# LICENSE AGREEMENT

This License Agreement ("Agreement") is made by and between DALLAS AREA RAPID TRANSIT ("DART"), a regional transportation authority created, organized, and existing pursuant to Chapter 452, Texas Transportation Code, with offices at 1401 Pacific Avenue, Dallas, Texas 75202, and CITY OF CARROLLTON ("Licensee"), a Texas municipality located at P. O. Box 10535, Carrollton, Texas 75011.

DART and Licensee (individually referred to herein as a "Party" or collectively as "Parties") agree as follows:

## I. Definitions.

- 1.1 "Corridor" shall mean DART's railroad corridor between Dallas and Denton, Texas.
- 1.2 "Effective Date" shall mean the date this Agreement is last signed by a Party.
- 1.3 "Permitted Improvement" shall mean the following items more particularly detailed in Exhibit A-1 through A-13, attached to this Agreement and fully incorporated herein:
  - A rock riprap channel, one (1) 6'x6' storm drain manhole, and an 18-inch storm drain connecting to an existing 30-inch RCP storm sewer at Donald Avenue.
  - A concrete apron headwall, outflow with rock riprap to existing culvert, a 3'x2' RCB, and one (1) 6'x6' storm drain manhole at Northside Drive.
  - A wing-wall and combination of V Notch and trapezoid concrete storm drain channel along with stabilizing rock riprap running longitudinally along the Corridor (parallel to the railroad tracks) between Northside Drive and Vinylex Drive.
- 1.4 "Permitted Use" shall mean designing, constructing, installing, operating, reconstructing, maintaining, repairing, replacing, and removing the Permitted Improvement at the Property.
- 1.5 The "Property" where the Permitted Improvement is located shall mean the tract of right-of-way on the Corridor located between:

Mile Post 743.90 to 744.30 Starting: Latitude: 32.962666 / Longitude: -96.914072 Ending: Latitude: 32.958556 / Longitude: -96.911250 Carrollton, Dallas County, Texas

1.6 "Railroad" shall mean Dallas, Garland & Northeastern Railroad, Inc, which holds certain rights and obligations with respect to freight railroad operations on the Corridor, and any future freight operators, passenger operators, and entities providing passenger service or railroad maintenance on the Corridor during the term of this Agreement pursuant to an agreement with DART.

## II. Consideration.

2.1 <u>License Fee</u>. Licensee shall pay Ten Dollars and No/100 DOLLARS (\$10.00) on the Effective Date. No additional License Fee shall be assessed during the term of this Agreement.

### III. **Purpose and Term.**

- 3.1 Permitted Improvement. DART hereby grants a license to Licensee for the Permitted Use so long as the Permitted Use does not interfere with the operations of DART or Railroad, and Licensee otherwise complies with the requirements of this Agreement.
- 3.2 Limitations. Licensee's right to enter upon and use the Property shall be limited solely to the Permitted Use, for the term of this Agreement, and in accordance with the conditions of this Agreement. This Agreement is not intended to convey and does not convey to Licensee any real property interest in the Property or any portion of the Corridor. This Agreement may not be recorded in the real property records. The license granted pursuant to this Agreement is non-exclusive and is subject to (a) any existing utility, drainage, or communication facility located in, on, under, or upon the Property; (b) all vested rights presently owned by any railroad, utility or communication company, or other entity located within the boundaries of the Property; and (c) any existing lease, license, easement, or other interest in the Property granted by DART or its predecessors in interest. The license granted by this Agreement is granted expressly subject and subordinate to DART's right to use the Property for any purpose whatsoever, except as expressly provided in this Agreement.
- 3.3 No Warranty. DART and Railroad make no representations as to the condition of the Property or its suitability for any particular purpose, including by example and not limitation, warranties regarding the Property's state of repair, use of the Property, access to the Property, or subsurface or aerial installations on or near the Property. The Property is available for Licensee's use on an "as is, where is, and with all faults" basis. Licensee shall, at its sole cost, conduct its own inspections of the Property and shall not rely on any information disclosed or not disclosed by DART, Railroad, or any of their respective employees, agents, or representatives.
- 3.4 Term. The term of this Agreement shall begin on the Effective Date and continue until terminated in accordance with this Agreement.

#### IV. Design, Construction, Operation, and Maintenance of the Permitted Improvement.

- 4.1. Construction Plans. During the design phase and prior to commencing any construction on the Property, a copy of the construction plans ("the Plans") for the Permitted Improvement showing the exact location, type, depth of the construction, the working area, and any cathodic protection measures shall be submitted for written approval to DART. No work shall commence on the Property until the Plans have been approved in writing by DART, which approval shall not be unreasonably withheld. To the extent necessary for construction of the Permitted Improvement, Licensee shall also coordinate with Railroad and obtain Railroad's approval of the Plans prior to the start of any work.
- 4.2. Safety. Licensee agrees to design, construct, and operate the Permitted Improvement in such a manner so as not to create a dangerous, unsafe, or otherwise hazardous condition on or near the Property. Licensee shall implement any cathodic protection, including stray current corrosion control measures, necessary to ensure the safety of the Permitted Improvement and maintain compliance with applicable laws, regulations, ordinances, and rules. If applicable to the Permitted Improvement, Licensee shall institute and maintain a continuous testing program to determine whether additional cathodic protection of its Permitted Improvement is needed.
- Authority to Enter the Property. Licensee shall ensure that anyone working on the Property under 4.3. Licensee's control possesses authority to be on the Property and can readily demonstrate such authority, either through photo identification issued by Licensee or Licensee's contractor ("Contractor") or immediate confirmation by the worker's on-site supervisor.

- 4.4. Foul Zone. Licensee shall not perform any activities, or permit Contractor to perform any activities, that could result in equipment, people, or materials entering within 25 feet of any railroad tracks (the "Foul Zone") unless:
  - a. Flagger(s) qualified on DART and Railroad's operating and safety rules are present; and
  - b. Anyone working under Licensee's control and engaged in an activity that necessitates flaggers has, within the last 365 calendar days from the date the Work is to be performed, attended a creditable Roadway Worker Protection course, successfully passed all required examinations associated with that course, and can provide proof of course completion upon request from DART or Railroad. DART and Railroad shall determine whether the Roadway Worker Protection course is creditable.

Licensee shall pay all costs associated with flaggers and Roadway Worker Protection courses.

- Maintenance. Licensee shall maintain the Property and Permitted Improvement in a good, clean, and safe 4.5. condition. Licensee shall use diligent care to avoid damaging any existing structures, equipment, and/or vegetation on or about the Property and any adjacent property. If Licensee, Contractor, or anyone under Licensee's control causes damage to the Property or an adjacent property, Licensee shall immediately replace or repair the damage at no cost or expense to DART or Railroad.
- 4.6. Costs and Reimbursement. Licensee agrees to pay for any damages, costs, or expenses that DART incurs by reason of Licensee's use of the Property. If Licensee fails to repair or replace damage to the Property or fails to properly maintain the Property or Permitted Improvement, DART and/or Railroad shall notify Licensee of such noncompliance with this Agreement. In the event Licensee has not remedied the failure within ten (10) days from the date of such notice, DART and Railroad, individually or collectively, shall have the right, but not the obligation, to remedy such failure at the sole cost and expense of Licensee. Licensee shall immediately reimburse DART and/or Railroad, as applicable, for all costs resulting from Licensee's failure to repair, replace, or maintain the Property and/or Permitted Improvement in accordance with this Agreement.
- 4.7. As-builts. Licensee shall provide certified final construction drawings ("As-Builts"), signed and sealed by a Texas professional engineer, to DART within ninety (90) days after the last date of construction work on the Property. The Parties agree that DART will suffer damages if As-Builts are not timely provided by Licensee and it is impossible to determine the amount of such damages in advance. Accordingly, the Parties agree, not as a penalty but as a measure of reasonable damages, that a fee of \$500 per month (prorated as applicable) until As-Builts are provided represents reasonable compensation for DART's actual damages suffered by the delay. DART shall comply with state and local laws, including Chapter 251 of the Texas Utilities Code, before performing work around the Permitted Improvement and shall not exclusively rely on As-Builts provided by Licensee pursuant to this Agreement.
- 4.8. Electrically Powered Equipment. DART and Railroad may, in compliance with applicable state and federal safety regulations, use electrically powered equipment on the Property or adjoining properties, which could result in live electrical current in proximity to the Permitted Improvement and produce corrosive effects to the Permitted Improvement. Licensee WAIVES any claim against DART or Railroad arising from the use of electrically powered equipment pursuant to this paragraph.
- 4.9. Governmental Approvals. Licensee, at its sole cost and expense, shall be responsible for obtaining any licenses, permits, or other approvals from any federal, state, or local agencies required to carry on any activity on the Property permitted by this Agreement.
- 4.10. Other Required Agreements. Prior to the start of any construction work on the Property, Licensee or Contractor, as applicable, shall execute any additional agreements that DART or Railroad determine are

necessary in connection with such work, including but not limited to a contractor's right-of-entry agreement. Licensee shall be responsible for ensuring Contractor complies with the terms and conditions of this Agreement and any contractor's right-of-entry agreement or other agreement related to the Permitted Use. Licensee shall be responsible for obtaining a copy of any such agreement entered into by Contractor pursuant to this section.

- 4.11. Mechanic's Liens Not Permitted. Licensee shall fully pay for all labor and materials used in, on, or about the Property and, to the extent permitted by law, shall not permit or suffer any mechanic's or materialmen's liens of any nature to be affixed against the Property by reason of any work done or materials furnished to the Property on behalf of Licensee. In the event a lien is attached to the Property, Licensee shall (at DART's option) immediately seek removal of the lien or provide a bond that discharges the lien in accordance with Texas law. Licensee shall pay all costs associated with such removal, including reasonable attorney's fees.
- Compliance with Laws and Regulations. Licensee agrees to abide by all laws, ordinances, and regulations 4.12. of any governmental entity or regulatory agency with jurisdiction over the Property and/or Licensee. Licensee shall also abide by all rules, policies, and operating procedures established by DART or Railroad that are communicated to Licensee in advance, so long as such rules, policies, or operating procedures do not conflict with any rules or guidance promulgated by a regulatory agency and applicable to Licensee.

#### V. Insurance

- Required Insurance. Prior to entry onto the Property, Licensee shall procure and maintain, at its sole cost 5.1. and expense, commercial general liability insurance in the following form and amount:
  - a. Per occurrence limit of at least \$5,000,000
  - b. Primary and non-contributory endorsement
  - c. Endorsement naming DART, Railroad, and their respective directors, officers, representatives, contractors, agents, and employees as additional insureds with respect to ongoing and completed operations without qualifications or restrictions
  - d. Endorsement waiving the issuing insurance company's rights of recovery against DART and Railroad, whether by way of subrogation or otherwise
  - e. Endorsement removing exclusions for operations within fifty (50) feet of a railroad or, alternatively, purchase of a Railroad Protective Policy
  - f. Endorsement removing exclusions for XCU hazards
  - The form of coverage and insurer(s) must be satisfactory to DART. g.
- 5.2. Proof of Insurance. Licensee shall furnish Certificates of Insurance and copies of required endorsements to DART as evidence of the coverages required. Upon DART's request, Licensee shall also provide any additional documentation necessary to demonstrate the insurance coverage required. Licensee's insurance shall be primary and non-contributory coverage in all instances.
- 5.3. Notice of Cancellation or Nonrenewal. Licensee shall provide written notice to DART within fifteen (15) days of learning (through notice from Licensee's insurer or other means) that an insurance policy required by this Agreement will be cancelled, non-renewed, or modified in a manner that will result in Licensee's noncompliance with the terms of this Agreement.

#### VI. **Environmental Protection**

6.1. Licensee shall not use or permit the use of the Property for any purpose that may be in violation of any local, state, or federal laws pertaining to health or the environment, including but not limited to, the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), the Resource Conservation and Recovery Act ("RCRA"), the Clean Water Act ("CWA"), and the Clean Air Act ("CAA").

- 6.2. Licensee warrants that the Permitted Use of the Property will not result in the disposal or other release of any hazardous substance or solid waste on or to the Property, and that it will take all steps necessary to ensure that no such hazardous substance or solid waste will ever be discharged onto the Property by Licensee, Contractor, or any other person under Licensee's control.
- 6.3. The terms "hazardous substance" and "release" shall have the meanings specified in CERCLA and the terms "solid waste" and "disposal" (or "disposed") shall have the meanings specified in the RCRA; provided, however, that in the event either CERCLA or RCRA is amended so as to broaden the meaning of any term defined thereby, such broader meaning shall apply subsequent to the effective date of such amendment. To the extent that the laws of the State of Texas establish a meaning for "hazardous substance," "release," "solid waste," or "disposal," that is broader than that specified in either CERCLA or RCRA, such broader meaning shall apply.

# VII. Termination and Relocation.

- 7.1. <u>Methods of Termination</u>. This Agreement shall terminate and be of no further force and effect: (a) if Licensee discontinues or abandons the use of the Permitted Improvement for ninety (90) days or more; (b) if either Party materially breaches this Agreement and fails to cure such breach within thirty (30) days' after receiving written notice of the breach (provided, however, if the breach cannot be cured within 30 days, the period to cure shall be extended so long as the breaching Party is promptly and diligently pursuing the cure to completion); (c) if Licensee relocates the Permitted Improvement from the Property; or (d) if DART determines, in its sole discretion, that relocation of the Permitted Improvement is necessary or useful for DART or Railroad's use of the Property and provides written notice to Licensee.
- 7.2. <u>Restoration of the Property</u>. Upon termination of this Agreement, Licensee shall remove all improvements and appurtenances owned by it, situated in, on, under or attached to the Property, regardless of whether or not such improvements were placed on the Property by Licensee, unless otherwise directed or permitted by DART. Licensee shall restore the Property to a condition satisfactory to DART at its sole cost (unless otherwise provided by this Agreement).
- 7.3. <u>Relocation of the Permitted Improvement</u>. If DART elects to terminate this Agreement by providing written notice to Licensee that relocation of the Permitted Improvement is necessary or useful for DART or Railroad's use of the Property (as addressed above), DART shall work collaboratively with Licensee to identify another property site that, in DART's sole discretion, is suitable for the relocation of the Permitted Improvement. If the Parties determine a mutually-acceptable property site owned by DART for the relocation of the Permitted Improvement, the Parties shall execute a new license agreement comprised of either the same terms and conditions contained in this Agreement or such other new terms and conditions agreed-to by the Parties at that time. Licensee shall promptly and diligently remove or relocate the Permitted Improvement within the period of time provided in DART's relocation/termination notice (which shall be no shorter than 90 days).
- 7.4. <u>Relocation Costs.</u> Licensee shall pay all costs and expenses associated with any relocation of the Permitted Improvement. Licensee hereby **WAIVES** any claim that it may have regarding the payment of relocation benefits, including claims arising under Chapter 460 of the Texas Transportation Act.

