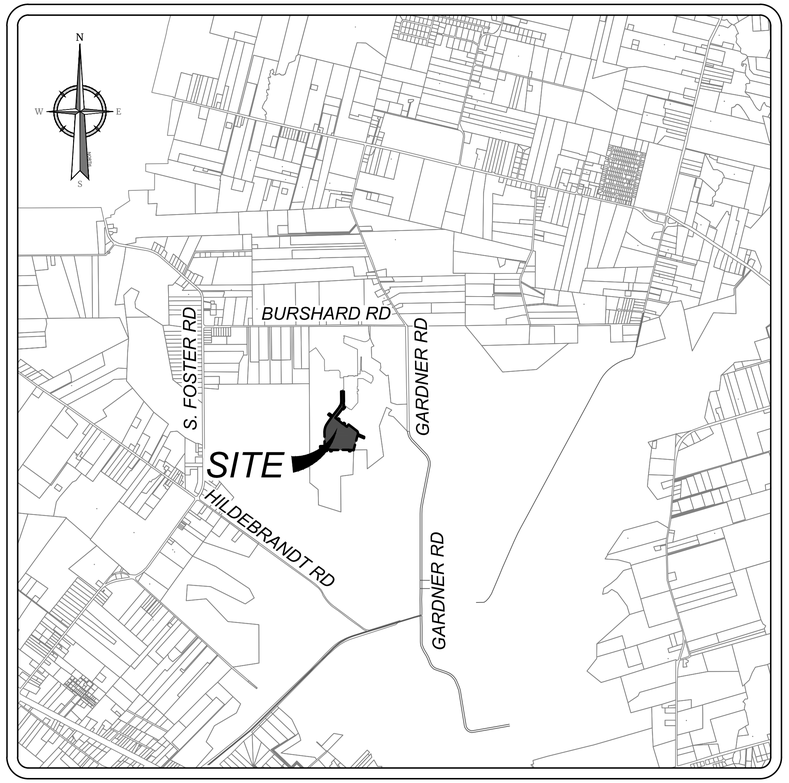
NORTHLAKE PHASE 2A

BEXAR COUNTY, TEXAS

UTILITY, DRAINAGE, STREET, SANITARY SEWER AND WATER IMPROVEMENTS



LOCATION MAP

SCALE: NOT-TO-SCALE

OWNER/DEVELOPER:
LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TEXAS 78216
(210) 403-6200

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OVERALL UTILITY PLAN (2 OF 3)	1.1
OVERALL UTILITY PLAN (3 OF 3)	1.2
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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14809
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

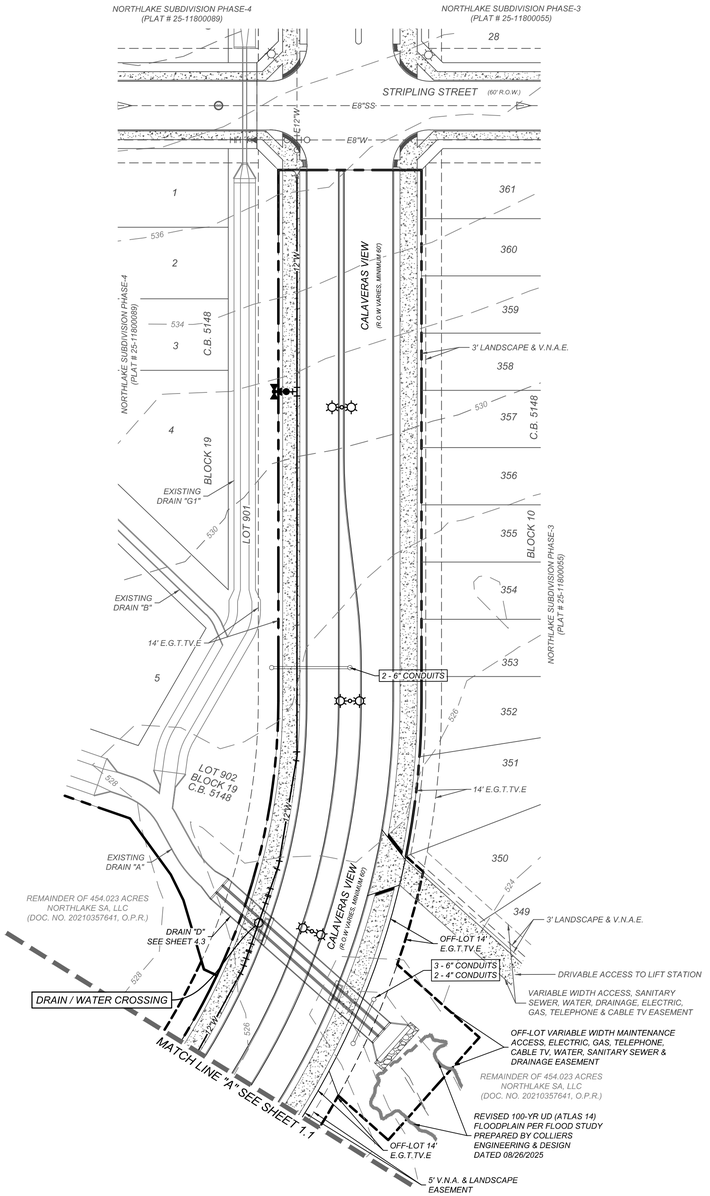
PROJECT NUMBER:	DRAWING NAME:
314-65-03	CV3146503

SHEET TITLE: COVER SHEET

SHEET NUMBER: 0.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

\\R\CV3146503.dwg\0.0 By: ABEL.MONTALVO



COMPACTION NOTE:

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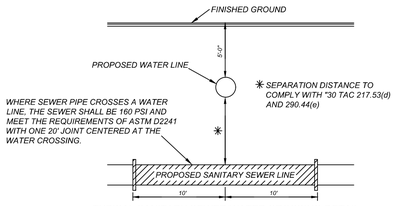
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TRENCH EXCAVATION SAFETY PROTECTION

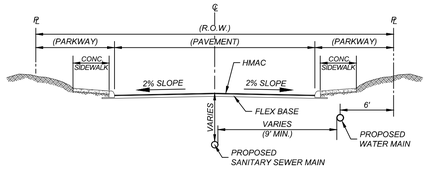
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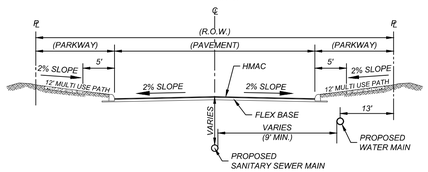


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.



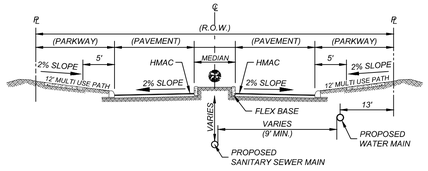
TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
60' R.O.W.	34'	13'	4'/6'

TYPICAL STREET SECTION
N.T.S.



TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
80' R.O.W.	34'	23'	12'

COLLECTOR TYPE "C" STREET SECTION
N.T.S.



TYPE	PAVEMENT WIDTH	MEDIAN WIDTH	PARKWAY WIDTH
100' R.O.W.	34' MAX, 22' MIN	16' MAX, 4' MIN	20'

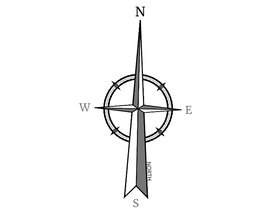
COLLECTOR TYPE "C" STREET SECTION
N.T.S.

