PRELIMINARY ENGINEERING PLANS FOR

WATER, SEWER, PAVING & DRAINAGE IMPROVEMENTS

TO SERVE

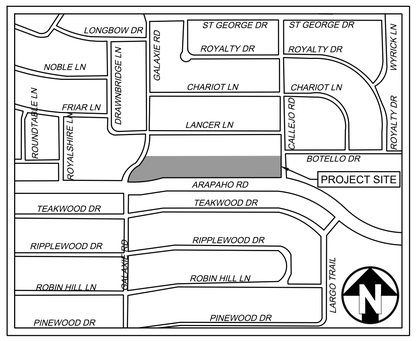
ARAPAHO TOWNHOME

THE CITY OF GARLAND, DALLAS COUNTY, TEXAS

OWNER/DEVELOPER:
FIRST INFRA LLC
1925 E BELTLINE ROAD
CARROLLTON, TEXAS 75006
PHONE: (408) 992 - 5558
CONTACT: BHARATH NANDIGAM
bharath@firstinfrallc.com

ENGINEER:
KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
PHONE: (817) 488-4960
CONTACT: JOHN GARDNER, P.E.
john.gardner@trustke.COM

SURVEYOR:
BARTON CHAPA SURVEYING
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
PHONE: (817) 864 - 1957
CONTACT: JACK BARTON, RPLS
jack@bcsdfw.com



VICINITY MAP
N.T.S.

Sheet List Table

kirkman ENGINEERING
TEXAS FIRM NO. 15874

PROJECT NO. NCL21008

P R E L I M I N A R Y
FOR REVIEW ONLY
THESE DOCUMENTS ARE FOR DESIGN REVIEW ONLY AND NOT INTENDED FOR THE PURPOSES OF CONSTRUCTION, BIDDING OR PERMIT. THEY WERE PREPARED BY, OR UNDER THE SUPERVISION OF:

SHAWN T. WALDO
P.E.# 138653
DATE: January 9, 2023

JANUARY 2023

CITY OF GARLAND, TX CASE #: 210928-1

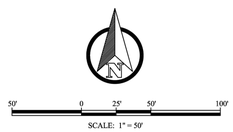
PLANS FOR THE CONSTRUCTION OF WATER, SANITARY SEWER, PAVING, GRADING & DRAINAGE IMPROVEMENTS TO SERVE: NCL21008

TREE TABLE

TAG#	DIAMETER (INCHES)	GENERAL SPECIES	TAG#	DIAMETER (INCHES)	GENERAL SPECIES
392	17 (MULTI-TRUNK)	HACKBERRY	3924	8	HACKBERRY
393	12	ELM	3925	10	OAK
394	7	HACKBERRY	3926	19 (MULTI-TRUNK)	HACKBERRY
395	10	ELM	3927	13 (MULTI-TRUNK)	HACKBERRY
396	11	ELM	3928	7	HACKBERRY
397	7	HACKBERRY	3929	13	HACKBERRY
398	7	HACKBERRY	3930	9	HACKBERRY
399	10	HACKBERRY	3931	8	HACKBERRY
400	10	HACKBERRY	3932	11 (MULTI-TRUNK)	HACKBERRY
3901	15	ELM	3933	12	HACKBERRY
3902	8	HACKBERRY	3934	17 (MULTI-TRUNK)	HACKBERRY
3902	6	ELM	3935	14	HACKBERRY
3903	8	OAK	3936	15	HACKBERRY
3905	11 (MULTI-TRUNK)	HACKBERRY	3937	8	HACKBERRY
3906	8	HACKBERRY	3938	13 (MULTI-TRUNK)	HACKBERRY
3907	6	HACKBERRY	3939	7	HACKBERRY
3908	8	HACKBERRY	3940	15	HACKBERRY
3909	15	COTTONWOOD	3941	7	BOIS D'ARC
3910	13	COTTONWOOD	3942	7	HACKBERRY
3911	12	COTTONWOOD	3943	17	HACKBERRY
3912	11	HACKBERRY	3944	10	HACKBERRY
3913	8	HACKBERRY	3945	8	HACKBERRY
3914	19	HACKBERRY	3946	8	HACKBERRY
3915	10	HACKBERRY	3947	6	HACKBERRY
3916	12	HACKBERRY	3948	8	HACKBERRY
3917	9	HACKBERRY	3949	17 (MULTI-TRUNK)	HACKBERRY
3918	9	HACKBERRY	3950	11	HACKBERRY
3919	11 (MULTI-TRUNK)	HACKBERRY	3951	11 (MULTI-TRUNK)	HACKBERRY
3920	11	HACKBERRY	3952	16	HACKBERRY
3921	8	HACKBERRY	3953	14	HACKBERRY
3922	9	HACKBERRY	3954	8	HACKBERRY
3923	8	HACKBERRY			

LEGEND OF SYMBOLS

- air conditioning unit
- ICV irrigation control valve
- CATV cable tv
- EM electric meter
- fence or guardrail
- FDC fire dept. connection
- FH fire hydrant
- BOL bollard
- AD area drain
- GI grate inlet
- GV gas valve
- GM gas meter
- GWELL gas well
- sign
- S sanitary sewer manhole
- D storm water manhole
- T telephone manhole
- TFL tank fill lid
- TPED telephone pedestal
- TSE traffic signal pole
- CO utility clean out
- UCC comm. utility cabinet
- UCE electric utility cabinet
- UVC comm. utility vault
- UVE elect. utility vault
- UVW water utility vault
- UP/SP utility/service pole
- utility sign
- water shutoff
- WV water valve
- well
- WM water meter
- CATV cable tv riser
- ARV air release valve
- utility markings
- tree
- shrub/decorative tree or tree with diameter < 4 in.
- contour lines



SURVEYOR'S NOTES:

1. Bearings are based on the State Plane Coordinate System, Texas North Central Zone (4202) North American Datum of 1983 (NAD '83), distances are surface with a combined scale factor of 1.000136506.
2. This property lies within Zone "X" of the Flood Insurance Rate Map for Dallas County, Texas and Incorporated Areas, map no. 48113C0210L, with an effective date of July 7, 2014, via scaled map location and graphic plotting.
3. Monuments are found unless specifically designated as set.
4. Elevations (if shown) are North American Vertical Datum of 1988 (NAVD '88).

NOTE REGARDING UTILITIES

Utility locations are per observed evidence

SITE BENCHMARKS:

1. The benchmark is an "X" cut set located on the northwest side of the subject property along the east side of Galaxie Rd on a curb inlet, located approximately 7 feet west of a headwall, and approximately 30 feet southeast of a sanitary sewer manhole. ELEVATION=589.5' (NAVD'88)
2. The benchmark is an "X" cut set located on the northeast side of the subject property along the west side of Callejo Rd on a curb inlet, located approximately 27 feet north of a sign, and approximately 53 feet south of a curb inlet. ELEVATION=584.58' (NAVD'88)

SURVEYOR'S CERTIFICATE

To: Chicago Title Insurance Company

To: First Infra, LLC

This is to certify that I, John H. Barton III, a Registered Professional Land Surveyor of the State of Texas, have prepared this map from an actual survey on the ground, and that this map correctly represents that survey made by me or under my direction and supervision. This survey meets the minimum requirements for a Category 1A, Condition II Land Title Survey. Fieldwork was completed on February 8, 2022.

Date of Plat/Map: **February 11, 2022**

John H. Barton III, RPLS# 6737

STATE OF TEXAS — REGISTERED — JOHN HOMER BARTON III — 6737 — PROFESSIONAL LAND SURVEYOR

PROPERTY DESCRIPTION TRACT 1:

BEING a tract of land out of the Frederick Moss Survey, Abstract Number 941, in the City of Garland, Dallas County, Texas, and being a portion of that tract of land described by deed to William F. Callejo as recorded under Volume 576, Page 1326, Deed Records, Dallas County, Texas, (D.R.D.C.T.), the subject tract being more particularly described by metes and bounds as follows (bearings are based on State Plane Coordinate System, Texas North Central Zone (4202) North American Datum of 1983 (NAD '83)):

BEGINNING at a 1/2 inch rebar with pink cap stamped, "BARTON CHAPA" set in the north line of said William F. Callejo tract, same being the northwest corner of a tract of land described by deed to Adelfa B. Callejo, Trustee of the Callejo-Botello Foundation, a Charitable Trust, as recorded under Document Number 201000152223, Official Public Records, Dallas County, Texas, (O.P.R.D.C.T.), and being the northeast corner of the herein described tract;

THENCE South 00 degrees 56 minutes 04 seconds East, with the west line of said Adelfa B. Callejo tract, a distance of 192.15 feet to a 1/2 inch rebar with cap stamped, "AZB" found for the southwest corner thereof, said point being in the north right-of-way of Arapaho Road, having a 100.00 foot right-of-way as shown on Volume 98146, Page 13, Plat Records, Dallas County, Texas, (P.R.D.C.T.), said point also being the beginning of a non-tangent curve to the left, having a radius of 850.00 feet, with a delta angle of 06 degrees 59 minutes 13 seconds, whose chord bears South 80 degrees 28 minutes 27 seconds West, a distance of 103.59 feet;

THENCE along said non-tangent curve to the left, and with the north right-of-way of said Arapaho Road, an arc length of 103.65 feet to a point from which a 1/2 inch rebar found bears South 07 degrees West, a distance of 1.69 feet, said point also being the beginning of a reverse curve to the right, having a radius of 819.44 feet, with a delta angle of 12 degrees 41 minutes 47 seconds, whose chord bears South 83 degrees 19 minutes 44 seconds West, a distance of 181.21 feet, from which a 1/2 inch rebar found bears South 07 degrees West, a distance of 1.69 feet;

THENCE along said reverse curve to the right, and with the north right-of-way of said Arapaho Road, an arc length of 181.58 feet to a MAG nail set in the east right-of-way of said Galaxie Road, said point being the beginning of a non-tangent curve to the right, having a radius of 130.00 feet, with a delta angle of 55 degrees 01 minutes 03 seconds, whose chord bears North 27 degrees 47 minutes 21 seconds East, a distance of 120.09 feet;

THENCE along said non-tangent curve to the right, and with the east right-of-way of said Galaxie Road, an arc length of 124.83 feet to a 5/8 inch rebar with cap stamped, "MYCOSKIE" found at the beginning of a reverse curve to the left, having a radius of 194.06 feet, with a delta angle of 40 degrees 05 minutes 34 seconds, whose chord bears North 35 degrees 10 minutes 26 seconds East, a distance of 133.04 feet;

THENCE along said reverse curve to the left, and with the east right-of-way of said Galaxie Road, an arc length of 135.79 feet to a 5/8 inch rebar with cap stamped, "MYCOSKIE" found;

THENCE North 15 degrees 07 minutes 41 seconds East, with the east right-of-way of said Galaxie Road, a distance of 13.47 feet to a 5/8 inch rebar with an illegible cap found in the north line of said William F. Callejo tract;

THENCE North 89 degrees 03 minutes 58 seconds East, with the north line of said William F. Callejo tract, a distance of 148.89 feet to the **POINT OF BEGINNING** and enclosing 1.032 acres (16,347 square feet) of land, more or less.

PROPERTY DESCRIPTION TRACT 2:

BEING a tract of land out of the Frederick Moss Survey, Abstract Number 941, in the City of Garland, Dallas County, Texas, and being a portion of that of land described by deed to Adelfa B. Callejo, Trustee of the Callejo-Botello Foundation, a Charitable Trust, as recorded under Document Number 201000152223, Official Public Records, Dallas County, Texas, (O.P.R.D.C.T.), the subject tract being more particularly described by metes and bounds as follows (bearings are based on State Plane Coordinate System, Texas North Central Zone (4202) North American Datum of 1983 (NAD '83)):

BEGINNING at a 1/2 inch rebar with pink cap stamped, "BARTON CHAPA" set for the northwest corner of said Callejo tract and the herein described tract;

THENCE North 89 degrees 03 minutes 58 seconds East, with the north line of said Callejo tract, a distance of 879.35 feet to a point within electric utility cabinet for corner, said point being in the west right-of-way of Callejo Road, having a 60.00 foot right-of-way per Volume 87025, Page 4749, (D.R.D.C.T.);

THENCE South 02 degrees 00 minutes 56 seconds East, with the west right-of-way of said Callejo Road, a distance of 193.94 feet to the beginning of a non-tangent curve to the left, having a radius of 850.00 feet, with a delta angle of 05 degrees 51 minutes 37 seconds, whose chord bears North 87 degrees 57 minutes 07 seconds West, a distance of 86.90 feet, from which a MAG nail found bears North 70 degrees West, a distance of 0.50 feet;

THENCE along said non-tangent curve to the left, and with the south line of said Callejo tract, an arc length of 86.94 feet to a point from which a 1/2 inch rebar found bears North 11 degrees East, a distance of 0.31 feet;

THENCE South 89 degrees 06 minutes 48 seconds West, with the south line of said Callejo tract, a distance of 720.00 feet to a 1/2 inch rebar with cap stamped, "AZB" found at the beginning of a tangent curve to the left, having a radius of 850.00 feet, with a delta angle of 05 degrees 08 minutes 42 seconds, whose chord bears South 86 degrees 32 minutes 36 seconds West, a distance of 76.30 feet;

THENCE along said tangent curve to the left, and with the south line of said Callejo tract, an arc length of 76.33 feet to a 1/2 inch rebar with cap stamped, "AZB" found for the southwest corner thereof;

THENCE North 00 degrees 56 minutes 04 seconds West, with the west line of said Callejo tract, an arc length of 192.15 feet to the **POINT OF BEGINNING** and enclosing 3.830 acres (166,831 square feet) of land, more or less.

TITLE COMMITMENT NOTES (AS TO TRACT 1)

This survey was prepared with the benefit of a commitment for title insurance provided by Chicago Title Insurance Company, G.F. Number CTDAL36-8000362100385, Effective Date January 24, 2022 This commitment was relied upon for encumbrance research, and the surveyor has performed no independent title search. Therefore, easements, agreements, or other documents, either recorded, or unrecorded may exist that affect the subject property that are not shown on this survey. The following exceptions from Schedule "B" were addressed as follows:

Item 10(e): Easement as recorded under Volume 1992, Page 548, Deed Records, Dallas County, Texas. (easement is blanket in nature, no plottable description, not shown)

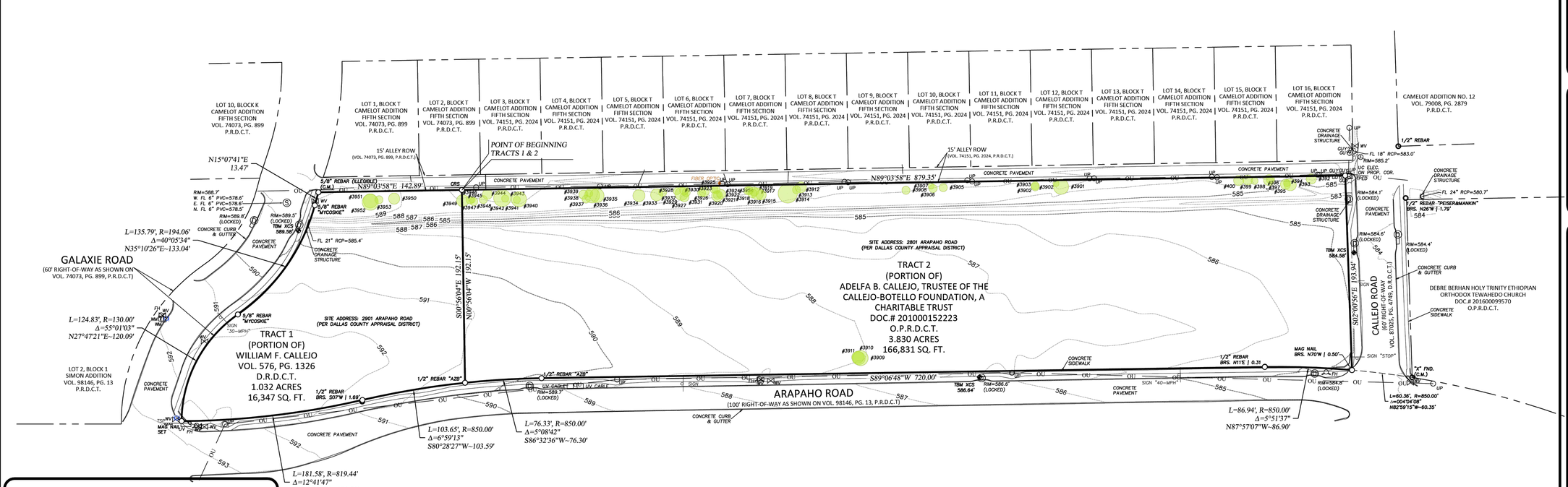
Item 10(i): Easement as recorded under Volume 2565, Page 587, Deed Records, Dallas County, Texas. (easement is blanket in nature, no plottable description, not shown)

Item 10(j): Easement as recorded under Volume 92167, Page 1482, Deed Records, Dallas County, Texas. (document contains a description which includes the subject property, easement in blanket in nature, not plottable, not shown)

TITLE COMMITMENT NOTES (AS TO TRACT 2)

This survey was prepared with the benefit of a commitment for title insurance provided by Chicago Title Insurance Company, G.F. Number CTDAL36-8000362100383, Effective Date October 13, 2021 This commitment was relied upon for encumbrance research, and the surveyor has performed no independent title search. Therefore, easements, agreements, or other documents, either recorded, or unrecorded may exist that affect the subject property that are not shown on this survey. The following exceptions from Schedule "B" were addressed as follows:

Item 10(g): Easement as recorded under Volume 92167, Page 1482, Deed Records, Dallas County, Texas. (easement does not cross or abut the subject property, not shown)



LEGEND OF ABBREVIATIONS

- D.R.D.C.T. DEED RECORDS, DALLAS COUNTY, TEXAS
- P.R.D.C.T. PLAT RECORDS, DALLAS COUNTY, TEXAS
- O.P.R.D.C.T. OFFICIAL PUBLIC RECORDS, DALLAS COUNTY, TEXAS
- DOC.# DOCUMENT NUMBER
- C.M. CONTROLLING MONUMENT
- SQ. FT. SQUARE FEET
- ROW RIGHT OF WAY
- CRS CAPPED REBAR SET

CITY OF GARLAND, TX CASE #: 210928-1

CATEGORY 1A, CONDITION II, LAND TITLE SURVEY & TOPOGRAPHIC SURVEY

A TRACT SITUATED IN THE FREDERICK MOSS SURVEY, ABSTRACT #941 GARLAND DALLAS COUNTY, TEXAS

kirkman ENGINEERING
5200 State Highway 121
Colleyville, TX 76034
Phone: 817-488-4960

ARAPAHO TOWNHOME

GARLAND, TEXAS

JOB NO.	2022.001.244
DRAWN:	BCS
CHECKED:	JHB

TABLE OF REVISIONS

DATE	SUMMARY

SHEET:

CATEGORY 1A, CONDITION II, LAND TITLE SURVEY & TOPOGRAPHIC SURVEY

SURVEY PREPARED BY BARTON CHAPA SURVEYING, LLC. 5300 STATE HIGHWAY 121, COLLEYVILLE, TX. TBPLS FIRM# 10194474

Z:\Project Data\Survey\001 - Kirkman Engineering\2022\244 - Arapaho Townhome - Garland\Drawings

