Paving, Drainage, and Utility Plans

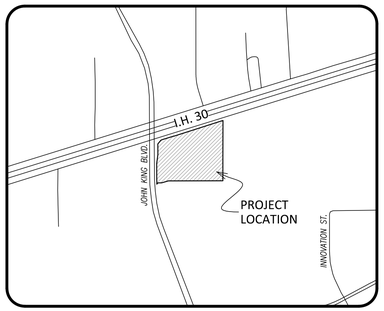
NISSAN OF ROCKWALL

LOT 1, BLOCK A

City of Rockwall

Rockwall County, Texas

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



Vicinity Map
N.T.S.

INDEX OF DRAWINGS
● CURRENT ISSUE ○ PREVIOUS ISSUE ☒ DELETED DRAWING
NOTES:
1.

DATE		ISSUED FOR
01.30.15		PERMITTING AND BIDDING
03.31.15	1	ASI #1
04.06.15	2	ASI #2
05.20.15	3	ASI #3
09.04.15	6	ASI #6

CIVIL

SHEET	TITLE												
	COVER SHEET	○	○	○	○	●							
	REPLAT – 1 OF 2	○	●										
	REPLAT – 2 OF 2	○	●										
	SITE PLAN	○	●										
C1	DEMOLITION PLAN	●											
C2	PAVING AND HORIZONTAL CONTROL PLAN	○	○			●							
C3	PAVING AND GRADING PLAN – TURN LANE	●											
C4	PAVING PLAN – TXDOT DRIVEWAYS	●											
C5	GRADING PLAN	○	○		○	●							
C6	DRAINAGE AREA MAP	●											
C7	DETENTION CALCULATIONS	●											
C8	DRAINAGE PLAN	○	○		●								
C9	STORM SEWER PROFILES	●											
C10	STORM SEWER PROFILES	○	○	●									
C10a	CONTECH DETENTION SYSTEM	●											
C10b	CONTECH DETENTION SYSTEM	●											
C10c	CONTECH DETENTION SYSTEM	●											
C11	UTILITY PLAN	○	○	○	●								
C12	SANITARY SEWER PROFILE	○	●										
C13	EROSION CONTROL PLAN	●											
C14	STORMWATER POLUTION PREVENTION GUIDELINES	●											
C15	SITE DETAILS	○				●							

TXDOT DETAILS

SHEET	TITLE												
BC (1)–14	BARRICADE AND CONSTRUCTION – GENERAL NOTES AND REQUIREMENTS	○	●										
BC (2)–14	BARRICADE AND CONSTRUCTION – PROJECT LIMIT	○	●										
BC (3)–14	BARRICADE AND CONSTRUCTION – WORK ZONE SPEED LIMIT	○	●										
BC (4)–14	BARRICADE AND CONSTRUCTION – TEMPORARY SIGN NOTES	○	●										
BC (5)–14	BARRICADE AND CONSTRUCTION – TYPICAL SIGN SUPPORT	○	●										
BC (6)–14	BARRICADE AND CONSTRUCTION – PORTABLE CHANGEABLE SIGN	○	●										
BC (7)–14	BARRICADE AND CONSTRUCTION – ARROW PANEL, REFLECTORS,.....	○	●										
BC (8)–14	BARRICADE AND CONSTRUCTION – CHANNELIZING DEVICES	○	●										
BC (9)–14	BARRICADE AND CONSTRUCTION – CHANNELIZING DEVICES	○	●										
BC (10)–14	BARRICADE AND CONSTRUCTION – CHANNELIZING DEVICES	○	●										
BC (11)–14	BARRICADE AND CONSTRUCTION – PAVEMENT MARKINGS	○	●										
BC (12)–14	BARRICADE AND CONSTRUCTION – PAVEMENT MARKINGS PATTERNS	○	●										
CCCG–12	CONCRETE CURB AND CURB AND GUTTER		●										
CPCD–94	CONCRETE PAVEMENT DETAILS	○	☒										
CRPC (1)–11	CONTINUALLY REINFORCED CONCRETE PAVEMENT	●											
FDR (CP)–05	FULL DEPTH REPAIR FOR CONCRETE PAVEMENT	●											
SCC–MD	SINGLE BOX CULVERTS CAST–IN–PLACE MISCELLANEOUS DETAILS		●										
TCP(1–4)–12	TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILINE ROADS	○	☒										
TCP(1–5)–12	TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK		●										

SITE STRUCTURAL

SHEET	TITLE												
S1	NOTES, AUTO DISPLAY FOUNDATION PLAN, SECTIONS AND DETAILS	●											
S2	RETAINING WALL PLAN AND SECTIONS	●											

LANDSCAPE

SHEET	TITLE												
L1	PARTIAL LANDSCAPE PLAN – NW	●											
L2	PARTIAL LANDSCAPE PLAN – NE	●											
L3	PARTIAL LANDSCAPE PLAN – SW	●											
L4	PARTIAL LANDSCAPE PLAN – SE	●											
L5	TREESCAPE PLAN	●											

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

STATE OF TEXAS · JOHN W. SPIARS · 84016 · LICENSED · PROFESSIONAL ENGINEER
3/15/16

RECORD DRAWINGS

NOTE:
TO THE BEST OF OUR KNOWLEDGE, SPIARS ENGINEERING, INC. HEREBY STATES THAT THIS PLAN IS A RECORD DRAWING. THE INFORMATION PROVIDED IS BASED ON FIELD SURVEYING AT THE SITEAND INFORMATION PROVIDED BY THE CONTRACTOR.

Prepared For:
Fenton Motor Group
2601 Network Blvd., Ste. 202
Frisco, TX 75034
Telephone: (903) 592-9600
Contact: Lance Fenton

Plotted by: tbarnett Plot Date: 3/15/2016 - 1:52 PM
Drawing: G:\2014_JOBS\14-077 Nissan of Rockwall\14-077 Cover.dwg Saved By: tbarnett Save Time: 3/15/2016 - 1:36:14 PM

Plotted By: DBond10 Plot Date: 3/25/2015 10:56 AM
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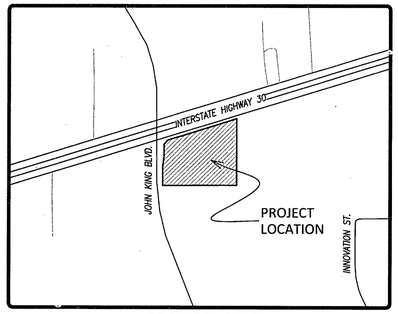
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80 0 40 80 160

1 inch = 80 ft.

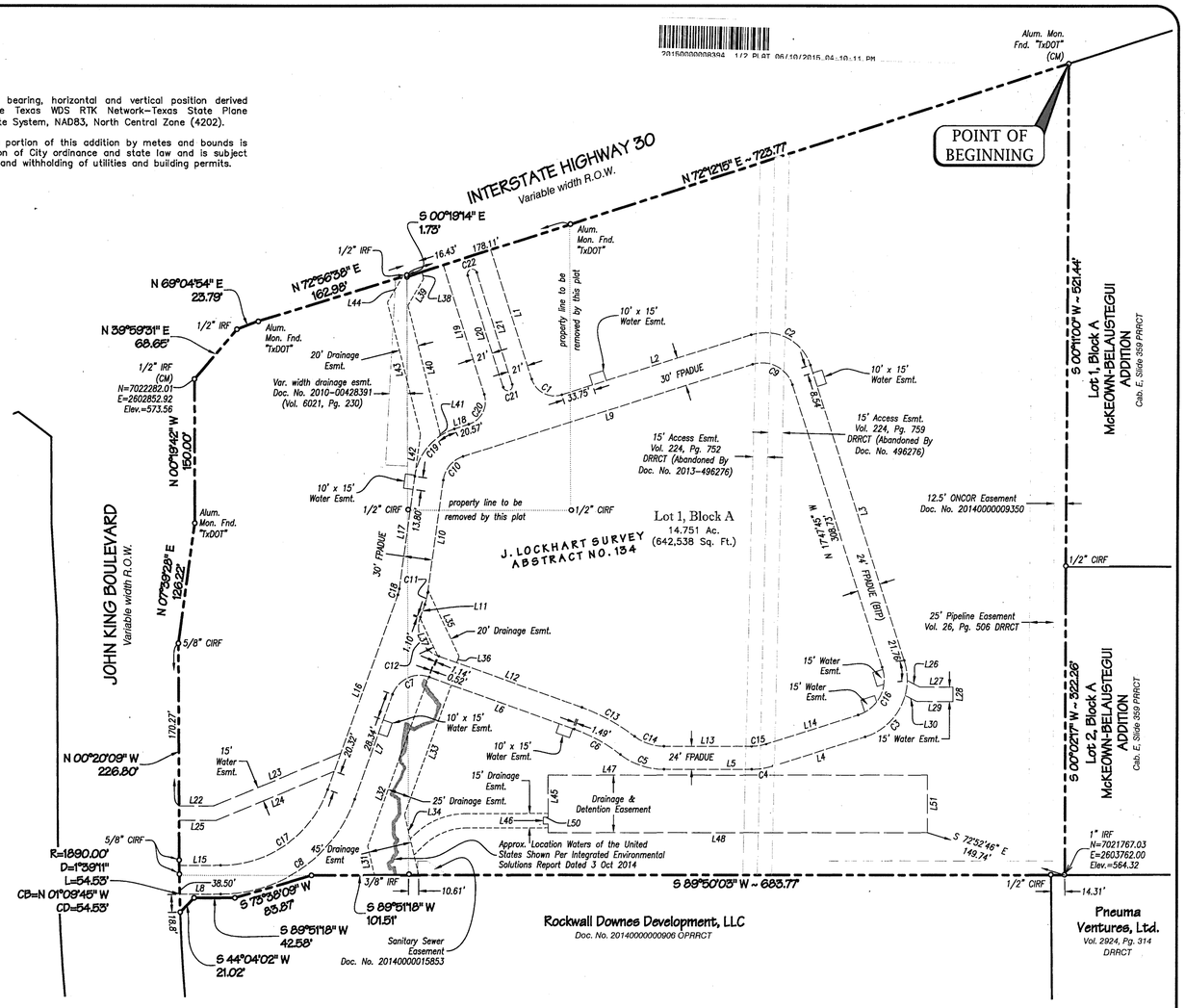
LEGEND (Not all items may be applicable)	
o	1/2" IRON ROD WITH PLASTIC CAP STAMPED "SPIARSENG" SET, UNLESS OTHERWISE NOTED
IRF	IRON ROD FOUND
CIRF	CAPPED IRON ROD FOUND
CM	CONTROL MONUMENT
FPADUE	FIRELANE, PUBLIC ACCESS, DRAINAGE, & UTILITY EASEMENT
(BTP)	BY THIS PLAT
R.O.W.	RIGHT-OF-WAY
BL	BUILDING LINE
DRRCT	DEED RECORDS, ROCKWALL COUNTY, TEXAS



LOCATION MAP
1" = 1000'

NOTES:

1. Basis of bearing, horizontal and vertical position derived from the Texas WDS RTK Network–Texas State Plane Coordinate System, NAD83, North Central Zone (4202).
2. 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.



Line Table		
Line #	Bearing	Distance
L1	S 17°47'45" E	141.50'
L2	N 72°12'15" E	207.14'
L3	S 17°47'45" E	322.73'
L4	S 72°12'15" W	100.46'
L5	S 89°50'03" W	91.34'
L6	N 70°20'17" W	160.84'
L7	S 19°39'43" W	116.35'
L8	S 89°39'51" W	42.84'
L9	S 72°12'15" W	316.92'
L10	S 07°39'28" W	118.27'
L11	S 19°39'43" W	13.87'
L12	S 70°20'17" E	158.84'
L13	N 89°50'03" E	91.34'
L14	N 72°12 15" E	100.47'
L15	N 89°39'51" E	43.19'
L16	N 19°39'43" E	216.23'
L17	N 07°39'28" E	118.27'
L18	N 72°12'15" E	15.78'
L19	N 17°47'45" W	141.50'
L22	N 89°50'54" E	35.99'
L23	N 67°20'54" E	144.77'
L24	S 67°20'54" W	134.10'
L25	S 89°50'54" W	38.93'
L26	S 62°47'45" E	14.91'
L27	S 89°57'28" E	34.41'
L28	S 00°02'32" W	15.00'
L29	N 89°57'28" W	38.04'
L30	N 62°47'45" W	13.32'
L31	N 13°12'24" W	31.20'
L32	N 19°39'43" E	188.05'

Line Table		
Line #	Bearing	Distance
L33	S 19°39'43" W	143.82'
L34	S 13°12'24" E	65.22'
L35	S 25°20'17" E	76.19'
L36	S 19°39'43" W	7.23'
L37	N 25°20'17" W	43.62'
L38	S 14°12'06" E	6.97'
L39	S 30°47'54" W	31.90'
L40	S 14°12'06" E	138.24'
L41	S 07°39'28" W	3.04'
L42	N 07°39'28" E	42.70'
L43	N 14°12'06" W	142.67'
L44	N 30°47'54" E	30.84'
L45	N 00°09'57" W	44.00'
L46	N 00°09'57" W	7.00'
L47	N 89°50'03" E	395.00'
L48	S 89°50'03" W	395.00'

Curve Table					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Dist.
C1	39.27'	25.00'	90°00'00"	S 62°47'43" E	35.35'
C2	76.97'	49.00'	90°00'00"	S 62°47'45" E	69.30'
C3	99.97'	63.04'	90°51'28"	S 26°45'37" W	89.82'
C4	22.77'	74.00'	17°37'49"	S 81°01'09" W	22.68'
C5	48.85'	74.00'	37°49'14"	N 71°15'19" W	47.96'
C6	55.27'	176.00'	17°59'34"	N 61°20'30" W	55.04'
C7	47.12'	30.00'	90°00'00"	S 64°39'43" W	42.43'

Curve Table					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Dist.
C8	183.27'	150.00'	70°00'08"	S 54°39'47" W	172.08'
C9	51.84'	33.00'	89°59'59"	N 62°47'45" W	46.67'
C10	33.80'	30.00'	64°32'47"	S 39°55'51" W	32.04'
C11	12.57'	60.00'	12°00'15"	S 13°39'35" W	12.55'
C12	50.27'	32.00'	90°00'00"	S 25°20'17" E	45.25'
C13	62.81'	200.00'	17°59'34"	S 61°20'30" E	62.55'
C14	33.00'	50.00'	37°49'14"	S 71°15'20" E	32.41'

Curve Table					
Curve #	Length	Radius	Delta	Chord Bearing	Chord Dist.
C15	15.39'	50.00'	17°37'49"	N 81°01'10" E	15.32'
C16	62.26'	39.02'	91°25'30"	N 26°28'44" E	55.87'
C17	146.61'	120.00'	70°00'08"	N 54°39'47" E	137.66'
C18	6.29'	30.00'	12°00'15"	N 13°39'35" E	6.27'
C19	67.59'	60.00'	64°32'47"	N 39°55'51" E	64.07'
C20	39.27'	25.00'	90°00'00"	N 27°12'15" E	35.36'

OWNER / APPLICANT
Security Holdings, Inc.
2601 Network Blvd., Ste. 202
Frisco, TX 75034
Telephone (469) 535-2200
Contact: Bill Lavin

ENGINEER / SURVEYOR
Spiars Engineering, Inc.
765 Custer Road, Suite 100
Plano, TX 75075
Telephone: (972) 422-0077
TBPE No. F-2121
Contact: John Spiars

REPLAT

NISSAN OF ROCKWALL ADDITION

LOT 1, BLOCK A (14.751 ACRES)
BEING A REPLAT OF PART OF LOT 1, BLOCK A
LAFON SUBDIVISION & 2 UNPLATTED TRACTS
IN THE J. LOCKHART SURVEY, ABSTRACT NO. 134
CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS

I191

Scale: 1" = 80' February, 2015 SEI Job No. 14-077

Plotted by: DBrown Plot Date: 2/18/2015 3:09 PM
Drawing: G:\2014 JOBS\14-077 Nissan of Rockwall\14-077 Final Plat.dwg Saved By: DBrown Save Time: 2/18/2015 2:31:57 PM

STATE OF TEXAS §
COUNTY OF ROCKWALL §

OWNER'S CERTIFICATE

WHEREAS Security Holdings, Inc., is the owner of a tract of land situated in the J. Lockhart Survey, Abstract No. 134, City of Rockwall, Rockwall County, Texas, the subject tract being a portion of Lot 1, Block A, Lafon Subdivision according to the deed recorded in Cabinet B, Slide 42 of the Plat Records, Rockwall County, Texas (PRRCT), as conveyed to Security Holdings, Inc., recorded in Document No. 20140000007755 of the Official Public Records, Rockwall County, Texas (OPRRCT), and being all of a tract conveyed to Security Holdings, Inc., recorded in Document No. 20140000009352 OPRRCT, and being all of a tract conveyed to Security Holdings, Inc., recorded in Document No. 20140000009351 OPRRCT, and being all of a tract conveyed to Security Holdings, Inc., recorded in Document No. 20140000015198 OPRRCT, the subject tract being more particularly described as follows:

BEGINNING at an aluminum TxDOT right-of-way monument found on the south line of Interstate Highway 30, a variable width public right-of-way, for the northwest corner of Lot 1, Block A, McKeown-Belastegui Addition, an addition recorded in Cabinet E, Slide 359 PRRCT;

THENCE S 00°11'00" W, 521.44 feet along the common line thereof to a 1/2" iron rod with plastic cap found for the southwest corner thereof and for the northwest corner of Lot 2, Block A, McKeown-Belastegui Addition;

THENCE S 00°02'17" W, 322.26 feet along the common line thereof to a 1" iron rod found for the southwest corner thereof and being on the north line of a tract conveyed to Pneuma Ventures, Ltd., recorded in Volume 2924, Page 314 DRRCT;

THENCE S 89°50'03" W, along the common line thereof, passing at 14.31 feet a 1/2" iron rod with plastic cap found for the northeast corner of a tract conveyed to Rockwall Downes Development, LLC, recorded in Document No. 20140000000906 OPRRCT, and continuing along the common line thereof a total distance of 683.77 feet to a 3/8" iron rod found;

THENCE S 89°51'18" W, 101.51 feet continuing along the common line thereof to a 1/2" iron rod with plastic cap stamped "SPIARSENG" set;

THENCE S 73°38'09" W, 83.87 feet continuing along the common line thereof to a 1/2" iron rod with plastic cap stamped "SPIARSENG" set;

THENCE S 89°51'18" W, 42.58 feet continuing along the common line thereof to a 1/2" iron rod with plastic cap stamped "SPIARSENG" set;

THENCE S 44°04'02" W, 21.02 continuing along the common line thereof to a 1/2" iron rod with plastic cap stamped "SPIARSENG" set on the east line of John King Boulevard;

THENCE along the east line of John King Boulevard, the following:

Around a non-tangent curve to the right having a central angle of 01°29'09", a radius of 1890.00 feet, a chord of N 01°09'45" W - 54.53 feet, passing at an arc length of 38.50 feet a 5/8" iron rod with plastic cap found for corner, continuing a total arc length of 54.53 feet to a 5/8" iron rod with plastic cap found;

N 00°20'09" W, 226.80 feet to a 5/8" iron rod with plastic cap found;

N 07°39'28" E, 126.22 feet to an aluminum TxDOT right-of-way monument found;

And N 00°19'42" W, 150.00 feet to a 1/2" iron rod found for the south end of a corner clip being the intersection of John King Boulevard and Interstate Highway 30;

THENCE N 39°59'31" E, 68.65 feet along said corner clip to a 1/2" iron rod found;

THENCE along the south line of Interstate Highway 30, the following:

N 69°04'54" E, 23.79 feet to an aluminum TxDOT right-of-way monument found;

N 72°56'38" E, 162.98 feet to a 1/2" iron rod found;

S 00°19'14" E, 1.73 feet to a 1/2" iron rod with plastic cap stamped "SPIARSENG" set;

And N 72°12'15" E, passing at 178.11 feet an aluminum TxDOT right-of-way monument found, continuing a total distance of 723.77 feet to the POINT OF BEGINNING with the subject tract containing 642,538 square feet or 14.751 acres of land.

Lienholder:

By: N/A

Name: _____

Title: _____

STATE OF TEXAS §
COUNTY OF COLLIN §

BEFORE ME, the undersigned, a Notary Public in and for The State of Texas, on this day personally appeared _____, known to me to be the person and officer whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and considerations therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the _____ day of _____, 2015.

_____
Notary Public, State of Texas

NOW THEREFORE, KNOW ALL MEN BY THESE PRESENTS:

We the undersigned owner(s) of the land shown on this plat, and designated herein as the NISSAN OF ROCKWALL ADDITION to the City of Rockwall, Texas, and whose name is subscribed hereto, hereby dedicated to the use of the public forever all streets, alleys, parks, water course, drains, easements and public places thereon shown on the purpose and consideration therein expressed. We further certify that all other parties who have a mortgage or lien interest in the NISSAN OF ROCKWALL ADDITION have been notified and signed this plat.

We understand and do hereby reserve the easement strips shown on this plat for the purposes stated and for the mutual use and accommodation of all utilities desiring to use or using same. We also understand the following;

1. No buildings shall be constructed or placed upon, over, or across the utility easements as described herein.
2. Any public utility shall have the right to remove and keep removed all or part of any buildings, fences, trees, shrubs, or other growths or improvements which in any way endanger or interfere with construction, maintenance or efficiency of their respective system on any of these easement strips; and any public utility shall at all times have the right of ingress or egress to, form and upon the said easement strips for purpose of construction, reconstruction, inspecting, patrolling, maintaining, and either adding to or removing all or part of their respective system without the necessity of , at any time, procuring the permission of anyone.
3. The City of Rockwall will not be responsible for any claims of any nature resulting from or occasioned by the establishment of grade of streets in the subdivision.
4. The developer and subdivision engineer shall bear total responsibility for storm drain improvements. Maintenance, repairs, and responsibility of the detention system shall be the property owner's.
5. The developer shall be responsible for the necessary facilities to provide drainage patterns and drainage controls such that properties within the drainage area are not adversely affected by storm drainage from the development.
6. No house dwelling unit, or other structure shall be constructed on any lot in the addition by the owner or any other person until the developer and/or owner has complied with all requirements of the Subdivision Regulation of the City of Rockwall regarding improvements with respect to the entire block on the street or streets on which property abuts, including the actual installation of streets with the required base and paving, curb and gutter, water and sewer, drainage structures, storm structures, storm sewers, and alleys according to the specifications of the City of Rockwall; or

Until an escrow deposit, sufficient to pay for the cost of such improvements, as determined by the city's engineer and/or city administrator, computed on a private commercial rate basis, has been made with the city secretary, accompanied by an agreement signed by the developer and/or owner, authorizing the city to make such improvements at prevailing private commercial rates, or have the same made by a contractor and pay for the same out of the escrow deposit, should the developer and/or owner fail to refuse to install the required improvements within the time stated in such written agreement, but in no case shall the City be obligated to make such improvements itself. Such deposit may be used by the owner and/or developer as progress payments as the work progresses in making such improvements by making certified requisitions to the city secretary, supported by evidence of work done; or

Until the developer and/or owner files a corporate surety bond with the city secretary in a sum equal to the cost of such improvements for the designated area, guaranteeing the installation thereof within the time stated in the bond, which time shall be fixed by the city council of the City of Rockwall.

We further acknowledge that the dedications and/or exaction's made herein are proportional to the impact of the Subdivision upon the public services required in order that the development will comport with the present and future growth needs of the City; We, our successors and adding hereby waive any claim, damage, or cause of action that We may have as a result of the dedication of exaction's made herein.

Security Holdings, Inc.

By: Brad Fenton

STATE OF TEXAS §
COUNTY OF Collin §

BEFORE ME, the undersigned, a Notary Public in and for The State of Texas, on this day personally appeared Brad Fenton, known to me to be the person and officer whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and considerations therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 3 day of June, 2015.

Amie Bullock
Notary Public, State of Texas

AMIE BULLOCK
Notary Public, State of Texas
My Commission Expires
February 13, 2016

SURVEYOR'S CERTIFICATE

That I, Darren K. Brown, of Spiars Engineering, Inc., do hereby certify that I prepared this plat and the field notes made a part thereof from an actual and accurate survey of the land and that the corner monuments shown thereon were properly placed under my personal supervision, in accordance with the Subdivision Regulations of the City of Rockwall Texas.

Dated this the 19 day of FEBRUARY, 2015.

DARREN K. BROWN, R.P.L.S. NO. 5252

STATE OF TEXAS
REGISTERED
DARREN K. BROWN
5252
PROFESSIONAL
LAND SURVEYOR

STATE OF TEXAS §
COUNTY OF COLLIN §

BEFORE ME, the undersigned, a Notary Public in and for The State of Texas, on this day personally appeared Darren K. Brown, known to me to be the person and officer whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and considerations therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 19 day of February, 2015.

Notary Public, State of Texas

JOY L. O'BRIEN
Notary Public, State of Texas
My Commission Expires
March 01, 2016

CERTIFICATE OF APPROVAL

Planning and Zoning Commission — 12.30.2014 Date

APPROVED

I hereby certify that the above and forgoing plat of an addition to the City of Rockwall, Texas, was approved by the City Council of the City of Rockwall on the 5th day of January, 2015.

This approval shall be invalid unless the approved plat for such addition is recorded in the office of the County Clerk of Rockwall, County, Texas, within one hundred eighty (180) days from the said date of final approval.

WITNESS OUR HANDS this the 13 day of May, 2015.

Mayor, City of Rockwall — City Secretary — City Engineer

CITY OF ROCKWALL TEXAS SEAL

Filed and Recorded
Official Public Records
Shelli Miller, County Clerk
Rockwall County, Texas
05/12/2015 04:10:11 PM
$100.00
20150000008394

REPLAT

NISSAN OF ROCKWALL ADDITION

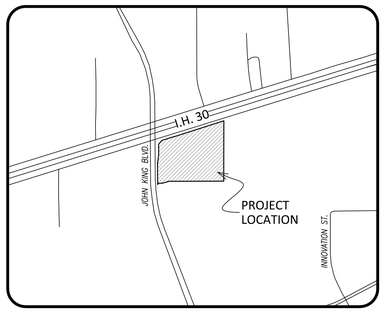
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CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS

OWNER / APPLICANT
Security Holdings, Inc.
2601 Network Blvd., Ste. 202
Frisco, TX 75034
Telephone (469) 535-2200
Contact: Bill Lavin

ENGINEER / SURVEYOR
Spiars Engineering, Inc.
765 Custer Road, Suite 100
Plano, TX 75075
Telephone: (972) 422-0077
TBPE No. F-2121
Contact: John Spiars

I192

February, 2015 SEI Job No. 14-077



Vicinity Map
N.T.S.

Note:
All work to be done within TxDOT Right-Of-Way shall conform to TxDOT Standards and Specifications.

50 0 25 50 100
1 inch = 50ft.

GENERAL NOTES

1. All materials and construction shall conform to City of Rockwall Stds. and Specifications and NCTCOG 3rd Edition.
2. Contractor shall be responsible for maintaining trench safety requirements in accordance with City Standards, Texas State Law, and O.S.H.A. Standards for all excavation in excess of five feet in depth. Contractor shall provide a trench safety plan.
3. The location of all utilities located on these plans are taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown on the plans may be present.
4. It shall be the responsibility of the Contractor to protect all public utilities in the construction of this project.
5. All dimensions are to the face of curb or edge of building.
6. See Architectural Plans for exact building and related sidewalk dimensions.
7. All parking spaces are 9'x20' unless noted otherwise.
8. All paving and earthwork operations shall conform to the recommendations in the Geotechnical Investigation Report
9. Contractor shall install handicap signage adjacent to back of curb at all handicap parking spaces.
10. Fire lanes shall be striped in accordance with the City of Rockwall Standards.
11. Contractor shall install traffic control for any work within city R.O.W. traffic control shall conform to part VI of the "Texas Manual on Uniform Traffic Control Devices".
12. Detention volume for 3.19 acres of site provided by Rockwall Downes Addition per Development Plans by Corwin Engineering, dated 9/3/2014. Detention for remainder of site to be provided underground as noted.

Notes:
1. Handicap Parking Is Provided In Accordance w/ ADA Standards.
2. No Floodplain Exists On The Site.
3. Site Plan Is For Informational Purposes Only. It Is Not A Construction Document.

SYNOPSIS	Lot 1, Block A	
Zoning	Commercial (C) & Light Industrial (LI) w/SUP	
Use	Car Dealership	
Lot Area	14.751 Ac. (642,538 S.F.)	
Building Area	80,233 Sq. Ft. Building 2,272 Sq. Ft. Car Wash 82,505 Sq. Ft. Total	
Building Height	36'-0" Max.	
Lot Coverage	12.84% Of Site	
Parking Required:	21,636 s.f. Retail Sales & Service @ 1 sp./250 s.f. = 87 Sp. 2,625 s.f. Office @ 1 sp./250 s.f. = 11 Sp. 44 Service Bays @ 2 sp./Bay = 88 Sp.	
Total Parking Required:		186 Sp. Req'd (Incl. 7 HC)
Total Parking Provided:		214 Sp. (Incl. 7 HC) 783 Inventory Sp.
	Total	997 Sp. (Inc. 7 HC)

Pervious Area: 153,143 s.f.
Impervious Area: 489,395 s.f.

LEGEND

- FIRELANE, ACCESS, DRAINAGE & UTILITY ESMT.
- 699 EXISTING CONTOUR
- SANITARY SEWER MANHOLE
- FIRE HYDRANT
- BFR PROP. TYPE 7 BARRIER FREE RAMP
- (Inv.) INVENTORY PARKING
- (Req.) REQUIRED PARKING

Variance Requests for Special Consideration

1. Request alternative masonry percentages on exterior walls.
2. Request alternative horizontal articulation of facades.
3. Request alternative vertical articulation of facades.
4. Request variance to slightly increase the maximum footcandle (fc) at the north and west property lines only from 0.2 fc to 0.5 fc.
5. Request variance to provide a living screen adjacent to the residential lots along the south property line.
6. Request variance to utilize 21' fire lane widths and the one-way entry and exit drives at the north side of the property.

SITE PLAN

FENTON NISSAN OF ROCKWALL

LOT 1, BLOCK A
IN THE CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
14.751 Acres
Zoned: LI/C
Case No: SP2014-029

OWNER
Fenton Motor Group
2601 Network Blvd., Suite 202
Frisco, TX 75034
Telephone: (469) 535-2200
Contact: Brad Fenton

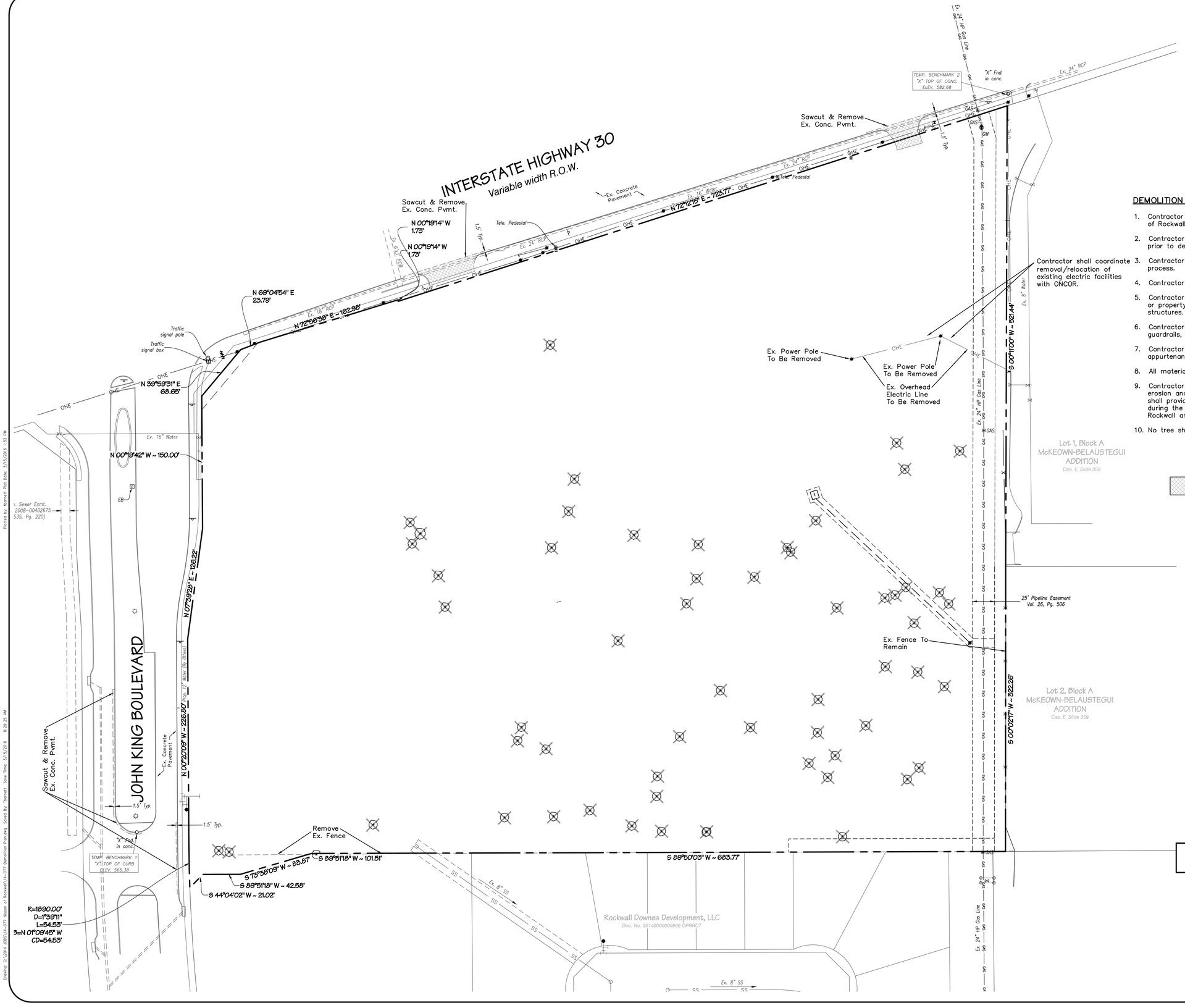
ARCHITECT
Boynton Williams & Associates
3010 LBJ Freeway, Suite 110
Dallas, TX 75234
Telephone: (972) 661-5461
Contact: Jeff Ball

ENGINEER/SURVEYOR
Spiars Engineering, Inc.
TBPE No. F-2121
765 Custer Road, Suite 100
Plano, TX 75075
Telephone: (972) 422-0077
Contact: John Spiars

LANDSCAPE ARCHITECT
Szafranski-Pugh & Associates
42 East 16th Street
Tulsa, OK 74119
Telephone: (918) 382-9081
Contact: Jeff Pugh

Scale: 1"=50' November 20, 2014 SEI Job No. 14-077

Plotted by: tbarnett Plot Date: 3/5/2016 1:53 PM
Drawing: G:\2014 JOBS\14-077 Nissan of Rockwall\14-077 Site Plan.dwg Saved By: tBlondfo Save Time: 4/1/2015 12:06:57 PM



DEMOLITION GENERAL NOTES

1. Contractor shall abide by the Demolition Specifications and all applicable City of Rockwall requirements, ordinances, etc.
2. Contractor shall notify all affected utility companies a minimum of one week prior to demolition in order to comply with their requirements.
3. Contractor shall maintain positive drainage at all times during the demolition process.
4. Contractor shall protect all existing utilities during the demolition process.
5. Contractor shall perform work in a manner to eliminate hazards to persons or property, and avoid interference with adjacent areas, utilities, and structures.
6. Contractor shall provide temporary barricades, fences, warning signs, guardrails, warning lights, etc.
7. Contractor shall protect existing structures, landscaping materials, and appurtenances which are not being demolished.
8. All materials removed shall be disposed of offsite in a legal manner.
9. Contractor shall refer to the Storm Water Pollution Prevention Plan for erosion and pollution control during the demolition process. The Contractor shall provide any additional erosion or pollution prevention devices as required during the demolition process in order to completely conform with the City of Rockwall and TCEQ requirements.
10. No tree shall be removed without prior approval by the Owner & City Arborist.