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	IRRIG
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100 WATT STREETLIGHT	=	
PROPOSED 250 WATT STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E.G.T.TV.E
VEHICULAR NON-ACCESS EASEMENT	=	V.N.A.E.
EXISTING WATER MAIN	=	E.W
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	E.SS
EXISTING SANITARY SEWER MANHOLE	=	
EXISTING 100 WATT STREET LIGHT	=	
EXISTING 250 WATT STREET LIGHT	=	

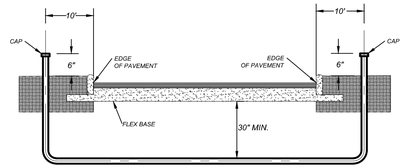


LOCATION MAP
SCALE: NOT-TO-SCALE





SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)



TYPICAL CONDUIT DETAIL
N.T.S.

NOTE:
CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH CPS FACILITY AT ALL STREETS AND DRAIN CROSSING IF BUILT AHEAD OF CPS CONSTRUCTION. SLEEVES MUST ALSO BE LOCATED FOR CPS CREWS DURING CONSTRUCTION. (SEPARATE ITEM) SEE THIS SHEET FOR CONDUIT CROSSING DETAIL AND SCHEDULE.

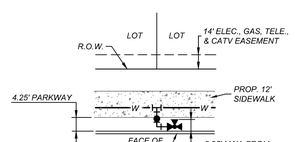
CONDUIT NOTES:

1. CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).

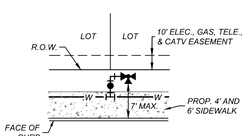
2. CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 36 INCHES BELOW PROPOSED FINISHED GRADE. SCHEDULE 80 TO BE USED FOR CPS CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.

3. ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.

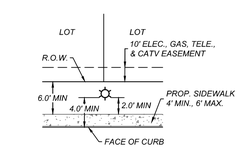
4. ALL CONDUIT SLEEVES TO BE USED FOR ELECTRIC, GAS, OR TELECOMMUNICATION UTILITY CROSSINGS SHALL BE INSTALLED TO MEET OR EXCEED DESIGN REQUIREMENTS FOR THE UTILITY AGENCY WHICH THEY ARE SERVING, INCLUDING BUT NOT LIMITED TO THE DEPTH, TRENCH PLACEMENT, AND PROXIMITY TO OTHER UTILITIES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING AND INSTALLING THE CONDUIT SLEEVES TO MEET THESE SPECIFICATIONS INCLUDING COORDINATING WITH THE UTILITY AGENCY FOR ANY REQUIRED INSPECTIONS



TYPICAL FIRE HYDRANT DETAIL
(CALAVERAS VIEW)
N.T.S.



TYPICAL FIRE HYDRANT DETAIL
N.T.S.



TYPICAL STREETLIGHT DETAIL
N.T.S

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OMAR A. ESPINOSA
125560
LICENSED
PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
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3421 Paesanos Parkway
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TBPE Firm#: F-14909
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

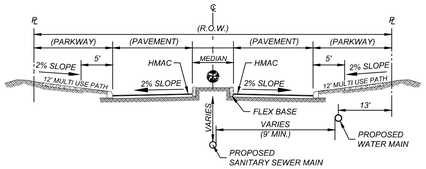
PROJECT NUMBER: 314-65-03
DRAWING NAME: OU3146503-PH2A

SHEET TITLE:
OVERALL UTILITY PLAN
(1 OF 3)

SHEET NUMBER:
1.0

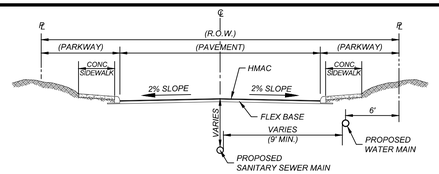
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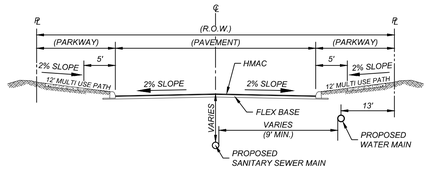
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COLLECTOR TYPE "C" STREET SECTION
N.T.S.



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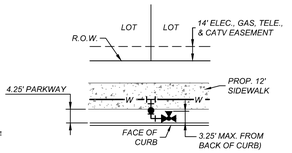
REFER SHEET 1.0 FOR CONDUIT DETAIL AND NOTES

LEGEND

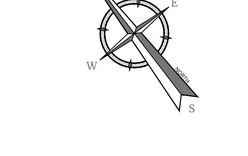
PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	W
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100 WATT STREETLIGHT	=	
PROPOSED 250 WATT STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E.G.T.TV.E
VEHICULAR NON-ACCESS EASEMENT	=	V.N.A.E.
EXISTING WATER MAIN	=	E.W
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	E.SS
EXISTING SANITARY SEWER MANHOLE	=	
EXISTING 100 WATT STREET LIGHT	=	
EXISTING 250 WATT STREET LIGHT	=	



LOCATION MAP
SCALE: NOT-TO-SCALE



TYPICAL FIRE HYDRANT DETAIL
(CALAVERAS VIEW)
N.T.S.