GENERAL NOTES

1. STANDARDS AND SPECIFICATIONS: ALL MATERIALS, CONSTRUCTION METHODS, WORKMANSHIP, EQUIPMENT, SERVICES AND TESTING FOR ALL PUBLIC IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE GOVERNING AUTHORITIES' ORDINANCES, REGULATIONS, REQUIREMENTS, STATUTES, SPECIFICATIONS AND DETAILS, LATEST PRINTING AND AMENDMENTS THERETO. THE GOVERNING AUTHORITIES' PUBLIC WORKS AND WATER DEPARTMENT REQUIREMENTS, PLUMBING CODES, AND FIRE DEPARTMENT REGULATIONS SHALL TAKE PRECEDENT FOR ALL PRIVATE IMPROVEMENTS WHERE APPLICABLE. ALL OTHER PRIVATE CONSTRUCTION, NOT REGULATED BY THE GOVERNING AUTHORITY, SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS, LATEST PRINTING AND AMENDMENTS THERETO, EXCEPT AS MODIFIED BY THE PROJECT CONTRACT DOCUMENTS.
2. EXAMINATION OF PLANS: PRIOR TO COMMENCING ANY CONSTRUCTION, THE CONTRACTOR SHALL FAMILIARIZE THEIR SELF WITH THE CONTRACTOR DOCUMENTS AND SPECIFICATIONS. FAILURE ON THE PART OF THE CONTRACTOR TO FAMILIARIZE THEIR SELF WITH ALL STANDARDS AND SPECIFICATIONS PERTAINING TO THE WORK SHALL IN NO WAY RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PERFORMING THE WORK IN ACCORDANCE WITH ALL SUCH APPLICABLE STANDARDS AND SPECIFICATIONS.
3. EXAMINATION OF SITE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INVESTIGATING AND SATISFYING THEIR SELF AS TO THE CONDITIONS AFFECTING THE WORK, INCLUDING BUT NOT RESTRICTED TO THE BEARING UPON TRANSPORTATION, DISPOSAL, HANDLING AND STORAGE OF MATERIALS, AVAILABILITY OF LABOR, WATER, ELECTRIC POWER, ROADS AND UNCERTAINTIES OF WEATHER, OR SIMILAR PHYSICAL CONDITIONS AT THE SITE, CONDITIONS OF THE GROUND, THE CHARACTER OF EQUIPMENT AND FACILITIES NEEDED PRELIMINARY TO AND DURING THE PERFORMANCE OF THE WORK.
   FAILURE BY THE CONTRACTOR TO ACQUAINT HIMSELF WITH THE AVAILABLE INFORMATION WILL NOT RELIEVE HIM FROM RESPONSIBILITY FOR ESTIMATING THE DIFFICULTY OR COST OF SUCCESSFULLY PERFORMING THE WORK.
4. SUBSURFACE INVESTIGATION: SUBSURFACE EXPLORATION TO ASCERTAIN THE NATURE OF SOILS HAS BEEN PERFORMED BY THE GEOTECHNICAL ENGINEER OF RECORD ON THE PROJECT. THE SUBSURFACE INFORMATION WILL BE MADE AVAILABLE FOR THE CONTRACTOR'S USE. THE ENGINEER DISCLAIMS ANY RESPONSIBILITY FOR THE ACCURACY, TRUE LOCATION AND EXTENT OF THE SOILS INFORMATION PREPARED BY OTHERS.
5. TOPOGRAPHY SURVEY: TOPOGRAPHIC SURVEY INFORMATION SHOWN ON THE PLANS IS PROVIDED FOR INFORMATIONAL PURPOSES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE INFORMATION SHOWN IS CORRECT, AND SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY ERRORS, DISCREPANCIES OR OMISSIONS TO THE SURVEY INFORMATION PROVIDED.
6. COMPLIANCE WITH LAWS: THE CONTRACTOR SHALL FULLY COMPLY WITH ALL LOCAL, STATE AND FEDERAL LAWS, INCLUDING ALL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS CONTRACT AND THE WORK TO BE DONE THEREUNDER, WHICH EXIST OR MAY BE ENACTED LATER BY GOVERNMENTAL BODIES HAVING JURISDICTION OR AUTHORITY FOR SUCH ENACTMENT. ALL WORK REQUIRED UNDER THIS CONTRACT SHALL COMPLY WITH ALL REQUIREMENTS OF LAW, REGULATION, PERMIT OR LICENSE. IF THE CONTRACTOR FINDS THAT THERE IS A VARIANCE, HE SHALL IMMEDIATELY REPORT THIS TO THE OWNER FOR RESOLUTION.
7. PUBLIC CONVENIENCE AND SAFETY: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONA AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. MATERIALS STORED ON THE WORK SITE SHALL BE PLACED, AND THE WORK SHALL AT ALL TIMES BE SO CONDUCTED, AS TO CAUSE NO GREATER OBSTRUCTION TO THE TRAVELING PUBLIC THAN IS CONSIDERED ACCEPTABLE BY THE GOVERNING AUTHORITIES AND THE DEVELOPER AND NOT TO PREVENT FREE UNINTERRUPTED ACCESS TO ALL HIRE HYDRANTS, WATER VAL YES, GAS VALVES, MANHOLES AND FIRE ALARM OR POLICE CALL BOXES IN THE VICINITY.
8. STORM WATER POLLUTION PREVENTION PLAN (SWPPP): THE CONTRACTOR SHALL COMPLY WITH THE CONDITIONS OF THE SWPPP WHILE CONDUCTING HIS ACTIVITIES ON THE PROJECT.
9. PERMITS AND LICENSES: THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND LICENSES NECESSARY FOR THE EXECUTION OF THE WORK AND SHALL FULLY COMPLY WITH ALL THEIR TERMS AND CONDITIONS. WHENEVER THE WORK UNDER THIS CONTRACT REQUIRES THE OBTAINING OF PERMITS FROM THE GOVERNING AUTHORITIES, THE CONTRACTOR SHALL FURNISH DUPLICATE COPIES OF SUCH PERMITS TO THE DEVELOPER BEFORE THE WORK COVERED THEREBY IS STARTED. NO WORK WILL BE ALLOWED TO PROCEED BEFORE SUCH PERMITS HAVE BEEN OBTAINED. COSTS ASSOCIATED WITH PERMITS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
10. APPROVED PLANS: THE CONTRACTOR SHALL HAVE AT LEST ONE SET OF APPROVED PLANS ON -SITE AT ALL TIMES.
11. BONDS: PERFORMANCE, PAYMENT AND MAINTENANCE BONDS MAY BE REQUIRED FROM THE CONTRACTOR FOR "PUBLIC" IMPROVEMENTS. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE THE BONDS IN THE FORM AND IN THE AMOUNTS AS REQUIRED BY THE GOVERNING AUTHORITIES. COSTS ASSOCIATED WITH PROVIDING THE BONDS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
12. TESTING: THE TESTING AND CONTROL OF ALL MATERIALS USED IN THE WORK SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY, EMPLOYED AND PAID DIRECTLY BY THE CITY. IN THE EVENT THE RESULTS OF THE INITIAL TESTING DO NOT COMPLY WITH THE PLANS AND SPECIFICATIONS, SUBSEQUENT TESTS NECESSARY TO DETERMINE THE ACCEPTABILITY OF MATERIALS OR CONSTRUCTION SHALL BE AT THE CONTRACTOR'S EXPENSE.
13. INSPECTION: THE GOVERNING AUTHORITIES AND/OR THE DEVELOPER WILL PROVIDE INSPECTION OF THE PROPOSED CONSTRUCTION. THE OWNER WILL PAY THE COSTS FOR INSPECTION SERVICES. THE CONTRACTOR SHALL PROVIDE SUFFICIENT NOTICE WELL IN ADVANCE OF PENDING CONSTRUCTION ACTIVITIES TO THE GOVERNING AUTHORITIES AND/OR OWNER FOR SCHEDULING OF INSPECTION SERVICES.
14. SHOP DRAWINGS: THE CONTRACTOR SHALL HAVE PREPARED, REVIEW, AND SUBMIT ALL SHOP DRAWING, PRODUCT DATA AND SAMPLES REQUIRED BY THE GOVERNING AUTHORITIES AND THE PROJECT CONTRACT DOCUMENTS IN ACCORDANCE WITH ITEM 1.28 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, NORTH CENTRAL TEXAS - NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS.
15. SURVEYING: ALL SURVEYING REQUIRED FOR CONSTRUCTION STAKING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE OWNER SHALL PROVIDE THE PROPERTY CORNERS AND TWO BENCHMARKS FOR USE AS HORIZONTAL AND VERTICAL DATUM. THE CONTRACTOR SHALL EMPLOY A REGISTERED PROFESSIONAL LAND SURVEY TO PERFORM ALL ADDITIONAL SURVEY, LAYOUT AND MEASUREMENT WORK NECESSARY FOR THE COMPLETION OF THE PROJECT. THE COSTS ASSOCIATED WITH THE CONSTRUCTION STAKING SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
16. PROTECTION OF PROPERTY CORNERS AND BENCHMARKS: THE CONTRACTOR SHALL PROTECT ALL PROPERTY CORNER MARKERS AND BENCHMARKS. WHEN ANY SUCH MARKERS OR MONUMENTS ARE IN DANGER OF BEING DISTURBED, THEY SHALL BE PROPERLY REFERENCED AND IF DISTURBED SHALL BE RESET BY A REGISTERED PUBLIC SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.
17. EXISTING STRUCTURES: THE PLANS SHOW THE LOCATION OF ALL KNOWN SURFACE AND SUB SURFACE STRUCTURES, HOWEVER, THE DEVELOPER AND ENGINEER ASSUME NO RESPONSIBILITY FOR THE FAILURE TO SHOW ANY OR ALL OF THESE STRUCTURES ON THE PLANS, OR TO SHOW THEM IN THEIR EXACT LOCATION. SUCH FAILURE SHALL NOT BE CONSIDERED SUFFICIENT BASIS FOR CLAIMS FOR ADDITIONAL COMPENSATION FOR EXTRA WORK OR FOR INCREASING THE PAY QUANTITIES IN ANY MANNER WHATSOEVER, UNLESS THE OBSTRUCTION ENCOUNTERED IN SUCH AS TO REQUIRE CHANGES IN THE LINES OR GRADES, OR REQUIRE THE CONSTRUCTION OF SPECIAL WORK, FOR WHICH PROVISIONS ARE NOT MADE IN THE PLANS.
18. PROTECTION OF EXISTING UTILITIES: AS REQUIRED BY "THE TEXAS UNDERGROUND FACILITY DAMAGE PREVENTION AND SAFETY ACT". TEXAS ONE CALL SYSTEM MUST BE CONTACTED (800-245-4545) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION OPERATIONS BEING PERFORMED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT TEXAS ONE CALL SYSTEM. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS ARE BASED ON THE BEST RECORDS AND/OR FIELD INFORMATION AVAILABLE AND ARE NOT GUARANTEED BY THE DEVELOPER OR ENGINEER TO BE ACCURATE AS TO THE LOCATION AND DEPTH. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO VERIFY LOCATIONS OF ADJACENT AND/OR CONFLICTING UTILITIES SUFFICIENTLY IN ADVANCE OF HIS ACTIVITIES IN ORDER THAT HE MAY NEGOTIATE SUCH LOCAL ADJUSTMENTS AS NECESSARY IN THE CONSTRUCTION PROCESS TO PROVIDE ADEQUATE CLEARANCES. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL EXISTING UTILITIES, SERVICES, AND STRUCTURES ENCOUNTERED WHETHER OR NOT THEY ARE ON THE PLANS. ANY DAMAGE TO UTILITIES RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED AT HIS EXPENSE. TO AVOID UNNECESSARY INTERFERENCE'S OR DELAYS, THE CONTRACTOR SHALL COORDINATE ALL UTILITY REMOVALS, REPLACEMENTS AND CONSTRUCTION WITH THE APPROPRIATE GOVERNING AUTHORITIES. THE DEVELOPER WILL NOT BE LIABLE FOR DAMAGES DUE TO DELAY BECAUSE OF THE ABOVE.
19. DAMAGE TO EXISTING FACILITIES: ALL EXISTING UTILITIES, PAVEMENT, SIDEWALKS, WALLS, FENCE, ETC. DAMAGE DURING CONSTRUCTION ACTIVITIES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE TO A CONDITION AS GOOD AS OR BETTER THAN THE CONDITIONS PRIOR TO STARTING THE WORK.
20. FIRE AND LIFE SAFETY SYSTEMS: THE CONTRACTOR SHALL NOT REMOVE, DISABLE OR DISRUPT EXISTING FIRE OR LIFE SAFETY SYSTEMS WITHOUT RECEIVING PRIOR WRITTEN PERMISSION FROM THE GOVERNING AUTHORITY.
21. TRENCH SAFETY: THE CONTRACTOR IS RESPONSIBLE FOR HAVING A TRENCH SAFETY PLAN PREPARED IN ACCORDANCE WITH OSHA REQUIREMENTS BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS FOR THE IMPLEMENTATION OF TRENCH SAFETY CONTROL MEASURES THAT WILL BE IN EFFECT DURING THE CONSTRUCTION OF THE PROJECT. THE COSTS FOR PREPARATION OF THE TRENCH SAFETY PLAN SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
22. TRAFFIC CONTROL: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IMPLEMENT THE TRAFFIC CONTROL PLAN INCLUDED IN THIS PLAN SET. THE COSTS ASSOCIATED WITH THE IMPLEMENTATION OF THE TRAFFIC CONTROL PLAN SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
23. ACCESS TO ADJACENT PROPERTIES: ACCESS TO ADJACENT PROPERTIES SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE DIRECTED BY THE GOVERNING AUTHORITIES AND/OR OWNER.
24. ACCESS ROUTES, STAGING AREAS AND STORAGE AREAS: ALL PRIVATE HAUL ROADS AND ACCESS ROUTES AND THE LOCATION OF ALL STAGING AREAS AND STORAGE AREAS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND REPAIR ALL ROADS AND OTHER FACILITIES USED DURING CONSTRUCTION. UPON COMPLETION OF THE PROJECT, ALL HAUL ROADS, ACCESS ROADS, STAGING AREAS AND STORAGE AREAS SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THAT AT THE TIME THE CONTRACTOR COMMENCES WORK ON THE PROJECT.
25. PARKING OF CONSTRUCTION EQUIPMENT: AT NIGHT AND DURING ALL PERIODS OF TIME WHEN EQUIPMENT IS NOT BEING ACTIVELY USED FOR THE CONSTRUCTION WORK, THE CONTRACTOR SHALL PARK THE EQUIPMENT AT LOCATIONS WHICH ARE APPROVED BY THE OWNER. DURING THE CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL COMPLY WITH THE PRESENT ZONING REQUIREMENTS OF THE GOVERNING AUTHORITIES IN THE USE OF VACANT PROPERTY FOR STORAGE PURPOSES. THE CONTRACTOR SHALL ALSO PROVIDE ADEQUATE BARRICADES, MARKERS AND LIGHTS TO PROTECT THE OWNER, THE GOVERNING AUTHORITIES, THE PUBLIC AND THE OTHER WORK. ALL BARRICADES, LIGHTS, AND MARKERS MUST MEET THE REQUIREMENTS OF THE GOVERNING AUTHORITIES' REGULATIONS.
26. WATER FOR CONSTRUCTION: THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS FOR PURCHASING WATER FROM THE GOVERNING AUTHORITY FOR HIS USE ON THE PROJECT SITE. COST ASSOCIATED WITH THIS SERVICE SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
27. TEMPORARY ELECTRIC AND COMMUNICATIONS FOR CONSTRUCTION: THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS FOR THE INSTALLATION AND PURCHASING OF TEMPORARY ELECTRIC AND COMMUNICATIONS SERVICES FROM THE GOVERNING AUTHORITIES FOR HIS USE ON THE PROJECT SITE. COSTS ASSOCIATED WITH THIS SERVICE SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
28. FENCES: ALL FENCES ENCOUNTERED AND REMOVED DURING CONSTRUCTION, EXCEPT THOSE DESIGNATED TO BE REMOVED OR RELOCATED, SHALL BE RESTORED TO THE ORIGINAL OR BETTER THAN CONDITION UPON COMPLETION OF THE PROJECT.WHERE WIRE FENCING, EITHER WIRE MESH OR BARBED WIRE, IS NOT TO BE CROSSED, THE CONTRACTOR SHALL SET CROSS-BRACED POSTS ON EITHER SIDE OF THE CROSSING. TEMPORARY FENCING SHALL BE ERECTED IN PLACE OF THE FENCING REMOVED WHENEVER THE WORK IS NOT IN PROGRESS AND WHEN THE SITE IS VACATED OVERNIGHT AND/OR AT ALL TIMES TO PREVENT PERSONS AND/OR LIVESTOCK FROM ENTERING THE CONSTRUCTION AREA. THE COST OF FENCE REMOVAL, TEMPORARY CLOSURES AND REPLACEMENT SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
29. COORDINATION WITH OTHERS: IN THE EVENT THAT OTHER CONTRACTORS ARE DOING WORK IN THE SAME AREA SIMULTANEOUSLY WITH THE PROJECT, THE CONTRACTOR SHALL COORDINATE HIS PROPOSED CONSTRUCTION WITH THAT OF THE OTHER CONTRACTORS.
30. CONDITION OF THE SITE DURING CONSTRUCTION: THE CONTRACTOR SHALL KEEP THE SITE OF THE WORK AND ADJACENT PREMISES AS FREE FROM MATERIAL, DEBRIS AND RUBBISH AS IS PRACTICABLE. THE CONTRACTOR SHALL REMOVE MATERIAL, DEBRIS AND RUBBISH FROM ANY PORTION OF THE SITE IF, IN THE OPINION OF THE DEVELOPER, SUCH MATERIAL, DEBRIS AND RUBBISH CONSTITUTES A NUISANCE OR IS OBJECTIONABLE.
31. EXISTING ROADWAYS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE CLEANLINESS OF EXISTING PAVED ROADS. COSTS ASSOCIATED WITH MAINTAINING THE CLEANLINESS OF EXISTING ROADS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.

GENERAL NOTES CONTINUED:

32. DUST CONTROL: THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO CONTROL DUST ON THE PROJECT SITE BY SPRINKLING OF WATER, OR ANY OTHER METHODS APPROVED BY THE GOVERNING AUTHORITIES. COSTS ASSOCIATED WITH DUST CONTROL SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
33. CLEAN UP FOR FINAL ACCEPTANCE: THE CONTRACTOR SHALL MAKE A FINAL CLEAN UP OF ALL PARTS OF THE WORK BEFORE ACCEPTANCE BY THE OWNER. THIS CLEAN UP SHALL INCLUDE REMOVAL OF ALL OBJECTIONABLE E MATERIALS AND, IN GENERAL, PREPARING THE SITE OF THE WORK IN AN ORDERLY MANNER OF APPEARANCE.
34. REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK: ALL WORK, WHICH HAS BEEN REJECTED OR CONDEMNED, SHALL BE REPAIRED, OR IF IT CANNOT BE REPAIRED SATISFACTORILY, IT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. DEFECTIVE MATERIALS SHALL BE IMMEDIATELY REMOVED FROM THE WORK SITE. WORK DONE BEYOND THE LINE OR NOT IN THE CONFORMITY WITH THE GRADES SHOWN ON THE DRAWINGS OR AS WRITTEN AUTHORITY AND PRIOR AGREEMENT IN WRITING AS TO PRICES, SHALL BE AT THE CONTRACTOR'S RISK, AND WILL BE CONSIDERED UNAUTHORIZED, AND AT THE OPTION OF THE OWNER MAY NOT BE MEASURED AND PAID FOR AND MAY BE ORDERED REMOVED AT THE CONTRACTOR'S EXPENSE. UPON FAILURE OF THE CONTRACTOR TO REPAIR SATISFACTORY OR TO REMOVE AND REPLACE, IF SO DIRECTED, REJECTED, UNAUTHORIZED OR CONDEMNED WORK OR MATERIALS IMMEDIATELY AFTER RECEIVING NOTICE FROM THE OWNER, THE OWNER WILL, AFTER GIVING WRITTEN NOTICE TO THE CONTRACTOR, HAVE THE AUTHORITY TO CAUSE DEFECTIVE WORK TO BE REMEDIED OR REMOVED AND REPLACED, OR TO CAUSE UNAUTHORIZED WORK TO BE REMOVED AND TO DEDUCT THE COST THEREOF ANY MONIES DUE OR TO BECOME DUE THE CONTRACTOR.
35. DISPOSITION AND DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS: ALL MATERIALS TO BE REMOVED FROM THE SITE INCLUDED BUT NOT LIMITED TO EXCESS MATERIAL AND UNSUITABLE MATERIALS SUCH AS CONCRETE, ASPHALT, LARGE ROCKS, REFUSE, AND OTHER DEBRIS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OUTSIDE THE LIMITS OF THE PROJECT. CONTRACTOR SHALL ALSO COMPLY WITH ALL APPLICABLE LAWS GOVERNING SPILLAGE OF DEBRIS WHILE TRANSPORTING TO A DISPOSAL SITE. COSTS ASSOCIATED WITH THE DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
36. RECORD DRAWINGS: THE CONTRACT SHALL MAINTAIN AN ACCURATE RECORD OF THE INSTALLATION OF ALL MATERIALS AND SYSTEM COVERED BY THE PROJECT CONTRACT DOCUMENTS. THE COMPLETE SET OF "RECORD DRAWINGS" MUST BE DELIVERED TO THE OWNER AND/OR ENGINEER BEFORE REQUESTING FINAL PAYMENT.

EROSION CONTROL NOTES:

1. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY THE GOVERNING AUTHORITIES, PERMITS ARE OBTAINED, AND ALL EROSION CONTROL MEASURES ARE IN PLACE.
2. CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL ORDINANCES THAT APPLY.
3. THE GENERAL CONTRACTOR (AND ALL SUBCONTRACTORS INVOLVED WITH ANY CONSTRUCTION ACTIVITIES RELATED TO EARTHWORK, EROSION CONTROL, ETC. OR WHICH UTILIZE POSSIBLE POLLUTANTS AS DEFINED IN THE TPDES GENERAL PERMIT) SHALL REVIEW AND ADHERE TO THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE PROJECT, AS WELL AS ALL THE TCEQ REQUIREMENTS SET FORTH IN THE TPDES GENERAL PERMIT.
4. THIS EROSION CONTROL PLAN IS A SUPPLEMENT TO THE SWPPP PREPARED BY OTHERS. REFER TO THE SWPPP FOR ADDITIONAL REQUIREMENTS.
5. ALL WASH WATER SHALL BE DISPOSED OF IN A MANNER THAT PREVENTS CONTACT BETWEEN WASH WATER POLLUTANTS AND STORM RUNOFF DISCHARGED FROM THIS SITE.
6. OIL AND GREASE ABSORBING MATERIALS SHALL BE READILY AVAILABLE ON-SITE AND SHALL BE PROMPTLY USED TO CONTAIN AND/OR CLEAN UP ALL FUEL OR CHEMICAL SPILLS OR LEAKS.
7. DUST CONTROL SHALL BE ACCOMPLISHED BY WATERING DRY, EXPOSED AREAS ON A REGULAR BASIS. SPRAYING OF PETROLEUM BASED OR TOXIC LIQUIDS FOR THIS IS PROHIBITED.
8. DISTURBED AREAS ON THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED FOR AT LEAST 14 DAYS SHALL BE TEMPORARILY PLANTED AND/OR SEEDED AND WATERED.
9. DISTURBED AREAS ON THE SITE WHERE CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED SHALL BE PERMANENTLY PLANTED AND/OR SEEDED WITHIN 14 DAYS.
10. PLANTING AND/OR SEEDING OF VEGETATED AREAS TO ACCOMPLISH STABILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH THE LANDSCAPING PLAN. AREAS BEYOND THE LIMITS OF THE LANDSCAPING PLAN (OR WHEN A LANDSCAPING PLAN DOES NOT EXIST) SHALL BE HYDROMULCHED WITH HIGHWAY MIX AND WATERED WITH TEMPORARY ABOVE GROUND IRRIGATION UNTIL THE VEGETATION IS ESTABLISHED.
11. ALL VEHICLES SHALL BE CLEANED AT THE CONSTRUCTION EXIT POINT(S) BEFORE LEAVING THE SITE.
12. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED ONTO ADJACENT ROADWAYS BY ANY VEHICLES EXITING THE SITE SHALL BE CLEANED OR REMOVED IMMEDIATELY.
13. THE CONTRACTOR SHALL REMOVE ALL ACCUMULATED SILT IN ANY STORM SEWER INLETS AND PIPES, AND ALONG SILT FENCES, WITHIN 48 HOURS AFTER INSPECTION OF DEVICES REVEALS THE PRESENCE OF EXCESS SILTATION.
14. SILT FENCES SHALL BE PLACES AROUND ANY STOCKPILES USED ON THE SITE.
15. ADDITIONAL EROSION CONTROL MEASURES MAY BE IMPLEMENTED BY THE CONTRACTOR AT HIS DISCRETION AT NO ADDITIONAL EXPENSE TO THE OWNER. THE ADDITION OR DELETION OF ANY EROSION CONTROL MEASURE MAY REQUIRE THAT THE SWPPP BE MODIFIED IN ACCORDANCE WITH THE TCEQ'S TPDES GENERAL PERMIT GUIDELINES.
16. ALL TEMPORARY EROSION CONTROL DEVICES (SILT FENCE, ETC.) SHALL BE REMOVED AND PROPERLY DISPOSED OF OFF SITE WITHIN THIRTY DAYS AFTER STABILIZATION OF ALL DISTURBED SURFACES IS COMPLETE.
17. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGE TO ADJACENT PROPERTIES AND/OR PUBLIC RIGHT OF WAY RESULTING FROM FAILURE TO FULLY IMPLEMENT AND EXECUTE ALL EROSION CONTROL PROCEDURES SHOWN AND NOTED IN THESE PLANS.
18. THE CONTRACTOR SHALL MODIFY THIS PLAN TO SHOW LOCATIONS OF TEMPORARY WASH DOWN AREA, PORTABLE TOILETS, EQUIPMENT MAINTENANCE/REPAIR AREAS, STOCKPILE AREAS, FUEL STORAGE AREAS, ETC. AND POLLUTANT CONTROLS FOR EACH.
19. THE GENERAL CONTRACTOR, AS THE TCEQ DEFINED "OPERATOR," SHALL PERFORM ALL REQUIRED INSPECTIONS OF STORM WATER CONTROLS AND PRACTICES AT FREQUENCIES OUTLINED IN THE TPDES GENERAL PERMIT, AND SHALL FILL OUT APPROPRIATE INSPECTION FORMS (AS PROVIDED IN THE SWPPP).
20. IF DIRT OR ROCK IS EXPORTED FROM THIS SITE, OR IF DIRT OR ROCK IS IMPORTED FROM AN OFF SITE BORROW LOCATION, THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR COMPLIANCE WITH ALL TCEQ STORM WATER REQUIREMENTS FOR THE REMOTE SITE. THE CONTRACTOR SHALL FURNISH THE OWNER WITH A COPY OF THE WRITTEN AGREEMENT WITH THE LANDOWNER OF THE REMOTE SITE INDICATING PERMITTING AND EROSION CONTROL MEASURES WILL BE IMPLEMENTED THEREON.