DEMOLITION LEGEND

Remove Existing Concrete Pavement

Remove Existing Tree – Reference Landscape Architect Plans for mitigation.

RECORD DRAWINGS

NOTE:
TO THE BEST OF OUR KNOWLEDGE, SPIARS ENGINEERING, INC. HEREBY STATES THAT THIS PLAN IS A RECORD DRAWING. THE INFORMATION PROVIDED IS BASED ON FIELD SURVEYING AT THE SITEAND INFORMATION PROVIDED BY THE CONTRACTOR.

BENCHMARKS:

1: "X" cut on center of north median nose on John King Blvd. 64' northwest of southwest property corner.
Elevation = 565.38'

2: "X" cut on southwest corner of concrete pad by TxDOT manhole along I.H. 30 Frontage Road 13' north of northeast property corner.
Elevation = 582.68'

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

STATE OF TEXAS
JOHN W. SPIARS
84016
LICENSED
PROFESSIONAL ENGINEER
3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

DEMOLITION PLAN

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

Revisions | Date

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 1
of 15

SEI No. 14-077

Drawing: G:\2014_JOBS\14-077 Nissan of Rockwall\14-077 Demolition Plan.dwg Saved By: tbarnett Save Time: 3/15/2016 8:29:25 AM Plotted by: tbarnett Plot Date: 3/15/2016 1:53 PM

Centerline Line Table		
Line #	Length	Direction
L1	57.59	S89°39'51"W
L2	216.23	S19°39'43"W
L3	146.69	S07°39'28"W
L4	158.35	S19°39'43"W
L5	188.32	N00°20'09"W
L6	183.86	S00°20'09"E
L7	105.88	N82°20'32"W
L8	285.04	N07°39'28"E
L9	134.98	S07°39'28"W
L10	166.54	S07°39'28"W
L12	204.93	N72°12'15"E
L13	176.37	N72°12'15"E
L14	60.00	S17°47'45"E
L15	311.20	N17°47'45"W
L16	131.00	N17°47'45"W
L18	409.49	S72°12'15"W
L19	409.49	N72°12'15"E
L20	98.27	S17°47'45"E
L21	415.35	S00°11'00"W
L22	188.77	N72°12'15"E

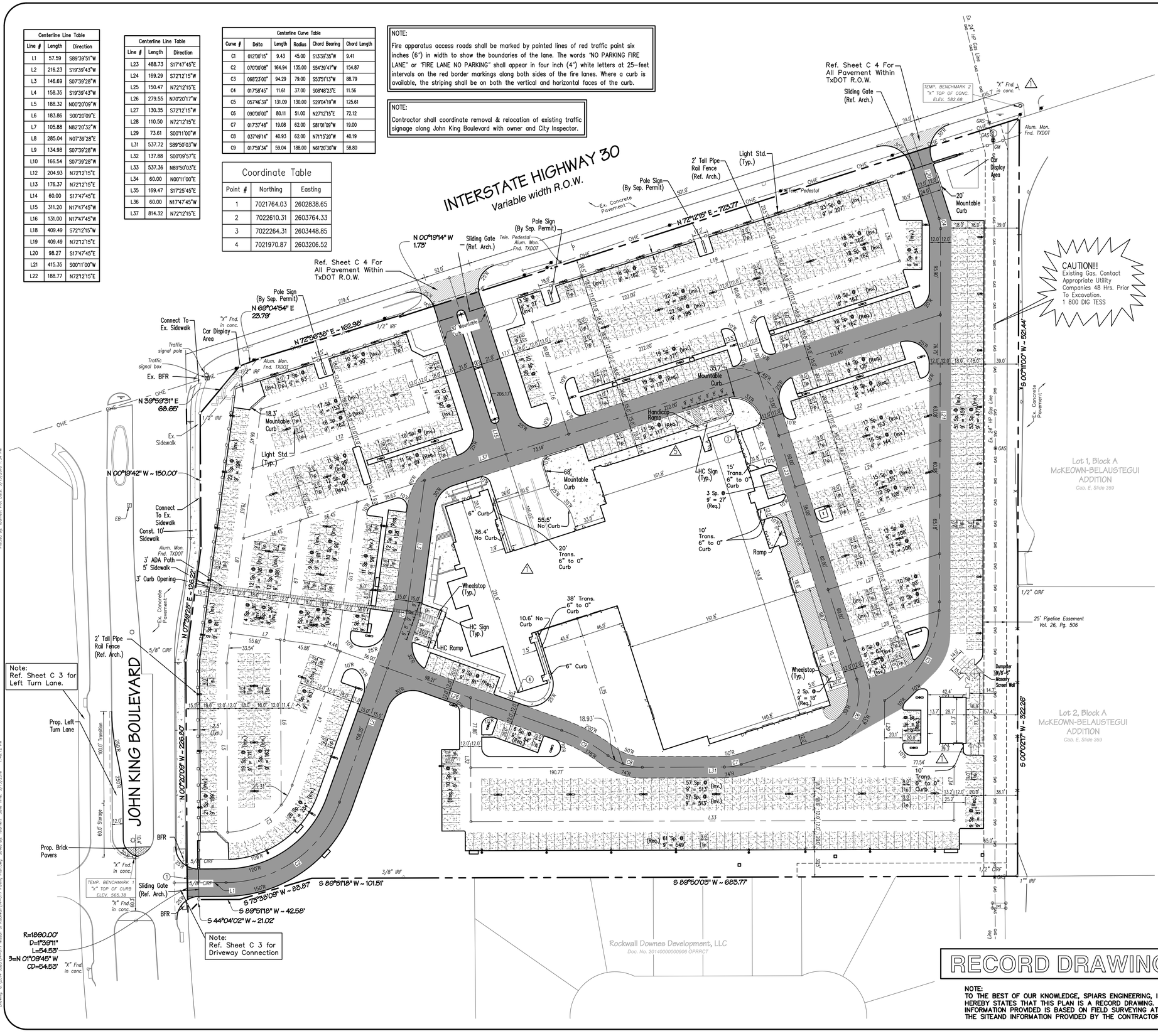
Centerline Line Table		
Line #	Length	Direction
L23	488.73	S17°47'45"E
L24	169.29	S72°12'15"W
L25	150.47	N72°12'15"E
L26	279.55	N70°20'17"W
L27	130.35	S72°12'15"W
L28	110.50	N72°12'15"E
L29	73.61	S00°11'00"W
L31	537.72	S89°50'03"W
L32	137.88	S00°09'57"E
L33	537.36	N89°50'03"E
L34	60.00	N00°11'00"E
L35	169.47	S17°25'45"E
L36	60.00	N17°47'45"W
L37	814.32	N72°12'15"E

Centerline Curve Table					
Curve #	Delta	Length	Radius	Chord Bearing	Chord Length
C1	012°00'15"	9.43	45.00	S13°39'35"W	9.41
C2	070°00'08"	164.94	135.00	S54°39'47"W	154.87
C3	068°23'00"	94.29	79.00	S53°51'13"W	88.79
C4	017°56'45"	11.61	37.00	S08°48'23"E	11.56
C5	057°46'39"	131.09	130.00	S29°04'19"W	125.61
C6	090°00'00"	80.11	51.00	N27°12'15"E	72.12
C7	017°37'48"	19.08	62.00	S81°01'09"W	19.00
C8	037°49'14"	40.93	62.00	N71°15'20"W	40.19
C9	017°59'34"	59.04	188.00	N61°20'30"W	58.80

Coordinate Table		
Point #	Northing	Easting
1	7021764.03	2602838.65
2	7022610.31	2603764.33
3	7022264.31	2603448.85
4	7021970.87	2603206.52

NOTE:
Fire apparatus access roads shall be marked by painted lines of red traffic paint six inches (6") in width to show the boundaries of the lane. The words "NO PARKING FIRE LANE" or "FIRE LANE NO PARKING" shall appear in four inch (4") white letters at 25-feet intervals on the red border markings along both sides of the fire lanes. Where a curb is available, the striping shall be on both the vertical and horizontal faces of the curb.

NOTE:
Contractor shall coordinate removal & relocation of existing traffic signage along John King Boulevard with owner and City Inspector.



50 0 25 50 100
1 inch = 50 ft.

NOTES:

1. All materials and construction shall conform to the City of Rockwall Standard Details and Specifications & NCTCOG 3rd Edition.
2. It shall be the responsibility of the Contractor to protect all public utilities in the construction of this project. All manholes, cleanouts, valve boxes, fire hydrants, etc. must be adjusted to proper line and grade by the Contractor prior to and after the placing of permanent paving. Utilities must be maintained to proper line and grade during construction of this project.
3. The Contractor shall be responsible for coordinating with all the appropriate utility companies for the location of all utilities within the construction area.
4. The Paving Contractor shall not place permanent pavement until all sleeving for irrigation, electric, gas, telephone, cable TV, site lighting, etc. has been installed. It shall be the Paving Contractor's responsibility to insure that all sleeving is in place prior to placing permanent paving.
5. All paving and earthwork operations shall conform to the recommendations in the Geotechnical Investigation, Investigation by ECS Texas, LLP, Project #19:6377, Dated 8/28/14 and the City Rockwall Standard Construction Details.
6. All dimensions are to face of curb or edge of building unless otherwise noted.
7. Irrigation sleeves shall be 4" PVC conduit. Ends shall be capped or temporarily plugged, red flag tied to each end and brought to surface 2' behind curb. Minimum depth shall be 18 inches below proposed grade.
8. Concrete shall have a minimum compressive strength at 28 days of 3600 psi for pavement and curbs; 3000 psi for sidewalks.
9. Refer to Architectural Plans for exact building and related sidewalk dimensions.
10. Fences, berms walls, shrubs, trees, signs, structures, etc. are limited to a maximum height of 2 feet above the adjacent curb within visibility easements.
11. Contractor shall install traffic control for any work within R.O.W. to conform to part VI of the "Texas Manual on Uniform Traffic Control Devices."
12. Reference Site Details (Sheet C 15) for pavement section details.
13. Longitudinal (Key) Joints shall be placed as necessary.
14. Contractor shall extend all paving joints through curbs.
15. Contractor shall verify building and parking lot layout with the Architect prior to forming of buildings, walks and parking lot areas.
16. Contractor shall back fill against top of curbs at 4:1 max. slope to existing grade unless noted otherwise.
17. Slope of paving shall not exceed 2% at handicap accessible spaces.
18. Contractor shall grade pavement around sidewalks & curbs for positive drainage to an inlet or designated drainage area.
19. All landings at doors to be flush with finish floor.
20. The detention system shall be completely installed & functioning prior to any concrete/paving installation (including building slab).

PAVEMENT LEGEND

- 8" 3600 psi Conc. Pavement W/ #3 @ 18" O.C.E.W. with 6" subgrade compacted at least 95% of standard proctor (ASTM D-698) maximum dry density at -2 to +3 percent of optimum moisture. (Min. 6.5 sack mix)
- 7" 3600 psi Conc. Pavement W/ #3 @ 18" O.C.E.W. with 6" subgrade compacted at least 95% of standard proctor (ASTM D-698) maximum dry density at -2 to +3 percent of optimum moisture. (Min. 6.5 sack mix)
- 6" 3600 psi Conc. Pavement W/ #3 @ 18" O.C.E.W. with 6" subgrade compacted at least 95% of standard proctor (ASTM D-698) maximum dry density at -2 to +3 percent of optimum moisture. (Min. 6.5 sack mix)
- 5" 3600 psi Conc. Pavement W/ #3 @ 18" O.C.E.W. with 6" subgrade compacted at least 95% of standard proctor (ASTM D-698) maximum dry density at -2 to +3 percent of optimum moisture. (Min. 6.5 sack mix)
- 4" 3000 psi Conc. Pavement W/ #3 @ 18" O.C.E.W (Min. 5.5 sack mix)
- BFR Barrier Free Ramp (Per City Standards)

RECORD DRAWINGS

NOTE:
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Elevation = 565.38'

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Elevation = 582.68'

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

STATE OF TEXAS JOHN W. SPIARS 84016 LICENSED PROFESSIONAL ENGINEER 3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
PAVING & HORIZONTAL CONTROL PLAN

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

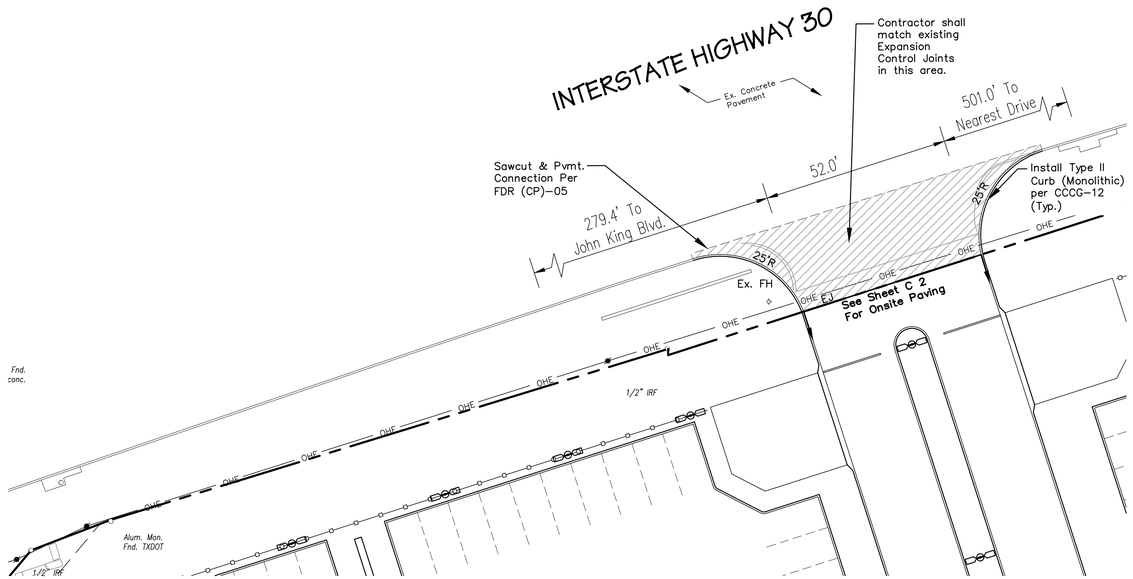
Revisions	Date
ASI #1	3/31/2015
ASI #6	9/4/2015

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Drawn By: BLM
Checked By: JWS

Sheet C 2 of 15

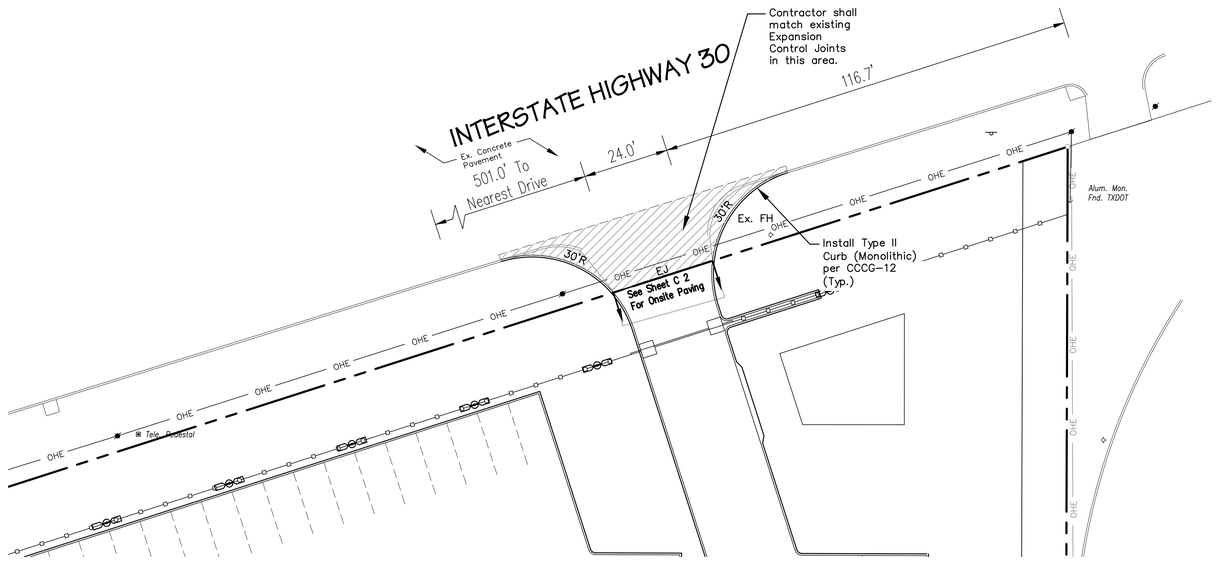
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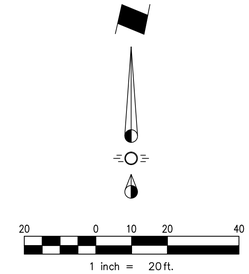


WEST DRIVEWAY

Note:
All work to be done within TxDOT Right-Of-Way shall conform to TxDOT Standards and Specifications.



EAST DRIVEWAY



TXDOT NOTES

1. These notes shall apply to all work being performed within the TxDOT ROW.
2. All Traffic Control and Protective devices used must conform to the Texas Manual of Uniform Traffic Control Devices for Streets and Highways.
3. A copy of this permit shall be kept on job site at all times during the proposed work.
4. Contractor shall leave all right of way areas undisturbed until actual construction is to be performed in said areas.
5. Contractor shall repair or replace any structures and utilities that might have been damaged by negligence or a failure to have utility located performed.
6. Provide written proposed lane closure information by 1:00 pm on the business day prior to the proposed closures. Do not close lanes when this requirement is not met.
7. Do not commence work on the road before sunrise. Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset.
8. The location of all utilities located on these plans are taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown on the plans may be present.
9. It shall be the responsibility of the Contractor to protect all public utilities in the construction of this project. All manholes, clean- outs, valve boxes, fire hydrants, etc. must be adjusted to proper line and grade by the Contractor prior to and after the placing of permanent paving. Utilities must be maintained to proper line and grade during construction of the paving for this development.
10. All earthwork operations, pavement installation, etc. shall conform to the Geotechnical Investigation.

PAVEMENT LEGEND

12" 3600 psi Conc. Pvmt. w/Rebar per CRCP(1)-11 Over 4" Type B Asphalt w/ PG 64-22 Binder Over 12" Lime Treated Subgrade (7%) Over 20" Embedment (DENS CONT)(TY C2) (Min. 6.5' Sack Mix)

RECORD DRAWINGS

NOTE:
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BENCHMARKS:

1: "X" cut on center of north median nose on John King Blvd. 64' northwest of southwest property corner.
Elevation = 565.38'

2: "X" cut on southwest corner of concrete pad by TxDOT manhole along I.H. 30 Frontage Road 13' north of northeast property corner.
Elevation = 582.68'

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

STATE OF TEXAS
JOHN W. SPIARS
84016
LICENSED
PROFESSIONAL ENGINEER
3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

PAVING PLAN-TXDOT DRIVEWAYS

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

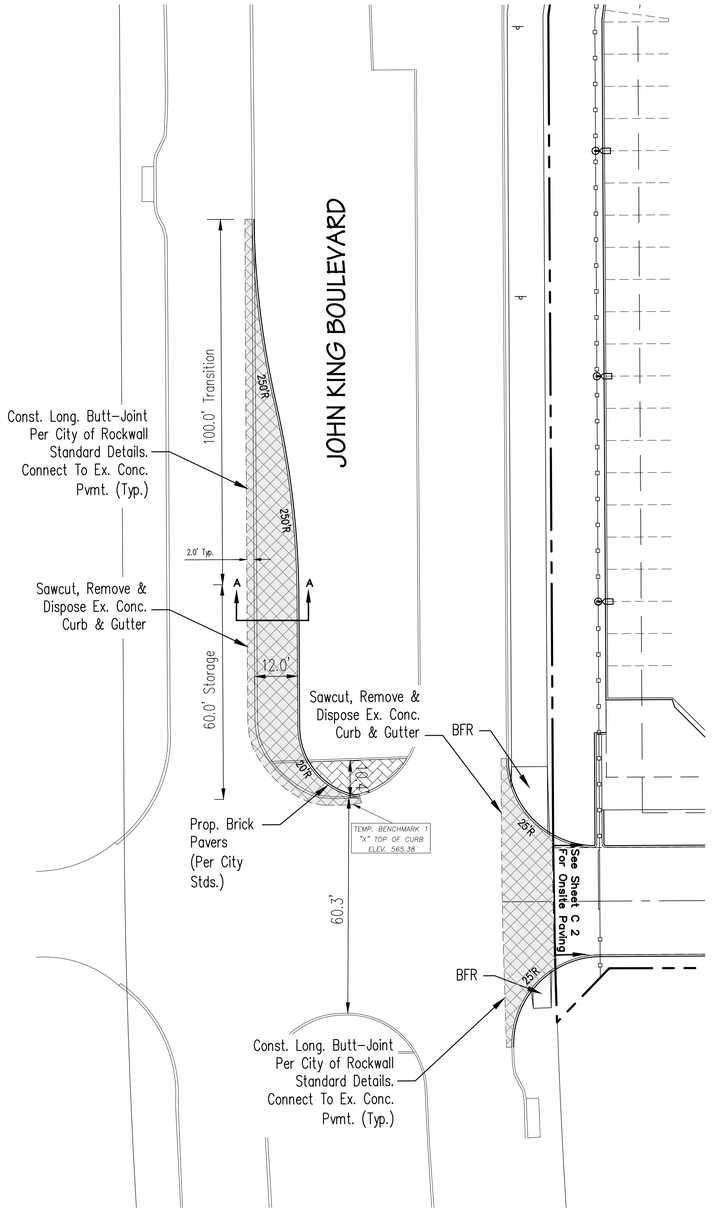
Date / Revisions

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 4 of 15

SEI No. 14-077

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PAVING PLAN

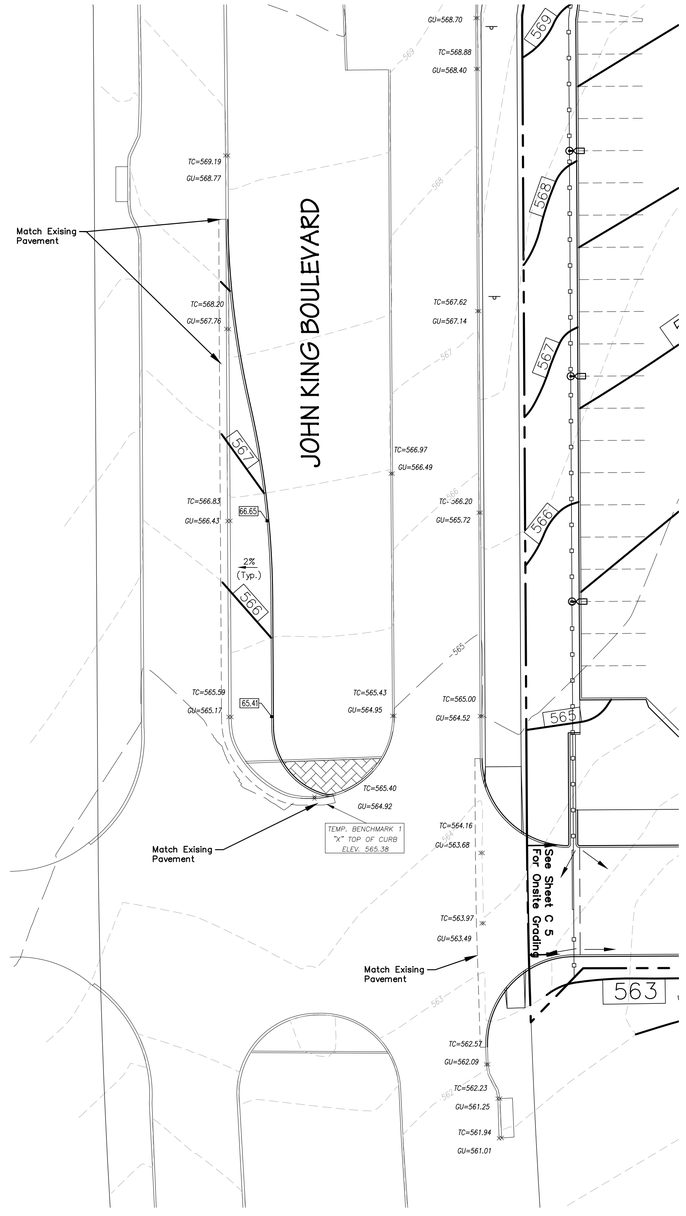
PAVEMENT LEGEND

12" 5000 psi Conc. Pavement W/#3 @ 24" O.C.E.W. Over 6" Compacted Subgrade. (Min. 7.5 Sack Mix)

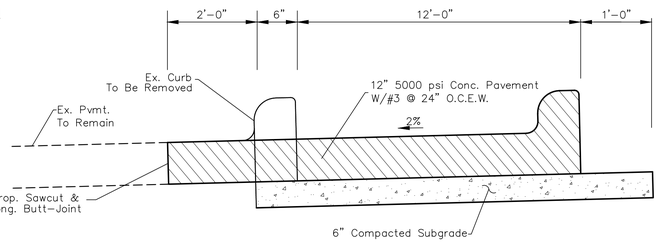
Curb & Gutter

BFR Barrier Free Ramp (Per City Standards)

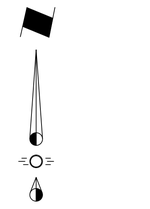
Note:
Contractor shall install traffic control for any work within R.O.W. to conform to part VI of the "Texas Manual on Uniform Traffic Control Devices", Traffic Control Plan must be submitted to the City for approval.



GRADING PLAN



SECTION A-A



LEGEND

66.13 Proposed Spot Elevation

× TC=573.50 GU=573.00 Existing Spot Elevation

571 Proposed Contour

573 Existing Contour

Direction Of Flow

RECORD DRAWINGS

NOTE:
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STATE OF TEXAS JOHN W. SPIARS 84016 LICENSED PROFESSIONAL ENGINEER 3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

PAVING & GRADING PLAN-TURN LANE

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

Date

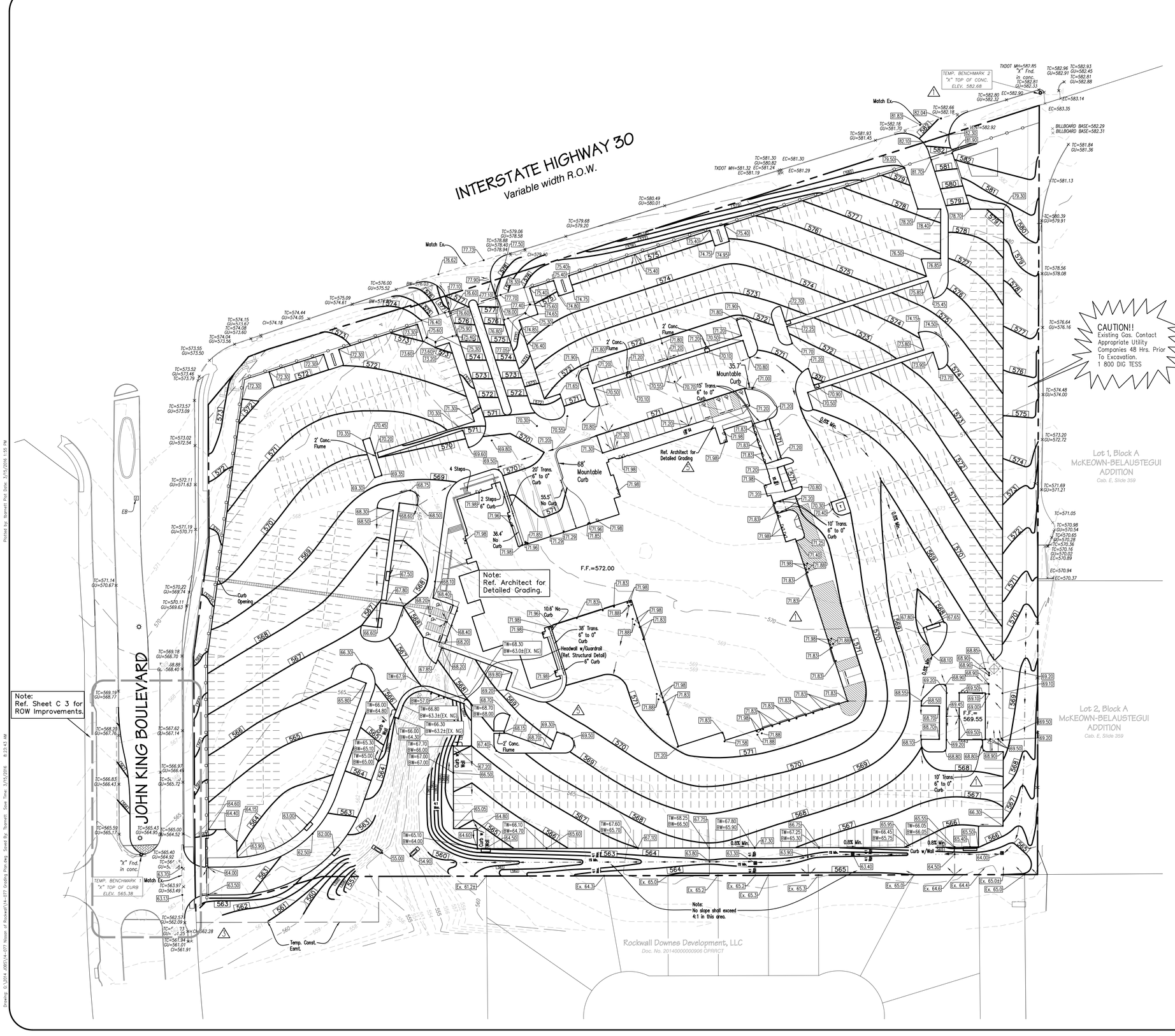
Revisions

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Checked By: JWS

Sheet C 3
of 15

SEI No. 14-077

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50 0 25 50 100

1 inch = 50ft.