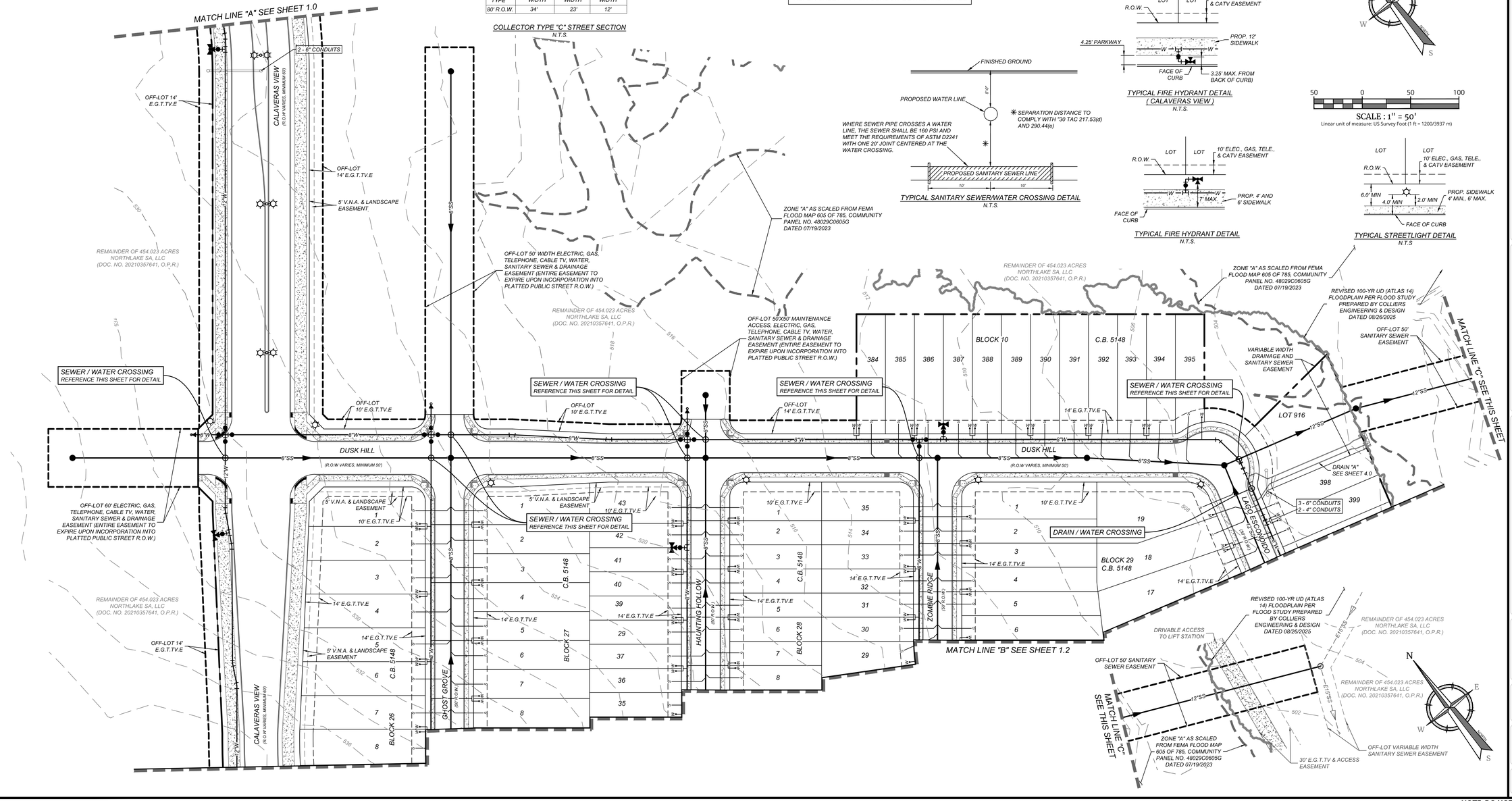


50 0 50 100
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

TYPICAL FIRE HYDRANT DETAIL
N.T.S.

TYPICAL STREETLIGHT DETAIL
N.T.S



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125560
LICENSED
PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14309
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: OU3146503-PH2A

SHEET TITLE:
OVERALL UTILITY PLAN (2 OF 3)

SHEET NUMBER:
1.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

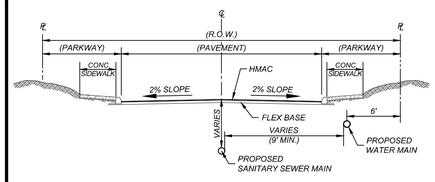
I:\ROU\3146503-PH2A.dwg\1.1 By: ABEL MONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

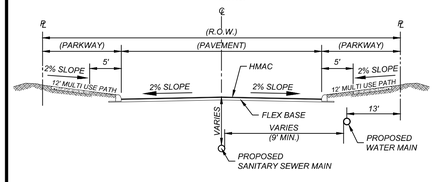
DRY UTILITY CONDUIT NOTE:

CONDUIT LOCATIONS SHOWN ON PLAN ARE FOR GEOGRAPHICAL PURPOSES ONLY AND ARE APPROXIMATE. CONTRACTOR TO INSTALL PROPOSED CONDUITS IN ACCORDANCE WITH DRY UTILITY PURVEYOR'S SPECIFICATIONS. CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES BASED ON THE DRY UTILITY PURVEYOR'S PLAN.



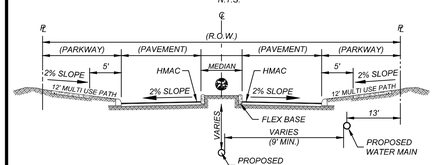
TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
60' R.O.W.	34'	13'	4'/6'

TYPICAL STREET SECTION
N.T.S.



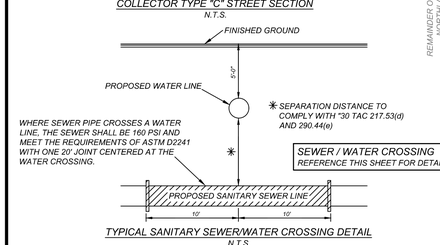
TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
80' R.O.W.	34'	23'	12'

COLLECTOR TYPE "C" STREET SECTION
N.T.S.



TYPE	PAVEMENT WIDTH	MEDIAN WIDTH	PARKWAY WIDTH
100' R.O.W.	34' MAX, 22' MIN	16' MAX, 4' MIN	20'

COLLECTOR TYPE "C" STREET SECTION
N.T.S.



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

COMPACTION NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTRATOR. PER EACH 12 INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. PERMITS AND/OR WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

CAUTION!!:

THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

REFER SHEET 1.0 FOR CONDUIT DETAIL AND NOTES

TYPICAL FIRE HYDRANT DETAIL
N.T.S.

TYPICAL STREETLIGHT DETAIL
N.T.S

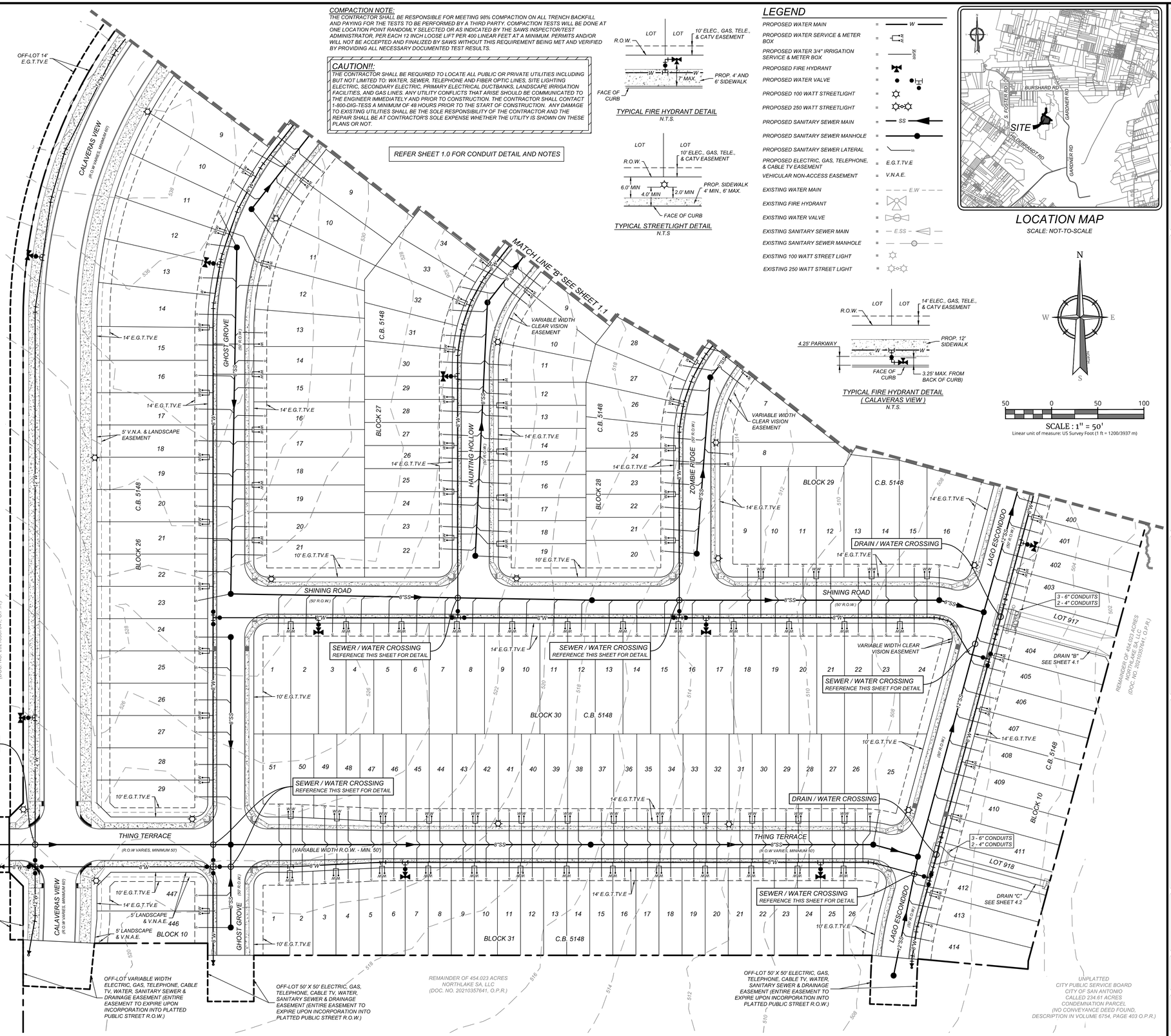
LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	WIRR
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100 WATT STREETLIGHT	=	
PROPOSED 250 WATT STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E.G.T.TV.E
VEHICULAR NON-ACCESS EASEMENT	=	V.N.A.E.
EXISTING WATER MAIN	=	E.W
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	E.SS
EXISTING SANITARY SEWER MANHOLE	=	
EXISTING 100 WATT STREET LIGHT	=	
EXISTING 250 WATT STREET LIGHT	=	

LOCATION MAP
SCALE: NOT-TO-SCALE

TYPICAL FIRE HYDRANT DETAIL (CALAVERAS VIEW)
N.T.S.

SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)



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AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER:	DRAWING NAME:
314-65-03	GU3146503-PHZA

SHEET TITLE:
OVERALL UTILITY PLAN (3 OF 3)

SHEET NUMBER:
1.2

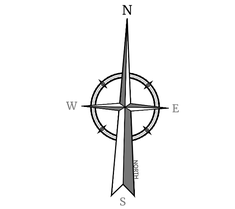
w:\PROJ\314650\3-PHZA.dwg\1.2 By: ABEL MONTALVO

GENERAL NOTES:

1. ELEVATION SHOWN ON FOUNDATION IS FOR FINISHED FLOOR.
2. CONTRACTOR SHALL PROVIDE OWNER ALL NECESSARY DENSITY TESTS FOR FILL LOTS AS REQUIRED BY HUD SPECIFICATIONS.
3. HOME BUILDER SHALL REFER TO THE APPROVED SUBDIVISION PLAT TO CONFIRM ALL BUILDING SETBACKS PRIOR TO ANY FOUNDATION WORK.
4. AS SOON AS PRACTICAL HOME BUILDER SHALL ESTABLISH VEGETATION (HYDROMULCH, SEEDING, SODDING, ETC...) TO PREVENT EROSION FROM OCCURRING.
5. CONTRACTOR SHALL CONTACT ENGINEER REGARDING ANY QUESTIONS ON THE INTENT OF THIS PLAN.
6. POSITIVE DRAINAGE SHALL BE MAINTAINED ON ALL SURFACE AREAS WITHIN THE SCOPE OF THIS PROJECT. DRAINAGE SHALL BE DIRECTED AWAY FROM ALL BUILDING FOUNDATIONS AND TOWARDS THE PROPER DRAINAGE EASEMENT OR STREET RIGHT OF WAY ACCORDING TO THE MASTER DRAINAGE PLAN FOR THE PROJECT. CONTRACTOR SHOULD TAKE PRECAUTIONS NOT TO ALLOW PONDING OF WATER.
7. ALL ELEVATIONS AND CONTOURS SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVEMENT, CURBS, AND SIDEWALKS MUST BE SUBTRACTED TO OBTAIN SUBGRADE ELEVATIONS.
8. GRADING PLAN IS INTENDED FOR USE IN LOT GRADING ONLY. CONTRACTOR SHOULD REFER TO CONSTRUCTION DRAWINGS FOR ALL OTHER GRADES, INCLUDING, BUT NOT LIMITED TO, CHANNELS, ROADS, AND DETENTION PONDS.
9. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE ALL SWALES.

LEGEND

E.G.T.TV.E	=	ELECTRIC, GAS, TELEPHONE, CABLE T.V. EASEMENT
C.B.	=	COUNTY BLOCK
V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
	=	FLOW ARROW
A	=	LOT GRADE TYPE
H.P.	=	HIGH POINT
F.F. MIN= 598.0'	=	FINISHED FLOOR MINIMUM ELEVATION AS REQUIRED PER FLOODPLAIN (SEE NOTE THIS SHEET)
735	=	EXISTING CONTOUR
735	=	PROPOSED CONTOUR
735	=	EXISTING CONTOUR
+ 731.69	=	SPOT ELEVATION



50 0 50 100

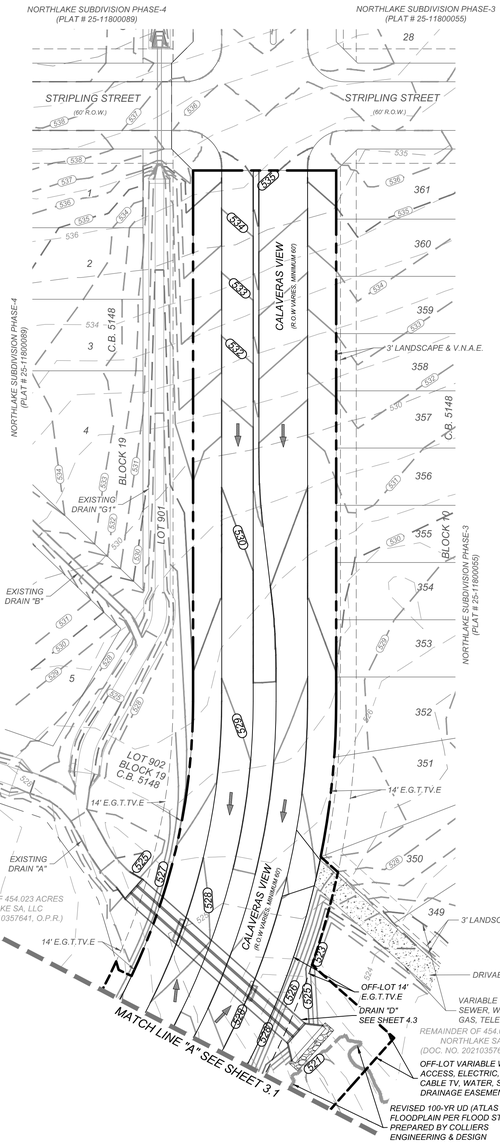
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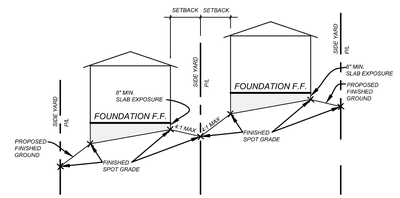
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)



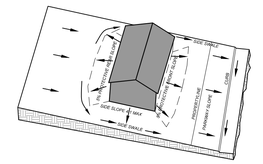
LOCATION MAP

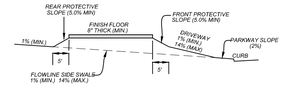
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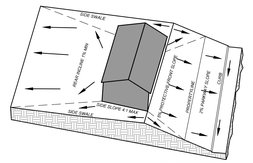


TYPICAL SIDE YARD GRADING
N.T.S.

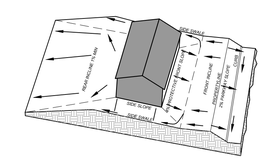




TYPE 'A' LOT GRADING



TYPE 'B' LOT GRADING



TYPE 'C' LOT GRADING

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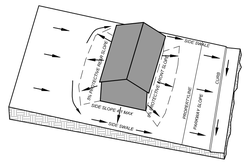
PROJECT NUMBER:	DRAWING NAME:
314-65-03	GR3146503

SHEET TITLE:
OVERALL GRADING PLAN (1 OF 3)

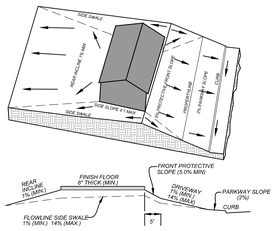
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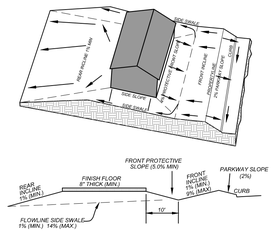
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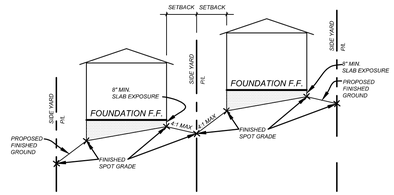
TYPE 'A' LOT GRADING



TYPE 'B' LOT GRADING



TYPE 'C' LOT GRADING



TYPICAL SIDE YARD GRADING
N.T.S.

