify the location of all existing utilities prior to excavation.



KEY MAP
N.T.S.

LEGEND

- EXIST. STORM SEWER
- PROP. STORM SEWER
- FLOW ARROW
- TW 780.80 / BF 780.40 — TOP OF PROPOSED WALL; HEIGHT OF EXPOSED FACE OF WALL; FINISHED GROUND ELEVATION AT THE BOTTOM OF EXPOSED WALL FACE
- 780 — EXISTING MAJOR CONTOUR
- 781 — EXISTING MINOR CONTOUR
- 770 — PROPOSED MAJOR CONTOUR
- 771 — PROPOSED MINOR CONTOUR
- 6.79 — PROPOSED TOP OF CURB [TRUNC.]
- 12" GB — PROPOSED GRADE BEAM
- 802.50 — PROPOSED RETAINING WALL
- (EG 802.7) — PROP. SPOT ELEVATION
- FP 807.60 — EXIST. SPOT ELEVATION
- [FF 808.60] — FINISHED PAD ELEVATION
- FF=FP+1.0' — FINISHED FLOOR ELEVATION

GRADING NOTES

1. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) TO BE COMPLETELY IMPLEMENTED PRIOR TO ANY GRADING WORK.
2. RETAINING WALLS TO BE PLACED ENTIRELY ON THE HIGH SIDE LOT.
3. SPECIFICATIONS FOR CONSTRUCTION AND TESTING FOR EXCAVATION AND FILLING ON PRIVATE LOTS SHALL BE PROVIDED BY THE PROJECT'S GEOTECHNICAL ENGINEER. SPECIFICATIONS FOR CONSTRUCTION AND TESTING FOR EXCAVATION AND FILLING WITHIN PUBLIC RIGHT-OF-WAYS SHALL BE PROVIDED BY THE GOVERNING AGENCY. IN THE EVENT OF AN ABSENCE OF A SPECIFICATION BY A GOVERNING AGENCY, THE GEOTECHNICAL ENGINEER'S SPECIFICATIONS SHALL CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE SPECIFICATIONS FROM THE GEOTECHNICAL ENGINEER AND GOVERNING AGENCY PRIOR TO COMMENCING WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING TESTING OF THE EXCAVATION AND FILLING WITH THE OWNER'S TESTING LABORATORY. THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE TESTING LABORATORY AMD THE SELECTED TESTING LABORATORY SHALL BE APPROVED BY THE OWNER.
5. RETAINING WALLS REQUIRE A SEPARATE PERMIT FROM THE BUILDING INSPECTION DEPARTMENT. RETAINING WALLS OVER 4' MUST BE DESIGNED BY AN ENGINEER REGISTERED IN THE STATE OF TEXAS. RETAINING WALLS SHOWN ON THIS PLAN ARE FOR LOCATION AND ELEVATION PURPOSES ONLY. STRUCTURAL AND STABILITY ENGINEERING OF THE RETAINING WALLS ARE NOT PART OF THE DESIGN RESPONSIBILITY OF JBI PARTNERS, INC.
6. ANY SLOPES GREATER THAN 3 FEET IN HEIGHT SHALL BE REVIEWED BY THE OWNER'S GEOTECHNICAL ENGINEER FOR STABILITY PURPOSES. ALL SLOPES ARE DESIGNED AT A MAXIMUM OF 4 HORIZONTAL TO 1 VERTICAL UNLESS OTHERWISE NOTED.

CONTRACTOR TO VERIFY LOCATION OF EX. UTILITIES PRIOR TO CONSTRUCTION & NOTIFY THE ENGINEER OF ANY DISCREPANCIES

NOTE
Utility Contractor shall coordinate with paving Contractor to place all systems after dirt work has been completed.

NOTE
All construction shall conform with City of Celina standard details and specifications.

NOTE
All fill to be compacted to 95% standard proctor density.

NOTE
RETAINING WALL CONTRACTOR SHALL PROVIDE RETAINING WALL DESIGN DRAWINGS TO THE CITY OF CELINA PRIOR TO CONSTRUCTION

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY: [signature]
DATE: 11-19-2013

BENCHMARKS
1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□ " Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE
1	SELECTED WALLS REPLACED WITH 3:1 GRADING. SELECTED PADS AS 45' WIDTH; FPs REVISED.	ERH	03/20/13

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
4	LEGEND UPDATED	ERH	01/23/13
3	WALLS ADDED ALONG BLOCKS B, D, & F.	CSF	12/11/12
2	GRADING NOTES REVISED. PAD DIMENSIONS ADDED.	ERH	11/15/12
1	KEY MAP & FLOW ARROWS ADDED, TC STYLE REVISED, PROPOSED CONTOURS ADDED TO EAST SIDE	CSF	10/19/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS — ERIK R. HANSEN — 106034 — LICENSED PROFESSIONAL ENGINEER — 03.21.2013 — FOR CONSTRUCTION

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Fax 972.248.1414
www.jbipartners.com
Texas Registered Engineering Firm F-438

GRADING PLAN
NORTH AREA
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 13

P-201310-01

Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-GR.dwg Saved By: ehansen Save Time: 3/21/2013 12:05 PM
Plotted by: ehansen Plot Date: 3/21/2013 12:06 PM

LEGEND

- EXIST. STORM SEWER
- PROP. STORM SEWER
- FLOW ARROW
- TW 780.8 / BF 780.4 — TOP OF PROPOSED WALL / HEIGHT OF EXPOSED FACE OF WALL / FINISHED GROUND ELEVATION AT THE BOTTOM OF EXPOSED WALL FACE
- 780 — EXISTING MAJOR CONTOUR
- 781 — EXISTING MINOR CONTOUR
- 770 — PROPOSED MAJOR CONTOUR
- 771 — PROPOSED MINOR CONTOUR
- 6.79 — PROPOSED TOP OF CURB [TRUNC.]
- 12" GB — PROPOSED GRADE BEAM
- 802.50 — PROPOSED RETAINING WALL
- (EG 802.7) — PROP. SPOT ELEVATION
- FP 807.60 — EXIST. SPOT ELEVATION
- [FF 808.60] — FINISHED PAD ELEVATION
- FINISHED FLOOR ELEVATION FF=FP+1.0'

CONTRACTOR TO VERIFY LOCATION OF EX. UTILITIES PRIOR TO CONSTRUCTION & NOTIFY THE ENGINEER OF ANY DISCREPANCIES

NOTE
RETAINING WALL CONTRACTOR SHALL PROVIDE RETAINING WALL DESIGN DRAWINGS TO THE CITY OF CELINA PRIOR TO CONSTRUCTION

NOTE
Utility Contractor shall coordinate with paving Contractor to place all systems after dirt work has been completed.

GRADING NOTES

1. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) TO BE COMPLETELY IMPLEMENTED PRIOR TO ANY GRADING WORK.
2. RETAINING WALLS TO BE PLACED ENTIRELY ON THE HIGH SIDE LOT.
3. SPECIFICATIONS FOR CONSTRUCTION AND TESTING FOR EXCAVATION AND FILLING ON PRIVATE LOTS SHALL BE PROVIDED BY THE PROJECT'S GEOTECHNICAL ENGINEER. SPECIFICATIONS FOR CONSTRUCTION AND TESTING FOR EXCAVATION AND FILLING WITHIN PUBLIC RIGHT-OF-WAYS SHALL BE PROVIDED BY THE GOVERNING AGENCY. IN THE EVENT OF AN ABSENCE OF A SPECIFICATION BY A GOVERNING AGENCY, THE GEOTECHNICAL ENGINEER'S SPECIFICATIONS SHALL CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE SPECIFICATIONS FROM THE GEOTECHNICAL ENGINEER AND GOVERNING AGENCY PRIOR TO COMMENCING WORK.

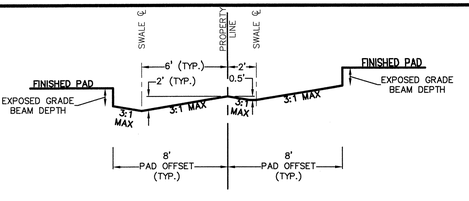
GRADING NOTES (CONT'D)

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING TESTING OF THE EXCAVATION AND FILLING WITH THE OWNER'S TESTING LABORATORY. THE CONTRACTOR IS RESPONSIBLE FOR RETAINING THE TESTING LABORATORY AND THE SELECTED TESTING LABORATORY SHALL BE APPROVED BY THE OWNER.
5. RETAINING WALLS REQUIRE A SEPARATE PERMIT FROM THE BUILDING INSPECTION DEPARTMENT. RETAINING WALLS OVER 4' MUST BE DESIGNED BY AN ENGINEER REGISTERED IN THE STATE OF TEXAS. RETAINING WALLS SHOWN ON THIS PLAN ARE FOR LOCATION AND ELEVATION PURPOSES ONLY. STRUCTURAL AND STABILITY ENGINEERING OF THE RETAINING WALLS ARE NOT PART OF THE DESIGN RESPONSIBILITY OF JBI PARTNERS, INC.
6. ANY SLOPES GREATER THAN 3 FEET IN HEIGHT SHALL BE REVIEWED BY THE OWNER'S GEOTECHNICAL ENGINEER FOR STABILITY PURPOSES. ALL SLOPES ARE DESIGNED AT A MAXIMUM OF 4 HORIZONTAL TO 1 VERTICAL UNLESS OTHERWISE NOTED.

CAUTION!!!
Contractor to call for locates (1-800-DIG-TESS) and field verify the location of all existing utilities prior to excavation.

NOTE
All construction shall conform with City of Celina standard details and specifications.

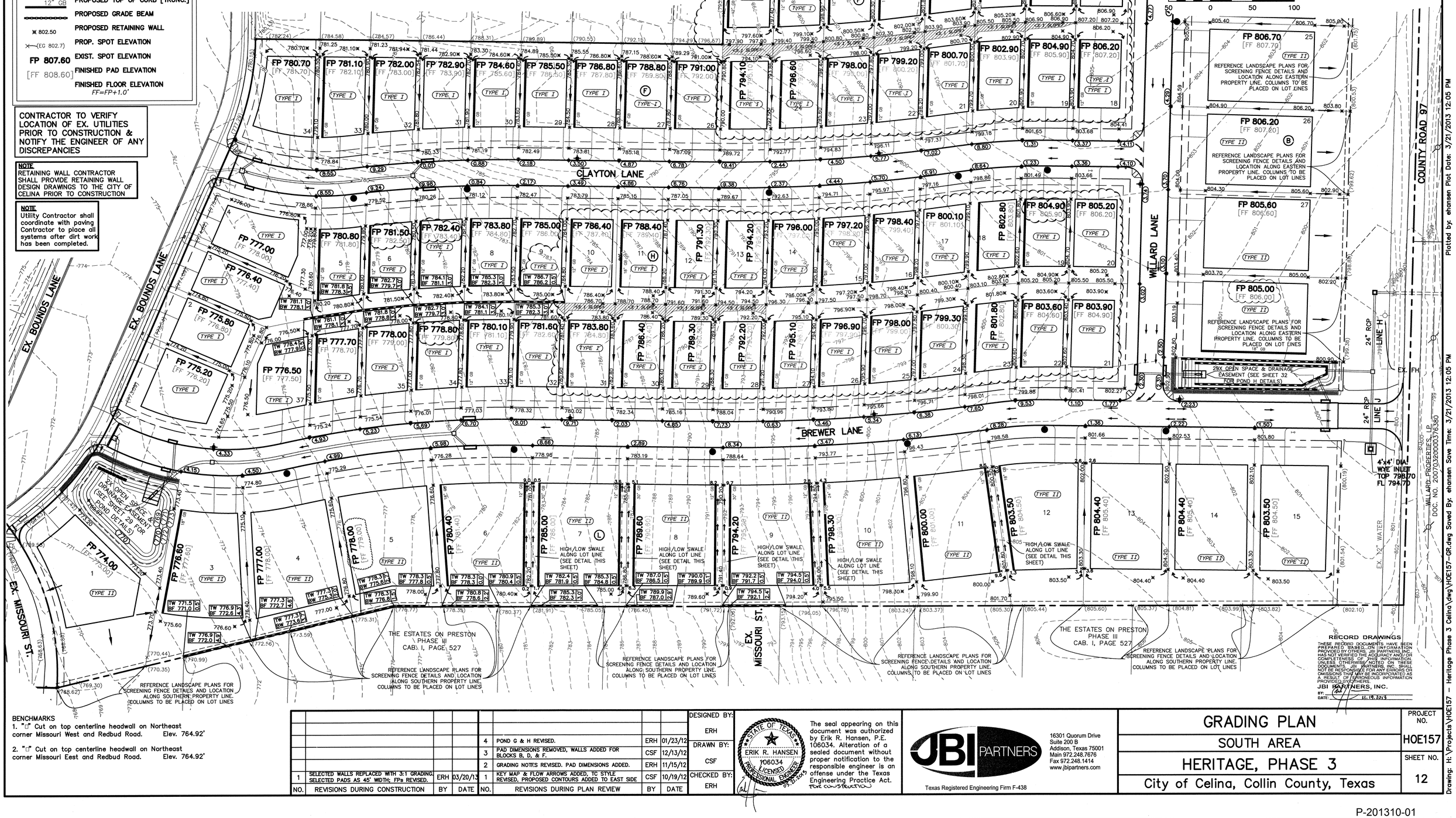
NOTE
All fill to be compacted to 95% standard proctor density.



HIGH/LOW SWALE DETAIL
N.T.S.

KEY MAP
N.T.S.

GRAPHIC SCALE
1"=50'
50 0 50 100



RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 11.19.2013

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE
1	SELECTED WALLS REPLACED WITH 3:1 GRADING, SELECTED PADS AS 45' WIDTH; FPs REVISED.	ERH	03/20/13

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
4	POND G & H REVISED.	ERH	01/23/12
3	PAD DIMENSIONS REMOVED, WALLS ADDED FOR BLOCKS B, D, & F.	CSF	12/13/12
2	GRADING NOTES REVISED. PAD DIMENSIONS ADDED.	ERH	11/15/12
1	KEY MAP & FLOW ARROWS ADDED, TC STYLE REVISED, PROPOSED CONTOURS ADDED TO EAST SIDE	CSF	10/19/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS — ERIK R. HANSEN — 106034 — LICENSED PROFESSIONAL ENGINEER — 03.21.2013

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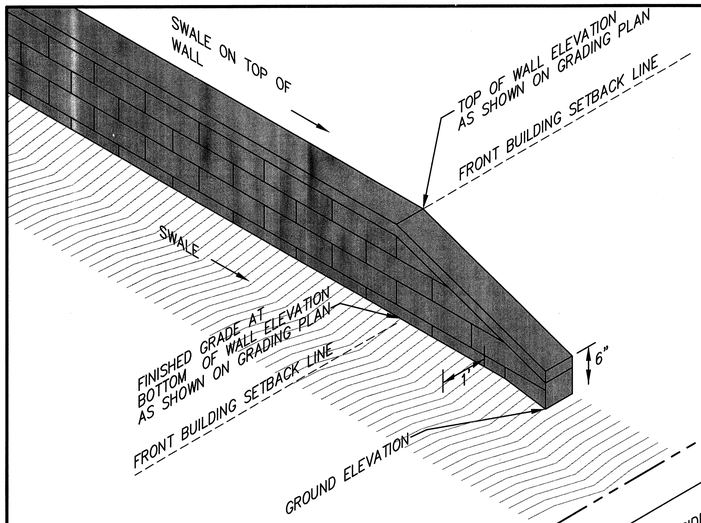
www.jbipartners.com
Texas Registered Engineering Firm F-438

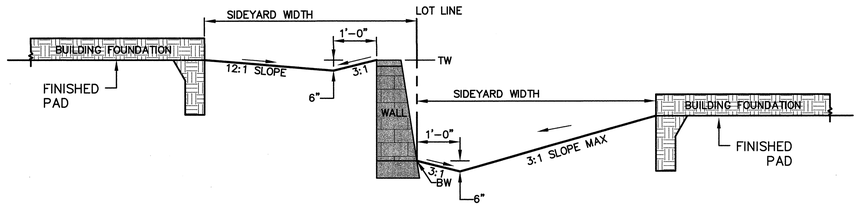
GRADING PLAN
SOUTH AREA
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 12

P-201310-01

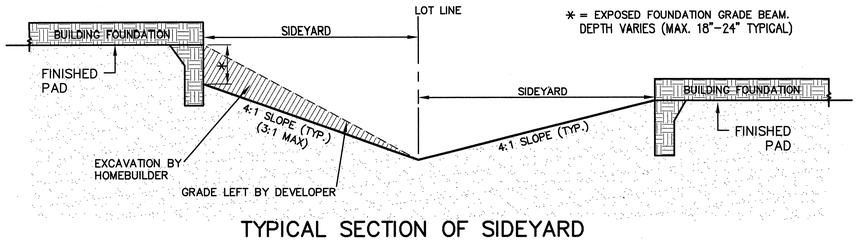
Plotted by: ehansen Plot Date: 3/21/2013 12:05 PM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-GR.dwg Saved By: ehansen Save Times: 3/21/2013 12:05 PM
WILLARD PROPERTIES, LP DOC. NO. 20070320000376380





TYPICAL SECTION OF SIDEYARD SWALE W/ WALL

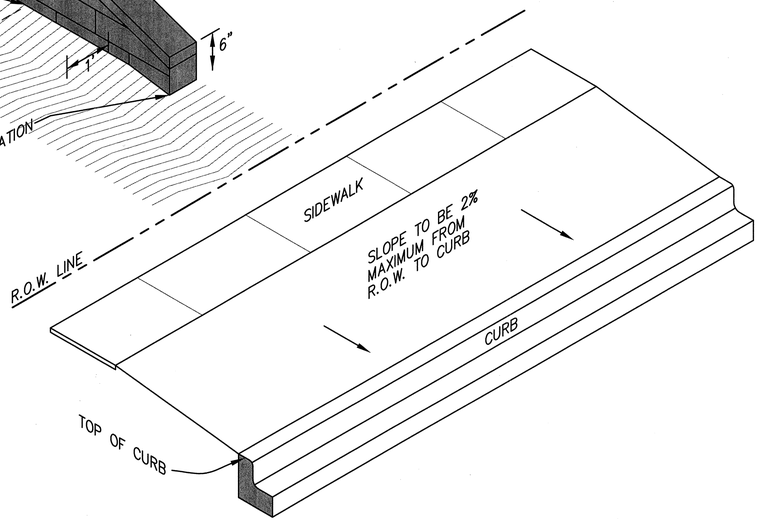
N.T.S.



TYPICAL SECTION OF SIDEYARD SWALE W/ DROPPED GRADE BEAM.

N.T.S.

NOTE
RETAINING WALL CONTRACTOR SHALL PROVIDE RETAINING WALL DESIGN DRAWINGS TO THE CITY OF CELINA PRIOR TO CONSTRUCTION



TYPICAL WALL END DETAIL

NTS

GRADING NOTES

1. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) TO BE COMPLETELY IMPLEMENTED PRIOR TO ANY GRADING WORK.
2. RETAINING WALLS TO BE PLACED ENTIRELY ON THE HIGH SIDE LOT.
3. SPECIFICATIONS FOR CONSTRUCTION AND TESTING FOR EXCAVATION AND FILLING ON PRIVATE LOTS SHALL BE PROVIDED BY THE PROJECT'S GEOTECHNICAL ENGINEER. SPECIFICATIONS FOR CONSTRUCTION AND TESTING FOR EXCAVATION AND FILLING WITHIN PUBLIC RIGHT-OF-WAYS SHALL BE PROVIDED BY THE GOVERNING AGENCY. IN THE EVENT OF AN ABSENCE OF A SPECIFICATION BY A GOVERNING AGENCY, THE GEOTECHNICAL ENGINEER'S SPECIFICATIONS SHALL CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE SPECIFICATIONS FROM THE GEOTECHNICAL ENGINEER AND GOVERNING AGENCY PRIOR TO COMMENCING WORK.
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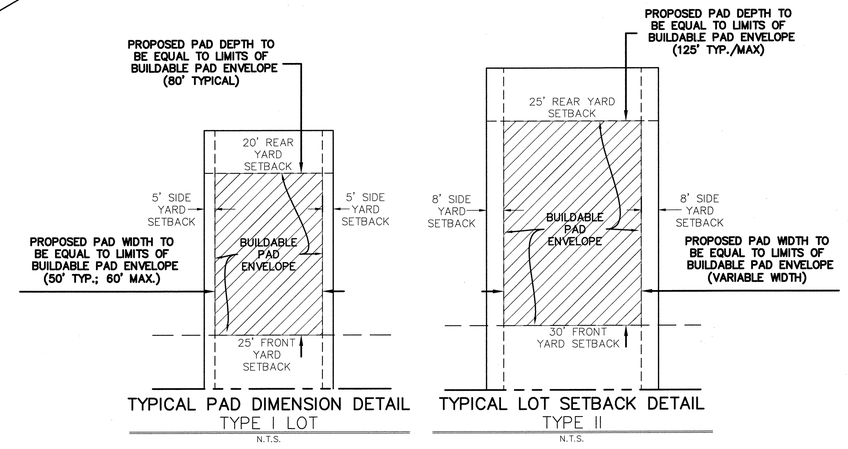
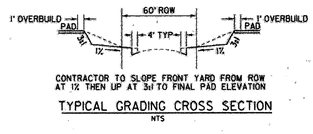


TYPICAL PAD DIMENSION DETAIL TYPE I LOT

N.T.S.

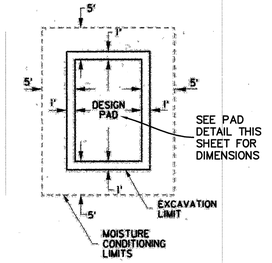
TYPICAL LOT SETBACK DETAIL TYPE II

N.T.S.



TYPICAL GRADING CROSS SECTION

NTS



RECORD DRAWINGS

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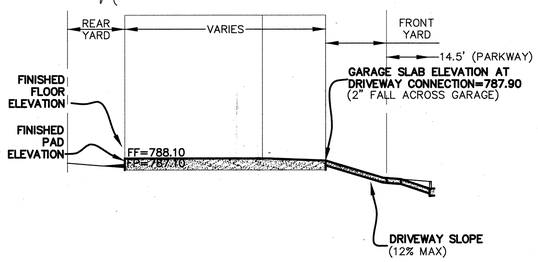
JBI PARTNERS, INC.
BY:
DATE: 11.14.2012

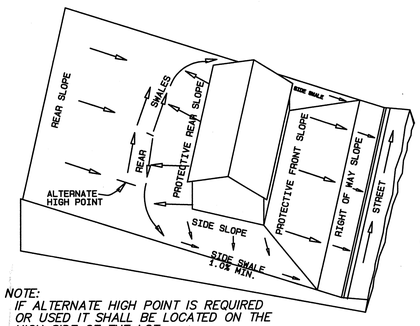
EXCAVATION NOTES:

1. CONTRACTOR TO BUILD PAD 1' BEYOND DESIGN PAD.
2. CONTRACTOR TO MOISTURE CONDITION 5' BEYOND PAD PER GEOTECH RECOMMENDATIONS.



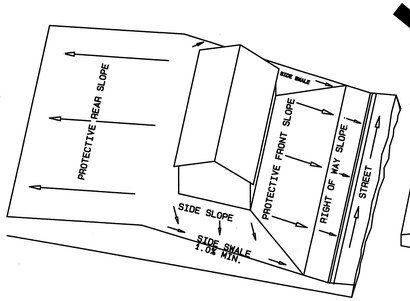
SAMPLE PAD (ELEVATION VIEW)

N.T.S.

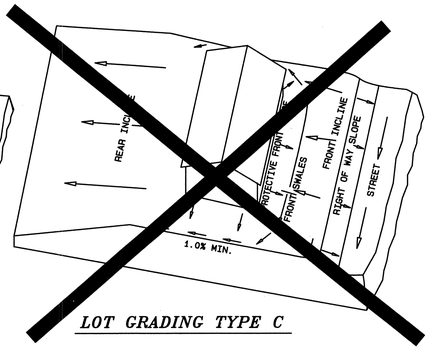


NOTE:
IF ALTERNATE HIGH POINT IS REQUIRED OR USED IT SHALL BE LOCATED ON THE HIGH SIDE OF THE LOT.

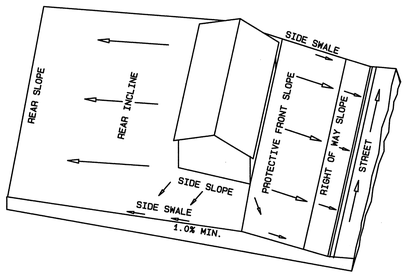
LOT GRADING TYPE A



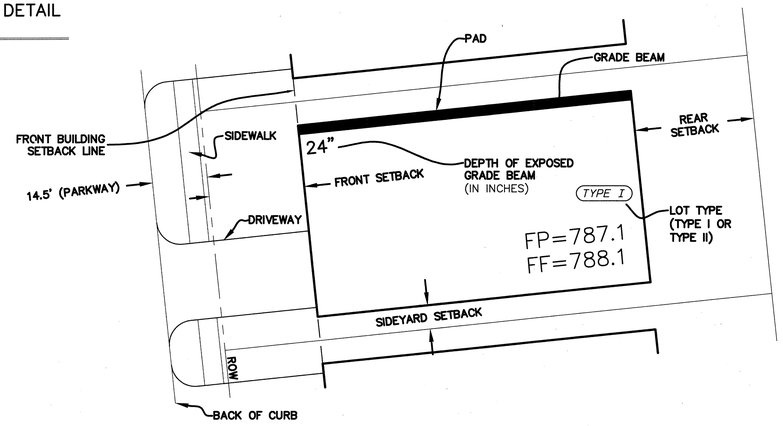
LOT GRADING TYPE B



LOT GRADING TYPE C



LOT GRADING TYPE D



SAMPLE PAD (PLAN VIEW)

N.T.S.

BENCHMARKS
1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□ " Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	SAMPLE PAD DIMENSIONS REVISED.	CSF	12/14/12
2	DETAILS REVISED. GENERAL NOTES UPDATED.	ERH	11/15/12
1	THIS SHEET ADDED	CSF	10/19/12

DESIGNED BY: ERH
DRAWN BY: ERH
CHECKED BY: JPM

STATE OF TEXAS
ERIK R. HANSEN
106034
LICENSED PROFESSIONAL ENGINEER
12-14-12

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FOR CITY APPROVAL CO-SIGNATURE

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Addison, Texas 75001
Main 972.248.7676
Fax 972.248.1414
www.jbipartners.com

GRADING DETAILS

PROJECT NO. HOE157

HERITAGE, PHASE 3

City of Celina, Collin County, Texas

SHEET NO. 14

P-201310-01

Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-GR-DTL.dwg Saved By: ehansen Save Time: 12/21/2012 9:42 AM Plotted by: ehansen Plot Date: 12/21/2012 9:43 AM

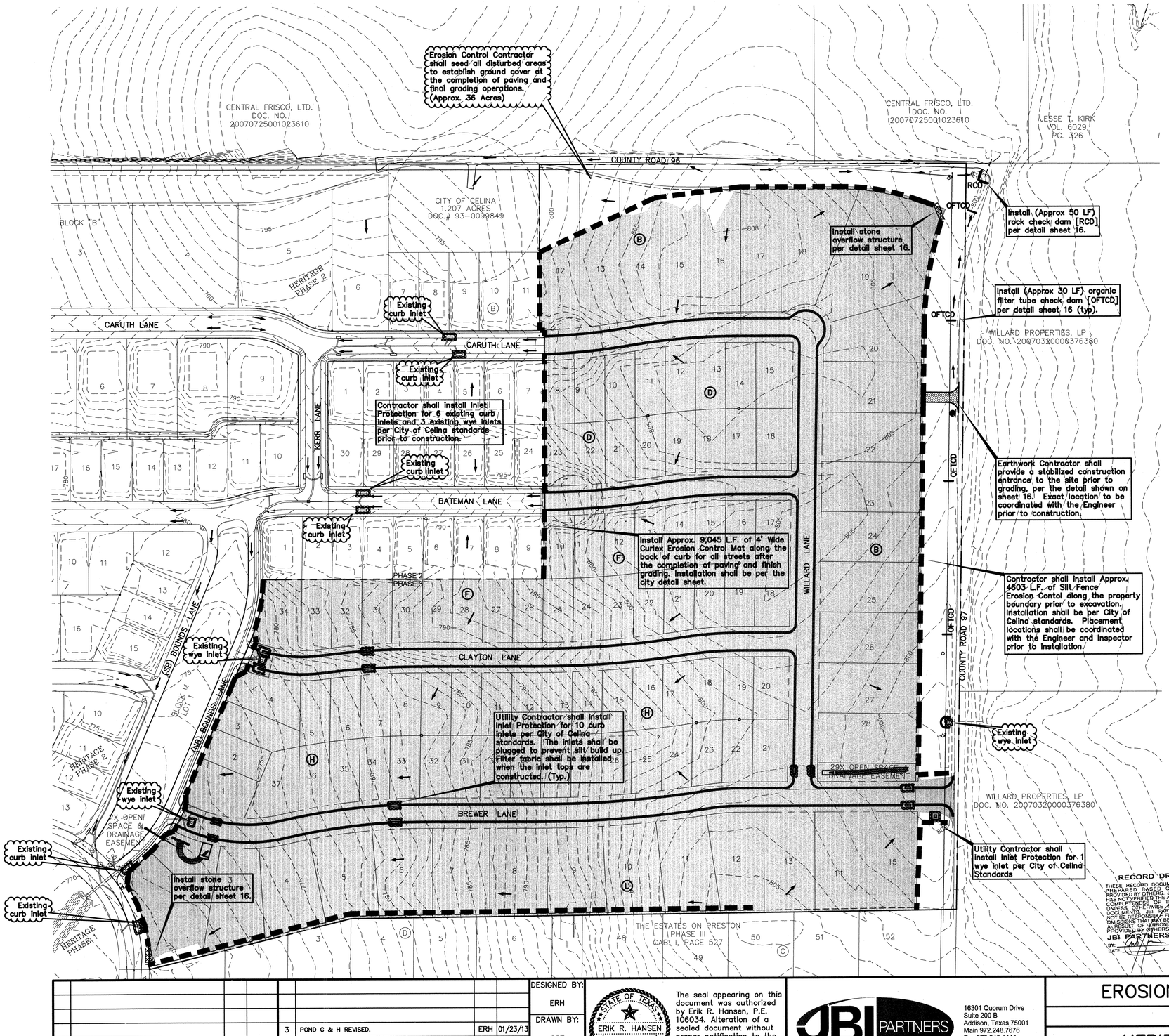
GRAPHIC SCALE 1"=100'
100 0 100 200

N

All Erosion Control Measures Shall Be Maintained Until Ground Cover Is Established. This Includes Grassing of All Areas Disturbed During Construction.

All Erosion Control Measures shall be constructed per City of Celina standards and the details shown on sheet 16.

1. ALL EROSION CONTROL MEASURES SHALL CONFORM TO THE STORM WATER POLLUTION PREVENTION PLAN AND NOTICE OF INTENT.
2. EROSION CONTROL CONTRACTOR SHALL SEED ALL DISTURBED AREAS WITH DRILL SEED TO ESTABLISH GROUND COVER AFTER PAVING IMPROVEMENTS AND FINAL LOT GRADING.



LEGEND

- PROPOSED SILT FENCE WITH WIRE MESH BACKING TO BE INSTALLED PRIOR TO EXCAVATION
- PROPOSED SILT FENCE WITHOUT WIRE MESH BACKING AT COMPLETION OF PAVING & FINISHED GRADING
- PROPOSED 4' CURLEX MATTING AT COMPLETION OF PAVING & FINISHED GRADING
- 610 — EXISTING CONTOURS
- INLET PROTECTION
- LIMITS OF DISTURBANCE
- ORGANIC FILTER TUBE CHECK DAM [OFTCD]
- ROCK CHECK DAM [RCD]

BENCHMARKS
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NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	POND G & H REVISED.	ERH	01/23/13
2	REVISED INLET PROTECTION.	CSF	12/14/12
1	INLET PROTECTION ADDED. LEGEND UPDATED.	ERH	11/15/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 9-25-2013

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www.jbipartners.com
Texas Registered Engineering Firm F-438

EROSION CONTROL PLAN

PROJECT NO. HOE157

HERITAGE, PHASE 3

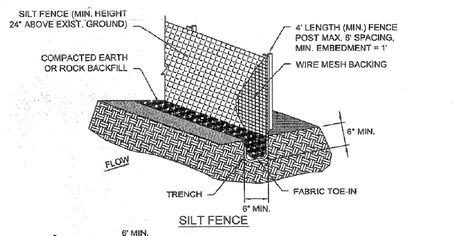
City of Celina, Collin County, Texas

SHEET NO. 15

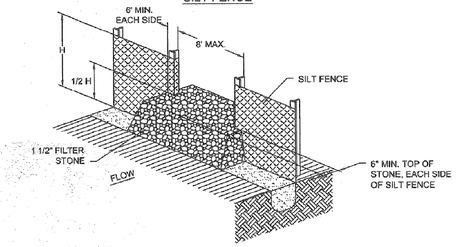
P-201310-01

Plotted by: ehansen Plot Date: 1/23/2013 5:19 PM
Saved By: ehansen Save Time: 12/28/2012 12:58 PM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-EC.dwg

SILT FENCE
DETAILS & NOTES



SILT FENCE



STONE OVERFLOW STRUCTURE

SILT FENCE GENERAL NOTES:

1. POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.

2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (e.g. PAVEMENT), WEIGHT FABRIC FLAP WITH ROCK ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.

3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

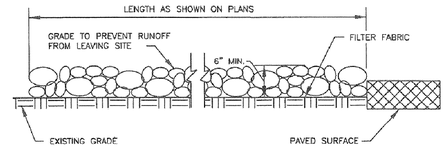
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH SUPPORT POST OR TO WIRE BACKING, WHICH IN TURN IS ATTACHED TO THE FENCE POST. THERE SHALL BE A 3 FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.

5. INSPECTION SHALL BE AS SPECIFIED IN THE SWPPP. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

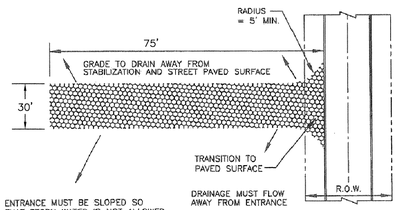
6. SILT FENCE SHALL BE REMOVED WHEN FINAL STABILIZATION IS ACHIEVED OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED.

7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF HALF THE HEIGHT OF THE FENCE. THE SILT SHALL BE DISPOSED OF AT AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

CONSTRUCTION ENTRANCE
DETAILS & NOTES



PROFILE VIEW
N.T.S.



PLAN VIEW
N.T.S.

STABILIZED CONSTRUCTION ENTRANCE GENERAL NOTES:

1. STONE SHALL BE 3 TO 5 INCH DIAMETER ROCK.

2. LENGTH SHALL BE AS SPECIFIED IN THE SWPPP.

3. THE THICKNESS SHALL NOT BE LESS THAN 12 INCHES.

4. THE WIDTH SHALL BE NO LESS THAN THE FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.

5. WHEN NECESSARY, VEHICLES SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO A PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WITH DRAINAGE FLOWING AWAY FROM BOTH THE STREET AND THE STABILIZED ENTRANCE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.

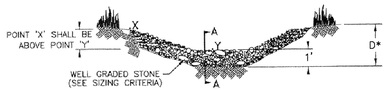
6. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PAVED SURFACES. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PAVED SURFACES MUST BE REMOVED IMMEDIATELY.

7. THE ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

8. PREVENT SHORTCUTTING OF THE FULL LENGTH OF THE CONSTRUCTION ENTRANCE BY INSTALLING BARRIERS AS NECESSARY.

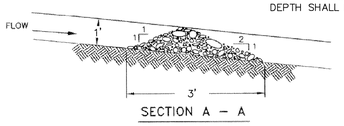
9. INSPECTION SHALL BE AS SPECIFIED IN THE SWPPP.