PAVING NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF A MAXIMUM NUMBER OF PASSING FIELD DENSITY TESTS ON THE STABILIZED SUBGRADE FOR SITE PAVING EQUAL TO THE RATIO OF 1 PER 5,000 SQUARE FEET OF PAVEMENT (AND ALL FAILING DENSITY TESTS AND REQUIRED MOISTURE DENSITY CURVES). ADDITIONAL FIELD DENSITY TESTS MAY BE REQUIRED FOR FOUNDATIONS REFER TO STRUCTURAL PLANS AND SPECIFICATIONS FOR SUCH. IN ADDITION, THE CONTRACTOR SHALL PROVIDE THE OWNER TEN (10) PASSING SITE PAVEMENT CORES FOR THE OWNERS USE IN THE OWNER'S TESTING FOR THICKNESS AND COMPRESSIVE STRENGTH. CORE LOCATIONS SHALL BE DESIGNATED BY THE OWNER. CONTRACTOR SHALL PATCH CORE HOLES AND FINISH WITH LIKE AND MATCHING MATERIALS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL TESTING COSTS SHOULD THE ABOVE TESTS FAIL MINIMUM CRITERIA AS ESTABLISHED BY NCTCOG. ANY NON-CONFORMING PAVING SHALL BE REPLACED OR RESOLVED IN ACCORDANCE WITH NCTCOG SPECIFICATIONS.
2. ALL EARTHWORK AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL INVESTIGATION AND REPORT FOR THIS PROJECT AND THOSE RECOMMENDATIONS LISTED WITHIN THE REPORT. REFER TO THIS REPORT FOR ALL EARTHWORK AND RELATED ITEMS. REFER TO STRUCTURAL FOR BUILDING PREP. THE REPORT REFERENCES AGENCY/INDUSTRY STANDARDS. IN THE EVENT THAT THERE IS A QUESTION OR DISPUTE BETWEEN GOVERNING SPECIFICATIONS, THE MOST STRINGENT SHALL APPLY SUCH THAT THE OWNER RECEIVES THE MOST ADVANTAGEOUS FINISHED PRODUCT.
3. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PERFORMING ALL CONSTRUCTION LAYOUTS FROM THE SITE LAYOUT CONTROL POINTS AND FROM THE DIMENSIONS SHOWN. THE CONTRACTOR MUST NOTIFY THE ENGINEER OF ANY DISCREPANCIES IN ADVANCE AND ALLOW FOR THE ENGINEER'S RESPONSE BEFORE PROCEEDING WITH THE WORK.
4. ALL PAVING DIMENSIONS ARE TO FACE OF CURB, AND EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUPPLY THE CITY AND THE ENGINEER WITH A CONCRETE MIX DESIGN AT THE PRE-CONSTRUCTION MEETING FOR REVIEW AND APPROVAL. THE COST OF THIS DESIGN SHALL BE INCLUDED IN THE UNIT PRICE OF PAVEMENT MATERIAL.
6. THE CONTRACTOR SHALL PROTECT ANY EXISTING AND/OR PROPOSED UTILITIES, WHICH ARE IN THE PROPOSED SUBGRADE DURING THE SUBGRADE STABILIZATION PROCESS.
7. CONTRACTOR SHALL ADJUST ALL UTILITIES (EXISTING AND PROPOSED) TO FINAL GRADE AT CONTRACTORS EXPENSE. ALL UTILITIES AND APPURTENANCES SHALL BE EXTENDED UP TO FINAL GRADE. UTILITY CLEAN-OUTS, VALVES, MANHOLES, ETC. LOCATED WITHIN PAVED AREAS SHALL BE PAVED PER DETAIL. IN NON-PAVED AREAS, SAID APPURTENANCES SHALL HAVE A 4" THICK CONCRETE PAD EXTENDING 12" BEYOND SAID APPURTENANCE (BLOCK OUT) POURED AT FINAL GRADE FOR PROTECTION AGAINST DAMAGE FROM MOWING AND MAINTENANCE EQUIPMENT. CONTRACTOR SHALL PLACE IRRIGATION AND OTHER SLEEVES PRIOR TO ANY PAVING, PER THE IRRIGATION PLAN, OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE WITH THE CURBS SCORED TO IDENTIFY THE SLEEVE LOCATIONS.
8. UNLESS OTHERWISE NOTED, SUBGRADE SHALL BE STABILIZED TO 12" BEYOND THE BACK OF CURB OR EDGE OF PAVEMENT PER GEOTECH RECOMMENDATIONS UNLESS STATED OTHERWISE. ALL CONCRETE STRENGTH AND REINFORCING STEEL SHALL BE PER PROJECT GEOTECHNICAL RECOMMENDATIONS. FIRE LANES, PARKING STALLS, AND ROADWAY STRIPING & MARKINGS SHALL CONFORM TO CITY STANDARDS. SIDEWALKS WITHIN LANDSCAPE AREAS SHALL BE MINIMUM 4" THICK. LARGE EXPANSES OF CONCRETE FLATWORK (SUCH AS MAJOR PEDESTRIAN AREAS, PLAZA AREAS BETWEEN BUILDINGS OR OTHER STRUCTURES) SHALL BE TREATED LIKE VEHICULAR CONCRETE PAVEMENT AND RECEIVE SAME SUBGRADE STABILIZATION AS VEHICULAR PAVEMENT (6" DEEP MINIMUM AND IN ACCORDANCE WITH A LIME SERIES TEST) AND ALL JOINTS (CONTRACTION AND EXPANSION JOINTS) SHALL BE SEALED WITH SELF LEVELING POLYURETHANE SEALANT.
9. ALL PAVEMENT WITHIN 5' OF PROPOSED BUILDING(S) SHALL ADHERE TO THE STRUCTURAL RECOMMENDATIONS AND OR ARCHITECTURAL REQUIREMENTS. REFER TO STRUCTURAL AND ARCHITECTURAL PLANS AND RELATED TECHNICAL SPECIFICATIONS. CIVIL PAVEMENT LIMITS BEGIN 5' OUTSIDE THE BUILDING. IN THE EVENT OF OF A CONFLICT WITH THE STRUCTURAL AND OR ARCHITECTURAL WITHIN THIS AREA, THE STRUCTURAL/ ARCHITECT REQUIREMENTS SHALL GOVERN.
10. FOR "CURB INLETS" SUBTRACT 0.5' (6 INCHES) FOR STANDARD THROAT RECESS AT INLETS PER STANDARD DETAILS. SURROUNDING PAVEMENT AND GUTTER SHALL BE WARPED TO DRAIN FOR INLETS ON GRADE, FLUMES, AND SAG INLETS. INLETS ON GRADE SHALL BE SET IN PLACE TO MATCH THE CURB GRADE LINE.
11. ALL REINFORCING STEEL AND DOWEL BARS IN PAVEMENT SHALL BE SUPPORTED AND MAINTAINED AT THE CORRECT CLEARANCES BY THE USE OF BAR CHAIRS OR OTHER APPROVED SUPPORT.
12. CONNECTION OF THE PROPOSED SIDEWALK TO EXISTING PAVING, SIDEWALK, BUILDING, AND WHEELCHAIR RAMPS SHALL BE CONSIDERED SUBSIDIARY TO THE COST OF THE CONSTRUCTION OF THE SIDEWALK. ALL JOINTS (EXPANSION, ISOLATION, CONTRACTION, & CONSTRUCTION) FOR CONCRETE PAVING AND INCIDENTAL CRACKS SHALL BE SEALED AND INSTALLED IN ACCORDANCE WITH THE AMERICAN CONCRETE PAVEMENT ASSOCIATION (ACPA) RECOMMENDATIONS. CONTRACTOR SHALL OBSERVE THE ARCHITECTURAL AND STRUCTURAL JOINTING LAYOUTS. IN THE EVENT OF A DISCREPANCY OR CONFLICT FOR SITE PAVING, THE CONTRACTOR SHALL REFER TO ACPA PUBLICATION IS061.01P AND IS400.01P FOR THE JOINT SPECIFICATIONS AND THE LAYOUT OF PAVEMENT JOINTS (NON-PAY ITEM).
13. JOINT SPACING SHALL BE AS FOLLOWS:
    5 INCH PAVEMENT THICKNESS - 10' JOINT SPACING
    6+ INCH PAVEMENT THICKNESS - 12' JOINT SPACING
    IN AREAS WHERE PAVEMENT THICKNESS VARIES, THE SHORTER JOINT SPACING SHALL GOVERN
14. THE CONTRACTOR SHALL USE CARE DURING SOIL STABILIZATION AND COMPACTION ACTIVITIES SO AS NOT TO ADVERSELY AFFECT LANDSCAPE AREAS OR UTILITY LINES WITH SOIL STABILIZATION TREATMENTS. AFTER COMPACTION AND PRIOR TO PLACING GRASS, THE UPPER 8 INCHES (8") OF ALL LANDSCAPED AREAS SHALL BE AERATED, TILLED, OR OTHERWISE PROCESSED SO AS TO PROMOTE HEALTHY ROOT GROWTH FOR TURF AND OTHER VEGETATION. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY REPAIRS, UNDERCUTTING, REMOVAL, DISPOSAL, AND BACKFILLING OF THESE AREAS IF STABILIZATION IS DISCOVERED (NON-PAY ITEM).

DEMOLITION NOTES

1. NO EARTH-DISTURBING ACTIVITIES SHALL COMMENCE UNTIL ALL PERMITS ARE OBTAINED AND PERIMETER EROSION CONTROL MEASURES ARE IN PLACE.
2. ALL DEMOLITION SHALL BE CLOSELY COORDINATED WITH THE OWNER'S REPRESENTATIVE REGARDING ITEMS TO BE SALVAGED, THOSE TO BE REMOVED, ETC. INCLUDING ANY AND ALL TREE PRESERVATION AND TRANSPLANTING ACTIVITIES, AS OUTLINED IN THE PRE-CONSTRUCTION MEETING. REMOVAL, RELOCATION AND/OR DISPOSAL OF ANY PRE-EXISTING ON-SITE TRASH, DEBRIS, OR STOCKPILES SHALL BE INCLUDED IN THE TOTAL COST OF DEMOLITION AND SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE AT ALL TIMES.
3. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH ALL REGULATIONS GOVERNING AGENCIES REGARDING THE DEMOLITION, REMOVAL, TRANSPORTATION AND DISPOSAL OF ALL DEMOLITION DEBRIS.
4. INGRESS AND EGRESS POINTS, PROPOSED DISPOSAL SITES, AND HAUL ROUTES MUST BE APPROVED BY CITY OFFICIALS PRIOR TO REMOVAL OF DEMOLITION DEBRIS OFF-SITE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING DISCONNECTION OF ALL UTILITIES SERVING THE EXISTING SITE WITH THE APPROPRIATE UTILITY COMPANY, AND SHALL OBTAIN APPROVAL FROM SAME TO COMMENCE DEMOLITION ACTIVITIES.
6. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST OSHA STANDARDS FOR EXCAVATION AND TRENCHING PROCEDURES. CONTRACTOR SHALL USE SUPPORT SYSTEMS, SLOPING, BENCHING, ETC. AS NECESSARY FOR THESE OPERATIONS, AND SHALL COMPLY WITH ALL OSHA PERFORMANCE CRITERIA.
7. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE PROTECTION OF ALL PROPERTY CORNER MONUMENTS, BENCHMARKS, CONTROL POINTS, ETC, AND SHALL HAVE, AT HIS EXPENSE, ALL CORNER MONUMENTS REPLACED WHICH ARE DISTURBED BY CONSTRUCTION ACTIVITIES.
8. THE CONTRACTOR SHALL INCUR ALL COSTS FOR MAINTENANCE AND REPAIR OF THE EXISTING FENCES TO REMAIN, IRRIGATION SYSTEMS TO REMAIN, UTILITY LINES, ETC, AS OUTLINED IN THE SPECIFICATIONS.
9. THE CONTRACTOR SHALL LOCATE AND REMOVE ALL UNDERGROUND UTILITY CABLES (ELECTRIC, TELEPHONE, ETC.) UP TO A DEPTH OF 24 INCHES BELOW GRADE AS PART OF THE BASE BID.
10. THE CONTRACTOR SHALL LOCATE AND REMOVE ALL UNDERGROUND UTILITY PIPING, CONDUIT, AND CABLES, REGARDLESS OF DEPTH, IN THE AREA OF THE PROPOSED BUILDING(S) FOUNDATIONS.
11. NOTES SHOWN HEREON REGARDING SPECIFIC ITEMS OF DEMOLITION ARE GENERAL IN NATURE, AND ARE NOT INTENDED TO BE WHOLLY INCLUSIVE. THE CONTRACTOR SHALL DEMOLISH AND REMOVE ALL EXISTING IMPROVEMENTS TO THE SATISFACTION OF THE OWNER, AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS, AND TO THE EXTENT AS NOTED IN THE SPECIFICATIONS.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PLUGGING, CAPPING, OR OTHERWISE TERMINATING UTILITY SERVICE LINES AT EXISTING METER LOCATIONS, CLEANOUTS, ETC. A MIN. DISTANCE OF 1 FOOT OUTSIDE THE LIMITS OF THE TRACT SHOWN.
13. THE CONTRACTOR SHALL CREATE AMPLE STAGING AND STOCKPILING AREAS FOR THE DELIVERIES OF CONSTRUCTION MATERIALS, CONCRETE DELIVERIES, TOPSOIL, ETC. IN ACCORDANCE WITH THE OWNER'S REPRESENTATIVE AND THE PROJECT SPECIFICATIONS.
14. IF ASBESTOS, LEAD-BASED ITEMS OR ANY OTHER HAZARDOUS MATERIALS ARE ENCOUNTERED THE CONTRACTOR IS REQUIRED TO FOLLOW ALL LOCAL, STATE, AND FEDERAL GUIDELINES FOR THE CONTAINMENT, REMOVAL, AND DISPOSAL PROCEDURES.

UTILITY NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES, WHETHER PRIVATE OR PUBLIC, PRIOR TO MOBILIZATION. CONTRACTOR SHALL VISIT THE SITE AND MAKE ALL NECESSARY OBSERVATIONS AND INSPECTIONS TO FAMILIARIZE THEMSELVES WITH THE SITE AND THE SITE FACILITIES. THE INFORMATION AND DATA SHOWN WITH RESPECT TO EXISTING UNDERGROUND FACILITIES AT OR CONTIGUOUS TO THE SITE IS APPROXIMATE AND BASED ON INFORMATION FURNISHED BY THE OWNERS OF SUCH UNDERGROUND FACILITIES OR ON PHYSICAL APPURTENANCES OBSERVED IN THE FIELD. THE OWNER AND ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY SUCH INFORMATION OR DATA; AND, THE CONTRACTOR, SHALL HAVE FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL SUCH INFORMATION AND DATA, FOR LOCATING ALL UNDERGROUND FACILITIES, FOR COORDINATION OF THE WORK WITH THE OWNERS OF SUCH UNDERGROUND FACILITIES DURING CONSTRUCTION, FOR THE SAFETY AND PROTECTION THEREOF, AND REPAIRING ANY DAMAGE THERETO RESULTING FROM THE WORK. THE COST OF ALL WILL BE CONSIDERED AS HAVING BEEN INCLUDED IN THE CONTRACT PRICE.
2. CONTRACTOR SHALL, IN BASE BID PROVIDE ALL NECESSARY FITTINGS AND APPURTENANCES REQUIRED TO COMPLETE ALL CONNECTIONS, RESOLVE UTILITY CONFLICTS AND OTHER INCIDENTAL UTILITY WORK SHOWN ON THE PLANS OR CONTAINED IN THE SPECIFICATIONS OR REQUIRED BY GOVERNING AGENCIES TO INCLUDE, BUT NOT LIMITED TO TEMPORARY SERVICES: VALVES, BOXES, METERS, BACKFLOW PREVENTORS, FIRE DEPARTMENT CONNECTIONS, ETC. INCLUDING THE REPAIR OR REPLACEMENT OF ANY EXISTING IRRIGATION SYSTEM. CONTRACTOR SHALL RAISE/LOWER OR ADJUST ALL EXISTING UTILITY MAINS IN CONFLICT WITH PROPOSED UTILITIES AS PART OF THE BASE BID FOR ALL KNOWN OR UNKNOWN LINES.
3. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITY COMPANIES OR AGENCIES IN WRITING AT LEAST 1 WEEK PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND MAKE ARRANGEMENTS FOR ANY AND ALL TEMPORARY UTILITIES, PERMITS, AND AGREEMENTS.
4. THE CONTRACTOR SHALL PROTECT ALL UTILITIES DURING THE CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL GIVE THE CITY, RESIDENTS AND BUSINESSES AFFECTED BY ANY ANTICIPATED WATER OR SEWER SERVICE DISRUPTIONS AT LEAST FORTY-EIGHT (48) HOURS PRIOR NOTICE.
5. CONTRACTOR SHALL EXERCISE CAUTION AND MAINTAIN ADEQUATE CLEAR ZONE BETWEEN THE CONTRACTOR'S EQUIPMENT AND ANY POWER LINES.
6. THE CONTRACTOR SHALL PROTECT ALL EXISTING POWER POLES, SIGNS, MANHOLES, TELEPHONES RISERS, WATER VALVES, UTILITIES, ETC. DURING ALL CONSTRUCTION PHASES. CONTRACTOR WILL BE RESPONSIBLE TO REPLACE ANY DAMAGED ITEMS AND RESTORE ANY SERVICES THAT HAVE BEEN DISTURBED. ALL MANHOLES, CLEAN-OUTS, WATER VALVES, FIRE HYDRANTS AND OTHER APPURTENANCES MUST BE ADJUSTED TO FINAL GRADE BEFORE THE OWNER WILL ACCEPT THE WORK.
7. THE CONTRACTOR SHALL SALVAGE ALL EXISTING CITY UTILITIES (INCLUDING SIGNS, VALVES, FIRE HYDRANTS, ETC.) IN ACCORDANCE WITH CITY REQUIREMENTS AND PROVIDE TO THE CITY.
8. ALL UTILITIES WITHIN 5' OF PROPOSED BUILDING(S) SHALL ADHERE TO THE MEP'S RECOMMENDATIONS AND OR REQUIREMENTS. CONTRACTOR SHALL PROVIDE STORM DRAIN CONNECTIONS FOR ALL ROOF DRAIN LINES. REFER TO MEP'S PLANS AND RELATED TECHNICAL SPECIFICATIONS. CIVIL UTILITIES (WATER, SANITARY SEWER & STORM SEWER) LIMITS BEGIN 5' OUTSIDE THE BUILDING. IN THE EVENT OF OF A CONFLICT WITH THE MEP'S WITHIN THIS AREA, THE MEP'S REQUIREMENTS SHALL GOVERN.
9. TESTING OF UTILITY TRENCH BACKFILL COMPACTION SHALL BE AT 75' INTERVALS AND EACH LIFT'S BACKFILL UNLESS OTHERWISE DEFINED IN THE GEOTECHNICAL REPORT FOR THIS PROJECT. BACKFILL SHALL BE PROCESSED SUCH THAT NO DIRT CLODS ARE IN EXCESS OF 4" DIAMETER. ALL SANITARY SEWER LINES AND STORM SEWER LINES SHALL BE TV TESTED AT THE COMPLETION OF THE PROJECT (IN ADDITION TO MINIMUM CODE OR OTHER REQUIREMENTS) TO CHECK FOR DAMAGE CAUSED BY OTHER TRADES, UTILITY CONFLICTS, TRENCH SETTLEMENT, ETC. THE COST OF SUCH SHALL BE INCLUDED IN THE CONTRACTORS BASE PRICE.

STANDARD ABBREVIATIONS:

		LT	LEFT
APPROX	APPROXIMATELY	MBC	MULTIPLE BOX CULVERT
ASPH	ASPHALT	ME	MATCH EXISTING
BC	BACK OF CURB	MH	MANHOLE
B-B	BACK TO BACK OF CURB	N/A	NOT APPLICABLE
BFR	BARRIER FREE RAMPS	NG	NATURAL GROUND (EXISTING)
BM	BENCHMARK	PC	POINT OF CURVATURE
BW	BOTTOM OF WALL	PCC	POINT OF COMPOUND CURVATURE
CATV	CABLE TV	PI	POINT OF INTERSECTION
CFS	CUBIC FEET PER SECOND	PIV	POST INDICATOR VALVE
CI	CURB INLET	PL	PROPERTY LINE
CMP	CORRUGATED METAL PIPE	PP	POWER POLE
CO	CLEANOUT	PRC	POINT OF REVERSE CURVATURE
CONC	CONCRETE	PROP	PROPOSED
CONN	CONNECTION	PT	POINT OF TANGENCY
CONST	CONSTRUCT	PVC	POLYVINYL CHLORIDE PIPE
CL	CENTER LINE	PVMT	PAVEMENT
DCO	DOUBLE CLEANOUT	OCEW	ON CENTER EACH WAY
DE	DRAINAGE EASEMENT	OHE	OVERHEAD ELECTRIC
DI	DROP INLET	R	RADIUS
DIA	DIAMETER	RCB	REINFORCED CONCRETE BOX
DIP	DUCTILE IRON PIPE	RCI	RECESSED CURB INLET
DW	DOMESTIC WATER	RCP	REINFORCED CONCRETE PIPE
EJ	EXPANSION JOINT	RCCP	REINFORCED CONCRETE CYLINDRICAL PIPE
ELEV	ELEVATION	REINF	REINFORCED
EMH	ELECTRIC MANHOLE	RL	RIDGE LINE
EP	EDGE OF PAVEMENT	ROW	RIGHT OF WAY
ESMT	EASEMENT	RT	RIGHT
EX	EXISTING	SF	SQUARE FEET
FC	FACE OF CURB	SD	STORM DRAIN
F-F	FACE TO FACE OF CURB	SQ	SQUARE
FFE	FINISH FLOOR ELEVATION	SS	SANITARY SEWER
FH	FIRE HYDRANT	SSE	SANITARY SEWER EASEMENT
FM	FORCE MAIN	STA	STATION
FO	FIBER OPTICS	SY	SQUARE YARD
FG	FINISHED GRADE	T	TELEPHONE
FP	FINISHED PAD	TC	TOP OF CURB
FPS	FEET PER SECOND	TG	TOP OF GROUND
FL	FLOW LINE	TMH	TELEPHONE MANHOLE
G	GUTTER	TP	TOP OF PAVEMENT
GI	GRATE INLET	TPIPE	TOP OF PIPE
GM	GAS METER	TW	TOP OF WALL
HDPE	HIGH DENSITY POLYETHYLENE PIPE	TYP	TYPICAL
HDWL	HEADWALL	UE	UTILITY EASEMENT
HMAC	HOT MIX ASPHALTIC CONCRETE	UGE	UNDERGROUND ELECTRIC
HORIZ	HORIZONTAL	VCP	VITRIFIED CLAY PIPE
HP	HIGH POINT	WTR	WATER
HVAC	HEATING, VENTILATION AND AIR CONDITIONING	WE	WATER EASEMENT
IRR	IRRIGATION	WL	WATER LINE
JB	JUNCTION BOX	WM	WATER METER
JT	JOINT	WMH	WATER MANHOLE
LF	LINEAR FEET	WV	WATER VALVE
LP	LOW POINT	WW	WASTE WATER

CITY OF GARLAND, TX CASE #: 210928-1

P R E L I M I N A R Y
F O R R E V I E W O N L Y
THESE DOCUMENTS ARE FOR DESIGN REVIEW ONLY AND NOT INTENDED FOR THE PURPOSES OF CONSTRUCTION, BIDDING OR PERMIT. THEY WERE PREPARED BY, OR UNDER THE SUPERVISION OF:

SHAWN T. WALDO
P.E.# 138653
DATE: January 9, 2023

ARAPAHO TOWNHOME

CITY OF GARLAND
DALLAS COUNTY, TEXAS

REV:	DATE:	DESCRIPTION:

KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

JOB NUMBER: NCL21008

ISSUE DATE: DATE

GENERAL NOTES

SHEET:
V1.2

FULL PATH: K:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\V1.2 GENERAL NOTES_

FILENAME: V1.2 GENERAL NOTES_.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023

GENERAL NOTES – ALL DEVELOPMENT

CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE ENGINEERING DEPARTMENT FOR FINAL INSPECTION. PRIOR TO FINAL ACCEPTANCE, COPIES OF CONTRACTS ON APPROVED FORMS AND BONDS MUST BE SUBMITTED TO THE ENGINEERING DEPARTMENT.

1. All construction shall be done in accordance with the adopted Standard Specifications for Public Works Construction in North Central Texas (Third Edition, unless otherwise specified) "Specifications" by North Central Texas Council of Governments, P.O. Drawer COG, Arlington, Texas 76005–5888, (817) 461–3300, as amended by the City of Garland. A copy of this book may be obtained from the North Central Texas Council of Governments at the address or phone number above, or is on file in the office of the Purchasing Agent of the City of Garland, located at City Hall, Garland, Texas. A copy of City Amendments is available in the Engineering Department, located at 800 Main Street, third floor, Garland, Texas.
2. The Engineering Department is to be NOTIFIED 24 HOURS PRIOR to ANY CONSTRUCTION.
3. WORK WILL NOT BE ACCEPTED WITHOUT A PERMIT AND CITY INSPECTION OF WORK.
   Contact Engineering Department (972–205–3622) for right–of–way permit and for work in city right–of–way or easement.
   Contact Building Inspection (972–205–2300) for sidewalk and driveway permits.
4. Four–foot (4) wide sidewalks are required in single family residential zoning districts unless waived by Planning Commission. All other zoning districts require six–foot (6) sidewalks. All existing sidewalk, driveway approach and curb and gutter abutting a new development or re–development must be in compliance with current City of Garland Engineering Department Standard Details. Existing paving not in compliance shall be repaired or replaced. Connecting to an existing sidewalk to make a wider sidewalk is prohibited; longitudinal butt joints are unacceptable in sidewalk paving.
5. Sidewalk and driveway geometrics shall conform to state and federal accessibility standards.
6. Sidewalk shall be free draining; low spots that pond water are unacceptable.
7. Sidewalks shall drain towards the street curb line. The parkway must be elevated a minimum of one fourth (1/4) of an inch per foot above the top of curb. Consult the most current City of Garland Engineering Department Standard Details for additional information.
8. Sidewalk cross slope and pathway across a driveway approach shall not exceed 1.5% at time of acceptance. Existing slopes shall be no more than 2% or the maximum allowed by the Americans with Disabilities Act (ADA).
9. Longitudinal alignment and grade shall follow the street.
10. City standard ADA Sidewalk Ramps are required at driveways, alleys and street intersections.
11. Running slope of a ramp shall be equal to or less than 1:12. Slopes greater than 1:12 shall be reconstructed to comply with ADA standards.
12. Sidewalk cracks that have separated – either horizontally or vertically and do not present a tripping hazard are acceptable and replacement is not required. The affected area of sidewalks with cracks or joints that are misaligned vertically by three fourths (3/4) of an inch or more or have a horizontal separation of three fourths (3/4) of an inch or more shall be replaced.
13. All existing sidewalk containing spalled surfaces shall be replaced.
14. Tree roots protruding more than 4 inches into the sidewalk path or if tree roots prohibit proper repair of the sidewalk as outlined in notes 4–13 above, the roots shall be saw cut and removed to allow the sidewalk to be placed on proper alignment and grade.
15. Site conditions may dictate that additional driveway paving be replaced due to excessive cracking, spalling, grade adjustment to new sidewalk, curb conditions of driveway, etc...
16. All affected areas of spalled or fractured curb and gutter shall be replaced.
17. Rough grading is to be done prior to construction of utilities.
18. All paving removed shall be sawcut to a neat line and removed.

1/5

Revision Date: 04/19

Scale : N/A Date : 06/01/05 Design : Drawn : JMK Dwg. File : GEN_001.DWG Project No. : STANDARD–DETAILS	GARLAND ENGINEERING STANDARD DETAILS	GENERAL NOTES	PAGE 1

GENERAL NOTES – (CONT.)

19. Any undesirable materials within the City Right–of–Way (ROW) and easements shall be excavated, materials removed, and filled with compacted select fill. Undesirable materials to be removed include, but are not limited to, organic material, unstable material, or undocumented fill. All materials removed shall be disposed of according to the Health Dept. and TCEQ regulations. See note 26 for further details regarding select fill.
20. Backfill of Excavations shall be select native material compacted in maximum 8 inch lifts to a minimum of 95 percent of standard proctor density as determined by laboratory testing. This applies to:
    a. Utility excavations above the Utility Embedment Material
    b. Structural excavations and other Non–Utility excavations
    c. In areas of new construction
    d. Areas of Utility replacement and/or repair under existing streets and alleys
21. The use of cement stabilized sand or flowable fill for final backfill is restricted primarily to localized or spot repairs of utilities under paving where restoration of paving and traffic is time critical as approved by the Engineering Department.
22. All bores under existing streets or alleys shall be lined with smooth steel carrier pipes unless open cutting of the street/alley is permitted by Engineering. Ends of steel carrier pipe to be sealed with grout.
23. The City will not accept utilities until all pavement over or near some has been constructed.
24. The contractor shall adjust the tops of all manholes, valves, meter boxes, fire hydrants and other utility appurtenances to fit the finished paving and shoulders. There will be no separate pay item for this work and the cost shall be included in the price bid for other items.
25. Barrier free ramps that comply with ADA requirements will be provided at all incoming streets, alleys, and non–residential driveways. No extra pay item.
26. Any fill material within proposed or future R.O.W. or Street Easements shall be Select fill provided, placed, and compacted in accordance with TxDOT current edition of Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges Item 132. Select fill shall be capable of forming a stable embankment from the required excavation and shall be granular material that is free from vegetation or other objectionable material and shall meet the requirements of TxDOT Item 132.2 Type A. The existing subgrade shall provide a stable working platform when the soil is compacted to a density of 95% of standard proctor at optimum moisture content according to ASTM D698. The cost shall be included in the price bid for excavation.
27. Traffic routing, signal removal and placement, and all other traffic matters shall be coordinated with the Transportation Department (972–205–2430) with 48 hours notice. Contractor is responsible for all temporary traffic signal, traffic control and school signal work during construction.
28. All traffic signal and street light base locations to be field approved prior to installation.
29. The contractor shall be required to provide and maintain all necessary warning and safety devices to protect the public safety and health until all work has been completed and accepted.
30. The location of existing utilities shown on these plans are approximate unless specifically noted. It is the responsibility of the contractor to locate and verify on–site any utilities that may conflict with the construction. At least 48 hours prior to beginning construction in the vicinity of existing underground utilities, the contractor shall notify the following as applicable:

    * CALL TEXAS811

    Contractor to mark area to be located with WHITE MARKER PAINT.