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LEGEND

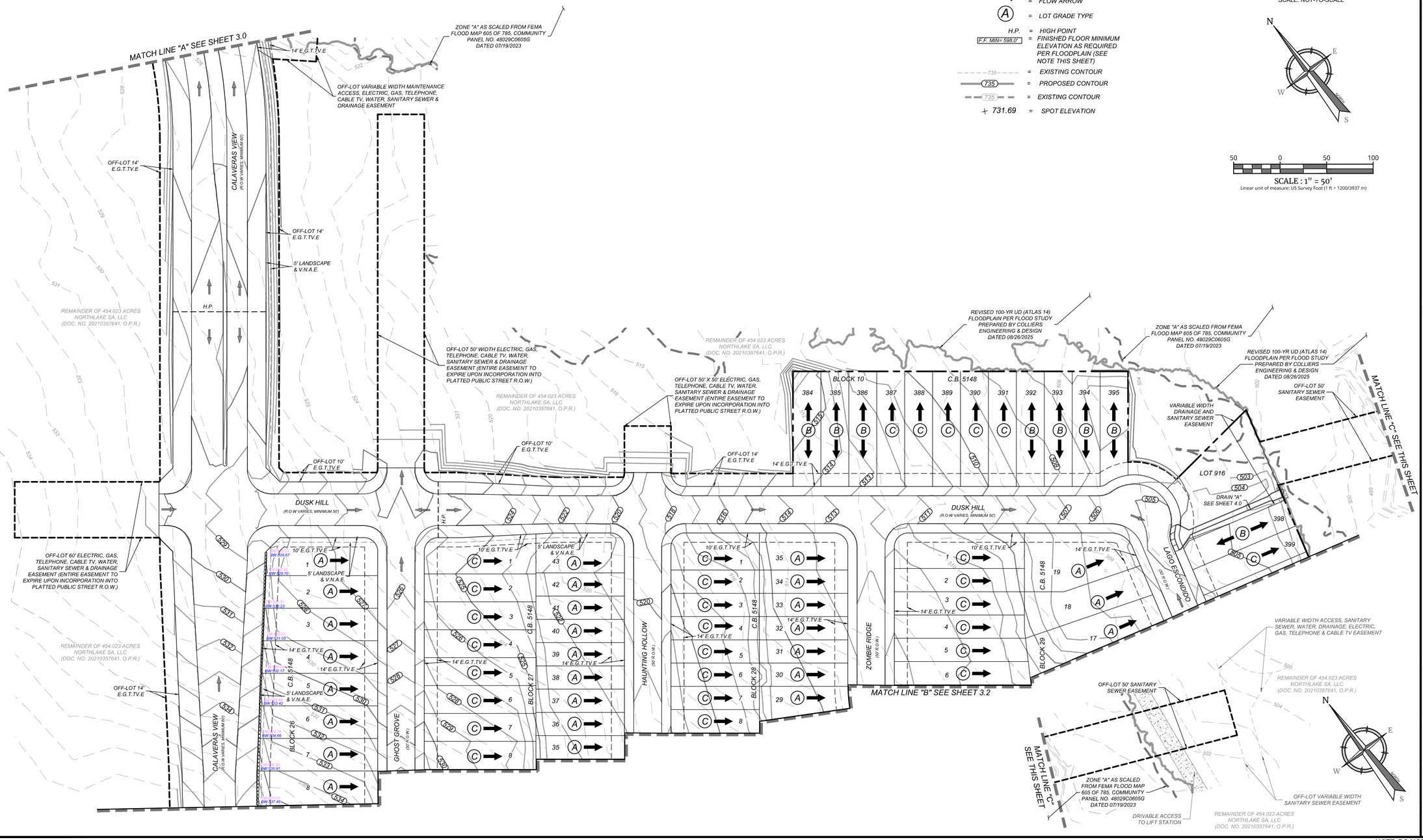
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(735)	=	PROPOSED CONTOUR
735	=	EXISTING CONTOUR
+ 731.69	=	SPOT ELEVATION



LOCATION MAP
SCALE: NOT-TO-SCALE

50 0 50 100

SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)



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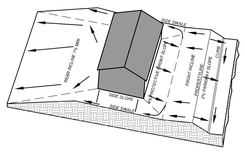
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DRAWING NAME: GR3146503

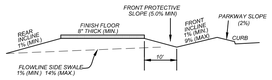
SHEET TITLE:
OVERALL GRADING PLAN (2 OF 3)

SHEET NUMBER:
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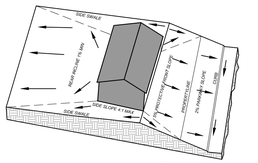
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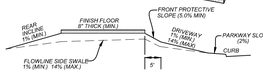
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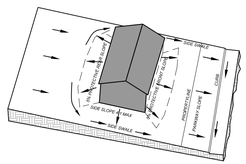


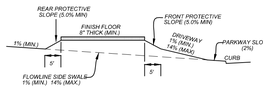
TYPE 'C' LOT GRADING



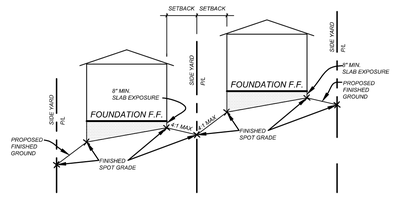


TYPE 'B' LOT GRADING





TYPE 'A' LOT GRADING



TYPICAL SIDE YARD GRADING
N.T.S.

GENERAL NOTES:

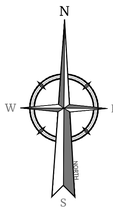
1. ELEVATION SHOWN ON FOUNDATION IS FOR FINISHED FLOOR.
2. CONTRACTOR SHALL PROVIDE OWNER ALL NECESSARY DENSITY TESTS FOR FILL LOTS AS REQUIRED BY HUD SPECIFICATIONS.
3. HOME BUILDER SHALL REFER TO THE APPROVED SUBDIVISION PLAT TO CONFIRM ALL BUILDING SETBACKS PRIOR TO ANY FOUNDATION WORK.
4. AS SOON AS PRACTICAL HOME BUILDER SHALL ESTABLISH VEGETATION (HYDROMULCH, SEEDING, SODDING, ETC...) TO PREVENT EROSION FROM OCCURRING.
5. CONTRACTOR SHALL CONTACT ENGINEER REGARDING ANY QUESTIONS ON THE INTENT OF THIS PLAN.
6. POSITIVE DRAINAGE SHALL BE MAINTAINED ON ALL SURFACE AREAS WITHIN THE SCOPE OF THIS PROJECT. DRAINAGE SHALL BE DIRECTED AWAY FROM ALL BUILDING FOUNDATIONS AND TOWARDS THE PROPER DRAINAGE EASEMENT OR STREET RIGHT OF WAY ACCORDING TO THE MASTER DRAINAGE PLAN FOR THE PROJECT. CONTRACTOR SHOULD TAKE PRECAUTIONS NOT TO ALLOW PONDING OF WATER.
7. ALL ELEVATIONS AND CONTOURS SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVEMENT, CURBS, AND SIDEWALKS MUST BE SUBTRACTED TO OBTAIN SUBGRADE ELEVATIONS.
8. GRADING PLAN IS INTENDED FOR USE IN LOT GRADING ONLY. CONTRACTOR SHOULD REFER TO CONSTRUCTION DRAWINGS FOR ALL OTHER GRADES, INCLUDING, BUT NOT LIMITED TO, CHANNELS, ROADS, AND DETENTION PONDS.
9. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE ALL SWALES.