ROCK CHECK DAM
DETAILS & NOTES

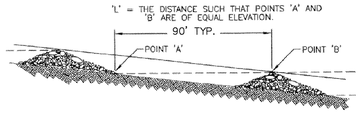


VIEW LOOKING UPSTREAM

(*) IN AREAS OF CHANNEL WHERE "D" IS UNDEFINED MINIMUM DEPTH SHALL BE 2'



SECTION A – A



SPACING BETWEEN CHECK DAMS

ROCK CHECK DAM GENERAL NOTES:

1. STONE SHALL BE WELL GRADED WITH SIZE RANGE FROM 1½ TO 3½ INCHES IN DIAMETER DEPENDING ON EXPECTED FLOWS.

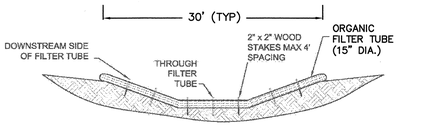
2. THE CHECK DAM SHALL BE INSPECTED AS SPECIFIED IN THE SWPPP AND SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

3. WHEN SILT REACHES A DEPTH EQUAL TO ONE–THIRD OF THE HEIGHT OF THE CHECK DAM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF PROPERLY.

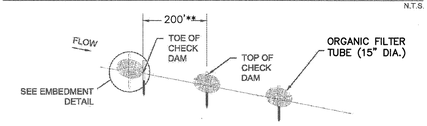
4. WHEN THE SITE HAS ACHIEVED FINAL STABILIZATION OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED, THE CHECK DAM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

5. ROCK CHECK DAM SHALL BE WIRE WRAPPED.

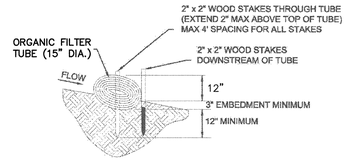
ORGANIC FILTER TUBE CHECK DAM
DETAILS & NOTES



ORGANIC FILTER TUBE CHECK DAM VIEW LOOKING UPSTREAM
N.T.S.



ORGANIC FILTER TUBE CHECK DAM PROFILE
N.T.S.



EMBEDMENT DETAIL FOR ORGANIC FILTER TUBE CHECK DAM
N.T.S.

(**) DISTANCE BETWEEN ORGANIC FILTER TUBE CHECK DAMS SHALL BE 200' UNLESS OTHERWISE NOTED ON EROSION CONTROL PLAN.

ORGANIC FILTER TUBE GENERAL NOTES:

1. ORGANIC FILTER TUBES MAY BE USED AS CHECK DAMS IN CHANNELS WITH A CONTRIBUTING DRAINAGE AREA OF 5 ACRES OR LESS.

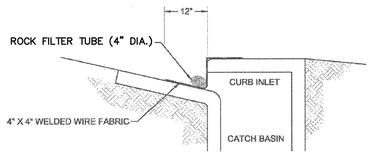
2. ORGANIC FILTER TUBES SHALL BE A MINIMUM OF 12 INCHES IN DIAMETER.

3. FILTER MATERIAL USED WITHIN TUBES TO CONSTRUCT CHECK DAMS SHALL BE LIMITED TO COIR, STRAW, ASPEN FIBER AND OTHER ORGANIC MATERIAL WITH HIGH CELLULOSE CONTENT. THE MATERIAL SHOULD BE SLOW TO DECAY OR LEACH NUTRIENTS IN STANDING WATER.

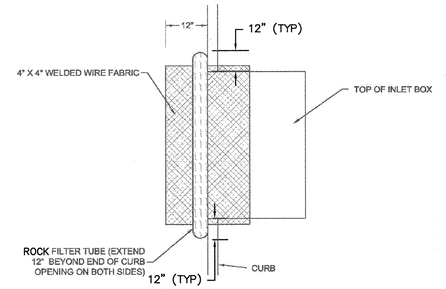
4. STAKING OF FILTER TUBE SHALL BE AT A MAXIMUM OF 4 FOOT SPACING AND SHALL ALTERNATE THROUGH THE TUBE AND ON THE DOWNSTREAM FACE OF THE TUBE.

5. FILTER TUBES AND FILTER MATERIAL SHALL COMPLY WITH THE ISWM CRITERIA FOR ORGANIC FILTER TUBES AS SHOWN IN SECTION 3.6.

CURB INLET EROSION PROTECTION
DETAILS & NOTES



ROCK FILTER TUBE CURB INLET PROTECTION CROSS SECTION
N.T.S.



ROCK FILTER TUBE CURB INLET PROTECTION PLAN VIEW
N.T.S.

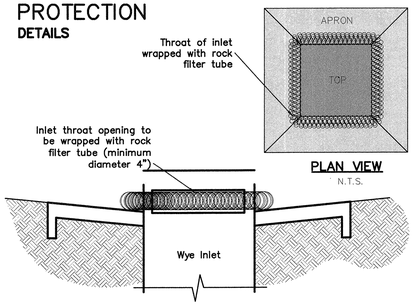
ROCK FILTER TUBE CURB INLET PROTECTION GENERAL NOTES:

1. THE DIAMETER OF THE TUBE SHALL BE AT LEAST 2 INCHES LESS THAN THE HEIGHT OF THE INLET OPENING. THE TUBE SHALL NOT BE ALLOWED TO BLOCK THE ENTIRE OPENING.

2. THE TUBE SHALL BE PLACED ON 4 INCH BY 4 INCH WIRE MESH OR 2 INCH BY 4 INCH WIRE MESH TO PREVENT THE TUBE FROM SAGGING INTO THE INLET.

3. THE TUBE SHALL BE LONG ENOUGH TO EXTEND A MINIMUM OF 12 INCHES BEYOND THE CURB OPENING ON EACH SIDE OF THE INLET.

ROCK FILTER TUBE WYE INLET PROTECTION
DETAILS

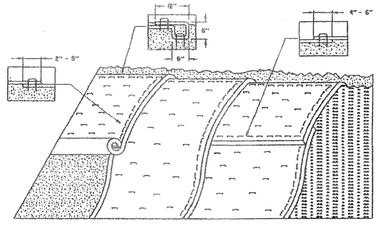


PLAN VIEW
N.T.S.

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'

2. "□" Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road. Elev. 764.92'

EROSION MATTING
DETAILS



GENERAL NOTES:

1. GRADE AND SMOOTH THE SLOPE TO PROVIDE GOOD MATTING TO SOIL SURFACE CONTACT.
2. APPLY FERTILIZER AND SEED PRIOR TO PLACING MATTING
3. ANCHOR MATTING AS SHOWN, UTILIZING ANCHOR STAPLES. STAPLE PLACEMENT SHALL BE DETERMINED BY THE MANUFACTURES INSTILLATION INSTRUCTIONS.
4. UNROLL EROSION MATTING VERTICALLY DOWN SLOPE IN THE DIRECTION OF WATER FLOW.
5. OVERLAP UPPER MATTING OVER LOWER MATTING AS SHOWN.
6. OVERLAP ADJACENT MATTING AS SHOWN.
7. CUT EXCESS MATTING AT END OF SLOPE AND ANCHOR THE END.
8. EROSION MATTING SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
9. EROSION MATTING SHALL BE REPAIRED AND RESTAPLED AS NECESSARY TO ENSURE PROPER FUNCTION.

STORM WATER PERMIT/ENVIRONMENTAL COMMENTS:

1. Construction activities within the City of Celina shall comply with the requirements of the Texas Pollution Discharge Elimination System (TPDES) Construction Storm Water General Permit.
2. Projects that will disturb five (5.0) or more acres, or are part of a larger common plan of development or sale that will ultimately disturb five (5.0) or more acres, must complete and submit a Notice of Intent (NOI) for Storm Commission on Environmental Quality (TCEQ) at least two (2) days prior to start of earth disturbing activities. All operators and/or owners of the project must individually submit a NOI to TCEQ. Two copies of the NOI and proof of payment to TCEQ for all operators and/or must be submitted to the City of Celina, Engineering Services before final approval of the grading plan.
3. Projects that will disturb one (1.0) or more acres but less than five (5.0) acres, or are part of a larger common plan of development or sale that will ultimately disturb one (1.0) or more acres but less than five (5.0) acres, must complete and post on the project site a TPDES Construction Site Notice before start of earth disturbing activities. Refer to the TPDES construction Storm Water General Permit No. TXR150000 for a template. Two copies of the Construction Site Notice must b submitted toe the City of Celina, Engineering Services before final approval of the grading plan.
4. All projects that will disturb one (1.0) or more acres, or are part of a larger common plan of development or sale that will ultimately disturb one (1.0) or more acres must develop and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the TPDES Construction Storm Water General Permit. A SWPPP must be prepared for each operator and/or owner, or operator(s) and/or owner(s) must sign a common SWPPP. A copy of the SWPPP(s) must be presented to Engineering Services at the preconstruction meeting for review and approval before final Notice to Proceed will be granted by the City of Celina. If site grading will occur before the Engineering Services preconstruction meeting, the project operator(s) and/or owner(s) must make arrangements for Engineering Services review and approval of the SWPPP(s) before final approval of the grading plan.

RECORD DRAWINGS
THESE RECORD DOCUMENTS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. JBI PARTNERS, INC. HAS NOT VERIFIED THE ACCURACY AND / OR COMPLETENESS OF THIS INFORMATION. UNLESS OTHERWISE NOTED ON SHALL DOCUMENTS, JBI PARTNERS, INC. SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS THAT MAY BE INCORPORATED AS A RESULT OF ERRONEOUS INFORMATION PROVIDED BY OTHERS.
JBI PARTNERS, INC.
BY: [signature]
DATE: 11.16.2015

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE	NO.	REVISIONS DURING PLAN REVIEW	BY	DATE

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS · ERIK R. HANSEN · 106034 · LICENSED PROFESSIONAL ENGINEER · DATE OF SEAL: 11.16.15

The seal appearing on this document was authorized by Erik R. Hansen, P.E. 106034. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act. FOR CITY REVIEW & CONSTRUCTION

JBI PARTNERS
16301 Quorum Drive
Suite 200 B
Addison, Texas 75001
Main 972.248.7676
Fax 972.248.1414
www.jbipartners.com
Texas Registered Engineering Firm F-438

EROSION CONTROL DETAILS

HERITAGE, PHASE 3
City of Celina, Collin County, Texas

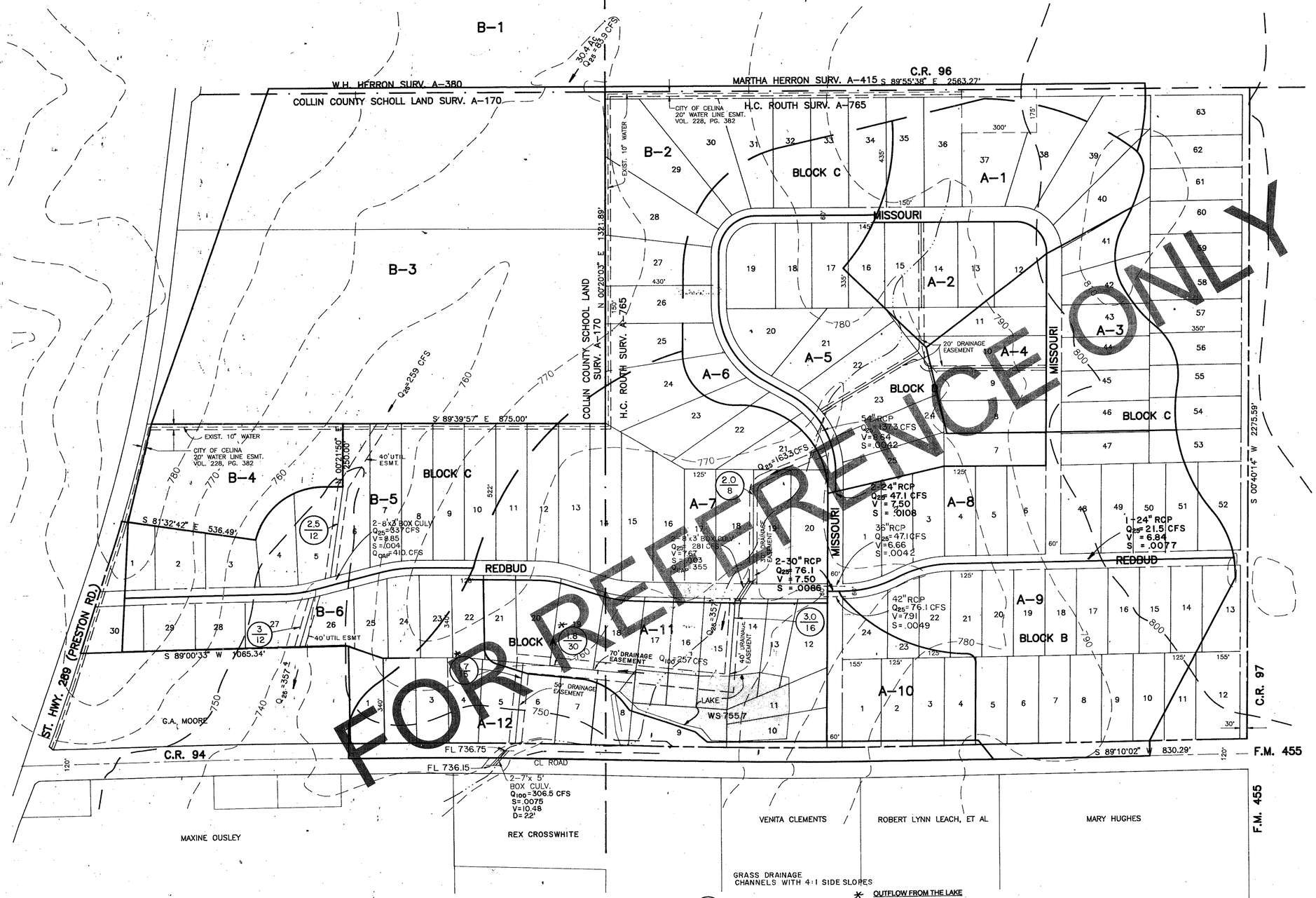
PROJECT NO. HOE157

SHEET NO. 16

P-201310-01

Plotted by: ehansen Plot Date: 12/28/2012 12:07 PM
Drawing: I:\HOE\Projects\HOE157 – Heritage Phase 3 Celina\dwg\HOE157-EC.dwg Saved By: ehansen Save Time: 12/28/2012 12:05 PM

* FOR REFERENCE ONLY *



FOR REFERENCE ONLY

200 100 0 200 400
SCALE IN FEET

BENCH MARK LIST

BM: USG&GS Bench Mark No. K-263 at City of Celina Water Tower on southwest concrete footing.

Elevation 695.46'

BM: Top of sanitary sewer, Station 0+00 on offsite sanitary sewer line, 630' west of SH289 and 50' south of CR94.

Elevation 705.50'

BM: Northeast corner of box culvert 1,115' east of SH289, 82.53' right of offsite sanitary sewer line Station 17+50.

Elevation 718.06'

DRAINAGE CALCULATIONS

DRAINAGE AREA DESIGNATION	A (AC)	C	I25 (IN/HR)	Q25 (CFS)	I100 (IN/HR)	Q100 (CFS)
A-1	10.22	0.4	7.79	31.8	9.60	39.2
A-2	5.63			17.5		21.6
A-3	7.63			23.8		29.3
A-4	5.46			17.0		21.0
A-5	15.16			47.2		58.2
A-6	8.35			26.0		32.1
A-7	22.67			70.6		87.1
A-8	15.12			47.1		58.1
A-9	18.50			57.6		71.0
A-10	5.94	0.4		18.5		22.8
A-11	14.47	0.53		45.1		55.6
A-12	12.89	0.4	7.79	40.2	9.60	49.5
B-1	30.40		6.90	83.9	8.50	103.4
B-2	16.04			44.3		54.5
B-3	47.40	0.4		130.8		161.2
B-4	6.82	0.8		37.6		46.4
B-5	14.70	0.4		40.6		50.0
B-6	7.4	0.4	6.90	20.4	8.50	25.2

GRASS DRAINAGE CHANNELS WITH 4:1 SIDE SLOPES

(2.5/12) FLOW DEPTH / BOTTOM WIDTH

* OUTFLOW FROM THE LAKE

Q100	=	257 CFS
LAKE STORAGE	=	5.87 ACRE FEET
100 WATER SURFACE	=	757.50
EAST TO WEST CHANNEL	=	30 FOOT BOTTOM WITH 1.8 DEPTH VEL = 3.84 FT/SEC. SLOPE = 0.5%
NORTH TO SOUTH CHANNEL	=	15 FOOT BOTTOM WITH 1.7 DEPTH VEL = 7.00 FT/SEC.SLOPE = 2.0% WITH 4 - 2.25 FOOT VERTICAL DROP STRUCTURES

OWNER
HOLIGAN FAMILY INVESTMENTS, INC.
6009 BELTLINE ROAD, SUITE 100
DALLAS, TEXAS 75240
(214) 701-8485

ENGINEER
BOYLE ENGINEERING CORPORATION
6606 LBJ FREEWAY, SUITE 100
DALLAS, TEXAS 75240
(214) 233-6606

STATE OF TEXAS
WILLIAM C. COLE
1957
REGISTERED PROFESSIONAL ENGINEER
8.24.93

* FOR REFERENCE ONLY *

REVISION | DATE

PROJECT MANAGER
WILLIAM C. COLE, P.E.
REG. NO. 19577

Boyle Engineering Corporation

ACCT. 7X-H07-006-01
DATE 8-93
SCALE 1"= 200'
DES. WCC
DWN. RME
CK.
QA.

THE ESTATES ON PRESTON
CITY OF CELINA
COLLIN COUNTY, TEXAS

DRAINAGE AREA MAP

SHEET 17 OF

P-201310-01

X FOR REFERENCE ONLY X

LEGEND

- D1 / ACRES / CFS — DRAINAGE AREA NUMBER / AREA (Acres) / RUNOFF (c.f.s.)
- ON–SITE DRAINAGE DIVIDE
- PROP. ON–SITE FLOW DIRECTION
- EXIST. OFF–SITE FLOW DIRECTION
- EXIST. 5' INTERVAL CONTOUR (575)
- EXIST. 1' INTERVAL CONTOUR
- PROP. STORM SEWER AND INLET

RUNOFF CALCULATIONS

Drainage Basin	Area (Acres) "A"	Runoff Coeff. "C."	Intensity (in./hr.) "I"	Time Conc. (min.) "Tc"	Discharge (c.f.s.) "Q"
A	0.85	0.55	7.52	15.0	3.52
B	0.42	0.55	7.52	15.0	1.74
C	1.38	0.55	7.52	15.0	5.71
D	1.38	0.55	7.52	15.0	5.71
E	1.44	0.55	7.52	15.0	5.96
F	0.48	0.55	7.52	15.0	1.99
G	0.86	0.55	7.52	15.0	3.56
H	2.26	0.55	7.52	15.0	9.35
I	0.87	0.55	7.52	15.0	3.60
J	1.36	0.55	7.52	15.0	5.62
K	1.52	0.55	7.52	15.0	6.29
L	1.67	0.55	7.52	15.0	6.91
M	1.97	0.55	7.52	15.0	8.15
N	0.63	0.55	7.52	15.0	2.61
O	1.52	0.55	7.52	15.0	6.29
P	1.84	0.55	7.52	15.0	7.61
Q	1.84	0.55	7.52	15.0	7.61
R	1.11	0.55	7.52	15.0	4.59
S	1.05	0.55	7.52	15.0	4.34
T	1.69	0.55	7.52	15.0	6.99
U	0.55	0.55	7.52	15.0	2.27
V	1.35	0.55	7.52	15.0	5.58
W	3.50	0.55	7.52	15.0	14.48
OF-1	110.00	0.50	7.52	15.0	413.60
OF-2	4.04	0.30	7.52	15.0	9.11
(Fut. Drainage Areas)					
P1	22.70	0.50	7.52	15.0	85.35
P2	4.31	0.52	7.52	15.0	16.85
P3	1.29	0.30	7.52	15.0	2.91
P4	37.00	0.50	7.52	15.0	139.12
P5	12.5	0.50	7.52	15.0	47.00

DRAINAGE DESIGN THEORY

Rational Method
Q=CIA
"C" and "I" values taken from City of Plano Standards

N

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

RECORD DRAWING
THIS DRAWING HAS BEEN REVISED TO REFLECT THE ACTUAL CONSTRUCTION DETAILS AS CONTAINED IN THE RECORDS OF THE CONTRACTOR. ELEVATIONS SHOWN ON THIS PLAN WERE NOT FIELD VERIFIED, UNLESS OTHERWISE NOTED ON THE PLANS.
JONES & BOYD, INC.
BY:
DATE: 5-12-03

FOR REFERENCE ONLY

FINLEY LANE — BATEMAN LANE — TIDWELL LANE — STANFORD LANE — STONE LANE — BOUNDS LANE — MISSOURI STREET — HUNTER LANE — MILLER LANE — BIGGS LANE — DRAKE LANE — FOUNDERS LANE — PRESTON ROAD (S.H. 289)

OF–1 110.0 413.6
OF–2 4.04 9.11

2'x2' DROP INLET #A16
2'x2' DROP INLET #A5
10' C.I. #A10 / #A11 / #A12 / #A13 / #A8 / #A9 / #A7 / #A6 / #A4 / #A3 / #A2 / #A1
8' C.I. #B5 / #B6 / #B4 / #B3
12' C.I. #B1 / #B2

BLOCK "A" / BLOCK "B" / BLOCK "C" / BLOCK "D" / BLOCK "I" / BLOCK "J" / BLOCK "K" / BLOCK "G"

LOT 17, BLOCK "K" COMMON OPEN SPACE DEDICATED TO AND MAINTAINED BY THE H.O.A.
LOT 34, BLOCK "J" DEDICATED TO H.O.A. FOR AMENITY CENTER
LOT 33, BLOCK "J"
COMMON OPEN SPACE DEDICATED TO AND MAINTAINED BY THE H.O.A.

60'X70' DRAINAGE EASEMENT (BY SEPARATE INSTRUMENT)
RESTRICTED COMMERCIAL BLOCK "J", LOT 32
20' Water Easement Vol.2281,Pg.380
5' FENCE EASEMENT TO HOA
15' PUBLIC UTILITY EASEMENT
15'UE CAB. PG. 527
15'UE CAB. PG. 10
100 YEAR FLOODPLAIN ELEVATION = 742.6
100 YEAR FLOODPLAIN ELEVATION = 758.6

BENCHMARKS:

1. "D" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road.
Elev. 764.92'
2. "D" Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road.
Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE	NO.	REVISIONS DURING PLAN REVIEW	BY	DATE

11/6/02
STATE OF TEXAS
JEFFERY M. WINKLER
90358
LICENSED PROFESSIONAL ENGINEER

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FOR CITY REVIEW
For Approval 11/27/02
For Construction 12/6/02

Jones & Boyd, Inc.
16800 Dallas Parkway, Suite 240
Dallas, Texas 75248
Tel: 972-248-7676
Fax: 972-248-1414
- Engineering
- Planning
- Landscape Architecture
- Surveying

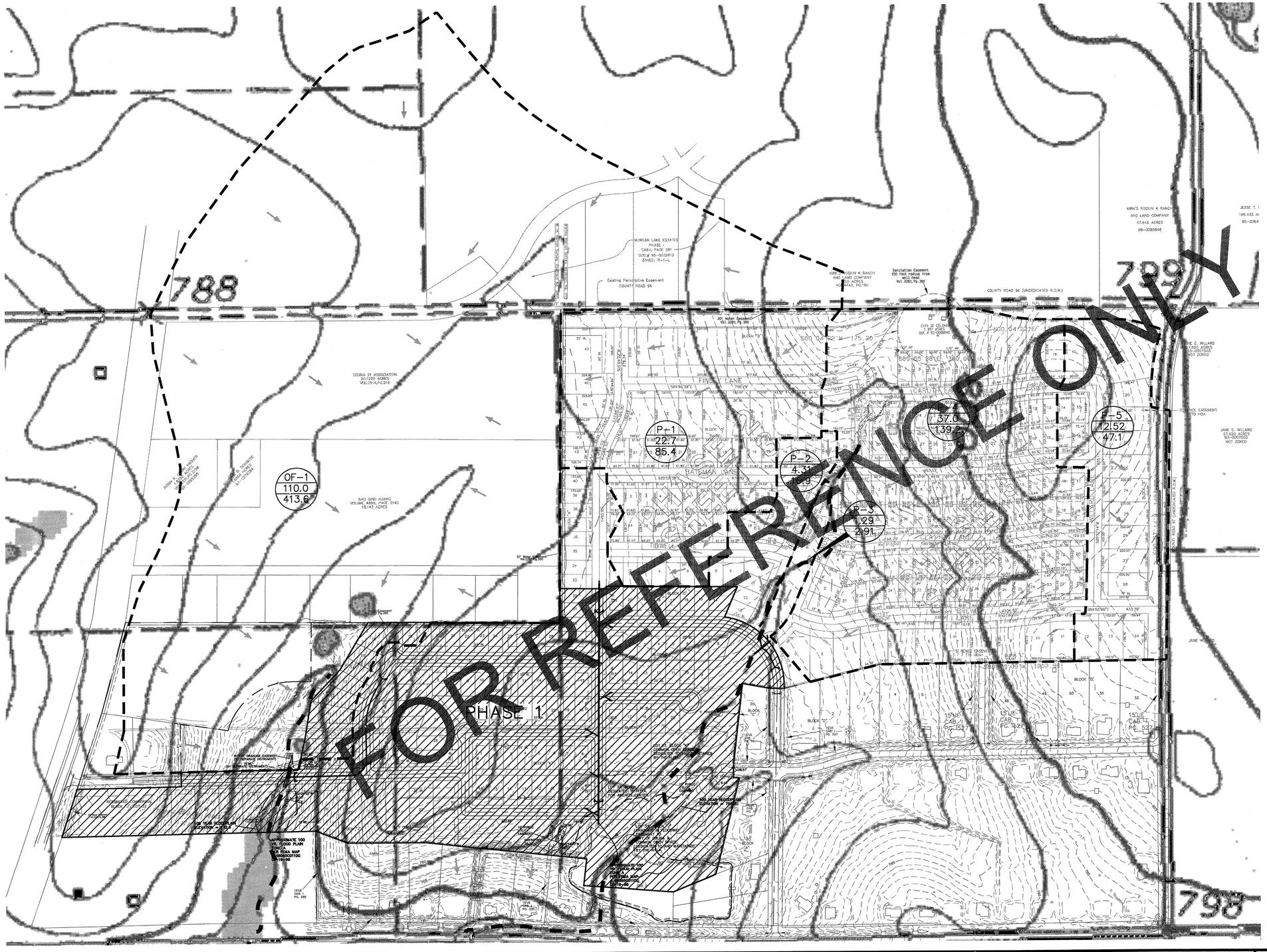
DRAINAGE AREA MAP
ON SITE
HERITAGE, PHASE 1
City of Celina, Collin County, Texas

PROJECT NO. W1401
SHEET NO. 18

Plot Info: Drawing: W401DAM.dwg H:\Projects\W401\dwg\ Plotted by: GJH Plot date: 10/7/02 Plot time: 3:24 pm
Plot Info: Drawing Info: KAB H:\projects\W401\dwg\W401DAM.dwg 10/30/02 4:52 pm

P-201310-01

FOR REFERENCE ONLY



GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

LEGEND

- D1 / ACRES / CFS — DRAINAGE AREA NUMBER; AREA (Acres); RUNOFF (c.f.s.)
- OFF-SITE DRAINAGE DIVIDE
- PROP. ON-SITE FLOW DIRECTION
- EXIST. OFF-SITE FLOW DIRECTION
- EXIST. 5' INTERVAL CONTOUR
- EXIST. 1' INTERVAL CONTOUR
- PROP. STORM SEWER AND INLET

RECORD DRAWING
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JONES & BOYD, INC.
BY:
DATE: 5-12-03

FOR REFERENCE ONLY

BENCHMARKS:

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2. "D" Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE

11/6/02
STATE OF TEXAS
JEFFERY M. WINKLER
90358
LICENSED PROFESSIONAL ENGINEER

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For Approval 11/27/02
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Jones & Boyd, Inc.
16800 Dallas Parkway, Suite 240
Dallas, Texas 75248
Tel: 972-248-7676
Fax: 972-248-1414

- Engineering
- Planning
- Landscape Architecture
- Surveying

DRAINAGE AREA MAP

OFF-SITE

HERITAGE, PHASE 1

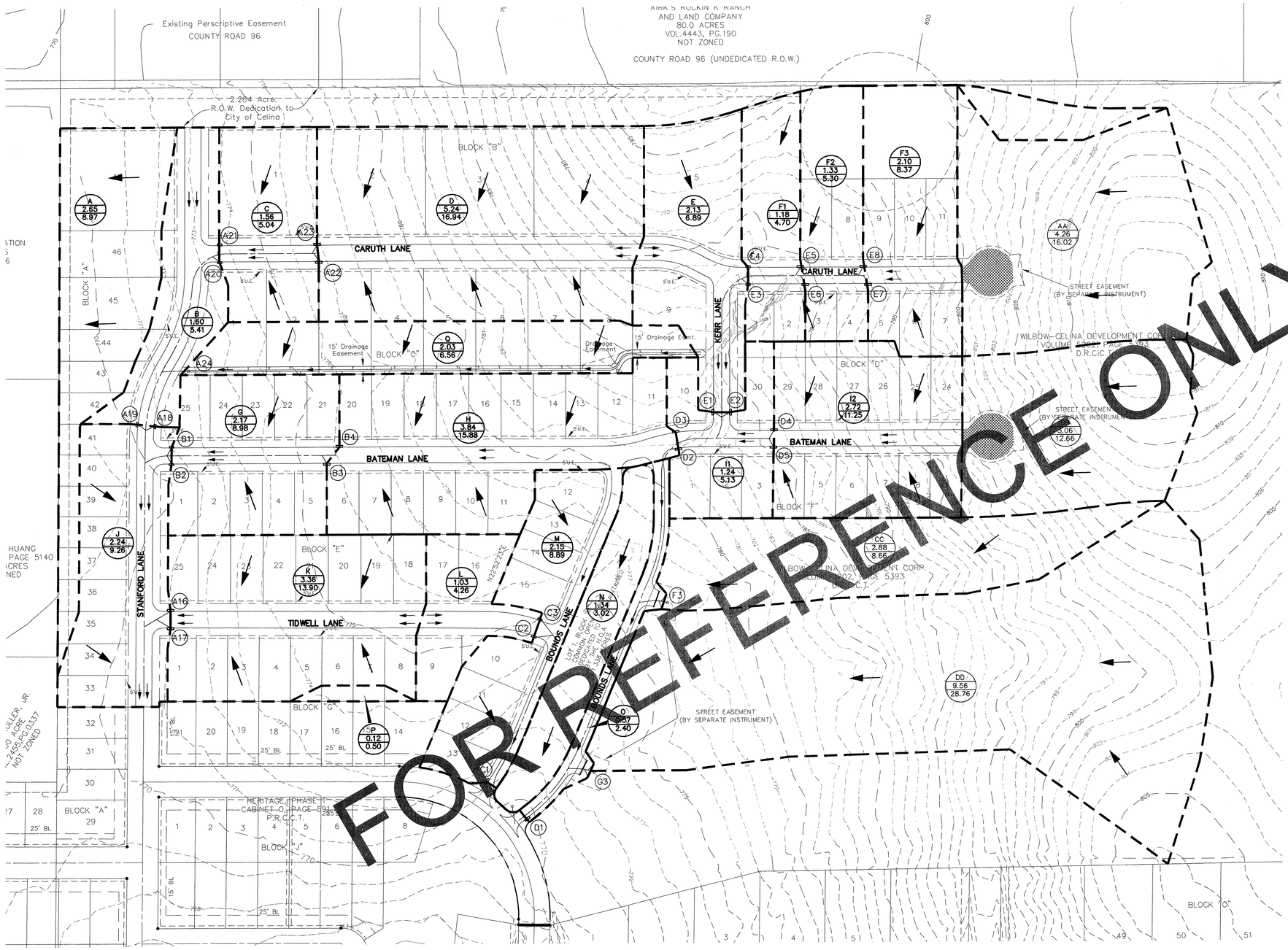
City of Celina, Collin County, Texas

PROJECT NO. W1401

SHEET NO. 19

P-201310-01

Plot Info: Drawing: W1401DAM.dwg H:\Projects\W1401\dwg\ Plotted by: GJH Plot date: 10/7/02 Plot time: 3:24 pm
Drawing Info: KAB H:\projects\W1401\dwg\W1401DAM.dwg 10/30/02 4:52 pm



FOR REFERENCE ONLY

FOR REFERENCE ONLY

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

RUNOFF CALCULATIONS

Drainage Basin	Area (Acres)	Runoff Coeff.	Intensity (in./hr.)	Time Conc. (min.)	Discharge (c.f.s.)
	"A"	"C."	"I"	"Tc"	"Q"
A	2.65	0.45	7.52	15.0	8.97
B	1.60	0.45	7.52	15.0	5.41
C	1.56	0.43	7.52	15.0	5.04
D	5.24	0.43	7.52	15.0	16.94
E	2.13	0.43	7.52	15.0	6.89
F1	1.18	0.53	7.52	15.0	4.70
F2	1.33	0.53	7.52	15.0	5.30
F3	2.10	0.53	7.52	15.0	8.37
G	2.17	0.55	7.52	15.0	8.98
H	3.84	0.55	7.52	15.0	15.88
I1	1.24	0.55	7.52	15.0	5.13
I2	2.72	0.55	7.52	15.0	11.25
J	2.24	0.55	7.52	15.0	9.26
K	3.36	0.55	7.52	15.0	13.90
L	1.03	0.55	7.52	15.0	4.26
M	2.15	0.55	7.52	15.0	8.89
N	1.34	0.30	7.52	15.0	3.02
O	0.58	0.55	7.52	15.0	2.40
P	0.12	0.55	7.52	15.0	0.50
Q	2.03	0.43	7.52	15.0	6.56
AA	4.26	0.50	7.52	15.0	16.02
BB	3.06	0.55	7.52	15.0	12.66
CC	2.88	0.40	7.52	15.0	8.66
DD	9.56	0.40	7.52	15.0	28.76

Drainage Theory

Rational Method

Q = C*I*A

Q ~ Flow in c.f.s.(100-year Frequency)

I ~ 100 yr. Intensity for Tc = 15 min (7.52 in./hr)

A ~ Area (Ac.)

C ~ Coefficient of runoff (varies)

LEGEND

- F / 6.11 / 24.0 — AREA DESIGNATION / AREA (ACRES) / 100-YEAR FLOW (CFS)
- PROPOSED DRAINAGE DIVIDE
- INLET
- A1 — INLET DESIGNATOR
- PROPOSED FLOW ARROW
- EXISTING CONTOUR

RECORD DOCUMENTS

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JONES & BOYD, INC.

BY: _____

DATE: 1/27/04

FOR REFERENCE ONLY

BENCHMARKS:

1. "D" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road.
Elev. 764.92'
2. "D" Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road.
Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
2	ADDED AREA F3	JRD	1/27/04
1	CHANGED C FACTOR TO 0.40 FOR OFFSITE AREAS	JRD	1/27/04

1/27/04 — STATE OF TEXAS — JEFFERY M. WINKLER — 90358 — LICENSED PROFESSIONAL ENGINEER

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FOR APPROVAL

Jones & Boyd, Inc.
17090 Dallas Parkway, Suite 200
Dallas, Texas 75248
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- Engineering
- Planning
- Landscape Architecture
- Surveying

DRAINAGE AREA MAP

PROJECT NO. W1401

HERITAGE, PHASE 2

City of Celina, Collin County, Texas

SHEET NO. 20

P-201310-01

Plot Info: Drawing Info: JRD H:\projects\W1401\dwg\Phase 2\W1401DA-PH2.dwg Plotted by: JRD Plot date: 1/27/04 1:50 pm Plot time: 3:30 pm

LEGEND

- Existing 1' Interval Contour
- 800 Existing 5' Interval Contour
- Existing Drainage Basin Divide
- Proposed Flow Arrow
- D / 39.5 — Existing Drainage Basin Designation / Existing Drainage Area [acres]
- D — Design Point Designation

Basin Designation	Area (Acres)	C	T_c (min)	I_{100} (in/hr)	Q_{100} (cfs)	Comments
D	39.5	0.48	15	7.52	142.0	To Existing Line D & Channel
H	9.6	0.45	15	7.52	32.6	To Ex. 36" CMP under CR 97
K	4.8	0.43	15	7.52	15.5	To Ex. 12" CMP under CR 96
L	4.3	0.40	15	7.52	12.9	To Estates on Preston (via south property line) & Missouri Street

DRAINAGE DESIGN THEORY

RATIONAL METHOD *(100-YEAR FREQUENCY)*

$$Q = C*I*A$$

where Q: FLOW [cfs]
I: 100 YR. AVERAGE RAINFALL INTENSITY DURING THE TIME OF CONCENTRATION for Tc= 15 minutes
I100: 7.52 in/hr
A: AREA [acres]
C: COEFFICIENT OF RUNOFF BASED ON GROUND COVER AND LAND USE [unitless]
TAKEN FROM CITY OF CELINA STORM DRAINAGE DESIGN MANUAL (MARCH 2006).