GENERAL NOTES:

1. All materials and construction shall conform to the City of Rockwall Standard Details and Specifications, except as noted herein and approved by the City and NCTCOG 3rd Edition.
2. Contractor shall be responsible for maintaining trench safety requirements in accordance with City Standards, Texas State Law, and O.S.H.A. Standards for all excavation in excess of five feet in depth.
3. The location of all utilities located on these plans are taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown on the plans may be present.
4. It shall be the responsibility of the Contractor to protect all public utilities in the construction of this project. All manholes, clean-outs, valve boxes, fire hydrants, etc. must be adjusted to proper line and grade by the Contractor prior to and after the placing of permanent paving. Utilities must be maintained to proper line and grade during construction of the paving for this development.
5. Care should be taken that fill materials and areas to receive fill are relatively free of vegetation, roots, debris, large rocks or other objectionable material. Fill shall be placed in accordance with the recommendations provided in the Geotechnical investigation.
6. Drainage should be maintained away from the foundations, both during and after construction.
7. All earthwork operations, pavement installation, etc. shall conform to the Geotechnical Investigation.
8. Trees shall remain unless specified otherwise on the Landscape Plan or approved by the Owner.
9. Prior to starting construction, the Contractor shall make certain that all required permits and approvals have been obtained. No construction or fabrication shall begin until the Contractor has received and thoroughly reviewed all plans and other documents approved by all of the permitting authorities.
10. In the event an item is not covered in the City's specifications, the City Engineer's decision shall apply.
11. Barricading, traffic control, and project signs shall conform to Texas Department of Transportation standards
12. The Contractor shall verify the suitability of all existing and proposed site conditions, including grades and dimensions before commencement of any construction. In the event of any conflict, and prior to commencement of any construction, immediately notify Engineer. Minor adjustments of finish grade to accomplish spot drainage are acceptable if necessary, upon prior approval of Engineer. All paving installed shall "flush out" at any juncture with existing paving.
13. Proposed spot elevations are finished grade elevations (top of pavement, top of sod, etc.)
14. Erosion control shall be in place prior to the disturbance of any existing surface.
15. All sidewalk and crosswalk slopes shall conform to ADA requirements as follows:
    1:20 longitudinal (along the walk) max.
    1:50 transverse (across the walk) max.
16. All fill to be compacted to a minimum 95% standard density using a sheep's foot roller.

LEGEND

- 66.13 — Proposed Spot Elevation
- × TC=573.50 GU=573.00 — Existing Spot Elevation
- 571 — Proposed Contour
- 573 — Existing Contour
- → Direction Of Flow

RECORD DRAWINGS

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Elevation = 582.68' △

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

STATE OF TEXAS JOHN W. SPIARS 84016 LICENSED PROFESSIONAL ENGINEER 3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
GRADING PLAN

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

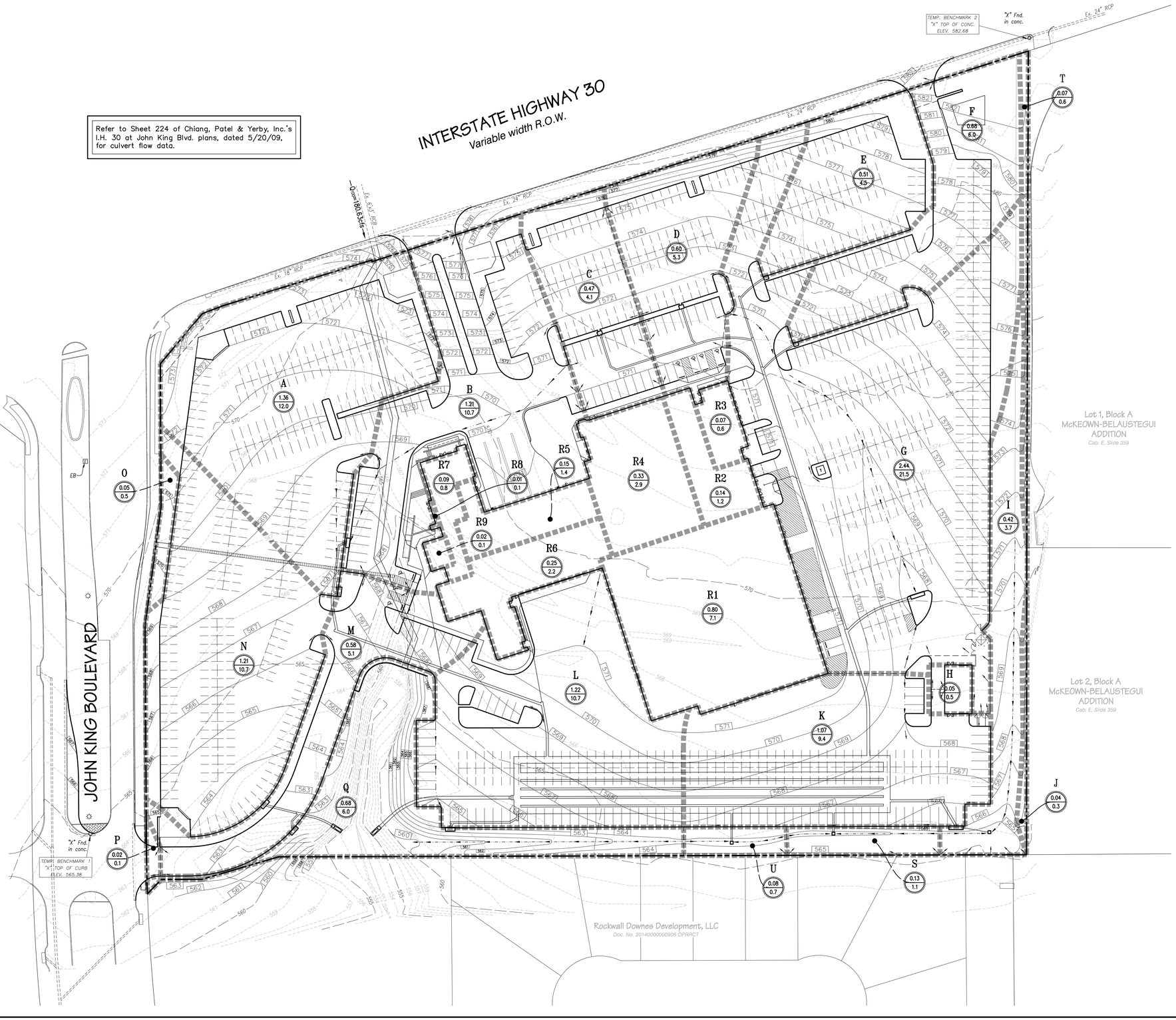
Revisions	Date
△ ASI #1	5/31/2015
△ ASI #3	5/20/2015
△ ASI #6	9/4/2015

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 5 of 15

SEI No. 14-077

Plotted by: tbarnett Plot Date: 3/15/2016 1:55 PM
Drawing: G:\2014_JOBS\14-077 Nissan of Rockwall\14-077 Grading Plan.dwg Saved By: tbarnett Save Time: 3/15/2016 8:25:43 AM



50 0 25 50 100

1 inch = 50ft.

Drainage Summary

Drainage Area	Drainage Area (Acres)	C	tc (Min.)	I100 (in./hr.)	Q100 (cfs)	Comments
A	1.36	0.9	10	9.80	12.0	TO 10' C.I.
B	1.21	0.9	10	9.80	10.7	TO 10' C.I.
C	0.47	0.9	10	9.80	4.1	TO DBL. SIDED 5' C.I.
D	0.60	0.9	10	9.80	5.3	TO DBL. SIDED 5' C.I.
E	0.51	0.9	10	9.80	4.5	TO 5' C.I.
F	0.68	0.9	10	9.80	6.0	TO 5' C.I.
G	2.44	0.9	10	9.80	21.5	TO 15' C.I.
H	0.05	0.9	10	9.80	0.5	SHEET FLOW TO GRADE
I	0.42	0.9	10	9.80	3.7	TO Y-INLET
J	0.04	0.9	10	9.80	0.3	SHEET FLOW TO SOUTH
K	1.07	0.9	10	9.80	9.4	TO 10' C.I.
L	1.22	0.9	10	9.80	10.7	TO 10' C.I.
M	0.58	0.9	10	9.80	5.1	TO 10' C.I.
N	1.21	0.9	10	9.80	10.7	TO 10' C.I.
O	0.05	0.9	10	9.80	0.5	SHEET FLOW TO JOHN KING
P	0.02	0.9	10	9.80	0.1	SHEET FLOW TO JOHN KING
Q	0.68	0.9	10	9.80	6.0	SHEET FLOW TO SOUTH
R1	0.80	0.9	10	9.80	7.1	SHEET FLOW TO GRADE
R2	0.14	0.9	10	9.80	1.2	TO BLDG DOWNSPOUT
R3	0.07	0.9	10	9.80	0.6	TO BLDG DOWNSPOUT
R4	0.33	0.9	10	9.80	2.9	TO BLDG DOWNSPOUT
R5	0.15	0.9	10	9.80	1.4	TO BLDG DOWNSPOUT
R6	0.25	0.9	10	9.80	2.2	TO BLDG DOWNSPOUT
R7	0.09	0.9	10	9.80	0.8	TO BLDG DOWNSPOUT
R8	0.01	0.9	10	9.80	0.1	TO BLDG DOWNSPOUT
R9	0.02	0.9	10	9.80	0.1	TO BLDG DOWNSPOUT
S	0.13	0.9	10	9.80	1.1	TO Y-INLET
T	0.07	0.9	10	9.80	0.6	SHEET FLOW TO EAST
U	0.08	0.9	10	9.80	0.7	To Y-Inlet

DRAINAGE CRITERIA

Q = C I A
C = 0.90
I_{100} = 9.8 in/hr
tc = 10 Min.

D.A. No. → A
X.XX → Acres
XX.X → Q_{100} (cfs)

Drainage Divide Line

NOTE:

Refer to Sheets 3, 14, & 15 of Rockwall Downes Phase 1 plans prepared by Corwin Engineering, dated 9/3/2014 for Detention Pond Design accomodating 3.19 acres of developed area from the Nissan site.

RECORD DRAWINGS

NOTE:
TO THE BEST OF OUR KNOWLEDGE, SPIARS ENGINEERING, INC. HEREBY STATES THAT THIS PLAN IS A RECORD DRAWING. THE INFORMATION PROVIDED IS BASED ON FIELD SURVEYING AT THE SITEAND INFORMATION PROVIDED BY THE CONTRACTOR.

BENCHMARKS:

1: "X" cut on center of north median nose on John King Blvd. 64' northwest of southwest property corner.
Elevation = 565.38'

2: "X" cut on southwest corner of concrete pad by TxDOT manhole along I.H. 30 Frontage Road 13' north of northeast property corner.
Elevation = 582.68'

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STATE OF TEXAS
JOHN W. SPIARS
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LICENSED
PROFESSIONAL ENGINEER
3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

DRAINAGE AREA MAP

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

Date
Revisions

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 6
of 15

SEI No. 14-077

Drawing: G:\2014_JOBS\14-077 Nissan of Rockwall\14-077 Drainage Area Map.dwg Saved By: tbarnett Save Time: 3/15/2016 8:04:59 AM Plotted by: tbarnett Plot Date: 3/15/2016 1:55 PM

T=5–year

Total Site Area = 14.75 ac
Undetained Area= 0.18 ac (Areas J, O, P, T) Pass-Thru Area to Rockwall Downes
Detained Area= 12.1 ac Detention Pond = 2.47 Ac.
Proposed C= 0.9 (Areas M, N, & Q)
I100 (in/hr)= 6.10 in/hr
Allowable Release= 23.72 cfs 0.35*12.10*4.90-.9*.18*6.10+.9*6.10*(3.19-2.47)
Proposed Runoff= 66.43 cfs
Detained Release= 42.71 cfs

Runoff Coefficient C = 0.90
Drainage Area - A = 12.10 acres = 14.75-2.47-0.18
Time of Concentration - tc = 10 minutes
Maximum Outflow Rate - Q = 23.72 cfs

Duration (minutes)	Intensity (in/hr)	Depth (inches)	Inflow Discharge Q=CiA	Inflow Volume Cu. Ft.	Outflow Duration (minutes)	Outflow Volume Cu. Ft.	Storage Volume Cu. Ft.
10	6.10	1.02	66.4	39857	20	14230	25628
15	5.50	1.38	59.9	53906	25	17787	36118
20	4.90	1.63	53.4	64033	30	21344	42689
30	4.10	2.05	44.6	80368	40	28459	51909
40	3.40	2.27	37.0	88862	50	35574	53288
50	2.80	2.33	30.5	91476	60	42689	48787
60	2.60	2.60	28.3	101930	70	49804	52127
70	2.40	2.80	26.1	109771	80	56919	52853
80	2.30	3.07	25.0	120226	90	64033	56192
90	2.10	3.15	22.9	123493	100	71148	52344
100	1.90	3.17	20.7	124146	110	78263	45883
110	1.80	3.30	19.6	129373	120	85378	43995

Required Storage Volume 56192 cubic feet
1.29 acre-feet

T=10–year

Total Site Area = 14.75 ac
Undetained Area= 0.18 ac (Areas J, O, P, T) Pass-Thru Area to Rockwall Downes
Detained Area= 12.10 ac Detention Pond = 2.47 Ac.
Proposed C= 0.9 (Areas M, N, & Q)
I100 (in/hr)= 8.30 in/hr
Allowable Release= 31.98 cfs 0.35*12.10*6.60-.9*.18*8.30+.9*8.3*(3.19-2.47)
Proposed Runoff= 90.39 cfs
Detained Release= 58.40 cfs

Runoff Coefficient C = 0.90
Drainage Area - A = 12.10 acres = 14.75-2.47-0.18
Time of Concentration - tc = 10 minutes
Maximum Outflow Rate - Q = 31.98 cfs

Duration (minutes)	Intensity (in/hr)	Depth (inches)	Inflow Discharge Q=CiA	Inflow Volume Cu. Ft.	Outflow Duration (minutes)	Outflow Volume Cu. Ft.	Storage Volume Cu. Ft.
10	8.30	1.38	90.4	54232	20	19191	35041
15	7.50	1.88	81.7	73508	25	23989	49519
20	6.60	2.20	71.9	86249	30	28786	57462
30	5.50	2.75	59.9	107811	40	38382	69429
40	4.60	3.07	50.1	120226	50	47977	72248
50	4.00	3.33	43.6	130680	60	57573	73107
60	3.50	3.50	38.1	137214	70	67168	70046
70	3.30	3.85	35.9	150935	80	76764	74172
80	3.10	4.13	33.8	162043	90	86359	75684
90	2.90	4.35	31.6	170537	100	95954	74583
100	2.70	4.50	29.4	176418	110	105550	70868
110	2.50	4.58	27.2	179685	120	115145	64540

Required Storage Volume 75684 cubic feet
1.74 acre-feet

T=25–year

Total Site Area = 14.75 ac
Undetained Area= 0.18 ac (Areas J, O, P, T) Pass-Thru Area to Rockwall Downes
Detained Area= 12.10 ac Detention Pond = 2.47 Ac.
Proposed C= 0.9 (Areas M, N, & Q)
I100 (in/hr)= 9.00 in/hr
Allowable Release= 36.14 cfs 0.35*12.10*7.50-.9*.18*9.0+.9*9.0*(3.19-2.47)
Proposed Runoff= 98.01 cfs
Detained Release= 61.87 cfs

Runoff Coefficient C = 0.90
Drainage Area - A = 12.10 acres = 14.75-2.47-0.18
Time of Concentration - tc = 10 minutes
Maximum Outflow Rate - Q = 36.14 cfs

Duration (minutes)	Intensity (in/hr)	Depth (inches)	Inflow Discharge Q=CiA	Inflow Volume Cu. Ft.	Outflow Duration (minutes)	Outflow Volume Cu. Ft.	Storage Volume Cu. Ft.
10	9.00	1.50	98.0	58806	20	21682	37124
15	8.10	2.03	88.2	79388	25	27102	52286
20	7.50	2.50	81.7	98010	30	32523	65487
30	6.10	3.05	66.4	119572	40	43364	76208
40	5.20	3.47	56.6	135907	50	54205	81702
50	4.50	3.75	49.0	147015	60	65046	81969
60	3.90	3.90	42.5	152896	70	75887	77009
70	3.70	4.32	40.3	169231	80	86728	82503
80	3.50	4.67	38.1	182952	90	97569	85383
90	3.30	4.95	35.9	194060	100	108410	85650
100	3.00	5.00	32.7	196020	110	119250	76770
110	2.90	5.32	31.6	208435	120	130091	78343

Required Storage Volume 85650 cubic feet
1.97 acre-feet

T=100–year

Total Site Area = 14.75 ac
Undetained Area= 0.18 ac (Areas J, O, P, T) Pass-Thru Area to Rockwall Downes
Detained Area= 12.10 ac Detention Pond = 2.47 Ac.
Proposed C= 0.9 (Areas M, N, & Q)
I100 (in/hr)= 9.80 in/hr
Allowable Release= 39.91 cfs 0.35*12.10*8.30-.9*.18*9.80+.9*9.80*(3.19-2.47)
Proposed Runoff= 106.72 cfs
Detained Release= 66.81 cfs

Runoff Coefficient C = 0.90
Drainage Area - A = 12.10 acres = 14.75-2.47-0.18
Time of Concentration - tc = 10 minutes
Maximum Outflow Rate - Q = 39.91 cfs

Duration (minutes)	Intensity (in/hr)	Depth (inches)	Inflow Discharge Q=CiA	Inflow Volume Cu. Ft.	Outflow Duration (minutes)	Outflow Volume Cu. Ft.	Storage Volume Cu. Ft.
10	9.80	1.63	106.7	64033	20	23948	40085
15	9.00	2.25	98.0	88209	25	29935	58274
20	8.30	2.77	90.4	108464	30	35922	72542
30	6.90	3.45	75.1	135254	40	47896	87358
40	5.80	3.87	63.2	151589	50	59870	91719
50	5.00	4.17	54.5	163350	60	71844	91506
60	4.50	4.50	49.0	176418	70	83818	92600
70	4.00	4.67	43.6	182952	80	95792	87160
80	3.70	4.93	40.3	193406	90	107766	85640
90	3.50	5.25	38.1	205821	100	119740	86081
100	3.40	5.67	37.0	222156	110	131714	90442
110	3.20	5.87	34.8	229997	120	143688	86309

Required Storage Volume 92600 cubic feet
2.13 acre-feet

ORIFICE CALCULATIONS

$Q_{5\ Allow}$ = 23.72 cfs
Flow Thru 1 – 8.0"ø Opening and 1 – 24.5"ø Opening @ 100–Yr. WSEL = 559.99
$Q_{\substack{8.0\\24.5}} = CA\sqrt{2gh} = 0.6*0.349\sqrt{2*32.2(559.99-(555.48+8.0/24))} = 3.43$ cfs
$Q_{\substack{8.0\\24.5}} = CA\sqrt{2gh} = 0.6*3.274\sqrt{2*32.2(559.99-(557.44+24.5/24))} = 19.49$ cfs

$Q_{5\ Actual}$ = 3.43 cfs + 19.49 cfs = 22.92 cfs

$Q_{5\ Actual} < Q_{5\ Allow}$

ORIFICE CALCULATIONS

$Q_{10\ Allow}$ = 31.98 cfs
Flow Thru 1 – 8.0"ø Opening and 1 – 24.5"ø Opening @ 100–Yr. WSEL = 561.24
$Q_{\substack{8.0\\24.5}} = CA\sqrt{2gh} = 0.6*0.349\sqrt{2*32.2(561.24-(555.48+8.0/24))} = 3.92$ cfs
$Q_{\substack{8.0\\24.5}} = CA\sqrt{2gh} = 0.6*3.274\sqrt{2*32.2(561.24-(557.44+24.5/24))} = 26.28$ cfs

$Q_{10\ Actual}$ = 3.92 cfs + 26.28 cfs = 30.20 cfs

$Q_{10\ Actual} < Q_{10\ Allow}$

ORIFICE CALCULATIONS

$Q_{25\ Allow}$ = 36.14 cfs
Flow Thru 1 – 8.0"ø Opening and 1 – 24.5"ø Opening @ 100–Yr. WSEL = 562.04
$Q_{\substack{8.0\\24.5}} = CA\sqrt{2gh} = 0.6*0.349\sqrt{2*32.2(562.04-(555.48+8.0/24))} = 4.19$ cfs
$Q_{\substack{8.0\\24.5}} = CA\sqrt{2gh} = 0.6*3.274\sqrt{2*32.2(562.04-(557.44+24.5/24))} = 29.82$ cfs

$Q_{25\ Actual}$ = 4.19 cfs + 29.82 cfs = 34.01 cfs

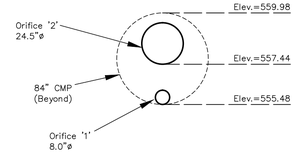
$Q_{25\ Actual} < Q_{25\ Allow}$

ORIFICE CALCULATIONS

$Q_{100\ Allow}$ = 39.91 cfs
Flow Thru 1 – 8.0"ø Opening and 1 – 24.5"ø Opening @ 100–Yr. WSEL = 563.39
$Q_{\substack{8.0\\24.5}} = CA\sqrt{2gh} = 0.6*0.349\sqrt{2*32.2(563.39-(555.48+8.0/24))} = 4.63$ cfs
$Q_{\substack{8.0\\24.5}} = CA\sqrt{2gh} = 0.6*3.274\sqrt{2*32.2(563.39-(557.44+24.5/24))} = 35.00$ cfs

$Q_{100\ Actual}$ = 4.63 cfs + 35.00 cfs = 39.63 cfs

$Q_{100\ Actual} < Q_{100\ Allow}$



Orifice Plate 'A' Detail

N.T.S.

NOTE: Refer to Contech
Detention System Plans for
Orifice Plate Installation Details.

NOTE:

Refer to Sheets 3, 14, & 15 of Rockwall Downes Phase 1 plans prepared by Corwin Engineering, dated 9/3/2014 for Detention Pond Design accomodating 3.19 acres of developed area from the Nissan site.

RECORD DRAWINGS

NOTE:
TO THE BEST OF OUR KNOWLEDGE, SPIARS ENGINEERING, INC. HEREBY STATES THAT THIS PLAN IS A RECORD DRAWING. THE INFORMATION PROVIDED IS BASED ON FIELD SURVEYING AT THE SITEAND INFORMATION PROVIDED BY THE CONTRACTOR.

BENCHMARKS:

1: "X" cut on center of north median nose on John King Blvd. 64' northwest of southwest property corner.
Elevation = 565.38'

2: "X" cut on southwest corner of concrete pad by TxDOT manhole along I.H. 30 Frontage Road 13' north of northeast property corner.
Elevation = 582.68'

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STATE OF TEXAS
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3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
DETENTION CALCULATIONS

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

Date
Revisions

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 7
of 15

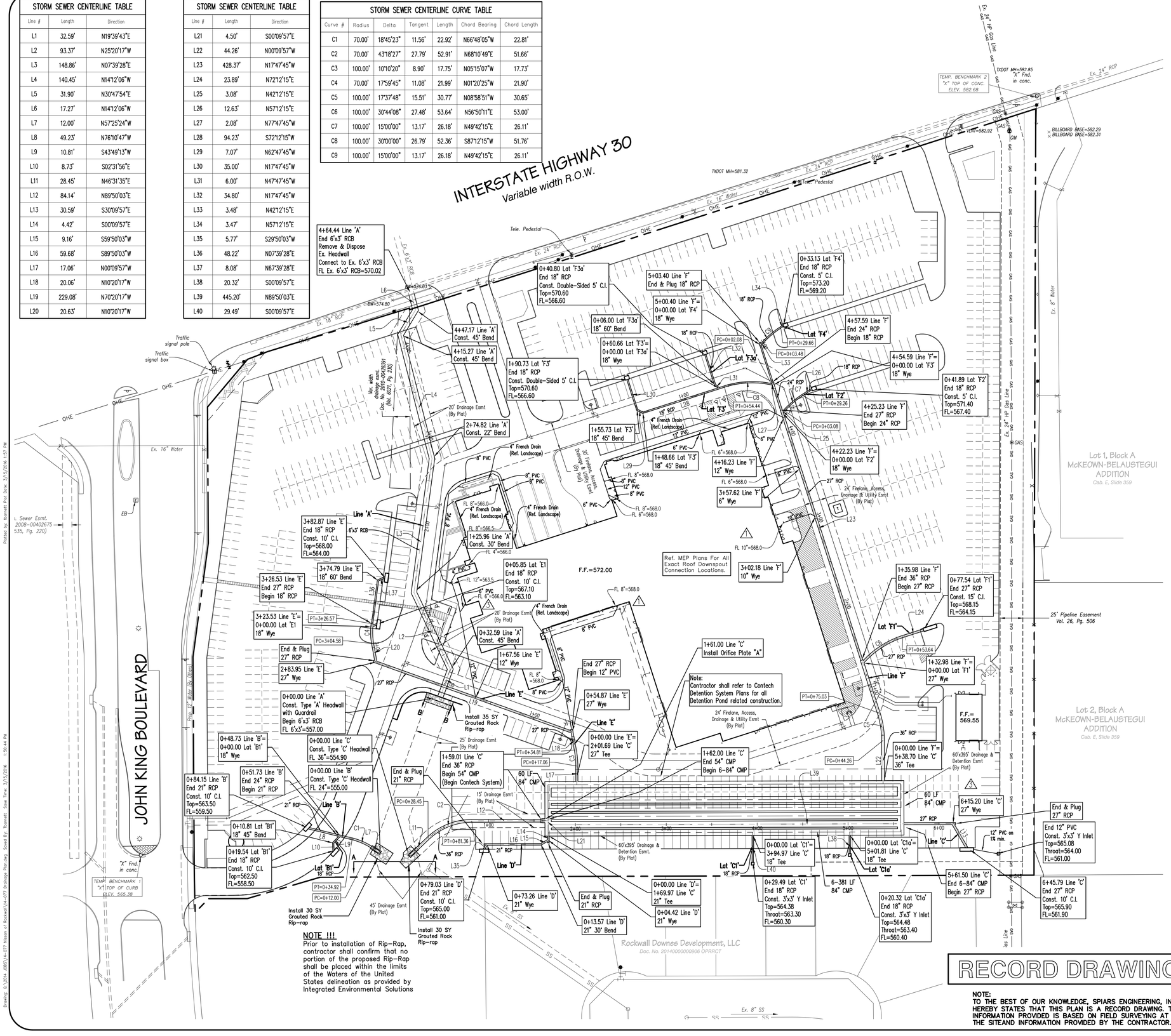
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Plotted by: tbarnett Plot Date: 3/15/2016 1:56 PM

STORM SEWER CENTERLINE TABLE		
Line #	Length	Direction
L1	32.59'	N19°39'43"E
L2	93.37'	N25°20'17"W
L3	148.86'	N07°39'28"E
L4	140.45'	N14°12'06"W
L5	31.90'	N30°47'54"E
L6	17.27'	N14°12'06"W
L7	12.00'	N57°25'24"W
L8	49.23'	N76°10'47"W
L9	10.81'	S43°49'13"W
L10	8.73'	S02°31'56"E
L11	28.45'	N46°31'35"E
L12	84.14'	N89°50'03"E
L13	30.59'	S30°09'57"E
L14	4.42'	S00°09'57"E
L15	9.16'	S59°50'03"W
L16	59.68'	S89°50'03"W
L17	17.06'	N00°09'57"W
L18	20.06'	N10°20'17"W
L19	229.08'	N70°20'17"W
L20	20.63'	N10°20'17"W

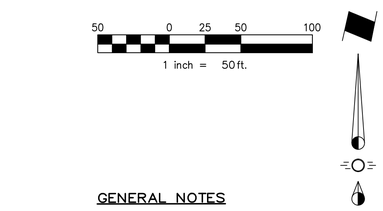
STORM SEWER CENTERLINE TABLE		
Line #	Length	Direction
L21	4.50'	S00°09'57"E
L22	44.26'	N00°09'57"W
L23	428.37'	N17°47'45"W
L24	23.89'	N72°12'15"E
L25	3.08'	N42°12'15"E
L26	12.63'	N57°12'15"E
L27	2.08'	N77°47'45"W
L28	94.23'	S72°12'15"W
L29	7.07'	N62°47'45"W
L30	35.00'	N17°47'45"W
L31	6.00'	N47°47'45"W
L32	34.80'	N17°47'45"W
L33	3.48'	N42°12'15"E
L34	3.47'	N57°12'15"E
L35	5.77'	S29°50'03"W
L36	48.22'	N07°39'28"E
L37	8.08'	N67°39'28"E
L38	20.32'	S00°09'57"E
L39	445.20'	N89°50'03"E
L40	29.49'	S00°09'57"E

STORM SEWER CENTERLINE CURVE TABLE						
Curve #	Radius	Delta	Tangent	Length	Chord Bearing	Chord Length
C1	70.00'	18°45'23"	11.56'	22.92'	N66°48'05"W	22.81'
C2	70.00'	43°18'27"	27.79'	52.91'	N68°10'49"E	51.66'
C3	100.00'	10°10'20"	8.90'	17.75'	N05°15'07"W	17.73'
C4	70.00'	17°59'45"	11.08'	21.99'	N01°20'25"W	21.90'
C5	100.00'	17°37'48"	15.51'	30.77'	N08°58'51"W	30.65'
C6	100.00'	30°44'08"	27.48'	53.64'	N56°50'11"E	53.00'
C7	100.00'	15°00'00"	13.17'	26.18'	N49°42'15"E	26.11'
C8	100.00'	30°00'00"	26.79'	52.36'	S87°12'15"W	51.76'
C9	100.00'	15°00'00"	13.17'	26.18'	N49°42'15"E	26.11'



GENERAL NOTES

1. All materials and construction shall conform to the City of Rockwall Standards and Specifications, except as noted herein and approved by the City and NCTCOG 3rd Edition.
2. Contractor shall be responsible for maintaining Trench safety requirements in accordance with City Standards, Texas State Law, and O.S.H.A. Standards for all excavation in excess of five feet in depth.
3. The location of all utilities located on these plans are taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown on the plans may be present.
4. It shall be the responsibility of the Contractor to protect all public utilities in the construction of this project. All manholes, clean-outs, valve boxes, fire hydrants, etc. must be adjusted to proper line and grade by the Contractor prior to and after the placing of permanent paving. Utilities must be maintained to proper line and grade during construction of the paving for this development.
5. The General Contractor and all sub-contractors shall verify the suitability of all existing and proposed site conditions, including grades and dimensions before commencement of any construction. In the event of any conflict and prior to commencement of any construction, immediately notify the Engineer. Minor adjustments of finished grade to accomplish spot drainage is acceptable, if necessary, upon prior approval of Engineer. Paving installed shall 'flush out' at any juncture with existing paving.
6. Drainage should be maintained away from the foundations, both during and after construction.
7. Backfill for utility lines should be carefully placed so that they will be stable. Where utility lines pass through the parking lot, the top 6" should be compacted similarly to the remainder of the lot. Utility ditches should be visually inspected during the excavation process to ensure that undesirable fill is not used.
8. If rock is encountered in the Trench, rock spoil shall not be used in the upper 1.5 feet of the Trench.
9. Four-foot RCP sections with beveled ends shall be used if pipe radius is less than 100 feet.
10. All storm sewer pipe 18" and larger shall be Class III RCP. All storm sewer pipe 15" and smaller shall be SDR-35 PVC, ADS N-12 pipe, or approved equal.
11. All PVC shall be installed on 1.0% min. slope unless otherwise noted.
12. Erosion control shall be in place prior to the disturbance of any surface.
13. Property Owner to maintain all private storm lines and detention system, including detention pond outfall structure.



SECTION A-A

Q=242.34 cfs
S=1.80%
n=0.035
D=1.88 ft.
V=5.64 ft/s
W=43.18 ft.

SECTION B-B

Q=180.63 cfs
S=4.2%
n=0.035
D=1.63 ft.
V=8.64 ft/s
W=20.50 ft.