    Contractor shall not begin work until all utilities have been located with marks on the ground.
31. Stabilization of disturbed areas prior to final acceptance:
    a. Public right–of–way, easements, and common areas must be stabilized with perennial vegetation cover, fully established with 100% coverage, or other approved stabilization method. (See typical paving section – Detail Sheet No. 1)
    b. Detention/Retention Facilities, Channels, Drainage Ways and Outfalls shall have established perennial vegetation with 100% coverage.

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Revision Date: 04/19

Scale : N/A Date : 06/01/05 Design : Drawn : JMK Dwg. File : GEN_001.DWG Project No. : STANDARD–DETAILS	GARLAND ENGINEERING STANDARD DETAILS	GENERAL NOTES	PAGE 2

GENERAL NOTES – (CONT.)

32. Contractor is responsible for maintaining pedestrian access and signage as directed by the City.
33. The contractor shall be responsible for furnishing all laboratory tests necessary for testing new pavement. The testing laboratory used shall be under the management of a professional engineer licensed to practice in the State of Texas.
34. Roadways and alleys (CIP and Development) shall have a geotechnical investigation and subgrade design performed per the Technical Standards Manual (TSM) Section 9. If after the geotechnical investigation, the soil parameters and standard subgrade result in a modulus of subgrade reaction of 300 pci, and all other parameters are applicable, the City's standard subgrade and pavement shown on the standard details can be specified. If not, a custom pavement design to achieve a 40–year design life will be required per the TSM.

GENERAL NOTES – WASTEWATER

1. All sewer lines shall be placed in the center of streets, alleys, or easements, unless otherwise noted.
2. All sewer pipe shall be PVC SDR–26, Minimum pipe size shall be 8 inch unless specifically approved.
3. All 4 inch sewer service laterals shall be SDR–26.
4. Install sewer services 10 feet downstream from water service.
5. TV inspection (with pan/tilt cameras) will be the responsibility of the Developer/Contractor, and must be performed by an independent testing company that is regularly employed for such services. A digital copy of the TV inspection shall be made and turned over for review and approval by the Engineering Department and/or Water Utilities Department.
6. All sanitary sewer mains are to be "SDR–26 pressure pipe" at least 5 feet on either side of water mains where crossings occur within a 9' radius.
7. Contractor may use standard precast concrete manholes or cast–in–place manholes.
8. Blocking of sewer lines, deep sewer cut connections, and embedment shall conform to City of Garland standards.
9. All sewer mains shall be installed with polyethylene plastic tape for identification and protection purpose. Tape for sewer mains shall be green and lettered with "caution sewer line buried below". Tape shall be 4.0 mil thick and 6" wide and furnished in 1000 foot rolls. Marking tape shall be placed along the center line of pipe trench on top of normal pipe embedment, and in no case less than than 6" above top of pipe. All tape shall be Terra Tape as manufactured by Reef Industries or equal.

GENERAL NOTES – LIGHT POLE BASES

Contractor shall have Engineering Inspector notify Garland Power and Light 48 hours prior to start of construction so that power to circuit may be killed out and light pole removed from base.

Existing street light bases shall be removed and new street light base, 1 1/2" PVC conduit, and new wiring installed to new base prior to removing existing curb and gutter for left turn lane.

New wire installed shall consist of 2 # 6 Cu. insulated conductors and 1 # 6 bare Cu. conductor with minimum of three feet of conductor extending out of top of new street light base or pull box. All existing/new conductor wires which are to be covered by concrete paving shall be placed in conduit in such a manner that the conduit extends a minimum of two feet beyond the edge of proposed concrete or median paving. Splicing of the conductor wires will not be permitted in the conduit, but shall be re–pulled so as to be continuous from street light base to street light base or junction box.

Anchor bolts and ground rods will be furnished by the City and will be picked up by the Engineering Inspector at the City Warehouse at the contractor request.

After installation of wire, Contractor shall notify Garland Power and Light Distribution Department (972–205–3449) to have street light pole re–installed. Garland Power and Light will re–energize circuit.

3/5

Revision Date: 04/19

Scale : N/A Date : 06/01/05 Design : Drawn : JMK Dwg. File : GEN_001.DWG Project No. : STANDARD–DETAILS	GARLAND ENGINEERING STANDARD DETAILS	GENERAL NOTES: WASTEWATER LIGHT POLE BASES	PAGE 3

GENERAL NOTES – STORM SEWER

1. Reinforced concrete pipe only. (min. 21")
2. Storm sewer connections for new intercepting mains and laterals into new trunk mains shall be factory wyes for 48" and smaller pipe.
3. Joint materials permitted are as follows:
   Ram–Neck
   Con–Seal
   Cement Grout
4. All headwalls shall be poured–in–place.
5. If reinforced box culvert is required, contractor shall provide shop drawings for city approval.

GENERAL NOTES – WATER

1. All water lines to have a minimum cover as follows or as required to clear other utilities:
   Up through 8" – 4'
   10" – 12" – 5'
   Over 12" – 6'
   Type K Copper – Services Min. Depth 2'
2. All water lines to be placed 6' from property line, unless otherwise noted.
3. All lines 12" or less in diameter shall be C–900 PVC DR–18.
4. Install services at center of lot or as shown on plans.
5. Services on PVC pipe shall be Mueller Ford, McDonald or Jones bronze double strap tapping saddles with outlet tapped with A.W.W.A. tapered threads. No PVC coated saddles will be allowed.
6. Service must be continuous, one piece copper, from corporation stop to meter without any splices or couplings.
7. "Squeeze Stopping" or "Crimp Stopping" is absolutely prohibited. This practice damages the copper too much and just contibutes to future problems. If this practice is employed for some emergency reason, then the copper service must be replaced from corporation stop to meter.
8. Meter boxes to be furnished and installed by developer and/or contractor shall be:

   For 5/8" & 3/4" Meters:
   - The box shall be 18" diameter & 18" tall, with slots 3" wide & 4" tall.
   - The lid shall be 12–5/8" dia., with a lid opening of 11–3/4" dia.

   For 1" Meters:
   - The box shall be 24" diameter & 18" tall, with slots 3" wide & 4" tall.
   - The lid shall be 20" dia., with a lid opening of 18–3/4" dia.

   For 1–1/2" & 2" Meters:
   - The box shall be 28" diameter & 18" tall, with slots 3" wide & 4" tall.
   - The lid shall be 20" dia., with a lid opening of 18–3/4" dia.

   Base
   - The box shall be constructed from black polyethylene material with crush resistant ribbing.
   - Only one slot shall be cut out on opposite end of the box's sides.
   - A cast iron ring shall be molded to the top and secured with four (4) coated self–tapping bolts.
   - The box shall have a (2") base footing to help eliminate sinking or floating.
   - The box shall be constructed to withstand twelve hundred pound (1200 lb) of compression on a vertical crush test.
   - Meter box shall be "F" series by DFW Plastics Inc. or approved equal.

   Lid
   - The lid shall be constructed from a black polyethylene material.
   - The lid shall have "Water Meter" molded into the lid.
   - The lid shall be textured with a diamond pattern for skid resistance.
   - The lid shall sit securely and evenly inside the cast iron ring.
   - The lid shall have a spring–loaded brass locking mechanism that uses a standard brass meter box key.

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Revision Date: 04/19

Scale : N/A Date : 06/01/05 Design : Drawn : JMK Dwg. File : GEN_001.DWG Project No. : STANDARD–DETAILS	GARLAND ENGINEERING STANDARD DETAILS	GENERAL NOTES: STORM SEWER WATER	PAGE 4

GENERAL NOTES – WATER (CONT.)

9. On all valves, use three piece adjustable screw type cast iron valve box covers with PVC C–900 extensions as required. The bell end of the C–900 shall be installed over the valve operating nut. Spigot end will not be allowed over the operating nut. Cast iron valve boxes and covers shall be made in the U.S.A. and conform to A.W.W.A. Permanent scoring of curbs or pavement for valve location, is required prior to final inspection. The arrow scoring is approximately 1/2" deep with a 6" high, three–sided arrow pointing directly at the valve box. The scored arrow marks are then neatly sprayed with Blue paint.
10. Fire hydrant brands acceptable to the City are Mueller Centurion A–423, Waterous Pacer W6867, Kennedy Guardian, Clow Medallion, or Firefly–Model F–06.
11. Bonnet of fire hydrants to be painted as follows:

Size of Main	Color
6 inch	Flynt Aluminum Paint
8 inch	Flynt Tropic Blue Enamel
10 inch or above	Flynt Safety Yellow Enamel

12. Fire hydrants must be located no less than 2'–6" nor more than 8'–0" (4'–0" in residential street) from the back of curb/drive to center of barrel or not in sidewalk location.
13. The center of the fire hydrant pumper nozzle must be no less than 15" nor more than 21" above the top of curb or finished grade.
14. Heavily Chlorinated water (3.5 mg/l or greater free Chlorine) resulting from water line sterilization shall be directed under permit to the sanitary sewer unless otherwise noted. The Contractor shall apply to the Engineering Department for a sanitary sewer discharge permit after the mandatory Chlorine retention time (usually 24 hours). The heavily Chlorinated water may be discharged to the sanitary sewer, beginning two working days after permit application.
15. Upon receipt of an acceptable bacteriological report on new water mains, the contractor shall remove all copper bleeder lines from water mains.
16. All bolts, studs and nuts used in water main fittings, valves and appurtenances shall be stainless steel on flange joints; Corten on MJ joints.
17. All fittings and valves shall be polywrapped with a minimum of 8 mils and shall be made in the U.S.A. and shall conform to A.W.W.A.
18. All PVC water main pipe with mechanical joint fittings (concrete blocking) shall be retained with:

    a. Retainer Glands (EBBA Series 2000 PV or equal) or,

    b. Romac GripRing Restrainer Glands (meeting the requirements of UNI–B–13–92 and designed for both ductile and C900 water pipe) or,

    c. Ford/Uni–Flange Series 1500 "Circle Lock" Restraining Glands (FM, ASTM F 1674 and ISO–9001 certified for C–900 PVC pipe 4"–12") or,

    d. Uni–Flange Series 1300 W/316 stainless steel. Plus standard thrust blocking. Blocking of water lines shall conform to City of Garland standards.
19. No person shall open, turn–off, interfere with, attach any hose to, or tap any water main belonging to the City unless duly authorized to do so by the City of Garland Water Department (972–205–3210).
20. Arrangements for construction water shall be made through the City of Garland Water Department (972–205–3210).
21. All water mains shall be installed with polyethylene plastic tape for identification and protection purpose. Tape for water mains shall be blue and lettered with "caution water line buried below". Tape shall be 4.0 mil thick and 6" wide and furnished in 1000 foot rolls. Marking tape shall be placed along the center line of pipe trench on top of normal pipe embedment, and in no case less than 6" above top of pipe. All tape shall be Terra Tape as manufactured by Reef Industries or equal.

5/5

Revision Date: 04/19

Scale : N/A Date : 06/01/05 Design : Drawn : JMK Dwg. File : GEN_001.DWG Project No. : STANDARD–DETAILS	GARLAND ENGINEERING STANDARD DETAILS	GENERAL NOTES: WATER	PAGE 5

FULL PATH: K:\Jobs\NCL21008_Garland\Townhome\Drawings\Preliminary Engineering\Civil\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\V1.3 GENERAL NOTES_

FILENAME: V1.2 GENERAL NOTES_.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023

CITY OF GARLAND, TX CASE #: 210928-1

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SHAWN T. WALDO
P.E.# 138653
DATE: January 9, 2023

FIRST INFRA
DEFINE & DELIVER

ARAPAHO TOWNHOME

CITY OF GARLAND
DALLAS COUNTY, TEXAS

REV:	DATE:	DESCRIPTION:

kirkman ENGINEERING
KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

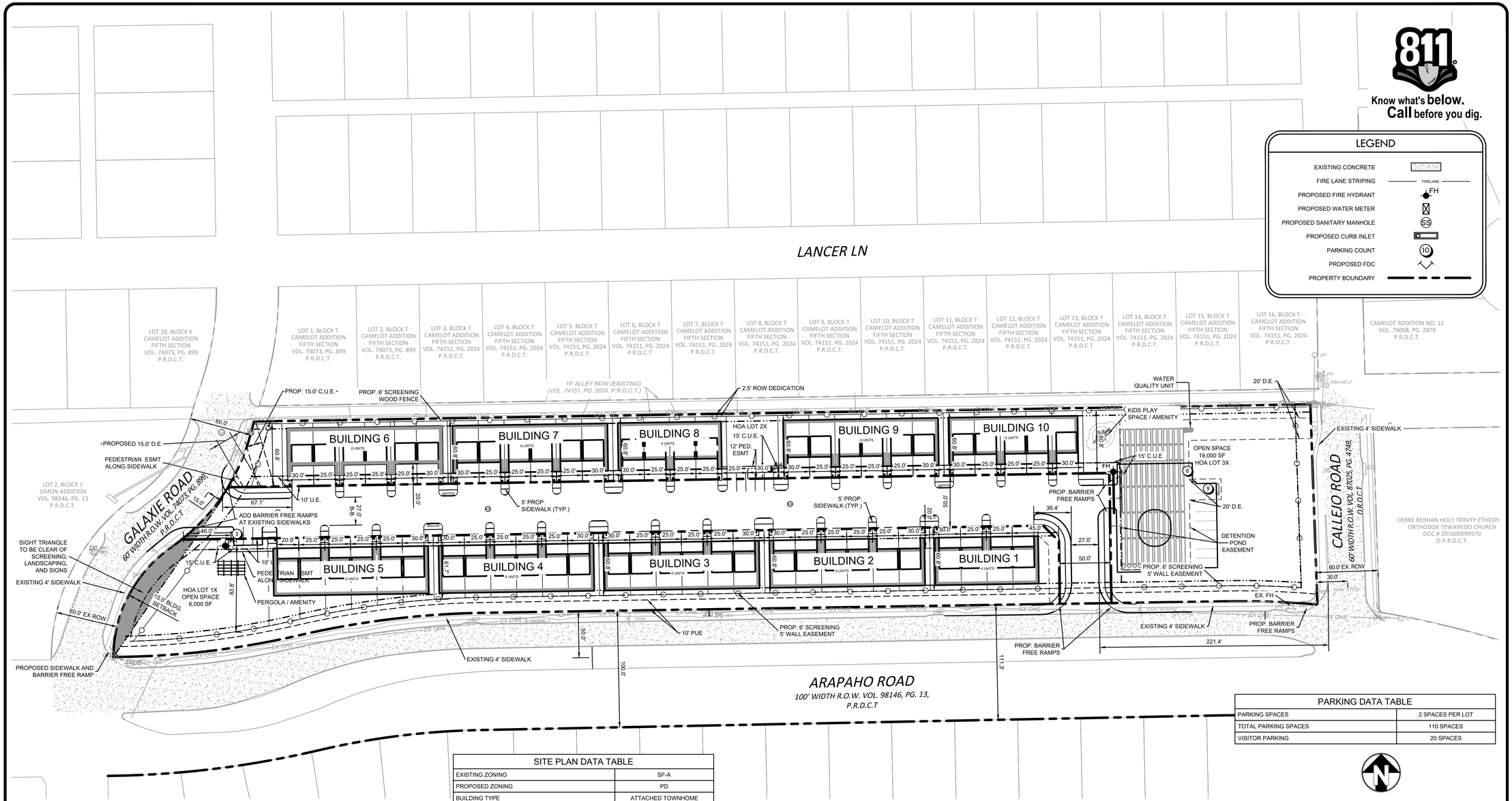
JOB NUMBER: NCL21008

ISSUE DATE: DATE

CITY OF GARLAND NOTES

SHEET:

V1.3



Know what's **below.** **Call** before you dig.

LEGEND

EXISTING CONCRETE	
FIRE LANE STRIPING	FIRELANE
PROPOSED FIRE HYDRANT	FH
PROPOSED WATER METER	
PROPOSED SANITARY MANHOLE	SS
PROPOSED CURB INLET	
PARKING COUNT	10
PROPOSED FDC	
PROPERTY BOUNDARY	

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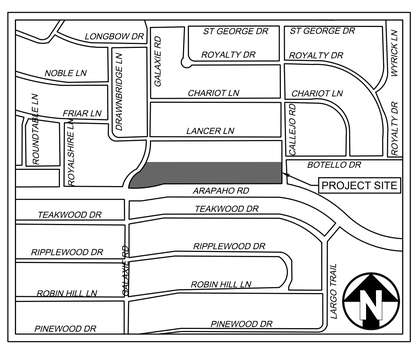
SHAWN T. WALDO
P.E.# 138653
DATE: January 9, 2023

FIRST INFRA
DEFINE & DELIVER

ARAPAHO TOWNHOME

CITY OF GARLAND
DALLAS COUNTY, TEXAS

REV:	DATE:	DESCRIPTION:



VICINITY MAP
N.T.S.

SITE PLAN DATA TABLE	
EXISTING ZONING	SF-A
PROPOSED ZONING	PD
BUILDING TYPE	ATTACHED TOWNHOME
TOTAL AREA OF SITE	212,005 SF / 4.87 AC
FLOOR AREA RATIO	25.6% / 0.256:1
TOTAL BUILDING COVERAGE	54,440 SF
OFF-STREET PARKING SPACES (GUEST PARKING)	20 SPACES
NET RESIDENTIAL DENSITY	11.9 UNITS / AC
MIN LOT SIZE	1,500SF
MIN LOT DEPTH	60'
MIN LOT WIDTH	25'
MAX BUILDING HEIGHT	36'-0" (3 STORY)
OPEN SPACE PROVIDED (SF/%)	25,000 SF / 11.7%
MINIMUM YARD SETBACKS	
FRONT:	10' (20' GARAGE SETBACK)
REAR:	5'
SIDE:	0' & 5'
NUMBER OF TOWNHOME LOTS	55
NUMBER OF HOA LOTS	3
TREE REQUIREMENTS:	1 TREE PER EVERY 2,500 SF
FINISHED FLOOR ELEVATION TO BE BUILT 1 FT ABOVE TOP OF CURB	
PROPOSED ROADWAY TO BE CONSTRUCTED PER CITY REQUIREMENTS	
PARKING PAVING WITHIN THE ROW SHALL BE MAINTAINED BY THE HOA AND A LICENSED AGREEMENT WILL REQUIRED FROM ENGINEERING AT THE TIME OF CONSTRUCTION	

NOTE
IT SHALL BE THE DEVELOPERS RESPONSIBILITY TO BRING THEIR HALF OF CALLEJO ROAD UP TO CURRENT STANDARDS IN ACCORDANCE WITH GDC SECTIONS 3.44-3.47

STREET APPROACH PER CITY STANDARD DETAILS.

STREET SHALL HAVE MOUNTABLE CURBS.

PARKING DATA TABLE	
PARKING SPACES	2 SPACES PER LOT
TOTAL PARKING SPACES	110 SPACES
VISITOR PARKING	20 SPACES

GRAPHIC SCALE
0 50 100 FEET
SCALE: 1" = 50'

CITY OF GARLAND, TX CASE #: 210928-1

SITE PLAN
CITY PROJECT NO. 210928-1

ARAPAHO TOWNHOME
4.87 ACRES
SURVEY ADDITION NAME
(INST. NO. 20190215010000670)
CITY OF GARLAND, DALLAS COUNTY, TEXAS
PREPARATION DATE: 11/07/2022

OWNER/APPLICANT
FIRST INFRA LLC
1925 E BELTLINE ROAD
CARROLLTON, TEXAS 75006
PH: 408-992-5558
CONTACT: BHARATH NANDIGAM

LANDSCAPE ARCHITECT
LANDSCAPE ARCHITECT COMAPNY
LANDSCAPE ADDRESS
LANDSCAPE ADDRESS
PH: LANDSCAPE PHONE NUMBER
CONTACT: LA ARCHITECT, RLA

ENGINEER
KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
PH: 817-488-4960
CONTACT: JOHN GARDNER, PE

SURVEYOR
BARTON CHAPA SURVEYING
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
PH: 817-864-1957
CONTACT: JACK BARTON, RPLS

kirkman ENGINEERING

KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

JOB NUMBER: NCL21008

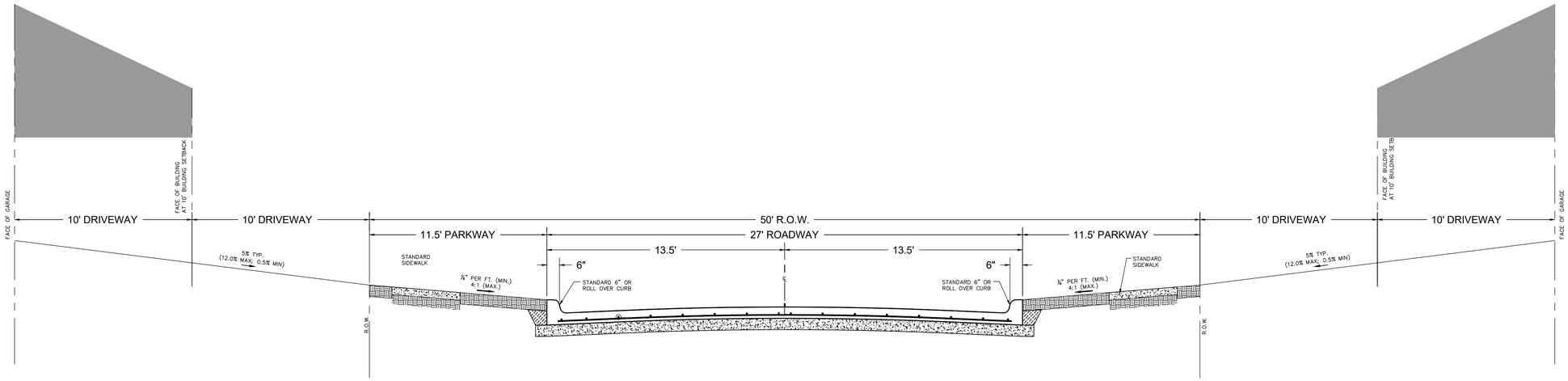
ISSUE DATE: DATE

SITE PLAN

SHEET:
V2.0

FILE PATH: K:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\~Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\V2.0 SITE PLAN_PCF2

FILENAME: V2.0 SITE PLAN_PCF2.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023



TYPICAL CROSS SECTION
n.t.s

CITY OF GARLAND, TX CASE #: 210928-1

SITE PLAN
CITY PROJECT NO. 210928-1

ARAPAHO TOWNHOME
4.87 ACRES
SURVEY ADDITION NAME
(INST. NO. 20190215010000670)
CITY OF GARLAND, DALLAS COUNTY, TEXAS
PREPARATION DATE: 05/20/2022

OWNER/APPLICANT
FIRST INFRA LLC
1925 E BELTLINE ROAD
CARROLLTON, TEXAS 75006
PH: 408-992-5558
CONTACT: BHARATH NANDIGAM

LANDSCAPE ARCHITECT
LANDSCAPE ARCHITECT COMAPNY
LANDSCAPE ADDRESS
LANDSCAPE ADDRESS
PH: LANDSCAPE PHONE NUMBER
CONTACT: LA ARCHITECT, RLA

ENGINEER
KIRKMAN ENGINEERING, LLC
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COLLEYVILLE, TX 76034
PH: 817-488-4960
CONTACT: JOHN GARDNER, PE

SURVEYOR
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5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
PH: 817-864-1957
CONTACT: JACK BARTON, RPLS

811 Know what's **below.** **Call** before you dig.

PRELIMINARY
FOR REVIEW ONLY
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SHAWN T. WALDO
P.E.# 138653
DATE: January 9, 2023

FIRST INFRA
REFINE & DELIVER

ARAPAHO TOWNHOME

CITY OF GARLAND
DALLAS COUNTY, TEXAS

REV:	DATE:	DESCRIPTION:

kirkman ENGINEERING
KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

JOB NUMBER: NCL21008

ISSUE DATE: DATE

CROSS SECTION

SHEET:
V2.1

FULL PATH: K:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\K:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\V2.1 SITE PLAN_Cross Section

FILENAME: V2.1 SITE PLAN_Cross Section.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023

Know what's **below.**
Call before you dig.