Existing Ground:	0.40
Single Family Residential	0.60
Park/Open Space	0.40

BENCHMARKS

1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□ " Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road. Elev. 764.92'

RECORD DRAWINGS

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JBI PARTNERS, INC.
BY:
DATE: 11.16.2015

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE
NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	BASIN LIMITS AND CALCULATIONS UPDATED.	ERH	12/28/12
2	SECTION L COMMENTS REVISED TO MORE CLEARLY DENOTE DESTINATION.	ERH	11/15/12
1	THIS SHEET ADDED	CSF	10/18/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS — ERIK R. HANSEN — 106034 — LICENSED PROFESSIONAL ENGINEER

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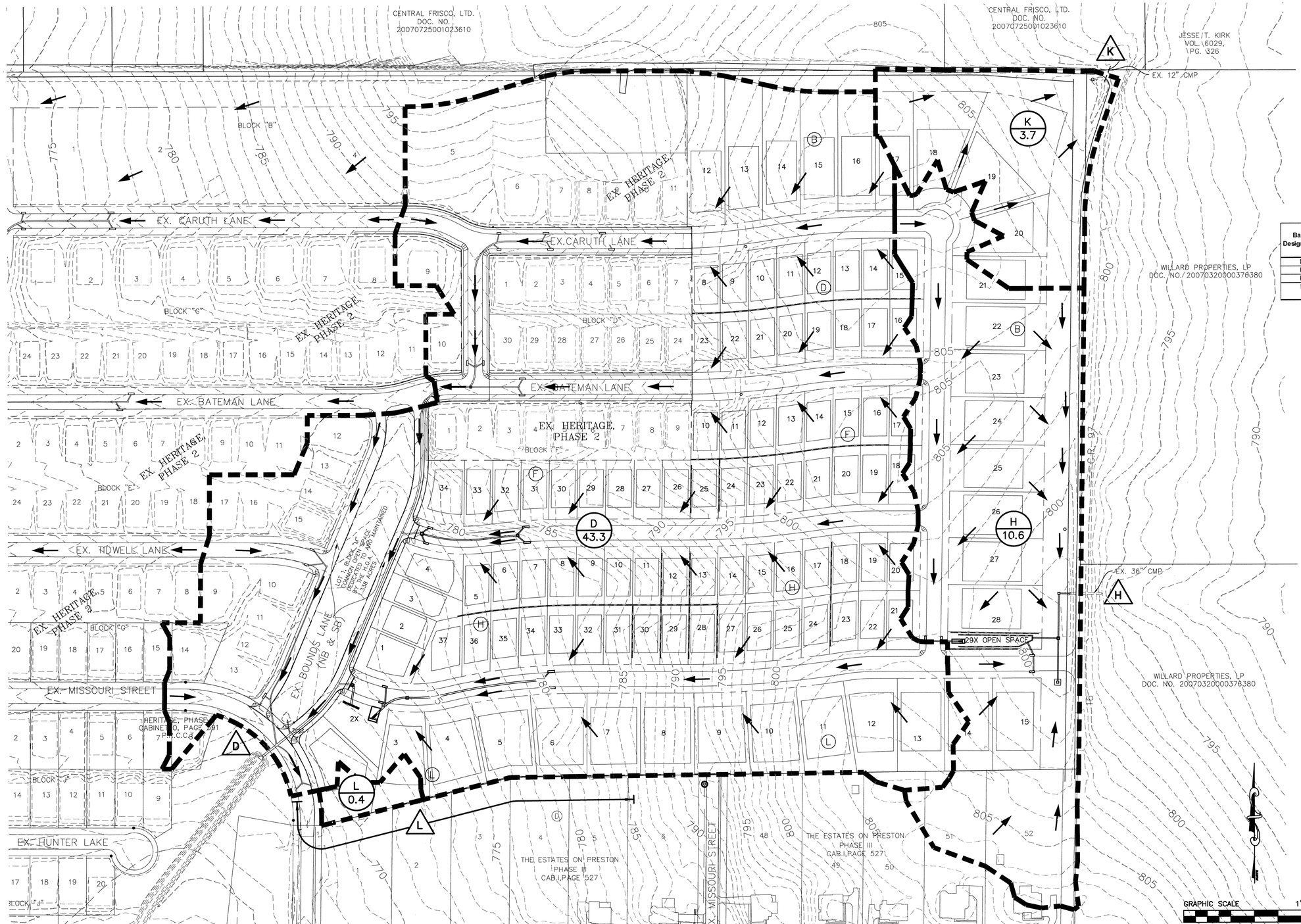
DRAINAGE BASIN MAP
EXISTING CONDITIONS
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. H0E157
SHEET NO. 21

P-201310-01

Plotted by: ehansen Plot Date: 12/28/2012 11:42 AM
Drawing: H:\Projects\H0E157 - Heritage Phase 3 Celina\dwg\H0E157-BASIN.dwg Saved By: ehansen Save Time: 12/28/2012 11:40 AM



LEGEND

- Existing 1' Interval Contour
- 800 Existing 5' Interval Contour
- Proposed Drainage Basin Divide
- Proposed Flow Arrow
- D / 43.2 — Proposed Drainage Basin Designation
- Proposed Drainage Area [acres]
- D — Design Point Designation

Basin Designation	Area (Acres)	C	T_c (min)	I_{100} (in/hr)	Q_{100} (cfs)	Comments
D	43.3	0.59	15	7.52	193.0	To Ex. Line D & Channel
H	10.6	0.57	15	7.52	45.6	To Ex. 36" CMP under CR 97
K	3.7	0.56	15	7.52	15.5	To Ex. 12" CMP under CR 96
L	0.4	0.60	15	7.52	1.8	To Estates on Preston (via south property line) & Missouri Street

DRAINAGE DESIGN THEORY

RATIONAL METHOD *(100-YEAR FREQUENCY)*

$$Q = C*I*A$$

where Q: FLOW [cfs]

I: 100 YR. AVERAGE RAINFALL INTENSITY DURING THE TIME OF CONCENTRATION for Tc= 15 minutes

I100: 7.52 in/hr

A: AREA [acres]

C: COEFFICIENT OF RUNOFF BASED ON GROUND COVER AND LAND USE [unitless]

TAKEN FROM CITY OF CELINA STORM DRAINAGE DESIGN MANUAL (MARCH 2006).

Existing Ground:	0.40
Single Family Residential	0.60
Park/Open Space	0.40

NOTE:
SEE SHEETS 31-32 FOR POND H PLANS AND CALCULATIONS, & SHEETS 29-30A FOR POND G PLANS AND CALCULATIONS.

GRAPHIC SCALE 1"=100'
100 0 100 200

RECORD DRAWINGS

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JBI PARTNERS, INC.
BY:
DATE: 11.19.2013

BENCHMARKS

1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
4	BASIN LIMITS AND CALCULATIONS UPDATED.	ERH	01/23/13
3	BASIN LIMITS AND CALCULATIONS UPDATED.	ERH	12/28/12
2	DRAINAGE AREAS REVISED.	ERH	11/15/12
1	THIS SHEET ADDED.	ERH	10/19/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS — ERIK R. HANSEN — 106034 — LICENSED PROFESSIONAL ENGINEER — 01-23-2013

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DRAINAGE BASIN MAP
PROPOSED CONDITIONS
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. H0E157

SHEET NO. 22

P-201310-01

Plotted by: ehansen Plot Date: 1/23/2013 12:27 PM
Drawing: H:\Projects\H0E157 - Heritage Phase 3 Celina\dwg\H0E157-BASIN.dwg Saved By: ehansen Save Time: 12/28/2012 11:45 AM

GRAPHIC SCALE 1"=100'
100 0 100 200

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 10.31.2013

LEGEND

- 761 — Existing 1' Interval Contour
- 760 — Existing 5' Interval Contour
- Existing storm sewer and inlet
- Proposed Drainage Area Divide
- D-1 Inlet Designation
- Proposed Flow Arrow
- D4 / 3.1 Proposed Drainage Area Designation / Proposed Drainage Area [acres]
- 1 Design Point Designation
- D Sump Design Point Designation

Designation	Area (Acres)	C	T_c (min)	I_{100} (in/hr)	Q_{100} (cfs)	Land Usage
B1	0.42	0.60	15	7.52	1.90	Single Family
B2	0.43	0.60	15	7.52	1.94	Single Family
C1	2.45	0.60	15	7.52	11.05	Single Family
C2	0.61	0.60	15	7.52	2.75	Single Family
C3	0.42	0.60	15	7.52	1.90	Single Family
D1	1.66	0.60	15	7.52	7.49	Single Family
D2	0.69	0.60	15	7.52	3.11	Single Family
D3	0.54	0.60	15	7.52	2.44	Single Family
D4	2.96	0.60	15	7.52	13.36	Single Family
D5	3.12	0.60	15	7.52	14.08	Single Family
E1	0.69	0.60	15	7.52	3.11	Single Family
E2	0.27	0.60	15	7.52	1.22	Single Family
E3	0.32	0.60	15	7.52	1.44	Single Family
E4A	1.17	0.60	15	7.52	5.28	Single Family
E4B	0.86	0.60	15	7.52	3.88	Single Family
E5	0.99	0.60	15	7.52	4.47	Single Family
E6	0.34	0.60	15	7.52	1.53	Single Family
E7	2.24	0.60	15	7.52	10.11	Single Family
E8	4.48	0.60	15	7.52	20.21	Single Family
F1	0.73	0.60	15	7.52	3.29	Single Family
F2	0.59	0.60	15	7.52	2.66	Single Family
F3	2.88	0.60	15	7.52	12.99	Single Family
F4	2.87	0.60	15	7.52	12.95	Single Family
G1	1.21	0.60	15	7.52	5.46	Single Family
G2	1.62	0.60	15	7.52	7.31	Single Family
G3	2.74	0.60	15	7.52	12.36	Single Family
G4	4.26	0.60	15	7.52	19.22	Single Family
H1	1.15	0.60	15	7.52	5.19	Single Family
H2	3.66	0.60	15	7.52	16.51	Single Family
H-A1	0.14	0.60	15	7.52	0.63	Single Family
H-A2	0.71	0.60	15	7.52	3.20	Single Family
H-A3	0.64	0.60	15	7.52	2.89	Single Family
J1	1.48	0.47	15	7.52	5.28	CR 97 [Undeveloped]
J2	0.71	0.60	15	7.52	3.20	Single Family
J3	0.43	0.47	15	7.52	1.52	CR 97 [Undeveloped]
J4	0.24	0.60	15	7.52	1.08	Single Family
J5	1.11	0.60	15	7.52	5.01	Single Family
K1	2.31	0.60	15	7.52	10.42	Single Family
K2	1.37	0.49	15	7.52	5.07	CR 97 [Undeveloped]
L	0.40	0.60	15	7.52	1.80	Single Family
N	1.34	0.40	15	7.52	4.03	Open Space
POND G	0.45	0.43	15	7.52	1.46	Detention Pond
POND H	0.33	0.43	15	7.52	1.07	Detention Pond

DRAINAGE DESIGN THEORY

RATIONAL METHOD *(100-YEAR FREQUENCY)*

$$Q = C*I*A$$

where
Q: FLOW [cfs]
I: 100 YR. AVERAGE RAINFALL INTENSITY DURING THE TIME OF CONCENTRATION
for Tc= 15 minutes I_{100}: 7.52 in/hr
AREA [acres]
C: COEFFICIENT OF RUNOFF BASED ON GROUND COVER AND LAND USE [unitless]
TAKEN FROM CITY OF CELINA STORM DRAINAGE DESIGN MANUAL (MARCH 2006).

Existing Ground:	0.40
Single Family Residential	0.60
Open Space/Park	0.40

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	DRAINAGE BASINS REVISED.	ERH	01/23/12
2	DRAINAGE AREA MAP REVISED BASED ON CITY COMMENTS	CSF	12/18/12
1	DRAINAGE AREA MAP REVISED BASED ON CITY COMMENTS	ERH	10/17/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ★ ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 01.28.2013

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DRAINAGE AREA MAP

HERITAGE, PHASE 3

City of Celina, Collin County, Texas

PROJECT NO. H0E157
SHEET NO. 23

P-201310-01

Plotted by: ehansen Plot Date: 1/23/2013 12:07 PM
Drawing: H:\Projects\H0E157 - Heritage Phase 3 Celina\dwg\H0E157-DA.dwg Saved By: ehansen Save Time: 1/23/2013 12:03 PM

INLET & STREET CAPACITY CALCULATIONS

STREET CONVEYANCE CALCULATIONS — INLET CAPTURE & BYPASS CALCULATIONS

Inlets B1 & B2 are existing inlets constructed with Heritage, Phase 1 construction plans.

Inlet C1 is an existing inlet constructed with Heritage, Phase 2 construction plans.

Inlets C2 & C3 are existing inlets constructed with Heritage, Phase 2 construction plans.

Inlet D1 is an existing inlet constructed with Heritage, Phase 2 construction plans.

Design Point calculations this sheet are provided for determination of street capacity, crossover, and depth of flows received by these inlets from the east and west. For sag inlet capacity calculations (Inlets G1 & G2) see sheet 25.

Inlets D2 & D3 are existing inlets constructed with Heritage, Phase 2 construction plans.

Inlets D4 & D5 are existing inlets constructed with Heritage, Phase 2 construction plans.

Inlets E1 & E2 are existing inlets constructed with Heritage, Phase 2 construction plans.

Inlets E3 & E4 are existing inlets constructed with Heritage, Phase 2 construction plans. Inlet E3 is an on grade inlet. Inlet E4 is in a sag. Design Point calculations this sheet are provided for determination of street capacity and inlet bypass as analyzed from the multiple flow directions being intercepted by inlet E4. For the sag inlet capacity calculations (Inlet E4) see next sheet.

Inlets E5 & E6 are existing inlets constructed with Heritage, Phase 2 construction plans.

Inlets E7 & E8 are existing inlets constructed with Heritage, Phase 2 construction plans.

Computation Sheet
For Determining Capacity of
Street Section and Curb Opening Inlets

Inlet			Drainage Area																										
Design Point	Inlet No.	Station	Area No.	Areas (acres)	Runoff "c"	Conc. Time (min)	Long. Slope "S" (ft/ft)	Depth of Flow "Yo"** (ft)	Street Section (type)	Manning's Coefficient pavement "n"	100-year Intensity (in/hr)	100- year Runoff (cfs)	100-year Bypass Flow (cfs)	$Q_{100}+Q_{bypass}$ (cfs)	Right-of-Way Capacity for Half Section (cfs)	Crown Capacity (cfs)	Local & DS Crossover To	Crossover (cfs)	Crossover Received (cfs)	Total Gutter Q (cfs)	Design Storm*	Length Required Lt (ft)	Length Provided L (ft)	Sag or On grade	Inlet Capacity "Qi" (cfs)	Area Intercepted (ac)	100-year Bypass Flow "q" (cfs)	DS Bypass To	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
DESIGN POINT 1																													
100-YR	B1	9+29 Ex. Missouri St, Lt.	B1	0.42	0.60	15	0.0081	0.30	Parabolic	0.0175	7.52	1.90		1.90	19.43	4.19	B2			1.90	100	2	8	On Grade	1.90	0.42			No Bypass
100-YR	B2	9+29 Ex. Missouri St, Rt.	B2	0.45	0.60	15	0.0081	0.32	Parabolic	0.0175	7.52	2.03	0.14	2.17	19.43	4.19	B1			2.17	100	3	8	On Grade	2.17	0.48			No Bypass
DESIGN POINT 2																													
100-YR	C1	Ex. Bounds Lane (SB), Rt.	C1	2.45	0.60	15	0.0060	0.44	Cross	0.0175	7.52	11.05		11.05	20.85	9.39				11.05	100	12	12	On Grade	10.91	2.42	0.14	B2	
DESIGN POINT 3																													
100-YR	C2	8+52 Tidwell Lane, Lt.	C2	0.61	0.60	15	0.0050	0.38	Parabolic	0.0175	7.52	2.75		2.75	15.27	3.29				2.75	100	3	8	On Grade	2.75	0.61		C1	No Bypass to D/S inlet
100-YR	C3	8+52 Tidwell Lane, Rt.	C3	0.42	0.60	15	0.0050	0.33	Parabolic	0.0175	7.52	1.90		1.90	15.27	3.29				1.90	100	2	8	On Grade	1.90	0.42		C1	No Bypass to D/S inlet
DESIGN POINT 4																													
100-YR	D1	1+49 Ex. Bounds Lane (NB), Rt.	D1	1.66	0.60	15	0.0204	0.31	Cross	0.0175	7.52	7.49		7.49	38.44	17.31				7.49	100	10	10	On Grade	7.49	1.66		B2	No Bypass to D/S inlet
DESIGN POINT 5																													
100-YR	G1	2+00 Brewer Lane, Lt	G1	1.21	0.60	15	0.0050	0.52	Parabolic	0.0175	7.52	5.46	1.96	7.42	15.27	3.29	G2		0.92	8.34	100	*	10	Sag	8.34	1.85		D1	See sag calculations; No Bypass
100-YR	G2	2+00 Brewer Lane, Rt	G2	1.62	0.60	15	0.0050	0.52	Parabolic	0.0175	7.52	7.31	1.96	9.27	15.27	3.29	G1	0.92		8.34	100	*	10	Sag	8.34	1.85		D1	See sag calculations; No Bypass
DESIGN POINT 6																													
100-YR	G3	5+61 Brewer Lane, Lt	G3	2.74	0.60	15	0.0220	0.51	Parabolic	0.0175	7.52	12.36		12.36	32.03	6.91	G4		3.43	15.79	100	16	14	On Grade	13.83	3.07	1.96	G1	
100-YR	G4	5+61 Brewer Lane, Rt	G4	4.26	0.60	15	0.0220	0.51	Parabolic	0.0175	7.52	19.22		19.22	32.03	6.91	G3	3.43		15.79	100	16	14	On Grade	13.83	3.07	1.96	G2	
DESIGN POINT 7																													
100-YR	F1	1+57 Clayton Lane, Lt	F1	0.73	0.60	15	0.0120	0.34	Parabolic	0.0175	7.52	3.29		3.29	23.65	5.10	F2			3.29	100	4	10	On Grade	3.29	0.73		D1	No Bypass to D/S inlet
100-YR	F2	1+57 Clayton Lane, Rt	F2	0.59	0.60	15	0.0120	0.32	Parabolic	0.0175	7.52	2.66		2.66	23.65	5.10	F1			2.66	100	3	10	On Grade	2.66	0.59		D1	No Bypass to D/S inlet
DESIGN POINT 8																													
100-YR	F3	3+67 Clayton Lane, Lt.	F3	2.88	0.60	15	0.0120	0.52	Parabolic	0.0175	7.52	12.99		12.99	23.65	5.10	F4	0.02		12.97	100	13	14	On Grade	12.97	2.88		F1	No Bypass to D/S inlet
100-YR	F4	3+67 Clayton Lane, Rt.	F4	2.87	0.60	15	0.0120	0.52	Parabolic	0.0175	7.52	12.95		12.95	23.65	5.10	F3		0.02	12.97	100	13	14	On Grade	12.97	2.88		F2	No Bypass to D/S inlet
DESIGN POINT 9																													
100-YR	D2	11+20 Ex. Bateman Lane, Rt	D2	0.69	0.60	15	0.0120	0.39	Parabolic	0.0175	7.52	3.11	1.59	4.70	23.65	5.10	D3			4.70	100	6	12	On Grade	4.70	1.04		D1	No Bypass to D/S inlet
100-YR	D3	13+05 Ex. Bateman Lane, Lt	D3	0.54	0.60	15	0.0120	0.37	Parabolic	0.0175	7.52	2.44	1.59	4.03	23.65	5.10	D2			4.03	100	5	12	On Grade	4.03	0.89		B4	No Bypass to D/S inlet
DESIGN POINT 10																													
100-YR	D5	13+05 Ex. Bateman Lane, Lt	D5	3.12	0.60	15	0.0120	0.53	Parabolic	0.0175	7.52	14.08		14.08	23.65	5.10	D4	0.36		13.72	100	14	12	On Grade	12.13	2.69	1.59	D3	
100-YR	D4	13+05 Ex. Bateman Lane, Rt	D4	2.96	0.60	15	0.0120	0.53	Parabolic	0.0175	7.52	13.36		13.36	23.65	5.10	D5		0.36	13.72	100	14	12	On Grade	12.13	2.69	1.59	D2	
DESIGN POINT 11																													
100-YR	E1	1+50 Kerr Lane, Lt.	E1	0.69	0.60	15	0.0175	0.31	Parabolic	0.0175	7.52	3.11		3.11	28.56	6.16	E2			3.11	100	4	10	On Grade	3.11	0.69		D3	No Bypass to D/S inlet
100-YR	E2	1+50 Kerr Lane, Rt.	E2	0.27	0.60	15	0.0175	0.32	Parabolic	0.0175	7.52	1.22	1.99	3.20	28.56	6.16	E1			3.20	100	4	10	On Grade	3.20	0.71		D3	No Bypass to D/S inlet
DESIGN POINT 12 (Inlet E4 from the west)																													
100-YR	E4W	11+70 Caruth Lane, Lt.	E4A	1.17	0.60	15	0.0050	0.42	Parabolic	0.0175	7.52	5.28		5.28	15.27	3.29				3.29	100	*	8	Sag	3.29	0.73	1.99	E2	See sag calculations; Crossover to E2
DESIGN POINT 13 (Inlets E3 & E4 from the east)																													
100-YR	E3E	11+70 Caruth Lane, Rt.	E3	0.32	0.60	15	0.0050	0.34	Parabolic	0.0175	7.52	1.44		1.44	15.27	3.29	E4E		0.59	2.03	100	3	8	On Grade	2.03	0.45		E2	No Bypass to D/S inlet
100-YR	E4E	11+70 Caruth Lane, Lt.	E4B	0.86	0.60	15	0.0050	0.42	Parabolic	0.0175	7.52	3.88		3.88	15.27	3.29	E3E	0.59		3.29	100	*	8	Sag	3.29	0.73		E2	See sag calculations; No Bypass
DESIGN POINT 14																													
100-YR	E5	12+69 Caruth Lane, Lt.	E5	0.99	0.60	15	0.0050	0.49	Parabolic	0.0175	7.52	4.47	3.71	8.18	15.27	3.29	E6	1.47		6.71	100	7	12	On Grade	6.71	1.49		E4	No Bypass to D/S inlet
100-YR	E6	12+79 Caruth Lane, Rt.	E6	0.34	0.60	15	0.0050	0.49	Parabolic	0.0175	7.52	1.53	3.71	5.24	15.27	3.29	E5		1.47	6.71	100	7	12	On Grade	6.71	1.49		E3	No Bypass to D/S inlet
DESIGN POINT 15																													
100-YR	E7	13+99 Ex. Caruth Lane, Rt	E7	2.24	0.60	15	0.0308	0.48	Parabolic	0.0175	7.52	10.11		10.11	37.89	8.17	E8		5.05	15.16	100	16	12	On Grade	11.45	2.54	3.71	E6	
100-YR	E8	13+89 Ex. Caruth Lane, Lt	E8	4.48	0.60	15	0.0308	0.48	Parabolic	0.0175	7.52	20.21		20.21	37.89	8.17	E7	5.05		15.16	100	16	12	On Grade	11.45	2.54	3.71	E5	
DESIGN POINT 16																													
100-YR	H1	1+52 Willard Ln, Rt.	H1	1.15	0.60	15	0.0060	0.55	Parabolic	0.0175	7.52	5.19		5.19	16.73	3.61	H2		5.66	10.85	100	10	12	On Grade	10.85	2.41		G3	No Bypass to D/S inlet
100-YR	H2	1+52 Willard Ln, Lt.	H2	3.66	0.60	15	0.0060	0.55	Parabolic	0.0175	7.52	16.51		16.51	16.73	3.61	H1	5.66		10.85	100	10	12	On Grade	10.85	2.41		G3	No Bypass to D/S inlet
DESIGN POINT 17																													
100-YR	H-A1	15+83 Brewer Ln, Rt.	H-A1	0.14	0.60	15	0.0050	0.42	Parabolic	0.0175	7.52	0.63		0.63	15.27	3.29	H-A2		2.73	3.36	100	4	10	On Grade	3.36	0.75		H	No Bypass
100-YR	H-A2	15+83 Brewer Ln, Lt.	H-A2 & H-A3	1.35	0.60	15	0.0050	0.42	Parabolic	0.0175	7.52	6.09		6.09	15.27	3.29	H-A1	2.73		3.36	100	4	10	On Grade	3.36	0.75		J	No Bypass

Inlet B4 is an existing inlet constructed with Heritage, Phase 2. Inlet B4 is part of another storm basin within Phase 2 and is included for reference. As no bypass is anticipated to leave the storm basin "D", this parallel basin and its inlets were not analyzed under the new drainage criteria requirements.

RUNOFF CAPACITY CALCS FOR 60' ROW HALF STREET SECTION (PARABOLIC CROWN)

Channel Slope (ft/ft)	Water Surface Elevation (ft)	Discharge (ft³/s)
0.0050	0.42	3.29
0.0050	0.63	15.27
0.0081	0.42	4.19
0.0081	0.63	19.44
0.0120	0.42	5.10
0.0120	0.63	23.66
0.0175	0.42	6.16
0.0175	0.63	28.57
0.0220	0.42	6.91
0.0220	0.63	32.04
0.0308	0.42	8.18
0.0308	0.63	37.91

Depths and discharges calculated using Mannings equation for parabolic section defined by:

Mannings "n"
n: 0.0175 (pavement)
n: 0.035 (parkway)

60' ROW HALF SECTION GEOMETRY DEFINITION

Horiz. distance from centerline (ft)	Elevation above flowline (ft)
0.00	0.42
1.00	0.42
2.00	0.41
3.00	0.40
4.00	0.39
5.00	0.37
6.00	0.35
7.00	0.33
8.00	0.30
9.00	0.27
10.00	0.23
11.00	0.19
12.00	0.15
13.00	0.10
14.00	0.05
15.00	0.00
15.01	0.50
15.50	0.50
21.50	0.63
30.00	0.80

RUNOFF CAPACITY CALCS FOR BOUNDS LANE HALF STREET SECTION (CROSS CROWN)

Channel Slope (ft/ft)	Water Surface Elevation (ft)	Discharge (ft³/s)
0.0060	0.42	9.39
0.0060	0.63	20.85
0.0204	0.42	17.31
0.0204	0.63	38.44

Depths and discharges calculated using Mannings equation for parabolic section defined by:

Mannings "n"
n: 0.0175 (pavement)
n: 0.035 (parkway)

BOUNDS LANE HALF SECTION GEOMETRY DEFINITION (CROSS)

Horiz. distance from open space adjacent pavement edge (ft)	Elevation above flowline (ft)
0.00	0.42
19.50	0.00
19.51	0.50
20.00	0.50
29.00	0.70

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 11.19.2013

BENCHMARKS
1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'

2. "□ " Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE	NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
				2	RUNOFF AND CAPACITY CALCULATIONS WITH ADDITION & REVISION OF PONDS "G" & "H"	CSF	12/20/12
				1	RUNOFF AND CAPACITY CALCULATIONS WITH NEW "C" FACTOR	ERH	10/18/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS — ERIK R. HANSEN — 106034 — LICENSED PROFESSIONAL ENGINEER — 01.02.2013

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STORM SEWER CALCULATIONS
ON GRADE INLET CALCULATIONS
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 24

ON-GRADE INLETS & STREET CAPACITY

Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-DA-CALCS.dwg Saved By: ehansen Save Time: 12/28/2012 3:25 PM Plotted by: ehansen Plot Date: 12/28/2012 3:26 PM

SAG INLET CALCULATIONS

Inlet No.	Inlet Type	Areas (acres)	Runoff "c"	Conc. Time (min)	100-year Intensity (in/hr)	100-year Total Q (cfs)	Depth of Depress. "a" (ft)	Length of Inlet Opening L or P (ft)	Width of Depress. (ft)	Coeff (Weir or Orrifice) Cw/Co	Depth of Flow at Opening "d" (ft)	Max Depth before bypass "dmax" (ft)	Capacity of Inlet per Foot of Length Q/L (cfs/ft)	Capacity of Inlet (cfs)	Carry - Over into Overflow (cfs)	Percent Q_{100} captured by inlet (%)	Notes
1		2	3	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Design Point A																	
Exist. D1A	Drop Inlet (2'x2')	1.34	0.40	15	7.52	4.03	0.00	8.0	0.0	3.00	0.30 ③	0.50	1.06 ③	8.49 ③	0.00	100%	Inlet depth as weir [Eqn ③]; Inlet capacity as weir [Eqn ③]
Design Point B																	
E4	Curb Inlet (8')	1.46	0.60	15	7.52	6.59	0.42	8.0	1.5	2.30	0.42 ③	0.42	0.83 ③	6.62 ③	0.00	100%	Inlet depth as weir [Eqn ③]; Inlet capacity as weir [Eqn ③]
Design Point C																	
G1	Curb Inlet (10')	1.85	0.60	15	7.52	8.34	0.42	10.0	1.5	2.30	0.43 ③	0.45	0.88 ③	8.82 ③	0.00	100%	Inlet depth as weir [Eqn ③]; Inlet capacity as weir [Eqn ③]
G2	Curb Inlet (10')	1.85	0.60	15	7.52	8.34	0.42	10.0	1.5	2.30	0.43 ③	0.45	0.88 ③	8.82 ③	0.00	100%	Inlet depth as weir [Eqn ③]; Inlet capacity as weir [Eqn ③]
Design Point D																	
Exist. H*	Wye Inlet (48" dia.)	2.19	0.52	15	7.52	8.48	0.00	12.6	0.0	3.00	0.37 ①	3.50	10.06 ②	126.40 ②	0.00	100%	Inlet depth as weir [Eqn ①]; Inlet capacity as orifice [Eqn ②]
(*called H for cross referencing purposes.)																	
Design Point E																	
J	Drop Inlet (4'x4')	1.78	0.57	15	7.52	7.61	0.00	16.0	0.0	3.00	0.29 ③	2.50	4.03 ④	64.52 ④	0.00	100%	Inlet depth as weir [Eqn ③]; Inlet capacity as orifice [Eqn ④]

① Equation 1 ADAPTED FROM FHWA HEC 22 SECOND EDITION

Inlet depth is controlled by weir equation

$Qi = Cw\ P\ d^{3/2}$

where:

- **Cw:** weir coefficient (3.0)
- **P:** perimeter of the grate inlet or open top inlet [ft]; where inlet has a grate top, 50% of the total perimeter is used in determining design capacity as a factor of safety for grate clogging
- **d:** depth of flow at the inlet [ft]

Q/L calculation controlled by max depth determined by analysis of depth before bypass.

② Equation 2 ADAPTED FROM FHWA HEC 22 SECOND EDITION

Inlet depth is controlled by orifice equation

$Qi = Co\ Ag\ (2\ g\ d)^{1/2}$

where:

- **Co:** orifice coefficient (0.67)
- **Ag:** clear opening area of the grate or open top inlet [ft²]; where inlet has a grate top, 50% of the total area is used as a factor of safety for grate clogging
- **g:** gravitational acceleration constant (32.2 ft/sec²)
- **do:** depth of flow at the inlet [ft]

Q/L calculation controlled by max depth determined by analysis of depth before bypass.

③ Equation 3 ADAPTED FROM FHWA HEC 22 SECOND EDITION

Inlet depth is controlled by weir equation

$Qi = Cw\ (L + 1.8\ W)\ d^{3/2}$

where:

- **Cw:** weir coefficient
  - 2.3 for depressed (L<12')
  - 3.0 for non depressed & depressed (L≥12')
- **L:** inlet length [ft]
- **W:** gutter depression width [ft]
- **d:** depth of flow at the inlet [ft]

Q/L calculation controlled by max depth determined by analysis of depth before bypass.

④ Equation 4 ADAPTED FROM FHWA HEC 22 SECOND EDITION

Inlet depth is controlled by orifice equation

$Qi = Co\ h\ L\ (2\ g\ do)^{1/2}$

where:

- **Co:** orifice coefficient (0.67)
- **h:** height of opening (0.5 ft)
- **L:** inlet length or perimeter [ft]
- **g:** gravitational acceleration constant (32.2 ft/sec²)
- **do:** effective head at the center of orifice opening [ft]

Q/L calculation controlled by max depth determined by analysis of depth before bypass.