#### VIII. **INDEMNITY AND SHIFTING OF RISK.**

- 8.1. To the extent permitted by law, Licensee agrees to RELEASE, DEFEND, HOLD HARMLESS, AND INDEMNIFY DART, Railroad, and their respective directors, officers, employees, contractors, agents, and representatives (collectively "Indemnitees") from and against all liabilities, losses, damages, claims, costs, and expenses (including attorney's fees) for bodily injury or death to any person and for damage to, loss of, or loss of the use of any property arising out of or resulting from Licensee's (including Licensee's employees, contractors, subcontractors, agents, or invitees) entry onto the Property, performance under this Agreement, or breach of any of the terms of this Agreement, except to the extent proximately caused by the gross negligence or intentional misconduct of one or more Indemnitees. Additionally, Licensee shall INDEMNIFY, DEFEND, AND HOLD DART AND RAILROAD HARMLESS against all costs, expenses, claims, and liability related to any environmental contamination and related clean-up of the Property resulting from Licensee's use of the Property under this Agreement.
- 8.2. In the event any of the provisions of this indemnification section are determined by statutory authority or judicial decision to be void or unenforceable, then this section shall not fail in its entirety, but will be enforceable to the greatest extent permitted by law. This indemnification section and all other indemnification and waiver provisions shall survive the termination of this Agreement.

#### IX. Miscellaneous.

- 9.1. Notice. Notices permitted or required by this Agreement shall be in writing and shall be deemed delivered when hand delivered or sent by certified mail, return receipt requested, and addressed to: Licensee at the address set out in the first paragraph of this Agreement; and DART at 1401 Pacific Avenue, Dallas Texas 75202, Attn: Railroad Management. Either Party may designate a different address for receipt of notice by giving written notice of such change of address.
- 9.2. Assignment. Licensee shall not, absent DART's prior written consent, assign or transfer its rights under this Agreement in whole or in part or permit any other person or entity to use the license granted pursuant to this Agreement.
- 9.3. Governing Law. This Agreement shall be construed under and in accordance with the laws of the State of Texas. Any action brought by a Party to enforce any provision of this License shall be commenced in a state district court of competent jurisdiction in Dallas County, Texas.
- 9.4. Entirety. This Agreement embodies the entire agreement between the Parties and supersedes all prior agreements and understandings, if any, relating to the Property and the matters addressed herein.
- 9.5. Amendments; Counterparts. This Agreement may be amended or supplemented only by a written instrument executed by the Parties. The Parties may execute this Agreement in multiple originals and when taken together, those originals constitute a whole.
- 9.6. Parties Bound; Third-Party Beneficiaries. This Agreement shall be binding upon and inure to the benefit of the Parties and their respective heirs, personal representatives, successors and assigns. There are no third-party beneficiaries to this Agreement.
- 9.7. No Joint Enterprise. The Parties do not intend that this Agreement be construed as finding that the Parties have formed a joint enterprise. The purposes for which each Party has entered into this Agreement are separate and distinct.

- 9.8. <u>Severability</u>. If any provision of this Agreement is determined to be illegal or unenforceable in any respect, such determination will not affect the validity or enforceability of any other provision, each of which will be deemed to be independent and severable.
- 9.9. <u>No Waiver of Governmental Immunity</u>. By entering into this Agreement, DART does not waive or diminish any immunities, protections, or defenses available to it, including by example and without limitation, governmental immunity and statutory caps on damages, except as provided by Chapter 271 of the Texas Local Government Code.
- 9.10. <u>Signature Authority</u>. Each of the individuals signing this Agreement warrants that he or she is duly and properly authorized to execute this Agreement on behalf of his or her respective Party.

DALLAS AREA RAPID TRANSIT:	BY: Caitlin Holland Vice President, Real Estate & Economic Development Development Department
	Date:
LICENSEE:	CITY OF CARROLLTON
	BY:
	Printed Name:
	Title:
	Date:

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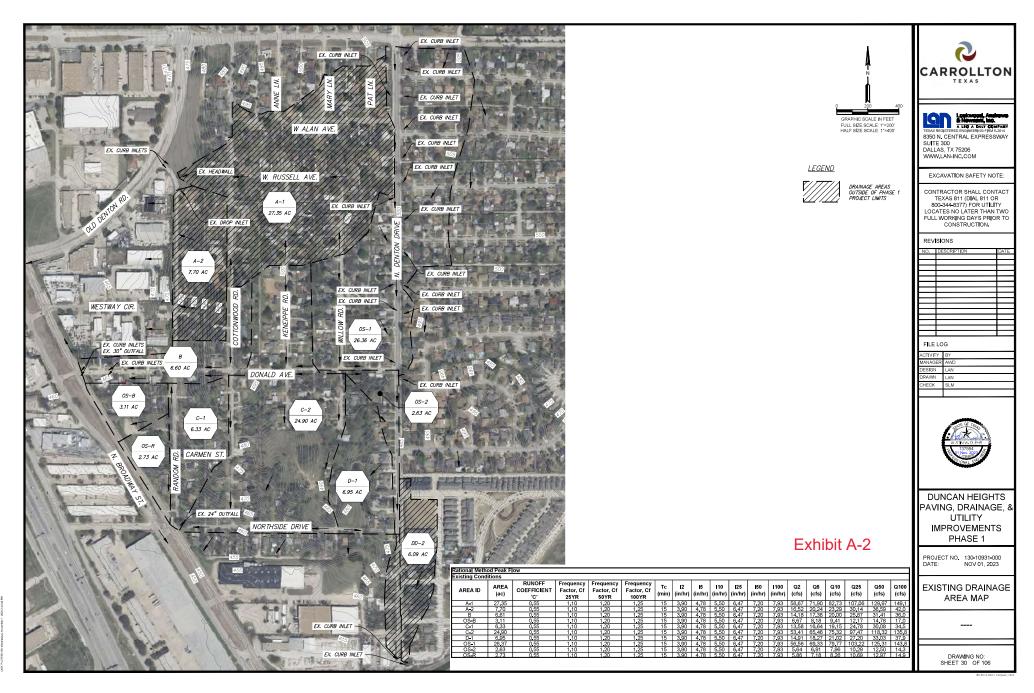
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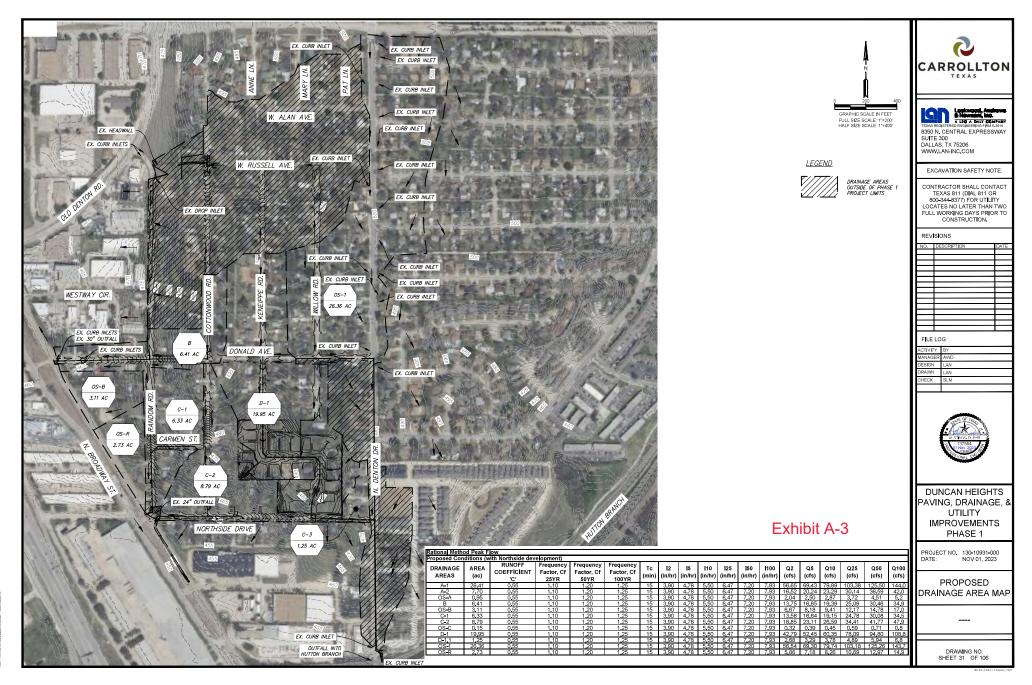
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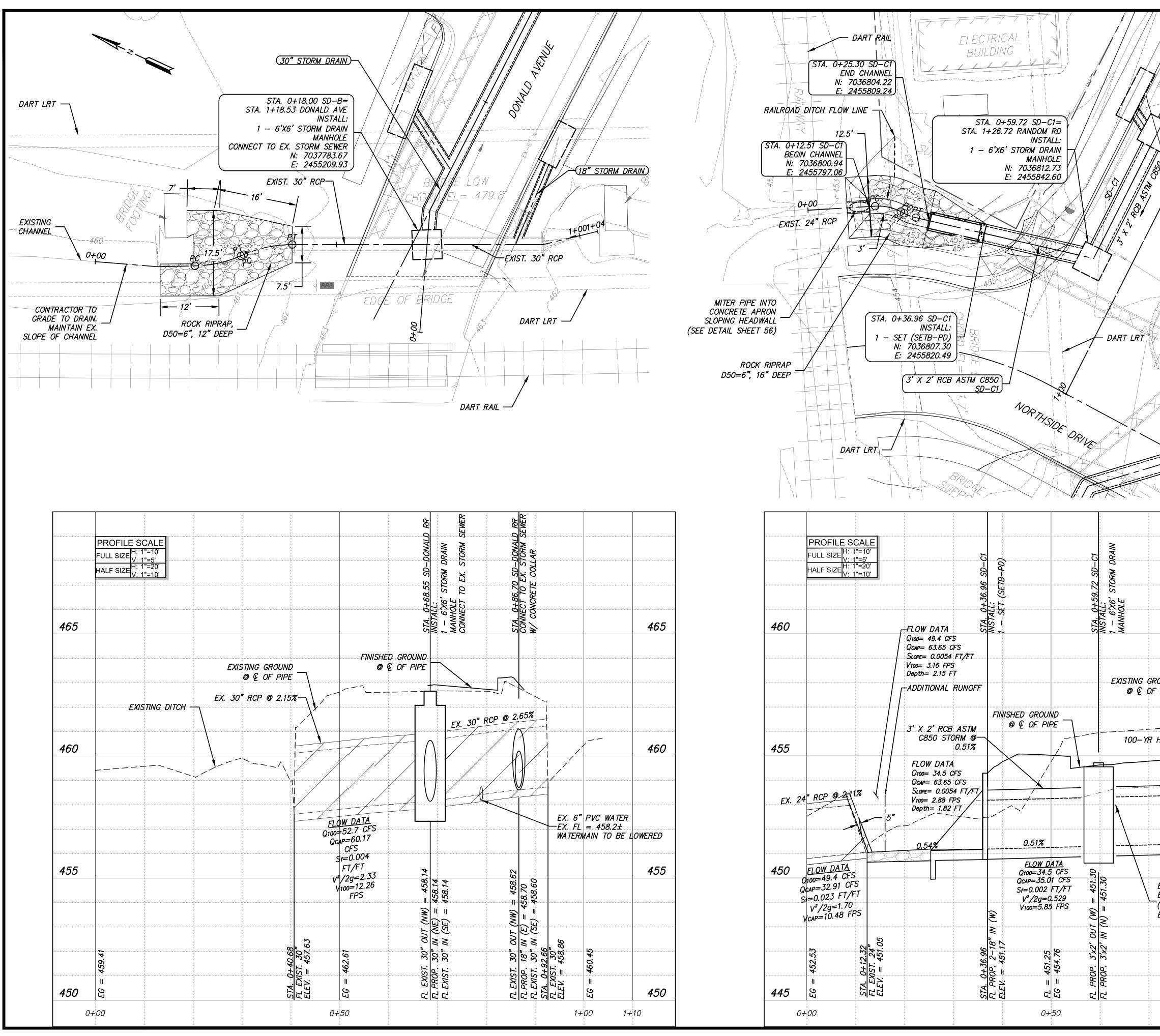
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TEXAS	Northside From To		(cfs)		(ft/ft)			(ft)	(ft)	(X:1)	(ft <sup>2</sup> )	(ft)	(ft)			(ft/sec)	(ft)	(cfs)	
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PROJECT NO. 130-10931-000						_													