LEGEND

EXISTING DRAINAGE AREA LABEL	BASIN NAME: DA1 / ACRES: 0.63 ac. / Q100 (cfs): 5.57
EXISTING DRAINAGE AREA DIVIDE	
EXISTING DRAINAGE FLOW ARROW	
EXISTING CONTOUR	500
EXISTING STORM PIPE	
PROPERTY BOUNDARY	

NOTE TO CONTRACTOR
THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES (WHETHER SHOWN ON PLANS OR NOT) PRIOR TO COMMENCING CONSTRUCTION. IF FIELD CONDITIONS DIFFER SIGNIFICANTLY FROM LOCATIONS SHOWN ON THE PLANS, THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

LANCER LN

LOT 10, BLOCK K CAMELOT ADDITION FIFTH SECTION VOL. 74073, PG. 899 P.R.D.C.T.

LOT 1, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 2, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 3, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 4, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 5, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 6, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 7, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 8, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 9, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 10, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 11, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 12, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 13, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 14, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

LOT 15, BLOCK T CAMELOT ADDITION FIFTH SECTION VOL. 74151, PG. 2024 P.R.D.C.T.

CAMELOT AD VOL. 790(P.R.

EX 6" WW PER 851763

EX 4' MH (SS8B-42MH) PER 851763 RIM 588.1 FLS 584.7

CONCRETE DRAINAGE STRUCTURE

EX1
0.74 ac.
2.77

EX2
4.25 ac.
15.51

DESIGN POINT 1
Q100 EXISTING = 26.23 cfs
Q100 PROGRAMMED = 18.28 cfs
Q100 ALLOWABLE = 26.23 cfs

GALAXIE ROAD

60' WIDTH R.O.W. VOL. 74073, PG. 899, P.R.D.C.T.

CALLEJO ROAD
60' WIDTH R.O.W. VOL. 87025, PG. 4249, D.R.D.C.T

EX 8" WATER PER 851763

LOT 2, BLOCK 1 SIMON ADDITION VOL. 98146, PG. 13 P.R.D.C.T.

EX3
1.00 ac.
3.16

DESIGN POINT 2
Q100 EXISTING = 0.0 cfs
Q100 PROGRAMMED = 3.16 cfs
Q100 ALLOWABLE = 3.16 cfs

EX4
1.45 ac.
4.50

DESIGN POINT 3
Q100 EXISTING = 0.0 cfs
Q100 PROGRAMMED = 4.5 cfs
Q100 ALLOWABLE = 4.5 cfs

EX5
1.33 ac.
4.05

DESIGN POINT 4
Q100 EXISTING = 0.0 cfs
Q100 PROGRAMMED = 4.05 cfs
Q100 ALLOWABLE = 4.05 cfs

EX 8" WATER PER 851763

ARAPAHO ROAD
100' WIDTH R.O.W. VOL. 98146, PG. 13, P.R.D.C.T

CITY PROJECT NO. 210928-1

PROGRAMMED DRAINAGE AREA CALCULATIONS Q=CiA

DRAINAGE AREA ID	Tc (min.)	RUNOFF COEFFICIENT "C"	AREA (acres)	I100 (in./hr.)	Q100 (cfs)	COMMENTS
EX1	15	0.50	0.74	7.50	2.77	DRAINS TO DESIGN POINT 1 (C6 PER 851763)
EX2	17	0.50	4.25	7.30	15.51	DRAINS TO DESIGN POINT 1
EX3	24	0.50	1.00	6.30	3.16	DRAINS TO DESIGN POINT 2 (C6 PER 851763)
EX4	25	0.50	1.45	6.20	4.50	DRAINS TO DESIGN POINT 3 (C6 PER 851763)
EX5	26	0.50	1.33	6.10	4.05	DRAINS TO DESIGN POINT 4 (C6 PER 851763)

NOTE: DRAINAGE CRITERIA TAKEN FROM CITY OF GARLAND ENGINEERING DESIGN MANUAL DATED APRIL 2022.
PROGRAMMED DRAINAGE AREAS ARE FROM AS BUILT 851763

GRAPHIC SCALE
0 50 100 FEET
SCALE: 1" = 50'

CITY OF GARLAND, TX CASE #: 210928-1

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SHAWN T. WALDO
P.E.# 138653
DATE: January 9, 2023

FIRST INFRA
DEFINE & DELIVER

ARAPAHO TOWNHOME

CITY OF GARLAND
DALLAS COUNTY, TEXAS

REV.:	DATE:	DESCRIPTION:

KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

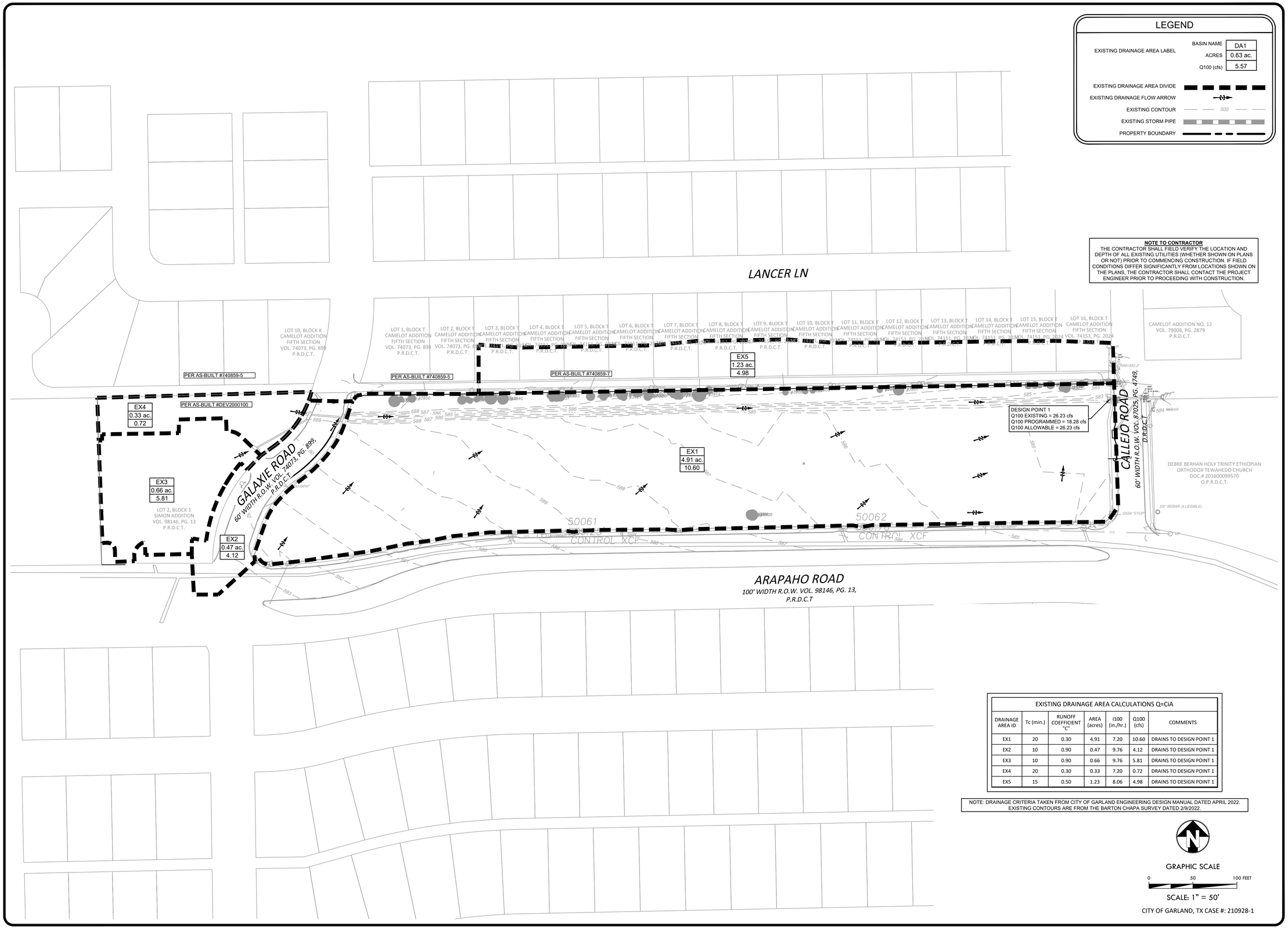
JOB NUMBER: NCL21008
ISSUE DATE: DATE

PROGRAMMED DRAINAGE AREA MAP

SHEET:
V3.0

FILE PATH: K:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\K:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\V3.0 PROGRAMMED DRAINAGE AREA MAP

FILENAME: V3.0 PROGRAMMED DRAINAGE AREA MAP.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023



EXISTING DRAINAGE AREA CALCULATIONS Q=CiA						
DRAINAGE AREA ID	Tc (min.)	RUNOFF COEFFICIENT "C"	AREA (acres)	I100 (in./hr.)	Q100 (cfs)	COMMENTS
EX1	20	0.30	4.91	7.20	10.60	DRAINS TO DESIGN POINT 1
EX2	10	0.90	0.47	9.76	4.12	DRAINS TO DESIGN POINT 1
EX3	10	0.90	0.66	9.76	5.81	DRAINS TO DESIGN POINT 1
EX4	20	0.30	0.33	7.20	0.72	DRAINS TO DESIGN POINT 1
EX5	15	0.50	1.23	8.06	4.98	DRAINS TO DESIGN POINT 1

NOTE: DRAINAGE CRITERIA TAKEN FROM CITY OF GARLAND ENGINEERING DESIGN MANUAL DATED APRIL 2022.
EXISTING CONTOURS ARE FROM THE BARTON CHAPA SURVEY DATED 2/9/2022.

GRAPHIC SCALE
0 50 100 FEET
SCALE: 1" = 50'

CITY OF GARLAND, TX CASE #: 210928-1

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kirkman ENGINEERING
KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

JOB NUMBER: NCL21008

ISSUE DATE: DATE

EXISTING DRAINAGE AREA MAP

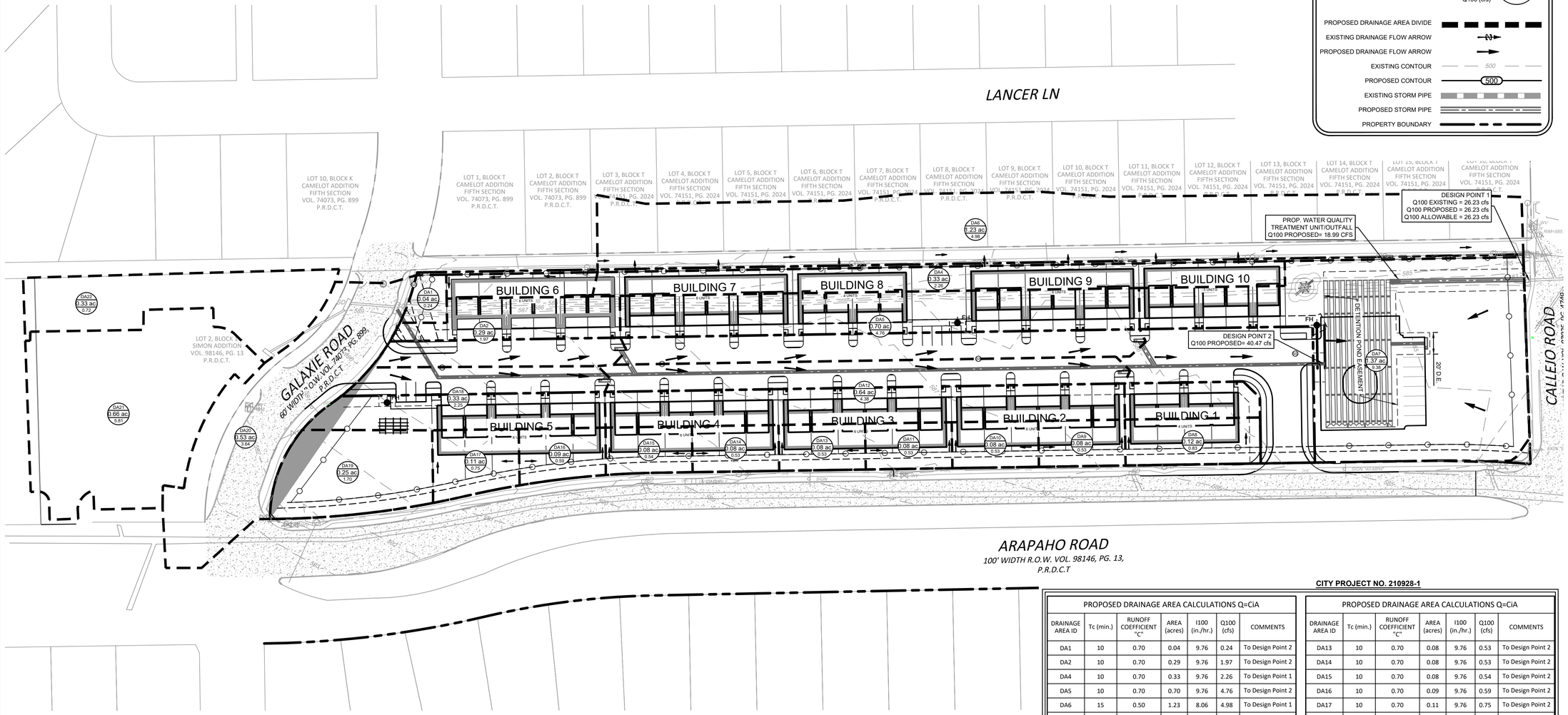
SHEET:
V3.1

FILENAME: V3.1 EXISTING DRAINAGE AREA MAP.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023
FULL PATH: K:\Jobs\NCL21008_Garland\Townhome\Drawings\Preliminary Engineering\K:\Jobs\NCL21008_Garland\Townhome\Drawings\Preliminary Engineering\V3.1 EXISTING DRAINAGE AREA MAP

Know what's **below.**
Call before you dig.

LEGEND

PROPOSED DRAINAGE AREA LABEL	BASIN NAME: DA1 / ACRES: 1.82 Ac. / Q100 (cfs): 14.52
PROPOSED DRAINAGE AREA DIVIDE	
EXISTING DRAINAGE FLOW ARROW	
PROPOSED DRAINAGE FLOW ARROW	
EXISTING CONTOUR	500
PROPOSED CONTOUR	500
EXISTING STORM PIPE	
PROPOSED STORM PIPE	
PROPERTY BOUNDARY	



ARAPAHO ROAD

100' WIDTH R.O.W. VOL. 98146, PG. 13, P.R.D.C.T

CITY PROJECT NO. 210928-1

PROPOSED DRAINAGE AREA CALCULATIONS Q=CiA

DRAINAGE AREA ID	Tc (min.)	RUNOFF COEFFICIENT "C"	AREA (acres)	I100 (in./hr.)	Q100 (cfs)	COMMENTS
DA1	10	0.70	0.04	9.76	0.24	To Design Point 2
DA2	10	0.70	0.29	9.76	1.97	To Design Point 2
DA4	10	0.70	0.33	9.76	2.26	To Design Point 1
DA5	10	0.70	0.70	9.76	4.76	To Design Point 2
DA6	15	0.50	1.23	8.06	4.98	To Design Point 1
DA7	10	0.70	1.37	9.76	9.38	To Design Point 2
DA8	10	0.70	0.12	9.76	0.83	To Design Point 2
DA9	10	0.70	0.08	9.76	0.53	To Design Point 2
DA10	10	0.70	0.08	9.76	0.53	To Design Point 2
DA11	10	0.70	0.08	9.76	0.53	To Design Point 2

PROPOSED DRAINAGE AREA CALCULATIONS Q=CiA

DRAINAGE AREA ID	Tc (min.)	RUNOFF COEFFICIENT "C"	AREA (acres)	I100 (in./hr.)	Q100 (cfs)	COMMENTS
DA13	10	0.70	0.08	9.76	0.53	To Design Point 2
DA14	10	0.70	0.08	9.76	0.53	To Design Point 2
DA15	10	0.70	0.08	9.76	0.54	To Design Point 2
DA16	10	0.70	0.09	9.76	0.59	To Design Point 2
DA17	10	0.70	0.11	9.76	0.75	To Design Point 2
DA18	10	0.70	0.33	9.76	2.25	To Design Point 2
DA19	10	0.70	0.25	9.76	1.70	To Design Point 2
DA20	10	0.70	0.53	9.76	3.64	To Design Point 2
DA21	10	0.90	0.66	9.76	5.81	To Design Point 2
DA22	20	0.30	0.33	7.20	0.72	To Design Point 2

NOTE: DRAINAGE CRITERIA TAKEN FROM CITY OF GARLAND ENGINEERING DESIGN MANUAL DATED APRIL 2022.

NOTE TO CONTRACTOR
EXISTING PRIVATE AND PUBLIC STORM SEWER AND UTILITY INFRASTRUCTURE ARE SHOWN PER RECORD DRAWING PLANS. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES (WHETHER SHOWN ON PLANS OR NOT) PRIOR TO COMMENCING CONSTRUCTION. IF FIELD CONDITIONS DIFFER SIGNIFICANTLY FROM LOCATIONS SHOWN ON THE PLANS, THE CONTRACTOR SHALL CONTACT THE PROJECT ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

GRAPHIC SCALE
0 50 100 FEET
SCALE: 1" = 50'

CITY OF GARLAND, TX CASE #: 210928-1

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SHAWN T. WALDO
P.E.# 138653
DATE: January 9, 2023

FIRST INFRA
DEFINE & DELIVER

ARAPAHO TOWNHOME

CITY OF GARLAND
DALLAS COUNTY, TEXAS

REV:	DATE:	DESCRIPTION:

KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

JOB NUMBER: NCL21008

ISSUE DATE: DATE

PROPOSED DRAINAGE AREA MAP

SHEET:
V3.2

FILE PATH: K:\Jobs\NCL21008_Garland\Townhome\Drawings\Preliminary Engineering\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\V3.2 PROPOSED DRAINAGE AREA MAP_

FILENAME: V3.2 PROPOSED DRAINAGE AREA MAP_.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023

Q100 DETENTION CALCULATIONS

Storm Duration Td (min)	Intensity (Proposed) ie (in/hr)	Allowable Outflow Qo (cfs)	Proposed Inflow Qp (cfs)	Inflow Volume Vin (cf)	Outflow Volume Vin (cf)	Storage Required (cf)
10	9.76	18.99	40.47	24282	11394	12888
11	9.32	18.13	39.11	25814	11964	13850
12	9.02	17.55	37.85	27254	12533	14721
13	8.74	17.01	36.68	28613	13103	15510
14	8.48	16.50	35.59	29899	13673	16226
15	8.06	15.68	34.58	31118	14243	16875
16	8.01	15.59	33.62	32276	14812	17464
17	7.80	15.17	32.72	33379	15382	17997
18	7.60	14.78	31.88	34432	15952	18480
19	7.41	14.41	31.09	35438	16521	18917
20	7.23	14.06	30.33	36402	17091	19311
21	7.06	13.73	29.62	37326	17661	19665
22	6.90	13.42	28.95	38213	18230	19983
23	6.74	13.12	28.31	39067	18800	20267
24	6.60	12.84	27.70	39889	19370	20520
25	6.46	12.57	27.12	40682	19940	20743
26	6.33	12.32	26.57	41448	20509	20939
27	6.20	12.07	26.04	42188	21079	21109
28	6.08	11.84	25.54	42904	21649	21255
29	5.97	11.62	25.06	43597	22218	21378
30	5.58	10.86	24.59	44269	22788	21481
31	5.75	11.20	24.15	44920	23358	21563
32	5.65	11.00	23.73	45553	23927	21626
33	5.56	10.81	23.32	46168	24497	21671
34	5.46	10.63	22.92	46766	25067	21700
35	5.37	10.45	22.55	47348	25637	21712
36	5.29	10.28	22.18	47915	26206	21709
37	5.20	10.12	21.83	48468	26776	21692
38	5.12	9.96	21.49	49006	27346	21661
39	5.04	9.81	21.17	49532	27915	21616
40	4.97	9.67	20.85	50045	28485	21560
41	4.90	9.53	20.55	50546	29055	21491
42	4.83	9.39	20.25	51036	29624	21411
43	4.76	9.26	19.97	51515	30194	21321
44	4.69	9.13	19.69	51983	30764	21219
45	4.63	9.00	19.42	52442	31334	21108
46	4.57	8.88	19.16	52891	31903	20987
47	4.51	8.77	18.91	53330	32473	20858
48	4.45	8.65	18.67	53761	33043	20719
49	4.39	8.54	18.43	54184	33612	20572
50	4.34	8.44	18.20	54599	34182	20417
51	4.28	8.33	17.98	55005	34752	20253
52	4.23	8.23	17.76	55404	35321	20083
53	4.18	8.13	17.55	55796	35891	19905
54	4.13	8.04	17.34	56181	36461	19720
55	4.08	7.95	17.14	56559	37031	19529
56	4.04	7.85	16.94	56931	37600	19331
57	3.99	7.77	16.75	57296	38170	19126
58	3.95	7.68	16.57	57656	38740	18916
59	3.90	7.60	16.39	58009	39309	18700
60	3.86	7.51	16.21	58357	39879	18478

DRAINAGE NOTE: FLOW TO DETENTION CALCULATED AS WEIGHTED AVERAGE OF DA1-22 EXCLUDING DA4 & DA6 WHICH BYPASS DETENTION	Acres	Runoff Coeff.	CA	T_c (min.)	I_{100} (in./hr.)	Q_{100} (c.f.s.)
	6.01	0.70	4.21	10.5	9.62	40.47

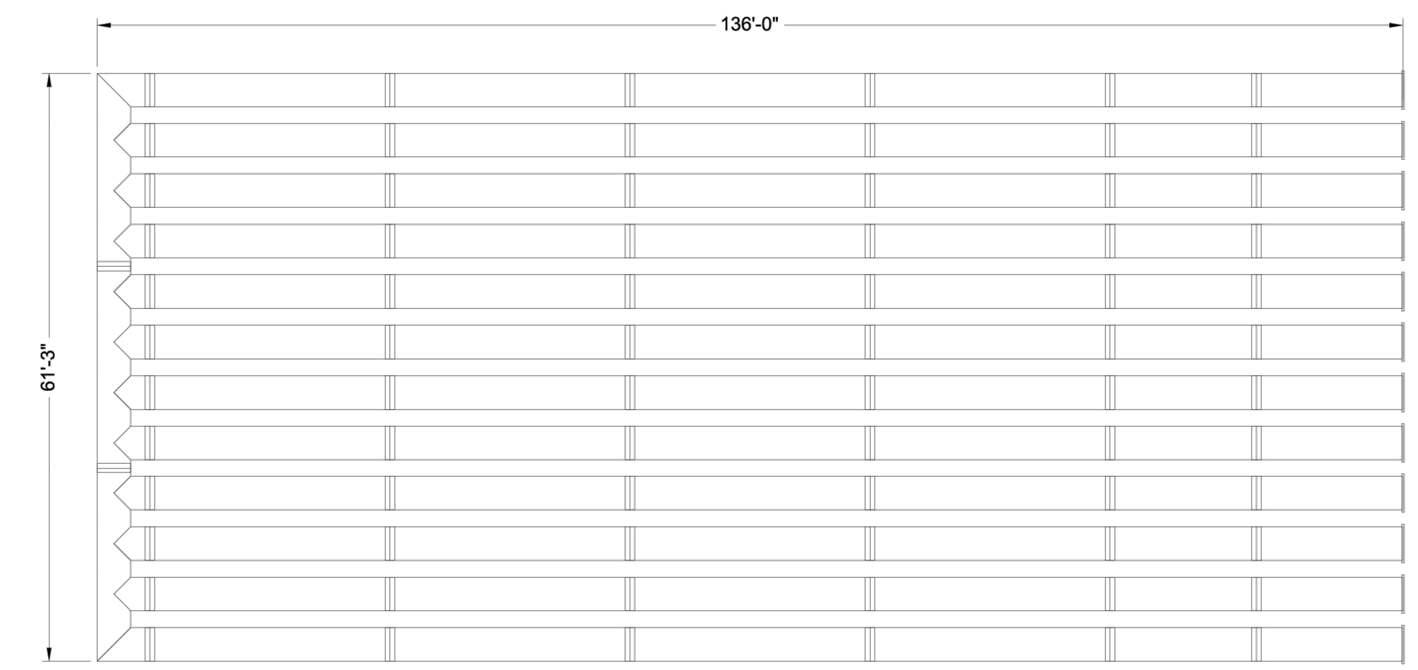
PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 1,651 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 21,712 CF
- PIPE STORAGE VOLUME = 15,887 CF
- BACKFILL STORAGE VOLUME = 5,865 CF
- TOTAL STORAGE PROVIDED = 21,752 CF

PIPE DETAILS
- DIAMETER = 42"
- CORRUGATION = 2 2/3x1/2
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 21"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 0"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 0"



ASSEMBLY
SCALE: 1" = 20'

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.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