BENCHMARKS
1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'

2. "□ " Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
2	REMOVED INLETS H1 & H2 THIS SHEET. ADDED INLETS G1 & G2 THIS SHEET.	CSF	12/20/12
1	THIS SHEET ADDED	ERH	10/18/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS · ERIK R. HANSEN · 106034 · LICENSED PROFESSIONAL ENGINEER · 01.15.1975

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STORM SEWER CALCULATIONS
SAG INLET CALCULATIONS
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 25

RECORD DRAWINGS
THESE RECORD DOCUMENTS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. ENGINEER HAS NOT VERIFIED THE ACCURACY AND/OR COMPLETENESS OF THIS INFORMATION. UNLESS OTHERWISE NOTED ON THESE DOCUMENTS, JBI PARTNERS, INC. SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS THAT MAY BE INCORPORATED AS A RESULT OF ERRONEOUS INFORMATION PROVIDED BY OTHERS.
JBI PARTNERS, INC.
BY:
DATE: 1.19.2013

Plotted by: ehansen Plot Date: 1/21/2013 9:33 AM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-DA-CALCS.dwg Saved By: ehansen Save Time: 1/2/2013 4:19 PM

HYDRAULIC CALCULATIONS

	UPSTREAM STATION	DNSTREAM STATION	DISTANCE "L" (FT)	AREA NO.	AREA "A" (ACRES)	RUNOFF COEF. "C"	INCREM. "CA"	ACCUM. "CA"	TIME AT UPSTREAM STATION (MIN)	STORM FREQUENCY (YEARS)	INTENSITY "I" (IN/HR)	RUNOFF "Q" (CFS)	SLOPE HYDRAULIC GRADIENT "S" (FT/FT)	STORM SEWER SIZE (IN)	(BOX ONLY) PIPE AREA (FT^2)	(BOX ONLY) PIPE CONVEYANCE "K" (n=0.013)	VELOCITY "V" (FPS)	VELOCITY HEAD "V^2/2G" (FT)	"L" X "S"	Kj	JUNCTION LOSSES (FT)	FLOW TIME (MIN)	TIME AT DNSTREAM STATION (MIN)	HGL	
	LINE B																				0.10			766.68	
EXISTING	2+00.00	1+00.00	100.00	60 WYE (LAT B1 & B2)	0.88	0.60	0.53	0.53	15.00	100	7.52	3.99	0.0014	18			2.26	0.08	0.14	0.75		0.74	15.74	766.58	
																								100 YEAR WSEL D/S (FROM LINE D)	766.44
	LAT B1																				0.10			766.79	
EXISTING	1+18.11	1+00.00	18.11	INLET B1	0.42	0.60	0.25	0.25	15.00	100	7.52	1.88	0.0003	18			1.06	0.02	0.01	1.25		0.28	15.28	766.69	
																								100 YEAR WSEL D/S (FROM LINE B)	766.68
	LAT B2																				0.10			766.79	
EXISTING	1+18.42	1+00.00	18.42	INLET B2	0.46	0.60	0.28	0.28	15.00	100	7.52	2.11	0.0004	18			1.19	0.02	0.01	1.25		0.26	15.26	766.69	
																								100 YEAR WSEL D/S (FROM LINE B)	766.68
	LINE C																				0.10			770.03	
EXISTING	5+03.13	2+00.49	302.64	60 WYE (LAT C2)	1.03	0.60	0.62	0.62	15.58	100	7.45	4.62	0.0019	18			2.61	0.11	0.58	0.75		1.93	17.51	769.93	
																					0.10			769.35	
EXISTING	2+00.49	1+97.49	3.00	SIZE CHANGE				0.62	17.51	100	7.22	4.48	0.0018	18			2.54	0.10	0.01	1.00		0.02	17.53	769.25	
																					0.83			769.24	
EXISTING	1+97.49	1+00.00	97.49	60 WYE (LAT C1)	2.42	0.60	1.45	2.07	17.53	100	7.22	14.95	0.0202	18			8.46	1.11	1.97	0.75		0.19	17.72	768.41	
																								100 YEAR WSEL D/S (FROM LINE D)	766.44
	LAT C2																				0.10			770.27	
EXISTING	1+44.69	1+09.63	35.06	INLET C2	0.61	0.60	0.37	0.37	15.00	100	7.52	2.78	0.0007	18			1.57	0.04	0.02	1.25		0.37	15.37	770.17	
																					0.10			770.15	
EXISTING	1+09.63	1+00.00	9.63	60 WYE (LAT C3)	0.42	0.60	0.25	0.62	15.52	100	7.46	4.63	0.0019	18			2.62	0.11	0.02	0.75		0.06	15.58	770.05	
																								100 YEAR WSEL D/S (FROM LINE C)	770.03
	LAT C3																				0.10			770.26	
EXISTING	1+32.85	1+00.00	32.85	INLET C3	0.42	0.60	0.25	0.25	15.00	100	7.52	1.88	0.0003	18			1.06	0.02	0.01	1.25		0.52	15.52	770.16	
																								100 YEAR WSEL D/S (FROM LAT C2)	770.15
	LINE D *(for detention pond peak release at 17.07 minutes)*																								
EXISTING	17+66.32	16+88.39	77.93	MH (LINE E)	11.37	0.60	6.81	10.03	15.95	100	7.41	74.32	0.0124	36			10.51	1.72	0.96	0.50		0.12	16.07	780.90	
																					0.60			779.94	
EXISTING	16+88.39	16+76.75	11.64	60 WYE (LAT D3)	0.89	0.60	0.53	10.56	16.07	100	7.39	78.04	0.0136	36			11.04	1.89	0.16	0.75		0.02	16.09	779.34	
																					0.70			779.18	
EXISTING	16+76.75	13+69.45	307.30	60 WYE (LAT D2)	1.04	0.60	0.62	11.18	16.09	100	7.39	82.62	0.0153	36			11.69	2.12	4.69	0.75		0.44	16.53	778.48	
																					0.10			773.79	
EXISTING	13+69.45	10+25.08	344.37	60 WYE (LINE F)	7.08	0.60	4.25	15.43	16.53	100	7.34	113.26	0.0087	45			10.25	1.63	3.01	0.75		0.56	17.09	773.69	
																					0.67			770.68	
EXISTING	10+25.08	8+96.68	128.40	60 WYE (LINE G)				15.43	17.34	100	7.24	**138.71**	0.0093	48			11.04	1.89	1.19	0.75		0.19	17.53	770.01	
																					0.67			768.82	
EXISTING	8+96.68	8+86.30	10.38	60° WYE (LAT D1)	1.66	0.60	1.00	16.43	17.53	100	7.22	**145.62**	0.0102	48			11.59	2.09	0.11	0.75		0.01	17.54	768.15	
																					0.00			768.04	
EXISTING	8+86.30	8+75.95	10.35	PVI				16.43	17.54	100	7.22	**145.62**	0.0140**	48			15.20**	3.59	0.14	NA		0.01	17.55	766.89	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																					0.00			766.63	
EXISTING	8+75.95	8+39.97	35.98	60 WYE (LAT D1A)	1.34	0.40	0.54	16.97	17.55	100	7.22	**149.52**	0.0140**	48			15.26**	3.62	0.50	NA		0.04	17.59	766.63	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																					0.00			766.44	
EXISTING	8+39.97	8+01.30	38.67	60 WYE (LINES B & C)	4.33	0.60	2.60	19.57	17.72	100	7.20	**167.90**	0.0140**	48			15.42**	3.69	0.54	NA		0.04	17.76	766.44	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																								100 YEAR WSEL AT OUTFALL (NORMAL DEPTH IN PIPE>CHANNEL NORMAL DEPTH)	765.90
	LINE G *(for detention pond peak release at 17.07 minutes)*																				0.10			773.79	
	6+37.09	2+95.21	341.88	MH (LAT G3 & G4)	6.14	0.60	3.68	3.68	15.05	100	7.51	27.64	0.0017	36			3.91	0.24	0.58	0.50		1.46	16.51	773.69	
																					0.17			773.11	
	3+46.22	2+95.21	51.01	MH				3.68	16.51	100	7.34	27.01	0.0016	36			3.82	0.23	0.08	0.25		0.22	16.73	772.94	
																					0.21			772.86	
	2+95.21	2+87.46	7.75	WYE (LAT G1)	1.85	0.60	1.11	4.79	16.73	100	7.32	35.06	0.0027	36			4.96	0.38	0.02	0.75		0.03	16.76	772.65	
																					0.30			772.63	
	2+87.46	2+56.19	31.27	WYE (LAT G2)	1.85	0.60	1.11	5.90	16.76	100	7.31	43.13	0.0042	36			6.10	0.58	0.13	0.75		0.09	16.85	772.33	
																									772.20
	2+56.19	1+75.95	80.24	DETENTION POND	0.45	0.43	0.19	6.09	16.85	100	7.30	44.46					6.10					0.22	17.07	**772.20**	
																					0.50			772.20	
	1+75.95	1+36.02	39.93	HEADWALL (DETENTION POND)					17.07	100		**27.00**	0.0016	36			3.82	0.23	0.07	ORIFICE		0.17	17.24	771.70	
																					0.10			771.63	
	1+36.02	1+30.94	5.08	45 HORIZ. BEND					17.24	100		**27.00**	0.0016	36			3.82	0.23	0.01	0.35		0.02	17.26	771.53	
																					0.61			771.52	
EXISTING	1+30.94	1+00.00	30.94	MH					17.26	100		**27.00**	0.0076	27			6.79	0.72	0.23	0.50		0.08	17.34	770.91	
																								100 YEAR WSEL D/S (FROM LINE D)	770.68
	LAT G1 *(for detention pond peak release at 17.07 minutes)*																				0.14			773.05	
	1+38.22	1+00.00	38.22	INLET G1	1.85	0.60	1.11	1.11	15.00	100	7.52	8.35	0.0014	24			2.66	0.11	0.05	1.25		0.24	15.24	772.91	
																								100 YEAR WSEL D/S (FROM LINE G)	772.86
	LAT G2 *(for detention pond peak release at 17.07 minutes)*																				0.14			772.78	
	1+10.44	1+00.00	10.44	INLET G2	1.85	0.60	1.11	1.11	15.00	100	7.52	8.35	0.0014	24			2.66	0.11	0.01	1.25		0.07	15.07	772.64	
																								100 YEAR WSEL D/S (FROM LINE G)	772.63
	LAT G3 *(for detention pond peak release at 17.07 minutes)*																				1.11			775.06	
	1+21.45	1+00.00	21.45	INLET G3	3.07	0.60	1.84	1.84	15.00	100	7.52	13.84	0.0076	21			7.56*	0.89	0.16	1.25		0.05	15.05	773.95	
																								100 YEAR WSEL D/S (FROM LINE G)	773.79
	LAT G4 *(for detention pond peak release at 17.07 minutes)*																				1.11			775.06	
	1+21.20	1+00.00	21.20	INLET G4	3.07	0.60	1.84	1.84	15.00	100	7.52	13.84	0.0076	21			7.56*	0.89	0.16	1.25		0.05	15.05	773.95	
																								100 YEAR WSEL D/S (FROM LINE G)	773.79
	LINE F																				0.44			776.77	
	3+48.93	1+43.50	205.43	MH (LAT F3 & F4)	5.76	0.60	3.46	3.46	15.06	100	7.51	25.98	0.0070	27			6.53	0.66	1.44	0.50		0.52	15.58	776.33	
																					0.65			774.89	
EXISTING	1+43.50	1+00.00	43.50	MH (LAT F1 & F2)	1.32	0.60	0.79	4.25	15.58	100	7.45	31.66	0.0104	27			7.96	0.98	0.45	0.50		0.09	15.67	774.24	
																								100 YEAR WSEL D/S (FROM LINE D)	773.79
	LAT F1																				0.10			775.00	
	1+24.78	1+02.50	22.28	INLET F1	0.73	0.60	0.44	0.44	15.00	100	7.52	3.31	0.0004	21			1.38	0.03	0.01	1.25		0.27	15.27	774.90	
																								100 YEAR WSEL D/S (FROM LINE F)	774.89
	LAT F2																				0.10			775.00	
	1+23.74	1+02.50	21.24	INLET F2	0.59	0.60	0.35	0.35	15.00	100	7.52	2.63	0.0003	21			1.09	0.02	0.01	1.25		0.32	15.32	774.90	
																								100 YEAR WSEL D/S (FROM LINE F)	774.89
	LAT F3																				0.56			777.46	
	1+21.24	1+02.50	18.74	INLET F3	2.88	0.60	1.73	1.73	15.00	100	7.52	13.01	0.0067	21			5.41	0.45	0.13	1.25		0.06	15.06	776.90	
																								100 YEAR WSEL D/S (FROM LINE F)	776.77
	LAT F4																				0.10			776.99	
	1+21.10	1+02.50	18.60	INLET F4	2.88	0.60	1.73	1.73	15.00	100	7.52	13.01	0.0067	21			5.41	0.45	0.12	0.00		0.06	15.06	776.89	
																								100 YEAR WSEL D/S (FROM LINE F)	776.77

BENCHMARKS
1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'

2. "□ " Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	CALCULATIONS REVISED.	ERH	01/23/13
2	CALCULATIONS REVISED.	CSF	12/20/12
1	CALCULATIONS REVISED.	ERH	10/19/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS · ERIK R. HANSEN · 106034 · LICENSED PROFESSIONAL ENGINEER · 01.25.2013

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STORM SEWER CALCULATIONS
HYDRAULIC CALCULATIONS
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. H0E157
SHEET NO. 26

RECORD DRAWINGS
THESE RECORD DOCUMENTS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. JBI PARTNERS, INC. HAS NOT VERIFIED THE ACCURACY AND/OR COMPLETENESS OF THIS INFORMATION. UNLESS OTHERWISE NOTED, JBI PARTNERS, INC. DOES NOT WARRANT NOR ASSUME ANY LIABILITY OR RESPONSIBILITY FOR ANY ERRORS OR OMISSIONS THAT MAY BE INCORPORATED AS A RESULT OF ERRONEOUS INFORMATION PROVIDED BY OTHERS.
JBI PARTNERS, INC.
BY: _____
DATE: 11.19.2013

DESIGN NODE	Kj
Inlet at the end of line	1.25
Pipe size change	0.10
45° wye connection	0.75
Manhole at 90° bend	0.25
Inlet with connection	0.50
45° bend	0.35

(*) DENOTES PARTIAL FLOW VELOCITY
(**) DENOTES NORMAL DEPTH FLOW AND VELOCITY

LINES B, C, D, F, & G

Plotted by: ehansen Plot Date: 1/24/2013 3:05 PM
Drawing: H:\Projects\H0E157 – Heritage Phase 3 Celina\dwg\H0E157-DA-CALCS.dwg Saved By: ehansen Save Time: 1/24/2013 3:03 PM

HYDRAULIC CALCULATIONS

UPSTREAM STATION	DNSTREAM STATION	DISTANCE	AREA NO.	AREA "A" (ACRES)	RUNOFF COEF. "C"	INCREM "CA"	ACCUM "CA"	TIME AT UPSTREAM STATION (MIN)	STORM FREQUENCY (YEARS)	INTENSITY "I" (IN/HR)	RUNOFF "Q" (CFS)	SLOPE HYDRAULIC GRADIENT "S" (FT/FT)	STORM SEWER SIZE (IN)	(BOX ONLY) PIPE AREA (FT^2)	(BOX ONLY) PIPE CONVEYANCE "K" (n=0.013)	VELOCITY "V" (FPS)	VELOCITY HEAD "V^2/2G" (FT)	"L" X "S"	Kj	JUNCTION LOSSES (FT)	FLOW TIME (MIN)	TIME AT DNSTREAM STATION (MIN)	HGL
LINE H																				0.40			801.33
4+66.66	4+32.66	34.00	INLET H1	2.41	0.60	1.45	1.45	15.00	100	7.52	10.90	0.0047	21			4.53	0.32	0.16	1.25		0.13	15.13	800.93
																				0.58			800.77
4+32.66	3+89.89	42.77	INLET H2	2.41	0.60	1.45	2.90	15.13	100	7.50	21.75	0.0092	24			6.92	0.74	0.39	0.50		0.10	15.23	800.19
																							799.80
3+89.89	2+41.61	148.28	DETENTION POND	1.83	0.57	1.04	3.94	15.23	100	7.49	29.51					3.00					0.82	16.05	**799.80**
																				1.63			799.75
2+41.61	1+85.84	55.77	HEADWALL (DETENTION POND)					16.05			**16.50**	0.0108	21			6.86	0.73	0.17	ORIFICE		0.14	16.19	798.12
																				0.72			797.95
1+85.84	0+91.17	94.67	MH (LAT JA)	1.78	0.57	1.01	1.01	16.19	100	7.38	**23.96**	0.0112	24			7.63	0.90	0.17	0.25		0.21	16.40	797.23
																				0.68			797.06
0+91.17	0+68.09	23.08	MH				1.01	16.40	100	7.35	**23.93**	0.0111	24			7.62	0.90	0.26	0.25		0.05	16.45	796.38
																				0.10			796.12
0+68.09	0+00.00	68.09	EX. WYE INLET	2.19	0.52	1.13	2.14	16.45	100	7.35	**32.23**	0.0082	36			4.56	0.32	0.56	0.50		0.25	16.70	796.02
																				STARTING 100 YR HGL (FROM CROWN OF 36" CMP AT OUTFALL ON EAST SIDE OF CR 97)			795.46
LINE HA																				0.10			800.05
1+71.93	1+37.93	34.00	INLET HA-2	0.75	0.60	0.45	0.45	15.00	100	7.52	3.38	0.0005	21			1.41	0.03	0.02	1.25		0.40	15.40	799.95
																				0.10			799.93
1+37.93	1+07.74	30.19	INLET HA-1	0.75	0.60	0.45	0.90	15.40	100	7.47	6.72	0.0009	24			2.14	0.07	0.03	0.50		0.24	15.64	799.83
																				100 YEAR WSEL D/S (FROM LINE H)			799.80
LINE J																				0.11			798.09
1+27.76	1+00.00	27.76	INLET J	1.78	0.57	1.01	1.01	15.00	100	7.52	7.60	0.0011	24			2.42	0.09	0.03	1.25		0.19	15.19	797.98
																				100 YEAR WSEL D/S (FROM LAT J1)			797.95

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 11.19.2013

DESIGN NODE	Kj
Inlet at the end of line	1.25
Pipe size change	0.10
45° wye connection	0.75
Manhole at 90° bend	0.25
Inlet with connection	0.50
45° bend	0.35

(*) DENOTES PARTIAL FLOW VELOCITY

LINES H, HA, & J

BENCHMARKS
1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'

2. "□ " Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	LINES INCLUDED IN CALCULATIONS REVISED.	ERH	01/21/13
2	CALCULATIONS REVISED.	CSF	12/20/12
1	CALCULATIONS REVISED.	ERH	10/19/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS
ERIK R. HANSEN
106034
LICENSED PROFESSIONAL ENGINEER
01.25.13

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Texas Registered Engineering Firm F-438

STORM SEWER CALCULATIONS
HYDRAULIC CALCULATIONS
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 27

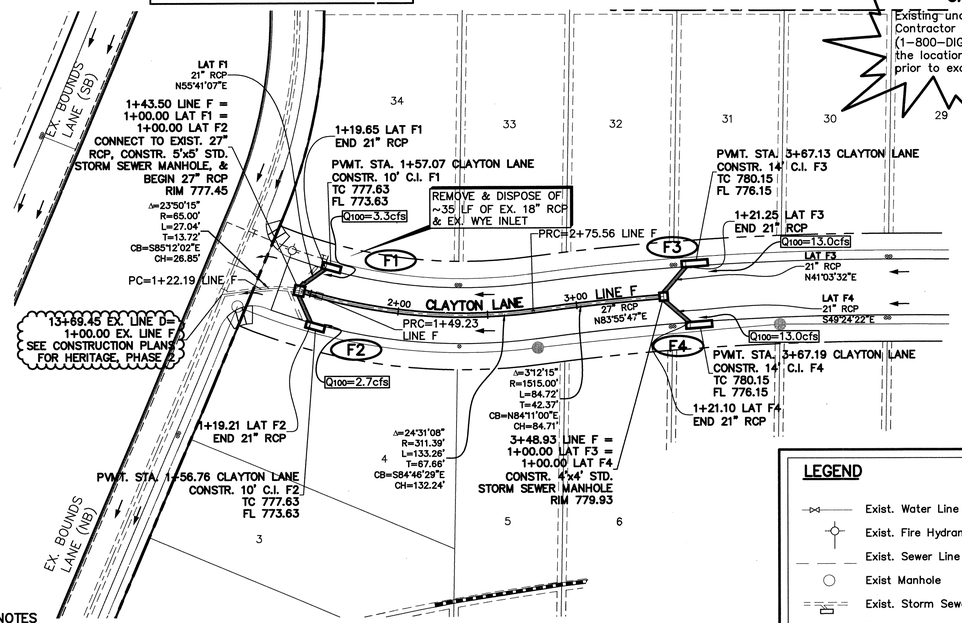
P-201310-01

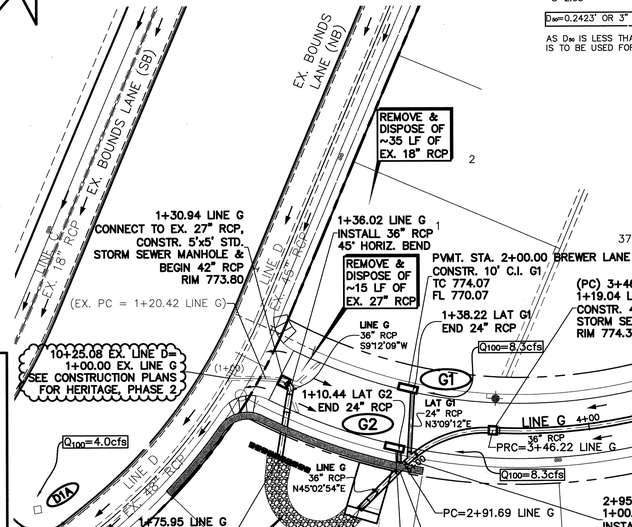
Plotted by: ehansen Plot Date: 1/21/2013 9:48 AM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-DA-CALCS.dwg Saved By: ehansen Save Time: 1/21/2013 9:46 AM

NOTES
ALL STORM DRAIN JOINTS SHALL BE FULLY GROUTED THROUGH ALL CURVES UNLESS RADIAL PIPE IS PROVIDED.

GRAPHIC SCALE 1"=40'
40 0 40 80

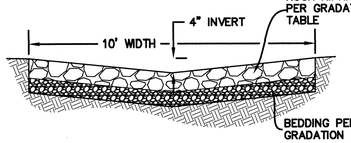
CAUTION!!!
Existing underground utilities. Contractor to call for locates (1-800-DIG-TESS) and field verify the location of all existing utilities prior to excavation.





LEGEND
- Exist. Water Line & Valve
- Exist. Fire Hydrant
- Exist. Sewer Line
- Exist Manhole
- Exist. Storm Sewer
- Prop. Water Line & Valve
- Prop. Fire Hydrant
- Prop. Sewer Line
- Prop. Manhole
- Prop. Storm Sewer & Inlet

ROCK RIPRAP DETAIL FOR OUTFALL OF LINE G



RIPRAP SIZING PER HEC 11 (BROWN & CLYDE, 1989)

EQUATION: $D_{50} = \frac{0.692}{S-1} \times \frac{V^2}{2G}$

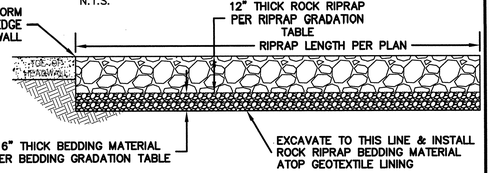
WHERE,
D_{50} MEDIAN ROCK SIZE (FT)
V: VELOCITY (FT/S)
S: RIPRAP SPECIFIC GRAVITY

FOR:
V=6.10 FT/S
S=2.65

D_{50}=0.2423' OR 3"

AS D_{50} IS LESS THAN 8", A DESIGN D_{50} OF 8" IS TO BE USED FOR CONSTRUCTION.

N.T.S.



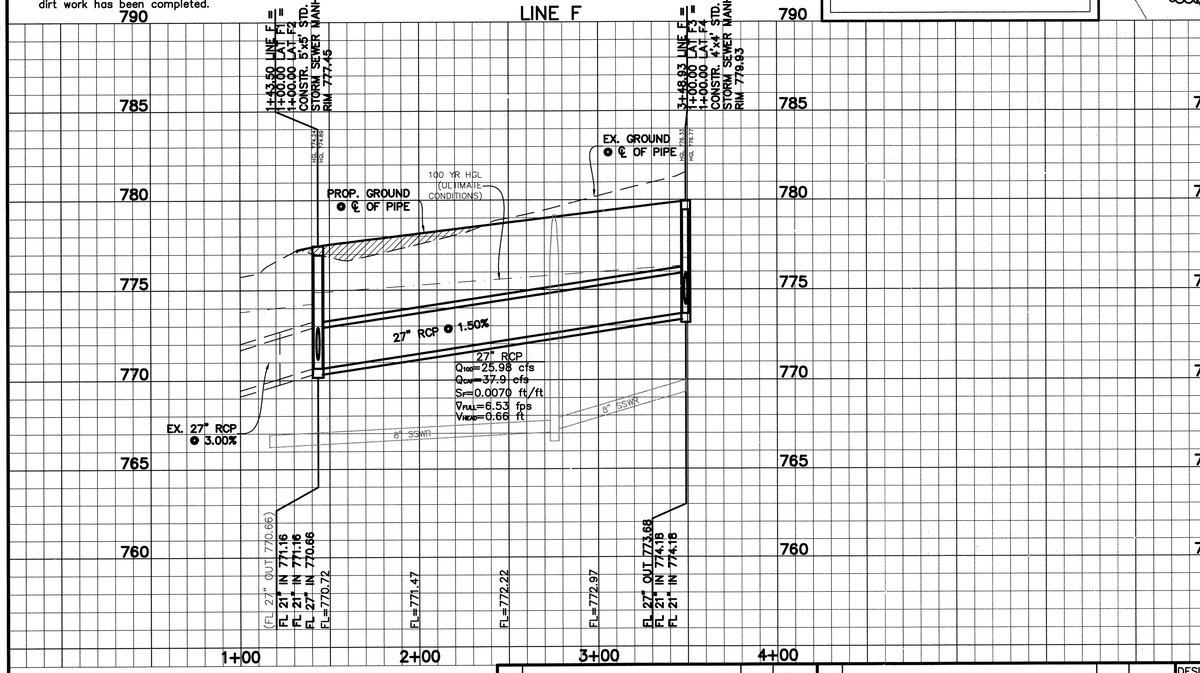
ROCK RIPRAP GRADATION
D50=8"

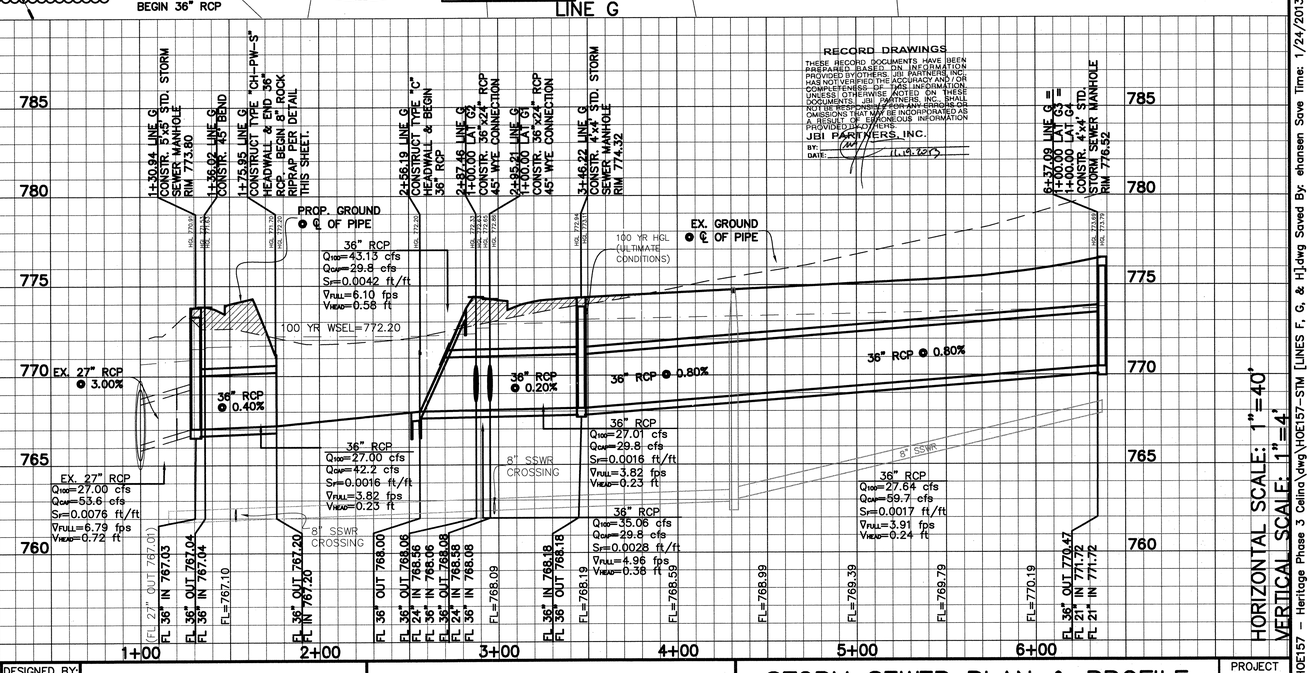
SEIVE SIZE SQUARE MESH	PERCENT PASSING
15"	100
12"	70-100
8"	45-75
6"	30-55
3"	10-30
1½"	0-10

BEDDING GRADATION
D50=8"

SEIVE SIZE SQUARE MESH	PERCENT PASSING
3"	100
1½"	55-100
¾"	25-60
⅜"	5-30
NO. 4	0-10

NOTES
1. All construction shall conform with City of Celina standard details and specifications.
2. Contractor shall verify location of existing utilities prior to construction & notify engineer of any discrepancies.
3. Utility contractor shall coordinate with paving contractor to place all systems after dirt work has been completed.





RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 11-19-2013

HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
1	POND REVISED.	ERH	01/23/13
1	RUNOFF LABELS ADDED	CSF	10/22/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 07-25-2013

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FOR COMMENT ONLY

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STORM SEWER PLAN & PROFILE
LINES F & G
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 28

Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-STM [LINES F, G, & H].dwg Saved By: ehansen Save Time: 1/24/2013 12:42 PM
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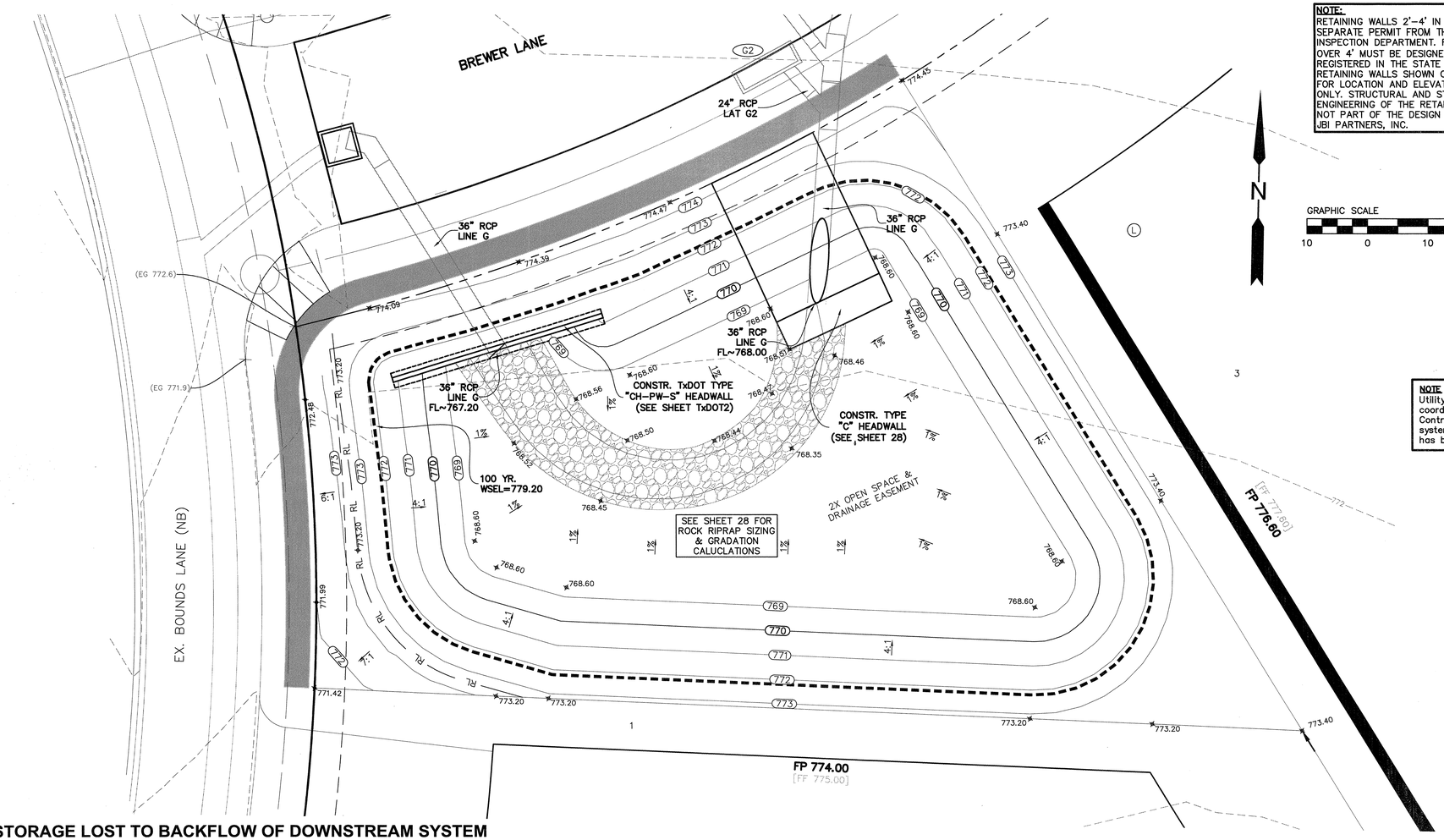
P-201310-01



NOTE:
RETAINING WALLS 2'-4' IN HEIGHT REQUIRE A SEPARATE PERMIT FROM THE BUILDING INSPECTION DEPARTMENT. RETAINING WALLS OVER 4' MUST BE DESIGNED BY AN ENGINEER REGISTERED IN THE STATE OF TEXAS. RETAINING WALLS SHOWN ON THIS PLAN ARE FOR LOCATION AND ELEVATION PURPOSES ONLY. STRUCTURAL AND STABILITY ENGINEERING OF THE RETAINING WALLS ARE NOT PART OF THE DESIGN RESPONSIBILITY OF JBI PARTNERS, INC.

LEGEND

- EXIST. STORM SEWER
- PROP. STORM SEWER
- FLOW ARROW
- 780 — EXISTING MAJOR CONTOUR
- 781 — EXISTING MINOR CONTOUR
- 770 — PROPOSED MAJOR CONTOUR
- 771 — PROPOSED MINOR CONTOUR
- 12" GB — PROPOSED GRADE BEAM
- PROPOSED RETAINING WALL
- 802.50 — PROP. SPOT ELEVATION
- (EG 802.7) — EXIST. SPOT ELEVATION
- FP 807.60 — FINISHED PAD ELEVATION
- [FF 808.60] — FINISHED FLOOR ELEVATION
  FF=FP+1.0'
- RL — RIDGE LINE

NOTE
All fill to be compacted to 95% standard proctor density.

NOTE
Utility Contractor shall coordinate with paving Contractor to place all systems after dirt work has been completed.

NOTE
All construction shall conform with City of Celina standard details and specifications.

CONTRACTOR TO VERIFY LOCATION OF EX. UTILITIES PRIOR TO CONSTRUCTION & NOTIFY THE ENGINEER OF ANY DISCREPANCIES

DETENTION CALCULATIONS (100-YEAR)

POST-PROJECT PEAK DISCHARGE

Area	Description	Duration (Min.)	Intensity (In./Hr.)	C	A (Acres)	Q (cfs)
G1	SF Residential	17.1	7.27	0.60	1.21	5.3
G2	SF Residential	17.1	7.27	0.60	1.62	7.1
G3	SF Residential	17.1	7.27	0.60	2.74	12.0
G4	SF Residential	17.1	7.27	0.60	4.26	18.6
POND G	SF Residential/Pond	17.1	7.27	0.43	0.45	1.4
			TOTAL AREA TO EXISTING LINE D		10.28	Acres

Inflow Calculations

Duration (Min.)	Intensity (In./Hr.)	C	A (Acres)	Q (cfs)
17.1	7.27	0.59	10.28	44.3
20	6.93	0.59	10.28	42.2
22	6.69	0.59	10.28	40.8
23	6.58	0.59	10.28	40.1

Storage Volume

Duration (Min.)	Inflow (cf)	Design Outflow Rate (cfs)	Outflow (cf)	Storage (cf)	Storage (acre-ft)
17.1	45450	26.25	26933	18517	0.43
20	50657	28.90	32166	18491	0.42
22	53825	30.05	35249	**18576**	0.43
23	55280	30.60	36812	18468	0.42

REQUIRED STORAGE VOLUME
18,576 cu. ft.
688 cu. yd.
0.43 acre-ft
TIME TO PEAK (Tpeak)
22.0 minutes

ANALYSIS OF STORAGE LOST TO BACKFLOW OF DOWNSTREAM SYSTEM

UPSTREAM STATION	DNSTREAM STATION	DISTANCE "L" (FT)	AREA NO.	AREA "A" (ACRES)	RUNOFF COEF. "C"	INCREM "CA"	ACCUM "CA"	TIME AT UPSTREAM STATION (MIN)	STORM FREQUENCY (YEARS)	INTENSITY "I" (IN/HR)	RUNOFF "Q" (CFS)	SLOPE HYDRAULIC GRADIENT "S" (FT/FT)	STORM SEWER SIZE (IN)	VELOCITY "V" (FPS)	VELOCITY HEAD "V^2/2G" (FT)	"L" X "S"	Kj	JUNCTION LOSSES (FT)	FLOW TIME (MIN)	TIME AT DNSTREAM STATION (MIN)	HGL
LINE D	*(for detention pond peak release at 15.05 minutes)*																				
17+66.32	16+88.39	77.93	MH (LINE E)	11.37	0.60	6.81	10.03	15.95	100	7.41	74.32	0.0160**	36	10.51**	1.72	1.25	NA		0.12	16.07	777.90
																		0.00			776.76
16+88.39	16+76.75	11.64	60 WYE (LAT D3)	0.89	0.60	0.53	10.56	16.07	100	7.39	78.04	0.0160**	36	11.04**	1.89	0.19	NA		0.02	16.09	776.76
																		0.00			776.74
16+76.75	13+69.45	307.30	60 WYE (LAT D2)	1.04	0.60	0.62	11.18	16.09	100	7.39	82.62	0.0160**	36	11.69**	2.12	4.92	NA		0.44	16.53	776.74
																		0.00			771.82
13+69.45	10+25.08	344.37	60 WYE (LINE F)	7.08	0.60	4.25	15.43	16.53	100	7.34	113.26	0.0090**	45	11.84**	2.18	3.10	NA		0.48	17.01	771.67
																		0.00			768.57
10+25.08	8+96.68	128.40	60 WYE (LINE G)				15.43	17.01	100	7.28	**112.33**	0.0090**	48	12.11**	2.28	1.16	NA		0.18	17.19	768.06
																		0.00			767.03
8+96.68	8+86.30	10.38	60" WYE (LAT D1)	1.66	0.60	1.00	16.43	17.19	100	7.26	**119.28**	0.0090**	48	12.22**	2.32	0.09	NA		0.01	17.20	767.03
																		0.00		*	766.94
8+86.30	8+75.95	10.35	PVI				16.43	17.20	100	7.26	**119.28**	0.0140**	48	14.64**	3.33	0.14	NA		0.01	17.21	766.51
																		0.00			766.24
8+75.95	8+39.97	35.98	60 WYE (LAT D1A)	1.34	0.40	0.54	16.97	17.21	100	7.26	**123.20**	0.0140**	48	14.74**	3.37	0.50	NA		0.04	17.25	766.24
																		0.00			765.98
8+39.97	8+01.30	38.67	60 WYE (LINES B & C)	4.33	0.60	2.60	19.57	17.72	100	7.20	**140.90**	0.0140**	48	15.12**	3.55	0.54	NA		0.04	17.76	765.98
																					765.44

100 YEAR WSEL AT OUTFALL (NORMAL DEPTH IN PIPE>CHANNEL NORMAL DEPTH)

(**) Downstream pipe in normal depth flow. Velocities are supercritical. No hydraulic jumps at junctions.