PRIVATE STORM SEWER LINES

Line 'B'
Lat. 'B-1'
Lat. 'C-1'
Lat. 'C1a'
Line 'C' Sta.5+56.40 to 6+42.43
Line 'D'
Line 'E'
Line 'F'
Lat. 'F-1'
Lat. 'F-2'
Lat. 'F-3'
Lat. 'F-4'

NOTE !!!
Prior to installation of Rip-Rap, contractor shall confirm that no portion of the proposed Rip-Rap shall be placed within the limits of the Waters of the United States delineation as provided by Integrated Environmental Solutions

RECORD DRAWINGS

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BENCHMARKS:

1: "X" cut on center of north median nose on John King Blvd. 64' northwest of southwest property corner.
Elevation = 565.38'

2: "X" cut on southwest corner of concrete pad by TxDOT manhole along I.H. 30 Frontage Road 13' north of northeast property corner.
Elevation = 582.68'

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

STATE OF TEXAS
JOHN W. SPIARS
84016
LICENSED
PROFESSIONAL ENGINEER
3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
DRAINAGE PLAN

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

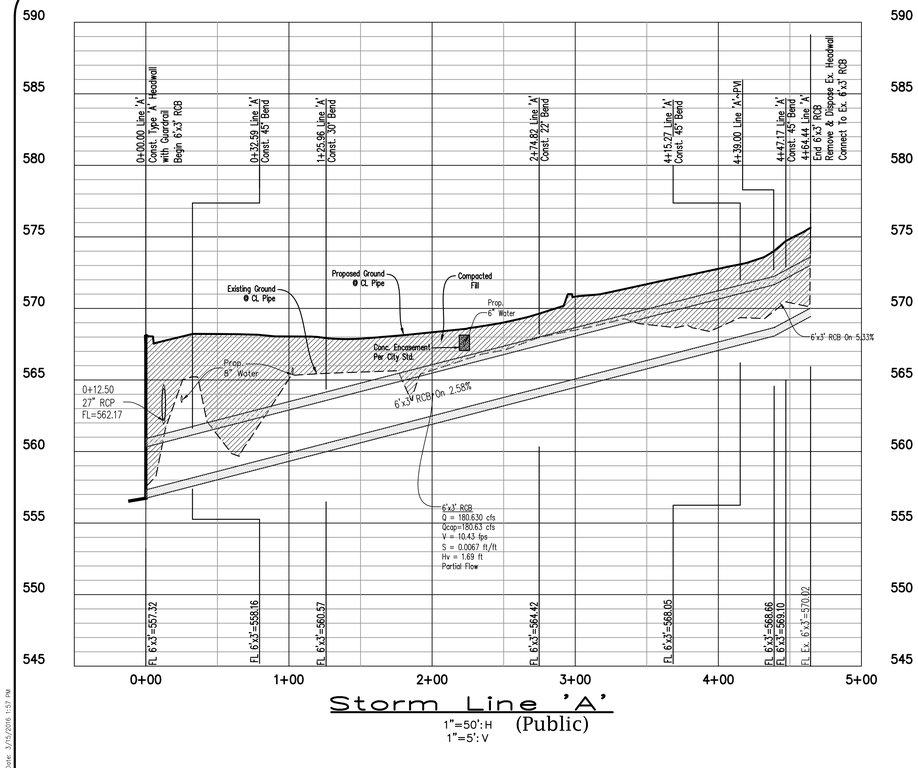
Revisions
Date
3/31/2015
5/20/2015
ASI #1
ASI #3

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 8 of 15

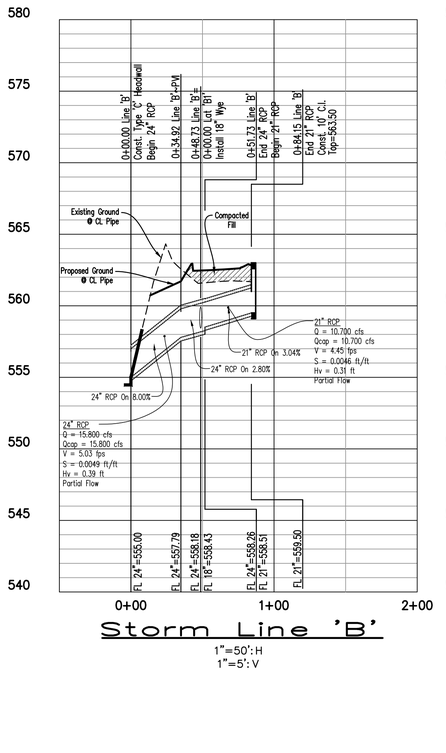
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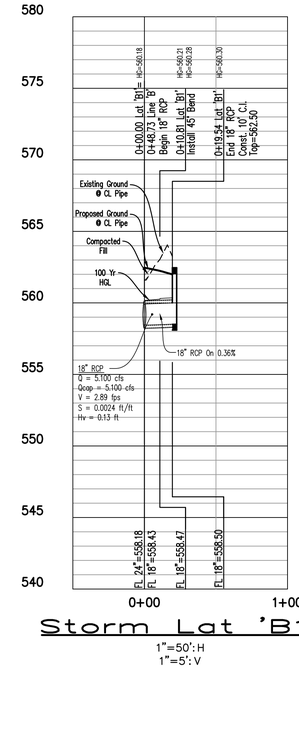
Storm Line 'A' (Public)

1"=50': H
1"=5': V



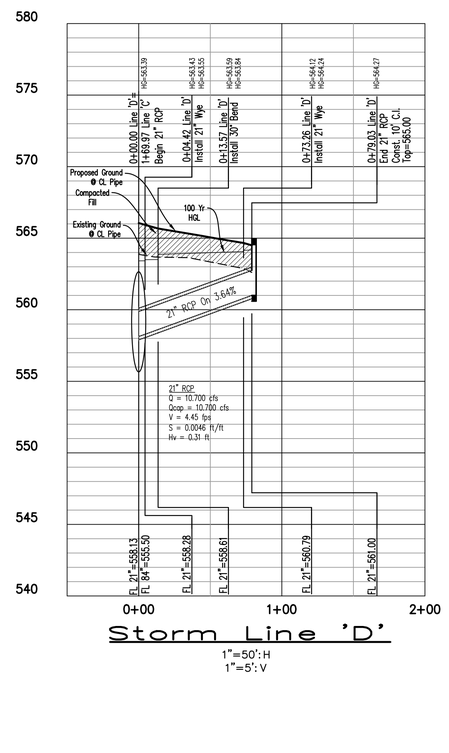
Storm Line 'B'

1"=50': H
1"=5': V



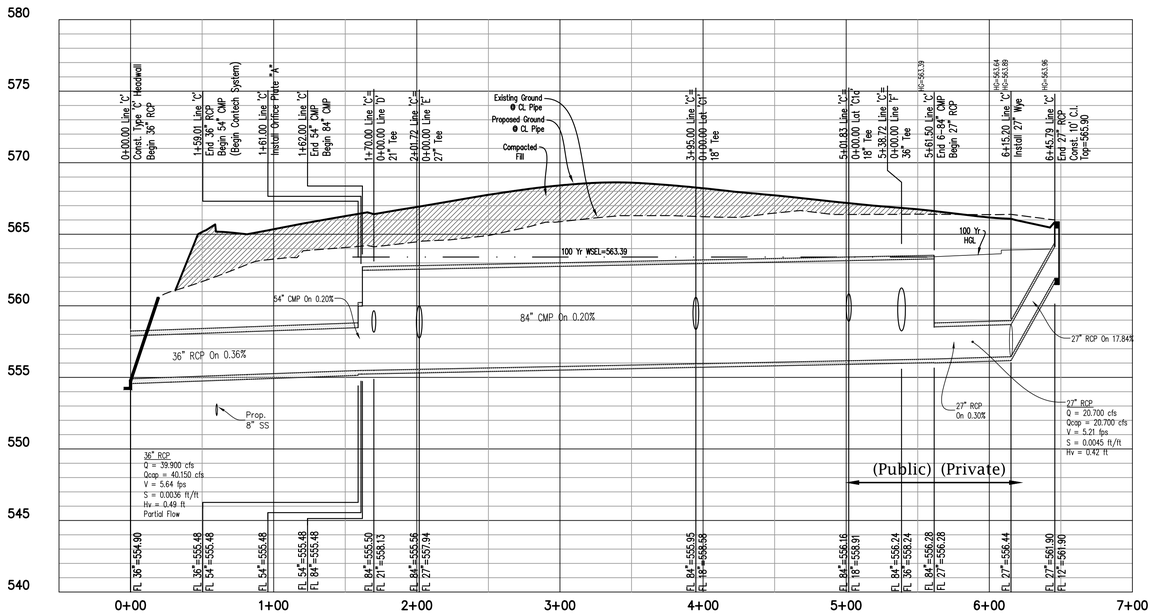
Storm Lat 'B1'

1"=50': H
1"=5': V



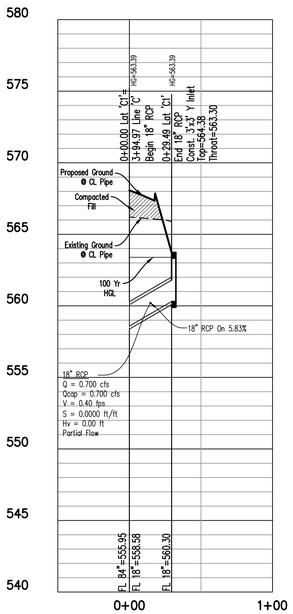
Storm Line 'D'

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1"=5': V



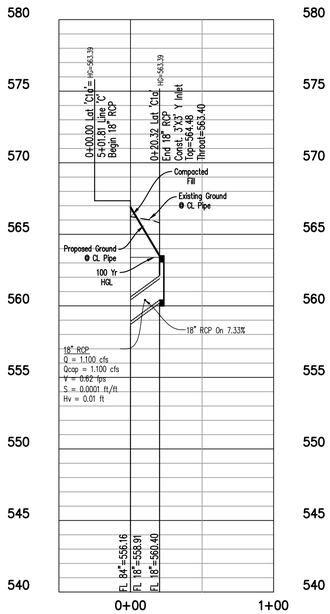
Storm Line 'C'

1"=50': H
1"=5': V



Storm Lat 'C1'

1"=50': H
1"=5': V



Storm Lat 'C1a'

1"=50': H
1"=5': V

Note:
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3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

STORM SEWER PROFILES

Issue Dates:
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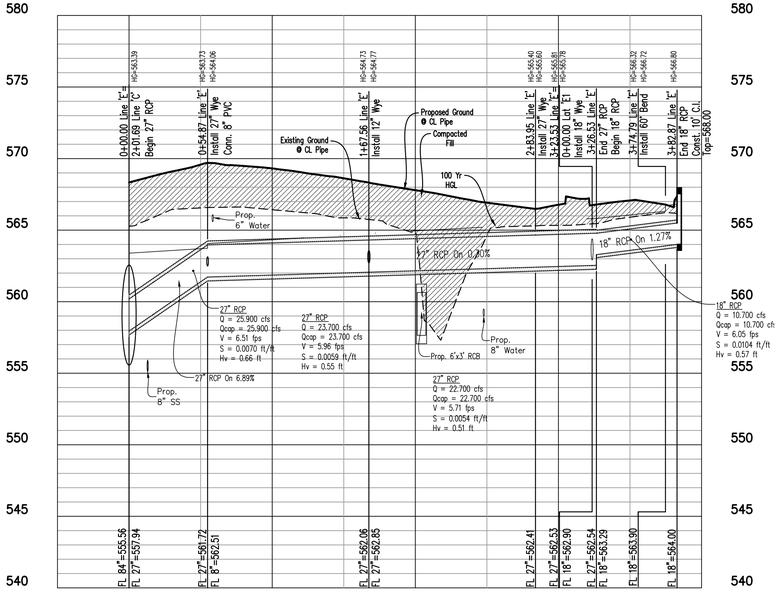
Date
Revisions

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 9
of 15

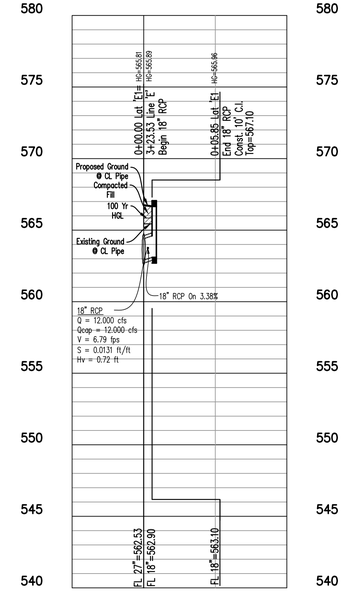
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Plotted by: tbarnett Plot Date: 3/15/2016 1:57 PM
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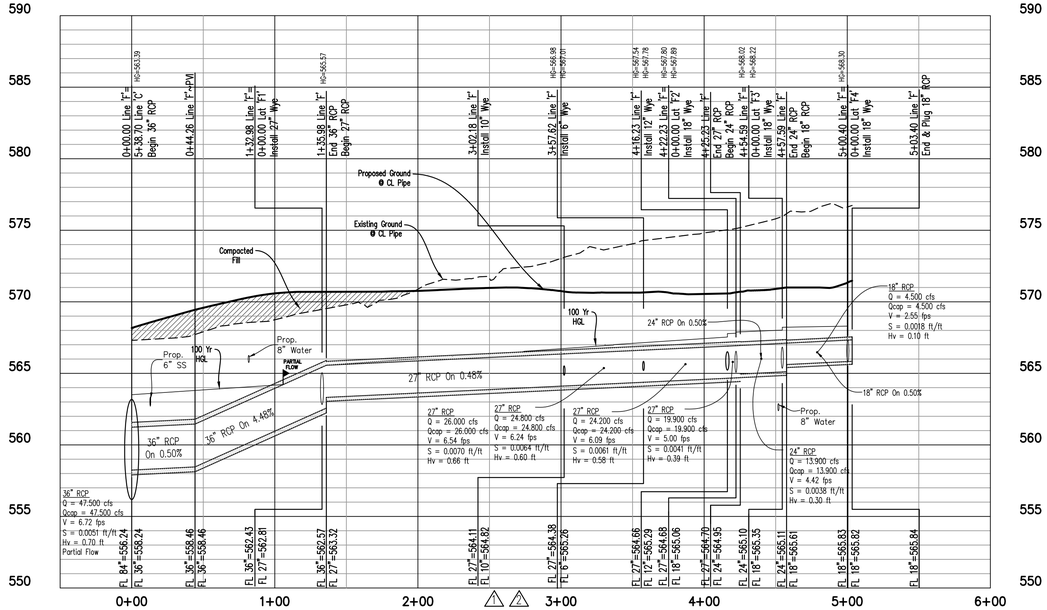
Storm Line 'E'

1"=50':H
1"=5':V



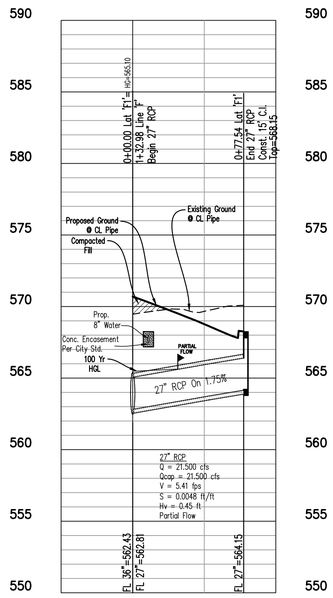
Storm Lat 'E1

1"=50':H
1"=5':V



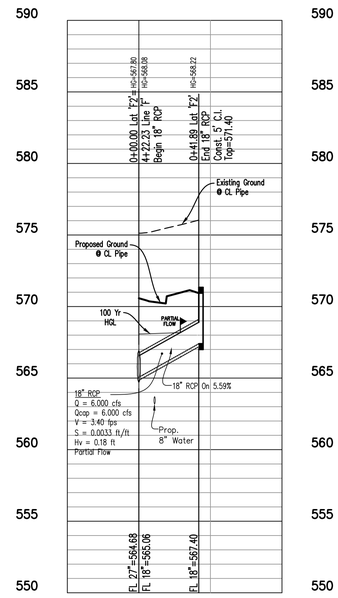
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1"=5':V



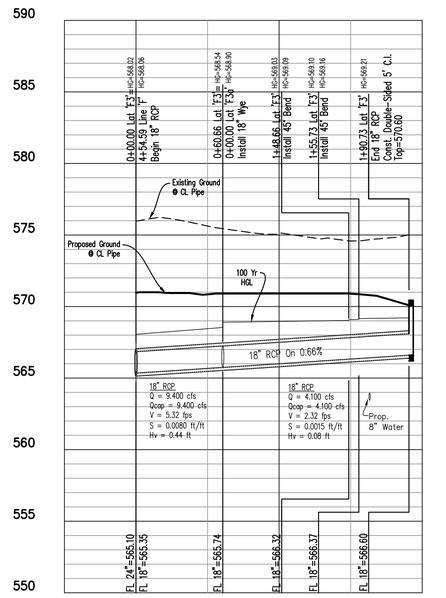
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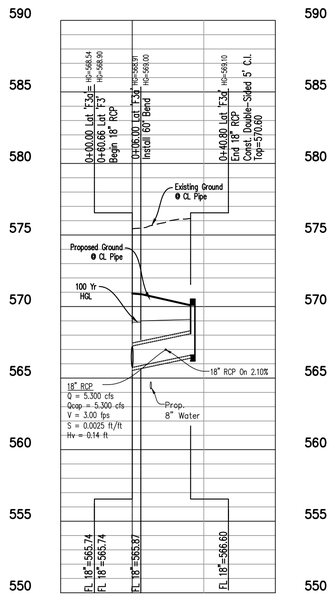
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1"=50':H
1"=5':V



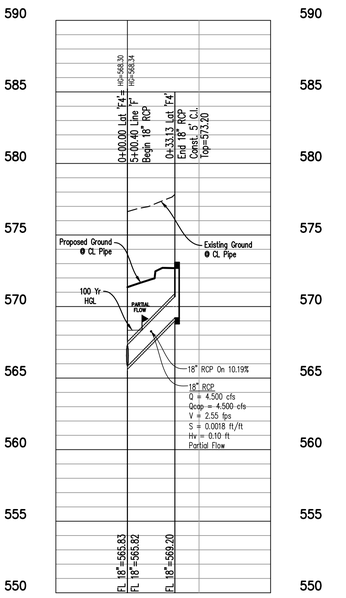
Storm Lat 'F3'

1"=50':H
1"=5':V



Storm Lat 'F3a'

1"=50':H
1"=5':V



Storm Lat 'F4'

1"=50':H
1"=5':V

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NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

STORM SEWER PROFILES

Issue Dates:
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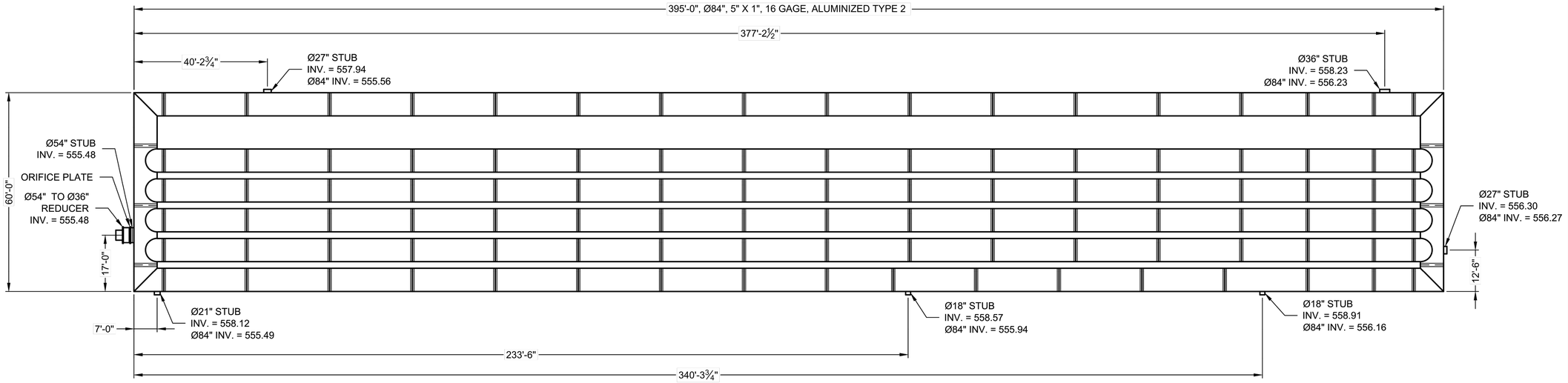
Revisions	Date
ASI #1	3/31/2015
ASI #2	4/6/2015

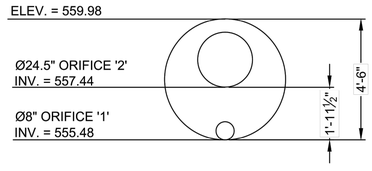
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Drawn By: BLM
Checked By: JWS

Sheet C 10
of 15

SEI No. 14-077

Plotted by: tbarnett Plot Date: 3/15/2016 1:57 PM
Drawing: G:\2014 JOBS\14-077 Nissan of Rockwall\14-077 Storm Sewer Profiles.dwg Saved By: tbarnett Save Time: 3/15/2016 8:11:31 AM





ORIFICE PLATE 'A' DETAIL
REINFORCEMENT TBD

THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (3) PAGES INCLUDING THE FOLLOWING:

- **VOLUME = 92,610 CF**
- **MAINLINE PIPE GAUGE = 16**
- **WALL TYPE = SOLID**
- **DIAMETER = 84"**
- **FINISH = ALT2**

CUSTOMER _____ DATE _____

ASSEMBLY

SCALE: 1" = 30'
VOLUME: 92,610 C.F.
LOADING: H20/H25
SYSTEM INV = VARIES

RECORD DRAWINGS

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NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.

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MARK	DATE	REVISION DESCRIPTION	BY
1	1/15/15	REVISE OUTLET	DLF

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
11815 NE Glenn Widing Drive, Portland, OR 97220
800-548-4667 503-240-3393 800-561-1271 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH **PROPOSAL** DRAWING

Ø84" UNDERGROUND DETENTION SYSTEM - 514377-010
NISSAN OF ROCKWALL
ROCKWALL, TX
SITE DESIGNATION: DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
514377	010	1/14/15
DESIGNED: SDS	DRAWN: DLF	
CHECKED:	APPROVED:	
SHEET NO.: P1 OF 3		

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

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
CONTECH DETENTION SYSTEM

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

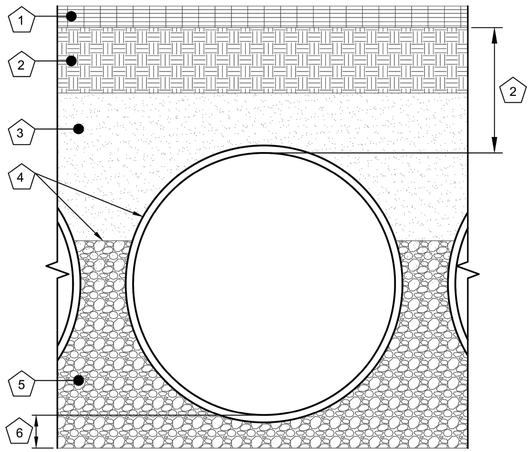
Date / Revisions

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Drawn By: BLM
Checked By: JWS

Sheet **C 10a**
of **15**

SEI No. 14-077

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Drawing: G:\2014 JOBS\14-077 Nissan of Rockwall\14-077 Contech System.dwg Saved By: tbarnett Save Time: 3/15/2016 8:13:41 AM



1. RIGID OR FLEXIBLE PAVEMENT.
2. NORMAL ROADWAY EMBANKMENT FILL PLACED IN 8" LIFTS AND COMPACTED TO MIN. 90% STANDARD DENSITY PER AASHTO T-99.
3. SAND FILL TO 12" ABOVE PIPE.
4. CONTECH C40 NON-WOVEN GEOTEXTILE RECOMMENDED TO PREVENT SOIL MIGRATION.
5. WELL GRADED CRUSHED STONE, IN DEPTH. (#57 OR #8 OR OTHER SUITABLE GRANULAR) 2/3RDS UP THE PIPE.
6. 6" WELL GRADED CRUSHED STONE BEDDING BELOW PIPE.

FOUNDATION/BEDDING PREPARATION

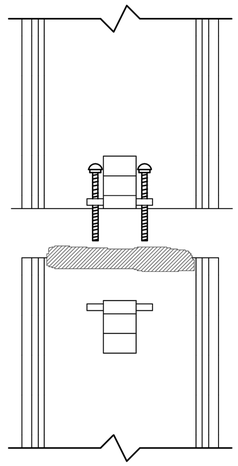
PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, THE 4 INCHES OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

THE BACKFILL SHALL BE AN A1, A2 OR A3 GRANULAR FILL PER AASHTO M-145 OR A WELL-GRADED GRANULAR FILL AS APPROVED BY THE ENGINEER (SEE INSTALLATION GUIDELINES). THE MATERIAL SHALL BE PLACED IN 8-INCH LOOSE LIFTS AND COMPACTED TO 90% AASHTO T99 STANDARD PROCTOR DENSITY. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE DETENTION SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON THE PIPE.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS. REFER TO TYPICAL BACKFILL DETAIL FOR MATERIAL REQUIRED.

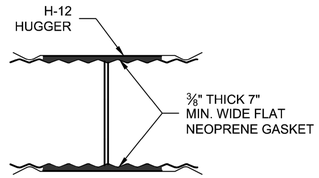
1/P2 BACKFILL DETAIL
SCALE: N.T.S.



CONNECTION DETAIL
SINGLE BOLT, BAR AND STRAP

GENERAL NOTES

1. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   12" THRU 48", 1-PIECE
   54" THRU 96", 2-PIECE
   102" THRU 144", 3-PIECES
2. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS
3. REROLLED ANNULAR END CORRUGATIONS ARE NORMALLY 2⅔" x ½". DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES



FLAT GASKET

2/P2 H-12 HUGGER BAND DETAIL
SCALE: N.T.S.

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CONTECH CMP DETENTION SYSTEMS
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Ø84" UNDERGROUND DETENTION SYSTEM - 514377-010
NISSAN OF ROCKWALL
ROCKWALL, TX
SITE DESIGNATION: DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
514377	010	1/14/15
DESIGNED: SDS	DRAWN: DLF	
CHECKED:	APPROVED:	
SHEET NO.: P2 OF 3		

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

NISSAN OF ROCKWALL
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CITY OF ROCKWALL
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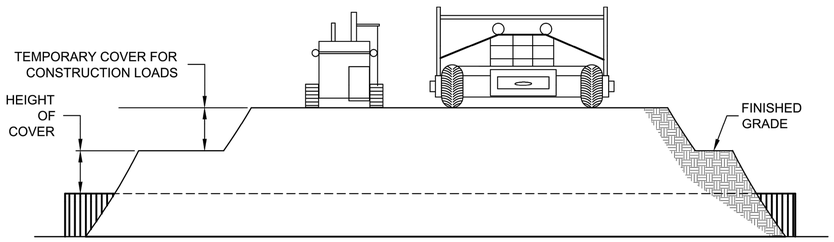
Date / Revisions

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Drawn By: BLM
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Sheet C 10b
of 15

SEI No. 14-077

Plotted by: tbarnett Plot Date: 3/15/2016 1:58 PM
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Drawing: G:\2014_JOBS\14-077 Nissan of Rockwall\14-077 Contech System.dwg Saved By: tbarnett Save Time: 3/15/2016 8:13:41 AM



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

3 / P3 CONSTRUCTION LOADING DIAGRAM
SCALE: N.T.S.

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

RECORD DRAWINGS

NOTE:
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If discrepancies between the supplied information upon which the drawing is based and actual field conditions are encountered as site work progresses, these discrepancies must be reported to Contech immediately for re-evaluation of the design. Contech accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

MARK	DATE	REVISION DESCRIPTION	BY
1	1/15/15	REVISE OUTLET	DLF

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
11815 NE Glenn Widing Drive, Portland, OR 97220
800-548-4667 503-240-3393 800-561-1271 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

Ø84" UNDERGROUND DETENTION SYSTEM - 514377-010
NISSAN OF ROCKWALL
ROCKWALL, TX
SITE DESIGNATION: DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
514377	010	1/14/15
DESIGNED: SDS		DRAWN: DLF
CHECKED:		APPROVED:
SHEET NO.: P3 OF 3		

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

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

CONTECH DETENTION SYSTEM

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

Date / Revisions

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 10c of 15

SEI No. 14-077

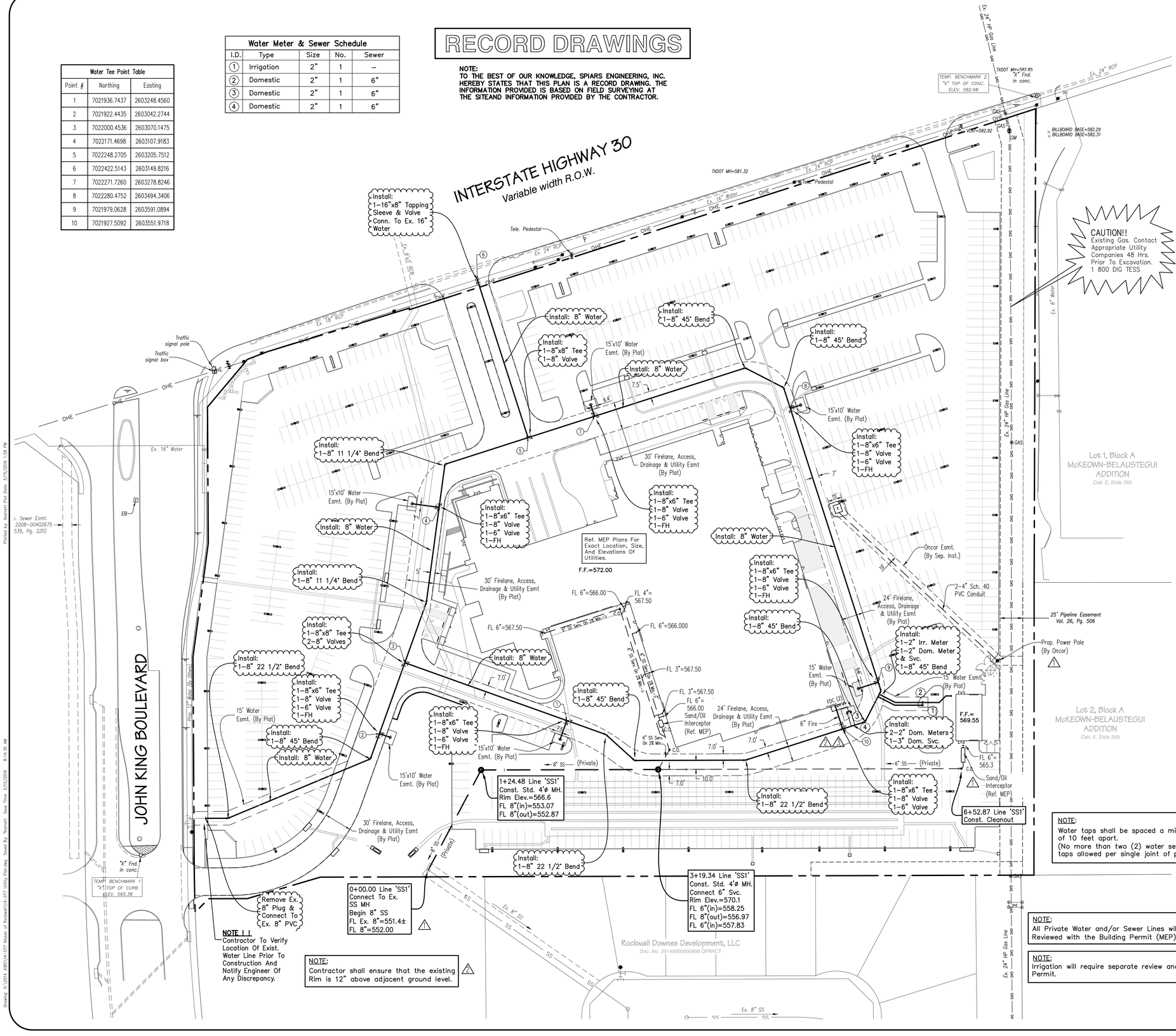
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RECORD DRAWINGS

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Water Tee Point Table		
Point #	Northing	Easting
1	7021936.7437	2603248.4560
2	7021922.4435	2603042.2744
3	7022000.4536	2603070.1475
4	7022171.4698	2603107.9183
5	7022248.2705	2603205.7512
6	7022422.5143	2603149.8216
7	7022271.7260	2603278.8246
8	7022280.4752	2603494.3406
9	7021979.0628	2603591.0894
10	7021927.5092	2603551.9718

Water Meter & Sewer Schedule				
I.D.	Type	Size	No.	Sewer
①	Irrigation	2"	1	–
②	Domestic	2"	1	6"
③	Domestic	2"	1	6"
④	Domestic	2"	1	6"



50 0 25 50 100

1 inch = 50ft.

Notes:

1. All materials and construction shall conform to the City of Rockwall Standard Details and Specifications, and NCTCOG 3rd Edition except as noted herein and approved by the City.
2. Contractor shall be responsible for maintaining trench safety requirements in accordance with City Standards, Texas State Law, and O.S.H.A. Standards for all excavation in excess of five feet in depth.
3. The location of all utilities located on these plans are taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown on the plans may be present.
4. It shall be the responsibility of the Contractor to protect all public utilities in the construction of this project.
5. The Contractor shall be responsible for obtaining permits, inspections, and approval of the completed utility work from all of the approving authorities and each utility company before back filling and/or paving over any of the utility work.
6. The Contractor shall be responsible for payment of all connection fees for temporary connections. deposits and any impact fees issues by utility companies for utility service will be paid by Owner.
7. The contractor shall verify utility service entrance points and meter locations with the architect prior to the installation of any service lines.
8. Any utility installed outside of an easement shall be installed by a plumber and inspected by Code Enforcement.
9. Backfill for utility lines should be carefully placed so that the utility will be stable. Where utility lines cross the parking lot, the top 6" should be compacted similarly to the remainder of the lot. Utility ditches should be visually inspected during the excavation process to ensure that undesirable fill is not used.
10. If rock is encountered in the trench, rock spoil shall not be used in the upper 1.5 feet of the trench. The upper 1.5 feet of the trench is to be backfilled only with quality topsoil.
11. All water mains shall be C–900 PVC SDR 14 Class 200. Domestic and fire water service lines shall be per City of Rockwall Building Code requirements.
12. All ductile iron fittings shall be of the mechanical joint type or slip joint and shall be Class D, or Class 250 on sizes 12" and smaller in accordance with A.W.W.A. Specification C–110–64 and C–111–64.
13. All 6" and smaller water mains shall have a minimum cover of 42"; all 8"and larger water mains shall have a minimum cover of 48" or sufficient cover to clear other utilities as measured from top of pipe to existing ground level or finished grade, whichever is greater.
14. All water and sanitary mains and services shall have a 10' min. lateral separation.
15. Concrete blocking shall be provided on water mains at all tees, fire hydrants, and bends per City of Rockwall standards. Payment for concrete blocking shall be subsidiary to pipe installation and shall be included in the bid price thereof.
16. The slope for sanitary sewer laterals shall be 2%, or 1/4" per foot, or greater unless other wise noted.
17. Class "B–3" Embedment, per NTCOG 3rd Edition with Rockwall revisions, shall be used for PVC water mains.
18. All water meters to be placed in a non–traffic area.
19. Refer to Plumbing Plans for exact water and sewer service locations.
20. Fire sprinkler line shall be sized and installed by a State Licensed Fire Sprinkler Contractor.
21. All fittings for waterlines to be Megalug.
22. All domestic & irrigation servings to have a backflow device with doublecheck after each meter.