C:\EXPORTS\TEMPLATES\CMP_V8.DWG 10/18/2019 10:02 AM

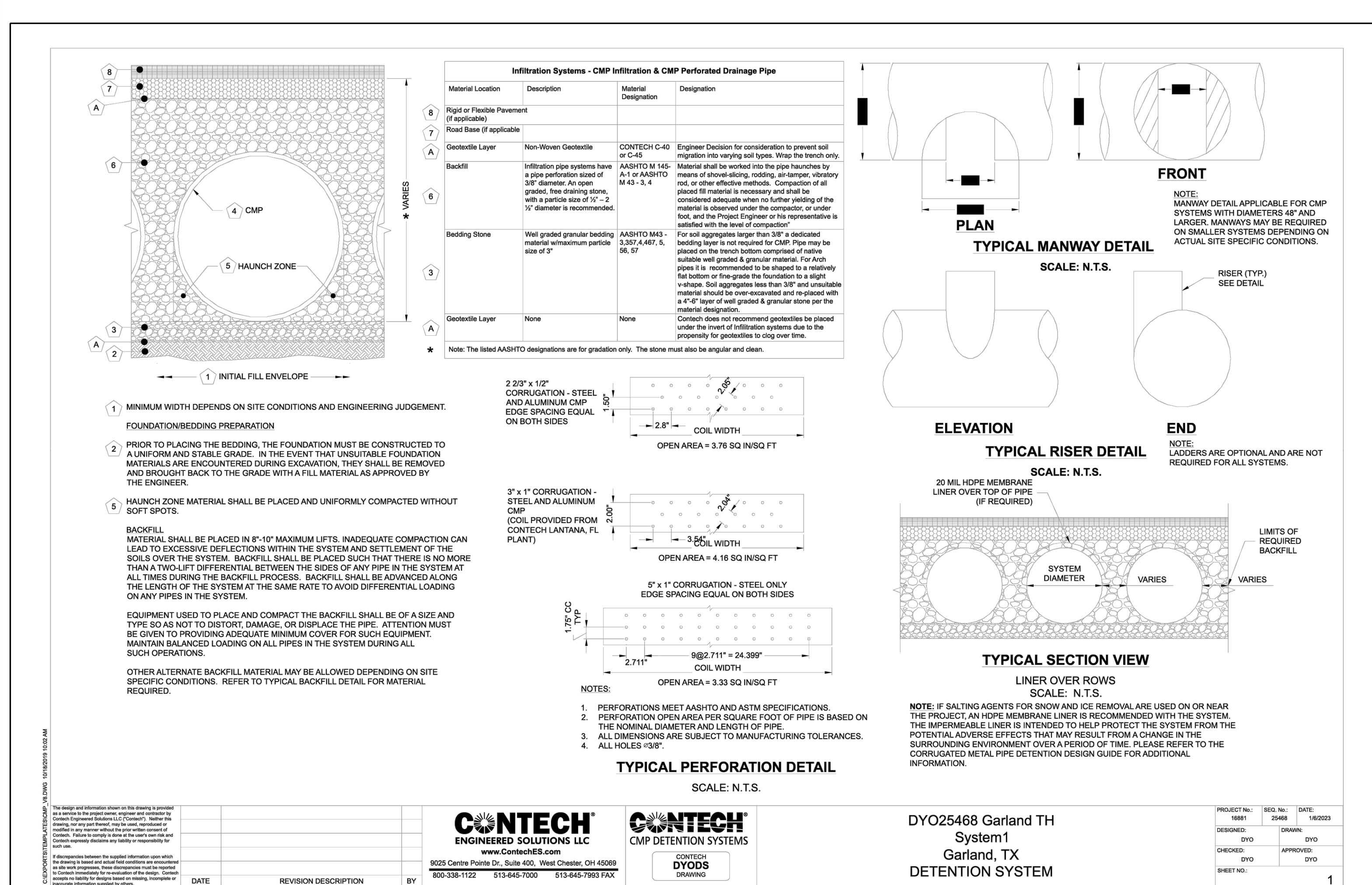
DATE	REVISION DESCRIPTION	BY

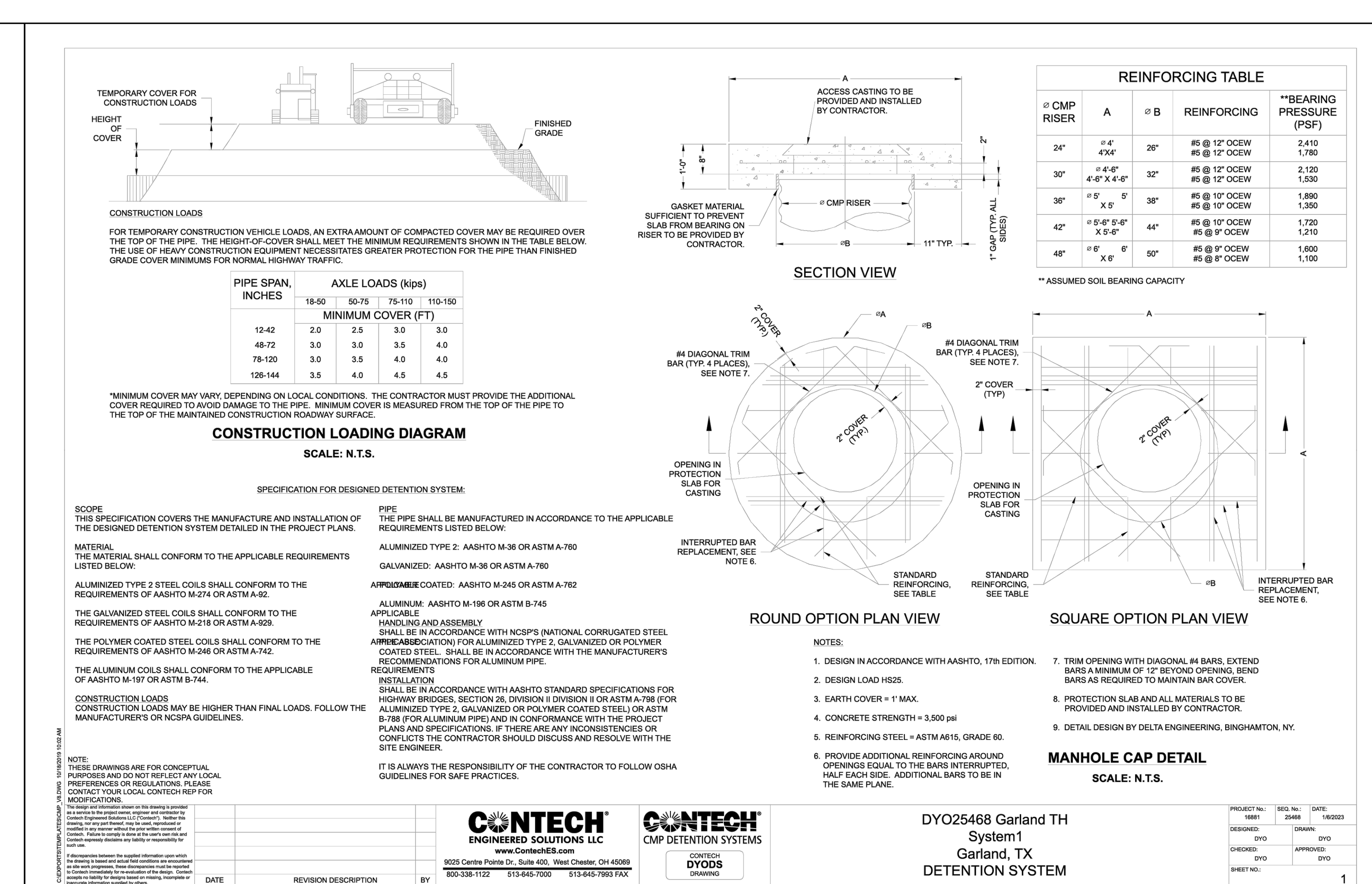
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

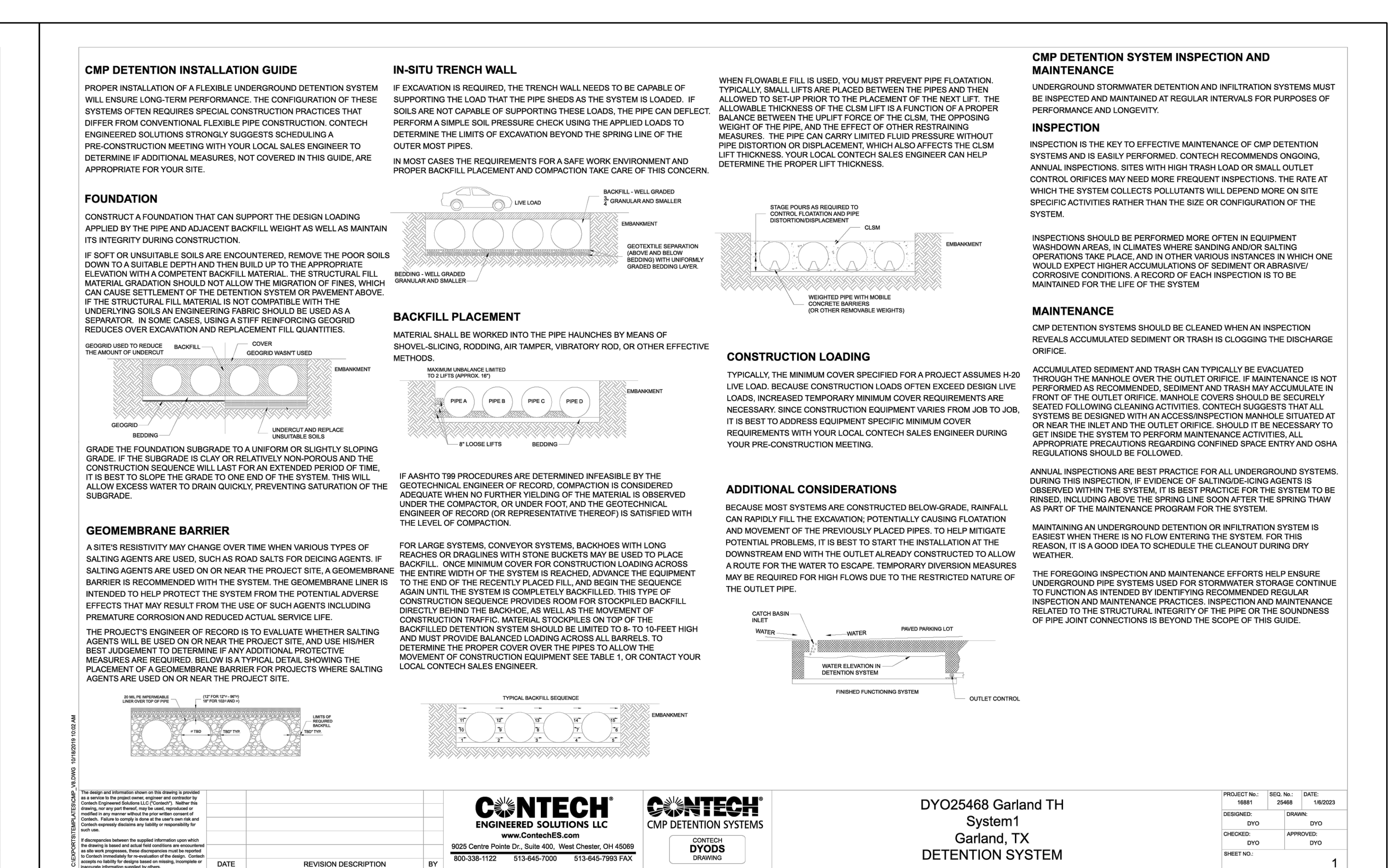
CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO25468 Garland TH
System1
Garland, TX
DETENTION SYSTEM

PROJECT No.: 16881	SEQ. No.: 25468	DATE: 1/6/2023
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 1		







CITY OF GARLAND, TX CASE #: 210928-1

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SHAWN T. WALDO
P.E.# 138653
DATE: January 9, 2023

ARAPAHO TOWNHOME
CITY OF GARLAND
DALLAS COUNTY, TEXAS

REV:	DATE:	DESCRIPTION:

KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

JOB NUMBER: NCL21008
ISSUE DATE: DATE

PRELIM DETENTION CALCS

SHEET:
V3.3

FULL PATH: K:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\K:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\V3.2 PROPOSED DRAINAGE AREA MAP_
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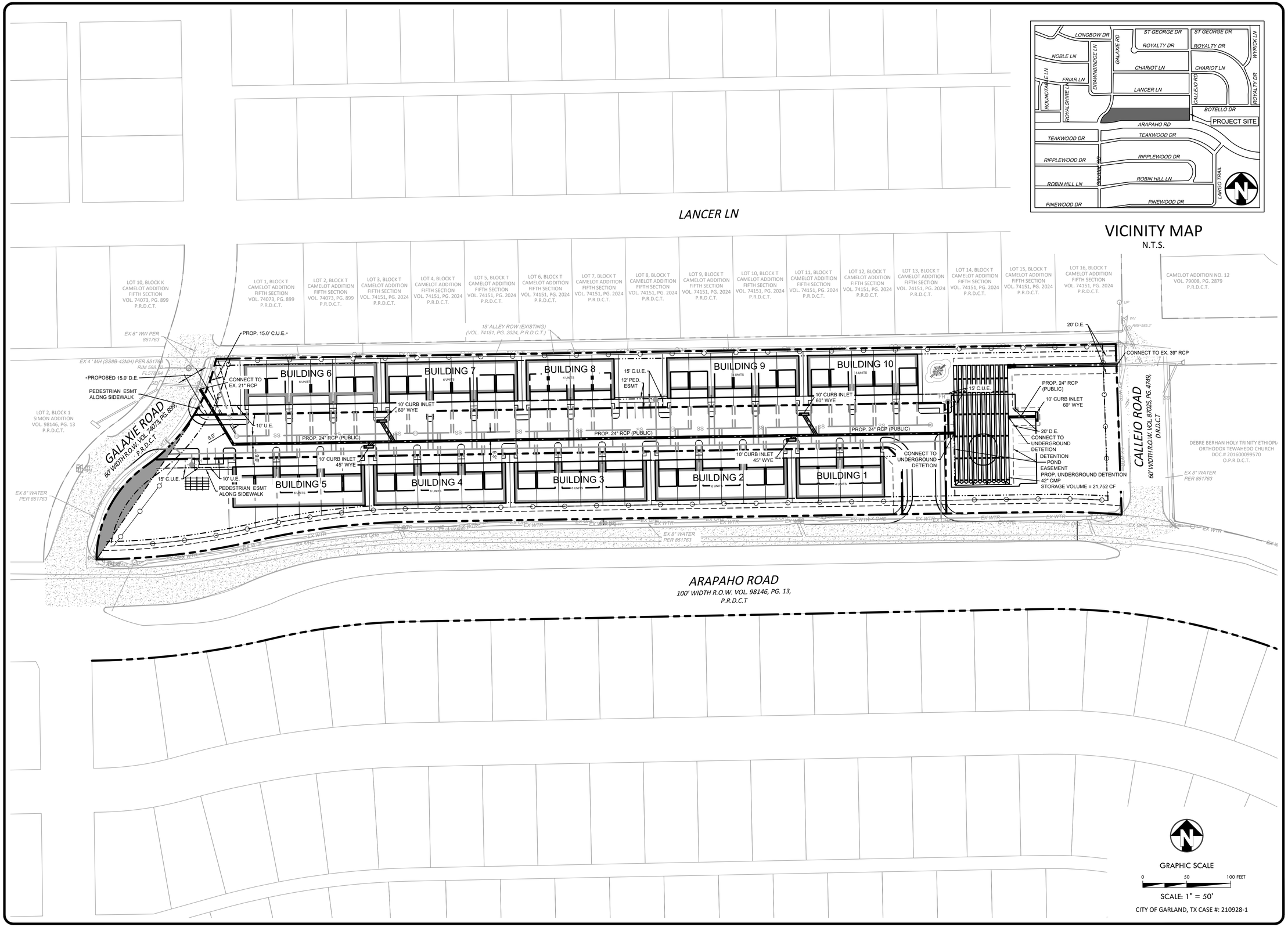
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023



VICINITY MAP
N.T.S.

GRAPHIC SCALE
0 50 100 FEET
SCALE: 1" = 50'

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5200 STATE HIGHWAY 121
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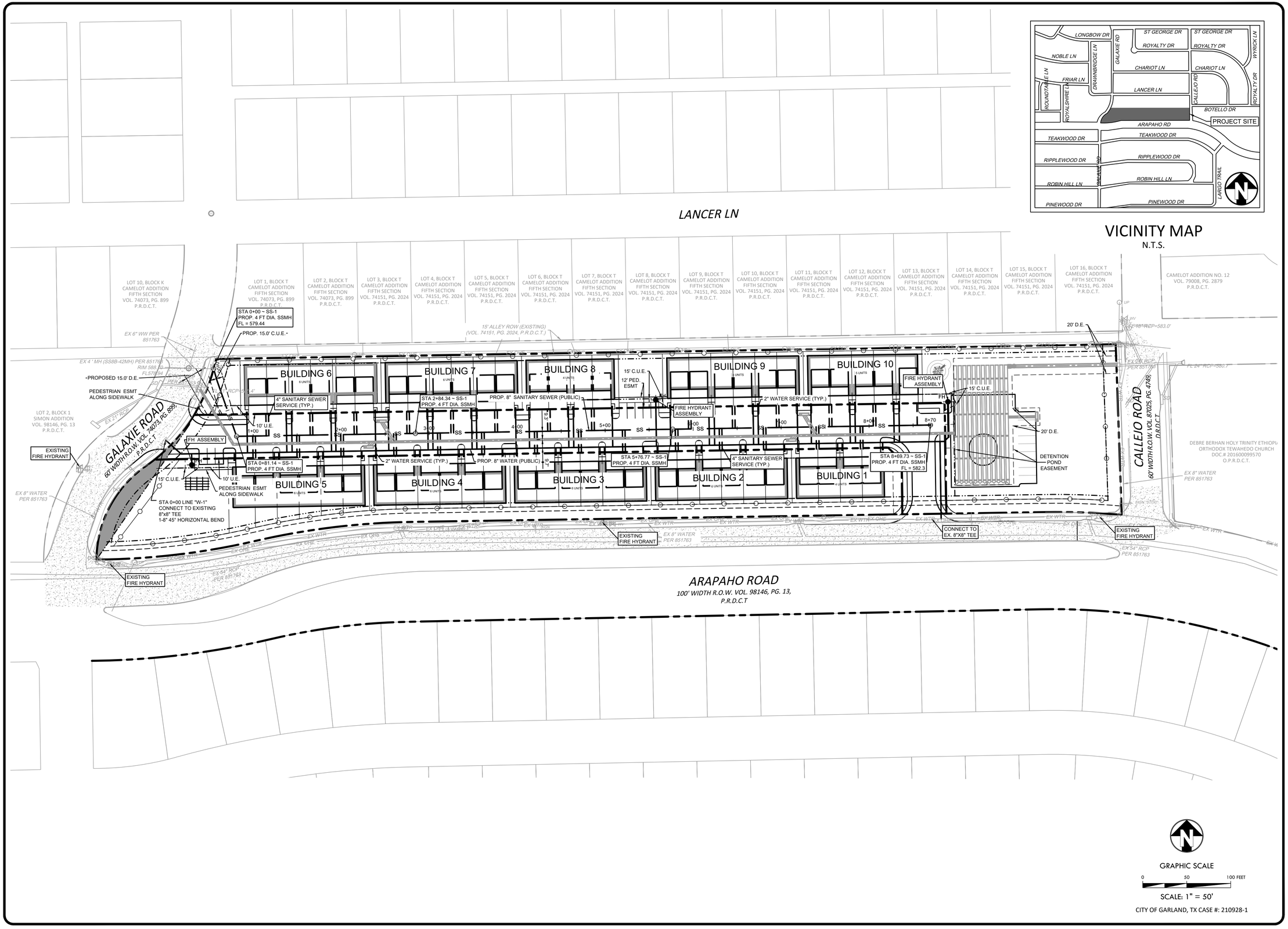
ISSUE DATE: DATE

PRELIMINARY STORM PLAN

SHEET:
V4.0

FILE PATH: K:\Job\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\K:\Job\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\V4.0 PRELIMINARY STORM PLAN

FILENAME: V4.0 PRELIMINARY STORM PLAN.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023



VICINITY MAP
N.T.S.

GRAPHIC SCALE
0 50 100 FEET
SCALE: 1" = 50'

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ISSUE DATE: DATE

PRELIMINARY UTILITY PLAN

SHEET:
V5.0

FILE PATH: K:\Jobs\NCL21008_Garland Townhome\Drawings\Preliminary Engineering\K:\Jobs\NCL21008_Garland Townhome\Drawings\Preliminary Engineering\V5.0 PRELIMINARY UTILITY PLAN.dwg

FILENAME: V5.0 PRELIMINARY UTILITY PLAN.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023

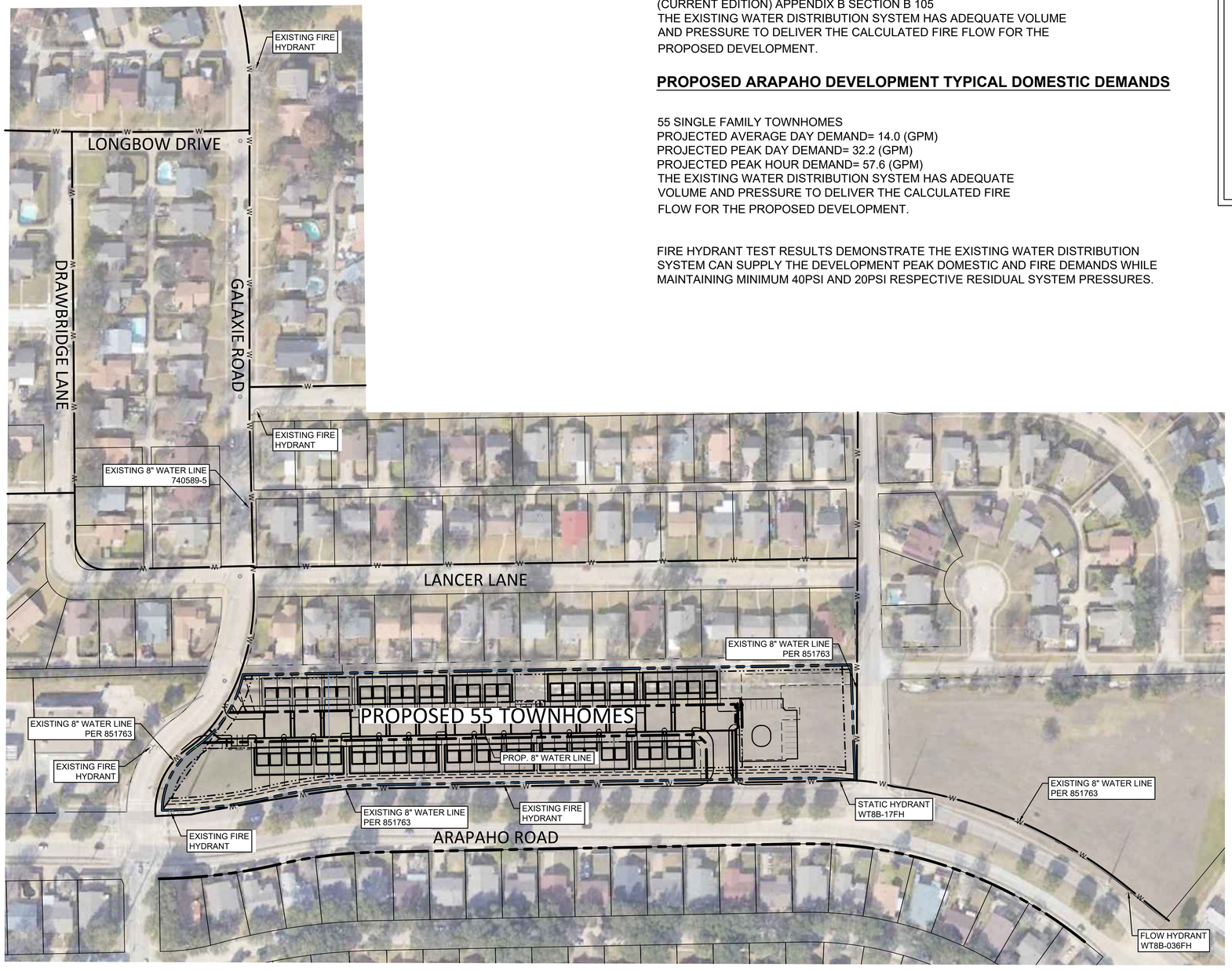
PROPOSED ARAPAHO DEVELOPMENT FIRE DEMAND

55 SINGLE FAMILY TOWNHOMES
FIRE FLOW CALCULATION AREA= 2000 SF
AUTOMATIC SPRINKLER SYSTEM INSTALLED
MINIMUM FIRE FLOW REQUIRED= 500 (GPM)
MINIMUM FIRE FLOW AS SPECIFIED IN THE INTERNATIONAL FIRE CODE (CURRENT EDITION) APPENDIX B SECTION B 105
THE EXISTING WATER DISTRIBUTION SYSTEM HAS ADEQUATE VOLUME AND PRESSURE TO DELIVER THE CALCULATED FIRE FLOW FOR THE PROPOSED DEVELOPMENT.

PROPOSED ARAPAHO DEVELOPMENT TYPICAL DOMESTIC DEMANDS

55 SINGLE FAMILY TOWNHOMES
PROJECTED AVERAGE DAY DEMAND= 14.0 (GPM)
PROJECTED PEAK DAY DEMAND= 32.2 (GPM)
PROJECTED PEAK HOUR DEMAND= 57.6 (GPM)
THE EXISTING WATER DISTRIBUTION SYSTEM HAS ADEQUATE VOLUME AND PRESSURE TO DELIVER THE CALCULATED FIRE FLOW FOR THE PROPOSED DEVELOPMENT.