Exhibit A-4

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<u>10+05.45</u> <u>9+50.00</u> 8+00.00	9+50.00 8+00.00 6+88.90	55 B1I, B1J 150 DSLOPE	1.80         0.00         0.55           1.80         0.55           1.80         0.55	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	.99         15         0.10         15.10         6.42         6.9           .99         15         0.16         15.27         6.39         6.9           .99         15         0.12         15.38         6.37         6.9		0.013 0.019 2.41 5 0.013 0.0535 2.41 5 0.013 0.0557 2.41 5	50         0.44         21.90         9.10         2.91           50         0.44         36.75         15.28         2.89           50         0.44         37.50         15.59         2.88		91.90         491.81         0.00         0.13         Junction           90.65         483.79         0.13         0.13         VBend           82.63         477.60         0.13         0.13         VBend	0.000         0.250         0.13         0.13         492.04           0.000         0.250         0.10         0.10         491.81           0.000         0.000         0.00         0.00         483.79
6+88.90 6+80.90	6+80.90 6+77.95	8 B1H 3 B1G	0.57 1.80 0.55 0.41 2.37 0.55	25         1.1         0.00         0           25         1.1         0.31         1           25         1.1         0.23         1	.33         15         0.12         13.30         0.37         0.33           .30         15         0.01         15.39         6.36         9.1           .53         15         0.00         15.40         6.36         10.	3         RCP         21           70         RCP         21	0.013 0.0545 2.41 5. 0.013 0.0506 2.41 5.	50         0.44         37.09         15.42         3.79           50         0.44         35.74         14.86         4.45	475.85         475.41         0.00332         0.0265         4           475.41         475.26         0.00456         0.0135         4	77.19 477.16 0.13 0.22 Wye	0.43         0.096         0.00         0.10         477.60           0.37         0.114         0.00         0.11         477.16
6+77.95 6+31.43	6+31.43 6+08.66	47 DSLOPE 23 B1E	2.78 0.55 1.11 3.89 0.55	25 1.1 0.00 1 25 1.1 0.61 2	.53         15         0.05         15.45         6.35         10.           .14         15         0.03         15.47         6.35         14.	69         RCP         21           04         RCP         21	0.013         0.0506         2.41         5.           0.013         0.0505         2.41         5.	500.4435.7414.864.44500.4435.7014.846.21	475.26         472.91         0.00455         0.2116         4           472.91         471.76         0.00889         0.2025         4	177.03         477.01         0.22         0.31         Wye           176.02         474.66         0.31         0.31         VBend           173.82         473.51         0.31         0.60         Junction	0.000         0.00         0.00         477.01           0.000         0.350         0.49         0.49         474.66
6+08.66 5+25.14 4+00.00	5+25.14 4+00.00 3+15.00	84 DSLOPE 125 DSLOPE 85 DSLOPE	3.89         0.55           3.89         0.55           3.89         0.55           3.89         0.55	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	.14         15         0.10         15.57         6.33         14.           .14         15         0.18         15.75         6.30         14.           .14         15         0.13         15.88         6.27         14.	32 RCP 21	0.013         0.0435         2.41         5.           0.013         0.0324         2.41         5.           0.013         0.0253         2.41         5.	50         0.44         33.14         13.78         6.19           50         0.44         28.60         11.89         6.16           50         0.44         25.27         10.51         6.13	6 468.13 464.07 0.00874 1.0942 4	472.71         469.88         0.60         0.60         VBend           469.17         465.82         0.60         0.59         VBend           465.17         463.53         0.59         0.58         VBend	0.000         0.00         0.00         473.51           0.000         0.00         0.00         469.88           0.000         0.00         0.00         465.82
3+15.00 2+12.01	2+12.01 1+90.64	103 DSLOPE 21 EXPANSIOI	3.89         0.55           N         3.89         0.55	25         1.1         0.00         2           25         1.1         0.00         2           25         1.1         0.00         2	.14         15         0.19         16.07         6.23         14.           .14         15         0.06         16.13         6.22         14.	67         RCP         21           64         RCP         24	0.013 0.0187 2.41 5. 0.013 0.0071 3.14 6.	50         0.44         21.73         9.03         6.10           28         0.50         19.11         6.08         4.66	461.92         459.99         0.00857         0.8830         4           459.74         459.59         0.00419         0.0895         4	463.53         462.65         0.58         0.58         VBend           462.62         462.53         0.58         0.34         Expansion	0.000         0.00         0.00         463.53           0.03         0.000         0.00         0.03         462.65
<u>1+90.64</u> <u>1+82.64</u> 0+80.40	1+82.64 0+80.40 0+34.34	8 B1D 102 B1C 46	0.38 4.27 0.55 0.80 5.07 0.55 5.07 0.55	25         1.1         0.21         2           25         1.1         0.44         2           25         1.1         0.00         2	.35         15         0.02         16.16         6.22         16.           .79         15         0.28         16.44         6.17         18.           .79         15         0.17         16.61         6.14         18.	RCP         24           92         RCP         24           32         RCP         30	0.013         0.0071         3.14         6.           0.013         0.0071         3.14         6.           0.013         0.0071         3.14         6.           0.013         0.0028         4.91         7.	28         0.50         19.11         6.08         5.11           28         0.50         19.11         6.08         6.02           85         0.63         21.76         4.43         3.83	459.54 458.81 0.00699 0.7143 4	62.24         462.20         0.34         0.41         Wye           61.84         461.13         0.41         0.56         Wye           61.05         460.96         0.56         0.23         VBend	0.000         0.350         0.29         0.29         462.53           0.000         0.500         0.36         0.36         462.20           0.07         0.000         0.00         0.00         461.13
0+34.34 0+25.09	0+25.09 0+18.00	9 B1A, B1B 7 BEND	1.34         6.41         0.55           6.41         0.55	25 1.1 0.74 3		77         RCP         30           75         RCP         30	0.013 0.0025 4.91 7.	85 0.63 20.56 4.19 4.84		60.76 460.73 0.23 0.27 Wye	0.07         0.000         0.000         0.000         0.000         0.000         0.19         401.13           0.000         0.350         0.19         0.19         460.96           0.25         0.068         0.00         0.07         460.73
LATERALS											
B.EX1.1 0+26.26	0+10.81	15 B1A	1 1.10 0.55	25 1.1 0.61 0	.61 15 0.07 15.07 6.43 4.2	8 RCP 21	0.013 0.0032 2.41 5.	50 0.44 8.99 3.74 1.78	3   458.60   458.55   0.00073   0.0113   4	60.97 460.96 0.00 0.05 Lateral	0.000 0.00 0.00 460.97
0+29.49 B1.2	0+06.67	23 B1D	0.38 0.38 0.55	25 1.1 0.21 0	.21 15 0.03 15.03 6.44 1.4	8 RCP 21	0.013 0.0439 2.41 5.	50 0.44 33.29 13.84 0.62	2   460.67   459.67   8.7E-05   0.0020   4	62.20 462.20 0.00 0.01 Lateral	0.000 0.00 0.00 462.42
0+21.63 B2	0+03.73	18 B1C	0.80 0.80 0.55	25 1.1 0.44 0	.44 15 0.04 15.04 6.43 3.1	1 RCP 21	0.013 0.0117 2.41 5.	* * * * *	9 459.93 459.72 0.00039 0.0069 4		0.000 0.00 0.00 462.53
0+53.39 0+48.73	0+48.73 0+03.90	5 BEND 45 BEND	1.11         1.11         0.55           0.00         0.55	25         1.1         0.61         0           25         1.1         0.00         0	.61         15         0.02         15.02         6.44         4.3           .61         15         0.17         15.19         6.41         4.3				473.13         473.11         0.00074         0.0035         4           473.11         472.91         0.00074         0.0330         4		0.000         0.00         0.00         474.88           0.37         0.018         0.00         0.02         474.88
<b>B3.1</b> 0+22.83 <b>B3.2</b>	0+05.01	18 B1H	0.57 0.57 0.55	25 1.1 0.31 0	.31 15 0.04 15.04 6.43 2.2	2 RCP 21	0.013 0.0109 2.41 5.	50 0.44 16.59 6.90 0.92	2 476.04 475.85 0.0002 0.0035 4	77.60 477.60 0.00 0.01 Lateral	0.000 0.00 0.00 477.79
0+25.75 <b>B4.1</b>	0+03.78	22 B1G	0.41 0.41 0.55	25 1.1 0.23 0	.23 15 0.03 15.03 6.44 1.6	0 RCP 21		50 0.44 27.29 11.35 0.66	6 476.06 475.41 0.0001 0.0022 4	77.16 477.16 0.01 0.01 Bend	0.000 0.00 0.00 477.81
0+71.94 0+54.88	0+54.88 0+46.87	17 B1J 8	1.38 1.38 0.55 1.38 0.55	25         1.1         0.76         0           25         1.1         0.00         0           25         1.1         0.00         0	.76         15         0.07         15.07         6.43         5.3           .76         15         0.04         15.11         6.42         5.3           .76         15         0.04         15.11         6.42         5.3           .76         15         0.04         15.26         6.32         5.3		0.013 0.0033 2.41 5.	50 0.44 9.13 3.79 2.23	3         491.31         491.26         0.00115         0.0196         4           3         491.26         491.23         0.00114         0.0092         4           4         491.23         0.00114         0.0092         4	92.20 492.19 0.08 0.08 Bend	0.000         0.00         0.00         492.25           0.43         0.033         0.00         0.03         492.24           0.000         0.500         0.09         0.09         492.19
0+46.87 <b>B4.2</b> 0+25.57	0+12.75	34  B11 20  R11	0.42 1.80 0.55		.99 15 0.15 15.26 6.39 6.9	6 RCP 21		50         0.44         9.40         3.91         2.89           50         0.44         11.23         4.67         0.68	9   491.23   491.11   0.00193   0.0659   4 3   491.38   491.28   0.00011   0.0022   4	92.10 492.04 0.08 0.13 Wye	0.000         0.500         0.09         0.09         492.19           0.000         0.000         0.00         493.13
0.20.01	, 0.00.10	, _, _, _,			00.00.000.	1.01   21					
SD-C1											
POINT	D	LENGTH AREA ID	INC TOTAL RUNOFF	Level of Cf	TIME OF RAIN "I" RUN	IOFF TYPE (BOX E	BOX RISE PIPE N SLOPE PIPE A PIPE	WP Hyd Radius Q <sub>cap</sub> FULL DESIG	S. H.	HGL Upstream Downstream $V_1^2 / 2g V_2^2 / 2g$ Loss Type	Losses Top of HGL Expansion Kb Bend Kj Junction Total US Junctio
FROM	ТО	(FT)	(ACRES)(ACRES)	"Service FACTOR		SPAN) FS) IN (FT)	FT (FT/FT) (SF) (F	T) (FT) (CFS) (FT/S) (FT/S)	S) (FT) (FT) (FT/FT) (FT)	(FT) (FT) (FT) (FT) (FT)	Loss coefficient Loss coefficient Loss hL (FT)
1 SYSTEM C1	2	3 4	5 6 7	8 9 10		6 17 18	19 20 21 22 2	3 24 25 26 27	28 29 30 31	32 33 34 35 36	37 38 39 40 41 42 43
7+64.06 7+55.17	7+55.17 5+96.05	9 C1A 159 BEND	0.97 0.97 0.55 0.97 0.55	25         1.1         0.53         0           25         1.1         0.00         0	.53         15         0.02         15.02         6.44         3           .53         15         0.27         15.29         6.39         3           .44         .45         0.40         .45         0.47         15.29	78         RCP         21           75         RCP         21           60         POP         01		50         0.44         21.08         8.76         1.5           50         0.44         23.46         9.75         1.50	7         471.43         471.27         0.00057         0.0051           6         471.27         467.80         0.00056         0.0890           0         467.00         464.50         0.0400         0.0004	473.03         473.02         0.000         0.038           471.82         469.55         0.038         0.038         Bend	0.00         0.000         0.00         0.00         473.03           0.43         0.016         0.00         0.02         473.02           0.00         0.00         0.02         473.02
5+96.05 5+17.06 4+43.08	5+17.06 4+43.08 3+82.68	79 C1B 74 DSLOPE 60 C1E.C1E	1.65         2.62         0.55           2.62         0.55           0.78         3.40         0.55	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	.44         15         0.10         15.39         6.37         10           .44         15         0.08         15.46         6.35         10           .87         15         0.08         15.54         6.34         13	.09         RCP         21           .07         RCP         21           .03         RCP         21	0.013         0.0414         2.41         5.           0.013         0.0604         2.41         5.           0.013         0.0385         2.41         5.	50         0.44         32.33         13.44         4.20           50         0.44         39.05         16.23         4.19           50         0.44         31.17         12.96         5.42	9 464.53 460.06 0.00404 0.2987	468.26         466.28         0.038         0.273         Wye           465.23         461.81         0.273         0.27         PVI           460.97         458.71         0.272         0.46         Junction	0.000         0.35         0.26         0.26         469.55           0.000         0.00         0.00         466.28           0.000         0.50         0.32         0.32         461.81
3+82.68 3+10.00	3+10.00 2+44.68	73 DSLOPE 65 DSLOPE	3.40         0.55           3.40         0.55	25         1.1         0.00         1           25         1.1         0.00         1           25         1.1         0.00         1	.87         15         0.14         15.68         6.31         12           .87         15         0.09         15.77         6.29         12		0.013         0.0174         2.41         5.           0.013         0.0359         2.41         5.	50         0.44         20.96         8.71         5.40           50         0.44         30.10         12.52         5.30	0456.74456.470.006710.48768456.47454.130.006670.4359	458.71         458.22         0.456         0.45         PVI           457.40         456.00         0.452         0.45         PVI	0.000         0.00         0.00         458.71           0.000         0.00         0.00         458.22
2+44.68 1+82.53 0+88.58	1+82.53 0+88.58 0+59.89	62 C1D 94 DSLOPE 29 C1C	2.20         5.60         0.55           5.60         0.55           0.73         6.33         0.55	25         1.1         1.21         3           25         1.1         0.00         3           25         1.1         0.40         3	.08         15         0.11         15.88         6.27         21           .08         15         0.17         16.06         6.24         21           .48         15         0.08         16.14         6.22         23	.13 RCP 24	0.013         0.0157         3.14         6.           0.013         0.0155         3.14         6.           2         0.013         0.0051         6.00         10	28         0.50         28.42         9.05         6.70           28         0.50         28.24         8.99         6.73           00         0.60         34.94         5.82         3.93	3 452.90 451.45 0.00872 0.8192	455.45         454.90         0.450         0.71         Junction           454.29         453.47         0.710         0.70         PVI           453.47         453.40         0.703         0.24         Junction	0.000         0.35         0.55         0.55         456.00           0.000         0.00         0.00         454.90           0.000         0.35         0.00         0.00           0.000         0.35         0.00         0.00           0.000         0.35         0.00         0.17           0.000         0.30         0.17         0.17
0+59.89 LATERALS	0+36.96	23 BEND	6.33 0.55	25 1.1 0.40 3 25 1.1 0.00 3					451.43         451.30         0.00230         0.0003           6         451.30         451.18         0.00237         0.0544	453.23 453.18 0.245 0.24 Junction	0.000 0.30 0.17 0.17 453.40
C1.1 0+13.27	0+05.24	8 C1C	0.73 0.73 0.55	25 1.1 0.40 0	.40   15   0.03   15.03   6.44   2	84 RCP 21	0.013 0.005 2.41 5.	50 0.44 11.23 4.67 1.18	8   451.71   451.67   0.00032   0.0026	453.47 453.47 0.00 0.02 Lateral	453.47
C1.2 0+14.19	0+05.79	8 C1D	2.04 2.04 0.55	25 1.1 1.12 1	.12   15   0.01   15.01   6.44   7	95 RCP 21	0.013 0.032 2.41 5.	50 0.44 28.42 11.82 3.30	0   454.61   454.34   0.00252   0.0211	456.36 456.00 0.00 0.17 Lateral	456.36
3+20.65 3+03.17	3+03.17 2+49.99	17 C1F 53 BEND	0.47 0.47 0.55 0.00 0.55	25         1.1         0.26         0           25         1.1         0.00         0	.26         15         0.07         15.07         6.43         1           .26         15         0.21         15.28         6.39         1		0.013         0.0039         2.41         5.           0.013         0.0042         2.41         5.	50         0.44         9.92         4.13         0.76           50         0.44         10.30         4.28         0.76	6470.15470.080.000130.00236470.08469.860.000130.0070	471.62 471.61 0.01 0.01 Bend	0.000         0.00         0.00         471.90           0.43         0.004         0.00         0.00         471.83
2+49.99 1+33.28	1+33.28 0+61.82	117 DSLOPE 71 C1E	0.00 0.55 0.31 0.31 0.55	25 1.1 0.17 0	.26         15         0.21         15.49         6.35         1           .43         15         0.08         15.57         6.33         2	99 RCP 21	0.013         0.0197         2.41         5.           0.013         0.0495         2.41         5.	50         0.44         22.30         9.27         0.75           50         0.44         35.35         14.70         1.24	5         469.86         467.56         0.00013         0.0151           4         467.56         464.02         0.00036         0.0254	470.25         469.31         0.01         0.01         VPI           467.96         465.77         0.01         0.02         Junction	0.000         0.00         0.00         471.61           0.000         0.50         0.02         0.02         469.31
0+61.82 <b>C1.3A</b> 0+19.78	0+04.56	57 BEND	0.21 0.21 0.55		.43         15         0.06         15.62         6.32         2           .17         .15         0.02         .15.02         .6.44         .1		0.013 0.0682 2.41 5.		4         464.02         460.06         0.00035         0.0203           0         468.22         468.02         5.8E-05         0.0009	464.39 461.81 0.02 0.02 Bend	0.43 0.010 0.00 0.01 465.77
<b>C1.4</b> 0+14.08	0+04.70	9 C1B	0.31 0.31 0.55	25 1.1 0.17 0		21 RCP 21			<u>468.92</u> 468.88 0.00198 0.0175		0.13 469.70
SD-C2		1 1									
POINT		LENGTH AREA ID	INC TOTAL RUNOFF L	_evel of Cf INC. TOTA	RUNOF			Hyd Radius Q <sub>cap</sub> FULL DESIGN	U/S D/S S <sub>f</sub> H <sub>f</sub> Ups	HGL stream Downstream $V_1^2 / 2g V_2^2 / 2g$ Loss Type Ex	Losses pansion Kb Bend Kj Junction Total US Junctio
FROM	ТО		CRES) (ACRES)	Service FACTOR	(MIN) (MIN) (MIN) (IN/HR) (CFS)	IN (FT)	FT (FT/FT) (SF) (FT)	(FT) (CFS) (FT/S) (FT/S)	(FT)         (FT)         (FT/FT)         (FT)         (FT)	FT) (FT) (FT) (FT)	Loss coefficient Loss coefficient Loss hL (FT)
1 SYSTEM C2 5+92.59	2 5+75.02			8 9 10 11	12         13         14         15         16           5         15         0.03         15.03         6.44         2.45	17   18	<u>19</u> 20 21 22 23		28 29 30 31 3 458.32 458.02 0.00024 0.0042 45	32 33 34 35 36 59.78 459.77 0.000 0.016 Entrance	37         38         39         40         41         42         43           0.000         0.000         0.000         459.78
5+92.59 5+75.02 5+39.78	5+39.78 5+19.55	35 BEND 20 C2I,C2H	0.63 0.63 0.55 0.63 0.55 1.54 2.17 0.55	25         1.1         0.35         0.33           25         1.1         0.00         0.33           25         1.1         0.85         1.19	5         15         0.03         13.03         0.44         2.43           5         15         0.07         15.10         6.42         2.45           9         15         0.04         15.14         6.41         8.42	RCP         21           RCP         21           RCP         21	0.013         0.0166         2.41         5.50           0.013         0.0166         2.41         5.50           0.013         0.0166         2.41         5.50           0.013         0.0166         2.41         5.50	0.44         20.47         8.51         1.02           0.44         20.47         8.51         1.02           0.44         20.47         8.51         3.50	458.02 457.44 0.00024 0.0084 45	is.76         459.77         0.000         0.010         Entrance           i9.20         459.19         0.016         0.016         Bend           i8.91         458.85         0.016         0.190         Wye	0.43         0.007         0.00         0.01         459.77           0.000         0.35         0.18         0.18         459.19
5+19.55 4+05.06	4+05.06 3+56.76	114 C2G 48 C2E	0.29 2.46 0.55 0.39 2.85 0.55	25         1.1         0.16         1.3           25         1.1         0.21         1.5	5         15         0.22         15.37         6.37         9.48           7         15         0.09         15.46         6.35         10.95	RCP         21           RCP         21	0.013         0.0166         2.41         5.50           0.013         0.0166         2.41         5.50	0.44         20.47         8.51         3.94           0.44         20.47         8.51         4.55           0.52         0.24         7.25	455.20 454.40 0.00478 0.2307 45	i7.36456.950.1900.24Wyei6.70456.470.240.32Wye	0.000         0.35         0.17         0.17         458.85           0.000         0.35         0.24         0.24         456.95
3+56.76 2+62.50 1+39.13	2+62.50 1+39.13 0+36.59	94 C2C, C2D 123 DSLOPE 103 C2B, C2A	2.94         5.79         0.55           5.79         0.55           2.47         8.26         0.55	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	8         15         0.15         15.61         6.32         22.14           8         15         0.37         15.98         6.25         21.90           4         15         0.30         16.28         6.20         30.96	RCP 24	0.013         0.0205         3.14         6.28           0.013         0.006         3.14         6.28           2         0.013         0.005         6.00         10.00	0.50 17.57 5.59 6.97	452.22 451.48 0.00936 1.1550 45	55.86         454.96         0.32         0.77         Junction           64.96         453.80         0.77         0.75         Vbend           63.65         453.24         0.75         0.41         Junction	0.000         0.50         0.61         0.61         456.47           0.000         0.000         0.000         454.96           0.000         0.35         0.15         0.15         453.80
0+36.59 0+15.95	0+15.95 0+07.31	21 BEND 9 BEND	8.26 0.55 8.26 0.55	25         1.1         0.00         4.54           25         1.1         0.00         4.54	4 15 0.06 16.34 6.18 30.91	RCB 3	2         0.013         0.005         6.00         10.00           2         0.013         0.005         6.00         10.00	0.60 34.59 5.77 5.15	450.97 450.86 0.00401 0.0827 45	33.09         453.01         0.41         0.41         Bend           52.85         452.82         0.41         0.41         Bend	0.37         0.152         0.00         0.15         453.24           0.37         0.152         0.00         0.15         453.01
LATERALS C2A 0+32.31	0+07.85	24 1C2	0.53 0.53 0.55	25 1.1 0.29 0.29	9   15   0.09   15.09   6.43   2.06	RCP 21	0.013 0.005 2.41 5.50	0.44 11.23 4.67 0.86	451.05   450.93   0.00017   0.0041   45	2.68 452.68 0.00 0.01 Lateral	0.000 0.00 452.80
<b>C2.1</b> 0+19.48	0+04.35	15 C2A, C2B		25         1.1         0.23         0.23           25         1.1         1.36         1.36			0.013 0.0171 2.41 5.50		451.03         450.33         0.00017         0.00417         45           451.74         451.48         0.00369         0.0558         45		0.000 0.00 453.86
C2.2 0+78.51 0+62.99	0+62.99 0+41.34	16 C2C	0.53 0.53 0.55 0.53 0.55	25         1.1         0.29         0.29           25         1.1         0.00         0.29	9         15         0.02         15.02         6.44         2.06           9         15         0.03         15.05         6.43         2.06	RCP 21 RCP 21	0.013         0.0298         2.41         5.50           0.013         0.0298         2.41         5.50		456.66         456.20         0.00017         0.0026         45           456.20         455.55         0.00017         0.0037         45	67.95         457.95         0.00         0.01         Entrance           67.30         457.30         0.01         0.01         Bend	0.000         0.00         0.00         458.41           0.43         0.005         0.00         0.00         457.95
0+41.34 <b>C2.2A</b>	0+03.08	38 C2D	0.53         0.55           2.41         2.94         0.55	25         1.1         0.00         0.24           25         1.1         1.33         1.62			0.013 0.0298 2.41 5.50	0.44 27.43 11.40 4.75	455.55 454.41 0.0052 0.1988 45	i6.67 456.47 0.01 0.35 Wye	0.000 0.500 0.34 0.34 457.30
0+24.40 C2.3	0+05.50				3         15         0.02         15.02         6.44         9.39           4         45         0.04         45.04         0.42         4.50		0.013 0.0367 2.41 5.50			i7.37         457.30         0.00         0.24         Lateral           i0.00         450.05         0.00         0.24         Lateral	0.000 0.00 457.99
0+26.23 <b>C2.4</b> 0+33.21	0+08.89	17 C2E	0.39 0.39 0.55 1.54 1.54 0.55	25 1.1 0.21 0.2 25 1.1 0.85 0.8		RCP 21	0.013 0.01 2.41 5.50		455.38         455.21         9.2E-05         0.0016         45           457.48         457.20         0.01109         0.1387         45		0.000         0.00         0.00         457.13           0.000         0.00         0.00         459.51
0+20.70 <b>C2.5</b>	0+20.70	17 Bend	1.54         1.54         0.55           1.54         0.55	25         1.1         0.85         0.83           25         1.1         0.00         0.83		RCP 21 RCP 21	0.03620.02172.415.500.03620.02172.415.50	0.44         8.40         5.49         2.49           0.44         8.40         3.49         2.48	457.46         457.20         0.01109         0.1367         45           457.20         456.84         0.01103         0.1852         45		0.25 0.024 0.00 0.02 459.40
0+70.44 0+27.95	0+27.95 0+05.18	42 C2G 23 BEND	0.29 0.29 0.55 0.29 0.55	25         1.1         0.16         0.16           25         1.1         0.00         0.16           100         4.25         0.00         0.16	6150.0515.056.431.136150.0215.076.431.139150.0115.017.856.75	RCP         18           RCP         18           DOD         01	0.013 0.0656 1.77 4.71 0.013 0.0656 1.77 4.71 0.013 0.1125 2.41 5.50	0.38         26.98         15.27         0.64           0.38         26.98         15.27         0.64           0.44         52.08         15.27         0.64	461.53         458.74         0.00012         0.0049         46           458.73         457.24         0.00012         0.0026         45           460.21         467.24         0.0012         0.0026         45	1.77         460.23         0.00         0.01         Lateral           88.97         458.85         0.00         0.01         Bend           90.60         460.06         0.00         0.12         Lateral	0.000         0.00         0.00         463.03           0.25         0.002         0.00         0.00         460.23           0.000         0.000         0.00         470.96
0+30.69	U+13.83	<u>   /  (5   </u>	1.20   1.20   0.55	100   1.23   0.69   0.69	ויט ( 1.85   15.01   1.85   16.75	<u>  RUF   21  </u>	<u>  0.013   0.1125   2.41   5.50</u>	<u> </u>	<u>409.21   407.31   0.00181   0.0306   46</u>	9.69 469.06 0.00 0.12 Lateral	0.000 0.00 0.00 470.96