ENGINEER'S NOTE: The effects of backwater (created by the downstream storm system) on the release of of flow and storage volume of the pond were analyzed by calculating the hydraulics of the downstream pipe with the assumption that none of the pond flows were being conveyed by this downstream system. The resulting HGL in the wye at station 10+25.08, provides the base elevation or backwater elevation of the downstream system (ELEV~768.57). Storage within the pond below this backwater elevation is considered ineffective volume. Effective storage as determined by Rational Method is provided above this elevation.

Detention Pond (Goal Storage is 0.43 acre-ft at 772.2) (Storage below 768.6 as ineffective under backflow evaluation)

Pond Depth	Elevation ft	Area sq. ft	Area acres	Incremental Volume cubic feet	Incremental Volume acre feet	Total Volume cubic feet	Total Volume acre feet	Effective Volume cubic feet	Effective Volume acre feet	Comments
0	767.2	0	0.00	0.00	0.00					
0.8	768	441	0.01	176	0.00	176	0.00	0	0.00	
1.4	768.6	3447	0.08	1166	0.03	1342	0.03	0	0.00	
1.8	769	3817	0.09	1453	0.03	2795	0.06	1453	0.03	
2.8	770	4778	0.11	4298	0.10	7093	0.16	5751	0.13	
3.8	771	5784	0.13	5281	0.12	12374	0.28	11032	0.25	
4.8	772	6974	0.16	6379	0.15	18753	0.43	17411	0.40	
5	772.2	7222	0.17	1420	0.03	20173	0.46	18831	0.43	100-Year volume requirement met (18,576 cubic feet)
5.8	773	8252	0.19	6190	0.14	26363	0.61	25021	0.57	

RECORD DRAWINGS
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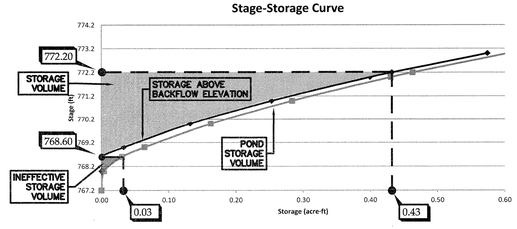
JBI PARTNERS, INC.
BY: [signature]
DATE: 11.14.2013

Stage-Storage Curve



SEE SHEET 30A & 30B FOR POND RELEASE RATE CALCULATIONS.

BENCHMARKS
1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□ " Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
2	POND G CALCULATIONS AND SIZING REVISED	ERH	01/24/13
1	THIS SHEET ADDED	CSF	12/14/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS
ERIK R. HANSEN
106034
LICENSED
PROFESSIONAL ENGINEER
01.25.2013

The seal appearing on this document was authorized by Erik R. Hansen, P.E. 106034. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.
For an alteration

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DETENTION POND PLAN
POND G
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 29

Plotted by: ehansen Plot Date: 1/24/2013 2:32 PM
Drawing: H:\Projects\HOE157 – Heritage Phase 3 Celina\dwg\HOE157–POND [SW].dwg Saved By: ehansen Save Time: 1/24/2013 10:12 AM

DETENTION CALCULATIONS (FOR A PEAK RELEASE AT 20 MINUTES)

	UPSTREAM STATION	DNSTREAM STATION	DISTANCE "L" (FT)	AREA NO.	AREA "A" (ACRES)	RUNOFF COEF. "C"	INCREM. "CA"	ACCUM. "CA"	TIME AT UPSTREAM STATION (MIN)	STORM FREQUENCY (YEARS)	INTENSITY "I" (IN/HR)	RUNOFF "Q" (CFS)	SLOPE HYDRAULIC GRADIENT "S" (FT/FT)	STORM SEWER SIZE (IN)	VELOCITY "V" (FPS)	VELOCITY HEAD "V^2/2G" (FT)	"L" X "S"	Kj	JUNCTION LOSSES (FT)	FLOW TIME (MIN)	TIME AT DNSTREAM STATION (MIN)	HGL	
	LINE D *(for detention pond peak release at 20 minutes)*																						
EXISTING	17+66.32	16+88.39	77.93	MH (LINE E)	11.37	0.60	6.81	10.03	15.95	100	7.41	74.32	0.0124	36	10.51	1.72	0.96	0.50		0.12	16.07	780.70	
																			0.60			779.74	
EXISTING	16+88.39	16+76.75	11.64	60 WYE (LAT D3)	0.89	0.60	0.53	10.56	16.07	100	7.39	78.04	0.0136	36	11.04	1.89	0.16	0.75		0.02	16.09	779.14	
																			0.70			778.98	
EXISTING	16+76.75	13+69.45	307.30	60 WYE (LAT D2)	1.04	0.60	0.62	11.18	16.09	100	7.39	82.62	0.0153	36	11.69	2.12	4.69	0.75		0.44	16.53	778.28	
																			0.10			773.59	
EXISTING	13+69.45	10+25.08	344.37	60 WYE (LINE F)	7.08	0.60	4.25	15.43	16.53	100	7.34	113.26	0.0087	45	10.25	1.63	3.01	0.75		0.56	17.09	773.49	
																			0.58			770.48	
EXISTING	10+25.08	8+96.68	128.40	60 WYE (LINE G)				15.43	20.25	100	6.90	**135.37**	0.0088	48	10.77	1.80	1.13	0.75		0.20	20.45	769.90	
																			0.63			768.77	
EXISTING	8+96.68	8+86.30	10.38	60" WYE (LAT D1)	1.66	0.60	1.00	16.43	20.45	100	6.88	**141.94**	0.0097	48	11.30	1.98	0.10	0.75		0.02	20.47	768.14	
																			0.00			768.04	
EXISTING	8+86.30	8+75.95	10.35	PVI				16.43	20.47	100	6.87	**141.77**	0.0140**	48	15.14**	3.56	0.14	NA		0.01	20.48	766.83	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																			0.00			766.57	
EXISTING	8+75.95	8+39.97	35.98	60 WYE (LAT D1A)	1.34	0.40	0.54	16.97	20.48	100	6.87	**145.48**	0.0140**	48	15.20**	3.59	0.50	NA		0.04	20.52	766.57	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																			0.00			766.35	
EXISTING	8+39.97	8+01.30	38.67	60 WYE (LINES B & C)	4.33	0.60	2.60	19.57	20.52	100	6.87	**163.35**	0.0140**	48	15.40**	3.68	0.54	NA		0.04	20.56	766.35	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																					100 YEAR WSEL AT OUTFALL (NORMAL DEPTH IN PIPE>CHANNEL NORMAL DEPTH)	765.81	
	LINE G *(for detention pond peak release at 20 minutes)*																		0.10			773.79	
	6+37.09	2+95.21	341.88	MH (LAT G3 & G4)	6.14	0.60	3.68	3.68	15.05	100	7.51	27.64	0.0017	36	3.91	0.24	0.58	0.50		1.46	16.51	773.69	
																			0.17			773.11	
	3+46.22	2+95.21	51.01	MH				3.68	16.51	100	7.34	27.01	0.0016	36	3.82	0.23	0.08	0.25		0.22	16.73	772.94	
																			0.21			772.86	
	2+95.21	2+87.46	7.75	WYE (LAT G1)	1.85	0.60	1.11	4.79	16.73	100	7.32	35.06	0.0027	36	4.96	0.38	0.02	0.75		0.03	16.76	772.65	
																			0.30			772.63	
	2+87.46	2+56.19	31.27	WYE (LAT G2)	1.85	0.60	1.11	5.90	16.76	100	7.31	43.13	0.0042	36	6.10	0.58	0.13	0.75		0.09	16.85	772.33	
																						772.20	
	2+56.19	1+75.95	80.24	DETENTION POND	0.45	0.43	0.19	6.09	16.85	100	7.30	44.46			6.10					0.22	17.07	**772.20**	
																			0.58			772.20	
	1+75.95	1+36.02	39.93	HEADWALL (DETENTION POND)					20.00	100		**28.90**	0.0019	36	4.09	0.26	0.07	ORIFICE		0.16	20.16	771.62	
																			0.10			771.55	
	1+36.02	1+30.94	5.08	45 HORIZ. BEND					20.16	100		**28.90**	0.0019	36	4.09	0.26	0.01	0.35		0.02	20.18	771.45	
																			0.69			771.44	
EXISTING	1+30.94	1+00.00	30.94	MH					20.18	100		**28.90**	0.0087	27	7.27	0.82	0.27	0.50		0.07	20.25	770.75	
																					100 YEAR WSEL D/S (FROM LINE D)	770.48	

Orifice Equation ADAPTED FROM FHWA HEC 22

Pond depth is controlled by orifice equation

$$Qi = Co\,A\,(2\,g\,do)^{1/2}$$

where:

- **Co: orifice coefficient (0.67)**
- **A: Area of opening (7.07 ft)**
- **g: gravitational acceleration constant (32.2 ft/sec²)**
- **do: effective head above downstream tailwater elevation [ft]**

DETENTION CALCULATIONS (FOR A PEAK RELEASE AT 22 MINUTES)

	UPSTREAM STATION	DNSTREAM STATION	DISTANCE "L" (FT)	AREA NO.	AREA "A" (ACRES)	RUNOFF COEF. "C"	INCREM. "CA"	ACCUM. "CA"	TIME AT UPSTREAM STATION (MIN)	STORM FREQUENCY (YEARS)	INTENSITY "I" (IN/HR)	RUNOFF "Q" (CFS)	SLOPE HYDRAULIC GRADIENT "S" (FT/FT)	STORM SEWER SIZE (IN)	VELOCITY "V" (FPS)	VELOCITY HEAD "V^2/2G" (FT)	"L" X "S"	Kj	JUNCTION LOSSES (FT)	FLOW TIME (MIN)	TIME AT DNSTREAM STATION (MIN)	HGL	
	LINE D *(for detention pond peak release at 22 minutes)*																						
EXISTING	17+66.32	16+88.39	77.93	MH (LINE E)	11.37	0.60	6.81	10.03	15.95	100	7.41	74.32	0.0124	36	10.51	1.72	0.96	0.50		0.12	16.07	780.56	
																			0.60			779.60	
EXISTING	16+88.39	16+76.75	11.64	60 WYE (LAT D3)	0.89	0.60	0.53	10.56	16.07	100	7.39	78.04	0.0136	36	11.04	1.89	0.16	0.75		0.02	16.09	779.00	
																			0.70			778.84	
EXISTING	16+76.75	13+69.45	307.30	60 WYE (LAT D2)	1.04	0.60	0.62	11.18	16.09	100	7.39	82.62	0.0153	36	11.69	2.12	4.69	0.75		0.44	16.53	778.14	
																			0.10			773.45	
EXISTING	13+69.45	10+25.08	344.37	60 WYE (LINE F)	7.08	0.60	4.25	15.43	16.53	100	7.34	113.26	0.0087	45	10.25	1.63	3.01	0.75		0.56	17.09	773.35	
																			0.51			770.34	
EXISTING	10+25.08	8+96.68	128.40	60 WYE (LINE G)				15.43	22.25	100	6.66	**132.81**	0.0085	48	10.57	1.73	1.09	0.75		0.20	22.45	769.83	
																			0.60			768.74	
EXISTING	8+96.68	8+86.30	10.38	60" WYE (LAT D1)	1.66	0.60	1.00	16.43	22.45	100	6.64	**139.15**	0.0093	48	11.07	1.90	0.10	0.75		0.02	22.47	768.14	
																			0.00			768.04	
EXISTING	8+86.30	8+75.95	10.35	PVI				16.43	22.47	100	6.64	**139.15**	0.0140**	48	15.09**	3.54	0.14	NA		0.01	22.48	766.79	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																			0.00			766.53	
EXISTING	8+75.95	8+39.97	35.98	60 WYE (LAT D1A)	1.34	0.40	0.54	16.97	22.48	100	6.64	**142.73**	0.0140**	48	15.15**	3.56	0.50	NA		0.04	22.52	766.53	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																			0.00			766.28	
EXISTING	8+39.97	8+01.30	38.67	60 WYE (LINES B & C)	4.33	0.60	2.60	19.57	22.52	100	6.63	**159.80**	0.0140**	48	15.38**	3.67	0.54	NA		0.04	22.56	766.28	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																					100 YEAR WSEL AT OUTFALL (NORMAL DEPTH IN PIPE>CHANNEL NORMAL DEPTH)	765.74	
	LINE G *(for detention pond peak release at 22 minutes)*																		0.10			773.79	
	6+37.09	2+95.21	341.88	MH (LAT G3 & G4)	6.14	0.60	3.68	3.68	15.05	100	7.51	27.64	0.0017	36	3.91	0.24	0.58	0.50		1.46	16.51	773.69	
																			0.17			773.11	
	3+46.22	2+95.21	51.01	MH				3.68	16.51	100	7.34	27.01	0.0016	36	3.82	0.23	0.08	0.25		0.22	16.73	772.94	
																			0.21			772.86	
	2+95.21	2+87.46	7.75	WYE (LAT G1)	1.85	0.60	1.11	4.79	16.73	100	7.32	35.06	0.0027	36	4.96	0.38	0.02	0.75		0.03	16.76	772.65	
																			0.30			772.63	
	2+87.46	2+56.19	31.27	WYE (LAT G2)	1.85	0.60	1.11	5.90	16.76	100	7.31	43.13	0.0042	36	6.10	0.58	0.13	0.75		0.09	16.85	772.33	
																						772.20	
	2+56.19	1+75.95	80.24	DETENTION POND	0.45	0.43	0.19	6.09	16.85	100	7.30	44.46			6.10					0.22	17.07	**772.20**	
																			0.63			772.20	
	1+75.95	1+36.02	39.93	HEADWALL (DETENTION POND)					22.00	100		**30.05**	0.0020	36	4.25	0.28	0.08	ORIFICE		0.16	22.16	771.57	
																			0.10			771.49	
	1+36.02	1+30.94	5.08	45 HORIZ. BEND					22.16	100		**30.05**	0.0020	36	4.25	0.28	0.01	0.35		0.02	22.18	771.39	
																			0.75			771.38	
EXISTING	1+30.94	1+00.00	30.94	MH					22.18	100		**30.05**	0.0094	27	7.56	0.89	0.29	0.50		0.07	22.25	770.63	
																					100 YEAR WSEL D/S (FROM LINE D)	770.34	

Orifice Equation ADAPTED FROM FHWA HEC 22

Pond depth is controlled by orifice equation

$$Qi = Co\,A\,(2\,g\,do)^{1/2}$$

where:

- **Co: orifice coefficient (0.67)**
- **A: Area of opening (7.07 ft)**
- **g: gravitational acceleration constant (32.2 ft/sec²)**
- **do: effective head above downstream tailwater elevation [ft]**

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 11.19.2013

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE	NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
				2	POND DESIGN REVISED.	ERH	01/24/13
				1	THIS SHEET ADDED.	ERH	01/02/13

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS — ERIK R. HANSEN — 106034 — LICENSED PROFESSIONAL ENGINEER — 01.25.2013 FOR CONSTRUCTION

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DETENTION CALCULATIONS
POND G
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 30A

Plotted by: ehansen Plot Date: 1/24/2013 5:17 PM
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DETENTION CALCULATIONS (FOR A PEAK RELEASE AT 23 MINUTES)

	UPSTREAM STATION	DNSTREAM STATION	DISTANCE "L" (FT)	AREA NO.	AREA "A" (ACRES)	RUNOFF COEF. "C"	INCREM. "CA"	ACCUM. "CA"	TIME AT UPSTREAM STATION (MIN)	STORM FREQUENCY (YEARS)	INTENSITY "I" (IN/HR)	RUNOFF "Q" (CFS)	SLOPE HYDRAULIC GRADIENT "S" (FT/FT)	STORM SEWER SIZE (IN)	VELOCITY "V" (FPS)	VELOCITY HEAD "V^2/2G" (FT)	"L" X "S"	Kj	JUNCTION LOSSES (FT)	FLOW TIME (MIN)	TIME AT DNSTREAM STATION (MIN)	HGL	
	LINE D	*(for detention pond peak release at 23 minutes)*																					
EXISTING	17+66.32	16+88.39	77.93	MH (LINE E)	11.37	0.60	6.81	10.03	15.95	100	7.41	74.32	0.0124	36	10.51	1.72	0.96	0.50		0.12	16.07	780.50	
																			0.60			779.54	
EXISTING	16+88.39	16+76.75	11.64	60 WYE (LAT D3)	0.89	0.60	0.53	10.56	16.07	100	7.39	78.04	0.0136	36	11.04	1.89	0.16	0.75		0.02	16.09	778.94	
																			0.70			778.78	
EXISTING	16+76.75	13+69.45	307.30	60 WYE (LAT D2)	1.04	0.60	0.62	11.18	16.09	100	7.39	82.62	0.0153	36	11.69	2.12	4.69	0.75		0.44	16.53	778.08	
																			0.10			773.39	
EXISTING	13+69.45	10+25.08	344.37	60 WYE (LINE F)	7.08	0.60	4.25	15.43	16.53	100	7.34	113.26	0.0087	45	10.25	1.63	3.01	0.75		0.56	17.09	773.29	
																			0.49			770.28	
EXISTING	10+25.08	8+96.68	128.40	60 WYE (LINE G)				15.43	23.24	100	6.55	**131.67**	0.0084	48	10.48	1.71	1.07	0.75		0.20	23.44	769.79	
																			0.59			768.72	
EXISTING	8+96.68	8+86.30	10.38	60" WYE (LAT D1)	1.66	0.60	1.00	16.43	23.44	100	6.52	**137.72**	0.0091	48	10.96	1.87	0.09	0.75		0.02	23.46	768.13	
																			0.00			768.04	
EXISTING	8+86.30	8+75.95	10.35	PVI				16.43	23.46	100	6.52	**137.72**	0.0140**	48	15.06**	3.52	0.14	NA		0.01	23.47	766.78	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																			0.00			766.50	
EXISTING	8+75.95	8+39.97	35.98	60 WYE (LAT D1A)	1.34	0.40	0.54	16.97	23.47	100	6.52	**141.24**	0.0140**	48	15.13**	3.55	0.50	NA		0.04	23.51	766.50	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																			0.00			766.25	
EXISTING	8+39.97	8+01.30	38.67	60 WYE (LINES B & C)	4.33	0.60	2.60	19.57	23.51	100	6.52	**158.20**	0.0140**	48	15.36**	3.66	0.54	NA		0.04	23.55	766.25	NORMAL DEPTH (SUPERCRITICAL FLOW). NO HEAD LOSS APPLIED.
																					100 YEAR WSEL AT OUTFALL (NORMAL DEPTH IN PIPE>CHANNEL NORMAL DEPTH)	765.71	
	LINE G	*(for detention pond peak release at 23 minutes)*																					
																			0.10			773.79	
	6+37.09	2+95.21	341.88	MH (LAT G3 & G4)	6.14	0.60	3.68	3.68	15.05	100	7.51	27.64	0.0017	36	3.91	0.24	0.58	0.50		1.46	16.51	773.69	
																			0.17			773.11	
	3+46.22	2+95.21	51.01	MH				3.68	16.51	100	7.34	27.01	0.0016	36	3.82	0.23	0.08	0.25		0.22	16.73	772.94	
																			0.21			772.86	
	2+95.21	2+87.46	7.75	WYE (LAT G1)	1.85	0.60	1.11	4.79	16.73	100	7.32	35.06	0.0027	36	4.96	0.38	0.02	0.75		0.03	16.76	772.65	
																			0.30			772.63	
	2+87.46	2+56.19	31.27	WYE (LAT G2)	1.85	0.60	1.11	5.90	16.76	100	7.31	43.13	0.0042	36	6.10	0.58	0.13	0.75		0.09	16.85	772.33	
																						772.20	
	2+56.19	1+75.95	80.24	DETENTION POND	0.45	0.43	0.19	6.09	16.85	100	7.30	44.46			6.10					0.22	17.07	**772.20**	
																			0.65			772.20	
	1+75.95	1+36.02	39.93	HEADWALL (DETENTION POND)					23.00	100		**30.60**	0.0021	36	4.33	0.29	0.08	ORIFICE		0.15	23.15	771.55	
																			0.10			771.47	
	1+36.02	1+30.94	5.08	45 HORIZ. BEND					23.15	100		**30.60**	0.0021	36	4.33	0.29	0.01	0.35		0.02	23.17	771.37	
																			0.78			771.36	
EXISTING	1+30.94	1+00.00	30.94	MH					23.17	100		**30.60**	0.0097	27	7.70	0.92	0.30	0.50		0.07	23.24	770.58	
																					100 YEAR WSEL D/S (FROM LINE D)	770.28	

Orifice Equation ADAPTED FROM FHWA HEC 22

Pond depth is controlled by orifice equation

$$Qi = Co\ A\ (2\ g\ do)^{1/2}$$

where:

- **Co: orifice coefficient (0.67)**
- **A: Area of opening (7.07 ft)**
- **g: gravitational acceleration constant (32.2 ft/sec²)**
- **do: effective head above downstream tailwater elevation [ft]**

RECORD DRAWINGS

THESE RECORD DOCUMENTS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. JBI PARTNERS, INC. HAS NOT VERIFIED THE ACCURACY AND / OR COMPLETENESS OF THIS INFORMATION. UNLESS OTHERWISE NOTED ON THESE DOCUMENTS, JBI PARTNERS, INC. SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS THAT MAY BE INCORPORATED AS A RESULT OF ERRONEOUS INFORMATION PROVIDED BY OTHERS.

JBI PARTNERS, INC.

BY: _____

DATE: 11.18.2013

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
2	POND G REVISED.	ERH	01/24/13
1	THIS SHEET ADDED.	ERH	01/02/13

DESIGNED BY: ERH

DRAWN BY: CSF

CHECKED BY: ERH

STATE OF TEXAS — ERIK R. HANSEN — 106034 — LICENSED PROFESSIONAL ENGINEER — 01.25.2013

The seal appearing on this document was authorized by Erik R. Hansen, P.E. 106034. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act. For Review

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Texas Registered Engineering Firm F-438

DETENTION CALCULATIONS

POND G

HERITAGE, PHASE 3

City of Celina, Collin County, Texas

PROJECT NO. H0E157

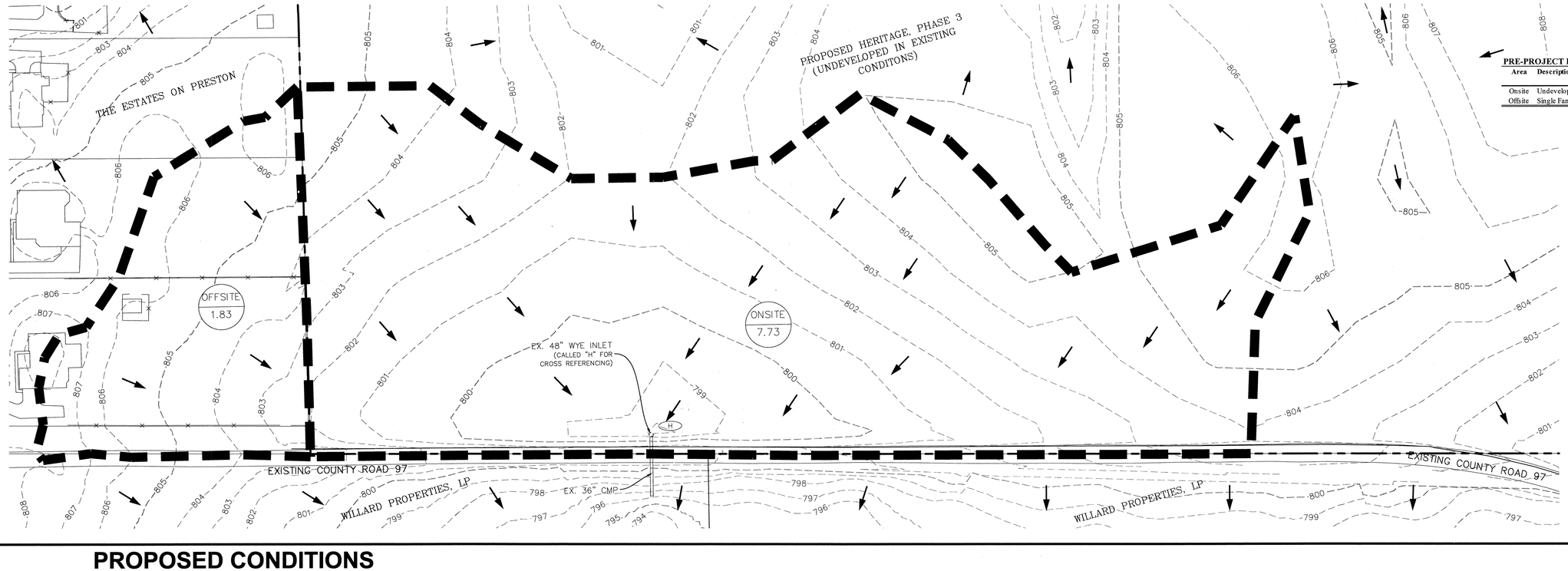
SHEET NO. 30B

P-201310-01

Plotted by: ehansen Plot Date: 1/24/2013 5:16 PM

Drawing: H:\Projects\H0E157 - Heritage Phase 3 Celina\dwg\H0E157-POND-G-CALCS.dwg Saved By: ehansen Save Time: 1/24/2013 3:57 PM

EXISTING CONDITIONS

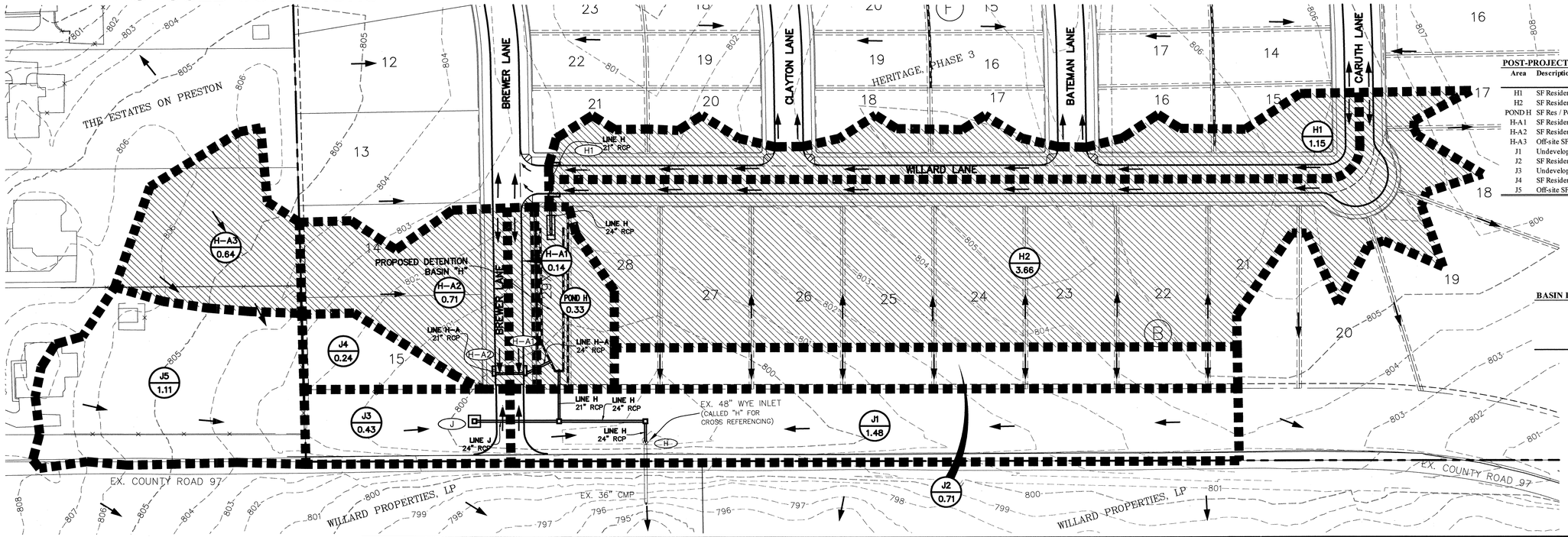


GRAPHIC SCALE 1"=60'
60 0 60 120

PRE-PROJECT PEAK DISCHARGE

Area	Description	Duration (Min.)	Intensity (In./Hr.)	C	A (Acres)	Q (cfs)
Onsite	Undeveloped	15	7.52	0.42	7.73	24.3
Offsite	Single Family Residential	15	7.52	0.60	1.83	8.3
	TOTAL RUNOFF TO EXISTING 36" CMP THAT CROSSES UNDER CR 97					32.6

PROPOSED CONDITIONS



GRAPHIC SCALE 1"=60'
60 0 60 120

POST-PROJECT PEAK DISCHARGE

Area	Description	Detained? (Y/N)	Duration (Min.)	Intensity (In./Hr.)	C	A (Acres)	Q (cfs)
H1	SF Residential	Y	15	7.52	0.60	1.15	5.2
H2	SF Residential	Y	15	7.52	0.60	3.66	16.5
POND H	SF Res / Pond	Y	15	7.52	0.43	0.33	1.1
H-A1	SF Residential	Y	15	7.52	0.60	0.14	0.6
H-A2	SF Residential	Y	15	7.52	0.60	0.71	3.2
H-A3	Off-site SF Res	Y	15	7.52	0.60	0.64	2.9
J1	Undeveloped	N	15	7.52	0.47	1.48	5.3
J2	SF Residential	N	15	7.52	0.60	0.71	3.2
J3	Undeveloped	N	15	7.52	0.47	0.43	1.5
J4	SF Residential	N	15	7.52	0.60	0.24	1.1
J5	Off-site SF Res	N	15	7.52	0.60	1.11	5.0
	TOTAL RUNOFF TO EXISTING 36" CMP THAT CROSSES UNDER CR 97						45.6

BASIN DETENTION TABULATIONS

BASIN ALLOWABLE RELEASE RATE (cfs) (based on existing conditions)	32.6
FLOW RATE OF UNDETAINABLE AREAS (cfs)	16.1
TIME OF CONCENTRATION AT POND OUTLET (minutes)	15.6
DETENTION AREA ALLOWABLE RELEASE RATE (cfs)	16.5

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 11-19-2013

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
4	PIPE SIZES REVISED.	ERH	01/21/13
3	BASIN AREAS REVISED.	CSF	12/18/12
2	BASIN AREAS REVISED.	ERH	11/15/12
1	THIS SHEET ADDED.	ERH	10/17/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS · ERIK R. HANSEN · 106034 · LICENSED PROFESSIONAL ENGINEER · 01-22-2013

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For Construction

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DETENTION DRAINAGE AREA MAP

BASIN H

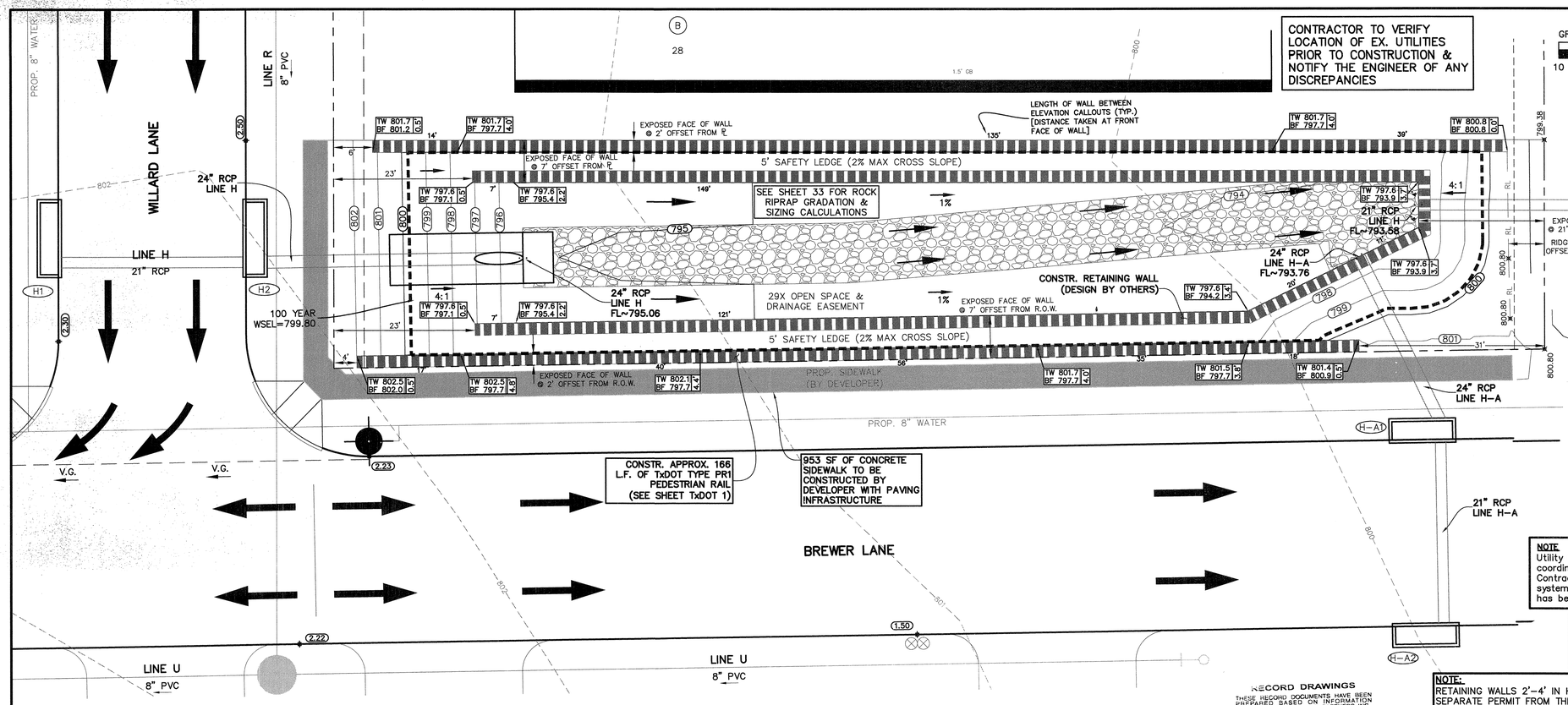
HERITAGE, PHASE 3

City of Celina, Collin County, Texas

PROJECT NO. H0E157
SHEET NO. 31

P-201310-01

Plotted by: ehansen Plot Date: 1/21/2013 9:54 AM
Drawing: H:\Projects\H0E157 – Heritage Phase 3 Celina\dwg\H0E157-DA.dwg Saved By: ehansen Save Time: 1/2/2013 11:43 AM



ANALYSIS OF STORAGE LOST TO BACKFLOW OF DOWNSTREAM SYSTEM

UPSTREAM STATION	DNSTREAM STATION	DISTANCE "L" (FT)	AREA NO.	AREA "A" (ACRES)	RUNOFF COEF. "C"	INCREM. "CA"	ACCUM. "CA"	TIME AT UPSTREAM STATION (MIN)	STORM FREQUENCY (YEARS)	INTENSITY "I" (IN/HR)	RUNOFF "Q" (CFS)	SLOPE HYDRAULIC GRADIENT "S" (FT/FT)	STORM SEWER SIZE (IN)	VELOCITY "V" (FPS)	VELOCITY HEAD "V^2/2G" (FT)	"L" X "S"	Kj	JUNCTION LOSSES (FT)	FLOW TIME (MIN)	TIME AT DNSTREAM STATION (MIN)	HGL
LINE H																					795.10
4+66.66	4+32.66	34.00	INLET H1																		795.10
																					795.10
4+32.66	3+89.89	42.77	INLET H2																		795.10
3+89.89	2+41.61	148.28	DETENTION POND																		**795.10**
																					795.10
2+41.61	1+85.84	55.77	HEADWALL (DETENTION POND)																		795.10
1+85.84	0+91.17	94.67	MH (LAT JA)	1.78	0.57	1.01	1.01	15.19	100	7.50	**7.58**	0.0011	24	2.41	0.09	0.17	0.25		0.65	15.84	795.00
																		0.10			794.83
0+91.17	0+68.09	23.08	MH				1.01	15.84	100	7.42	**7.49**	0.0011	24	2.38	0.09	0.03	0.25		0.16	16.00	794.73
																		0.21			794.70
0+68.09	0+00.00	68.09	EX. WYE INLET	2.19	0.52	1.13	2.14	16.00	100	7.40	**15.84**	0.0057**	36	4.00**	0.25	0.39	0.50		0.28	16.28	794.49
																				STARTING 100 YR HGL (FROM CROWN OF 36" CMP AT OUTFALL ON EAST SIDE OF CR 97)	794.10
LINE J																		0.11			795.24
1+27.76	1+00.00	27.76	INLET J	1.78	0.57	1.01	1.01	15.00	100	7.52	7.60	0.0011	24	2.42	0.09	0.03	1.25		0.19	15.19	795.13
																				100 YEAR WSEL D/S (FROM LAT J1)	795.10

ENGINEER'S NOTE: The effects of backwater (created by the downstream storm system) on the release of of flow and storage volume of the pond were analyzed by calculating the hydraulics of the downstream pipe with the assumption that none of the pond flows were being conveyed by this downstream system. The resulting HGL in the manhole at station 1+85.84, provides the base elevation or backwater elevation of the downstream system (ELEV~795.10). Storage within the pond below this backwater elevation is considered ineffective volume. Effective storage as determined by Rational Method is provided above this elevation.