NOTE:
Water taps shall be spaced a min. of 10 feet apart. (No more than two (2) water service taps allowed per single joint of pipe.) ⚠2

NOTE:
All Private Water and/or Sewer Lines will be Reviewed with the Building Permit (MEP) Plans.

NOTE:
Irrigation will require separate review and Permit.

LEGEND

- NEW DOMESTIC WATER LINE
- NEW SAN. SEWER LINE
- ① ⊗ WATER METER, VERIFY LOCATION

BENCHMARKS:

1: "X" cut on center of north median nose on John King Blvd. 64' northwest of southwest property corner.
Elevation = 565.38'

2: "X" cut on southwest corner of concrete pad by TxDOT manhole along I.H. 30 Frontage Road 13' north of northeast property corner.
Elevation = 582.68'

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STATE OF TEXAS — JOHN W. SPIARS — 84016 — LICENSED PROFESSIONAL ENGINEER — 3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

UTILITY PLAN

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

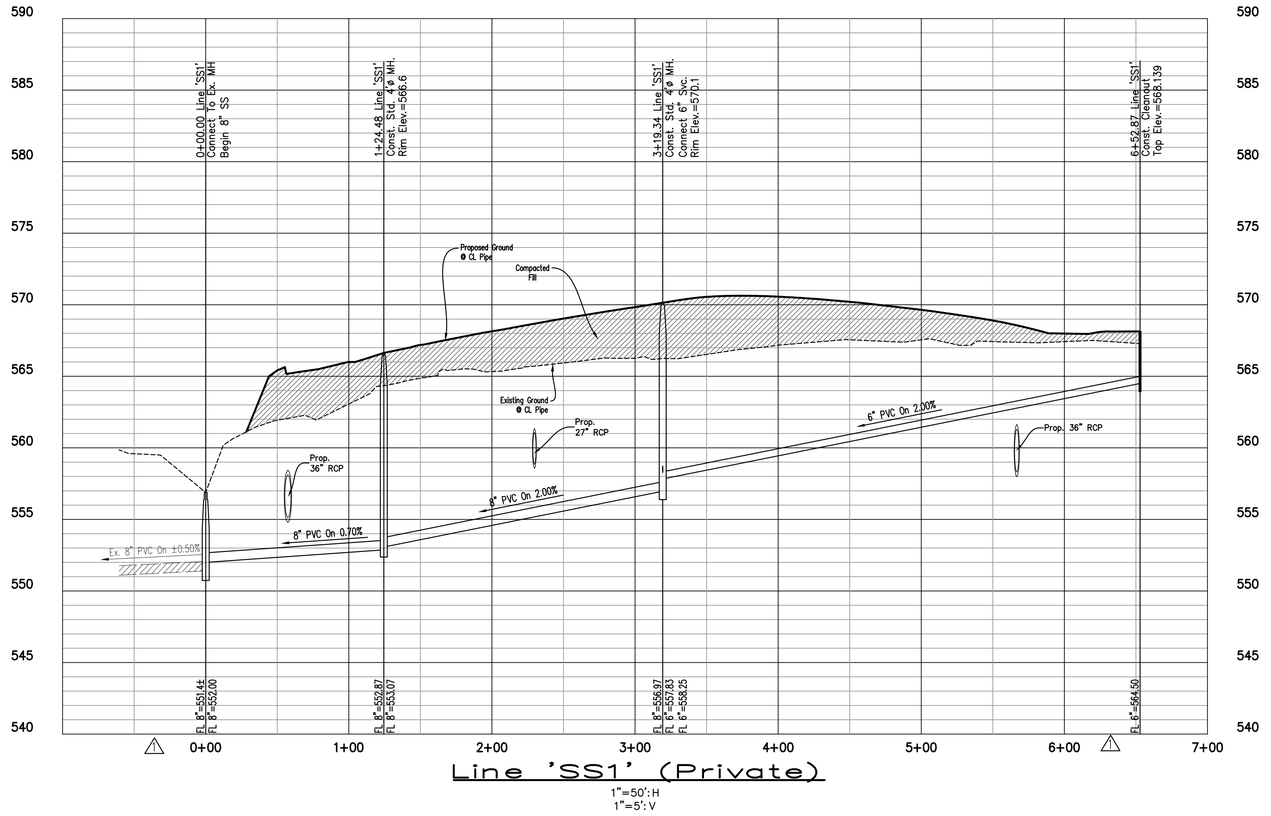
Revisions	Date
⚠1 ASI #1	3/31/2015
⚠2 ASI #2	4/6/2015
⚠3 ASI #3	5/20/2015

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 11 of 15

SEI No. 14-077

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Line 'SS1' (Private)

1"=50': H
1"=5': V

RECORD DRAWINGS

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STATE OF TEXAS
JOHN W. SPIARS
84016
LICENSED
PROFESSIONAL ENGINEER
3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

SANITARY SEWER PROFILE

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

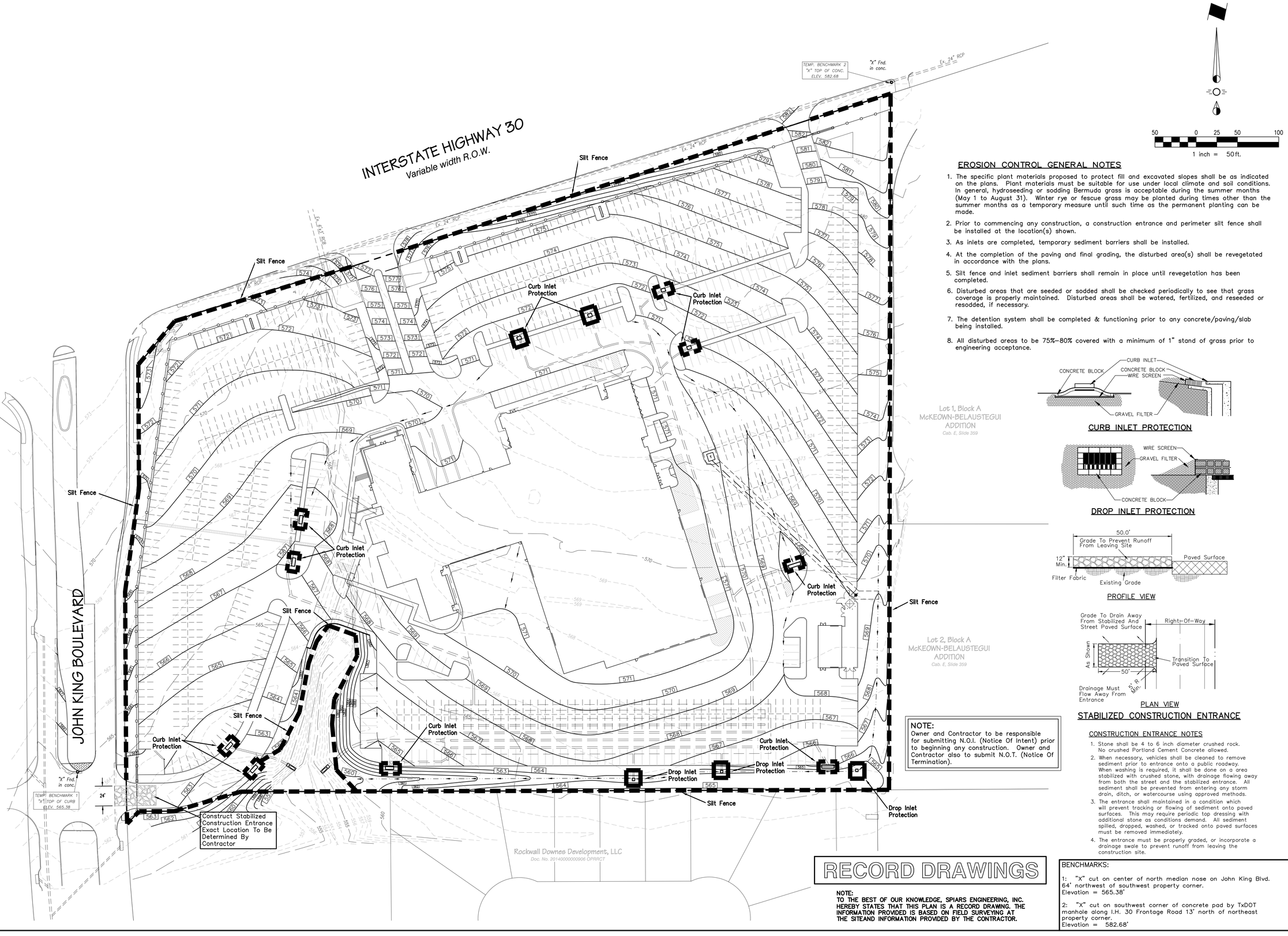
Revisions
ASI #1 3/31/2015

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Checked By: JWS

Sheet C 12
of 15

SEI No. 14-077

Plotted by: tbarnett Plot Date: 3/15/2016 1:59 PM
Drawing: C:\2014 JOBS\14-077 Nissan of Rockwall\14-077 Sanitary Sewer Profile.dwg Saved By: tbarnett Save Time: 3/15/2016 8:15:42 AM



50 0 25 50 100

1 inch = 50ft.

EROSION CONTROL GENERAL NOTES

1. The specific plant materials proposed to protect fill and excavated slopes shall be as indicated on the plans. Plant materials must be suitable for use under local climate and soil conditions. In general, hydroseeding or sodding Bermuda grass is acceptable during the summer months (May 1 to August 31). Winter rye or fescue grass may be planted during times other than the summer months as a temporary measure until such time as the permanent planting can be made.
2. Prior to commencing any construction, a construction entrance and perimeter silt fence shall be installed at the location(s) shown.
3. As inlets are completed, temporary sediment barriers shall be installed.
4. At the completion of the paving and final grading, the disturbed area(s) shall be revegetated in accordance with the plans.
5. Silt fence and inlet sediment barriers shall remain in place until revegetation has been completed.
6. Disturbed areas that are seeded or sodded shall be checked periodically to see that grass coverage is properly maintained. Disturbed areas shall be watered, fertilized, and reseeded or resodded, if necessary.
7. The detention system shall be completed & functioning prior to any concrete/paving/slab being installed.
8. All disturbed areas to be 75%–80% covered with a minimum of 1" stand of grass prior to engineering acceptance.

CURB INLET PROTECTION

DROP INLET PROTECTION

PROFILE VIEW

PLAN VIEW

STABILIZED CONSTRUCTION ENTRANCE

CONSTRUCTION ENTRANCE NOTES

1. Stone shall be 4 to 6 inch diameter crushed rock. No crushed Portland Cement Concrete allowed.
2. 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 a 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.
3. The entrance shall 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.
4. The entrance must be properly graded, or incorporate a drainage swale to prevent runoff from leaving the construction site.

NOTE:
Owner and Contractor to be responsible for submitting N.O.I. (Notice Of Intent) prior to beginning any construction. Owner and Contractor also to submit N.O.T. (Notice Of Termination).

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STATE OF TEXAS
JOHN W. SPIARS
84016
LICENSED
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3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

EROSION CONTROL PLAN

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

Date
Revisions

Scale: As Shown
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Sheet C 13 of 15

SEI No. 14-077

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SANDBLASTING WASTE MANAGEMENT

DESCRIPTION

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

INSTALLATION/APPLICATION CRITERIA

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

Operational Procedures

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

Educational Issues

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

Material Handling Recommendations

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

Quality Assurance

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

Requirements

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

Costs

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

LIMITATIONS

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

HAZARDOUS WASTE MANAGEMENT

DESCRIPTION

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

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

PRIMARY USE

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

INSTALLATION, APPLICATION AND DISPOSAL CRITERIA

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

Targeted Hazardous Waste Materials

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

Storage Procedures

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

Disposal Procedures

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

Education

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

Quality Assurance

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

Requirements

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

Costs

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

LIMITATIONS

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

SOLID WASTE MANAGEMENT

DESCRIPTION

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

PRIMARY USE

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

APPLICATIONS

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

Targeted Solid Waste Materials

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

Storage Procedures

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

Disposal Procedures

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

Education

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

Quality Control

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

Requirements

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

LIMITATIONS

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

CONCRETE WASTE MANAGEMENT

DESCRIPTION

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

PRIMARY USE

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

APPLICATIONS

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

Current Unacceptable Waste Concrete Disposal Practices

Dumping in vacant areas on the job-site
Illicit dumping off-jobsite
Dumping into ditches or drainage facilities

Recommended Disposal Practices

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

Education

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

Enforcement

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

Demolition Practices

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

Requirements

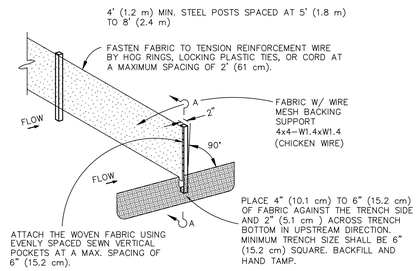
Use predetermined disposal for waste concrete.
Prohibit dumping waste concrete anywhere but predetermined areas.
Assign predetermined truck and equipment washing areas.
Educate drivers and operators on proper disposal and equipment cleaning procedures.

Costs

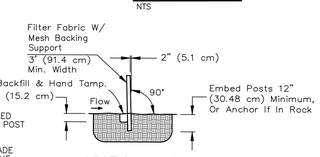
Minimal cost impact for training and monitoring.
Concrete disposal cost depends on availability and distance to suitable disposal areas.
Additional costs involved in equipment washing could be significant.

LIMITATIONS

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



SILT FENCE
NTS



SECTION A–A
NTS

SILT FENCE NOTES

1. STEEL 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 1 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 (e.g. PAVEMENT), WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER
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 STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHALL BE A 6 INCH DOUBLE OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

RECORD DRAWINGS

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

STATE OF TEXAS
JOHN W. SPIARS
84016
LICENSED
PROFESSIONAL ENGINEER
3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS

STORMWATER POLLUTION PREVENTION GUIDELINES

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

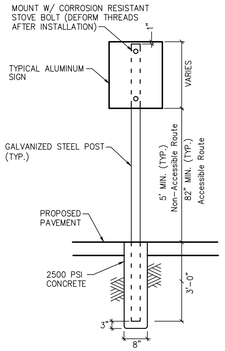
Date
Revisions

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 14
of 15

SEI No. 14-077

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TYPICAL SIGNAGE MOUNTING DETAIL

N.T.S.



COLORS:
LETTERS AND BORDER – GREEN
SYMBOL ON BLUE BACKGROUND
SIGN BACKGROUND – WHITE

NOTES:

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

TYPICAL SIGNAGE DETAIL TYPE I

N.T.S.



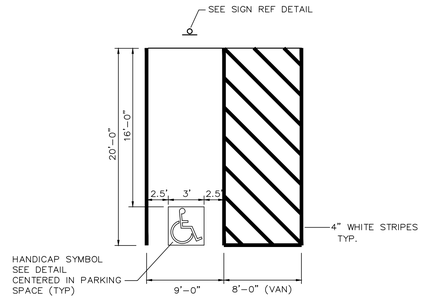
COLORS:
LETTERS AND BORDER – GREEN
SYMBOL ON BLUE BACKGROUND
SIGN BACKGROUND – WHITE

NOTES:

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

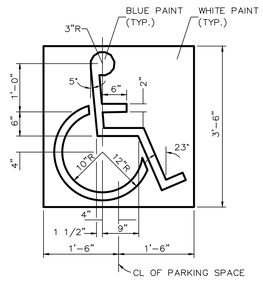
TYPICAL SIGNAGE DETAIL TYPE II

N.T.S.



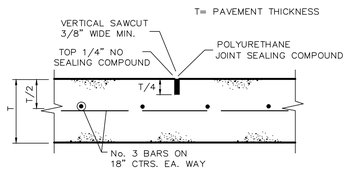
HANDICAP STRIPING DETAIL

N.T.S.



HANDICAP SYMBOL DETAIL

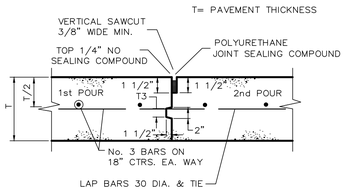
N.T.S.



SAWED DUMMY (CONTROL) JOINT

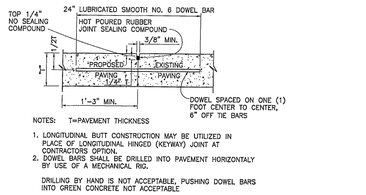
N.T.S.

MAXIMUM SPACING IS 15' CTRS. (TYP.)



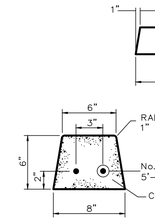
CONSTRUCTION JOINT

N.T.S.



LONGITUDINAL BUTT JOINT

N.T.S.



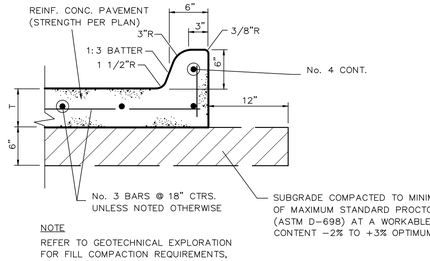
ELEVATION

1. PROVIDE ONE PRECAST CONCRETE SAFETY CURB PER PARKING SPACE 2 FEET FROM BACK OF CURB AND CENTERED BETWEEN STRIPES.
2. THE PRECAST CONCRETE SAFETY CURB SHALL BE ATTACHED SECURELY TO THE CONCRETE PAVEMENT WITH EPOXY ADHESIVE AS PER THE SPECIFICATIONS.

TYPICAL SECTION

PRECAST CONCRETE WHEELSTOP

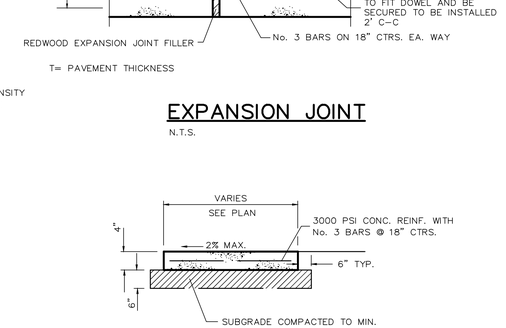
N.T.S.



NOTE
REFER TO GEOTECHNICAL EXPLORATION FOR FILL COMPACTION REQUIREMENTS, PAVEMENT INSTALLATION, AND ALL EARTHWORK OPERATIONS.

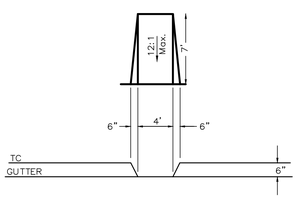
CONCRETE PAVEMENT SECTION

N.T.S.



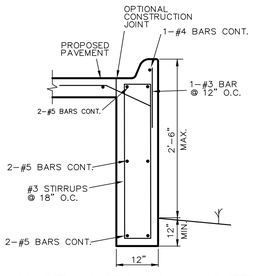
EXPANSION JOINT

N.T.S.



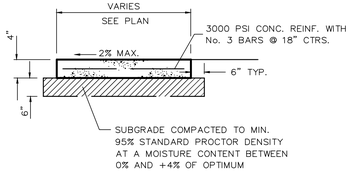
SIDEWALK RAMP DETAIL

N.T.S.



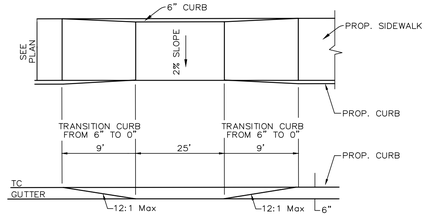
CURB WITH WALL DETAIL

N.T.S.



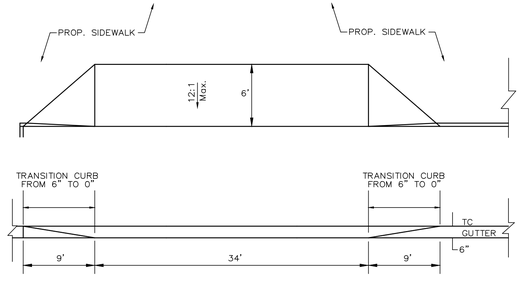
SITE SIDEWALK DETAIL

N.T.S.



HC RAMP DETAIL

N.T.S.



HANDICAP RAMP DETAIL

N.T.S.

TYPICAL 6" CURB TRANSITION TO MOUNTABLE CURB

N.T.S.

RECORD DRAWINGS

NOTE:
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STATE OF TEXAS
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84016
LICENSED
PROFESSIONAL ENGINEER
3/15/16

NISSAN OF ROCKWALL
LOT 1, BLOCK A
CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
SITE DETAILS

Issue Dates:
March 31, 2015
April 6, 2015
May 20, 2015

Revisions	Date
ASI #6	9/4/2015

Scale: As Shown
Drawn By: BLM
Checked By: JWS

Sheet C 15 of 15

SEI No. 14-077

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Barricade and Construction (BC) Standard Sheets General Notes:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets", the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

Worker Safety Apparel Notes:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel" labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.

DATE:
FILE:

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes prequalified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3134

WEB ADDRESSES FOR REFERENCED DOCUMENTS

Compliant Work Zone Traffic Control Devices List (CWZTCD)
http://www.txdot.gov/publications/traffic.htm

Texas Manual on Uniform Traffic Control Devices (TMUTCD)
http://www.txdot.gov/publications/traffic.htm

Standard Highway Sign Designs for Texas (SHSD)
http://www.txdot.gov/publications/traffic.htm

Traffic Engineering Standard Sheets
http://www.txdot.gov/business/disclaim.htm

Material Producer List
http://www.txdot.gov/business/producer*list.htm

Departmental Material Specifications (DMS)
http://www.txdot.gov/services/construction/material*specifications/

Roadway Design Manual
http://www.txdot.gov/services/general*services/manuals.htm

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

1 of 12 BC(1)-07

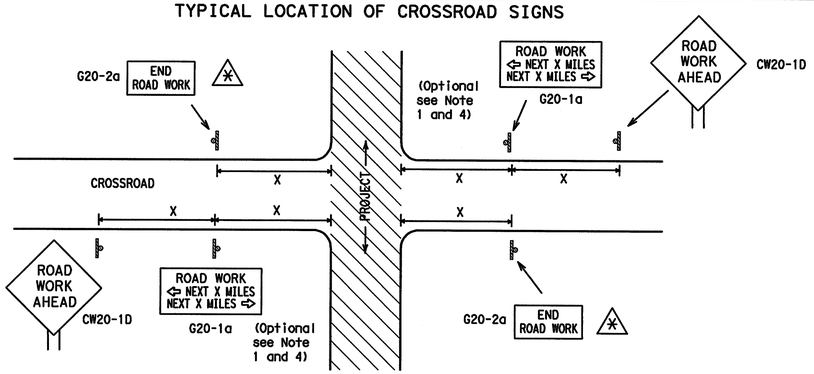
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DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	COUNT	SECT	JOB	HIGHWAY
4-03				
9-07	DIST	COUNTY		SHEET NO.

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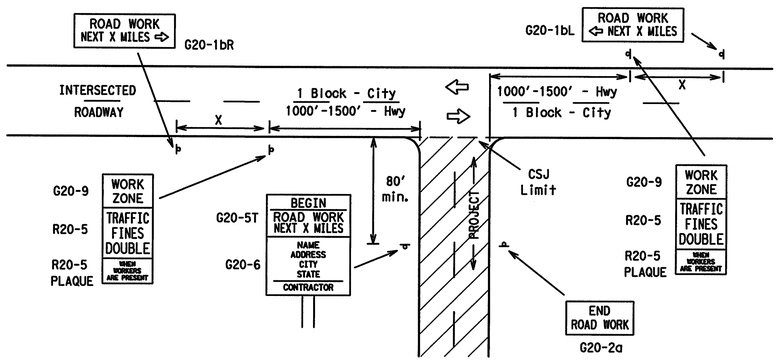
TYPICAL LOCATION OF CROSSROAD SIGNS



✱ May be mounted on back of CW20-1D sign with approval of engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a CW20-1D ROAD WORK AHEAD sign and a G20-2a END ROAD WORK sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" END ROAD WORK (G20-2a) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The G20-1a sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection the Contractor shall place the G20-6 "Contractor Name" sign behind the Type III Barricades for the road closure (see BC(10) also). The G20-1bL and G20-1bR signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING [1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20 [4], CW21, CW22, CW23, CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

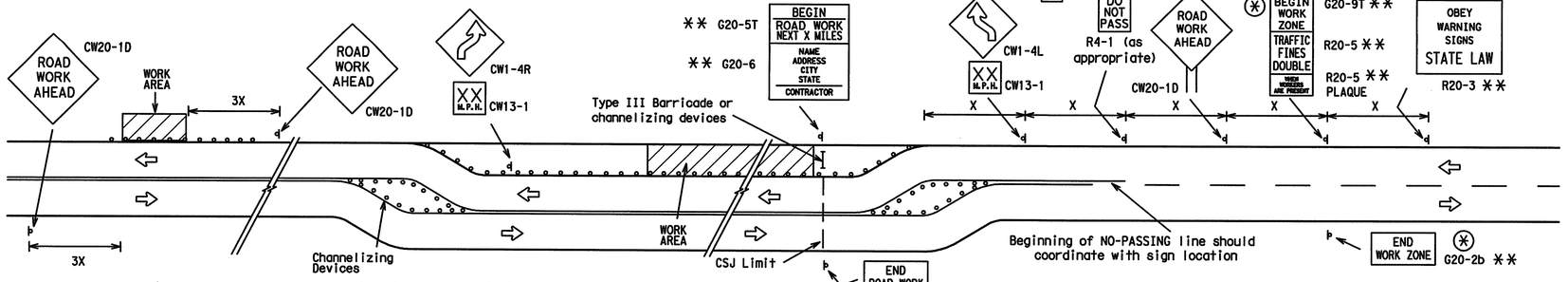
Posted Speed	Sign Spacing "X" △
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500 [2]
60	600 [2]
65	700 [2]
70	800 [2]
75	900 [2]
80	1000 [2]
✱	✱ [3]

✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

General Notes:

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have ½ mile or more advance warning.
4. 36" x 36" ROAD WORK AHEAD (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

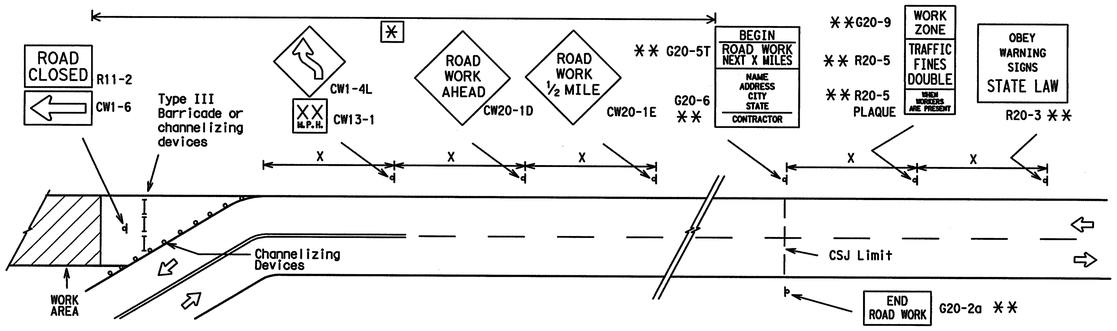
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work areas, the Engineer/Inspector should ensure additional Road Work Ahead (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and G20-5T sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

⊛ The G20-9T and G20-2b shall be used when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a work zone where traffic fines may double if workers are present.

✱✱ Required CSJ Limit signing. See Note 10 on BC(1).

✱ Area for placement of "ROAD WORK AHEAD" sign and other signs or devices as called for on the Traffic Control Plan.

LEGEND

- ○| Sign
- ○ ○ Channelizing Devices
- I Type III Barricade
- X See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.



R20-3
Legend/Border - Black
Background - White

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION PROJECT LIMIT STANDARD

2 of 12 BC(2)-07

©TxDOT 11-4-02	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-07 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

102

DATE:
FILE:

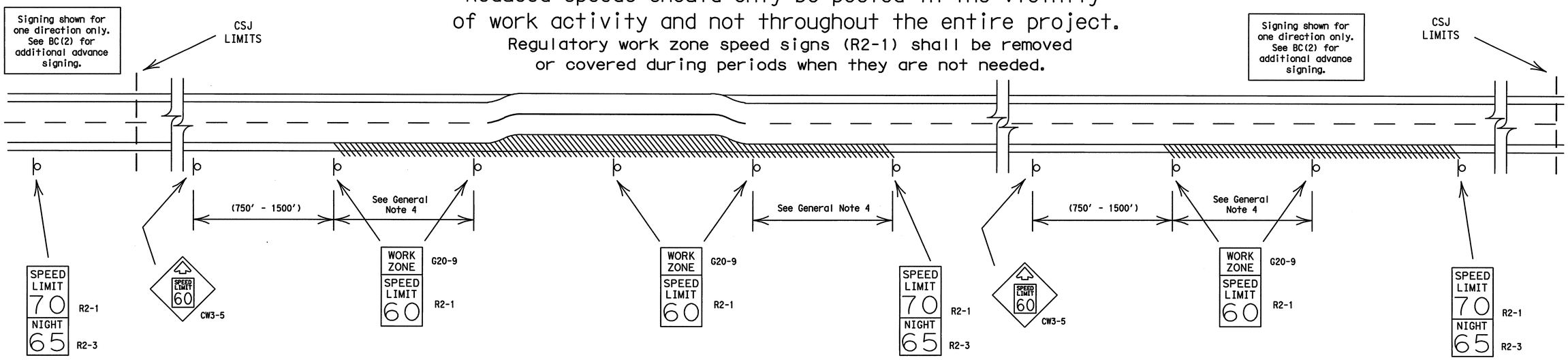
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DATE:
FILE:

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.
Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 15 feet of pavement edge or actually on the pavement.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES:

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, errection and maintenance of the CW3-5 sign, G20-9 plaque and the R2-1 and R2-3 signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless otherwise noted.
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only.
   Work Zone Speed Limits should only be posted as approved for each project.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT STANDARD

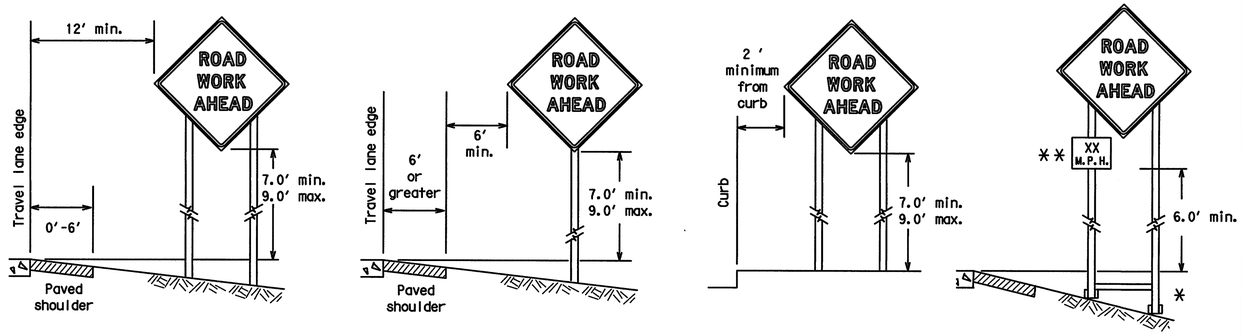
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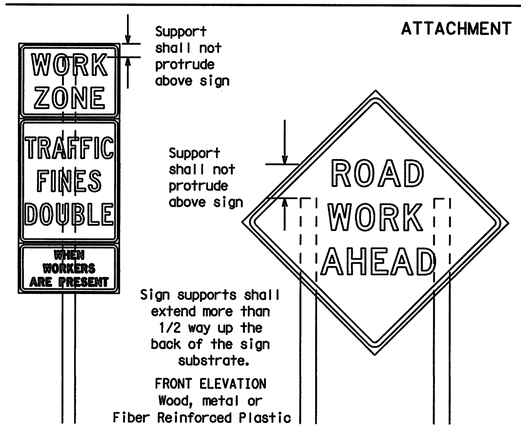
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



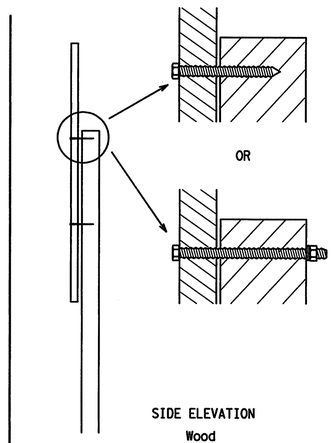
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same guage material.



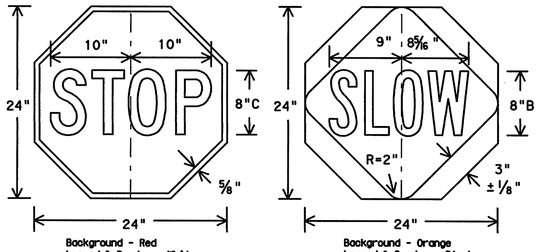
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails will NOT be allowed.

Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
6. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
7. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
8. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
9. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
10. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday. or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Engineer may allow the use of smaller size construction warning signs on secondary roads or city streets where speeds are low if the sign size is listed as an option on the "Typical Construction Warning Sign Size and Spacing" chart shown on BC(2).
2. The Contractor shall furnish the sign sizes shown in plans, the BC Sheets, the TCP sheets or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type C (High Specific Intensity), shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type E (Fluorescent Prismatic), shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This type of sign support meets the crashworthiness standards regardless of the direction of impact. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face. These materials can damage the retroreflectivity of sheeting.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact.
6. Rubber (such as tire inner tubes) shall NOT be used for sandbags.
7. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
8. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
9. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES STANDARD

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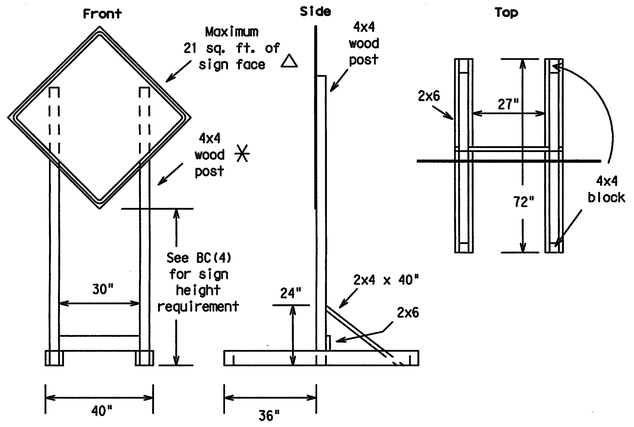
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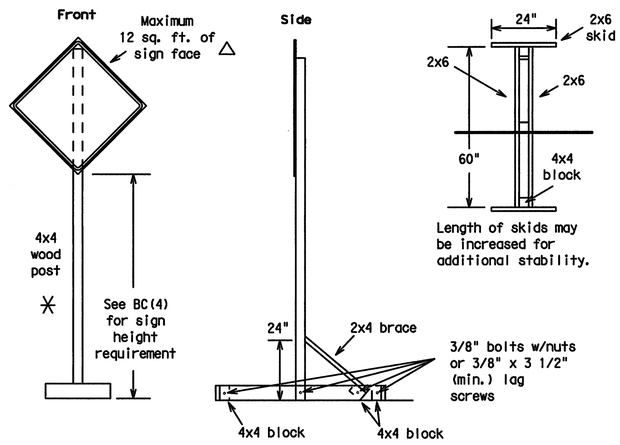
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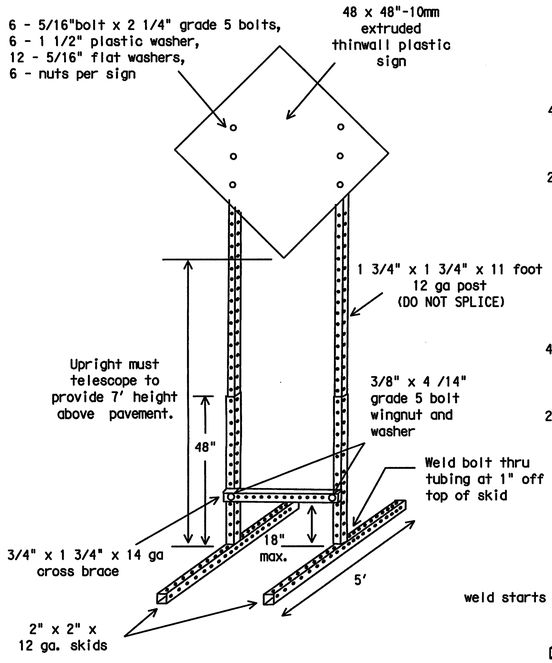
SKID MOUNTED WOOD SIGN SUPPORTS

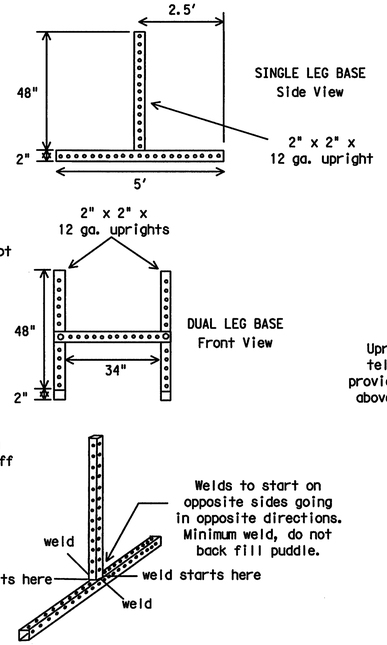
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

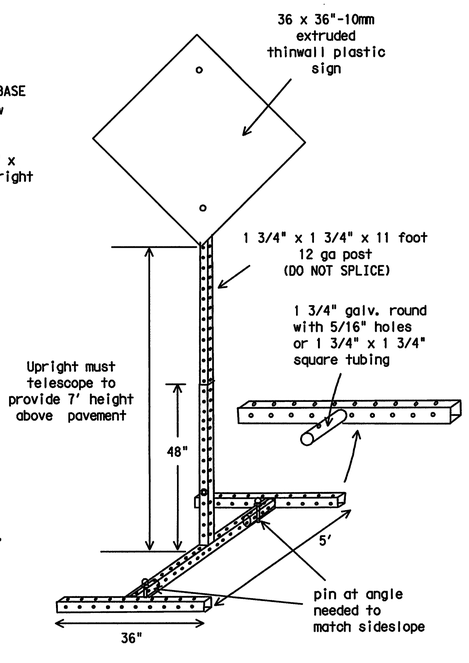




SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

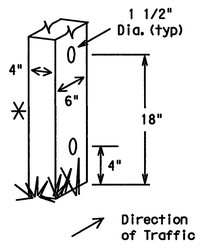






WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).



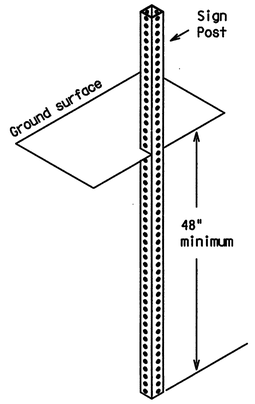
WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS

Nominal Post Size	No. of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

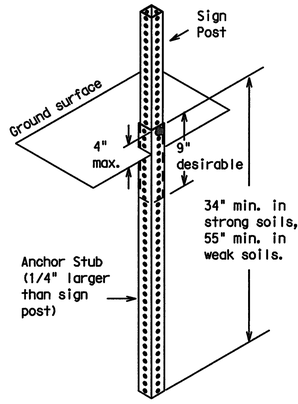
GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.

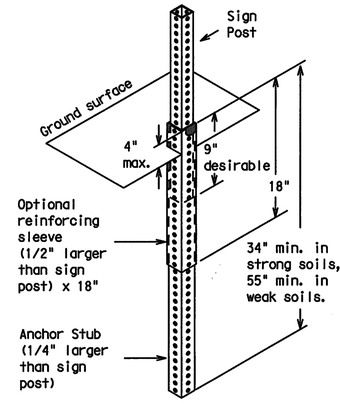
PERFORATED SQUARE METAL TUBING



OPTION 1
(Direct Embedment)



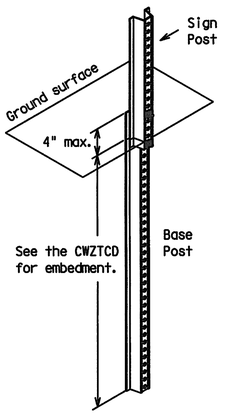
OPTION 2
(Anchor Stub)



OPTION 3
(Anchor Stub and Reinforcing Sleeve))

WING CHANNEL

Lap-splice/base bolted anchor



GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. More details of approved Long/Intermediate and Short Term supports can be found on the CWZTCD list. See BC(1) for website location.
3. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
4. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

□ See BC(4) for definition of "Work Duration."

✳ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

△ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT STANDARD

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PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 720 feet. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

Word or Phrase	Abb.	Word or Phrase	Abb.
Access Road	ACCS RD	Major	MAJ
Air Quality	AIR QLTY	Miles	MI
Alternate	ALT	Miles Per Hour	MPH
Avenue	AVE	Minor	MNR
Best Route	BEST RTE	Monday	MON
Boulevard	BLVD	Normal	NORM
Bridge	BRDG	North	N
Cannot	CANT	Northbound	(route) N
Center	CNTR	Parking	PKING
Construction Ahead	CONST AHEAD	Parking Lot	PRK LOT
Detour Route	DETOUR RTE	Road	RD
Do Not	DONT	Right Lane	RGT LN
East	E	Saturday	SAT
Eastbound	(route) E	Service Road	SERV RD
Emergency	EMER	Shoulder	SHLDR
Emergency Vehicle	EMER VEH	Slippery	SLIP
Entrance, Enter	ENT	South	S
Express Lanes	EXP LANE	Southbound	(route) S
Expressway	EXPWY	Speed	SPD
XXXX Feet	XXXX FT	Street	ST
Fog Ahead	FOG AHD	Sunday	SUN
Freeway	FRWY, FWY	Telephone	PHONE
Freeway Blocked	FWY BLKD	Temporary	TEMP
Friday	FRI	Thursday	THURS
Hazardous Driving	HAZ DRIVING	To Downtown	TO DWNTN
Hazardous Material	HAZMAT	Traffic	TRAF
High-Occupancy Vehicle	HOV	Travelers	TRVLRS
Highway	HWY	Tuesday	TUES
Hours	HR	Time Minutes	TIME MIN
Information	INFO	Upper Level	UPPR LVL
It Is	ITS	Vehicle	VEH
Junction	JCT	Warning	WARN
Left	LFT	Wednesday	WED
Left Lane	LFT LN	Weight Limit	WT LIMIT
Lane Closed	LN CLSD	West	W
Lower Level	LOWR LVL	Westbound	(route) W
Maintenance	MAINT	Wet Pavement	WET PVMT
		Will Not	WONT

Roadway designation # IH-number, US-number, SH-number, FM-number

WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

(The Engineer may approve other messages not specifically covered here.)

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT
RIGHT X LANES CLOSED	RIGHT X LANES OPEN
CENTER LANE CLOSED	DAYTIME LANE CLOSURES
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE
EXIT CLOSED	RIGHT LN TO BE CLOSED
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI
XXXXXXXX BLVD CLOSED	

Other Condition List

ROADWORK XXX FT	ROAD REPAIRS XXXX FT
FLAGGER XXXX FT	LANE NARROWS XXXX FT
RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
DETOUR X MILE	ROUGH ROAD XXXX FT
ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
BUMP XXXX FT	US XXX EXIT X MILES
TRAFFIC SIGNAL XXXX FT	LANES SHIFT *

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE *				

** See Application Guidelines Note 6.

Application Guidelines

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limted to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work

Wording Alternatives

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the CW20-7a Flagger Symbol, are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow panel provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) STANDARD

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CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.

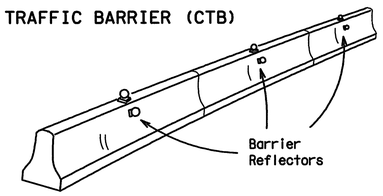
9-07 REVISIONS

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BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

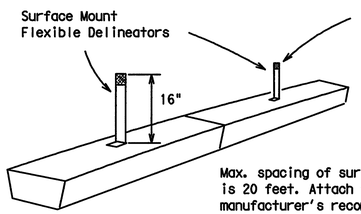
1. Barrier Reflectors shall be prequalified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors (Type C Delineators) can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 502.

CONCRETE TRAFFIC BARRIER (CTB)



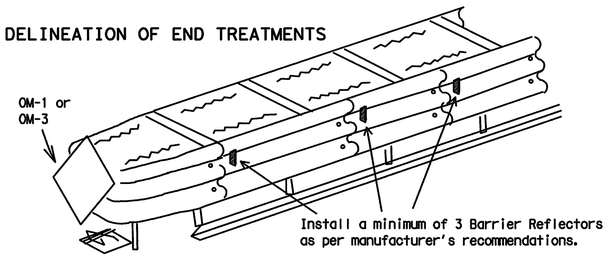
3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented. Yellow Barrier Reflectors shall be made with Type E Fluorescent Prismatic Yellow Retroreflective Sheeting. White reflectors shall be made with Type D White Prismatic sheeting.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.

LOW PROFILE CONCRETE BARRIER (LPCB)



Max. spacing of surface mount flexible delineators is 20 feet. Attach the delineators as per manufacturer's recommendations.

DELINEATION OF END TREATMENTS



	APPROACHING TRAFFIC	
	BOTH SIDES	ONE SIDE
DELINEATION	OM-1	OM-3 or Vertical Panel

END TREATMENTS FOR CTB'S USED IN WORK ZONES

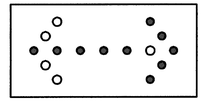
End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

TYPICAL FLASHING ARROW PANEL

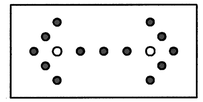
Arrow Panels may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. The Flashing Arrow Panel should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Panels should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Panel.
4. The Flashing Arrow Panel should be able to display the following symbols:

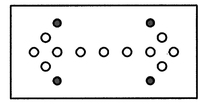
Flashing RIGHT (LEFT) ARROW



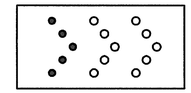
Flashing DOUBLE ARROW



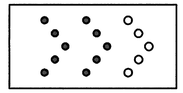
Flashing CAUTION

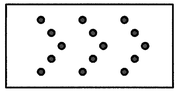


5. The "CAUTION" display consists of four corner lamps flashing simultaneously.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Panel shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.



Sequential Chevron





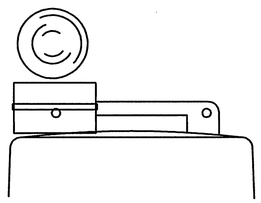
REQUIREMENTS

TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

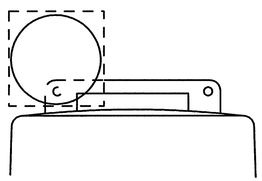
ATTENTION: Flashing Arrow Panels shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW PANEL FROM THE RIGHT-OF-WAY OR PLACE THE ARROW PANEL BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

11. The Flashing Arrow Panel shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Panel SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS may be used to simulate a Flashing Arrow Panel provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. Minimum mounting height of trailer mounted arrow panels should be 7 feet from roadway to bottom of panel.



Type C Warning Light or approved substitute mounted adjacent to the travel way.



Warning reflector may be round or square. Must have a reflective surface area of at least 30 square inches

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type E Sheeting (Fluorescent Prismatic) meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type D (Non-fluorescent Prismatic).
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the dates shown in the CWZTCD to ensure that the TMA meets the age requirements and the crashworthiness criteria established by the Federal Highway Administration (FHWA) for TMAs.
4. Refer to the CWZTCD for a list of approved TMAs.
5. TMAs are required on freeways unless otherwise noted in the plans.
6. A TMA should be used anytime that it can be positioned approximately 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
7. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR STANDARD

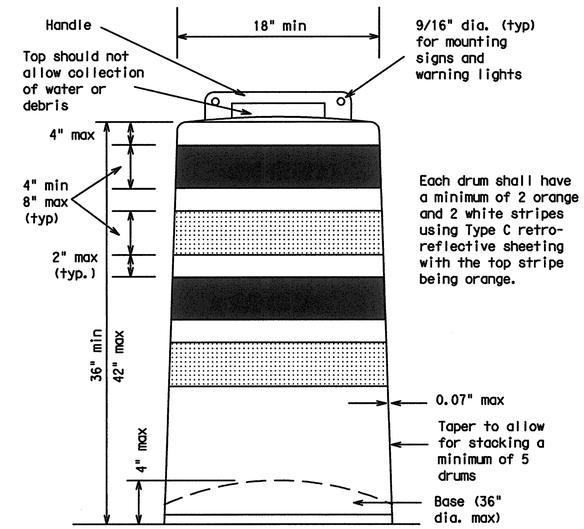
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9-07 REVISIONS	COUNT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

DATE:
FILE:

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones ar one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Prequalified plastic drums shall meet the following requirements:

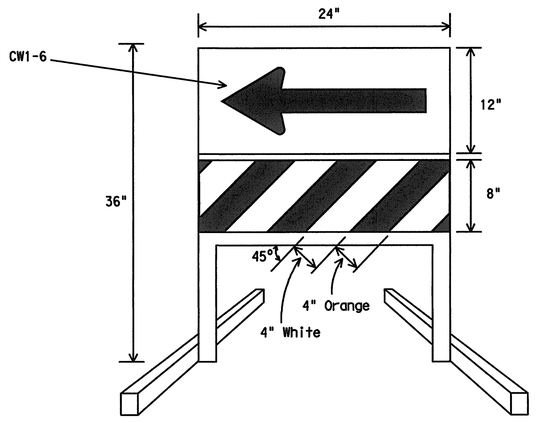
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a minimum unballasted weight of 7.7 lbs. and maximum unballasted weight of 11 lbs. The wall of the drum body shall be a minimum of 0.07 inch in thickness. Weight of any drum supplied shall not vary more than 0.5 lb. from that of the prequalified sample.
10. Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Flat Surface Reflective Sheeting." High Specific Intensity (Type C) retroreflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

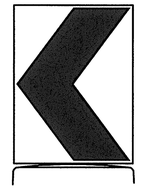
BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
4. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
5. Ballast shall not be placed on top of drums.
6. Adhesives may be used to secure base of drums to pavement.

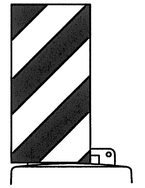


DIRECTION INDICATOR BARRICADE

1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type E Fluorescent Prismatic Orange above a rail with Type C High Specific Intensity retroreflective sheeting in alternation 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type E (Fluorescent Prismatic) sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type C (High Specific Intensity). Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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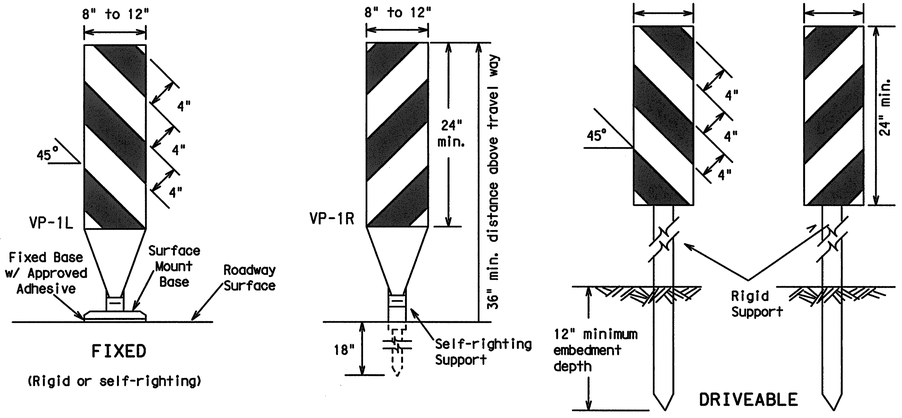
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REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
4-03	CONT	SECT	JOB	HIGHWAY
9-07				
	DIST	COUNTY		SHEET NO.

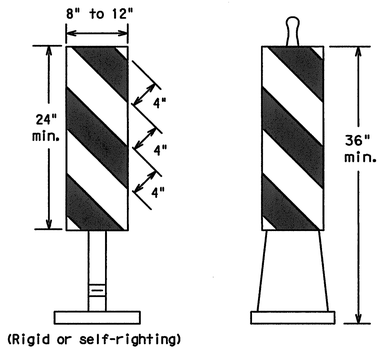
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CHANNELIZING DEVICES

VERTICAL PANELS (VPs)

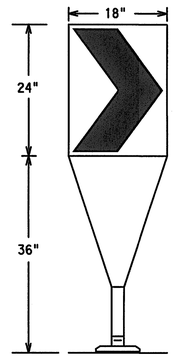


1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, shall have a minimum of 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is greater than 36 inches, a panel stripe of 6 inches shall be used.



PORTABLE

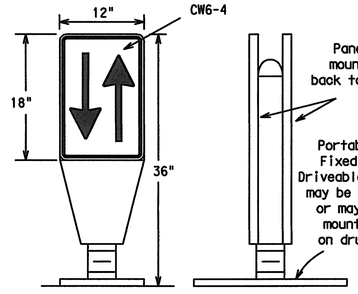
CHEVRONS



Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

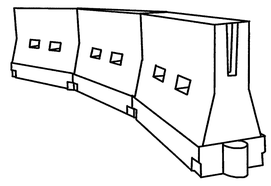
1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type E (Fluorescent Prismatic) conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall be black vinyl non-reflective decal sheeting meeting the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with simple tubular markers or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. Tubular markers or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type E (Fluorescent Prismatic) conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall be black vinyl non-reflective decal sheeting meeting the requirements of DMS-8300.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS



LONGITUDINAL CHANNELIZING DEVICES

1. Longitudinal channelizing devices are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. **They are not designed to contain or redirect a vehicle on impact.**
2. Longitudinal channelizing devices may be used instead of a line of cones or drums.
3. Longitudinal channelizing devices shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Longitudinal channelizing devices should not be used to provide positive protection for obstacles, pedestrians or workers.
5. Longitudinal channelizing devices shall be retroreflective, or supplemented with retroreflective delineation as required for temporary barriers on BC(7)-07.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall be not less than 32 inches in height.

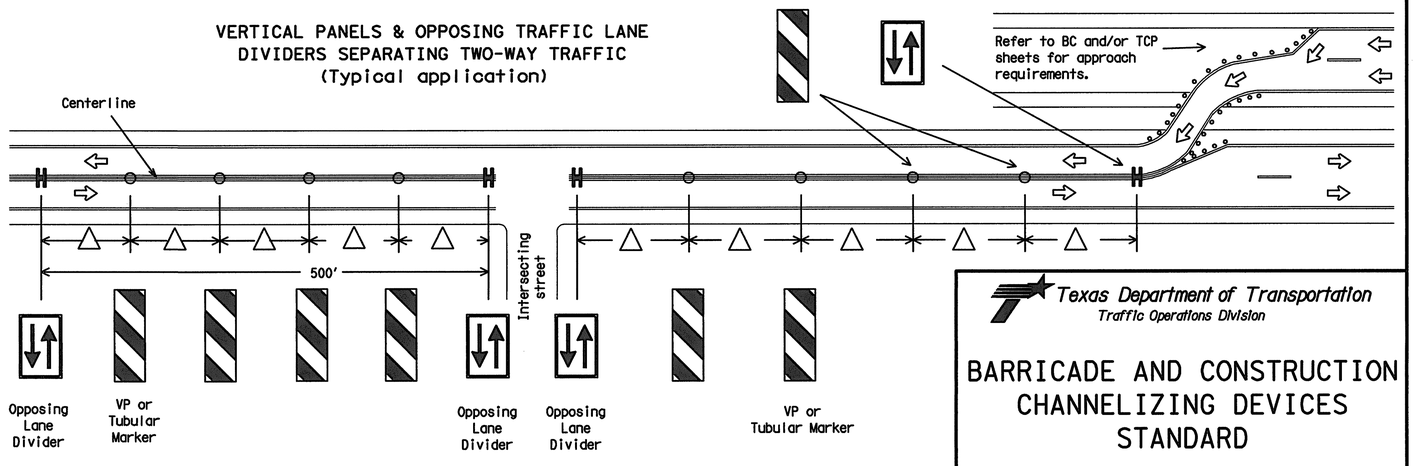
GENERAL NOTES:

1. Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh approximately 35 lbs.
6. Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.
8. Examples on this sheet are commonly used channelizing devices in work zones. For other devices, refer to the CWZTCD.

Posted Speed	Formula	Minimum Desirable Taper Lengths ✳✳ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'
35		205'	225'	245'	35'	70'-90'
40		265'	295'	320'	40'	80'-100'
45	L=WS	450'	495'	540'	45'	90'-110'
50		500'	550'	600'	50'	100'-125'
55		550'	605'	660'	55'	110'-140'
60		600'	660'	720'	60'	120'-150'
65		650'	715'	780'	65'	130'-165'
70		700'	770'	840'	70'	140'-175'
75		750'	825'	900'	75'	150'-185'
80		800'	880'	960'	80'	160'-195'

✳✳Taper lengths have been rounded off.
L=Length of Taper (FT.) W=Width of Offset (FT.)
S=Posted Speed (MPH)

VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS SEPARATING TWO-WAY TRAFFIC (Typical application)



△ Spacing between the VP's or tubular markers shall not exceed 100 feet. On roadways with speeds less than 45 MPH, spacing between the tubular markers or VP's shall be as shown on the channelizing spacing table shown on this page. If the table shows spacing greater than 100 feet based on the roadway speed, then use a maximum of 100 feet spacing between the tubular markers or VP's. Every fifth channelizing device shall be an OTLD, except when the OLTD must be spaced closer to accomodate an intersection. Spacing between the OTLD shall not exceed 500 feet.

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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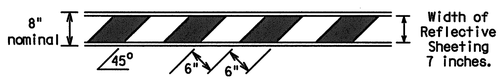
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TYPE III BARRICADES

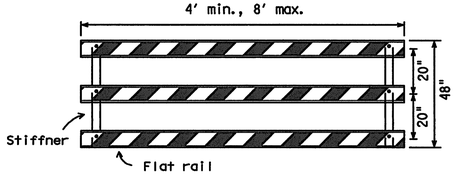
1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type III Barricades and a list of all materials used in the construction of Type III Baricades.
2. Type III Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specfication DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

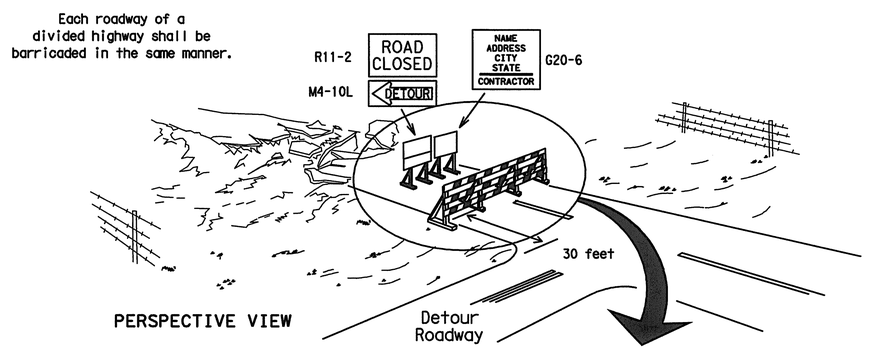


TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



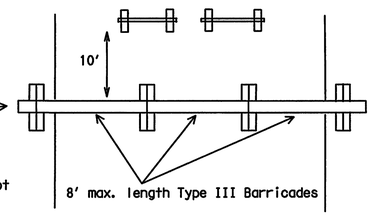
Stiffner may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPE III BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

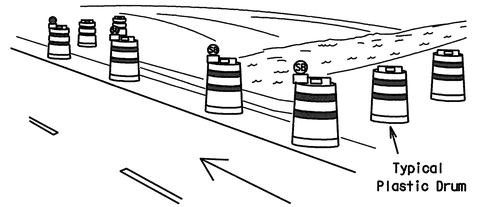
The three rails on Type III barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

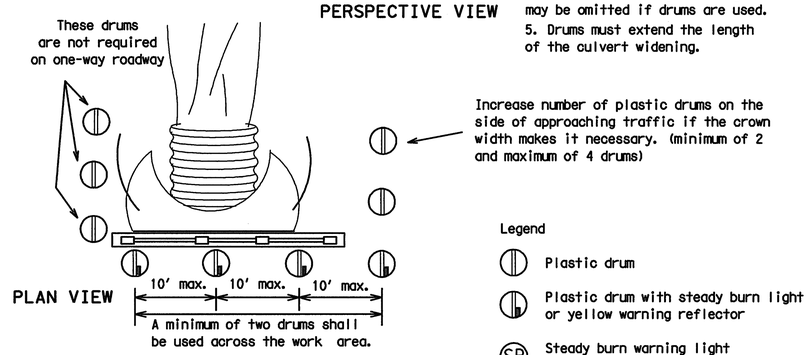
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type III Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



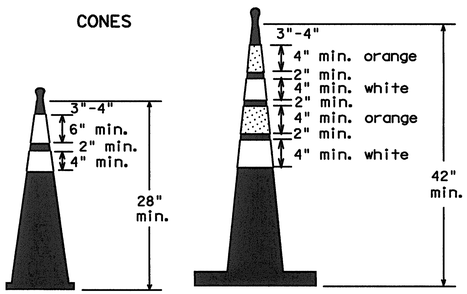
PERSPECTIVE VIEW

1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.