Exhibit A-5

СА	F	ROLLTO	N				
8350 SUIT DALL	N. E 3 .AS	Lockwood, And & Newnam, Inc. A LEO A DALY COM ISTERED ENGINEERING FIRM F- CENTRAL EXPRESS CO0 5, TX 75206 AN-INC.COM	<b>PANY</b> 2614				
EX	CA	VATION SAFETY NO	TE:				
- 8( LOC	CONTRACTOR SHALL CONTACT TEXAS 811 (DIAL 811 OR 800-344-8377) FOR UTILITY LOCATES NO LATER THAN TWO FULL WORKING DAYS PRIOR TO CONSTRUCTION.						
REVI	SIC	DNS					
NO.	DE	SCRIPTION	DATE				
FILE	LO	G					
		BY					
MANAG DESIGN		AWD LAN					
DRAWN		LAN					
CHECK		SLM					
	AUSTIN W. DUEHR 137554 BOIN NOV. 2023 VCENSED SS /ONAL ENS						
PAV	ΊΝ	NCAN HEIGHT NG, DRAINAG UTILITY PROVEMENTS PHASE 1	E, &				
PRO. DATE		CT NO. 130-10931-00 NOV 01, 2023					
(	CA	DRAINAGE	6				
	S١	STEMS B-C2					
	S	DRAWING NO: SHEET 34 OF 106					

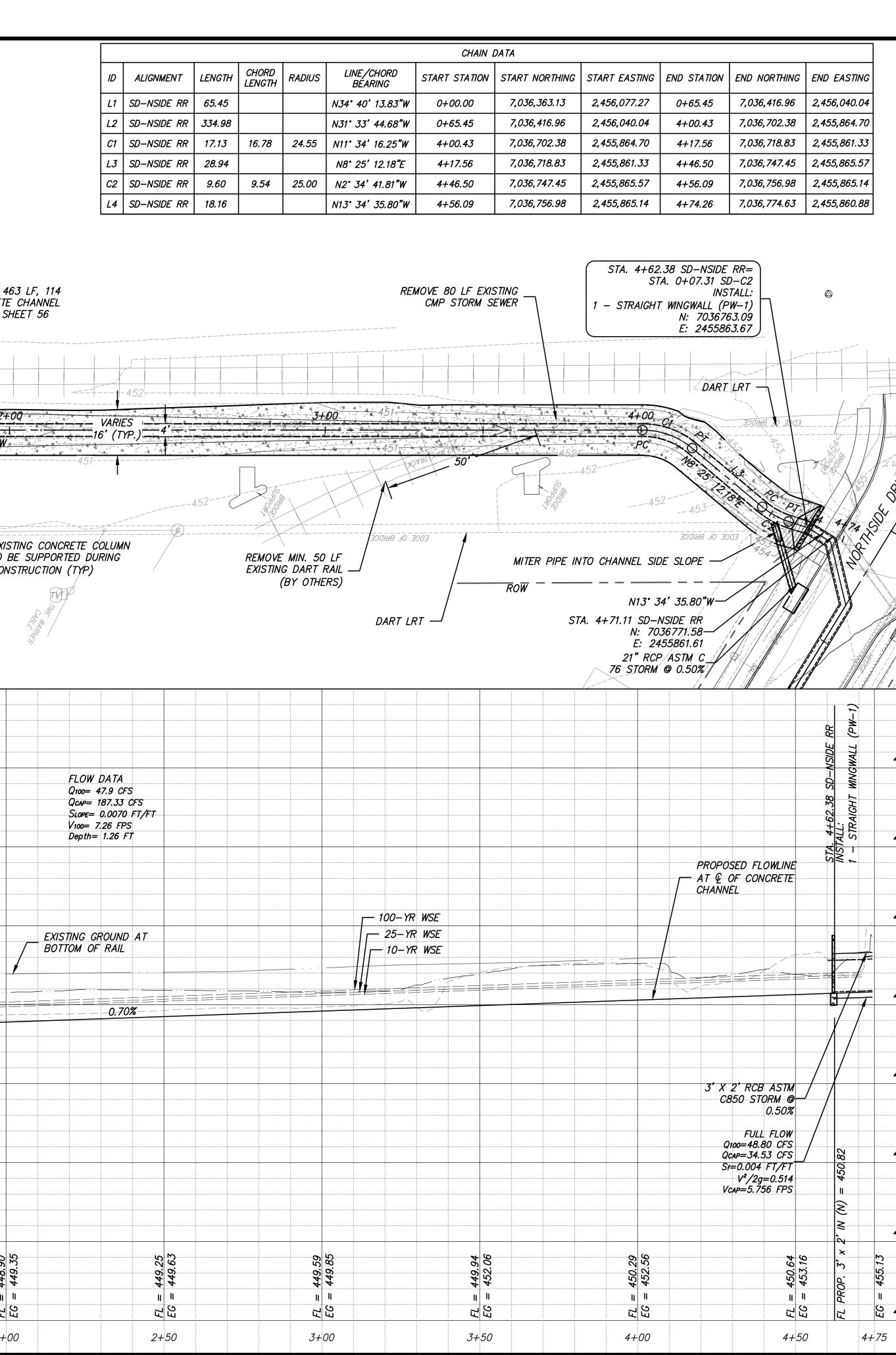


FILE LOCATION: P:\130\130-10931-000\4-0-Production-Working\4-1-BIM-CAD\CiviNSheets\130-10931-000 SD-DONAL LAST MODIFIED BY: AWDUEHR LAST PLOTTED BY: DUEHR, AUSTIN LAST PLOTTED ON: Monday, November 6, 2023 11:52:47 AM

	0 10 20	CARROLLTON TEXAS
2000 1000 1000 1000 1000	GRAPHIC SCALE IN FEET FULL SIZE SCALE: 1"=10' HALF SIZE SCALE: 1"=20' NOTES: 1. THE CONTRACTOR SHALL PROTECT EXISTING FOOTINGS.	Lockwood, Andrews & Newnam, Inc. A LEO A DALY COMPANY TEXAS REGISTERED ENGINEERING FIRM F-2614 8350 N. CENTRAL EXPRESSWAY SUITE 300 DALLAS, TX 75206 WWW.LAN-INC.COM
		EXCAVATION SAFETY NOTE: CONTRACTOR SHALL CONTACT TEXAS 811 (DIAL 811 OR 800-344-8377) FOR UTILITY LOCATES NO LATER THAN TWO FULL WORKING DAYS PRIOR TO CONSTRUCTION.
		REVISIONS NO. DESCRIPTION DATE
		FILE LOG
		ACTIVITY BY MANAGER AWD DESIGN LAN DRAWN LAN CHECK SLM
460 ROUND F PIPE		AUSTIN W. DUEHR 137554 06 Nov. 2023 1580 /ONAL ENGINE
455		DUNCAN HEIGHTS PAVING, DRAINAGE, & UTILITY IMPROVEMENTS PHASE 1
450		PROJECT NO. 130-10931-000 DATE: NOV 06, 2023
EX. COMM UTILITY EX. TOP = 453.0± (TO BE RELOCATED BY OTHER\$)		RAILROAD CHANNEL IMPROVEMENTS
	Exhibit A-6	DONALD AVENUE AND RANDOM ROAD
<b>445</b> 0+80		DRAWING NO: SHEET 54 OF 106