POND WATER SURFACE ELEVATION CALCULATION

UPSTREAM STATION	DNSTREAM STATION	DISTANCE	AREA NO.	AREA "A" (ACRES)	RUNOFF COEF. "C"	INCREM. "CA"	ACCUM. "CA"	TIME AT UPSTREAM STATION (MIN)	STORM FREQUENCY (YEARS)	INTENSITY "I" (IN/HR)	RUNOFF "Q" (CFS)	SLOPE HYDRAULIC GRADIENT "S" (FT/FT)	STORM SEWER SIZE (IN)	VELOCITY "V" (FPS)	VELOCITY HEAD "V^2/2G" (FT)	"L" X "S"	Kj	JUNCTION LOSSES (FT)	FLOW TIME (MIN)	TIME AT DNSTREAM STATION (MIN)	HGL
LINE H																					801.33
4+66.66	4+32.66	34.00	INLET H1	2.41	0.60	1.45	1.45	15.00	100	7.52	10.90	0.0047	21	4.53	0.32	0.16	1.25	0.40	0.13	15.13	800.93
																		0.58			800.77
4+32.66	3+89.89	42.77	INLET H2	2.41	0.60	1.45	2.90	15.13	100	7.50	21.75	0.0092	24	6.92	0.74	0.39	0.50		0.10	15.23	800.19
																					799.80
3+89.89	2+41.61	148.28	DETENTION POND	1.83	0.57	1.04	3.94	15.23	100	7.49	29.51			3.00					0.82	16.05	**799.80**
																		1.63			799.75
2+41.61	1+85.84	55.77	HEADWALL (DETENTION POND)					16.05			**16.50**	0.0108	21	6.86	0.73	0.17	ORIFICE		0.14	16.19	798.12
																		0.72			797.95
1+85.84	0+91.17	94.67	MH (LAT JA)	1.78	0.57	1.01	1.01	16.19	100	7.38	**23.96**	0.0112	24	7.63	0.90	0.17	0.25		0.21	16.40	797.23
																		0.68			797.06
0+91.17	0+68.09	23.08	MH				1.01	16.40	100	7.35	**23.93**	0.0111	24	7.62	0.90	0.26	0.25		0.05	16.45	796.38
																		0.10			796.12
0+68.09	0+00.00	68.09	EX. WYE INLET	2.19	0.52	1.13	2.14	16.45	100	7.35	**32.23**	0.0082	36	4.56	0.32	0.56	0.50		0.25	16.70	796.02
																				STARTING 100 YR HGL (FROM CROWN OF 36" CMP AT OUTFALL ON EAST SIDE OF CR 97)	795.46

Velocity in pond determined using Manning's equation for rectangular section with 20' bottom width, 1% slope, and a Manning's "n" value of 0.025.

Orifice Equation ADAPTED FROM FHWA HEC 22

Pond depth is controlled by orifice equation

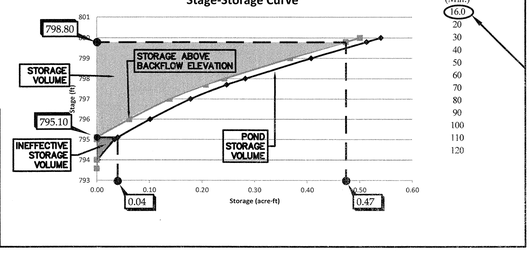
$Ql = Co\ A\ (2\ g\ do)^{1/2}$

where:

- Co: orifice coefficient (0.67)
- A: Area of opening (2.41 ft)
- g: gravitational acceleration constant (32.2 ft/sec²)
- do: effective head above downstream tailwater elevation [ft]

Detention Pond (Goal Storage is 0.47 acre-ft at 799.8) (Storage below 795.1 as ineffective under backflow evaluation)

Pond Depth	Elevation ft	Area sq. ft	Area acres	Incremental Volume cubic feet	Incremental Volume acre feet	Total Volume cubic feet	Total Volume acre feet	Effective Volume cubic feet	Effective Volume acre feet	Comments
0	793.58	0	0.00	0	0.00	0	0.00	0	0.00	
0.42	794	354	0.01	74	0.00	74	0.00	0	0.00	
1.42	795	2447	0.06	1401	0.03	1475	0.03	0	0.00	
1.52	795.1	2707	0.06	258	0.01	1733	0.04	0	0.00	
2.42	796	3259	0.07	2685	0.06	4418	0.10	2685	0.06	
3.42	797	3444	0.08	3352	0.08	7770	0.18	6037	0.14	
4.12	797.7	5092	0.12	2988	0.07	10758	0.25	9025	0.21	
4.42	798	5246	0.12	1551	0.04	12309	0.28	10576	0.24	
5.42	799	5655	0.13	5451	0.13	17760	0.41	16027	0.37	
6.22	799.8	5855	0.13	4604	0.11	22364	0.51	20631	0.47	Required 100-YR Storage
6.42	800	5914	0.14	1177	0.03	23541	0.54	21808	0.50	



DETENTION CALCULATIONS (100-YEAR)

PRE-PROJECT PEAK DISCHARGE

Area	Description	Duration (Min.)	Intensity (In./Hr.)	C	A (Acres)	Q (cfs)
Onsite	Undeveloped	15	7.52	0.42	7.73	24.3
Offsite	Single Family Residential	15	7.52	0.60	1.83	8.3
			TOTAL RUNOFF TO EXISTING 36" CMP THAT CROSSES UNDER CR 97			32.6

POST-PROJECT PEAK DISCHARGE

Area	Description	Detained? (Y/N)	Duration (Min.)	Intensity (In./Hr.)	C	A (Acres)	Q (cfs)
H1	SF Residential	Y	15	7.52	0.60	1.15	5.2
H2	SF Residential	Y	15	7.52	0.60	3.66	16.5
POND H	SF Res / Pond	Y	15	7.52	0.43	0.33	1.1
H-A1	SF Residential	Y	15	7.52	0.60	0.14	0.6
H-A2	SF Residential	Y	15	7.52	0.60	0.71	3.2
H-A3	Off-site SF Res	Y	15	7.52	0.60	0.64	2.9
J1	Undeveloped	N	15	7.52	0.47	1.48	5.3
J2	SF Residential	N	15	7.52	0.60	0.71	3.2
J3	Undeveloped	N	15	7.52	0.47	0.43	1.5
J4	SF Residential	N	15	7.52	0.60	0.24	1.1
J5	Off-site SF Res	N	15	7.52	0.60	1.11	5.0
			TOTAL RUNOFF TO EXISTING 36" CMP THAT CROSSES UNDER CR 97				45.6

BASIN DETENTION TABULATIONS

BASIN ALLOWABLE RELEASE RATE (cfs) (based on existing conditions)	32.6
FLOW RATE OF UNDETAINABLE AREAS (cfs)	16.1
TIME OF CONCENTRATION AT POND OUTLET (minutes)	16.0
DETENTION AREA ALLOWABLE RELEASE RATE (cfs)	16.5

Inflow Calculations

Duration (Min.)	Intensity (In./Hr.)	C	A (Acres)	Q (cfs)
16.0	7.40	0.59	6.63	29.0
20	6.93	0.59	6.63	27.2
30	5.75	0.59	6.63	22.6
40	5.14	0.59	6.63	20.1
50	4.52	0.59	6.63	17.7
60	3.91	0.59	6.63	15.3
70	3.70	0.59	6.63	14.5
80	3.48	0.59	6.63	13.6
90	3.27	0.59	6.63	12.8
100	3.05	0.59	6.63	12.0
110	2.84	0.59	6.63	11.1
120	2.62	0.59	6.63	10.3

Storage Volume

Duration (Min.)	Inflow (cf)	Outflow (cf)	Storage (cf)	Storage (acre-ft)
16.0	27869	15843	12025	0.28
20	32615	17824	14791	0.34
30	40592	22775	17817	0.41
40	48349	27726	**20623**	0.47
50	53220	32677	20543	0.47
60	55205	37628	17577	0.40
70	60864	42579	18285	0.42
80	65511	47530	17981	0.41
90	69147	52481	16666	0.38
100	71771	57432	14339	0.33
110	73383	62383	11000	0.25
120	73983	67334	6649	0.15

REQUIRED STORAGE VOLUME
20,623 cu. ft.
0.47 acre-ft
TIME TO PEAK (Tpeak)
40 minutes

BENCHMARKS

1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□ " Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	POND DESIGN & CALCULATIONS REVISED.	ERH	01/18/13
2	POND DESIGN REVISED.	CSF	01/02/13
1	THIS SHEET ADDED	CSF	10/22/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 01.25.2013

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Texas Registered Engineering Firm F-438

DETENTION POND PLAN
POND "H"
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. H0E157
SHEET NO. 32

P-201310-01

Plotted by: ehansen Plot Date: 1/24/2013 3:10 PM
Drawing: H:\Projects\H0E157 – Heritage Phase 3 Celina\dwg\H0E157–GR.dwg Saved By: ehansen Save Time: 1/24/2013 2:50 PM

ROCK RIPRAP SECTION

N.T.S.

TYPE C HEADWALL

RIPRAP SIZING PER HEC 11 (BROWN & CLYDE, 1989)

EQUATION:

$$D50=\frac{0.692}{S-1}\times\frac{V^2}{2G}$$

WHERE,
- D_{50}: MEDIAN ROCK SIZE (FT)
- V: VELOCITY (FT/S)
- S: RIPRAP SPECIFIC GRAVITY

FOR:
V=6.92 FT/S

S=2.65

D_{50}=0.3119' OR 4"

AS D_{50} IS LESS THAN 8", A DESIGN D_{50} OF 8" IS TO BE USED FOR CONSTRUCTION.

ROCK RIPRAP DETAIL FOR OUTFALL OF LINE H & LINE HA

N.T.S.

ROCK RIPRAP GRADATION D50=8"	
SEIVE SIZE SQUARE MESH	PERCENT PASSING
15"	100
12"	70–100
8"	45–75
6"	30–55
3"	10–30
1½"	0–10

BEDDING GRADATION D50=8"	
SEIVE SIZE SQUARE MESH	PERCENT PASSING
3"	100
1½"	55–100
¾"	25–60
⅜"	5–30
NO. 4	0–10

LEGEND

- Exist. Water Line & Valve
- Exist. Fire Hydrant
- Exist. Sewer Line
- Exist Manhole
- Exist. Storm Sewer
- Prop. Water Line & Valve
- Prop. Fire Hydrant
- Prop. Sewer Line
- Prop. Manhole
- Prop. Storm Sewer & Inlet
- (800) Prop. Major Contour
- (801) Prop. Minor Contour

NOTES

ALL STORM DRAIN JOINTS SHALL BE FULLY GROUTED THROUGH ALL CURVES UNLESS RADIAL PIPE IS PROVIDED.

NOTES

1. All construction shall conform with City of Celina standard details and specifications.
2. Contractor shall verify location of existing utilities prior to construction & notify engineer of any discrepancies.
3. Utility contractor shall coordinate with paving contractor to place all systems after dirt work has been completed.

CAUTION!!!
Existing underground utilities. Contractor to call for locates (1-800-DIG-TESS) and field verify the location of all existing utilities prior to excavation.

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE
1	WATER LINE LOWERING AT STORM CROSSING	ERH	07/01/13

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
4	POND DESIGN WSEL REVISED	ERH	01/18/13
3	REVISED STORM ALIGNMENTS & INLET LOCATIONS.	CSF	12/21/12
2	CLARIFIED CONNECTION TO WYE INLET IN PLAN VIEW.	CSF	12/04/12
1	RUNOFF LABELS, DETENTION POND, PROPOSED CONTOURS ADDED	CSF	10/22/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS — ERIK R. HANSEN — 106034 — LICENSED PROFESSIONAL ENGINEER — 11.19.2013

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FOR RECORD DRAWINGS

JBI PARTNERS
16301 Quorum Drive
Suite 200 B
Addison, Texas 75001
Main 972.248.7676
Fax 972.248.1414
www.jbipartners.com

TBPE No. F-438 TBPLS No. 10076000

STORM SEWER PLAN & PROFILE

LINE "H", LINE "H-A", & LINE "J"

HERITAGE, PHASE 3

City of Celina, Collin County, Texas

PROJECT NO. HOE157

SHEET NO. 33

Drawing: H:\Projects\HOE157 – Heritage Phase 3 Celina\dwg\HOE157-STM [LINES F, G, & H].dwg Saved By: ehansen Save Time: 11/19/2013 12:40 PM Plotted by: ehansen Plot Date: 11/19/2013 12:49 PM

P-201310-01

CAUTION!!!!
EXISTING UNDERGROUND UTILITIES.
CONTRACTOR TO FIELD VERIFY
LOCATION PRIOR TO CONSTRUCTION.

GRAPHIC SCALE 1"=60'
60 0 60 120

EXIST. 12" WATER

EXISTING FIRE HYDRANT

INSTALL 8" VALVE

CONNECT TO EXISTING 12" WATER LINE WITH TAPPING SLEEVE & VALVE. FIELD VERIFY LOCATION.

29X OPEN SPACE & DRAINAGE EASEMENT

PROP 8" WATER

8" SS

WILLARD LANE

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "B"

INSTALL 45° BEND

INSTALL 8"x8" TEE

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "F"

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "J"

INSTALL 8" VALVE

INSTALL 8"x8" TEE

PROPOSED WATER SERVICE

CARUTH LANE

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "C"

BATEMAN LANE

CLAYTON LANE

BREWER LANE

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "A"

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "E"

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "I"

REMOVE PLUG & CONNECT TO EXIST. 8" WATER

EXIST. VALVE

16+65.56 CARUTH LANE EXISTING FIRE HYDRANT

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "D"

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "H"

13+29.42 CARUTH LANE EXISTING FIRE HYDRANT

BLOCK "D"

PHASE 2
PHASE 3

CITY OF CELINA || 1.207 ACRES || DOC.# 93-0009849

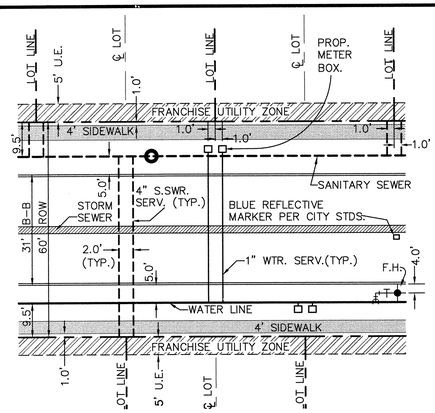
NOTE: EMBEDMENT FOR WATER LINES SHALL BE CLASS "B+".

NOTE: ALL FIRE HYDRANTS SHALL BE CLOW AND ALL FITTING SHALL BE MECHANICAL JOINTS AND RESTRAINED PER CITY STANDARDS.

CONTRACTOR TO VERIFY LOCATION OF EX. UTILITIES PRIOR TO CONSTRUCTION & NOTIFY THE ENGINEER OF ANY DISCREPANCIES

MATCHLINE SEE THIS SHEET

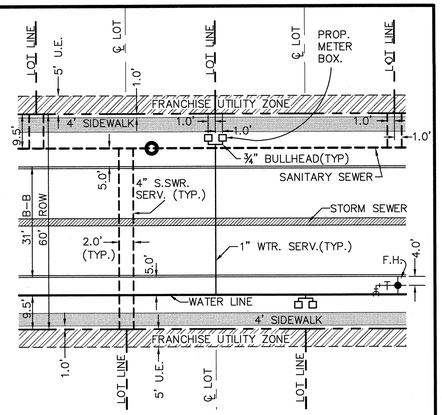
FIRE HYDRANT PAVING STATIONS		
FH#	STREET NAME	PAVING STATION
A	CARUTH LANE	18+24.35
B	WILLARD LANE	9+99.06
C	BATEMAN LANE	21+52.10
D	CLAYTON LANE	5+44.48
E	CLAYTON LANE	9+06.32
F	WILLARD LANE	3+73.96
G	BREWER LANE	2+52.38
H	BREWER LANE	6+80.91
I	BREWER LANE	10+45.05
J	BREWER LANE	14+08.77



UTILITY PLACEMENT DETAIL

(for lots 10,000 S.F. & over)

SCALE: 1"=20'



UTILITY PLACEMENT DETAIL

(for lots less than 10,000 S.F.)

SCALE: 1"=20'

LEGEND

- EXIST. FIRE HYDRANT
- EXIST. SANITARY SEWER MANHOLE
- EXIST. SANITARY SEWER MAIN
- EXIST. STORM SEWER
- EXIST. WATER VALVE
- PROP. SANITARY SEWER MAIN
- PROP. SANITARY SEWER SERVICE LATERAL
- 8" SS — SSWR PIPE SIZE & FLOW DIRECTION
- PROP. SANITARY SEWER MANHOLE
- PROP. SANITARY SEWER CLEANOUT
- PROP. STORM SEWER
- PROP. FIRE HYDRANT & LEAD
- PROP. WATER SERVICE W/ METER
- PROP. WATER LINE & VALVE

SERVICE SCHEDULE LEGEND	
A	EXIST. 1" SERVICE W/ ¾" BULLHEAD CONNECTION PER CITY STANDARDS (PHASE 2). [5 SERVICES]
B	TAP EXISTING 8" WATER LINE & INSTALL 1" SERVICE. [3 SERVICES]
C	TAP EXISTING 8" WATER LINE INSTALLED WITH PHASE 2 & INSTALL 1" SERVICE W/ ¾" BULLHEAD CONNECTIONS PER CITY STANDARDS. [2 SERVICES]
D	INSTALL 1" SERVICE. [33 SERVICES]
E	INSTALL 1" SERVICE W/ ¾" BULLHEAD CONNECTIONS PER CITY STANDARDS. [32 SERVICES]

MATCHLINE SEE THIS SHEET

GRAPHIC SCALE 1"=60'
60 0 60 120

REMOVE PLUG & CONNECT TO EXIST. 8" WATER

INSTALL 1-8"X6" TEE 1-6" VALVE 1-F.H. "G"

1+31.80 CLAYTON LANE EXISTING FIRE HYDRANT

REMOVE PLUG & CONNECT TO EXIST. 8" WATER

EXIST. 8" WATER

BOUNDS LANE

LOT 1
BLOCK M

2X OPEN SPACE & DRAINAGE EASEMENT

8+52.77 TIDWELL LANE EXISTING FIRE HYDRANT

8+50 MISSOURI STREET EXISTING FIRE HYDRANT

PHASE 3
PHASE 1

RECORD DRAWINGS
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JBI PARTNERS, INC.
BY:
DATE: 11.18.2013

BENCHMARKS
1. "□" Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□" Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE
4	STORM AND POND LINEWORK UPDATED. SCHEDULE UPDATED	ERH	01/23/13
3	REVISED SERVICE LOCATIONS TO ACCOMODATE REVISED LOT LINES.	CSF	12/13/12
2	EXISTING WATER LINE ALONG C.R. 97 REVISED TO BE NOTED AS A 12" WATER LINE. FHS ADDED.	ERH	11/13/12
1	CONNECTION TO WATER LINE ALONG CR 97 INCLUDED THIS SET.	ERH	10/18/12

DESIGNED BY: ERH
DRAWN BY: ERH
CHECKED BY: ERH

STATE OF TEXAS ★ ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 01-23-2013

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Main 972.248.7676
Fax 972.248.1414
www.jbipartners.com

WATER PLAN
OVERALL LAYOUT
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 34

P-201310-01

Plotted by: ehansen Plot Date: 1/25/2013 9:29 AM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-WTR.dwg Saved By: ehansen Save Time: 1/23/2013 11:16 AM

CAUTION!!!!
EXISTING UNDERGROUND UTILITIES.
CONTRACTOR TO FIELD VERIFY
LOCATION PRIOR TO CONSTRUCTION.

EXIST. 12" WTR

EXIST. 12" WTR

10+64.16 LINE R
CONST. 4' DIA. MH.
RIM: 807.08

5+88.35 LINE R
CONST. 4' DIA. MH.
RIM: 804.89

15+38.13 LINE U
END 8" SSWR &
INSTALL CLEANOUT

13+88.74 LINE U=
1+00.00 LINE R
CONST. 4' DIA. MH.
RIM: 802.31

29X OPEN SPACE &
DRAINAGE EASEMENT

N0°57'14"E

LINE R

WILLARD LANE

PROP. 8" WTR

20+77.40 LINE P
END 8" SSWR &
INSTALL CLEANOUT

12+30.16 LINE S
END 8" SSWR &
INSTALL CLEANOUT

11+49.68 LINE T
END 8" SSWR &
INSTALL CLEANOUT

CARUTH LANE

BATEMAN LANE

CLAYTON LANE

BREWER LANE

(PT) 19+86.91 LINE P
CONST. 4' DIA. MH.
RIM: 807.11

(PT) 11+66.36 LINE S
CONST. 4' DIA. MH.
RIM: 804.36

(PT) 11+00.63 LINE T
CONST. 4' DIA. MH.
RIM: 802.64

(PI) 12+44.08 LINE U
CONST. 4' DIA. MH.
RIM: 800.74

R=1314.50'
Δ=9°29'52"
L=217.90'
T=109.20'
CB=N85°19'26"E
CH=217.65'

R=1004.50'
Δ=8°48'03"
L=154.29'
T=77.30'
CB=N85°40'21"E
CH=154.14'

R=694.50'
Δ=8°48'03"
L=106.68'
T=53.44'
CB=N85°40'21"E
CH=106.57'

(PRC) 9+93.95 LINE T
CONST. 4' DIA. MH.
RIM: 798.17

PRC 10+12.06

R=1580.50'
Δ=8°48'03"
L=242.77'
T=121.62'
CB=N85°40'21"E
CH=242.53'

R=2428.97'
Δ=5°20'35"
L=226.51'
T=113.34'
CB=N84°25'53"E
CH=226.43'

(PT) 10+79.69 LINE U
CONST. 4' DIA. MH.
RIM: 796.30

(PRC) 17+69.00 LINE P
CONST. 4' DIA. MH.
RIM: 801.68

R=1270.50'
Δ=9°29'52"
L=210.61'
T=105.55'
CB=N85°19'26"E
CH=210.37'

17+06.93 LINE P
REMOVE 8" PLUG
& CONNECT TO
EXISTING 8" SSWR

8+87.06 LINE S
REMOVE 8" PLUG
& CONNECT TO
EXIST. 8" SSWR,
CONSTR. 4' DIA.
MH & BEGIN 8"
SSWR

(PC) 7+67.44 LINE T
CONST. 4' DIA. MH.
RIM: 792.48

R=2200.50'
Δ=6°03'19"
L=232.56'
T=116.39'
CB=N87°02'42"E
CH=232.45'

(PC) 8+47.13 LINE U
CONST. 4' DIA. MH.
RIM: 787.85

PHASE 3
PHASE 2

PC 7+69.29

EX. PC 15+58.40

PHASE 2
PHASE 3

(PT) 4+07.40 LINE T
CONST. 4' DIA. MH.
RIM: 780.91

(PT) 6+10.58 LINE U
CONST. 4' DIA. MH.
RIM: 778.20

R=4728.48'
Δ=1°38'47"
L=135.88'
T=67.94'
CB=N84°41'08"E
CH=135.87'

R=1184.50'
Δ=13°12'28"
L=273.05'
T=137.13'
CB=N83°28'08"E
CH=272.44'

CITY OF CELINA || 1.207 ACRES || DOC.# 93-0093849

BLOCK "D"

MATCHLINE SEE THIS SHEET

GRAPHIC SCALE 1"=60'

60 0 60 120

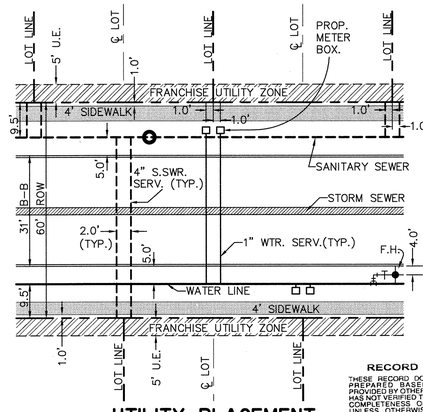
NOTE: EMBEDMENT FOR SANITARY SEWER LINES SHALL BE CLASS "H"

NOTE
* Denotes Sanitary Sewer Service to be SDR-26.

P SEWER SERVICE INSTALLED DURING DEVELOPMENT PHASE 2 OF HERITAGE.

G TAP EXISTING 8" SEWER & INSTALL 4" SEWER SERVICE

NOTE
CONTRACTOR TO VERIFY LOCATION OF EX. UTILITIES PRIOR TO CONSTRUCTION & NOTIFY THE ENGINEER OF ANY DISCREPANCIES



UTILITY PLACEMENT
SCALE: 1"=20'

LEGEND

- EXIST. FIRE HYDRANT
- EXIST. SANITARY SEWER MANHOLE
- EXIST. SANITARY SEWER MAIN
- EXIST. STORM SEWER
- EXIST. WATER VALVE
- PROP. SANITARY SEWER MAIN
- PROP. SANITARY SEWER SERVICE LATERAL
- 12" SSWR PIPE SIZE & FLOW DIRECTION
- PROP. SANITARY SEWER MANHOLE
- PROP. SANITARY SEWER CLEANOUT
- PROP. STORM SEWER
- PROP. FIRE HYDRANT & LEAD
- PROP. WATER SERVICE W/ METER
- PROP. WATER LINE & VALVE

RECORD DRAWINGS
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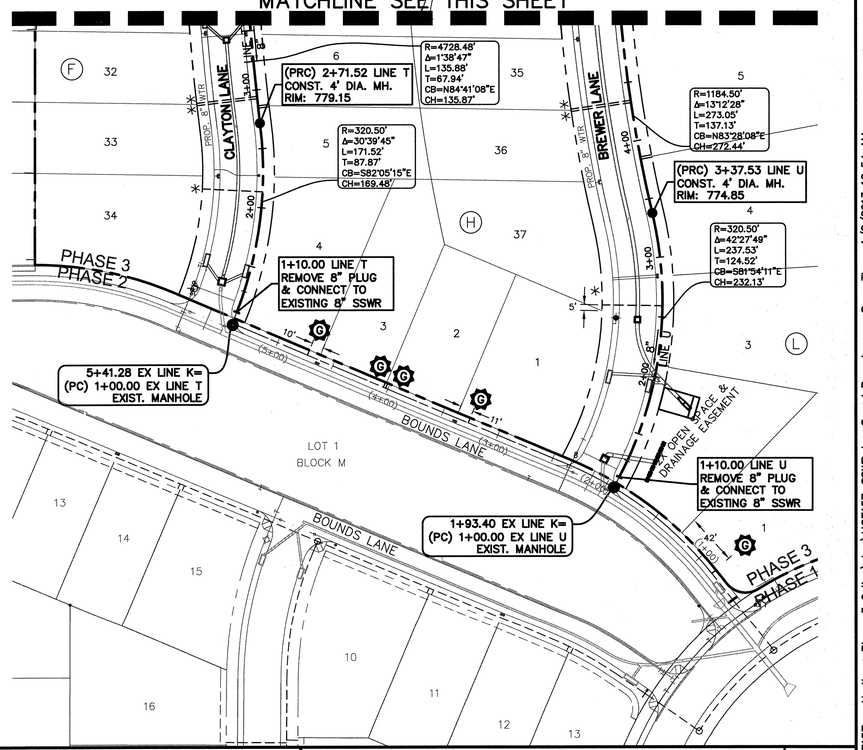
JBI PARTNERS, INC.
BY:
DATE: 12-19-2012

GRAPHIC SCALE 1"=60'

60 0 60 120

MATCHLINE SEE THIS SHEET



BENCHMARKS
1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'

2. "□ " Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
4	SERVICE LOCATIONS REVISED.	ERH	01/23/13
3	SERVICE LOCATIONS REVISED.	CSF	12/13/12
2	SERVICE LOCATIONS REVISED.	ERH	11/15/12
1	ADDED MANHOLES AT PT AND PC STATIONS ALONG ALIGNMENT	CSF	09/24/12

DESIGNED BY: ERH
DRAWN BY: ERH
CHECKED BY: ERH

STATE OF TEXAS
ERIK R. HANSEN
106034
LICENSED
PROFESSIONAL ENGINEER
01-25-2013

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FOR CONSTRUCTION

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Fax 972.248.1414
www.jbipartners.com
Texas Registered Engineering Firm F-438

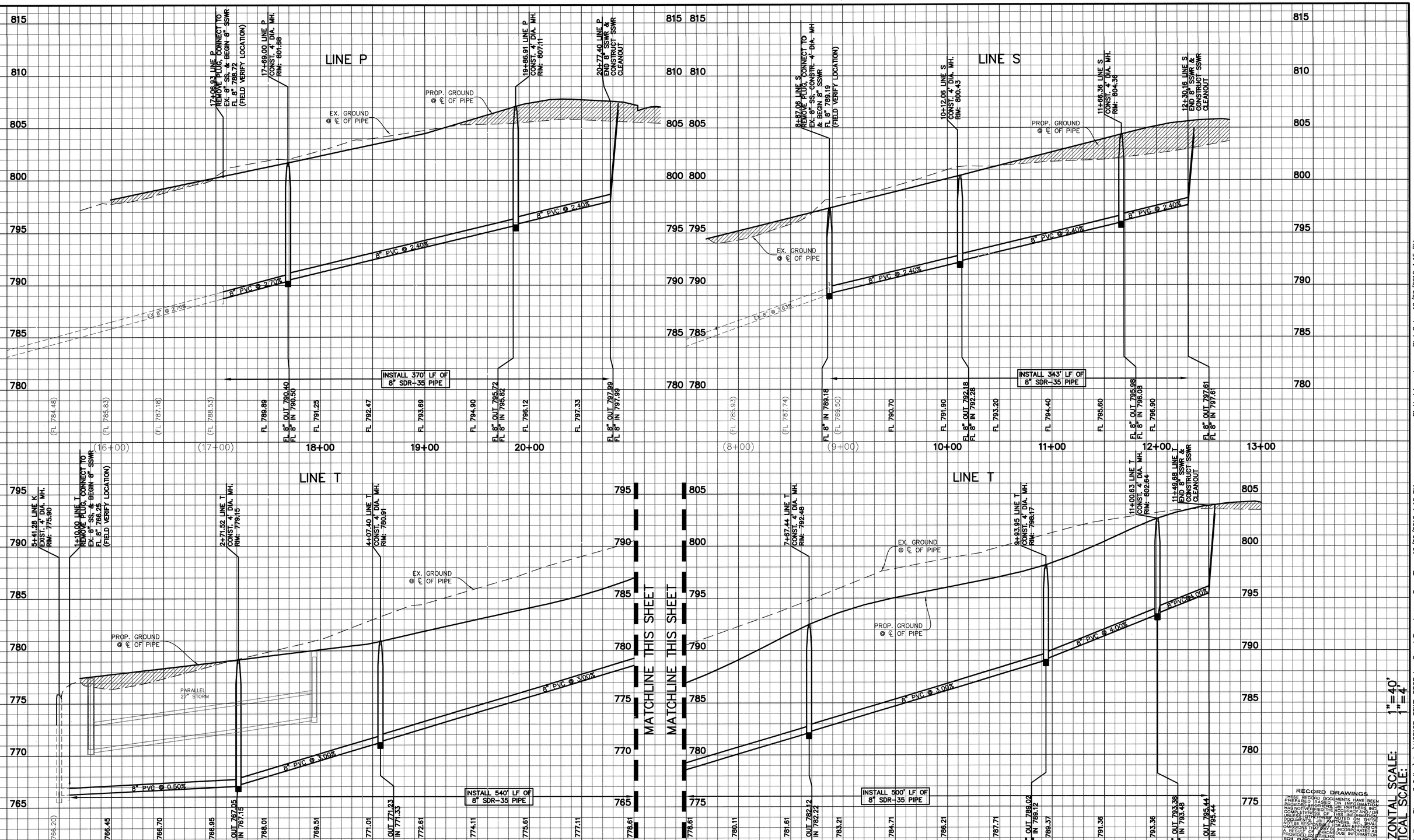
SANITARY SEWER
OVERALL LAYOUT
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157

SHEET NO. 35

P-201310-01

Plotted by: ehansen Plot Date: 1/23/2013 11:08 AM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-SSWR.dwg Saved By: ehansen Save Time: 1/2/2013 10:54 AM



BENCHMARKS

1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'

2. "□ " Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE
2	PARALLEL STORM LINES ADDED	CSF	12/19/12
1	MANHOLES ADDED AT PC AND PT LOCATIONS	CSF	09/24/12

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE

DESIGNED BY: ERH
DRAWN BY: ERH
CHECKED BY: ERH

STATE OF TEXAS
ERIK R. HANSEN
106034
LICENSED
PROFESSIONAL ENGINEER
12/20/12
FOR CITY APPROVAL & CONSTRUCTION

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JBI PARTNERS, INC.
BY:
DATE: 4-15-13

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Main 972.248.7676
Fax 972.248.1414
www.jbipartners.com

SANITARY SEWER PROFILES
LINE P, LINE S & LINE T
HERITAGE, PHASE 3
City of Celina, Collin County, Texas