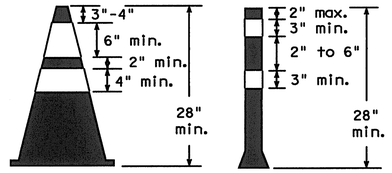


PLAN VIEW

CONES



Two-Piece cones



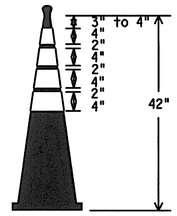
One-Piece cones

Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

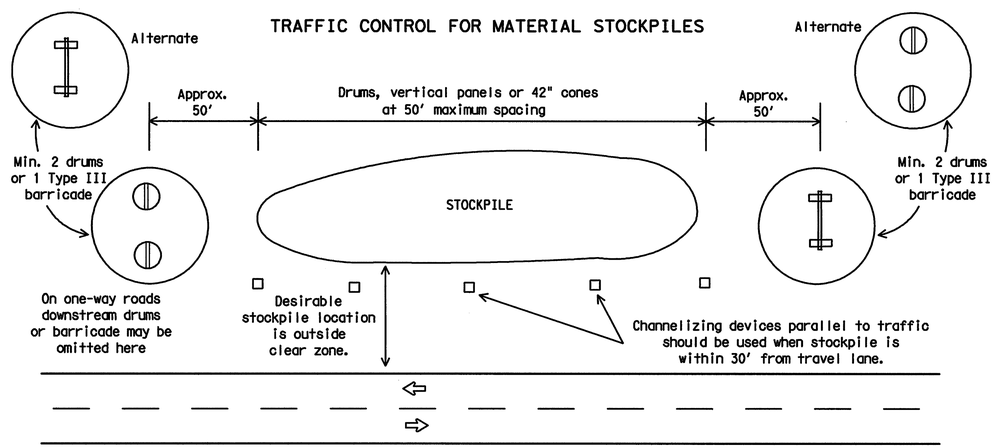
1. Traffic cones and tubular markers shall be a minimum of 28 inches in height when used either on freeways or at nighttime.
2. Cones or tubular markers shall be predominantly orange, fluorescent red-orange, or fluorescent yellow-orange. They should be kept clean and bright for maximum visibility.
3. Cones used only for daytime operations do not require the reflectorized bands.
4. Cones and tubular markers used for nighttime operations shall be reflectorized. Reflectorized material shall have a smooth, sealed outer surface that displays the same approximate color during the day and night. The reflectorized bands shall be retroreflective Type C (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
5. When used at night, appropriate personnel shall ensure that cones and tubular markers remain in their proper location and in an upright position.
6. Reflectorization of 28"cones shall consist of a minimum 6 inch band placed at least 3 inches but not more than 4 inches from the top, supplemented by a minimum 4 inch band spaced a minimum of 2 inches below the 6 inch band.
7. Reflectorization of 42" cones shall be provided by alternating 4 to 6" orange and white stripes with orange on top.
8. Reflectorization of tubular markers shall be a minimum of two 3 inch bands placed a maximum of 2 inches from the top with a maximum of 6 inches between bands.
9. One-piece cones or tubular markers are generally suitable for temporary usage (up to 8 hours) with other channelization devices such as vertical panels, drums or two-piece cones for long term usage. Care should be taken to ensure they remain in their proper location and in an upright position.
10. Cones or tubular markers used on each project shall be of the same size and shape.
11. The handle may be designed as a hook or other shape, fabricated from non-rigid materials similar to the cone material, and may extend up to a maximum of 8 inches above the top of cone. Length of the handle shall not be considered with regard to the overall height of the cone.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type C encapsulated bead (High Specific Intensity) conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

TRAFFIC CONTROL FOR MATERIAL STOCKPILES



Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES STANDARD

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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

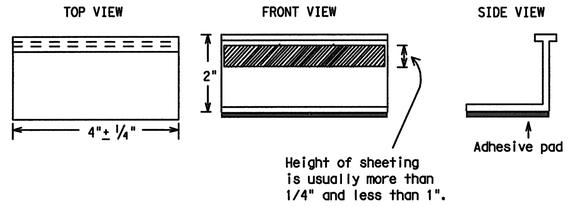
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway, shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than two weeks, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

Raised Pavement Markers used as Guidemarks

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PREFABRICATED PAVEMENT MARKINGS-PERMANENT	DMS-8240
PREFABRICATED PAVEMENT MARKINGS-REMOVABLE	DMS-8241
TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

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11-02	DIST	COUNTY		SHEET NO.
9-07				

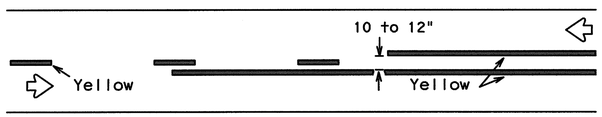
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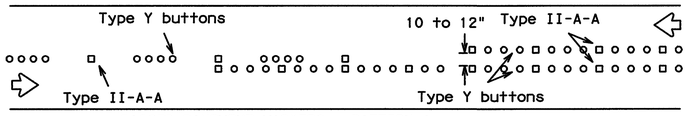
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PAVEMENT MARKING PATTERNS

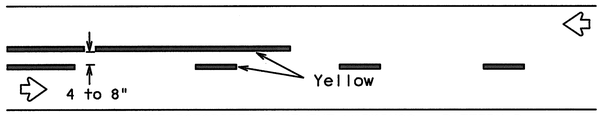
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



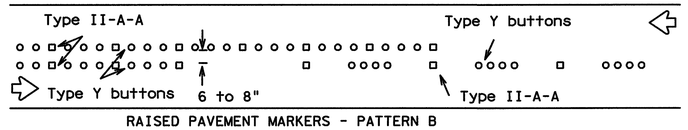
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



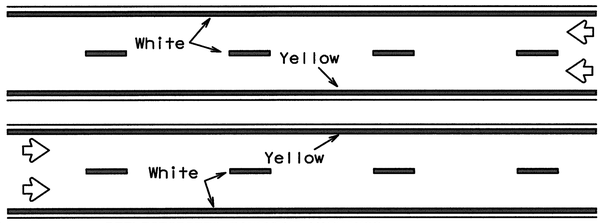
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



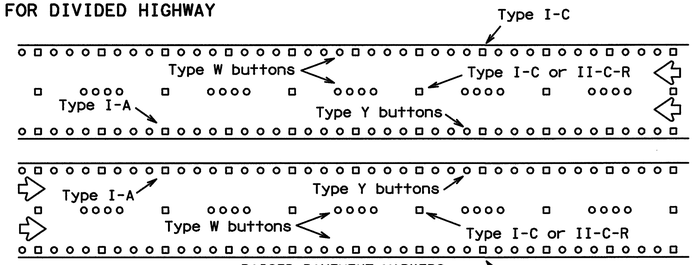
RAISED PAVEMENT MARKERS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



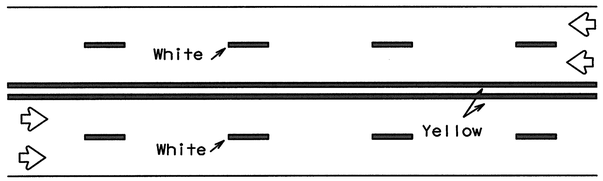
REFLECTORIZED PAVEMENT MARKINGS



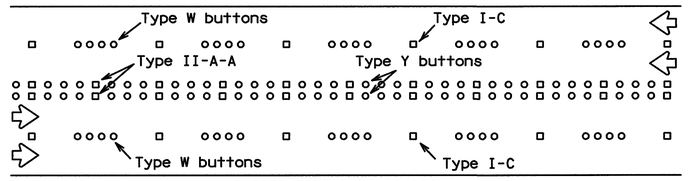
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



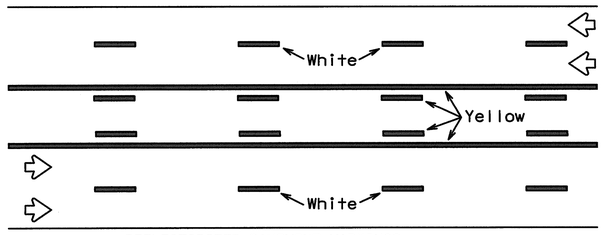
REFLECTORIZED PAVEMENT MARKINGS



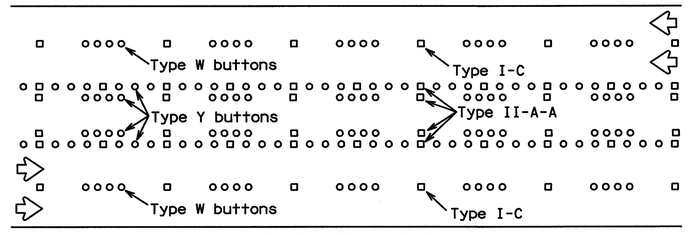
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE



REFLECTORIZED PAVEMENT MARKINGS



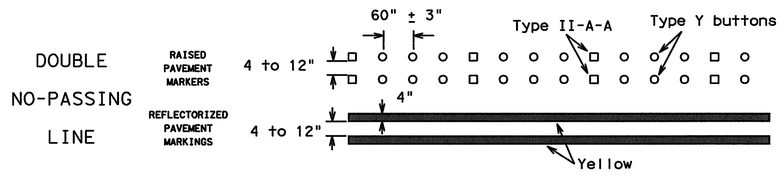
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

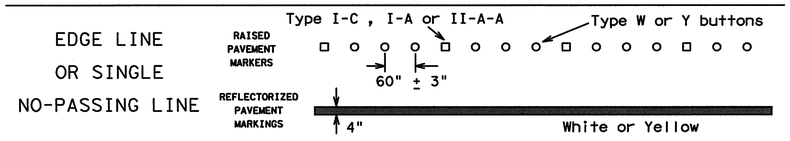
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

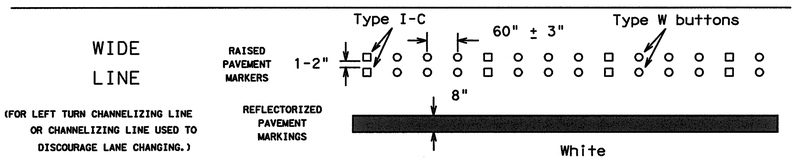


EDGE LINE OR SINGLE NO-PASSING LINE



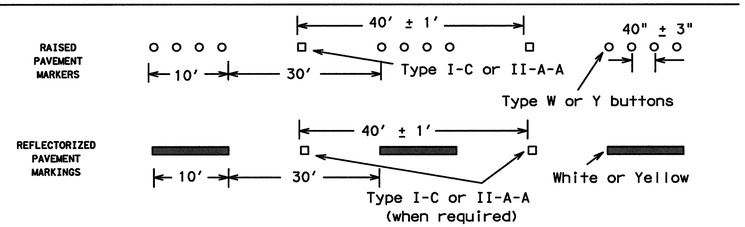
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)



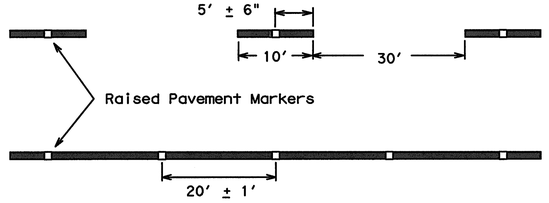
BROKEN LINE

(FOR CENTER LINE OR LANE LINE.)



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

Texas Department of Transportation
Traffic Operations Division

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS STANDARD

12 of 12 BC(12)-07

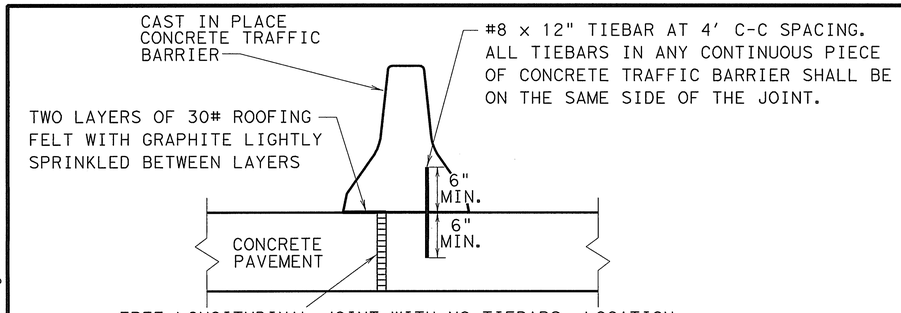
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REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
1-97	CONT	SECT	JOB	HIGHWAY
2-98				
11-02	DIST	COUNTY		SHEET NO.
9-07				

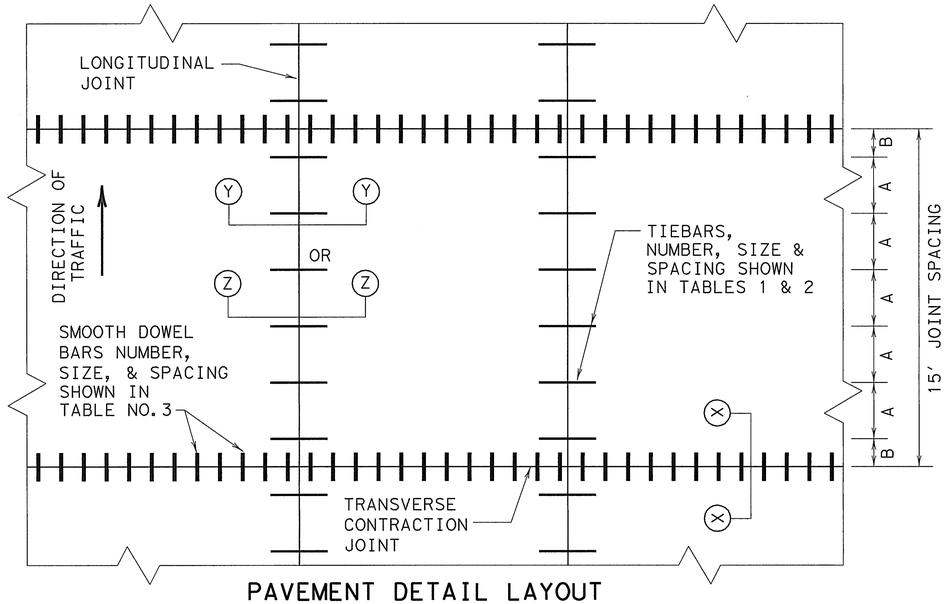
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FREE LONGITUDINAL JOINT DETAIL

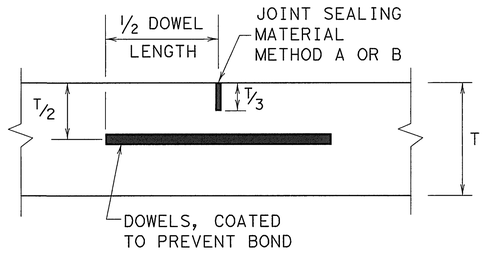


PAVEMENT DETAIL LAYOUT

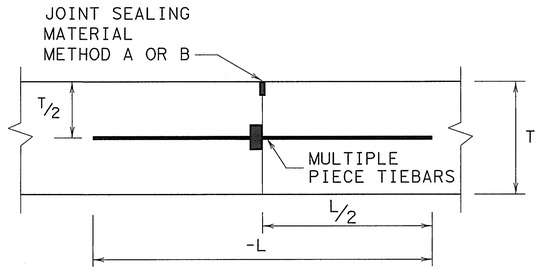
TABLE NO. 1 TIEBARS REQUIRED FOR LONGITUDINAL JOINT JOINTS FOR EACH 15' SLAB

ASTM A-616 OR A-615 (GRADE 60) STRAIGHT OR MULIPLE PIECE REINFORCING TIEBARS		CONCRETE SLAB THICKNESS	DISTANCE FROM THE LONGITUDINAL JOINT TO THE NEAREST LONGITUDINAL FREE EDGE			
			< OR =16'	< OR =24'	< OR =34'	< OR =50'
BAR LENGTH, "L" INCHES	BAR SIZE	"T" INCHES	REQUIRED NO. OF BARS	REQUIRED NO. OF BARS	REQUIRED NO. OF BARS	REQUIRED NO. OF BARS
42	#5 (5/8")	8	5	5	6	9
		9	5	5	7	10
		10	5	5	7	11
		11	5	6	8	12
		12	5	6	9	13
		13	5	7	9	13
		14	6	7	10	NA
		15	6	8	11	NA
50	#6 (3/4")	8	5	5	5	6
		9	5	5	5	7
		10	5	5	5	8
		11	5	5	6	8
		12	5	5	6	9
		13	5	5	7	10
		14	5	5	7	10
		15	5	6	8	11

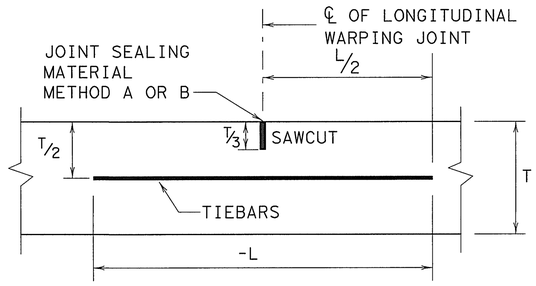
THE DISTANCE TO THE FREE EDGE WILL BE DETERMINED BY THE ENGINEER AND THE DISTANCE WILL BE BASED ON THE NOMINAL WIDTHS OF THE LANES AND SHOULDERS PLUS ANY TIED RAMPS OR CONNECTING ROADWAYS.



TRANSVERSE CONTRACTION JOINT SECTION X-X



LONGITUDINAL CONSTRUCTION JOINT SECTION Y-Y



LONGITUDINAL WARPING JOINT SECTION Z-Z

TABLE NO. 2 TIEBAR SPACINGS

SPACING REQUIREMENT FOR 15'SLAB FOR REQUIRED NUMBER OF BARS		
REQUIRED NO. OF BARS	REGUALR SPACING "A" INCHES	FIRST AT JOINT "B" INCHES
5	36	18
6	30	15
7	25	15
8	21	16.5
9	18	18
10	16	18
11	15	15
12	13	18.5
13	12	18

TABLE NO. 3 DOWELS REQUIEMENTS

T, IN.	DOWELS (SMOOTH BARS)	
	SIZE AND LENGTH	AVERAGE SPACING (INCHES)
8	1" X 18"	12
9	1 1/8" X 18"	12
10	1 1/4" X 18"	12
11	1 3/8" X 18"	12
12	1 1/2" X 18"	12
13	1 5/8" X 18"	12
14	1 3/4" X 18"	12
15	1 7/8" X 18"	12

GENERAL NOTES

1. CONCRETE SLABS WIDER THAN 100' WITHOUT A FREE JOINT, ARE NOT COVERED BY THIS STANDARD.
2. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND LOAD TRANSFER DEVICES REFER TO THE GOVERNING SPECIFICATIONS FOR "CONCRETE PAVEMENT" AND "REINFORCING STEEL."
3. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS, AND CROWN CROSS SLOPE SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
4. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR WILL BE SHOWN IN CONCRETE PAVEMENT DETAIL, JOINT SEALANT STANDARD (JS-94).
5. PAVEMENT WIDTHS IN EXCESS OF 16' SHALL BE PROVIDED WITH A LONGITUDINAL JOINT (SECTION Z-Z OR Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6" OF THE LANE LINES UNLESS SHOWN ELSEWHERE ON THE PLANS.
6. THE JOINT BETWEEN OUTSIDE LANE AND SHOULDER SHALL BE A LONGITUDINAL WARPING JOINT (SECTION Z-Z) UNLESS OTHERWISE SHOWN IN THE PLANS.
7. THE SPACING BETWEEN TRANSVERSE JOINTS SHALL BE 15 FEET UNLESS OTHERWISE SHOWN IN THE PLANS.
8. WHERE A MONOLITHIC CURB IS SPECIFIED, THE JOINT IN THE CURB SHALL COINCIDE WITH PAVEMENT JOINTS AND MAY BE FORMED BY ANY MEANS APPROVED BY THE ENGINEER.
9. TRANSVERSE CONSTRUCTION JOINTS MAY BE FORMED BY USE OF METAL OR WOOD FORMS EQUAL IN DEPTH TO THE NOMINAL DEPTH OF THE PAVEMENT, OR BY METHODS APPROVED BY THE ENGINEER.
10. THE ENGINEER WILL ADJUST THE REQUIRED NUMBER OF TIEBARS FOR SLABS SHORTER OR LONGER THAN 15'. SPACING "B" WILL BE ADJUSTED TO MAINTAIN A MINIMUM CLEARANCE OF 2" BETWEEN THE TIEBAR AND THE DOWEL BARS AT THE TRANSVERSE JOINT AND THE "A" SPACING WILL REMAIN AS REQUIRED FOR THE PAVEMENT SLAB WIDTH.
11. MULTIPLE PIECE TIEBARS SHALL BE USED AT LONGITUDINAL CONSTRUCTION JOINTS UNLESS OTHERWISE SPECIFIED IN THE PLANS.
12. THE SAW CUT FOR LONGITUDINAL WARPING AND THE TRANSVERSE CONSTRUCTION JOINTS MAY BE ONE FOURTH THE SLAB THICKNESS WHEN CRUSHED LIMESTONE IS USED AS THE COARSE AGGREGATE.

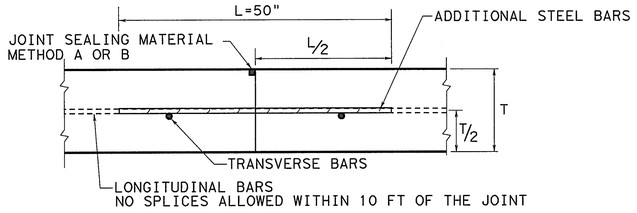
Texas Department of Transportation
Design Division Standard

CONCRETE PAVEMENT DETAILS
CONTRACTION DESIGN
T-8 THRUGH 15 INCHES
CPCD-94

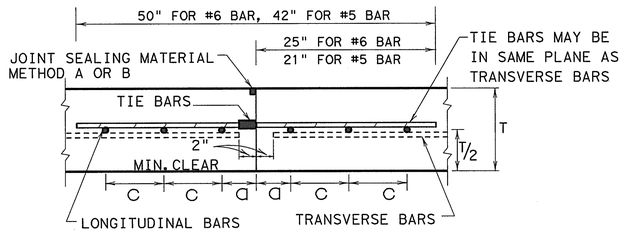
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REVISIONS				
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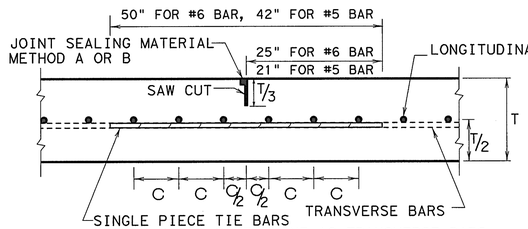
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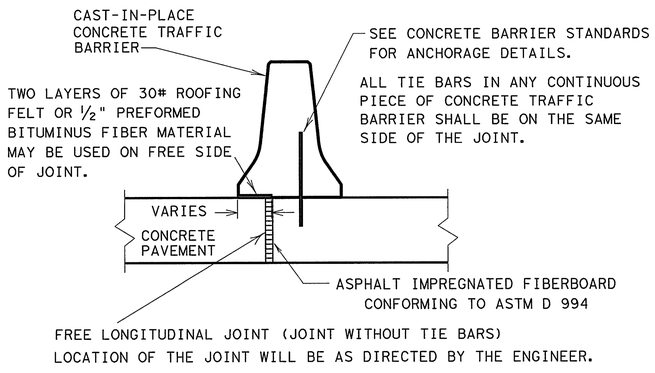
TRANSVERSE CONSTRUCTION JOINT
SECTION X - X



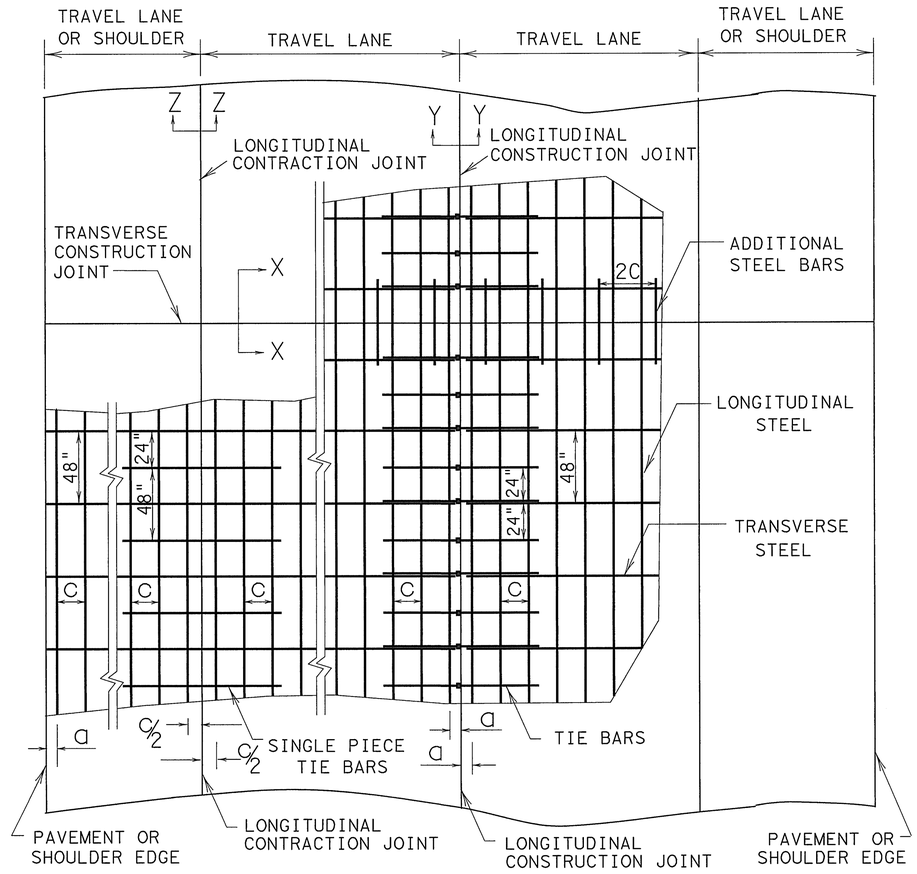
LONGITUDINAL CONSTRUCTION JOINT
SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z - Z



FREE LONGITUDINAL JOINT DETAIL



TYPICAL PAVEMENT LAYOUT

PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT, ARE NOT COVERED BY THIS STANDARD.
2. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."
3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60). STEEL BAR SIZES SHALL CONFORM TO TABLE NO. 1 & 2.
4. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO.1 AND AS SPECIFIED.
5. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
6. THE SAW CUT DEPTH FOR THE LONGITUDINAL CONTRACTION JOINT SHALL BE ONE THIRD OF THE SLAB THICKNESS.
7. WHEN APPROVED BY THE ENGINEER, SINGLE PIECE TIE BARS MAY BE USED BY INSERTING INTO PLASTIC CONCRETE AT LONGITUDINAL CONSTRUCTION JOINTS.
8. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
9. MISSING OR DAMAGED TIE BARS SHALL BE REPLACED BY DRILLING AND EPOXY GROUTING AT THE CONTRACTOR'S EXPENSE.
10. OMIT TIE BARS LOCATED WITHIN 18 IN. OF THE TRANSVERSE CONSTRUCTION JOINTS. USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
11. OBTAIN THE ENGINEER'S WRITTEN APPROVAL, IF THE CONCRETE MIX DESIGN USES MORE THAN 5.5 SACKS/CY.
12. LONGITUDINAL REINFORCING STEEL SPLICES SHALL BE A MINIMUM OF 25 IN.

TABLE NO. 2 TRANSVERSE STEEL AND TIE BARS

SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
6.0 - 7.5	#5	48	#5	48	#5	24
8.0 - 13.0	#5	48	#6	48	#6	24

TABLE NO. 1 LONGITUDINAL STEEL

SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT	
T (IN.)	BAR SIZE	SPACING c (IN.)	SPACING a (IN.)	SPACING 2 x c (IN.)	LENGTH L (IN.)
6.0	#5	7.5	3 TO 4	15	50
6.5	#5	7.0	3 TO 4	14	50
7.0	#5	6.5	3 TO 4	13	50
7.5	#5	6.0	3 TO 4	12	50
8.0	#6	9.0	3 TO 4	18	50
8.5	#6	8.5	3 TO 4	17	50
9.0	#6	8.0	3 TO 4	16	50
9.5	#6	7.5	3 TO 4	15	50

TABLE NO. 1 LONGITUDINAL STEEL (Cont.)

SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT	
T (IN.)	BAR SIZE	SPACING c (IN.)	SPACING a (IN.)	SPACING 2 x c (IN.)	LENGTH L (IN.)
10.0	#6	7.0	3 TO 4	14	50
10.5	#6	6.75	3 TO 4	13.5	50
11.0	#6	6.5	3 TO 4	13	50
11.5	#6	6.25	3 TO 4	12.5	50
12.0	#6	6.0	3 TO 4	12	50
12.5	#6	5.75	3 TO 4	11.5	50
13.0	#6	5.5	3 TO 4	11	50

Texas Department of Transportation
Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT
T - 6 to 13 INCHES

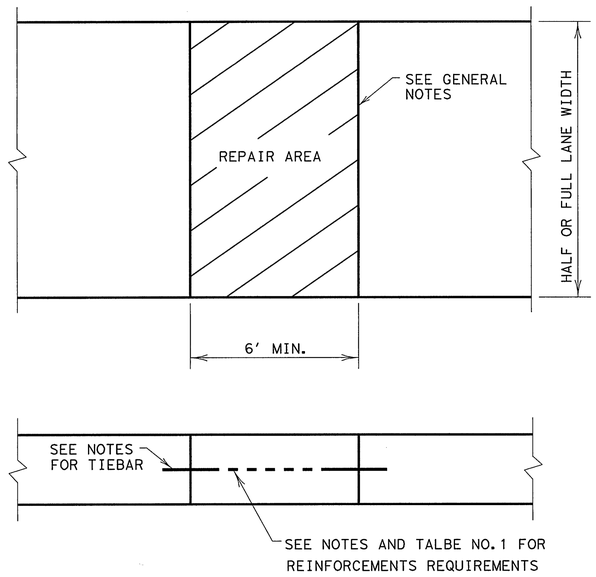
CRCP(1)-11

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REVISIONS 10/10/2011 ADD GN #12	DIST	COUNTY		SHEET NO.

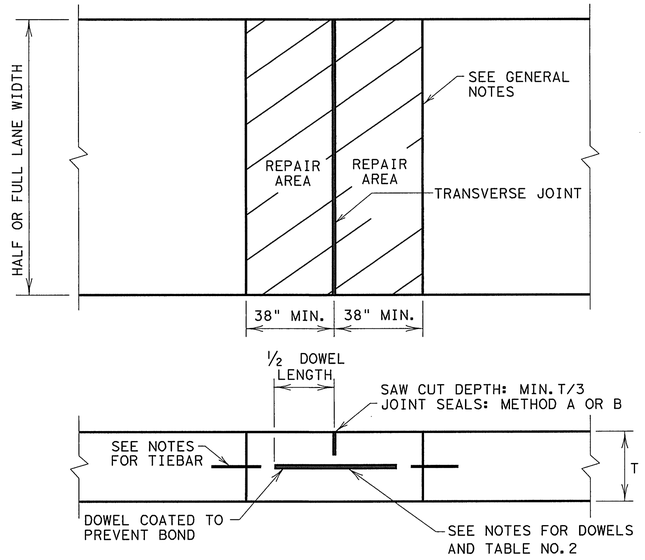
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FULL DEPTH REPAIR



FULL DEPTH TRANSVERSE JOINT REPAIR



TRANSVERSE CONTRACTION JOINT

GENERAL NOTES:

1. ITEM 361, "FULL-DEPTH REPAIR OF CONCRETE PAVEMENT," SHALL GOVERN FOR THIS WORK. THE FOLLOWING SPECIFICATIONS ARE REFERENCED IN ITEM 361.
   - * ITEM 360, " CONCRETE PAVEMENT "
   - * ITEM 421, " HYDRAULIC CEMENT CONCRETE "
   - * ITEM 438, " CLEANING AND SEALING JOINTS AND CRACKS (RIGID PAVEMENT AND BRIDGE DECKS) "
   - * ITEM 440, " REINFORCING STEEL"
   - * DMS-4650, " HYDRAULIC CEMENT CONCRETE CURING MATERIALS AND EVAPORATION RETARDANTS"
   - * DMS-6100, " EPOXIES AND ADHESIVES "
   - * DMS-6310, " JOINT SEALANTS AND FILLERS"
2. FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
3. LONGITUDINAL FULL DEPTH SAW CUTS SHALL BE AT EXISTING LONGITUDINAL JOINTS.
4. ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
5. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A GROUT APPROVED BY THE ENGINEER.
6. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."

REINFORCEMENTS REQUIREMENTS

REINFORCING STEEL SHALL BE #6 DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60).

R1. THE STEEL SPACING FOR CONTINUOUSLY REINFORCED CONCRETE PAVEMENT (CRCP) AND JOINTED REINFORCED CONCRETE PAVEMENT (JRCP) SHALL BE REINFORCED AS SHOWN IN TABLE NO.1.

R2 REINFORCING BARS SHALL BE PLACED IN ONE LAYER AND SHALL BE TIED TO THE TIEBARS.

R3. THE LENGTH OF THE REINFORCING BAR SHALL BE THE LENGTH OR WIDTH OF THE REPAIR AREA MINUS 2 INCHES. THE END OF THE BAR SHALL BE PLACED WITHIN 1 INCH FROM THE REPAIR EDGE.

TIEBARS FOR REPAIR AREAS

T1. TIEBARS SHALL BE PLACED AT APPROXIMATELY THE MID-DEPTH OF SLAB. THE BOTTOM OF THE HOLE DRILLED FOR THE LONGITUDINAL BARS SHALL BE AT MID-DEPTH AND THE TOP OF THE HOLES DRILLED FOR THE TRANSVERSE BARS SHALL BE AT MID-DEPTH. MID-DEPTH WILL BE ESTABLISHED BY MEASURING FROM THE TOP OF THE SLAB DOWN. THE THICKNESS OF THE CONCRETE SLAB WILL BE DEFINED BY THE PLANS OR THE ENGINEER.

T2. THE BAR SIZE AND SPACING OF TIEBARS ARE SHOWN IN TABLE NO. 1.

T3. THE MINIMUM LENGTH OF TIEBARS EXTENDED INTO THE REPAIR AREA SHOULD BE 25 INCHES FOR A #6 BAR.

T4. THE TIEBAR SHALL BE GROUTED INTO THE EXISTING CONCRETE A MINIMUM OF 12 INCHES. BEFORE REPAIR WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIEBARS MEETS THE REQUIREMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.

T5. MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.

DOWELS FOR TRANSVERSE JOINT REPAIRS

D1. SMOOTH DOWEL BARS SHALL BE DELIVERED TO THE JOBS SITE IN PREFABRICATED DOWEL ASSEMBLIES. THE ENTIRE DOWEL BAR SHALL BE COATED WITH A MATERIAL WHICH WILL PREVENT BONDING TO THE CONCRETE.

D2. THE SIZE AND SPACING OF DOWEL BARS SHALL BE AS SHOWN IN TABLE NO.2.

D3. PLACEMENT OF TIEBARS AND OTHER REINFORCING STEEL SHALL BE STOPPED APPROXIMATELY 4" FROM THE DOWEL BAR ASSEMBLY.

D4. DOWEL BAR PLACEMENT SHALL MEET THE REQUIREMENTS OF ITEM 360, "CONCRETE PAVEMENT."

TABLE NO. 2 DOWELS (SMOOTH BARS)

PAVEMENT THICKNESS (INCHES)	SIZE AND DIA.	LENGTH (INCHES)	SPACING (INCHES)
8	#8 (1 IN.)	18	12
9	#9 (1⅛ IN.)		
≥10	#10 (1¼ IN.)		

TABLE NO. 1 STEEL BARS SIZE AND SPACING

TYPE OF REINFORCEMENTS	TYPE PAVEMENT	PAVEMENT THICKNESS (INCHES)	TIEBARS		REGULAR REBARS		ALL BARS
			SIZE BAR (BAR NO.)	BAR SPACING (INCHES)	SIZE BAR (BAR NO.)	SPACING (INCHES)	FIRST & LAST SPACING AT END OR SIDE (INCHES)
TRANSVERSE BARS	CRCP JRCP	ALL	#6	24	#6	24	12
	JCP (CPCD)	ALL	#6	24	NONE	NONE	12
LONGITUDINAL BARS	CRCP	8	#6	9	#6	9	12
		9	#6	8	#6	8	12
		10	#6	7	#6	7	12
		11	#6	6.5	#6	6.5	12
		≥12	#6	6	#6	6	12
	JRCP	ALL	#6	12	#6	24	12
	JCP (CPCD)	ALL	#6	12	NONE	NONE	12

Texas Department of Transportation
Design Division Standard

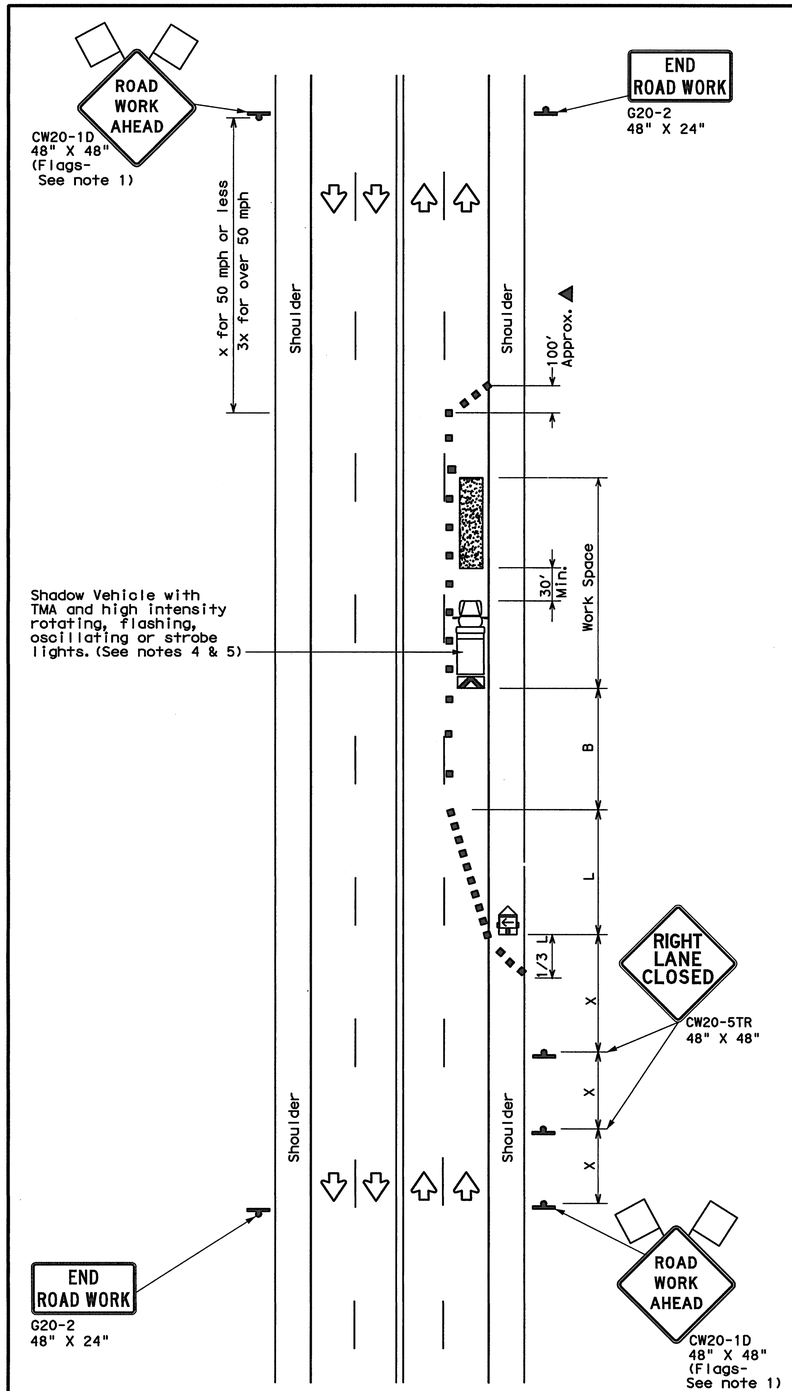
FULL DEPTH REPAIR FOR CONCRETE PAVEMENT

FDR(CP)-05

FILE: fdrcp05.dgn	DN: TxDOT	CK: LL	DW: HC	CK:
© TxDOT September 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.