LEGEND

E.G.T.TV.E	=	ELECTRIC, GAS, TELEPHONE, CABLE T.V. EASEMENT
C.B.	=	COUNTY BLOCK
V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
➡	=	FLOW ARROW
(A)	=	LOT GRADE TYPE
H.P.	=	HIGH POINT
F.F. MIN= 598.0'	=	FINISHED FLOOR MINIMUM ELEVATION AS REQUIRED PER FLOODPLAIN (SEE NOTE THIS SHEET)
735	=	EXISTING CONTOUR
735	=	PROPOSED CONTOUR
735	=	EXISTING CONTOUR
+ 731.69	=	SPOT ELEVATION



LOCATION MAP
SCALE: NOT-TO-SCALE



50 0 50 100

SCALE : 1" = 50'

Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

OFF-LOT 14' E.G.T.TV.E
CALAVERAS VIEW (R.O.W VARIES, MINIMUM 60')
H.P.
GHOST GROVE (50' R.O.W.)
HAUNTING HOLLOW (50' R.O.W.)
MATCH LINE "B" SEE SHEET 3.1
ZOMBIE RIDGE (50' R.O.W.)
LAGO ESCONDIDO (60' R.O.W.)
SHINING ROAD (50' R.O.W.)
THING TERRACE (R.O.W VARIES, MINIMUM 50')
(VARIABLE WIDTH R.O.W. - MIN. 50')
BLOCK 27
BLOCK 26
BLOCK 28
BLOCK 29
BLOCK 30
BLOCK 31
BLOCK 10
C.B. 5148
14' E.G.T.TV.E
10' E.G.T.TV.E
3' LANDSCAPE & V.N.A.E.
5' LANDSCAPE & V.N.A.E.
VARIABLE WIDTH CLEAR VISION EASEMENT
LOT 917
LOT 918
DRAIN "B" SEE SHEET 4.1
DRAIN "C" SEE SHEET 4.2
BW-304.07
BW-303.07
BW-301.07
REMAINDER OF 454.023 ACRES NORTHLAKE SA, LLC (DOC. NO. 20210357641, O.P.R.)
OFF-LOT 60' ELECTRIC, GAS, TELEPHONE, CABLE TV, WATER, SANITARY SEWER & DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W.)
OFF-LOT VARIABLE WIDTH ELECTRIC, GAS, TELEPHONE, CABLE TV, WATER, SANITARY SEWER & DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W.)
OFF-LOT 50' X 50' ELECTRIC, GAS, TELEPHONE, CABLE TV, WATER, SANITARY SEWER & DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W.)
UNPLATTED CITY PUBLIC SERVICE BOARD CITY OF SAN ANTONIO CALLED 234.61 ACRES CONDEMNATION PARCEL (NO CONVEYANCE DEED FOUND, DESCRIPTION IN VOLUME 6754, PAGE 403 O.P.R.)

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14305
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER:	DRAWING NAME:
314-65-03	GR3146503

SHEET TITLE:
OVERALL GRADING PLAN (3 OF 3)

SHEET NUMBER:
3.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

By: ABIEL MONTALVO
\\RCO314\6503.dwg\3.2

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CAUTION!!:

THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

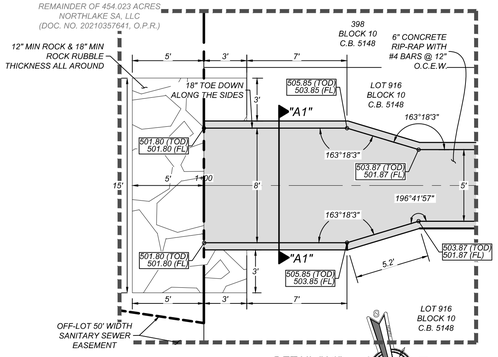
CHANNEL LINING:

PLEASE SEE SHEET 4.7 FOR TABLE 9.3.8.1 - RETARDATION CLASS FOR LINING MATERIALS AND TABLE 9.3.8.2 - PERMISSIBLE SHEAR STRESSES FOR VARIOUS LININGS

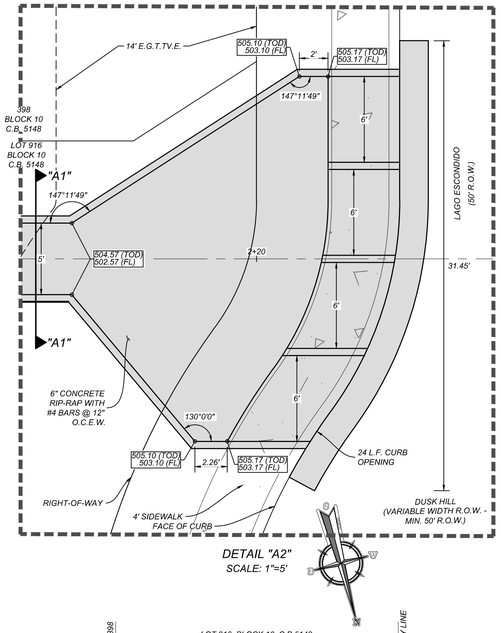
AREA'S EXCEEDING CITY OF SAN ANTONIO PERMISSIBLE SHEAR STRESS WILL BE REINFORCED WITH PROPOSED RETARDANCE CLASS D OR TURF REINFORCEMENT MAT (TRM) AS APPROVED BY CITY OF SAN ANTONIO STANDARD SPECIFICATIONS UNDER CONSTRUCTION ITEM 554.

BEXAR COUNTY R.O.W. NOTE

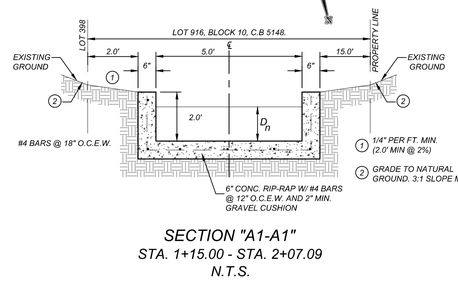
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.



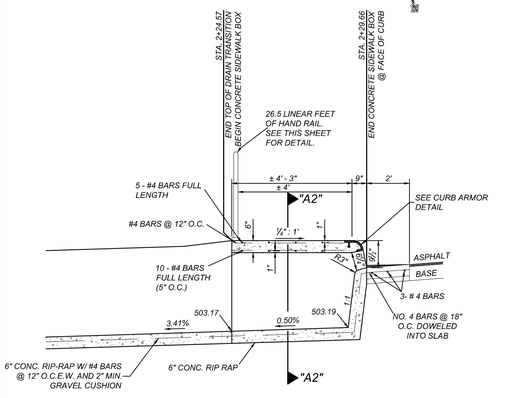
DETAIL "A1"
SCALE: 1"=5'



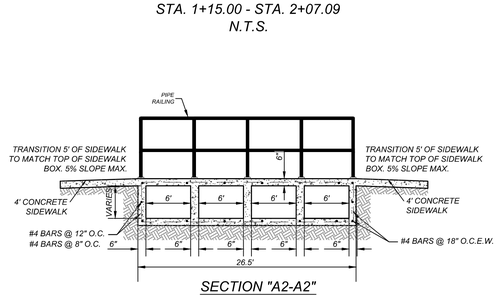
DETAIL "A2"
SCALE: 1"=5'



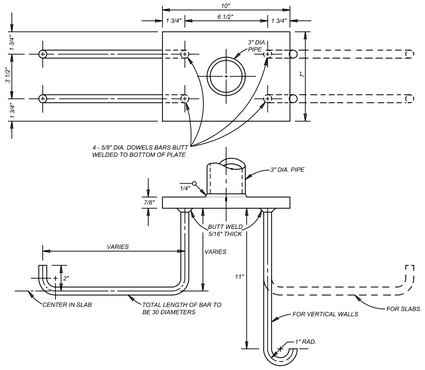
SECTION "A1-A1"
STA. 1+15.00 - STA. 2+07.09
N.T.S.