	EXISTING HEADWALL STA. 0+00.04 SD- CONNECT TO EXIST CONCRETE V-NOTO N: 7036363.16 E: 2456077.25	-NSIDE RR	RT RAIL		CONSTRUCT 4 CY, CONCRETE SEE DETAIL S
	0+ <b>00</b>	16°	451	<u>12</u> 449	27
	N34" 40" 13.83"W			449 450 6.6'± EXISTING CHANNEL	N31 33 44.68"W
	BKIDCE	EDCE OL	\ENI \CH, CH, N:	ROM	TCH
			N: 7036416.97 E: 2456040.03		
465	PROFILE SCALE           FULL SIZE         H: 1"=20'           V: 1"=4'         HALF SIZE           HALF SIZE         V: 1"=8'           FLOW DATA         Q100= 47.9 CFS	<u>47</u> RANSITION	20 RANSITION		
460	Qrav= 47.9 Cr3 QcAP= 390.85 CFS SLOPE= 0.0070 FT/FT V100= 7.28 FPS Depth= 1.84 FT	STA. 0+65. CHANNEL 7	STA. 1+00. CHANNEL TI		
455			FXIS	TING GROUND AT FXIST	
450					TING GROUND OF CHANNEL
445					
440					
435	20	83	22	23	<u> </u>
430	$\frac{FL}{EG} = 447.$	$\frac{FL}{EG} = 447.85$	$\frac{FL}{EG} = \frac{448.3}{449.3}$	$\frac{FL}{EG} = \frac{448.55}{449.23}$	$\frac{F_{L}}{E} = 448.90$
	0+00	0450	1+00	1+50	2+0

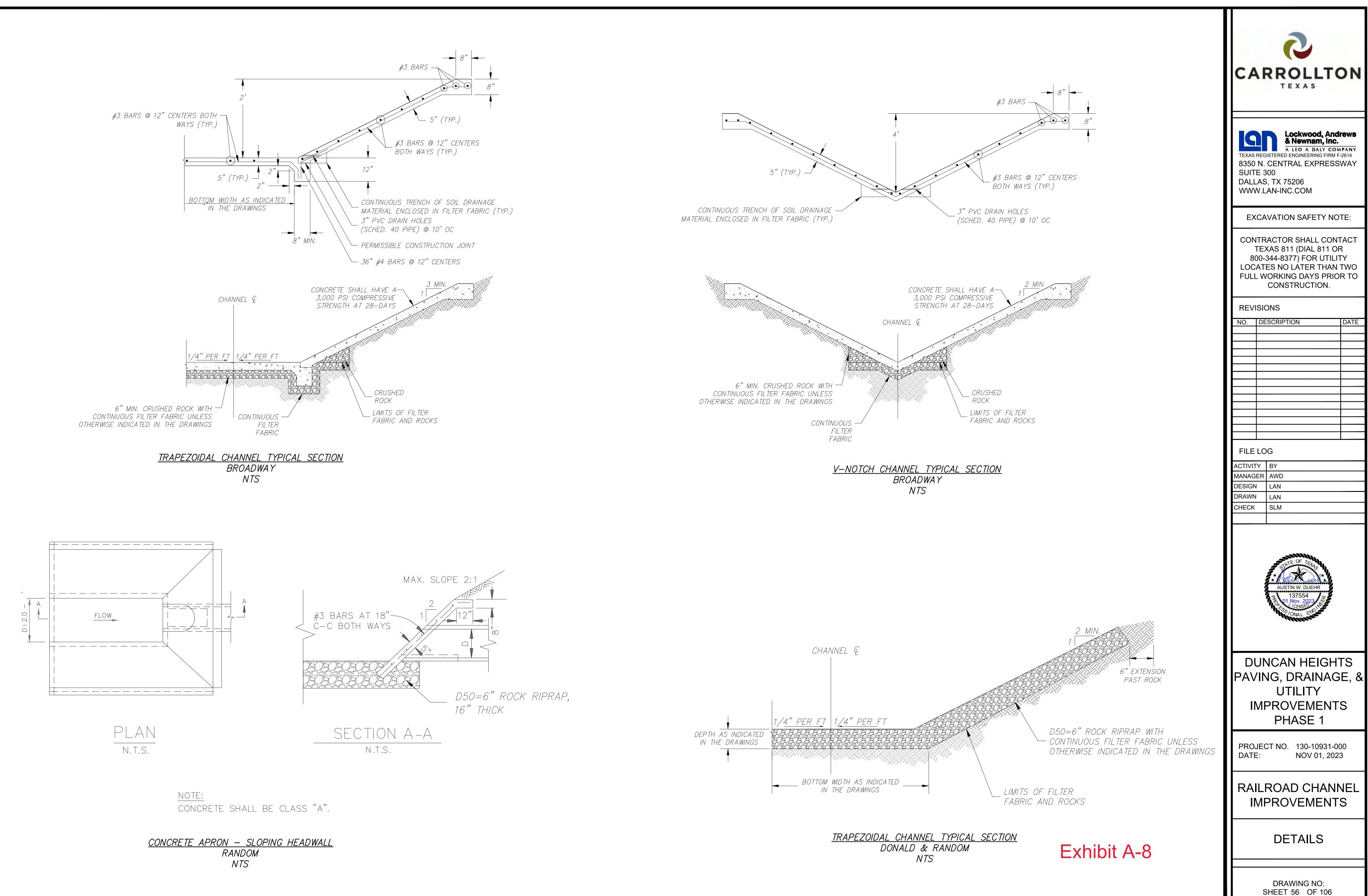
	CHAIN DATA									
IL	ALIGNMENT	LENGTH	CHORD LENGTH	RADIUS	LINE/CHORD BEARING	START STATION	START NORTHING	START EASTING	END STATION	END NORTHING
L	SD-NSIDE RR	65.45			N34° 40' 13.83"W	0+00.00	7,036,363.13	2,456,077.27	0+65.45	7,036,416.96
L	SD-NSIDE RR	334.98			N31° 33' 44.68"W	0+65.45	7,036,416.96	2,456,040.04	4+00.43	7,036,702.38
С	SD-NSIDE RR	17.13	16.78	24.55	N11° 34' 16.25"W	4+00.43	7,036,702.38	2,455,864.70	4+17.56	7,036,718.83
L	SD-NSIDE RR	28.94			N8° 25' 12.18"E	4+17.56	7,036,718.83	2,455,861.33	4+46.50	7,036,747.45
C	SD-NSIDE RR	9.60	9.54	25.00	N2° 34' 41.81"W	4+46.50	7,036,747.45	2,455,865.57	4+56.09	7,036,756.98
L	SD-NSIDE RR	18.16			N13° 34' 35.80"W	4+56.09	7,036,756.98	2,455,865.14	4+74.26	7,036,774.63

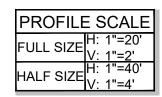


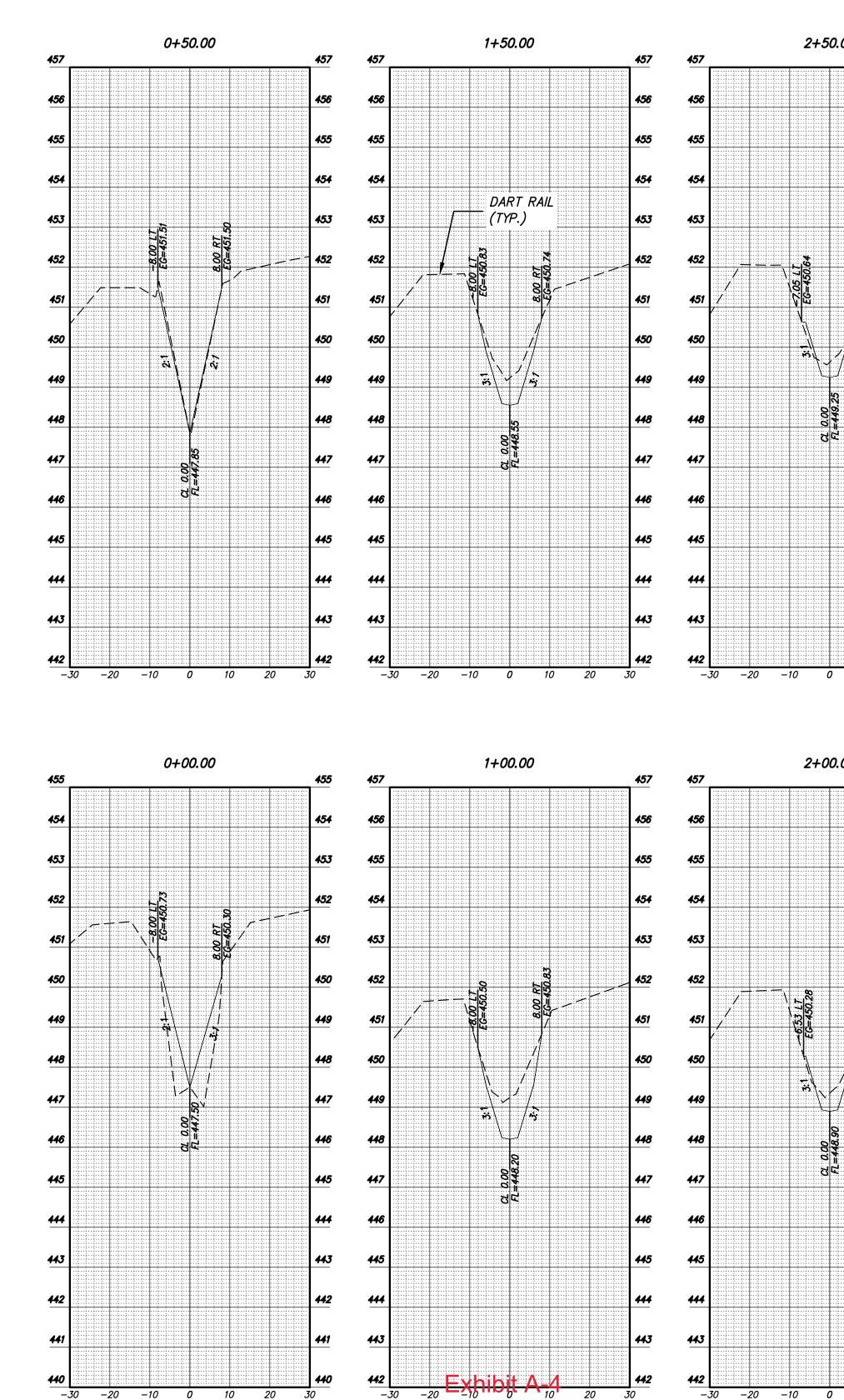
0.04 2.70 3.33 3.57 5.14 0 20 40	CARROLLT
0 20 40 GRAPHIC SCALE IN FEET FULL SIZE SCALE: 1"=20' HALF SIZE SCALE: 1"=40' NOTES: 1. THE CONTRACTOR SHALL PROTECT EXISTING FOOTINGS.	Lockwood, And & Newnam, Inc. A LEO A DALY CO TEXAS REGISTERED ENGINEERING FIRM 8350 N. CENTRAL EXPRESS SUITE 300 DALLAS, TX 75206 WWW.LAN-INC.COM
	EXCAVATION SAFETY NO CONTRACTOR SHALL CON TEXAS 811 (DIAL 811 C 800-344-8377) FOR UTIL LOCATES NO LATER THAN FULL WORKING DAYS PRIO CONSTRUCTION.
<i>L' 18t</i> = 73' G MQ 34 OIE	REVISIONS NO. DESCRIPTION
	FILE LOG
465	ACTIVITY BY MANAGER AWD DESIGN LAN DRAWN LAN CHECK SLM
460 455	AUSTIN W. DUEHR B 137554 OI Nov. 2023 S /ONAL ENG
450 7 445	DUNCAN HEIGH PAVING, DRAINAO UTILITY IMPROVEMENT PHASE 1
440	PROJECT NO. 130-10931-0 DATE: NOV 01, 202
	RAILROAD CHAN
435 Exhibit A-7	BROADWAY
॥ ♀ 430 4+75	DRAWING NO: SHEET 55 OF 106

CAR	RROLLT TEXAS	ON					
8350 N. SUITE 3 DALLAS	Lockwood, Andrews & Newnam, Inc. A LEO A DALY COMPANY TEXAS REGISTERED ENGINEERING FIRM F-2614 8350 N. CENTRAL EXPRESSWAY SUITE 300 DALLAS, TX 75206 WWW.LAN-INC.COM						
CONTR TEX	ACTOR SHALL CO	NTACT OR					
LOCAT	344-8377) FOR UTI ES NO LATER THA ORKING DAYS PR CONSTRUCTION.	N TWO					
REVISIO	ONS SCRIPTION	DATE					
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MANAGER DESIGN DRAWN CHECK	AWD LAN LAN SLM						
	AUSTIN W. DUEHR 137554 B, OI Nov. 2023 VCENSED G						
DUNCAN HEIGHTS PAVING, DRAINAGE, & UTILITY IMPROVEMENTS PHASE 1							
PROJECT NO. 130-10931-000 DATE: NOV 01, 2023							
RAILROAD CHANNEL IMPROVEMENTS							
	BROADWAY	, 					
	DRAWING NO:						