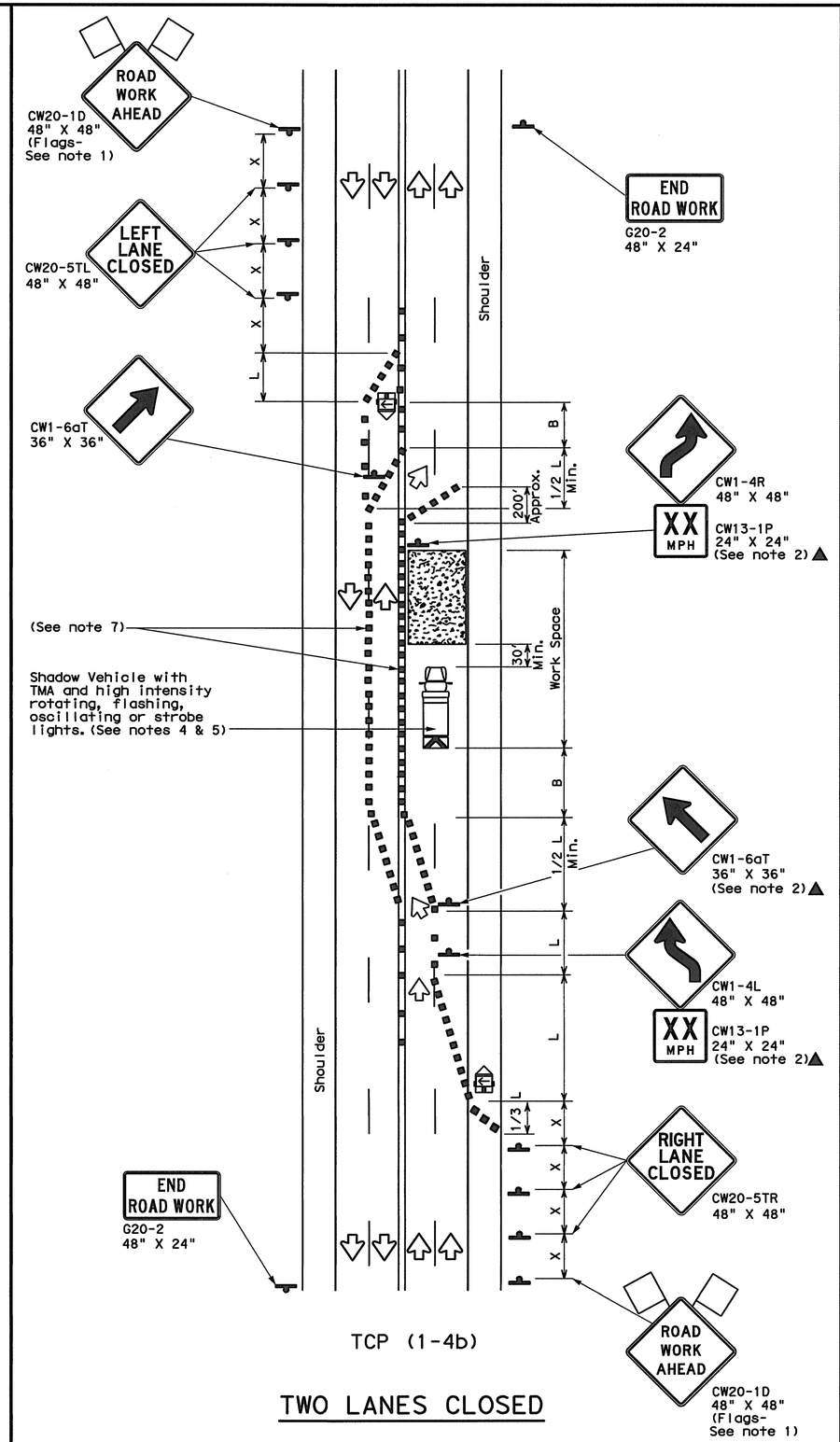
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DATE:
FILE:



TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

6. If this TCP is used for a left lane closure , CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

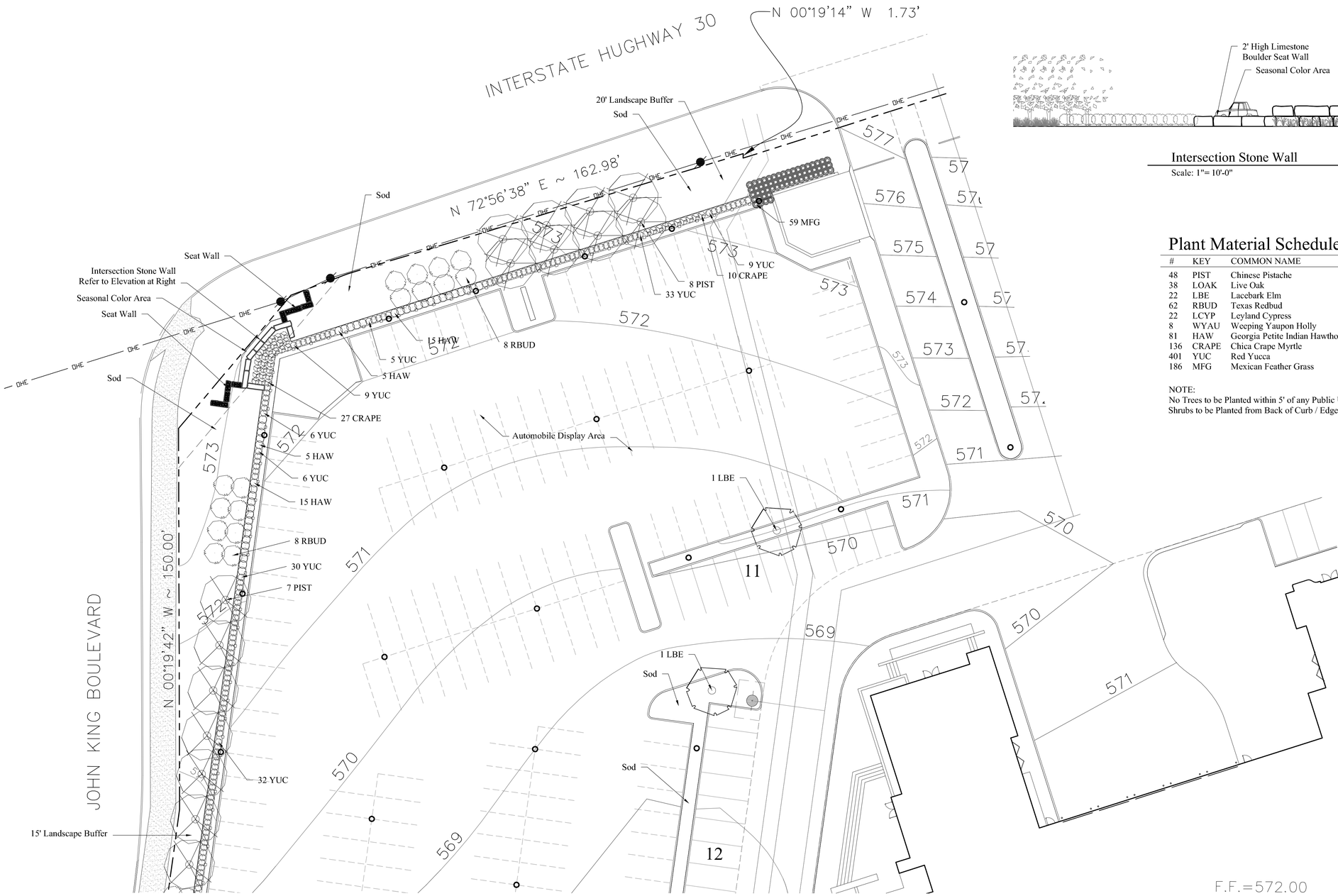
TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

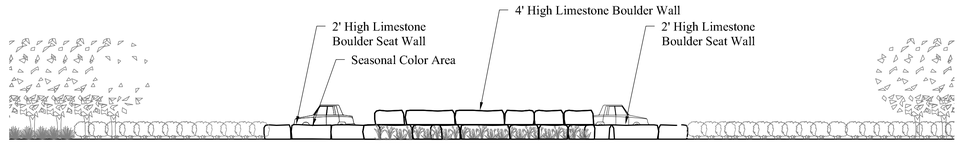
TCP(1-4)-12

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DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
2-94 2-12				
8-95	DIST	COUNTY		SHEET NO.
1-97				
4-98				





Intersection Stone Wall

Scale: 1"= 10'-0"

Plant Material Schedule

#	KEY	COMMON NAME	BOTANICAL NAME	SIZE	SPACING / REMARKS
48	PIST	Chinese Pistache	Pistachia chinensis	4" cal.	As Shown
38	LOAK	Live Oak	Quercus virginiana	4" cal.	25' o.c.
22	LBE	Lacebark Elm	Ulmus parvifolia	3" cal.	As Shown
62	RBUD	Texas Redbud	Cercis canadnesis 'Texensis'	2" cal., 5'-6' ht.	As Shown
22	LCYP	Leyland Cypress	Cupressus × leylandii	8' - 10' ht. min.	25' o.c.
8	WYAU	Weeping Yaupon Holly	Ilex vomitoria 'Pendula'	8' ht. min.	6' o.c.
81	HAW	Georgia Petite Indian Hawthorn	Rhaphiolepis x delacourii 'Georgia Petite'	8' ht. min.	30" o.c.
136	CRAPE	Chica Crape Myrtle	Lagerstroemia indica 'Moned'	8' ht. min.	30" o.c.
401	YUC	Red Yucca	Hesperaloe parviflora	8' ht. min.	24" o.c.
186	MFG	Mexican Feather Grass	Nassella tenuissima	8' ht. min.	24" o.c.

NOTE:
No Trees to be Planted within 5' of any Public Utility.
Shrubs to be Planted from Back of Curb / Edge of Paving IF Adjacent to an 18' Deep Parking Space.

F.F.=572.00

City of Rockwall
IH-30 Overlay Requirements ~950 LF Frontage

Buffer Strip	Required =	20'
	Provided =	20'
Buffer Strip Plantings	Required =	3 Canopy and 4 Accent per 100 LF Frontage
	=	30 Canopy and 40 Accent
	Provided =	30 Canopy and 40 Accent
	Required =	30" ht. shrubs along full frontage length
	Provided =	30" ht. shrubs along full frontage length
Irrigation:		An Automatic Underground Irrigation System will be provided in all Landscaped Areas

City of Rockwall
205 By-Pass Overlay Requirements ~598 LF Frontage

Buffer Strip	Required =	15'
	Provided =	15'
Buffer Strip Plantings	Required =	3 Canopy and 4 Accent per 100 LF Frontage
	=	18 Canopy and 24 Accent
	Provided =	18 Canopy and 24 Accent
	Required =	30" ht. shrubs along full frontage length
	Provided =	30" ht. shrubs along full frontage length
Irrigation:		An Automatic Underground Irrigation System will be provided in all Landscaped Areas

City of Rockwall
Landscape and Screening / UDC Requirements

Site Impervious Area 642,533 SF (14.751 Ac)	Required = Provided =	15% (96,018 SF) 20% (127,889 SF)
Parking 215 Spaces	Required = = Provided =	1 Tree per 10 required spaces; minimum 80' to all spaces 22 Trees 22 Trees
Screening South Residential Zone	Required = = Provided = Required =	Residential Screening Trees at Minimum 25' o.c. 2 Rows of Evergreen Trees at 25' o.c. Staggered Dumpster Screening
Dumpster	Provided =	Large Evergreen Shrubs at 8' o.c.
Irrigation:		An Automatic Underground Irrigation System will be provided in all Landscaped Areas

I, Jeff Pugh, Texas Registered Landscape Architect #2759, Certify that the Plan Shown Meets the Landscape Requirements in:
- Article VIII, Article IX of the Code of Ordinances
- Sec. 6.10 205 By-Pass Corridor Overlay
- Sec. 6.6 - IH-30 Overlay Requirements
- Unified Development Code

Signature
Date 11/20/14

REGISTERED LANDSCAPE ARCHITECT 1571 W. PUGH 2759 STATE OF TEXAS
11/20/14

NORTH

0 10 20 40 60
Scale: 1"= 20'-0"

LANDSCAPE PLAN - L1

FENTON NISSAN OF ROCKWALL

LOT 1, BLOCK A
IN THE CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
14.751 ACRES
ZONED: LI/C

SP2014-029

OWNER
Fenton Motor Group
2601 Network Blvd., Suite 202
Frisco, TX 75034
Telephone: (469) 535-2200
Contact: Brad Fenton

ARCHITECT
Boynton Williams & Associates
3010 LBJ Freeway, Suite 110
Dallas, TX 75234
Telephone: (972) 661-5461
Contact: Jeff Ball

ENGINEER/SURVEYOR
Spiars Engineering, Inc.
TBPE No. F-2121
765 Custer Road, Suite 100
Telephone: (972) 422-0077
Contact: John Spiars

LANDSCAPE ARCHITECT
Szafranski-Pugh & Associates
42 East 16th Street
Tulsa, OK 74119
Telephone: (918) 382-9081
Contact: Jeff Pugh

Date: 11/20/14

INTERSTATE HIGHWAY 30
Variable width R.O.W.

N 72°12'15" E ~ 723.77'

S 00°11'00" W ~ 521.44'

20' Landscape Buffer

25' Pipeline Easement

12.5' Easement

Automobile Display Area

2 PIST
4 RBUD
44 CRAPE
9 CRAPE
53 YUC
4 RBUD
12 HAW
8 PIST
32 YUC
12 RBUD
4 PIST
14 CRAPE
31 YUC
12 RBUD
14 HAW
31 YUC
8 PIST
14 CRAPE
Sod
24 YUC
57 MFG
Sod
1 LBE
18
14
16
19
17



11/20/14

NORTH

0 10 20 40 60

Scale: 1"= 20'-0"

LANDSCAPE PLAN - L2

FENTON NISSAN OF ROCKWALL

LOT 1, BLOCK A
IN THE CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
14.751 ACRES
ZONED: LI/C

SP2014-029

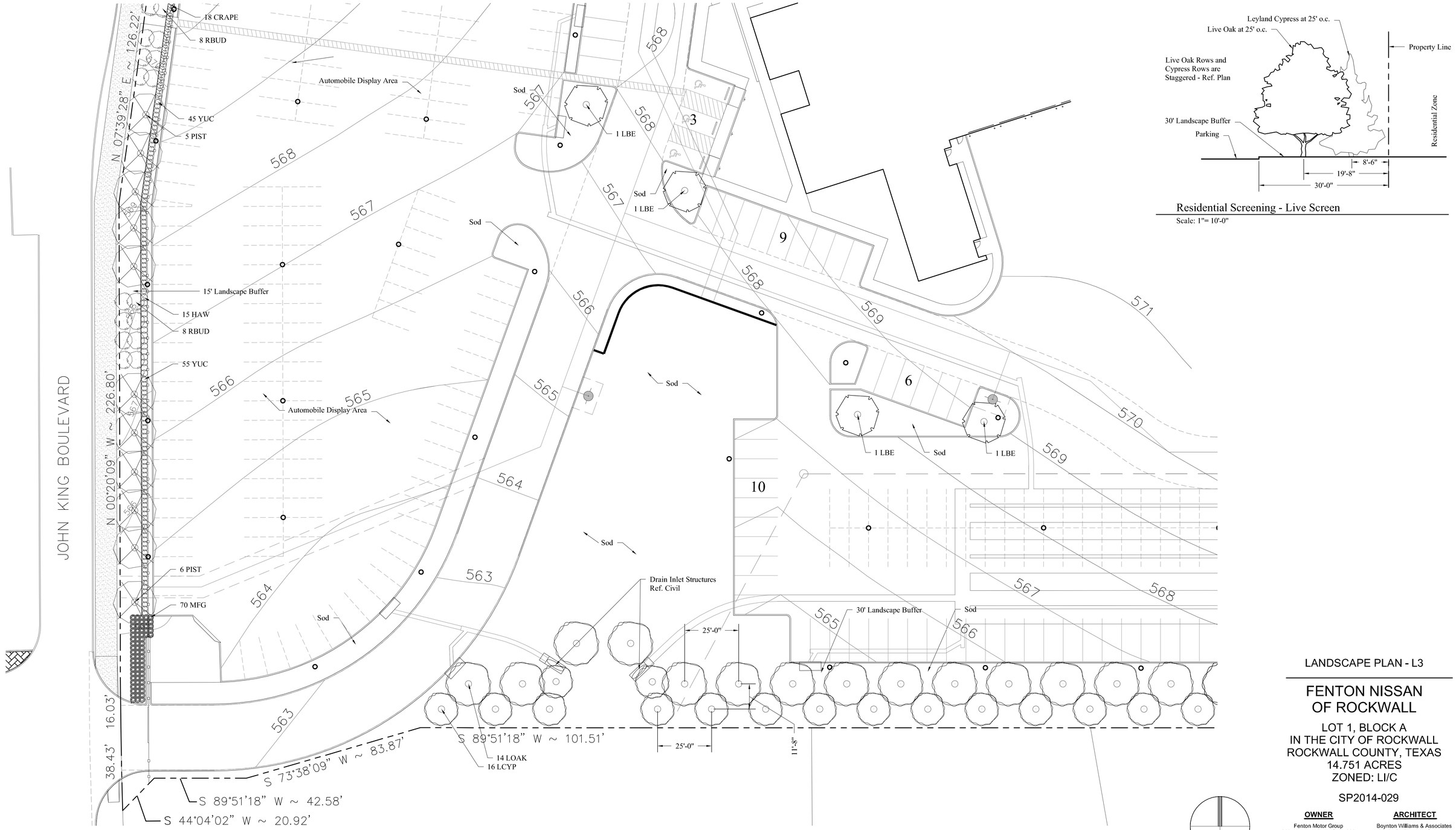
OWNER
Fenton Motor Group
2601 Network Blvd., Suite 202
Frisco, TX 75034
Telephone: (469) 535-2200
Contact: Brad Fenton

ARCHITECT
Boynton Williams & Associates
3010 LBJ Freeway, Suite 110
Dallas, TX 75234
Telephone: (972) 661-5461
Contact: Jeff Ball

ENGINEER/SURVEYOR
Spiars Engineering, Inc.
TBPE No. F-2121
765 Custer Road, Suite 100
Telephone: (972) 422-0077
Contact: John Spiars

LANDSCAPE ARCHITECT
Szafranski-Pugh & Associates
42 East 16th Street
Tulsa, OK 74119
Telephone: (918) 382-9081
Contact: Jeff Pugh

Date: 11/20/14



Residential Screening - Live Screen

Scale: 1"= 10'-0"

LANDSCAPE PLAN - L3

FENTON NISSAN OF ROCKWALL

LOT 1, BLOCK A
IN THE CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
14.751 ACRES
ZONED: LI/C

SP2014-029

OWNER
Fenton Motor Group
2601 Network Blvd., Suite 202
Frisco, TX 75034
Telephone: (469) 535-2200
Contact: Brad Fenton

ARCHITECT
Boynton Williams & Associates
3010 LBJ Freeway, Suite 110
Dallas, TX 75234
Telephone: (972) 661-5461
Contact: Jeff Ball

ENGINEER/SURVEYOR
Spiars Engineering, Inc.
TBPE No. F-2121
765 Custer Road, Suite 100
Telephone: (972) 422-0077
Contact: John Spiars

LANDSCAPE ARCHITECT
Szafranski-Pugh & Associates
42 East 16th Street
Tulsa, OK 74119
Telephone: (918) 382-9081
Contact: Jeff Pugh

Date: 11/20/14

REGISTERED LANDSCAPE ARCHITECT
JEFF W. PUGH
2759
STATE OF TEXAS
11/20/14

NORTH

0 10 20 40 60

Scale: 1"= 20'-0"

72.00

25' Easement

12.5' Easement

8 WYAU

1 LBE

Sod

F.F.=569.36

24 LOAK
7 LCYP

12'-6"

25'-0"

11'-8"

30' Landscape Buffer

15' Easement

S 89°50'03" W ~ 683.77'

S 00°02'17" W ~ 322.26'

571 570 569 568 567 566

2 4 9 61

LANDSCAPE PLAN - L4

FENTON NISSAN OF ROCKWALL

LOT 1, BLOCK A
IN THE CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
14.751 ACRES
ZONED: LI/C

SP2014-029

REGISTERED LANDSCAPE ARCHITECT
JEFF W. PUGH
2759
STATE OF TEXAS
11/20/14

NORTH

0 10 20 40 60
Scale: 1"= 20'-0"

Date: 11/20/14

OWNER
Fenton Motor Group
2601 Network Blvd., Suite 202
Frisco, TX 75034
Telephone: (469) 535-2200
Contact: Brad Fenton

ARCHITECT
Boynton Williams & Associates
3010 LBJ Freeway, Suite 110
Dallas, TX 75234
Telephone: (972) 661-5461
Contact: Jeff Ball

ENGINEER/SURVEYOR
Spiars Engineering, Inc.
TBPE No. F-2121
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Telephone: (972) 422-0077
Contact: John Spiars

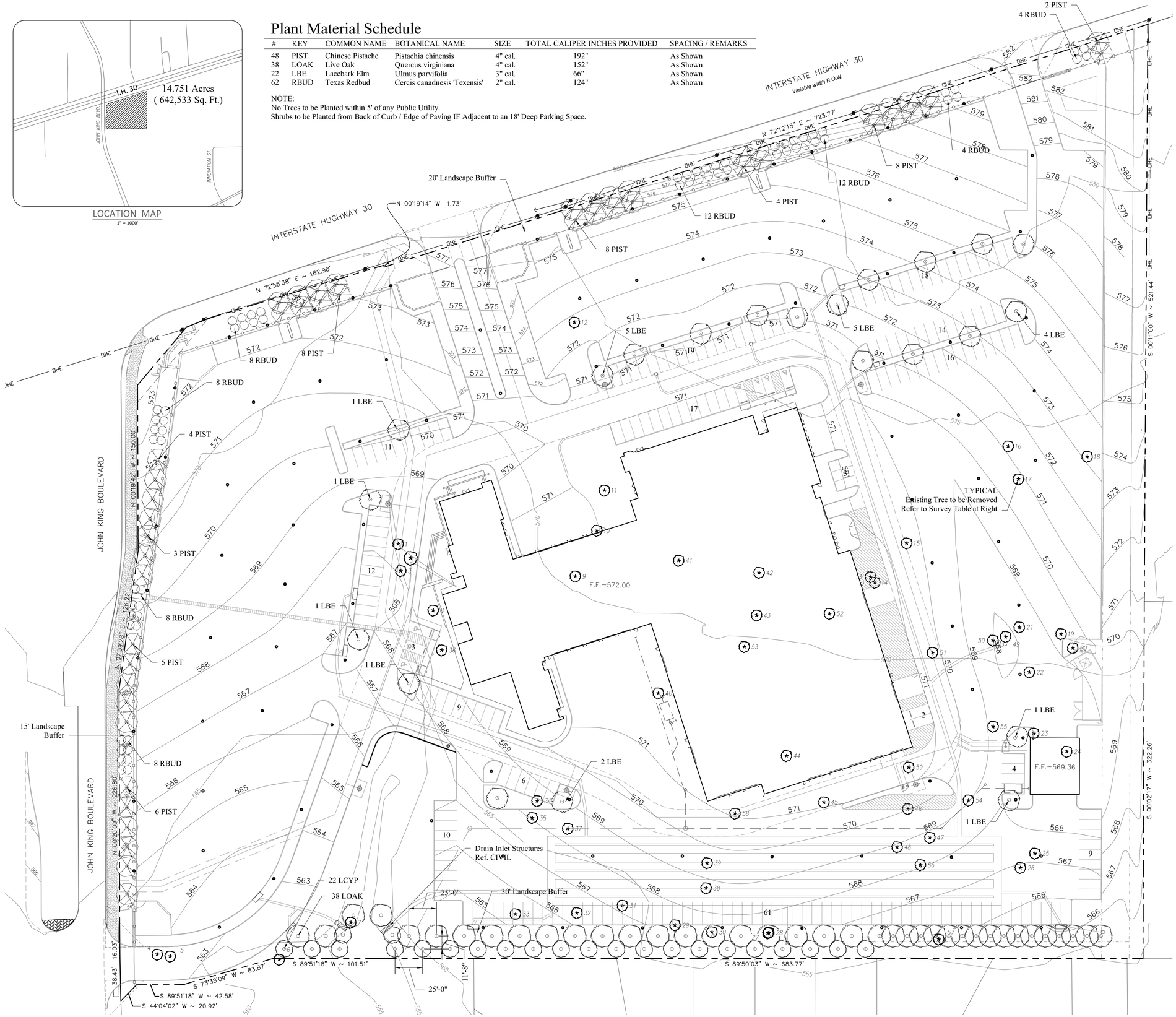
LANDSCAPE ARCHITECT
Szafranski-Pugh & Associates
42 East 16th Street
Tulsa, OK 74119
Telephone: (918) 382-9081
Contact: Jeff Pugh

LOCATION MAP
1" = 1000'

Plant Material Schedule

#	KEY	COMMON NAME	BOTANICAL NAME	SIZE	TOTAL CALIPER INCHES PROVIDED	SPACING / REMARKS
48	PIST	Chinese Pistache	Pistachia chinensis	4" cal.	192"	As Shown
38	LOAK	Live Oak	Quercus virginiana	4" cal.	152"	As Shown
22	LBE	Lacebark Elm	Ulmus parvifolia	3" cal.	66"	As Shown
62	RBUD	Texas Redbud	Cercis canadnesis 'Texensis'	2" cal.	124"	As Shown

NOTE:
No Trees to be Planted within 5' of any Public Utility.
Shrubs to be Planted from Back of Curb / Edge of Paving IF Adjacent to an 18' Deep Parking Space.



NORTH

0 20 40 80 120
Scale: 1"= 40'-0"

Project:	Fenton Nissan @ John A. King and I-30, Rockwall, Texas
Subject:	Protected Tree Survey
Date:	May 23, 2014

TAG	DBH	COMMON NAME	BOTANICAL NAME
1	18.75"	Texas Ash	Fraxinus texensis
2	11"	Hackberry	Celtis occidentalis
3	11.5"	Hackberry	Celtis occidentalis
4	11.5"	Hackberry	Celtis occidentalis
5	15.5"	Hackberry	Celtis occidentalis
6	13.25"	Hackberry	Celtis occidentalis
7	11.25"	Hackberry	Celtis occidentalis
8	13.5"	Eastern Red Cedar	Juniperus virginiana
9	17"	Eastern Red Cedar	Juniperus virginiana
10	14.5"	Eastern Red Cedar	Juniperus virginiana
11	13.25"	Eastern Red Cedar	Juniperus virginiana
12	14"	Hackberry	Celtis occidentalis
13	17.75"	Eastern Red Cedar	Juniperus virginiana
14	12.25"	Eastern Red Cedar	Juniperus virginiana
15	11"	Eastern Red Cedar	Juniperus virginiana
16	14.5"	Eastern Red Cedar	Juniperus virginiana
17	15.25"	Eastern Red Cedar	Juniperus virginiana
18	12.25"	Eastern Red Cedar	Juniperus virginiana
19	11.5"	Eastern Red Cedar	Juniperus virginiana
20	14"	Eastern Red Cedar	Juniperus virginiana
21	11.25"	Eastern Red Cedar	Juniperus virginiana
22	13.5"	Eastern Red Cedar	Juniperus virginiana
23	17.5"	Eastern Red Cedar	Juniperus virginiana
24	16"	Eastern Red Cedar	Juniperus virginiana
25	15"	Eastern Red Cedar	Juniperus virginiana
26	13.5"	Eastern Red Cedar	Juniperus virginiana
27	15.25"	Eastern Red Cedar	Juniperus virginiana
28	11.75"	Eastern Red Cedar	Juniperus virginiana
29	14.25"	Eastern Red Cedar	Juniperus virginiana
30	14.25"	Eastern Red Cedar	Juniperus virginiana
31	17.5"	Eastern Red Cedar	Juniperus virginiana
32	11.5"	Eastern Red Cedar	Juniperus virginiana
33	11"	Eastern Red Cedar	Juniperus virginiana
34	11.5"	Eastern Red Cedar	Juniperus virginiana
35	12"	Eastern Red Cedar	Juniperus virginiana
36	14.5"	Eastern Red Cedar	Juniperus virginiana
37	15.5"	Eastern Red Cedar	Juniperus virginiana
38	12.25"	Eastern Red Cedar	Juniperus virginiana
39	12.5"	Eastern Red Cedar	Juniperus virginiana
40	11.5"	Eastern Red Cedar	Juniperus virginiana
41	11.25"	Eastern Red Cedar	Juniperus virginiana
42	12"	Eastern Red Cedar	Juniperus virginiana
43	12"	Eastern Red Cedar	Juniperus virginiana
44	13.5"	Eastern Red Cedar	Juniperus virginiana
45	13"	Eastern Red Cedar	Juniperus virginiana
46	13.75"	Eastern Red Cedar	Juniperus virginiana
47	17"	Eastern Red Cedar	Juniperus virginiana
48	11.75"	Eastern Red Cedar	Juniperus virginiana
49	11.5"	Eastern Red Cedar	Juniperus virginiana
50	16.25"	Eastern Red Cedar	Juniperus virginiana
51	11.25"	Eastern Red Cedar	Juniperus virginiana
52	11"	Eastern Red Cedar	Juniperus virginiana
53	11.5"	Eastern Red Cedar	Juniperus virginiana
54	12"	Eastern Red Cedar	Juniperus virginiana
55	12.25"	Eastern Red Cedar	Juniperus virginiana
56	13.25"	Eastern Red Cedar	Juniperus virginiana
57	11"	Eastern Red Cedar	Juniperus virginiana
58	11.75"	Eastern Red Cedar	Juniperus virginiana
59	15"	Eastern Red Cedar	Juniperus virginiana

767.75"	Total Inches of Trees Removed - 50% Replacement Ratio
18.75"	Total Inches of Trees Removed - 100% Replacement Ratio
402.5"	Total Inches Replacement Required
534"	Total Inches Replacement Provided

TREESCAPE PLAN - L5

FENTON NISSAN OF ROCKWALL

LOT 1, BLOCK A
IN THE CITY OF ROCKWALL
ROCKWALL COUNTY, TEXAS
14.751 ACRES
ZONED: LI/C

SP2014-029

OWNER
Fenton Motor Group
2601 Network Blvd., Suite 202
Frisco, TX 75034
Telephone: (469) 535-2200
Contact: Brad Fenton

ARCHITECT
Boynton Williams & Associates
3010 LBJ Freeway, Suite 110
Dallas, TX 75234
Telephone: (972) 661-5461
Contact: Jeff Ball

ENGINEER/SURVEYOR
Spiars Engineering, Inc.
TBPE No. F-2121
765 Custer Road, Suite 100
Telephone: (972) 422-0077
Contact: John Spiars

LANDSCAPE ARCHITECT
Szafranski-Pugh & Associates
42 East 16th Street
Tulsa, OK 74119
Telephone: (918) 382-9081
Contact: Jeff Pugh

Date: 11/20/14

REGISTERED LANDSCAPE ARCHITECT
JEFF W. PUGH
2159
STATE OF TEXAS
11/20/14