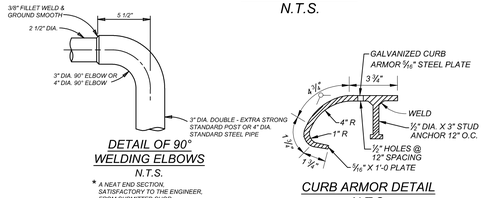
SIDEWALK BOX DETAIL
N.T.S.



SECTION "A2-A2"
N.T.S.



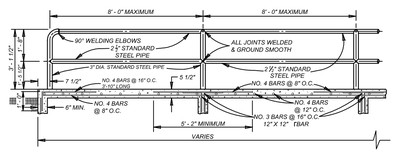
PIPE ANCHORAGE DETAILS
N.T.S.



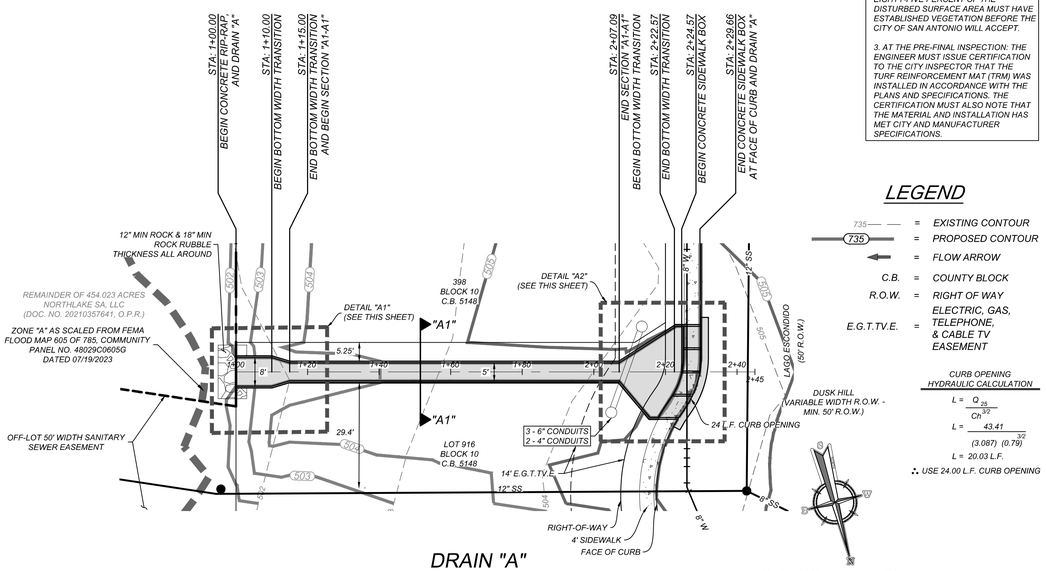
DETAIL OF 90° WELDING ELBOWS
N.T.S.

* A NEAT END SECTION, SATISFACTORY TO THE ENGINEER, FROM SUBMITTED SHOP DRAWINGS, MAY BE USED IN LIEU OF THE 90° WELDING ELBOW SHOWN.

CURB ARMOR DETAIL
N.T.S.



TYPICAL SIDEWALK BRIDGE & SIDEWALK PIPE RAILING SECTION
N.T.S.



DRAIN "A"
STA: 1+00.00 - END

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'

NOTE:

1. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.

2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.

3. AT THE PRE-FINAL INSPECTION: THE ENGINEER MUST ISSUE CERTIFICATION TO THE CITY INSPECTOR THAT THE TURF REINFORCEMENT MAT (TRM) WAS INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE CERTIFICATION MUST ALSO NOTE THAT THE MATERIAL AND INSTALLATION HAS MET CITY AND MANUFACTURER SPECIFICATIONS.

LEGEND

- 735 — — = *EXISTING CONTOUR*
- 735 = *PROPOSED CONTOUR*
- = *FLOW ARROW*
- *C.B.* = *COUNTY BLOCK*
- *R.O.W.* = *RIGHT OF WAY*
- *E.G.T.TV.E.* = *ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT*

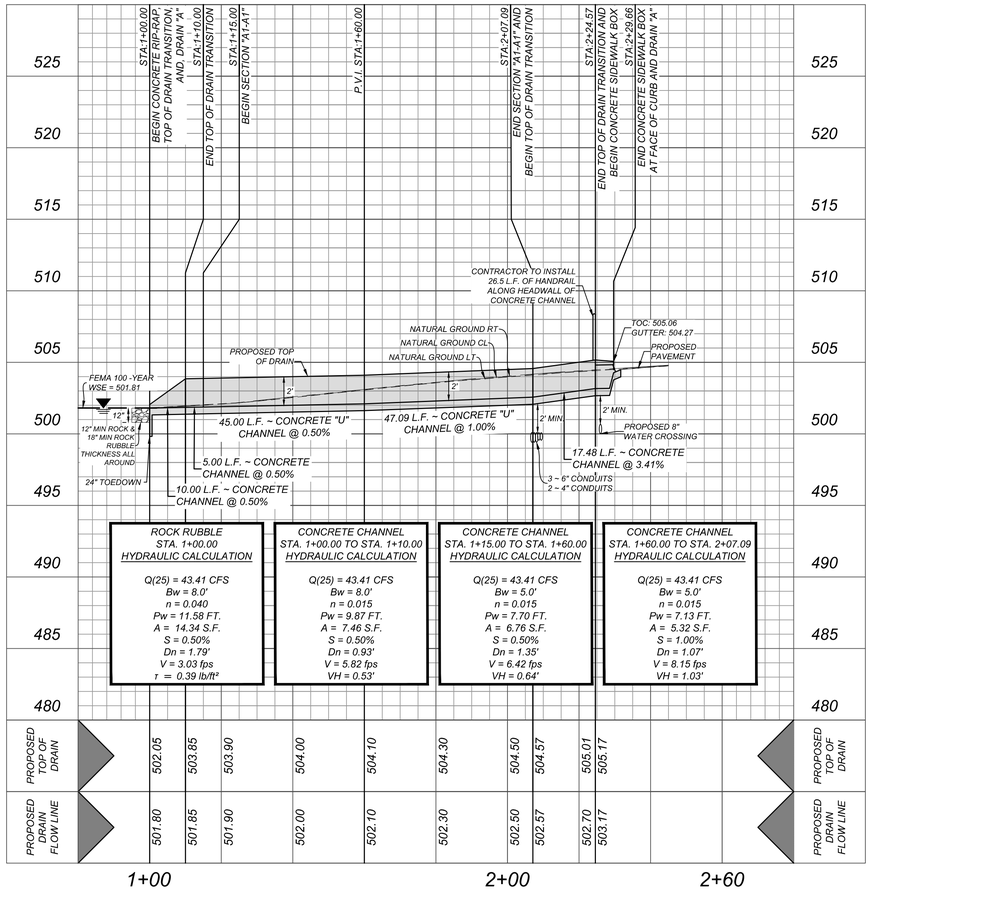
CURB OPENING HYDRAULIC CALCULATION

$L = \frac{Q_{25}}{Ch^{3/2}}$

$L = \frac{43.41}{(3.087)\ (0.79)^{3/2}}$

L = 20.03 L.F.