FIRE HYDRANT TEST RESULTS DEMONSTRATE THE EXISTING WATER DISTRIBUTION SYSTEM CAN SUPPLY THE DEVELOPMENT PEAK DOMESTIC AND FIRE DEMANDS WHILE MAINTAINING MINIMUM 40PSI AND 20PSI RESPECTIVE RESIDUAL SYSTEM PRESSURES.



Appendix 5B: Water and Wastewater Demand Determination Parameters

Table 5B.1: Development Water Demand Determination Parameters

Land Use Type	Population/Employment per Unit	Average Day Demand per Capita (gpcd)	Maximum Day to Average Dry Peaking Factor	Peak Hour to Maximum Day Peaking Factor
Single Family	3.09	120	2.3	1.8
Multi-Family	3.05	120	2.3	1.8
Mixed Use	3.05 people/unit 1 employee/400 sf	120 60	2.3 1.5	1.8 1.5
Commercial and Retail	1 employee / 400 sf 0.5 Floor to Area Ratio[1]	60	1.5	1.5
Office and Professional Services	1 employee / 400 sf 0.5 Floor to Area Ratio[1]	60	1.5	1.5
Industrial[2]	-	-	-	-

[1]Floor to Area Ratio is the ratio of a building's total floor area to the size of the land upon which it is built.

[2]Industrial water flows will be evaluated on a case-by-case basis due to the variability in flow generated within the industrial land use type.

FIRE HYDRANT FLOW TEST RESULTS
FOR
GARLAND TOWN HOMES

FLOW DATA OBTAINED BY CITY OF GARLAND

TEST DATE	10/29/2021	TEST TIME	
TEST HYDRANT	WT8B-17FH	FLOW HYDRANT	WT8B-036FH

FIRE HYDRANT FLOW DATA		
STATIC PRESSURE (Ps)	85	PSI
HYDRANT 722	70	PSI
PITOT PRESSURE HYD #1 (Pp1)	45	PSI
PITOT PRESSURE HYD #2 (Pp2)		PSI
PITOT PRESSURE HYD #3 (Pp3)		PSI
TEST NOZZLE DIAMETER (D)	2.5	INCHES
NOZZLE COEFFICIENT (Cd)	0.9	
FIRE HYDRANT #1 FLOW (Qr1)	2251	GPM
FIRE HYDRANT #2 FLOW (Qr2)		GPM
FIRE HYDRANT #3 FLOW (Qr3)	0	GPM
TOTAL TEST FLOW (Qr)	2251	GPM
CALCULATD FLOW AT 40 PSI (Qf)	4074	GPM
CALCULATD FLOW AT 20 PSI (Qf)	4969	GPM
CALCULATD FLOW AT 0 PSI (Qf)	5744	GPM

NOTE: (2) 2 1/2" NOZZLES WERE OPENED DURING THE FLOW TEST

THE FORMULAS FOR FIRE HYDRANT FLOW AND FIRE FLOW ARE AS FOLLOWS:

FIRE HYDRANT FLOW (Qr) = $29.83 \times Cd \times D^2 \times Pp^{.5}$

FIRE FLOW AT 20 PSI (Qf) = $\frac{(PS-20)}{Qr \times ((Ps - Pr))^{.54}}$

FIRE FLOW AT 0 PSI (Qf) = $\frac{(PS-0)}{Qr \times ((Ps - Pr))^{.54}}$

GRAPHIC SCALE
0 100 200 FEET
SCALE: 1" = 100'

CITY OF GARLAND, TX CASE #: 210928-1

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CITY OF GARLAND
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KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

JOB NUMBER: NCL21008
ISSUE DATE: DATE

WATER EXHIBIT

SHEET:
V5.1

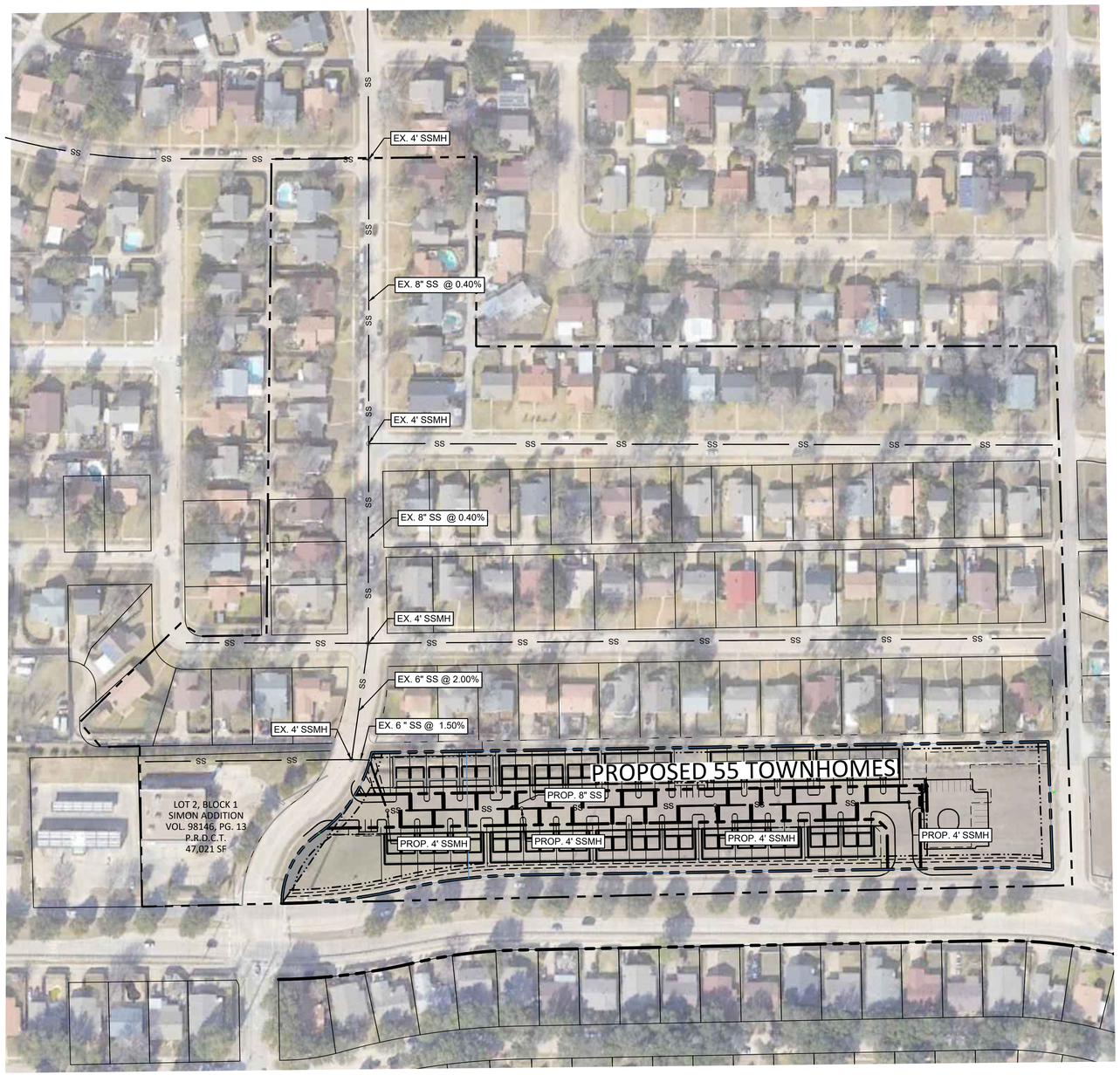

Table 5B.2: Development Wastewater Demand Determination Parameters

Land Use Type	Population/Employment per Unit	Average Daily Flow per Capita (gpcd)	Maximum Dry to Average Dry Peaking Factor	RDII Allowance (gpad)
Single Family	3.09	100	1.8	5,000
Multi-Family	3.05	100	1.8	5,000
Mixed Use	3.05 people/unit 1 employee/400 sf	100 35	1.8	5,000
Commercial and Retail	1 employee per 400 sf 0.5 Floor to Area Ratio[1]	35	1.8	5,000
Office and Professional Services	1 employee per 400 sf 0.5 Floor to Area Ratio[1]	35	1.8	5,000
Industrial[2]	-	-	-	-

[1]Floor to Area Ratio is the ratio of a buildings total floor area to the size of the land upon which it is built.
[2]Industrial wastewater flows will be evaluated on a case-by-case basis due to the variability in flow generated within the industrial land use type.

SEWER CAPACITY ANALYSIS							
CIRCULAR PIPE (SEWER CAPACITY CALCS.FM8)							
LABEL	SOLVE FOR	FRICTION METHOD	ROUGHNESS COEFFICIENT	CHANNEL SLOPE (%)	NORMAL DEPTH (IN)	DIAMETER (IN)	DISCHARGE (GAL/MIN)
8" SEWER	FULL CAPACITY FLOW	MANNING FORMULA	0.013	0.4	8	8	343

8" SANITARY SEWER CAPACITY ANALYSIS

SERVICE AREA BOUNDARY= 27.00 ACRES
(INCLUDES PROPOSED TOWNHOME DEVELOPMENT
83 SINGLE FAMILY HOMES=
7,200 SF OF COMMERCIAL AND RETAIL PROPERTY

EXISTING SINGLE FAMILY AVERAGE DAILY FLOW= 25,632 GPD
EXISTING COMMERCIAL AND RETAIL AVERAGE DAILY FLOW= 633.6 GPD
EXISTING SYSTEM AVERAGE DAILY FLOW= 26,265.6 GPD
EXISTING SYSTEM MAXIMUM DAILY FLOW= 47,232 GPD
EXISTING SYSTEM RDII FLOW= 135,000 GPD

EXISTING SYSTEM TOTAL PEAK FLOW (MDDF + RDII)= 182,232 GPD

PROPOSED DEVELOPMENT (55 TOWNHOMES) AVERAGE DAILY FLOW= 16,992 GPD

PROPOSED DEVELOPMENT MAXIMUM DAY FLOW= 30,585.6 GPD

TOTAL COMBINED PEAK FLOW= 212,818 GPD

THE EXISTING 6" SEWER LINE IS THE CONTROLLING FACTOR IN THE CAPACITY ANALYSIS AND HAS CALCULATED FLOW CAPACITY OF 452,953 GPD.

THE PEAK FLOW FOR THE ENTIRE SERVICE AREA BOUNDARY IS LESS THAN THE CAPACITY OF THE 6" SEWER LINE, THEREFORE IS THE OPINION OF THE DESIGN ENGINEER THAT THE EXISTING SEWER SYSTEM HAS ADEQUATE CAPACITY TO ACCOMMODATE THE PROPOSED DEVELOPMENT.

GRAPHIC SCALE
0 100 200 FEET
SCALE: 1" = 100'

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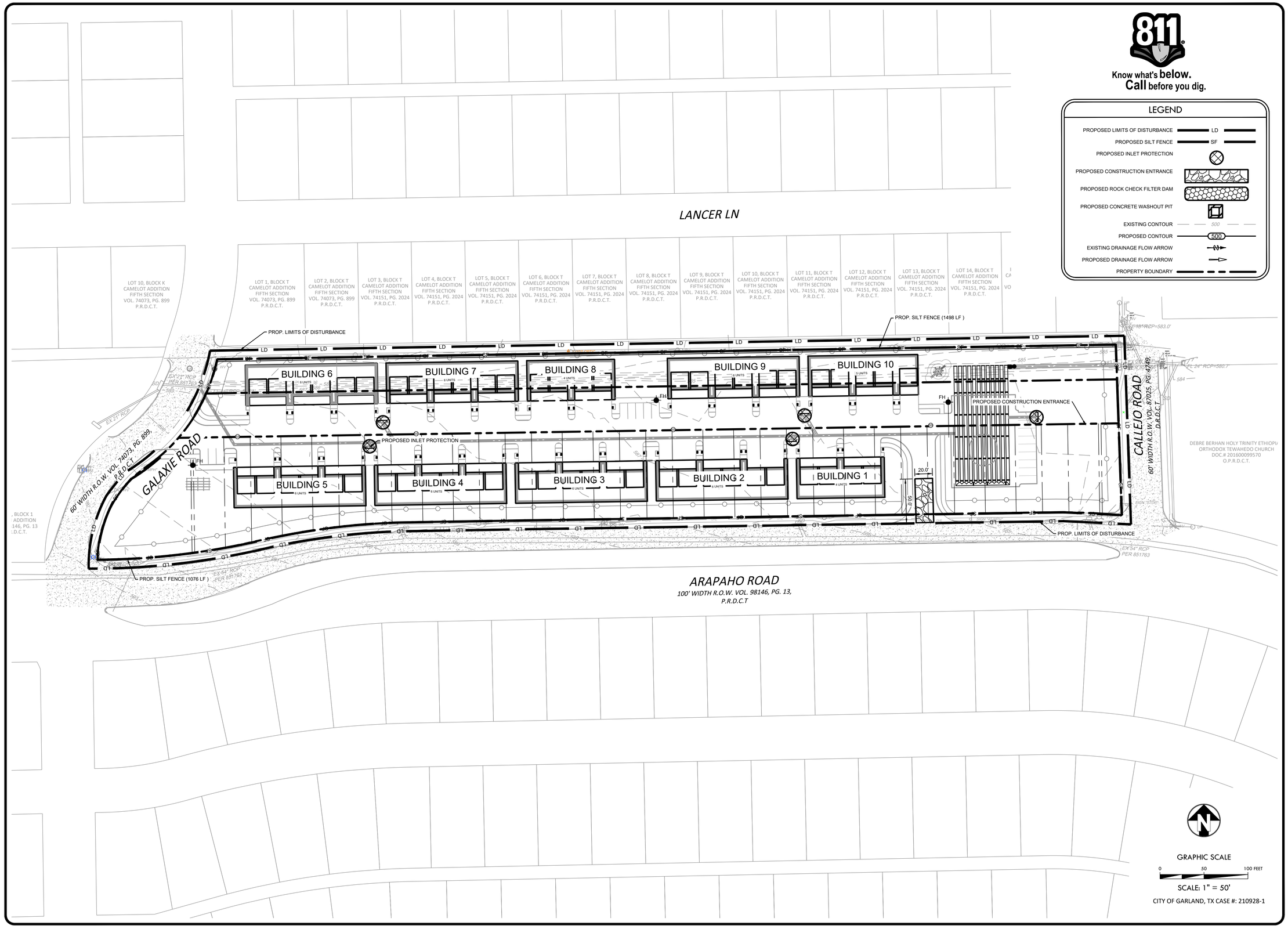
SANITARY SEWER EXHIBIT

SHEET:
V5.2



811
Know what's **below.**
Call before you dig.

LEGEND

- PROPOSED LIMITS OF DISTURBANCE — LD
- PROPOSED SILT FENCE — SF
- PROPOSED INLET PROTECTION
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED ROCK CHECK FILTER DAM
- PROPOSED CONCRETE WASHOUT PIT
- EXISTING CONTOUR — 500
- PROPOSED CONTOUR — 500
- EXISTING DRAINAGE FLOW ARROW
- PROPOSED DRAINAGE FLOW ARROW
- PROPERTY BOUNDARY

GRAPHIC SCALE
0 50 100 FEET
SCALE: 1" = 50'
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JOB NUMBER: NCL21008

ISSUE DATE: DATE

EROSION CONTROL PLAN

SHEET:
V6.0

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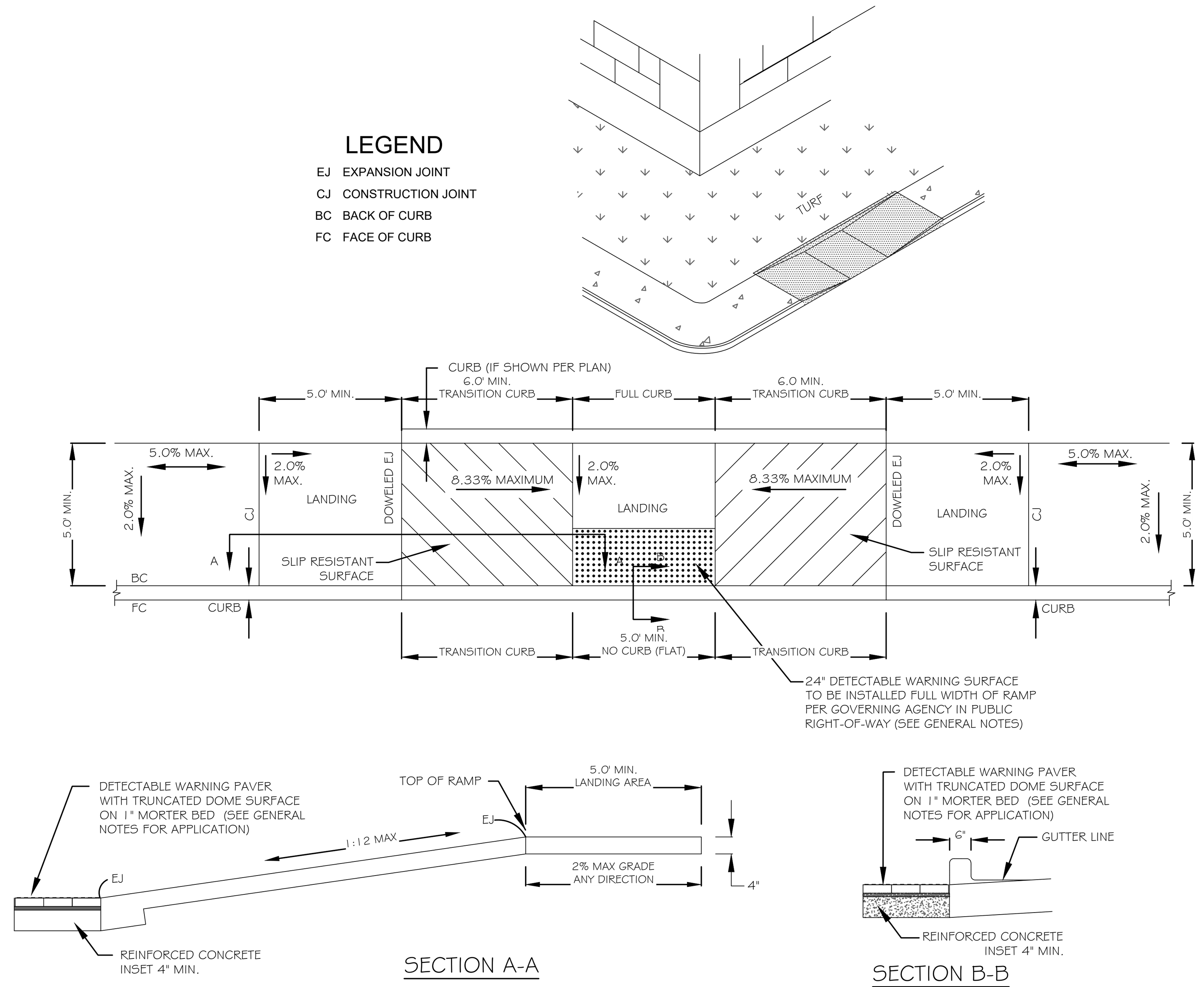
FILENAME: V6.0 EROSION CONTROL PLAN.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023

LEGEND

EJ EXPANSION JOINT
CJ CONSTRUCTION JOINT
BC BACK OF CURB
FC FACE OF CURB



PARALLEL CURB RAMP DETAIL

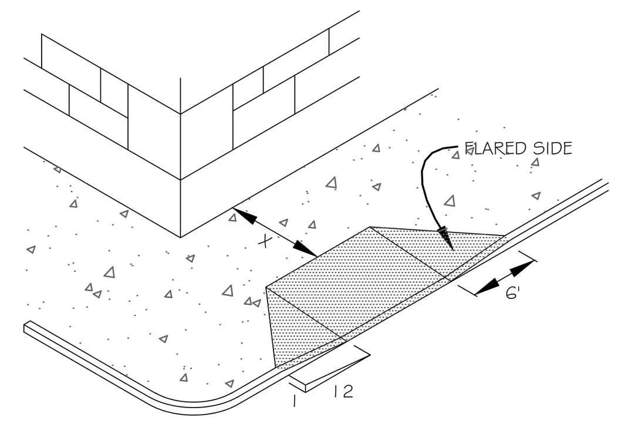
N.T.S. -SIDEWALK PARELEL TO CURB

GENERAL NOTES

NOTES:
1. CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP OR TRANSITION SURFACE.
2. RAMPS SHALL BE CONSTRUCTED PER ADA & APPLICABLE STATE ACCESSIBILITY STANDARDS..
3. CURB RAMPS SHALL BE MONOLITHIC POUR & SEPARATED FROM SITE PAVING WITH A DOWELED EXPANSION JOINT.

DETECTABLE WARNING SURFACE (PUBLIC RIGHT-OF-WAY):
1. TRUNCATED DOMES SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
2. TRUNCATED DOMES TO RUN PARALLEL TO PEDESTRIAN TRAVEL.
3. DETECTABLE WARNING PAVERS, OR PLATES MEETING ADA & STATE REQUIREMENTS ARE ACCEPTABLE.

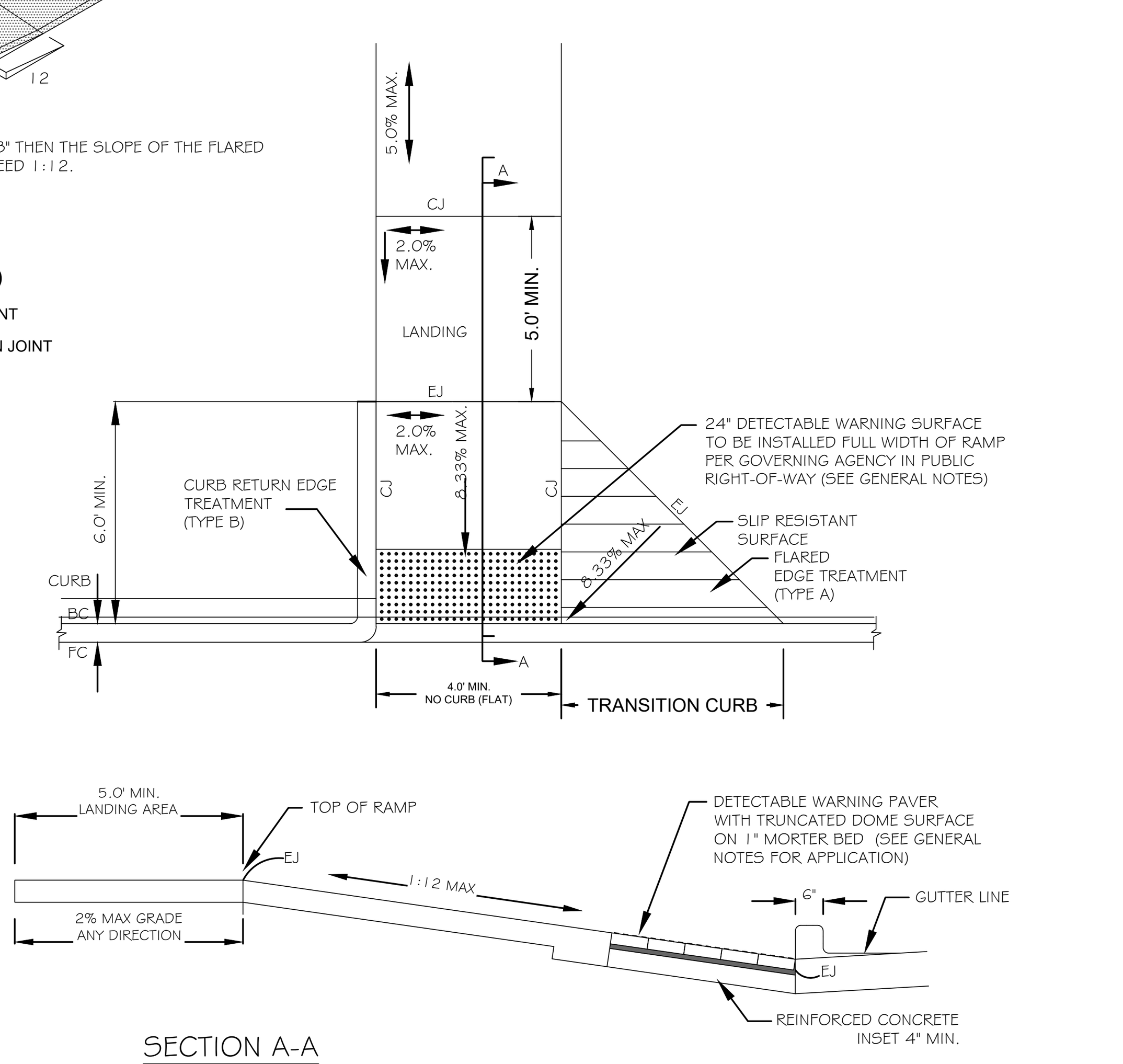
GROOVED SURFACE (RAMP FLARE):
1. FLARED CURB RAMP SURFACES SHALL BE TEXTURED WITH GROOVES 1/4" DEEP, 3/4" WIDE, 2" APART AND ARRANGED SO THAT WATER WILL NOT ACCUMULATE IN THE GROOVES.
2. FLARED CURB RAMP SURFACE SHALL HAVE A LIGHT REFLECTIVE VALUE AND TEXTURE THAT SIGNIFICANTLY CONTRASTS WITH THAT OF THE ADJOINING PEDESTRIAN ROUTE WHEN SPECIFIED.