© LEO A DALY Company 2023







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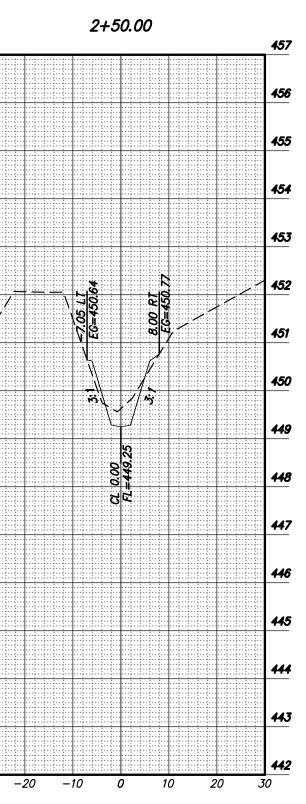
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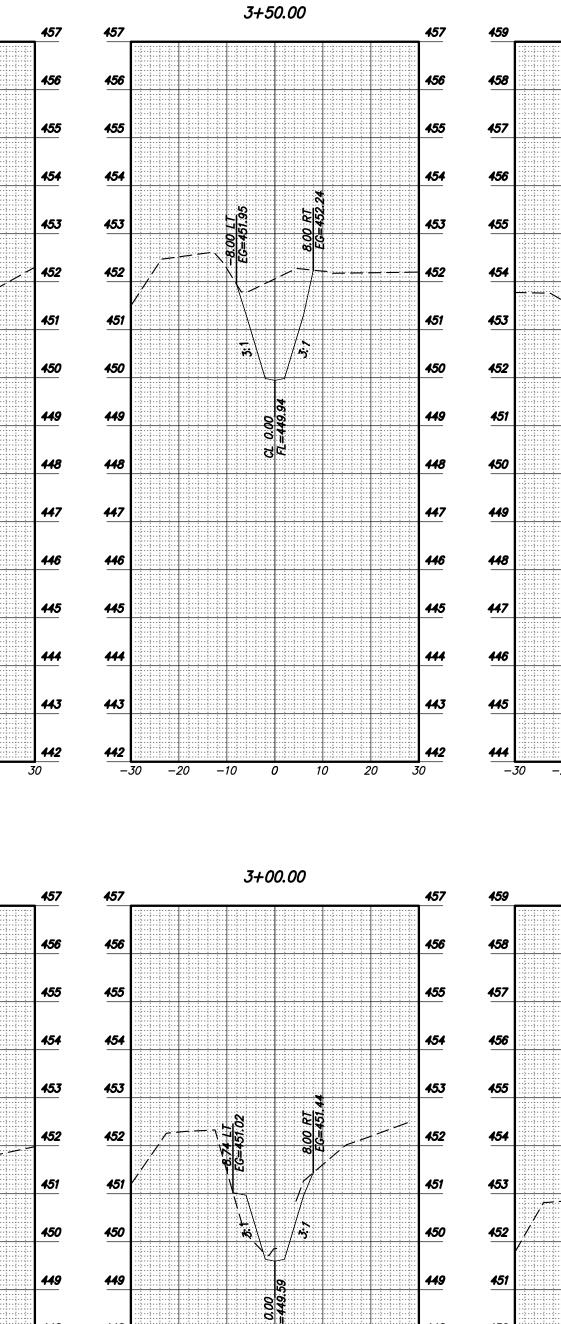
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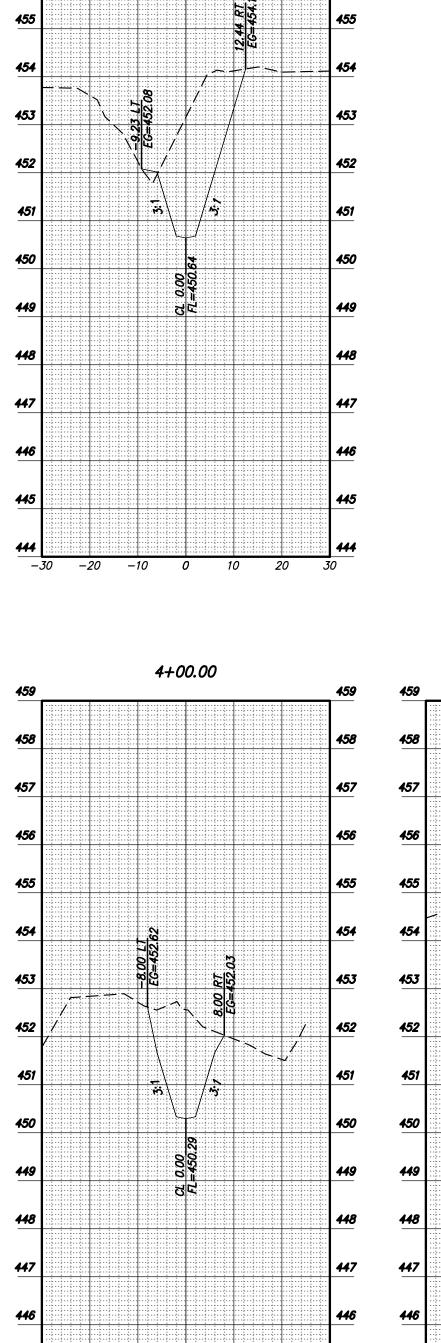


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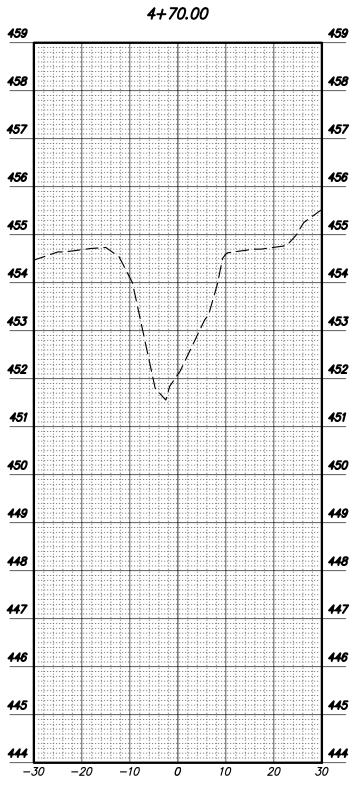


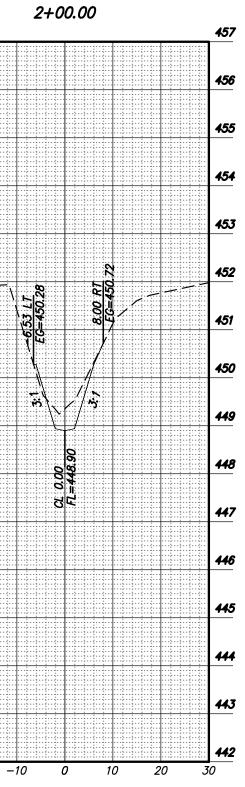
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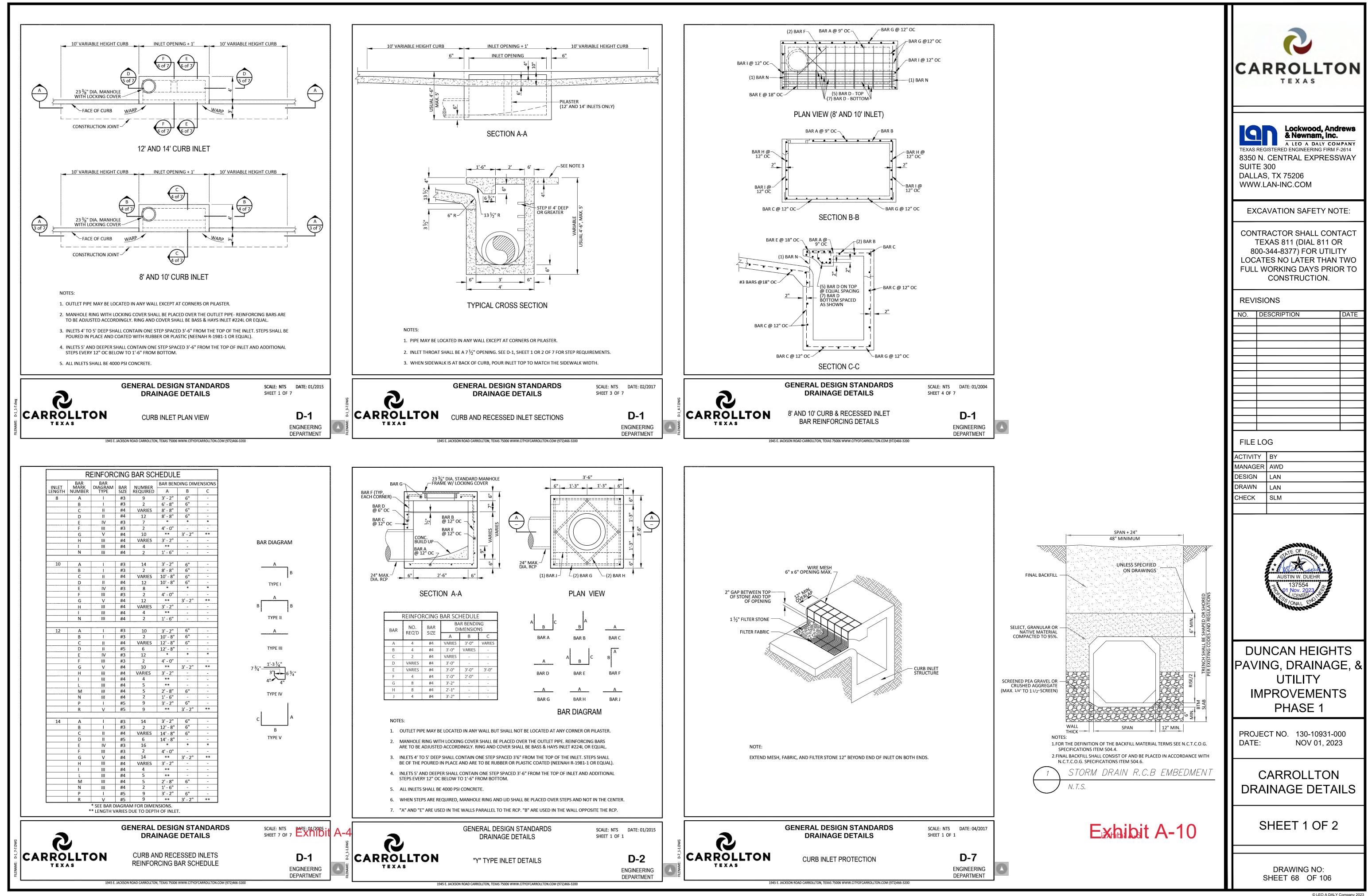
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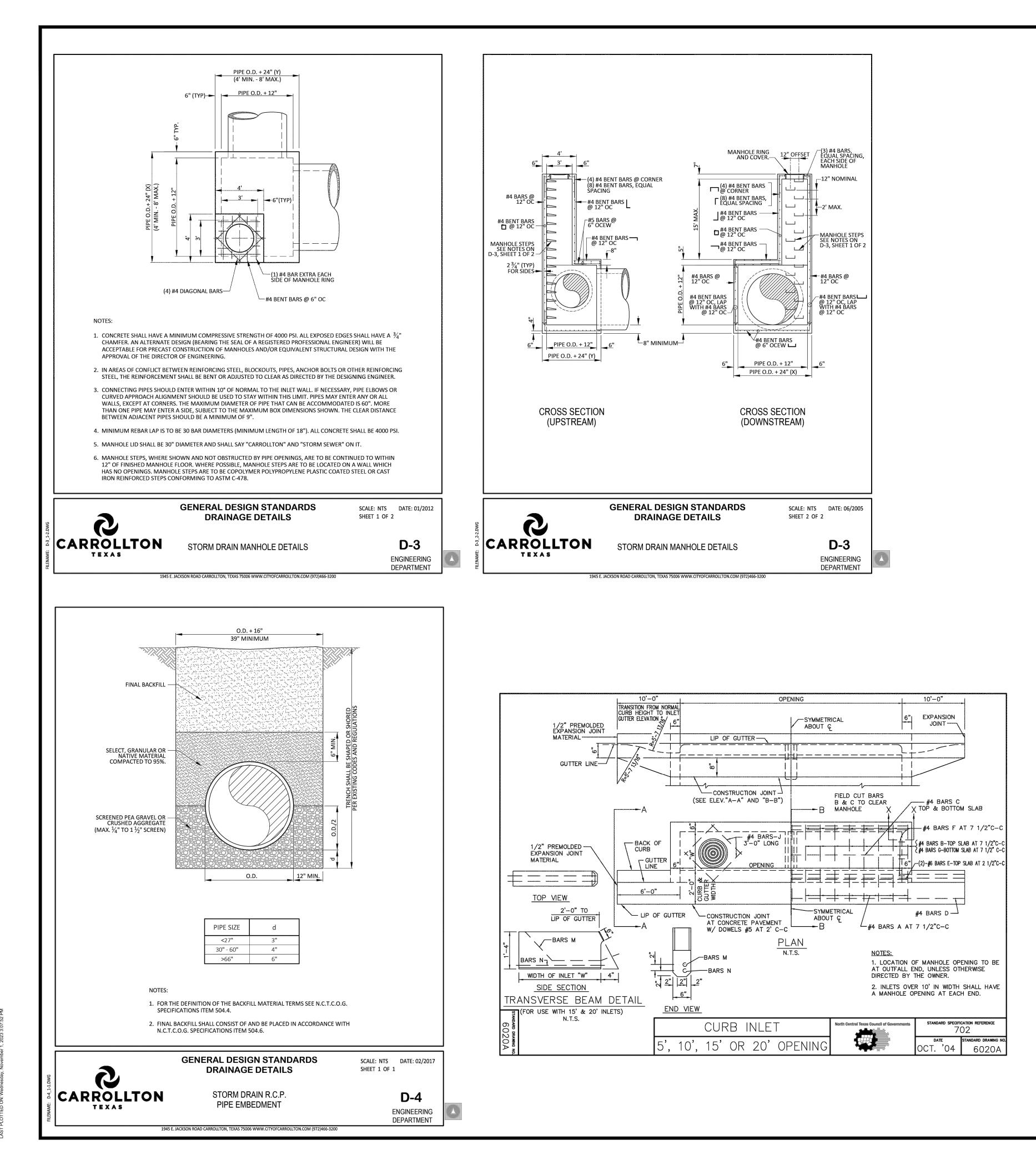
----- EXISTING CHANNEL

PROPOSED CHANNEL \_\_\_\_\_

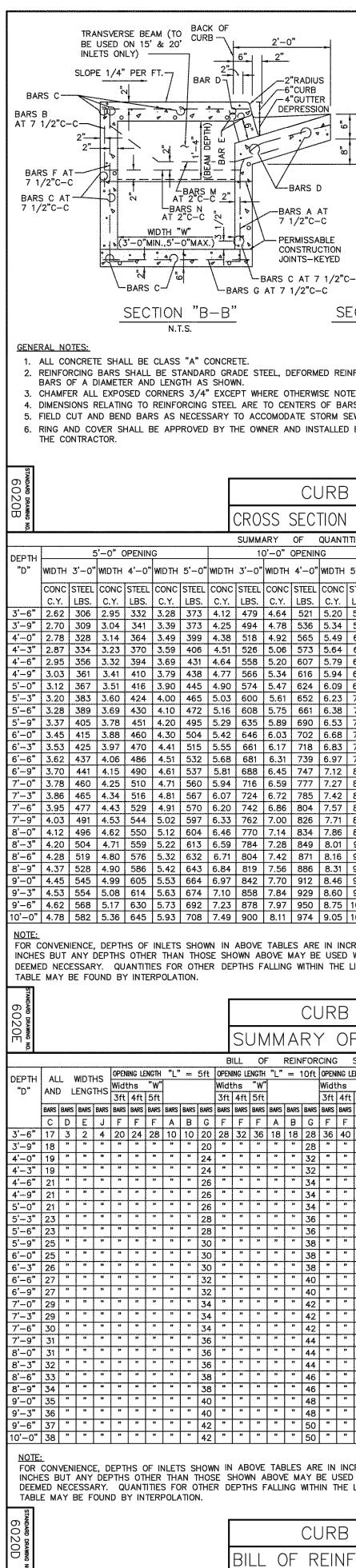
	CARROLLTON TEXAS				
-Δ	Lockwood, Andrews & Newnam, Inc. A LEO A DALY COMPANY TEXAS REGISTERED ENGINEERING FIRM F-2614 8350 N. CENTRAL EXPRESSWAY SUITE 300 DALLAS, TX 75206 WWW.LAN-INC.COM				
	EXCAVATION SAFETY NOTE: CONTRACTOR SHALL CONTACT TEXAS 811 (DIAL 811 OR 800-344-8377) FOR UTILITY LOCATES NO LATER THAN TWO FULL WORKING DAYS PRIOR TO CONSTRUCTION.				
	REVISIONS          NO.       DESCRIPTION       DATE         I       I       I         I       I       I         I       I       I         I       I       I         I       I       I         I       I       I         I       I       I         I       I       I         I       I       I         I       I       I         I       I       I				
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	AUSTIN W. DUEHR 137554 B 01 Nov. 2023 S /ONA L ENG				
	DUNCAN HEIGHTS PAVING, DRAINAGE, & UTILITY IMPROVEMENTS PHASE 1				
	PROJECT NO. 130-10931-000 DATE: NOV 01, 2023				
	RAILROAD CHANNEL IMPROVEMENTS				
Exhibit A-9	CROSS SECTIONS - NORTHSIDE DR				
	DRAWING NO: SHEET 57 OF 106				