PROJECT NO. HOE157
SHEET NO. 36

P-201310-01

Plotted by: ehansen Plot Date: 12/20/2012 4:15 PM
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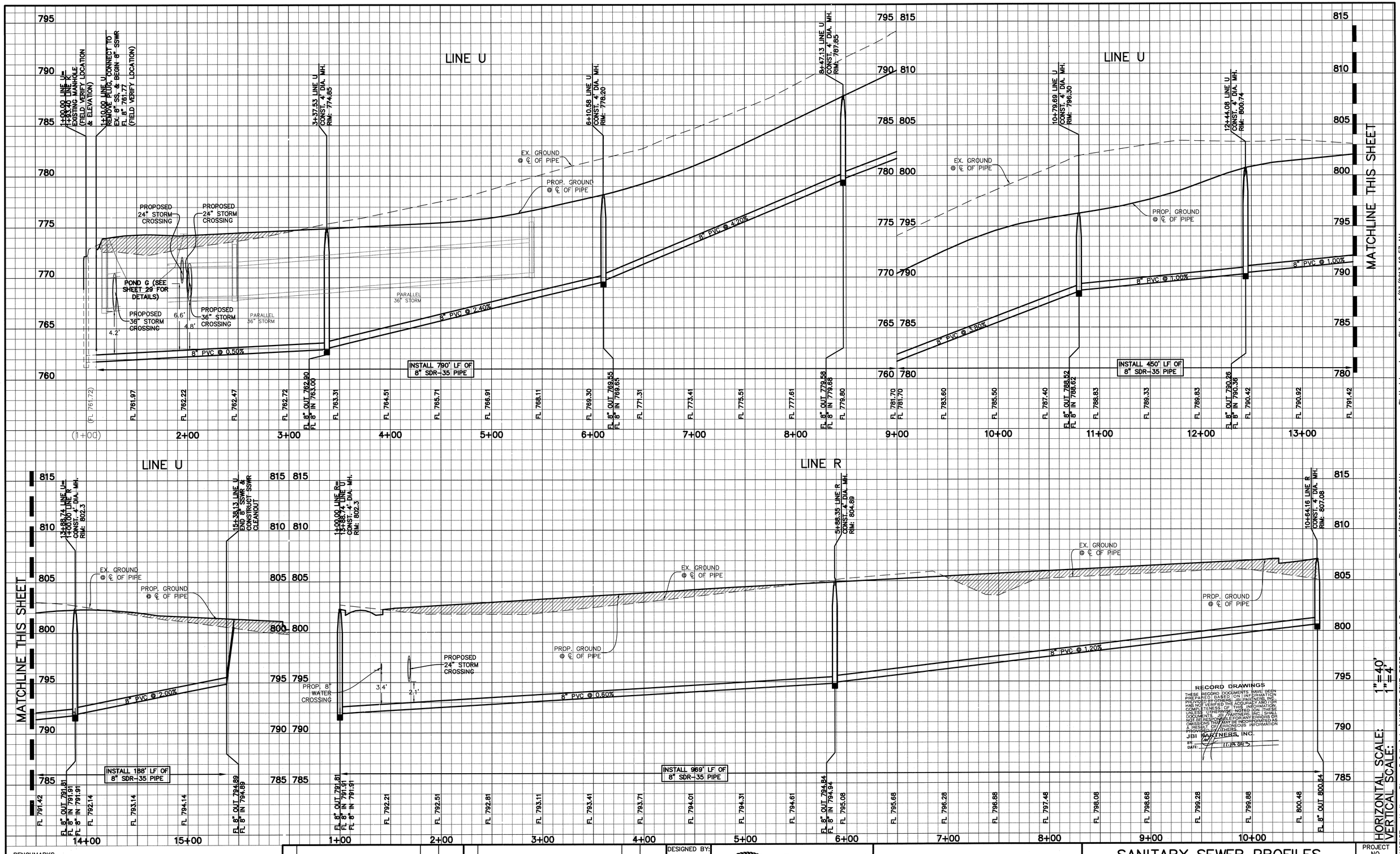

BENCHMARKS

1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'

2. "□ " Cut on top centerline headwall on Northeast corner Missouri Eest and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	CROSSING INFORMATION REVISED	ERH	01/23/12
2	PARALLEL STORM LINES ADDED	CSF	12/19/12
1	MANHOLES ADDED AT PC AND PT LOCATIONS	CSF	09/24/12

DESIGNED BY: ERH
DRAWN BY: ERH
CHECKED BY: ERH

STATE OF TEXAS ★ ERIK R. HANSEN 106034 LICENSED PROFESSIONAL ENGINEER 01-23-2013

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FOR CONSTRUCTION

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www.jbipartners.com
Texas Registered Engineering Firm F-438

SANITARY SEWER PROFILES

LINE U & LINE R

HERITAGE, PHASE 3

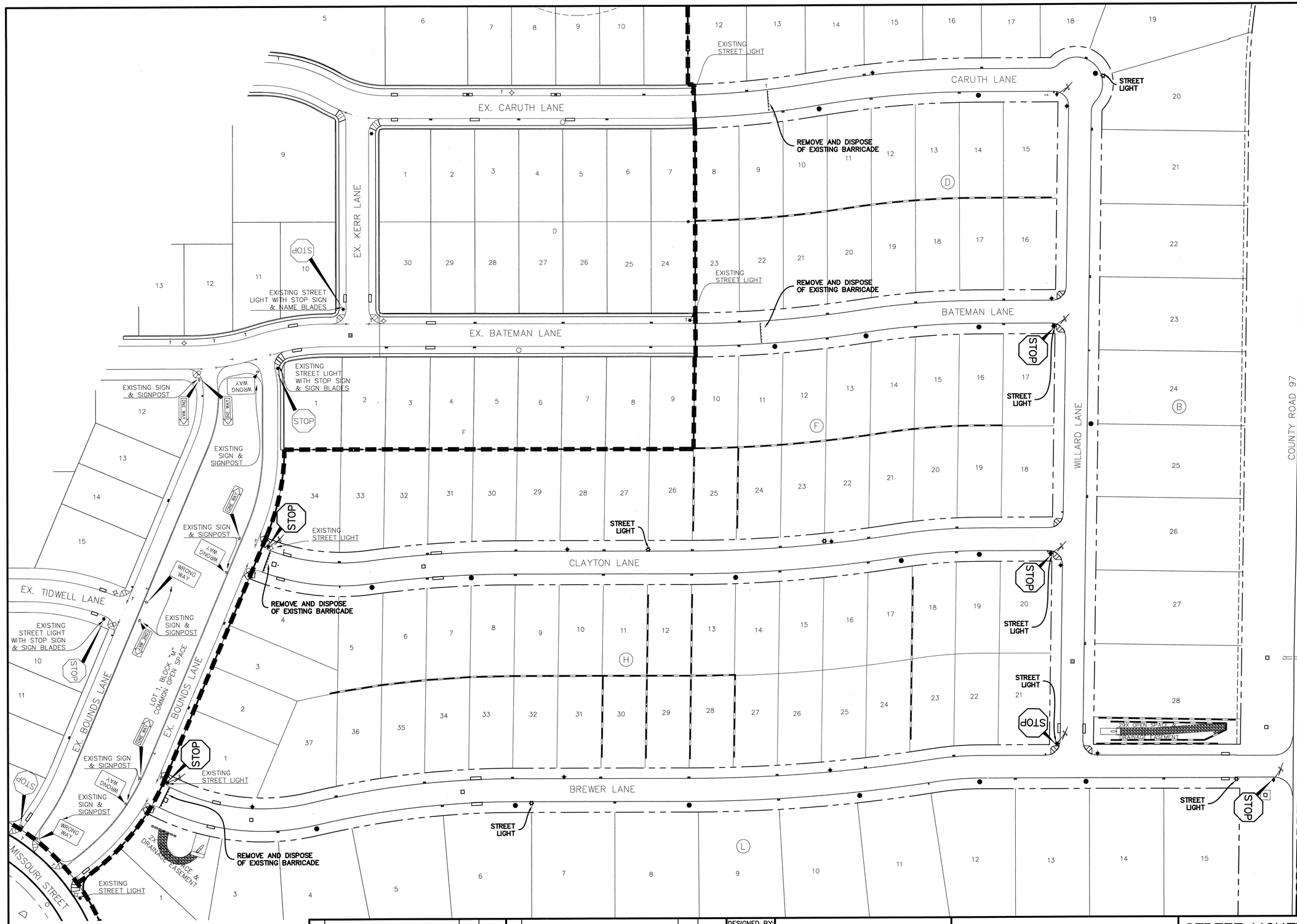
City of Celina, Collin County, Texas

PROJECT NO. HOE157

SHEET NO. 37

Plotted by: ehansen Plot Date: 1/23/2013 10:57 AM
Drawing: H:\Projects\HOE157 - Heritage Phase 3 Celina\dwg\HOE157-SSWR-PROF.dwg Saved By: ehansen Save Time: 1/23/2013 9:29 AM

P-201310-01



GRAPHIC SCALE 1"=60'
60 0 60 120

N

NOTE: ALL STREET SIGNS AND STOP SIGNS MUST MEET THE LATEST TMUTCD REQUIREMENTS FOR SIZE AND REFLECTIVITY. STREET SIGN BLADE DESIGN SHOULD INCLUDE CITY LOGO.

RECORD DRAWINGS

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JBI PARTNERS, INC.
BY:
DATE: 4.19.2013

LEGEND

- Approximate location of Decorative Sign Post Location including Street Name Blade (Sign post design to be per City Standards)
- Approximate Street Lamp Post Location per City Standards.
- STOP — Install Stop Sign Per City standard (36" x 36" unless otherwise noted)
- Proposed Fire Hydrant
- Proposed Manhole
- Proposed Inlet
- Proposed Water Meter
- Proposed Sewer Cleanout
- Proposed Barrier Free Ramp
- Proposed Barricade
- Existing Sign Post Location
- Existing Street Lamp Post Location
- Existing Fire Hydrant
- Existing Manhole
- Existing Barricade
- Existing Barrier Free Ramp
- STOP — Existing Stop Sign
- Proposed Signblade

BENCHMARKS

1. "□ " Cut on top centerline headwall on Northeast corner Missouri West and Redbud Road. Elev. 764.92'
2. "□ " Cut on top centerline headwall on Northeast corner Missouri East and Redbud Road. Elev. 764.92'

NO.	REVISIONS DURING CONSTRUCTION	BY	DATE

NO.	REVISIONS DURING PLAN REVIEW	BY	DATE
3	STREET LIGHT LOCATIONS NOTED	ERH	01/23/13
2	STREET LIGHTS UPDATED BASED ON ELECTRIC DESIGN	ERH	12/21/12
1	SIGNAGE INFORMATION UPDATED	ERH	10/11/12

DESIGNED BY: ERH
DRAWN BY: CSF
CHECKED BY: ERH

STATE OF TEXAS — ERIK R. HANSEN — 106034 — LICENSED PROFESSIONAL ENGINEER — 01-23-2013

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Fax 972.248.1414
www.jbipartners.com
Texas Registered Engineering Firm F-438

STREET LIGHTING & SIGNAGE PLAN

PROJECT NO. H0E157

HERITAGE, PHASE 3

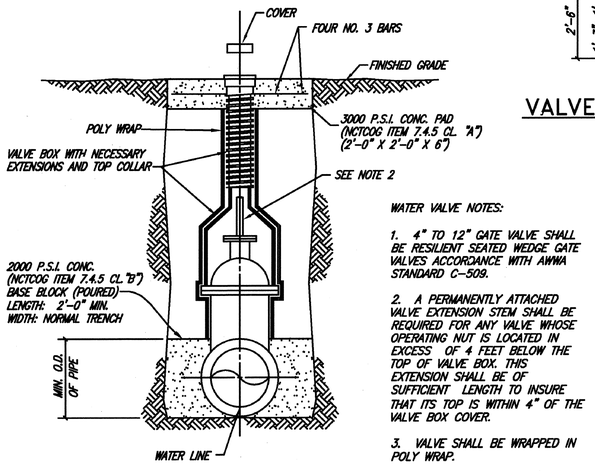
City of Celina, Collin County, Texas

SHEET NO. 38

P-201310-01

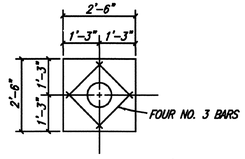
Plotted by: ehansen Plot Date: 1/23/2013 11:25 AM

Drawing: H:\Projects\H0E157 - Heritage Phase 3 Celina\dwg\H0E157-SL.dwg Saved By: ehansen Save Time: 1/2/2013 3:03 PM



VALVE SETTING & BOX

NO SCALE

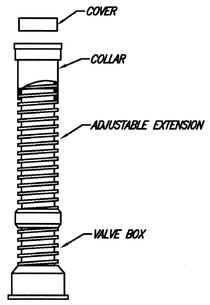


VALVE BOX PAD PLAN

NO SCALE

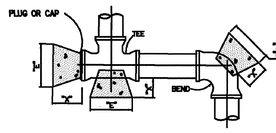
WATER VALVE NOTES:

1. 4" TO 12" GATE VALVE SHALL BE RESILIENT SEATED WEDGE GATE VALVES ACCORDANCE WITH AWWA STANDARD C-509.
2. A PERMANENTLY ATTACHED VALVE EXTENSION STEM SHALL BE REQUIRED FOR ANY VALVE WHOSE OPERATING NUT IS LOCATED IN EXCESS OF 4 FEET BELOW THE TOP OF VALVE BOX. THIS EXTENSION SHALL BE OF SUFFICIENT LENGTH TO INSURE THAT ITS TOP IS WITHIN 4" OF THE VALVE BOX COVER.
3. VALVE SHALL BE WRAPPED IN POLY WRAP.



VALVE BOX WITH EXTENSION

NO SCALE



NOTE: ALL CALCULATIONS ARE BASED ON A WATER LINE PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING VALUE OF 2,500 POUNDS PER SQUARE FOOT.
THESE ARE MINIMUM REQUIREMENTS. INCREASE AREA FOR CONDITIONS OTHER THAN THESE VALUES.

HORIZONTAL BLOCKING TABLE

PIPE SIZE	"A" DIM. IN FT.	11-1/4 DEGREES "A"	11-1/4 DEGREES MIN. AREA	22-1/2 DEGREES "B"	22-1/2 DEGREES MIN. AREA	45 DEGREES "C"	45 DEGREES MIN. AREA	90 DEGREES "D"	90 DEGREES MIN. AREA	TEE & PLUG "E"	TEE & PLUG MIN. AREA
4"	1.5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00	1.00
6"	1.5	1.00	1.00	1.00	1.00	1.14	1.30	1.55	2.40	1.30	1.70
8"	1.5	1.00	1.00	1.06	1.18	1.62	2.31	2.07	4.27	1.74	3.02
10"	1.5	1.00	1.00	1.35	1.84	1.90	3.61	2.58	6.66	2.17	4.71
12"	1.5	1.00	1.33	1.63	2.65	1.88	5.19	3.10	9.60	2.61	6.79
14"	1.5	1.03	1.81	1.90	3.60	2.66	7.07	3.61	13.06	3.04	9.24
16"	2.0	1.18	2.38	2.17	4.71	3.04	9.23	4.13	17.06	3.47	12.06
18"	2.0	1.33	2.99	2.44	5.96	3.42	11.69	4.65	21.59	3.91	15.27
20"	2.0	1.48	3.70	2.71	7.35	3.80	14.43	5.16	26.66	4.34	18.85
21"	2.0	1.55	4.07	2.85	8.11	3.99	15.91	5.42	29.39	4.56	20.78
24"	2.0	1.77	5.32	3.25	10.59	4.56	20.77	6.20	38.39	5.21	27.14
27"	2.5	1.99	6.73	3.66	13.40	5.13	26.29	6.97	48.58	5.86	34.35
30"	2.5	2.22	8.31	4.07	16.55	5.70	32.46	7.74	59.96	6.51	42.41
33"	2.5	2.44	10.06	4.47	20.03	6.27	39.28	8.52	72.57	7.16	51.31
36"	2.5	2.66	11.97	4.88	23.83	6.84	46.74	9.29	86.37	7.81	61.07
39"	3.0	2.88	14.06	5.29	27.97	7.41	54.88	10.07	101.36	8.47	71.69
42"	3.0	3.10	16.30	5.69	32.43	7.98	63.62	10.85	117.56	9.12	83.13

NOTE: CLASS "B" CONCRETE 2,000 PSI SHALL BE USED FOR ALL BLOCKING UNLESS OTHERWISE NOTED ON STANDARD DETAILS AND / OR PLANS.

THE MINIMUM VERTICAL DIMENSION OF ALL BLOCKING SHALL BE 1.5 TIMES THE PIPE DIAMETER WITH AT LEAST 0.75 TIMES THE PIPE DIAMETER EXTENDING BOTH ABOVE AND BELOW THE PIPE CENTERLINE. THIS DIMENSION DETERMINES THE "A" DIMENSION FOR 11-1/4" BENDS.

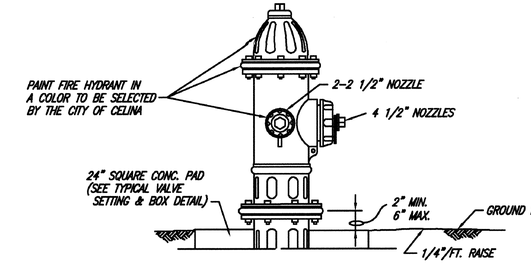
FOR 22-1/2," 45 ," 90 ," AND TEES AND PLUGS, THE VERTICAL DIMENSION SHALL BE EQUAL TO THE HORIZONTAL DIMENSION SHOWN TO PRODUCE THE REQUIRED MINIMUM AREA.

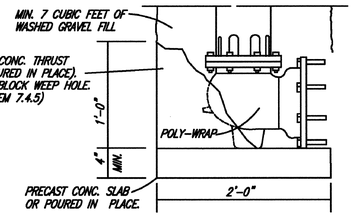
ALL MINIMUM AREAS ARE IN SQUARE FEET.

BLOCKING TO BE AGAINST UNDISTURBED TRENCH WALLS AND BOTTOM.

HORIZONTAL THRUST BLOCKING DETAIL

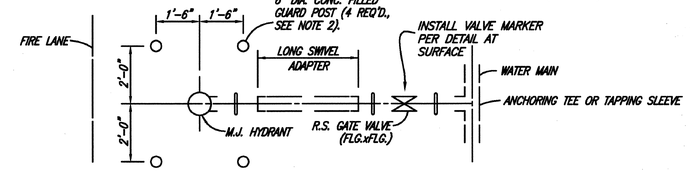
NO SCALE





FIRE HYDRANT NOTES:

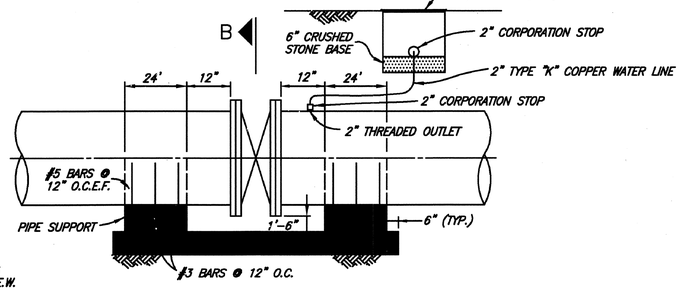
1. IN GENERAL ALL FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARDS SPECIFICATIONS FOR FIRE HYDRANTS FOR ORDINARY WATER WORKS SERVICE FOR WATER AND SANITARY SEWER IMPROVEMENTS. FIRE HYDRANTS SHALL HAVE A 5-1/4" MINIMUM VALVE OPENING AND WITH A BARREL APPROXIMATELY 7" INSIDE DIAMETER. ALL HYDRANTS SHALL BE EQUIPPED WITH A BREAKAWAY FLANGE. ALL HYDRANTS SHALL BE APPROVED BY THE CITY OF CELINA.
2. GUARD POSTS SHALL BE 6 L.F. OF 6" DIA. HOT DIPPED GALV. STEEL PIPE (3' ABOVE & BELOW GROUND LEVEL). POST SHALL BE ENCASED IN 16" DIA. CONC. PIER TO A DEPTH OF 12" BELOW POST BOTTOM. REINFORCE CONC. PIER WITH 2 NO. 6 BARS (12" LONG) THRU POST INTO PIER.



TYPICAL FIRE HYDRANT INSTALLATION

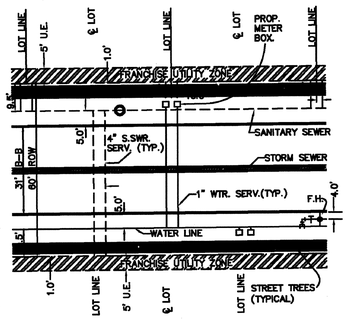
NO SCALE

SECTION B-B A



B SECTION A-A

BUTTERFLY VALVE INSTALLATION



UTILITY PLACEMENT DETAIL

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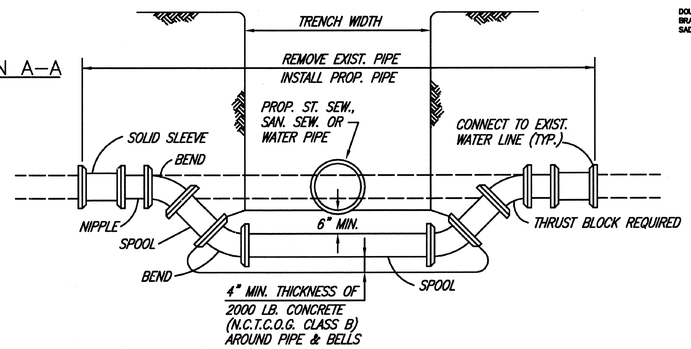
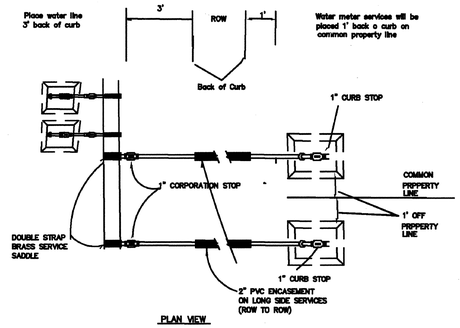
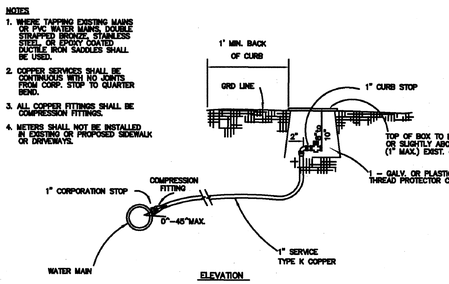


WATER MAIN LOWERING



NOTES

1. WHERE TAPPING EXISTING MAINS OR PVC WATER MAINS, DOUBLE STRAPPED BRONZE, STAINLESS STEEL, OR EPOXY COATED DUCTILE IRON SADDLES SHALL BE USED.
2. COPPER SERVICES SHALL BE CONTINUOUS WITH NO JOINTS FROM CORP. STOP TO QUARTER BEND.
3. ALL COPPER FITTINGS SHALL BE COMPRESSION FITTINGS.
4. METERS SHALL NOT BE INSTALLED IN EXISTING OR PROPOSED SIDEWALK OR DRIVEWAYS.



SERVICE CONNECTION DETAIL (LOTS10,000 S.F. OR LARGER)

NO SCALE

NOTES:

1. PROPOSED WATER PIPE SHALL BE PVC UNLESS OTHERWISE SPECIFIED IN PLANS. ALL FITTINGS SHALL BE DUCTILE IRON (M.J.-P.E.) MEGALUG.
2. PROPOSED PIPING & FITTINGS ARE SYMMETRIC ABOUT CENTER OF PROP. SAN. SEW. OR ST. SEW. PIPE AND SHALL RETAIN TEST PRESSURES.
3. ALL THRUST BLOCKING SHALL BE SUBSIDIARY TO UNIT PRICE.
4. CROSSING OF SANITARY SEWER SHALL BE IN ACCORDANCE WITH T.N.R.C.C. REQUIREMENTS. (CHAPTER 317.13 APPENDIX E)

RECORD DRAWINGS

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JBI PARTNERS, INC.

BY:

DATE: 11-19-12

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Texas Registered Engineering Firm F-438
16301 Quorum Drive
Suite 200 B
Addison, Texas 75001
Main 972.248.7676
Fax 972.248.1414
www.jbipartners.com

STANDARD DETAILS	PROJECT NO.
WATER & SANITARY SEWER DETAILS	HOE157
HERITAGE, PHASE 3	SHEET NO.
City of Celina, Collin County, Texas	SD1

P-201310-01

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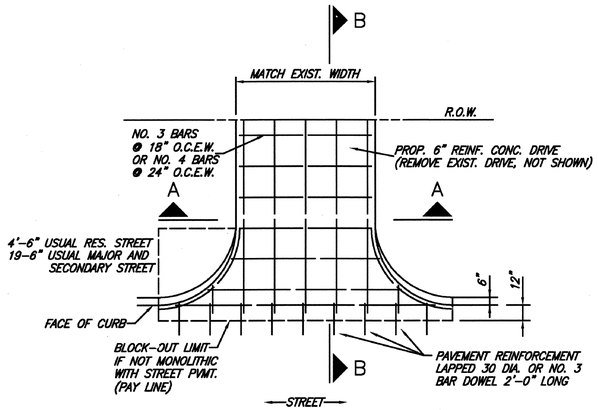
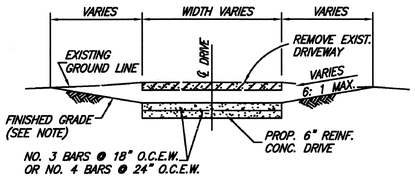
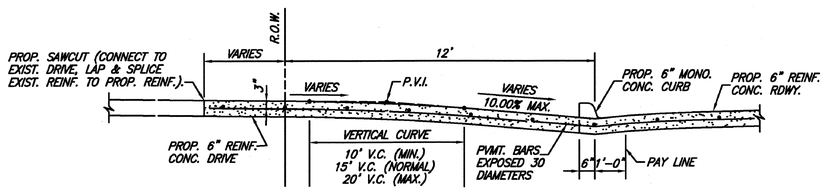


DRIVEWAY RETURN TO STREET

NOTE:
FINISHED GRADING WITHIN THE R.O.W. SHALL BE BROADCAST SEEDED. WHERE PROPOSED DRIVEWAY CONSTRUCTION GOES BEYOND THE R.O.W. AND INTO PRIVATE PROPERTY, THE FINISHED GRADING SHALL BE BLOCK SODDED TO RESTORE THE LANDSCAPING TO ITS PRE-CONSTRUCTION APPEARANCE.



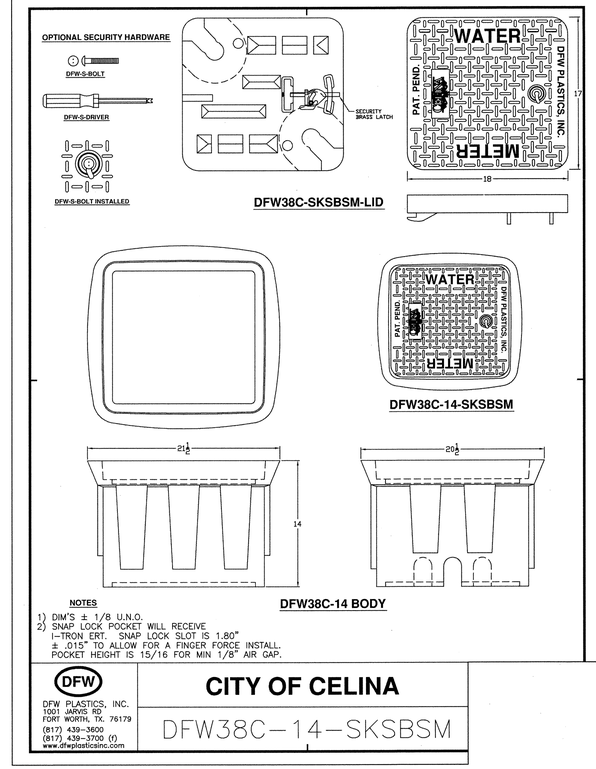
SECTION A-A



SECTION B-B

DRIVEWAY RETURN SECTIONS

(DRIVEDTL)



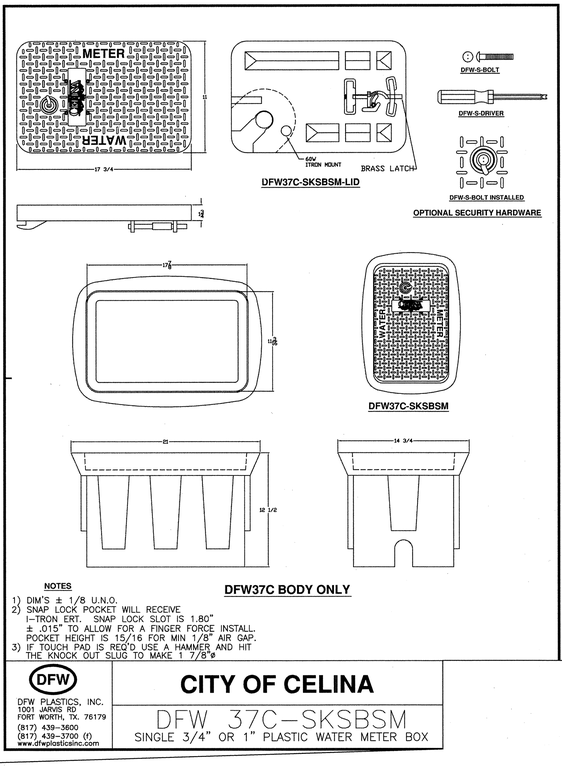
NOTES
1) DIM'S ± 1/8 U.N.O.
2) SNAP LOCK POCKET WILL RECEIVE I-TRON ERT. SNAP LOCK SLOT IS 1.80" ± .015" TO ALLOW FOR A FINGER FORCE INSTALL. POCKET HEIGHT IS 15/16 FOR MIN 1/8" AIR GAP.

DFW38C-14 BODY

DFW PLASTICS, INC.
1001 JARVIS RD
FORT WORTH, TX. 76179
(817) 439-3600
(817) 439-3700 (f)
www.dfwplasticsinc.com

CITY OF CELINA

DFW38C-14-SKSBSM



DFW37C-SKSBSM

NOTES
1) DIM'S ± 1/8 U.N.O.
2) SNAP LOCK POCKET WILL RECEIVE I-TRON ERT. SNAP LOCK SLOT IS 1.80" ± .015" TO ALLOW FOR A FINGER FORCE INSTALL. POCKET HEIGHT IS 15/16 FOR MIN 1/8" AIR GAP.
3) IF TOUCH PAD IS REQ'D USE A HAMMER AND HIT THE KNOCK OUT SLUG TO MAKE 1 7/8"ø

DFW37C BODY ONLY

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CITY OF CELINA

DFW 37C-SKSBSM

SINGLE 3/4" OR 1" PLASTIC WATER METER BOX

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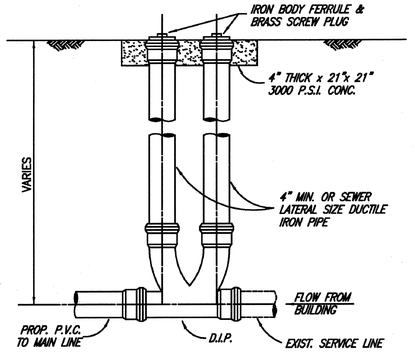
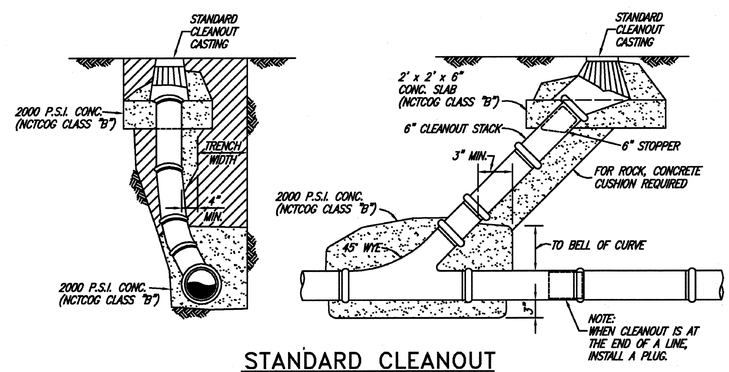
BY:
DATE: 11.09.2015



TYPICAL TWO WAY CLEANOUT

NO SCALE

(2-WAY-CO)



STANDARD CLEANOUT

NO SCALE

(CLEANOUT)

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Addison, Texas 75001
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STANDARD DETAILS

SANITARY SEWER & PAVING DETAILS

HERITAGE, PHASE 3

City of Celina, Collin County, Texas

PROJECT NO. HOE157

SHEET NO. SD2

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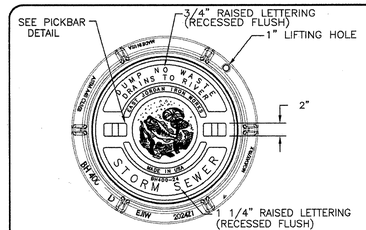

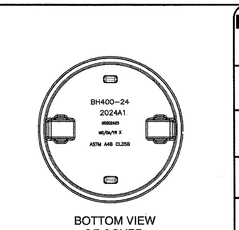

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MADE IN USA

PRODUCT NUMBER	00202425 00202415
CATALOG NUMBER	400-24 R/C
	MANHOLE ASSEMBLY
LOAD RATING	HEAVY DUTY
COATING	DIPPED
MATERIAL SPECIFICATION	COVER – GRAY IRON ASTM A48 CL35B FRAME – GRAY IRON ASTM A48 CL35B
OPEN AREA	N/A
√ DESIGNATES MACHINED SURFACE	
DRAWN DEW / DATE	06/29/06
LAST REVISED DEW / DATE	11/03/08
REFERENCE INFORMATION	00202425 00202415

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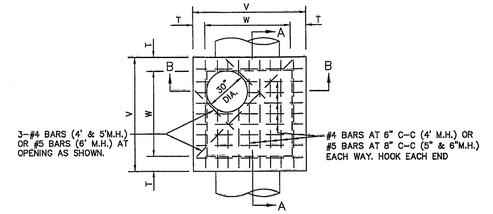
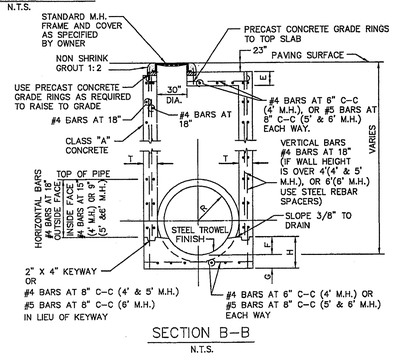
STORM WATER MANHOLE LID
N.T.S.



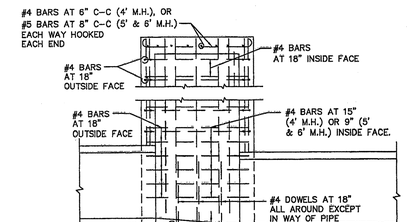
PLAN
N.T.S.

M.H. SIZE(W)	V	T	E	F	G	H
4'	5'-4"	8"	6"	9"	6"	1'-3"
5'	6'-4"	8"	6"	12"	8"	1'-8"
6'	7'-6"	9"	9"	16"	10"	2'-2"

TABLE OF DIMENSIONS
N.T.S.



SECTION B-B
N.T.S.



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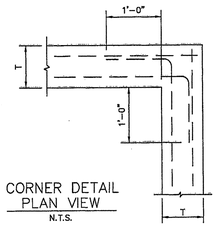
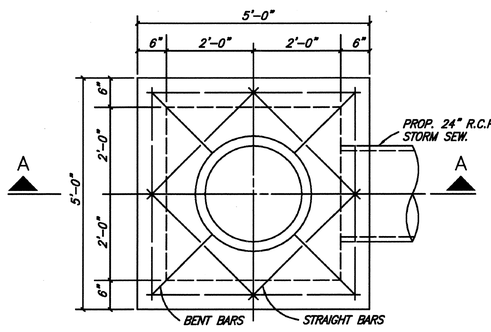
N.T.S.



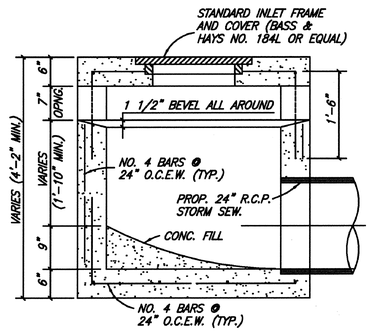
CORNER DETAIL
PLAN VIEW
N.T.S.

NOTES:
1. SLOPE INVERT OF MANHOLE AS INDICATED ON PLAN-PROFILE SHEET.
2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACE SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
3. CONCRETE SHALL BE CLASS "A".

STORM WATER MANHOLE
4', 5', OR 6' SQUARE
N.T.S.