NOTE:
IF 'X' IS LESS THAN 48" THEN THE SLOPE OF THE FLARED SIDE SHALL NOT EXCEED 1:12.

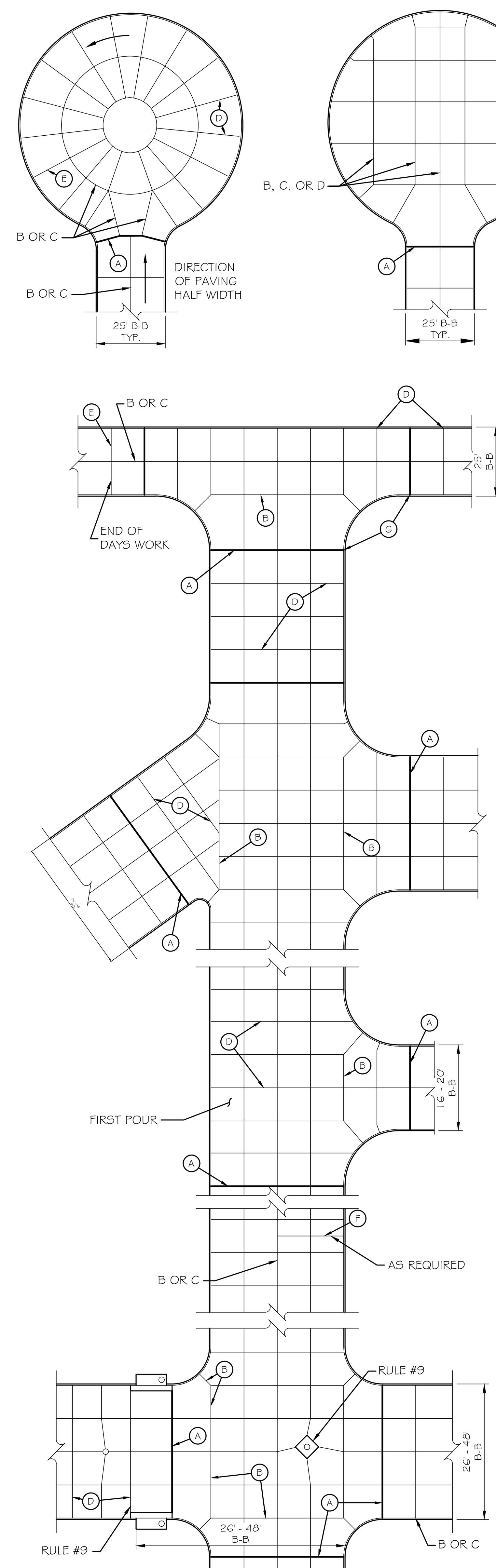
LEGEND

EJ EXPANSION JOINT
CJ CONSTRUCTION JOINT
BC BACK OF CURB
FC FACE OF CURB



CURB RAMP DETAIL

N.T.S. - FLARED OR RETURN CURB

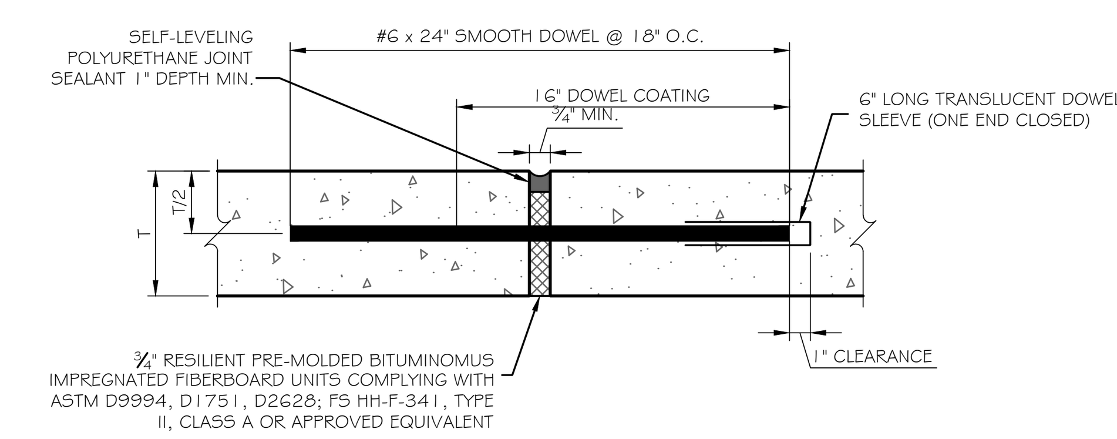


KEY NOTES:
A. EXPANSION JOINT (ISOLATION)
B. LONGITUDINAL CONSTRUCTION JOINT
C. LONGITUDINAL CONTROL JOINT (CONTRACTION)
D. TRANSVERSE CONTROL JOINT (CONTRACTION)
E. PLANNED TRANSVERSE CONSTRUCTION JOINT
F. EMERGENCY TRANSVERSE CONSTRUCTION JOINT
G. PLACE ½" EXPANSION JOINT FILLER IN TOP OF CURB ONLY AT ALL RADIUS POINTS

RULES:
1. AVOID ODD-SHAPED SLABS.
2. MAXIMUM TRANSVERSE JOINT SPACING FOR PAVEMENT SHOULD EITHER BE 24 TO 30 TIMES THE SLAB THICKNESS OR 15ft.
3. LONGITUDINAL JOINT SPACING SHOULD NOT EXCEED 12.5ft
4. KEEP SLABS AS SQUARE AS POSSIBLE. LONG NARROW SLABS TEND TO CRACK MORE THAN SQUARE ONES.
5. ALL TRANSVERSE CONTRACTION JOINTS MUST BE CONTINUOUS THROUGH THE CURB AND HAVE A DEPTH EQUAL TO ¼ THE PAVEMENT THICKNESS.
6. IN ISOLATION JOINTS, THE FILLER MUST BE FULL DEPTH AND EXTEND THROUGH THE CURB
7. IF THERE IS NO CURB, LONGITUDINAL JOINTS SHOULD BE TIED WITH DEFORMED BARS.
8. OFFSETS AT RADIUS POINTS SHOULD BE AT LEAST 1.5ft WIDE. JOINT INTERSECTION ANGLES LESS THAN 60° SHOULD BE AVOIDED.
9. MINOR ADJUSTMENTS IN JOINT LOCATION MADE BY SHIFTING OF SKEWING TO MEET INLETS AND MANHOLES WILL IMPROVE PAVEMENT PERFORMANCE.
10. WHEN THE PAVEMENT AREA HAS DRAINAGE STRUCTURES, PLACE JOINTS TO MEET THE STRUCTURES IF POSSIBLE.

TYPICAL JOINT LAYOUT

N.T.S.

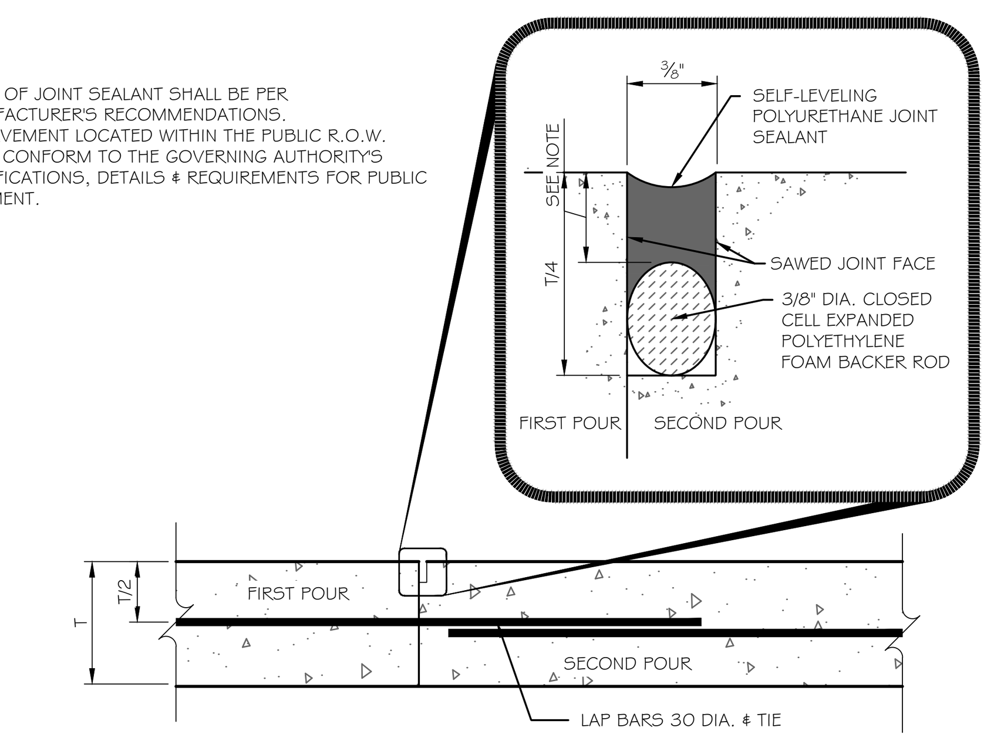


NOTES:
1. SLEEVES FOR DOWELS SHALL HAVE AN INSIDE DIAMETER OF $\frac{1}{16}$" GREATER THAN THE DIAMETER OF THE DOWELS AND SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL PRIOR TO USE.
2. EXPANSION JOINTS SHALL BE CONSTRUCTED A MAXIMUM OF 500' APART ON STRAIGHT PAVING, AND WHERE INDICATED PER THE AMERICAN CONCRETE PAVEMENT ASSOCIATION'S TECHNICAL PUBLICATION ACPA IS061.01P (LATEST VERSION)
3. DOWEL COATING SHALL BE ASPHALTIC COATING.
4. DOWELS SHALL NOT BE TIED TO OTHER REINFORCEMENT.
5. REFER TO SIDEWALK DETAILS THIS SHEET FOR EXPANSION JOINTS IN SIDEWALK AREAS.
6. ALL PAVEMENT LOCATED WITHIN THE PUBLIC R.O.W. SHALL CONFORM TO THE GOVERNING AUTHORITY'S SPECIFICATIONS, DETAILS & REQUIREMENTS FOR PUBLIC PAVEMENT.
7. FINISHED SURFACES SHALL BE INSTALLED FLUSH WITH A DIFFERENTIAL ELEVATION NOT TO EXCEED ⅛".

EXPANSION JOINT (ISOLATION)

N.T.S.

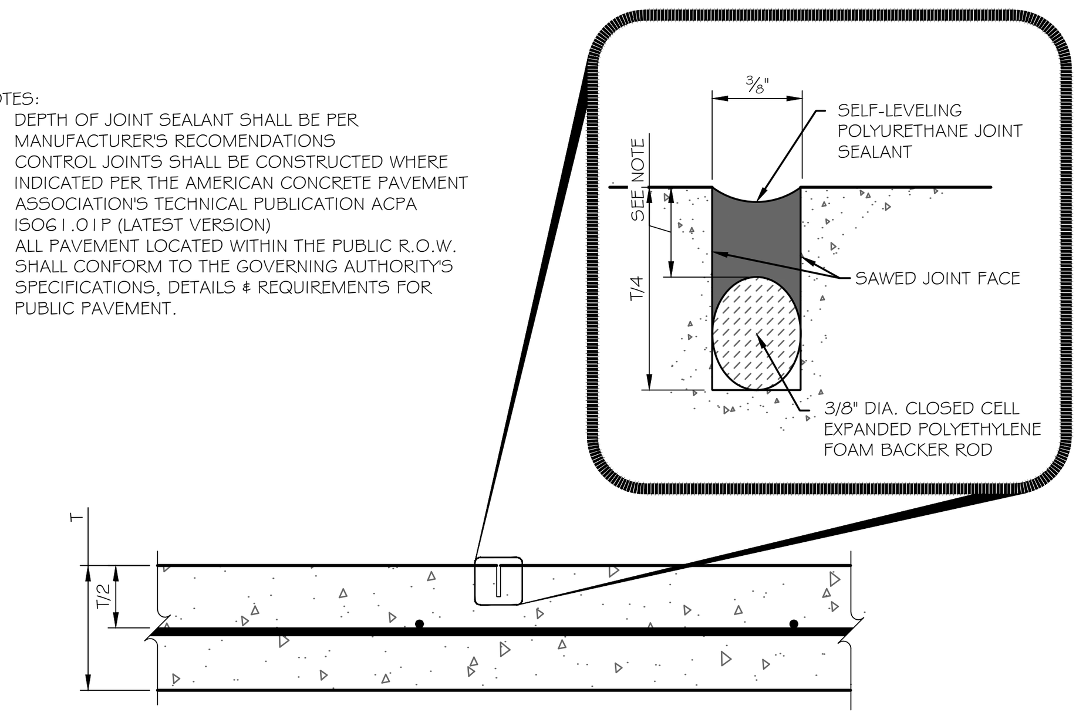
NOTES:
1. DEPTH OF JOINT SEALANT SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
2. ALL PAVEMENT LOCATED WITHIN THE PUBLIC R.O.W. SHALL CONFORM TO THE GOVERNING AUTHORITY'S SPECIFICATIONS, DETAILS & REQUIREMENTS FOR PUBLIC PAVEMENT.



CONSTRUCTION BUTT JOINT

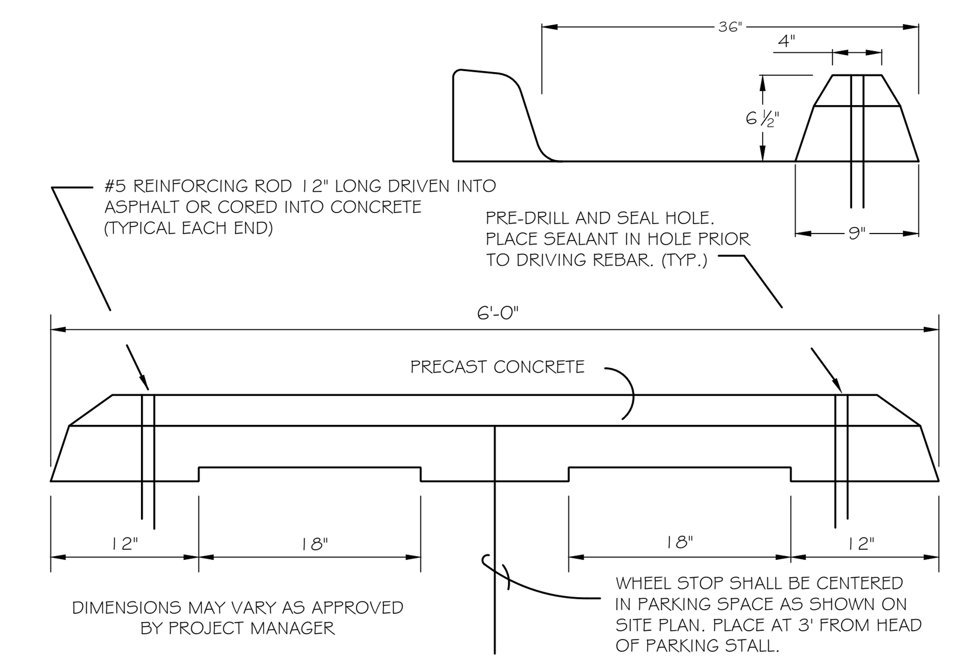
N.T.S.

NOTES:
1. DEPTH OF JOINT SEALANT SHALL BE PER MANUFACTURER'S RECOMENDATIONS
2. CONTROL JOINTS SHALL BE CONSTRUCTED WHERE INDICATED PER THE AMERICAN CONCRETE PAVEMENT ASSOCIATION'S TECHNICAL PUBLICATION ACPA IS061.01P (LATEST VERSION)
3. ALL PAVEMENT LOCATED WITHIN THE PUBLIC R.O.W. SHALL CONFORM TO THE GOVERNING AUTHORITY'S SPECIFICATIONS, DETAILS & REQUIREMENTS FOR PUBLIC PAVEMENT.



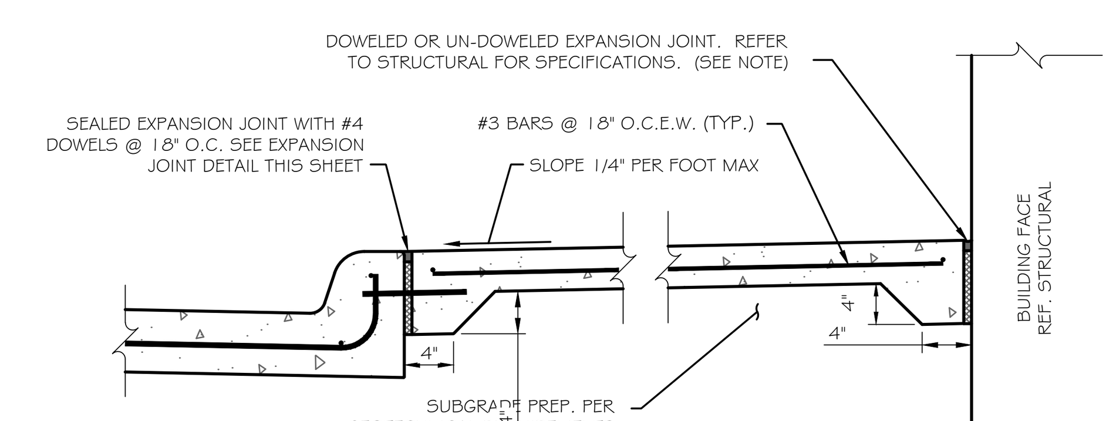
CONTROL JOINT (CONTRACTION)

N.T.S.



WHEEL STOP DETAIL

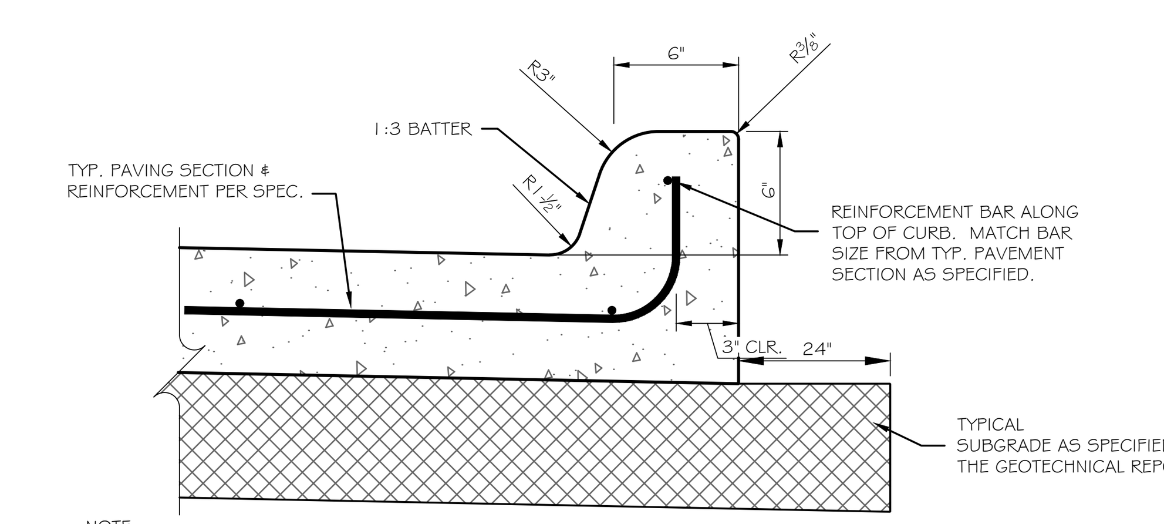
N.T.S.



NOTES
1. ALL SIDEWALK JOINTS LOCATED WITHIN 25' OF A BUILDING FACE OR ADJACENT TO ANY STRUCTURE SHALL BE SEALED.
2. REFER TO STRUCTURAL PLANS/DETAILS FOR DOWEL/HINGE JOINT AT ALL CONNECTIONS BETWEEN FOUNDATIONS/STOOPS AND FLATWORK.
3. THE SUBGRADE PREPARATION FOR ANY FLATWORK OR SIDEWALK PAVEMENT WITHIN 25' FROM ANY BUILDING FACE OR ADJACENT TO ANY STRUCTURE SHALL AS SPECIFIED BY THE GEOTECHNICAL REPORT. IN THE EVENT THAT THE GEOTECHNICAL REPORT DOES NOT CONTAIN A RECOMMENDATION THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
4. ALL PAVEMENT LOCATED WITHIN THE PUBLIC R.O.W. SHALL CONFORM TO THE GOVERNING AUTHORITY'S SPECIFICATIONS, DETAILS & REQUIREMENTS FOR PUBLIC PAVEMENT.
5. FINISHED SURFACES SHALL BE INSTALLED FLUSH WITH A DIFFERENTIAL ELEVATION NOT TO EXCEED ⅛".

SIDEWALK/CURB/BUILDING DETAIL

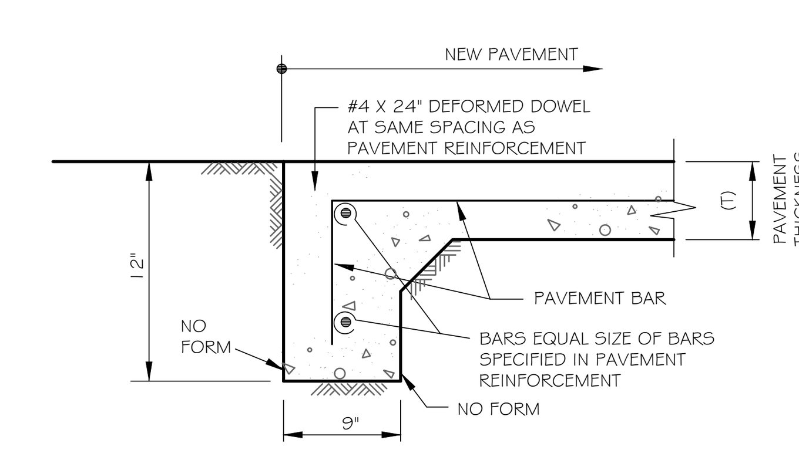
N.T.S.



NOTE:
1. ALL CURBS ARE CONSTRUCTED OF PORTLAND CEMENT CONCRETE UNLESS OTHERWISE SHOWN.
2. GRADES SHALL BE MEASURED AT BACK OF CURB UNLESS OTHERWISE SPECIFIED.
3. ALL PAVEMENT LOCATED WITHIN THE PUBLIC R.O.W. SHALL CONFORM TO THE GOVERNING AUTHORITY'S SPECIFICATIONS, DETAILS & REQUIREMENTS FOR PUBLIC PAVEMENT.
4. CONTROL JOINTS THROUGH CURB SHALL BE SEALED IN THE PAVEMENT AND TERMINATE AT THE GUTTER.

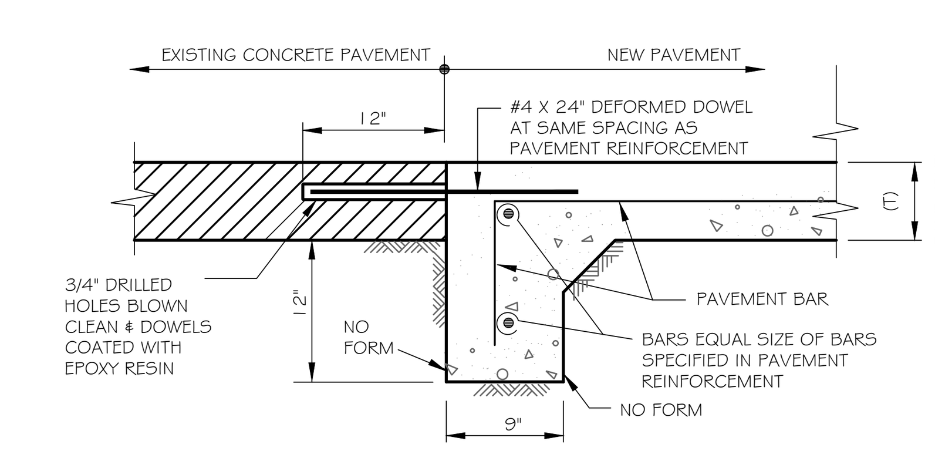
MONOLITHIC CURB DETAIL

N.T.S.



THICKENED PAVEMENT EDGE

N.T.S.



STREET HEADER AT EXISTING PAVEMENT

N.T.S.

P R E L I M I N A R Y
F O R R E V I E W O N L Y
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SHAWN T. WALDO
P.E.# 138653
DATE: January 9, 2023

FIRST INFRA
DEFINE & DELIVER

ARAPAHO TOWNHOME

CITY OF GARLAND
DALLAS COUNTY, TEXAS

REV:	DATE:	DESCRIPTION:

kirkman ENGINEERING

KIRKMAN ENGINEERING, LLC
5200 STATE HIGHWAY 121
COLLEYVILLE, TX 76034
TEXAS FIRM NO. 15874

JOB NUMBER: NCL21008
ISSUE DATE: DATE

SITE DETAILS

SHEET:
V7.0

FULL PATH: K:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary EngineeringK:\Jobs\NCL21008_GarlandTownhome\Drawings\Preliminary Engineering\V7.0 SITE DETAILS_

FILENAME: V7.0 SITE DETAILS_.dwg
PLOTTED BY: Shawn Waldo
PLOTTED DATE: 1/9/2023