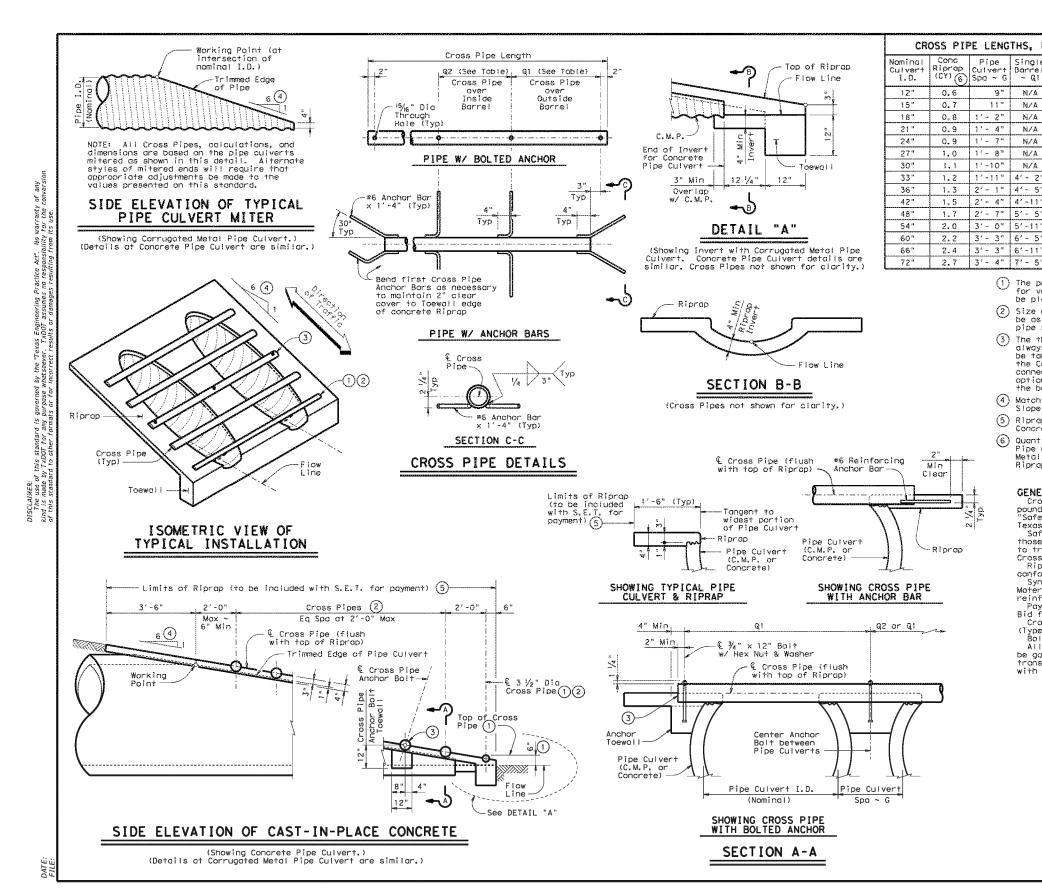
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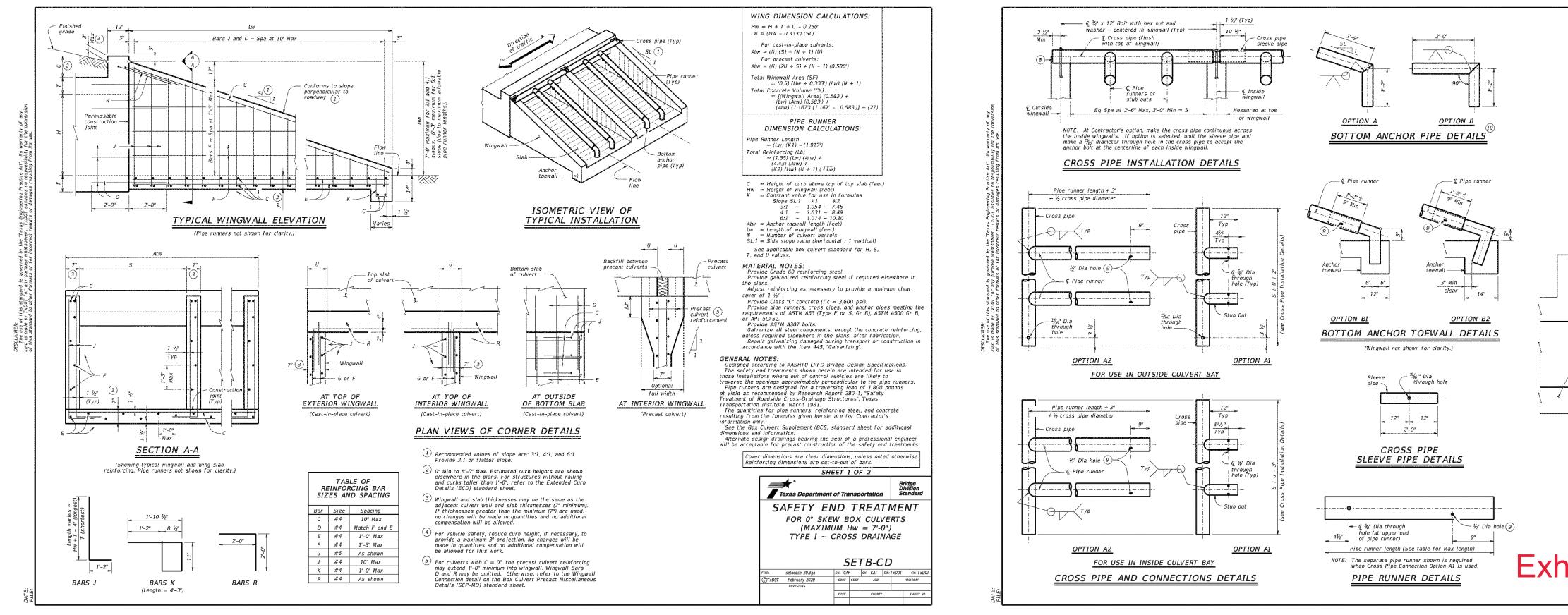


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GUTTER POINT TO REMAIN ON THIS LINE AND CONSTANT AT 2" 6" OPENING MIN. BARS B AT 7 1/2"C-C	CARROLLTON TEXAS
BARS G AT 7 1/2"C-C C-C BARS C BARS C	Lockwood, Andrews & Newnam, Inc. A LEO A DALY COMPANY TEXAS REGISTERED ENGINEERING FIRM F-2614 8350 N. CENTRAL EXPRESSWAY SUITE 300 DALLAS, TX 75206 WWW.LAN-INC.COM
	EXCAVATION SAFETY NOTE:
CINFORCING DTED. ARS. SEWER PIPE. D BY	CONTRACTOR SHALL CONTACT TEXAS 811 (DIAL 811 OR 800-344-8377) FOR UTILITY LOCATES NO LATER THAN TWO FULL WORKING DAYS PRIOR TO CONSTRUCTION.
BINLET North Central Texas Council of Governments To 202	REVISIONS
N & INLE   HROA   TITIES FOR CURB INLETS OCT. '04 6020B	NO. DESCRIPTION DATE
15'-0" OPENING         20'-0" OPENING           15'-0" WIDTH 3'-0" WIDTH 4'-0" WIDTH 5'-0" WIDTH 3'-0" WIDTH 4'-0" WIDTH 5'-0"	
STEEL CONC STEEL CONC STEEL CONC STEEL CONC STEEL CONC STEEL CONC STEEL LBS. C.Y. LBS.	
564         5.69         667         6.40         721         7.10         775         7.20         846         8.11         909         9.03         976           579         5.87         687         6.58         741         7.30         796         7.42         874         8.34         937         9.27         1010           610         6.05         718         6.77         776         7.49         835         7.64         909         8.58         976         9.51         1046	
619         6.22         729         6.95         787         7.69         847         7.87         922         8.81         990         9.75         1061           656         6.40         770         7.14         830         7.88         891         8.09         973         9.04         1043         9.99         1115           665         6.57         780         7.32         841         8.07         903         8.31         986         9.27         1056         10.23         1129	
674         6.75         791         7.51         853         8.27         915         8.53         999         9.50         1070         10.47         1144           704         6.93         827         7.69         890         8.46         955         8.76         1044         9.73         1118         10.71         1194	
713         7.11         837         7.88         901         8.66         967         8.98         1057         9.97         1131         10.95         1208           744         7.28         874         8.07         940         8.85         1007         9.20         1102         10.20         1178         11.19         1258           757         7.45         888         8.25         954         9.05         1022         9.42         1119         10.43         1196         11.43         1276	
773         7.63         908         8.44         975         9.24         1044         9.64         1147         10.66         1223         11.67         1305           797         7.81         935         8.62         1005         9.43         1057         9.87         1178         10.89         1258         11.92         1340	FILE LOG
806         7.98         945         8.81         1015         9.63         1066         10.09         1191         11.12         1272         12.15         1355           837         8.16         981         8.99         1053         9.82         1126         10.31         1237         11.35         1319         12.40         1404           846         8.33         992         9.18         1065         10.02         1138         10.53         1249         11.59         1333         12.64         1418	ACTIVITY BY
866         8.51         1016         9.36         1089         10.21         1163         10.75         1290         11.82         1365         12.88         1451           890         8.67         1040         9.55         1116         10.41         1193         10.98         1313         12.05         1399         13.12         1498           899         8.86         1051         9.73         1129         10.60         1205         11.20         1325         12.28         1412         13.36         1510	MANAGER AWD DESIGN LAN
915         9.04         1069         9.92         1149         10.80         1228         11.22         1323         12.23         1412         13.36         1310           938         9.21         1107         10.10         1176         10.99         1257         11.64         1385         12.74         1474         13.84         1565	DRAWN LAN CHECK SLM
954       9.39       1119       10.29       1199       11.18       1280       11.87       1410       12.97       1500       14.08       1592         982       9.56       1148       10.47       1231       11.38       1313       12.09       1447       13.21       1539       14.32       1631         999       9.74       1169       10.66       1252       11.57       1335       12.31       1474       13.44       1563       14.56       1660	
1022         9.92         1195         10.84         1280         11.77         1365         12.53         1505         13.67         1600         14.80         1696           1048         10.27         1227         11.21         1312         12.16         1399         12.98         1546         14.13         1642         15.29         1739	
ACREMENTS OF 3 D WHEREVER E LIMITS OF THE BINLET North Central Texas Council of Governments 702	SINTE OF TSURS * AUSTIN W. DUEHR
DF QUANTITIES DATE OCT. '04 6020E	137554 8 01 Nov. 2023 7 /CENSE
STEEL       CLENGTH     "L" = 15 ft     OPENING LENGTH     "L" = 20 ft       s     "W"     Widths     "W"	WWWAL EVE
ft     5ft     3ft     4ft     5ft       ARS     BARS     BARS     BARS     BARS     BARS     BARS	
F       A       B       G       M       N       F       F       A       B       G       M       N         10       44       26       26       36       2       2       44       48       52       34       34       44       2       2         "       "       "       "       "       "       "       "       44       "       "	DUNCAN HEIGHTS
n         n	PAVING, DRAINAGE, &
""""""""""""""""""""""""""""""""""""	
n     n     n     n     n     n     n     52     2     1       n     n     n     n     n     n     n     52     2     1       n     n     n     n     n     n     n     n     52     2     1       n     n     n     n     n     n     n     n     52     n       n     n     n     n     n     n     n     n     n     n       n     n     n     n     n     n     n     n     n     n       n     n     n     n     n     n     n     n     n     n       n     n     n     n     n     n     n     n     n     n       n     n     n     n     n     n     n     n     n     n       n     n     n     n     n     n     n     n     n     n       n     n     n     n     n     n     n     n     n     n	IMPROVEMENTS PHASE 1
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""""""""""""""""""""""""""""""""""""	PROJECT NO. 130-10931-000 DATE: NOV 01, 2023
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""""""""""""""""""""""""""""""""""""	CARROLLTON
""""""""""""""""""""""""""""""""""""	DRAINAGE DETAILS
""""""""""""""""""""""""""""""""""""	
<u>" " " 58 " " " " " 66 " "</u>	SHEET 2 OF 2
INCREMENTS OF 3 ED WHEREVER E LIMITS OF THE EXHIBIT A-11	
BINLEI DATE STANDARD DRAWING NO.	DRAWING NO: SHEET 69 OF 106
FORCING STEEL CCT. '04 6020D	© LEO A DALY Company 2023