PLAN



SECTION A-A

STANDARD DROP INLET
(DROPINLET)

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BY:
DATE: 1.14.13

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STANDARD DETAILS	PROJECT NO.
DRAINAGE DETAILS	HOE157
HERITAGE, PHASE 3	SHEET NO.
City of Celina, Collin County, Texas	SD3

P-201310-01

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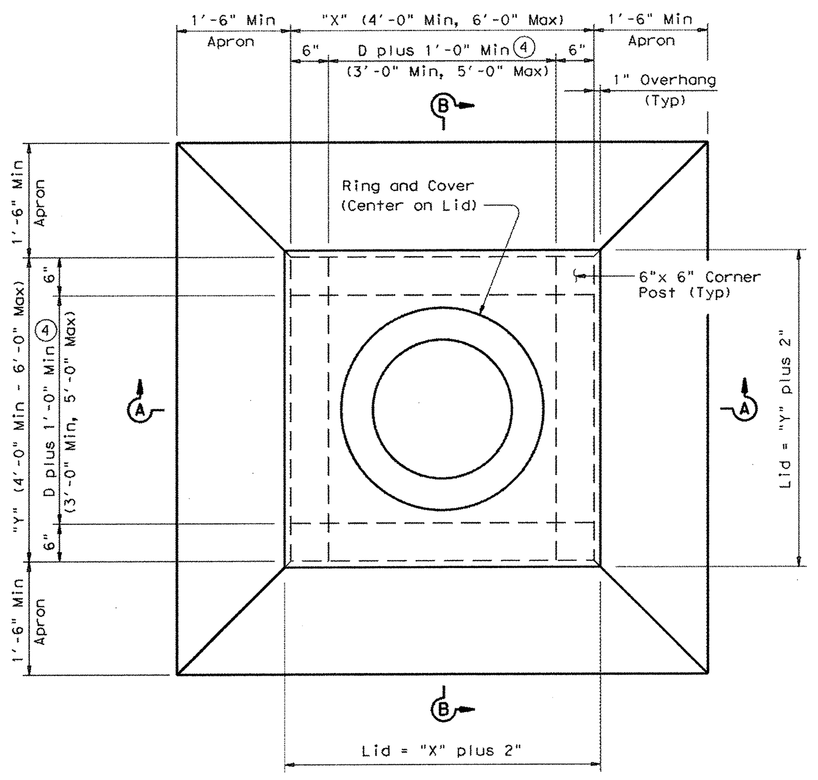
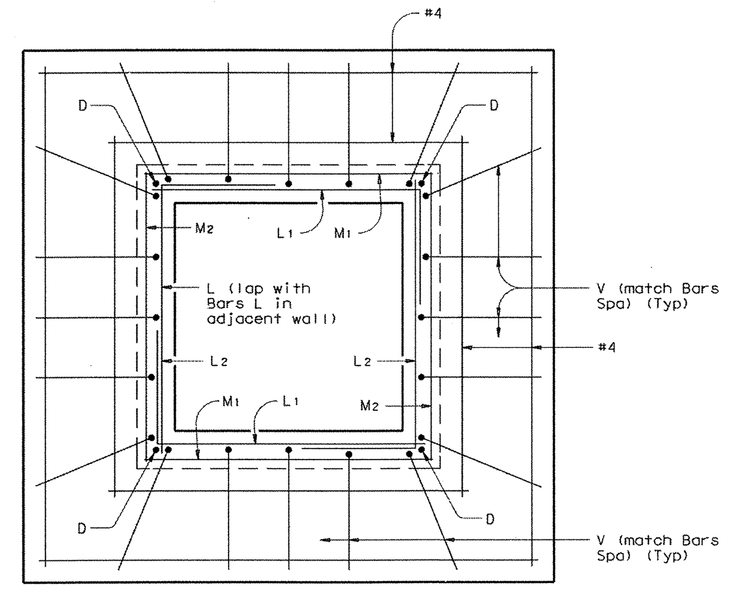


PLAN



TYPICAL APRON PLAN

(Lid not shown for clarity. Showing reinforcing in walls and in apron.)

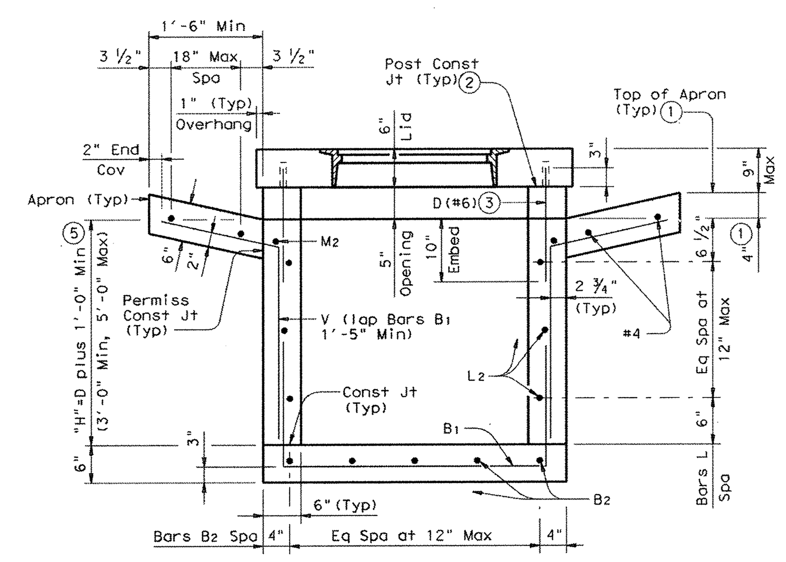
① May be changed as directed by the Engineer.

② Place layer of grout between lid and corner posts to provide stable seating of lid.

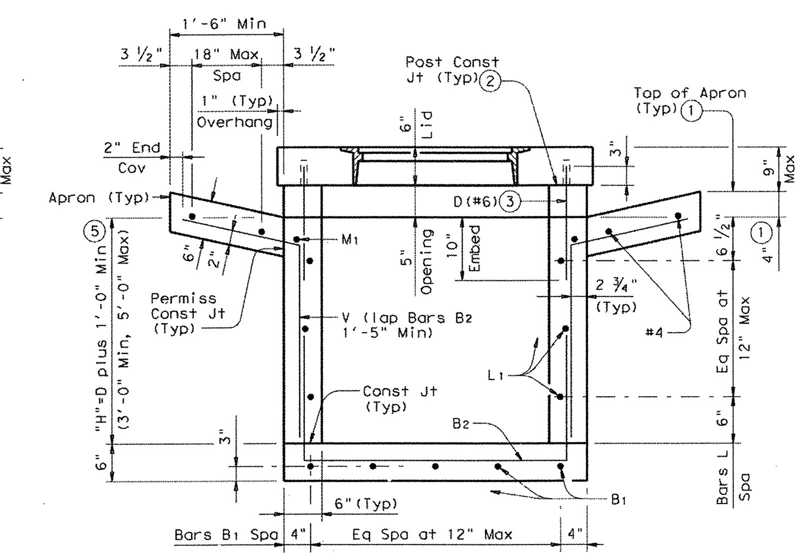
③ Center Dowels D in corner posts. (Typ)

④ D equals the maximum inside diameter of any pipe entering the wall shown or the opposite wall.

⑤ D equals the maximum inside diameter of any pipe entering the inlet.



SECTION A-A



SECTION B-B

SHEET 1 OF 2

Texas Department of Transportation
Bridge Division

HORIZONTAL INLET
TYPE H WITH LID
(MAX 48" DIA PIPES)

IL-H-L

FILE: ilhste02.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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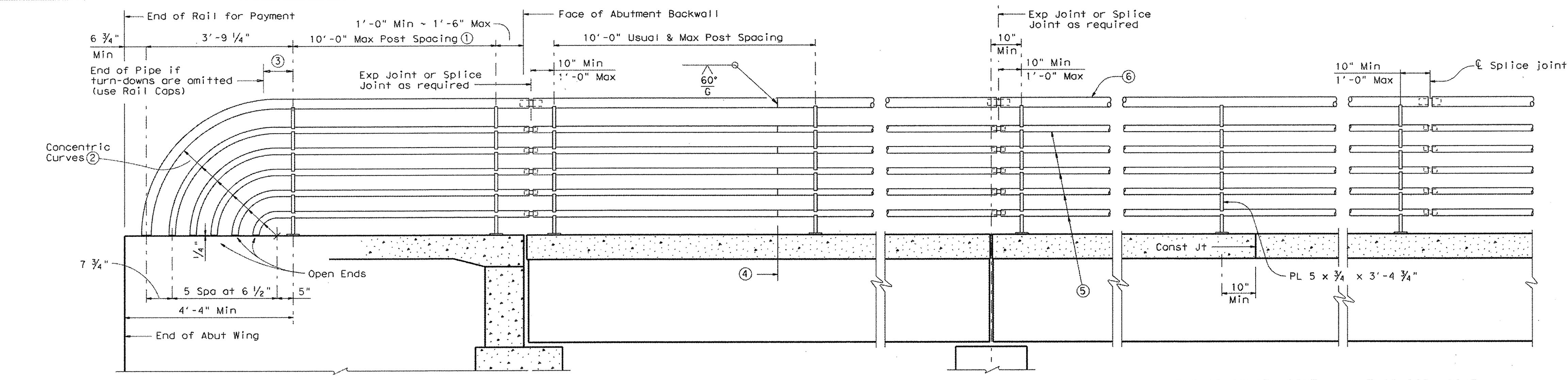
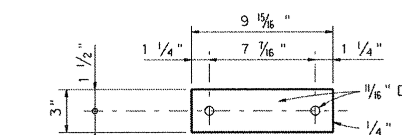
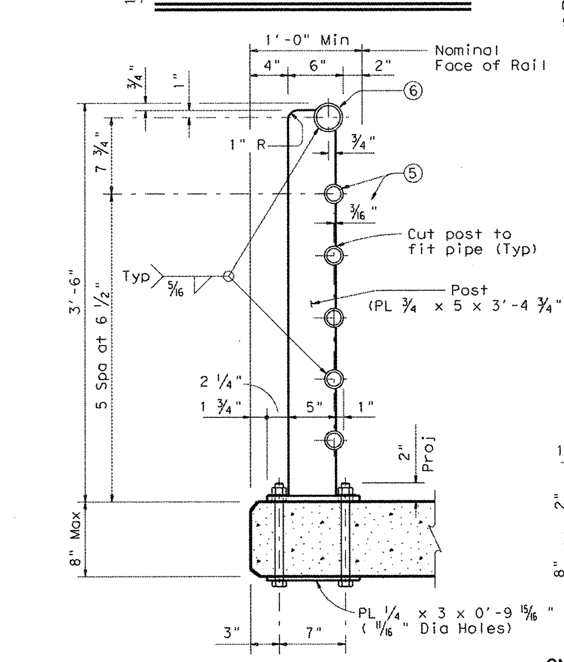
REVISIONS	COUNTY	CONTROL	SECT / JOB	HIGHWAY



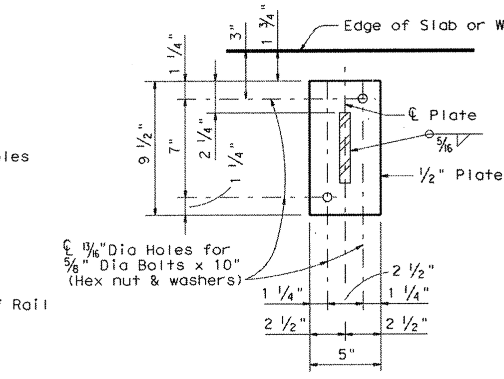
ROADWAY ELEVATION OF RAIL



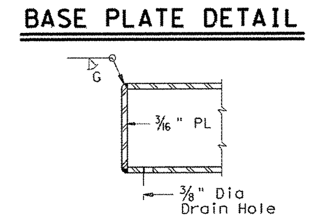
BOTTOM PLATE DETAIL



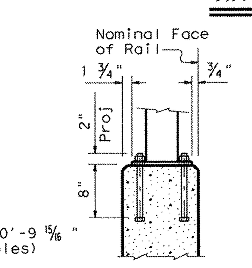
BASIC CONDITION



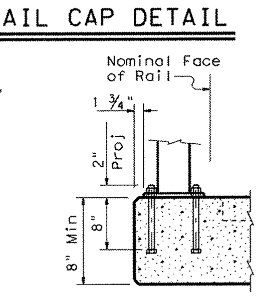
BASE PLATE DETAIL



RAIL CAP DETAIL

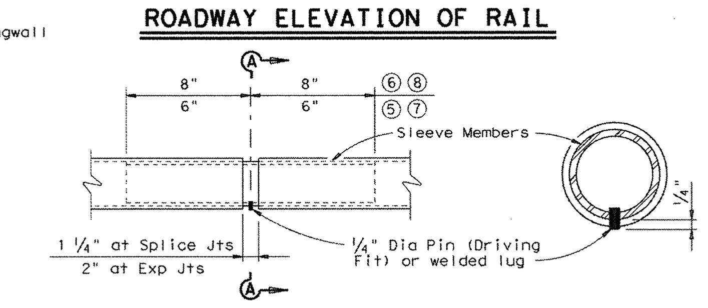


ON ABUT WING OR CIP RETAINING WALL



ON CULVERTS OR SLABS OVER 8" THICK

POST MOUNTING DETAILS



PIPE SPLICE DETAIL

① Min of 2 posts required on wingwall

② Portion of railing with turn-downs to be used or omitted as indicated on Bridge Layout.

③ 10" Min ~ 1'-6" Max if turn-downs are omitted.

④ One shop splice per panel is permitted (with minimum 85 percent penetration). The weld may be square groove or single vee groove. Grind smooth.

⑤ 2" Std Pipe (2.375" O.D., 0.154" wall thickness)

⑥ 3" Std Pipe (3.500" O.D., 0.216" wall thickness)

⑦ 1 1/2" Std Pipe Sleeve (1.900" O.D., 0.145" wall thickness)

⑧ 2 1/2" Std Pipe Sleeve (2.875" O.D., 0.203" wall thickness)

CONSTRUCTION NOTES:
Panel lengths of railing must be attached to a minimum of three posts except at abutment wingwalls.
Face of rail and posts must be vertical transversely unless otherwise approved by the Engineer. Posts must be perpendicular to adjacent roadway grade. Use epoxy mortar under post base plates if gaps larger than 1/16" exist.
For curved railing applications, fabricate the pipe rails to the radius when the radius is 600' or less. Submit shop drawings for approval when tubes are required to be fabricated to a radius. Shop drawings must be submitted to the Engineer for approval.
Exposed edges of pipe rail and pipe rail posts must be rounded or chamfered to approximately 1/16" by grinding.

MATERIAL NOTES:
Pipe for pipe rail must conform to ASTM A53 Gr B, or A500 Gr B. Posts and Plates must be ASTM A36.
All steel components to be galvanized unless otherwise shown in plans.
Anchor bolts must be 5/8" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt. Threaded rods may be 0.557" minimum diameter with rolled threads. Nuts must conform to A563 requirements.

GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.
This railing cannot be used on bridges with expansion joints providing more than 5" movement.
For all rails, erection drawings showing section lengths, splice locations, rail post spacing and anchor bolt setting must be submitted to the Engineer for approval.
Average weight of railing is 30 plf.

Texas Department of Transportation
Bridge Division

PEDESTRIAN RAIL

TYPE PR1

FILE: rlstd028.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
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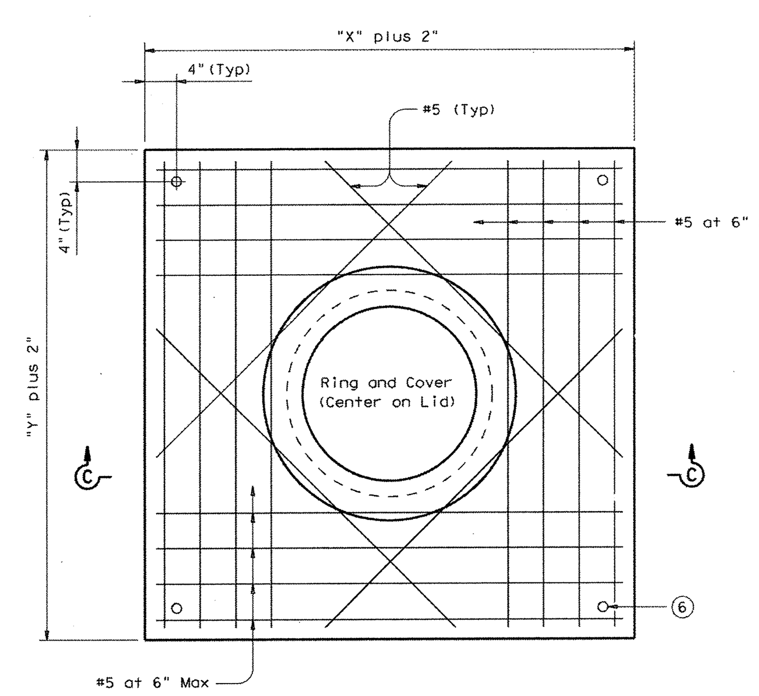
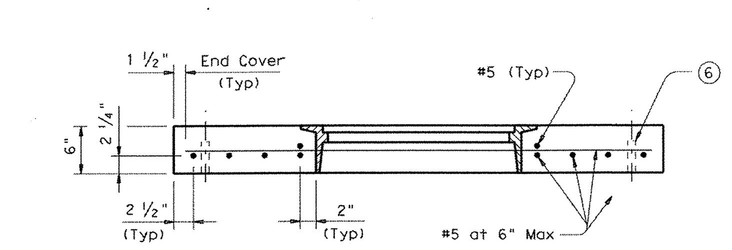
REVISIONS	COUNTY	CONTROL	SECT / JOB	HIGHWAY

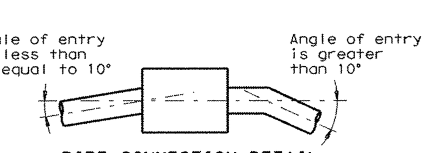


TYPICAL PRECAST LID PLAN



SECTION C-C

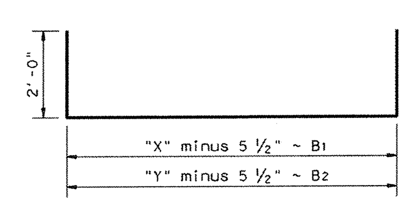
⑥ Form holes in lid for Dowels D using 1" Dia x 4" PVC Pipe (SCH 40) (Typ)



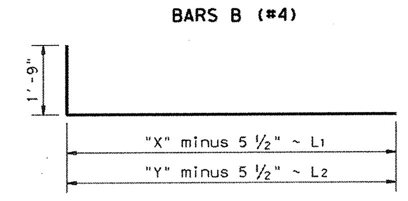
PIPE CONNECTION DETAIL

Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.

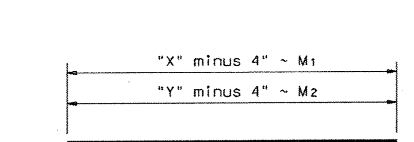
GENERAL NOTES:
When approved, precast inlets with equivalent structural capacity may be furnished. Sealed engineering calculations and drawings shall be submitted for approval prior to construction.
Shop drawings will not be required.
Apron will be cast-in-place.
Lid will be precast.
In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.
Structural Steel for grates shall conform to the requirements of ASTM Designation A-36 or AISI Designation M1010-M1020.
All reinforcing steel shall be Grade 60 unless otherwise noted.
All concrete shall be Class "A" (f'c = 3,000 psi).
All steel components except reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.
Inlet is to used in ditches and medians away from the roadway.



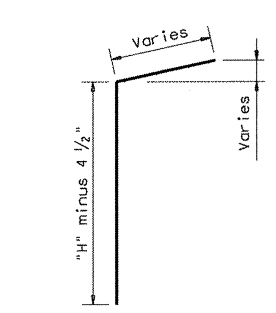
BARS B (#4)



BARS L (#4)



BARS M (#4)



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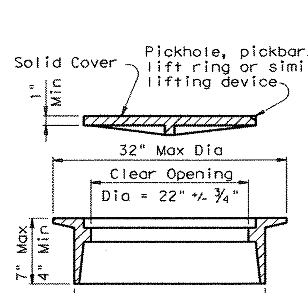

RING AND COVER DETAILS

Approximate Weight = 245 lb

SHEET 2 OF 2

Texas Department of Transportation
Bridge Division

HORIZONTAL INLET
TYPE H WITH LID
(MAX 48" DIA PIPES)

IL-H-L

FILE: ilhste02.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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DATE: 11.19.2013

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STANDARD DETAILS	PROJECT NO.
STORM DETAILS	HOE157
HERITAGE, PHASE 3	SHEET NO.
City of Celina, Collin County, Texas	TXDOT1

Drawing: H:\Projects\HOE157 – Heritage Phase 3 Celina\dwg\HOE157–DETAILS.dwg Saved By: cfarrow Save Time: 12/20/2012 3:49 PM

Plotted by: cfarrow Plot Date: 12/20/2012 3:50 PM

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)

SLOPE	DIA OF PIPE, D	15 Degrees: Values for one Pipe W	Reinf (Lbs)	Conc (CY) (1)	15 Degrees: Values to be added for each addt'l Pipe W	Reinf (Lbs)	Conc (CY) (1)	30 Degrees: Values for one Pipe W	Reinf (Lbs)	Conc (CY) (1)	30 Degrees: Values to be added for each addt'l Pipe W	Reinf (Lbs)	Conc (CY) (1)	45 Degrees: Values for one Pipe W	Reinf (Lbs)	Conc (CY) (1)	45 Degrees: Values to be added for each addt'l Pipe W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	9'- 4"	124	1.1	1'- 9 3/4"	15	0.2	10'- 5"	130	1.2	2'- 0"	16	0.2	12'- 9"	159	1.5	2'- 5 3/4"	17	0.3
	15"	10'- 7"	136	1.3	2'- 3"	17	0.2	11'-10"	159	1.5	2'- 6"	18	0.2	14'- 6"	191	1.8	3'- 0 3/4"	20	0.3
	18"	11'-11"	165	1.5	2'- 9"	19	0.3	13'- 3"	174	1.7	3'- 1"	29	0.3	16'- 3"	207	2.1	3'- 9 1/4"	33	0.4
	21"	13'- 2"	203	1.9	3'- 2 1/4"	31	0.4	14'- 9"	233	2.1	3'- 6 3/4"	33	0.4	18'- 0"	276	2.6	4'- 4 1/4"	36	0.5
	24"	14'- 6"	240	2.1	3'- 8 1/4"	34	0.4	16'- 2"	251	2.4	4'- 1 3/4"	36	0.5	19'-10"	318	2.9	5'- 0 3/4"	39	0.6
	27"	15'- 9"	258	2.5	4'- 0 3/4"	38	0.5	17'- 7"	292	2.8	4'- 6 1/4"	39	0.6	21'- 7"	342	3.4	5'- 6 1/4"	44	0.7
	30"	17'- 1"	297	2.8	4'- 5 3/4"	40	0.6	19'- 1"	311	3.1	5'- 0"	42	0.6	23'- 4"	388	3.8	6'- 1 3/4"	47	0.8
	33"	18'- 5"	320	3.3	4'- 9 3/4"	43	0.6	20'- 6"	358	3.6	5'- 4 3/4"	46	0.7	25'- 1"	439	4.4	6'- 7 1/4"	51	0.9
	36"	19'- 8"	401	4.0	5'- 3"	47	0.9	21'-11"	422	4.5	5'-10 3/4"	50	0.9	26'-10"	517	5.5	7'- 2 1/4"	55	1.2
	42"	22'- 3"	476	5.0	6'- 0 3/4"	53	1.1	24'-10"	528	5.6	6'- 8 3/4"	56	1.2	30'- 5"	634	6.9	8'- 3"	76	1.4
	48"	25'-11"	577	6.6	6'- 9 3/4"	60	1.3	28'-10"	637	7.3	7'- 7 1/4"	79	1.5	35'- 4"	791	9.0	9'- 3 3/4"	88	1.8
	54"	28'- 6"	711	7.8	7'- 9"	83	1.6	31'- 9"	781	8.7	8'- 8"	87	1.8	38'-11"	958	10.7	10'- 7 1/4"	97	2.2
	60"	31'- 1"	805	9.2	8'- 6 1/4"	91	1.9	34'- 8"	881	10.2	9'- 6 1/4"	97	2.1	42'- 5"	1113	12.5	11'- 8"	124	2.6
	66"	33'- 8"	907	10.6	9'- 0 3/4"	98	2.1	37'- 6"	1028	11.8	10'- 1 1/4"	102	2.4	46'- 0"	1235	14.5	12'- 4 1/4"	132	2.9
	72"	36'- 3"	1071	12.1	9'- 8"	105	2.4	40'- 5"	1207	13.5	10'- 9 1/4"	110	2.6	49'- 6"	1446	16.6	13'- 2 1/4"	141	3.2
3:1	12"	13'- 6"	178	1.6	1'- 9 3/4"	15	0.2	15'- 0"	189	1.8	2'- 0"	15	0.2	18'- 5"	237	2.2	2'- 5 3/4"	17	0.2
	15"	15'- 3"	212	1.9	2'- 3"	17	0.2	17'- 0"	223	2.1	2'- 6"	17	0.3	20'-10"	276	2.6	3'- 0 3/4"	20	0.3
	18"	17'- 1"	231	2.3	2'- 9"	19	0.3	19'- 1"	259	2.5	3'- 1"	29	0.3	23'- 4"	318	3.1	3'- 9 1/4"	32	0.4
	21"	18'-11"	306	2.7	3'- 2 1/4"	31	0.4	21'- 1"	339	3.0	3'- 6 3/4"	33	0.4	25'-10"	413	3.7	4'- 4 1/4"	36	0.5
	24"	20'- 8"	345	3.1	3'- 8 3/4"	35	0.4	23'- 1"	384	3.5	4'- 1 3/4"	36	0.5	28'- 3"	462	4.2	5'- 0 3/4"	40	0.6
	27"	22'- 6"	376	3.7	4'- 0 3/4"	38	0.5	25'- 1"	438	4.1	4'- 6 1/4"	39	0.6	30'- 9"	522	5.0	5'- 6 1/4"	44	0.7
	30"	24'- 4"	422	4.1	4'- 5 3/4"	40	0.6	27'- 2"	466	4.6	5'- 0"	42	0.6	33'- 3"	578	5.6	6'- 1 3/4"	47	0.8
	33"	26'- 2"	476	4.8	4'-10"	43	0.6	29'- 2"	522	5.3	5'- 4 3/4"	46	0.7	35'- 9"	644	6.5	6'- 7 1/4"	51	0.9
	36"	27'-11"	590	5.9	5'- 3 1/4"	47	0.8	31'- 2"	645	6.6	5'-10 3/4"	50	0.9	38'- 2"	787	8.0	7'- 2 1/4"	56	1.2
	42"	31'- 7"	684	7.3	6'- 0 1/4"	53	1.1	35'- 3"	776	8.2	6'- 8 3/4"	56	1.2	43'- 2"	933	10.0	8'- 3"	79	1.4
	48"	36'- 9"	880	9.6	6'- 9 3/4"	61	1.3	41'- 0"	953	10.7	7'- 7 1/4"	81	1.5	50'- 2"	1166	13.1	9'- 3 3/4"	88	1.8
	54"	40'- 5"	1065	11.4	7'- 9"	85	1.6	45'- 0"	1185	12.7	8'- 8"	89	1.8	55'- 2"	1435	15.5	10'- 7 1/4"	97	2.2
	60"	44'- 0"	1224	13.3	8'- 6 1/4"	93	1.9	49'- 1"	1356	14.8	9'- 6 1/4"	96	2.1	60'- 1"	1627	18.2	11'- 8"	124	2.6
	66"	47'- 7"	1357	15.4	9'- 1"	98	2.1	53'- 1"	1497	17.2	10'- 1 1/4"	103	2.3	65'- 1"	1834	21.1	12'- 4 1/4"	130	2.9
	72"	51'- 3"	1624	17.7	9'- 8"	105	2.3	57'- 2"	1787	19.7	10'- 9 1/4"	109	2.6	70'- 0"	2210	24.1	13'- 2 1/4"	139	3.2
4:1	12"	17'- 7"	232	2.1	1'- 9 3/4"	15	0.2	19'- 8"	259	2.4	2'- 0"	16	0.2	24'- 0"	314	2.9	2'- 5 3/4"	18	0.2
	15"	19'-11"	272	2.5	2'- 3"	17	0.2	22'- 3"	301	2.8	2'- 6"	18	0.3	27'- 3"	361	3.5	3'- 0 3/4"	21	0.3
	18"	22'- 3"	313	3.0	2'- 9"	19	0.3	24'-10"	344	3.3	3'- 1"	29	0.3	30'- 5"	427	4.0	3'- 9 1/4"	32	0.4
	21"	24'- 7"	407	3.6	3'- 2 1/4"	31	0.4	27'- 5"	446	4.0	3'- 6 3/4"	33	0.4	33'- 7"	549	4.9	4'- 4 1/4"	36	0.5
	24"	26'-11"	455	4.1	3'- 8 3/4"	35	0.4	30'- 0"	499	4.5	4'- 1 3/4"	36	0.5	36'- 9"	609	5.6	5'- 0 3/4"	40	0.6
	27"	29'- 3"	514	4.8	4'- 0 3/4"	38	0.5	32'- 7"	562	5.4	4'- 6 1/4"	40	0.6	39'-11"	703	6.6	5'- 6 1/4"	43	0.7
	30"	31'- 7"	568	5.4	4'- 5 3/4"	40	0.6	35'- 3"	620	6.0	5'- 0"	42	0.6	43'- 2"	768	7.4	6'- 1 3/4"	49	0.8
	33"	33'-11"	634	6.2	4'-10"	43	0.7	37'-10"	710	7.0	5'- 4 3/4"	46	0.7	46'- 4"	848	8.5	6'- 7 1/4"	52	0.9
	36"	36'- 3"	776	7.7	5'- 3"	48	0.9	40'- 5"	868	8.6	5'-10 3/4"	49	0.9	49'- 6"	1058	10.6	7'- 2 1/4"	56	1.1
	42"	40'-11"	921	9.6	6'- 0 1/4"	53	1.0	45'- 7"	1022	10.7	6'- 8 3/4"	57	1.2	55'-10"	1262	13.1	8'- 3"	78	1.4
	48"	47'- 7"	1152	12.6	6'-10"	61	1.3	53'- 1"	1268	14.0	7'- 7 1/4"	80	1.5	65'- 1"	1579	17.2	9'- 3 3/4"	86	1.8
	54"	52'- 3"	1416	14.9	7'- 9 1/4"	86	1.6	58'- 4"	1589	16.6	8'- 8"	89	1.8	71'- 5"	1916	20.4	10'- 7 1/4"	95	2.2
	60"	56'-11"	1606	17.5	8'- 6 3/4"	92	1.9	63'- 6"	1798	19.5	9'- 6 1/4"	95	2.1	77'- 9"	2184	23.9	11'- 8"	122	2.6
	66"	61'- 7"	1811	20.2	9'- 0 3/4"	97	2.1	68'- 8"	2011	22.5	10'- 1 1/4"	101	2.4	84'- 2"	2464	27.6	12'- 4 1/4"	131	2.9
	72"	66'- 3"	2142	23.2	9'- 8"	104	2.4	73'-11"	2371	25.9	10'- 9 1/4"	108	2.6	90'- 6"	2929	31.7	13'- 2 1/4"	138	3.2
6:1	12"	25'-11"	342	3.1	1'- 9 3/4"	15	0.2	28'-10"	374	3.5	2'- 0"	16	0.2	35'- 4"	456	4.3	2'- 5 3/4"	17	0.2
	15"	29'- 3"	390	3.7	2'- 3"	17	0.2	32'- 7"	442	4.2	2'- 6"	18	0.2	39'-11"	549	5.1	3'- 0 3/4"	20	0.3
	18"	32'- 7"	459	4.4	2'- 9"	20	0.3	36'- 4"	515	4.9	3'- 1"	29	0.3	44'- 7"	629	6.0	3'- 9 1/4"	33	0.4
	21"	36'- 0"	608	5.3	3'- 2 1/4"	31	0.4	40'- 2"	660	5.9	3'- 6 3/4"	33	0.4	49'- 2"	823	7.2	4'- 4 1/4"	38	0.5
	24"	39'- 4"	672	6.0	3'- 8 3/4"	35	0.4	43'-11"	748	6.7	4'- 1 3/4"	36	0.5	53'- 9"	920	8.2	5'- 0 3/4"	42	0.6
	27"	42'- 8"	770	7.1	4'- 0 3/4"	38	0.5	47'- 8"	852	8.0	4'- 6 1/4"	41	0.5	58'- 4"	1039	9.7	5'- 6 1/4"	45	0.7
	30"	46'- 1"	839	8.0	4'- 5 3/4"	40	0.6	51'- 5"	949	8.9	5'- 0"	44	0.6	62'-11"	1154	10.9	6'- 1 3/4"	48	0.8
	33"	49'- 5"	947	9.2	4'-10"	45	0.7	55'- 2"	1040	10.3	5'- 4 3/4"	48	0.7	67'- 6"	1284	12.6	6'- 7 1/4"	50	0.9
	36"	52'-10"	1151	11.4	5'- 3"	49	0.8	58'-11"	1287	12.7	5'-10 3/4"	51	1.0	72'- 1"	1575	15.6	7'- 2 1/4"	55	1.1
	42"	59'- 6"	1365	14.2	6'- 0 1/4"	55	1.0	66'- 5"	1522	15.8	6'- 8 3/4"	57	1.2	81'- 4"	1867	19.4	8'- 3"	76	1.4
	48"	69'- 4"	1729	18.5	6'-10"	59	1.3	77'- 4"	1934	20.7	7'- 7 1/4"	79	1.5	94'- 9"	2360	25.3	9'- 3 3/4"	86	1.8
	54"	76'- 1"	2130	22.0	7'- 9 1/4"	83	1.6	84'-10"	2370	24.6	8'- 8"	87	1.8	103'-11"	2904	30.1	10'- 7 1/4"	95	2.2
	60"	82'-10"	2414	25.8	8'- 6 3/4"	90	1.9	92'- 5"	2673	28.8	9'- 6 1/4"	94	2.1	113'-2"	3286	35.3	11'- 8"	122	2.6
	66"	89'- 7"	2712	29.9	9'- 0 3/4"	96	2.1	99'-11"	3030	33.3	10'- 1 1/4"	101	2.4	122'-4"	3689	40.8	12'- 4 1/4"	130	2.9
	72"	96'- 3"	3210	34.2	9'- 8"	102	2.4	107'-5"	3572	38.2	10'- 9 1/4"	108	2.6	131'-6"	4364	46.8	13'- 2 1/4"	139	3.2

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
ACC:

ELEVATION

PLAN OF SKEWED PIPES

Showing 30° Skew

℄ SECTION

(1) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(2) Indicated slope is perpendicular to centerline Pipe or Pipes.

(3) 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.

(4) Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

DIA OF PIPE, D	G	K	H	T	E
12"	9"	1'- 0"	2'- 8"	9"	1'- 9"
15"	11"	1'- 0"	2'-11"	9"	1'- 9"
18"	1'- 2"	1'- 0"	3'- 2"	9"	1'- 9"
21"	1'- 4"	1'- 0"	3'- 5"	9"	2'- 0"
24"	1'- 7"	1'- 0"	3'- 8"	9"	2'- 0"
27"	1'- 8"	1'- 0"	3'-11"	9"	2'- 3"
30"	1'-10"	1'- 0"	4'- 2"	9"	2'- 3"
33"	1'-11"	1'- 0"	4'- 5"	9"	2'- 6"
36"	2'- 1"	1'- 0"	4'- 8"	1'- 0"	2'- 6"
42"	2'- 4"	1'- 0"	5'- 2"	1'- 0"	2'- 9"
48"	2'- 7"	1'- 3"	5'-11"	1'- 0"	3'- 0"
54"	3'- 0"	1'- 3"	6'- 5"	1'- 0"	3'- 3"
60"	3'- 3"	1'- 3"	6'-11"	1'- 0"	3'- 6"
66"	3'- 3"	1'- 3"	7'- 5"	1'- 0"	3'- 9"
72"	3'- 4"	1'- 3"	7'-11"	1'- 0"	4'- 0"

TABLE OF REINFORCING STEEL (4)

Bar	Size	Spa	No.
A1	# 5	~	2
A2	# 5	1'-6"	~
E	# 5	~	2
F	# 5	1'-0"	~

BARS F2

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 PARALLEL WINGS FOR SKEWED PIPE CULVERTS

CH-PW-S

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

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JBI PARTNERS, INC.
BY:
DATE: 11.19.2017

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STANDARD DETAILS	PROJECT NO.
HEADWALL DETAILS	HOE157
HERITAGE, PHASE 3	SHEET NO.
City of Celina, Collin County, Texas	TXDOT2

Plotted by: ehansen Plot Date: 1/24/2013 3:41 PM

Drawing: H:\Projects\HOE157 – Heritage Phase 3 Celina\dwg\HOE157-DETAILS.dwg Saved By: cfarrow Save Time: 12/20/2012 3:50 PM

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