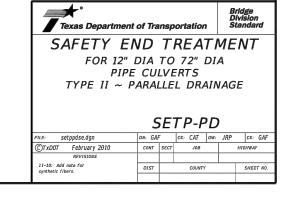


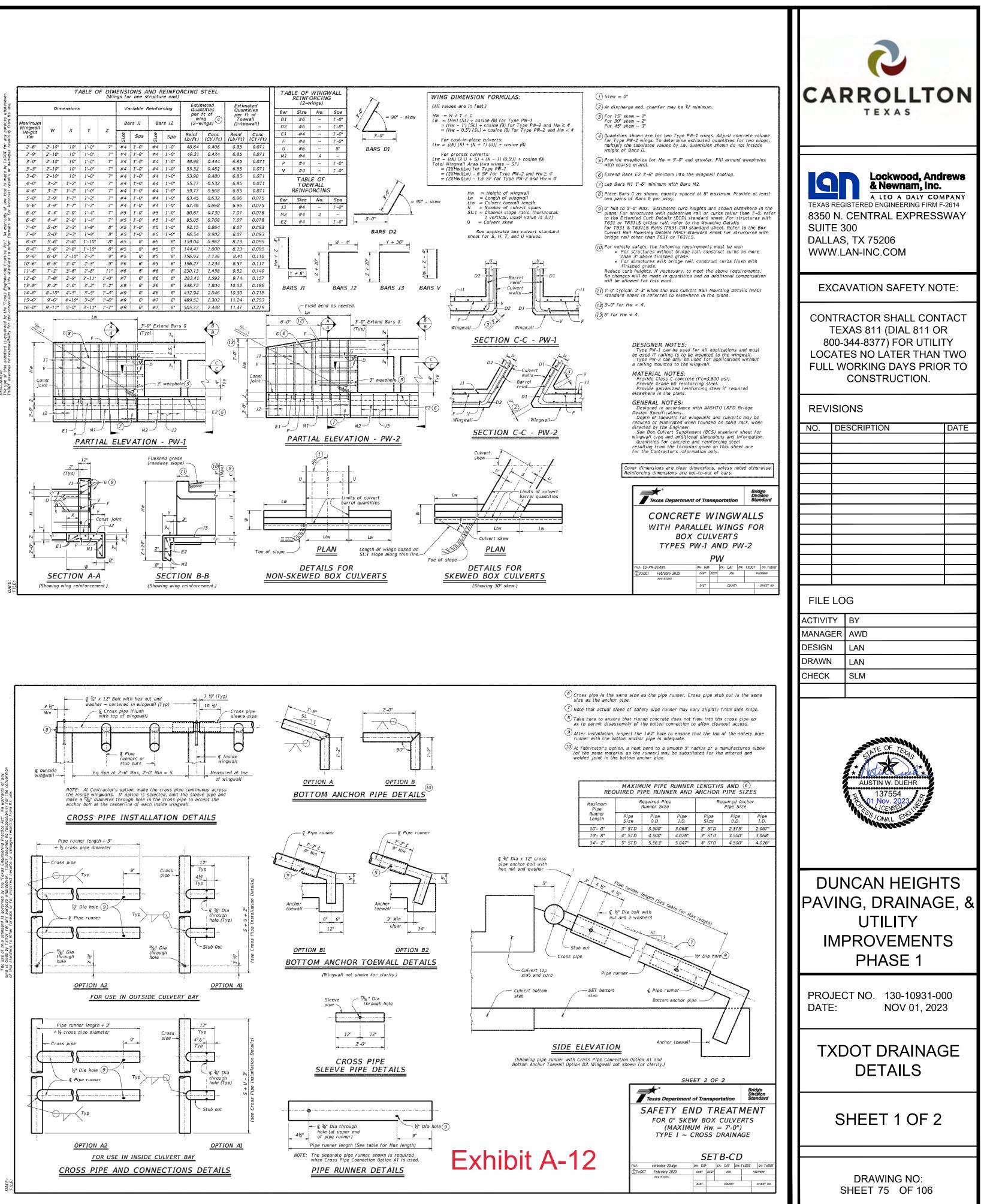
REQUIRED PIPE SIZES, & RIPRAP QUANTITIES $\textcircled{2}$											
Muiti- Barrei ~ Qi	Q2	Conditions for use of Cross Pipes	Cross Pipe Size								
2' - 1" 2' - 5" 2' -10" 3' - 2" 3' - 6"	1'- 9" 2'- 2" 2'- 8" 3'- 1" 3'- 7"	3 or more Pipe Culverts	3" Std (3.500" O.D.)								
3'-10" 4'- 2" 4'- 5"	3'-11" 4'- 4" 4'- 8"	3 or more Pipe Culverts 2 or more Pipe Culverts All Pipe Culverts	3 ½" Std (4.000" 0.D.)								
4' - 9" 5' - 5"	5' - 1" 5' -10"	All Pipe Culverts	4" Std (4,500" 0,D.)								
6' - 0" 6' - 9" 7' - 4" 7' - 10" 8' - 5"	6' - 7" 7' - 6" 8' - 3" 8' - 9" 9' - 4"	All Pipe Cuiverts	5" Std (5.563" O.D.)								
	$\begin{array}{c} M_{11} + i - \\ Borne i \\ \sim Q1 \\ 2' - 1" \\ 2' - 2" \\ 3' - 2" \\ 3' - 2" \\ 3' - 10" \\ 4' - 2" \\ 4' - 2" \\ 4' - 5" \\ 4' - 9" \\ 5' - 5" \\ 5' - 5" \\ 5' - 7" \\ 7' - 4" \end{array}$	$\begin{array}{c c} M_{L1}(+) - \\ Borrel \\ \sim Q1 \\ \hline Q2 \\ \hline 2' - 1" \\ 1' - 9" \\ 2' - 5" \\ 2' - 2" \\ 3' - 2" \\ 3' - 2" \\ 3' - 10" \\ 3' - 11" \\ 3' - 6" \\ 3' - 11" \\ 3' - 6" \\ 3' - 11" \\ 3' - 10" \\ 3' - 11" \\ 3' - 10" \\ 3' - 11" \\ 4' - 2" \\ 4' - 8" \\ 4' - 8" \\ 4' - 8" \\ 4' - 8" \\ 4' - 8" \\ 5' - 11" \\ 5' - 5" \\ 5' - 10" \\ 6' - 0" \\ 6' - 7" \\ 6' - 7" \\ 6'' - 8" \\ 7' - 6" \\ 8' - 9" \\ 7' - 10" \\ 8' - 9" \\ 8' - 9" \\ 7' - 10" \\ 8' - 9" \\ 8' - 9" \\ 7' - 10" \\ 7' - 10" \\ 8' - 9" \\ 7' - 10" \\ 7' - 10" \\ 8' - 9" \\ 7' - 10" \\ 7' - $	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$								

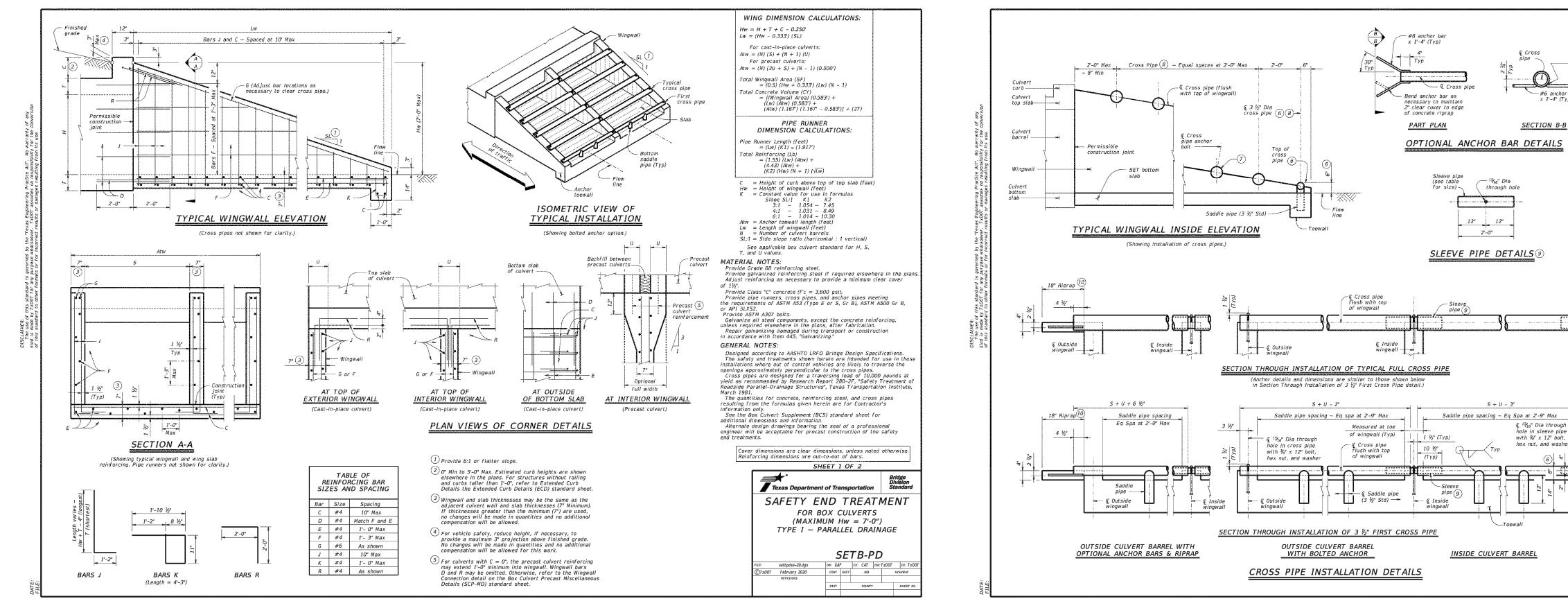
 The proper installation of the first Cross Pipe is critical for vehicle safety. The top of the first Cross Pipe must be placed at no more than 6" above the flow line.
 Size of Cross Pipes, except the first bottom pipe, shall be as shown in the PIPE SIZE table. The first bottom pipe shall be 3 ½" Standard Pipe (4" 0.D.).

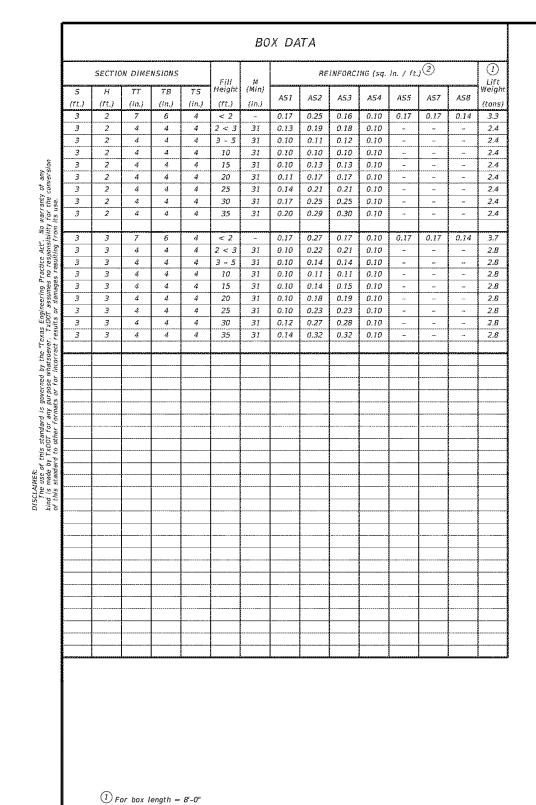
 The third Cross Pipe from the bottom of the Culvert shall always be installed using a bolted connection. Core shall be taken to ensure that Riprop concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, all other Cross Pipes may also be installed using the bolted connection details.
 Match Cross Siope as shown elsewhere in the plans. Cross Slope of 6:1 or flatter is required for vehicle safety.
 Riprop placed beyond the limits shown will be paid as Concrete Riprop in accordance with Item 432, "Riprop".
 Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple pipe culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprop quantities are for Contractor's information only.

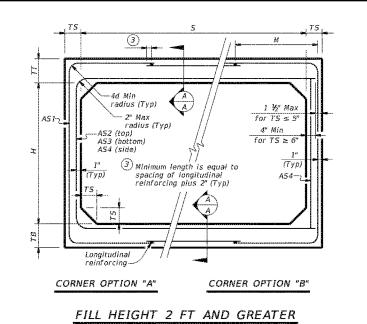
GENERAL NOTES: Cross Pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Paraliel-Drainage Structures", Texas Transportation Institute, March 1981. Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Cross Pipes. Riprop and all necessary inverts shall be Concrete Riprop conforming to the requirements of Item 432, "Riprop". Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprop concrete unless noted otherwise. Payment for riprop and toewall is included in the Price Bid for each Safety End Treatment. Cross Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API SLX52. Bolts and nuts shall conform to ASTM A307. Ail steel components, except concrete reinforcing, shall be gaivenized ofter fabrication. Gaivanizing damaged during transport or construction shall be repaired in accordance with the specifications.

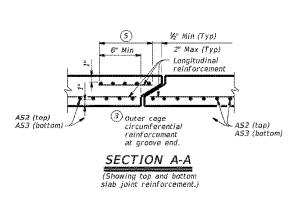




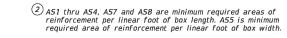


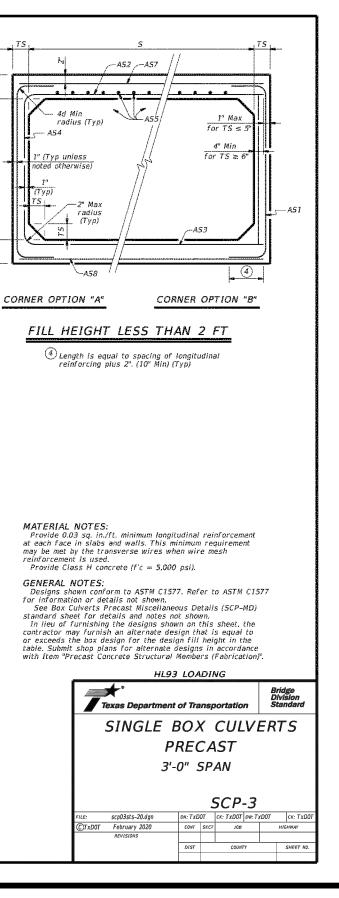






FILE LOCATION: P:/130/130-10931-000/4-0-Production-Working/4-1-BIM-CAD/Civil/Sheets/130-10931-000 DRAINAGE DETA LAST MODIFIED BY: AWDUEHR LAST PLOTTED BY: DUEHR, AUSTIN LAST PLOTTED ON: Wednesday, November 1, 2023 3:08:58 PM





	REQUIF	RED PIPE S	IZES 🛞	STANI	DARD PIPE	SIZES		
	Culvert Span Sizes First Pipe	Cross Pipe Size 3 ½" STD	Sleeve Pipe Size 9 2 ½ STD	Pipe Size 2 ½" STD	Pipe 0.D. 2.875"	Pipe I.D. 2.469"		
¥4 3" Typ	30" to 42" 48" to 72" 78" to 120"	4" STD 5" STD 6" STD	3" STD 4" STD 5" STD	3" STD 3 ½" STD 4" STD	3.500" 4.000" 4.500"	3.068" 3.548" 4.026"		
anchor bar -4* (Typ)	6 The prope	er installation	of the first cros	5" STD 6" STD s pipe is critic	5.563" 6.625" cal	5.047" 6.065"	CARROLLTO	N
<u>I B-B</u>	Always in: culvert us	stall the third sing a bolted c	of the first cros ce the top of the re the flow line. cross pipe from connection. Take c	the bottom of are to ensure	the that		TEXAS	
ILS			into this cross p ed connection to I sleeve pipes (if zes table. Provid oss pipe.					
	for the 3 At Contrac the inside pipe and b	1#2" first cro ctor's option, r e wingwalls. I make a 15#16	oss pipe. make the cross p f this option is s " diameter throug or bolt at the ce	ipe continuous elected, omit t phole in the c	across he sleeve FOSS			WS
	0 Provide ri is include	iprap when us d in the bid p	ing the Optional i rice for Safety E	Anchor Bar det Ind Treatment.			Lockwood, Andrew & Newnam, Inc.	ANY
	riprap in	accordance wi	th Item 432, "Rip	rap".			8350 N. CENTRAL EXPRESSW	
							SUITE 300 DALLAS, TX 75206	
i							WWW.LAN-INC.COM	
							EXCAVATION SAFETY NOTE	Ξ:
							CONTRACTOR SHALL CONTA	CT
I							TEXAS 811 (DIAL 811 OR 800-344-8377) FOR UTILITY	
							LOCATES NO LATER THAN TV FULL WORKING DAYS PRIOR	NO
lax nrough e pipe							CONSTRUCTION.	10
" bolt,    washer				<b>4</b>			REVISIONS	
		Г	Texas Depa	SHEET 2		Bridge Division Standard		ATE
			SAFET)	<b>END</b>	TREAT	MENT		
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Exhibit A-13							SHEET 2 OF 2	
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							DRAWING NO:	
							SHEET 76 OF 106	
	_	_		_	_		© LEO A DALY Com	1pany 2023