∴ USE 24.00 L.F. CURB OPENING



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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: DR3146503 - ABC

SHEET TITLE: DRAIN "A" PLAN & PROFILE

SHEET NUMBER: 4.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

In:\ROnline\DR3146503 - ABC.dwg/4.0 By: ABEL.MONTALVO

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CHANNEL LINING:

PLEASE SEE SHEET 4.7 FOR TABLE 9.3.8.1 - RETARDATION CLASS FOR LINING MATERIALS AND TABLE 9.3.8.2 - PERMISSIBLE SHEAR STRESSES FOR VARIOUS LININGS

AREA'S EXCEEDING CITY OF SAN ANTONIO PERMISSIBLE SHEAR STRESS WILL BE REINFORCED WITH PROPOSED RETARDANCE CLASS D OR TURF REINFORCEMENT MAT (TRM) AS APPROVED BY CITY OF SAN ANTONIO STANDARD SPECIFICATIONS UNDER CONSTRUCTION ITEM 554.

BEXAR COUNTY R.O.W. NOTE

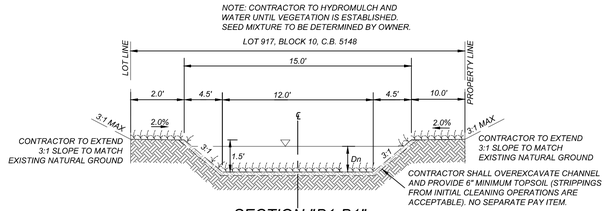
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

NOTE:

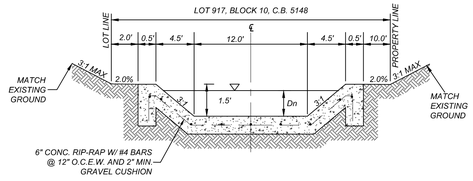
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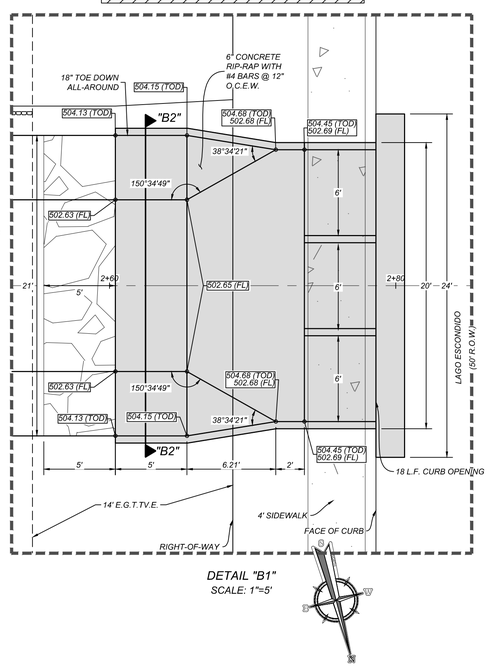
3. AT THE PRE-FINAL INSPECTION: THE ENGINEER MUST ISSUE CERTIFICATION TO THE CITY INSPECTOR THAT THE TURF REINFORCEMENT MAT (TRM) WAS INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE CERTIFICATION MUST ALSO NOTE THAT THE MATERIAL AND INSTALLATION HAS MET CITY AND MANUFACTURER SPECIFICATIONS.



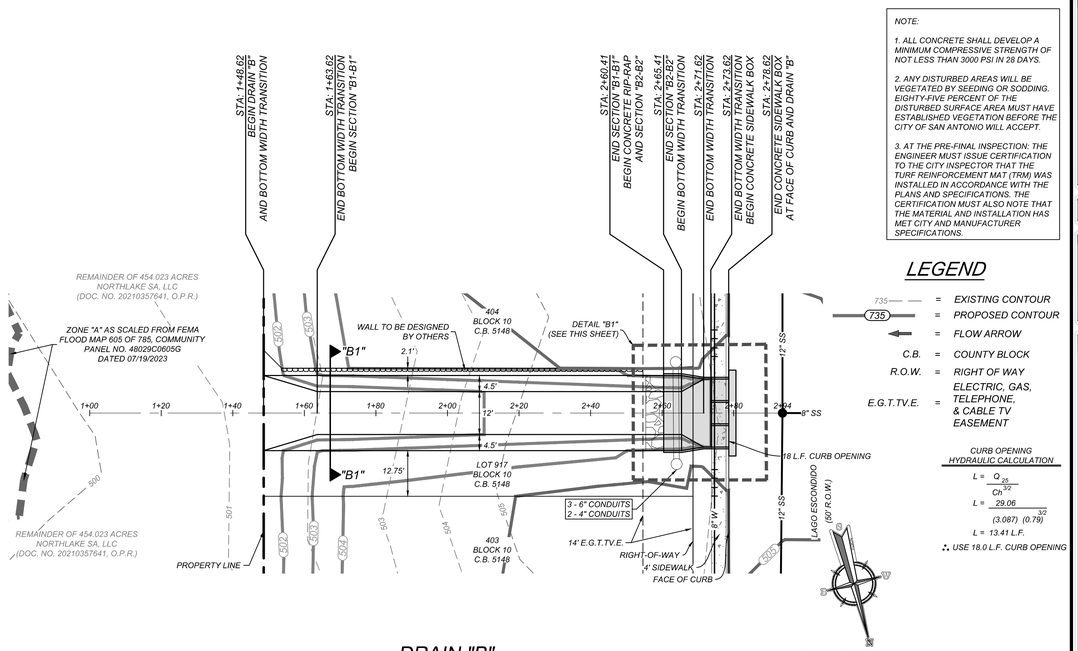
SECTION "B1-B1"
STA. 1+63.62 - STA. 2+60.41
N.T.S.



SECTION "B2-B2"
STA. 2+60.41 - STA. 2+65.41
N.T.S.



DETAIL "B1"
SCALE: 1"=5'



DRAIN "B"
STA: 1+48.62 - END

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'

LEGEND

- 735 — = *EXISTING CONTOUR*
- 735 = *PROPOSED CONTOUR*
- = *FLOW ARROW*
- *C.B.* = *COUNTY BLOCK*
- *R.O.W.* = *RIGHT OF WAY*
- *E.G.T.TV.E.* = *ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT*

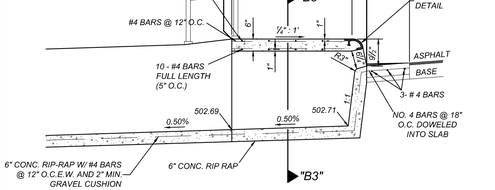
CURB OPENING HYDRAULIC CALCULATION

$L = \frac{Q_{25}}{Ch^{3/2}}$

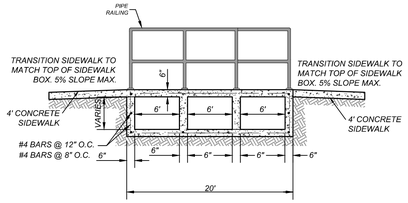
$L = \frac{29.06}{(3.087)\ (0.79)^{3/2}}$

$L = 13.41$ L.F.

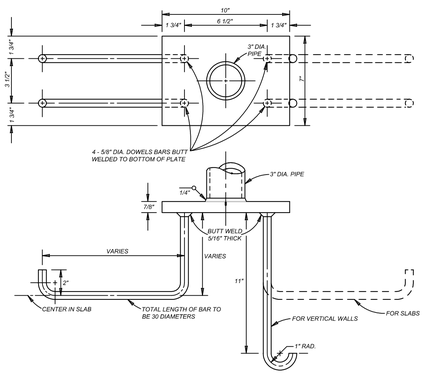
∴ USE 18.0 L.F. CURB OPENING



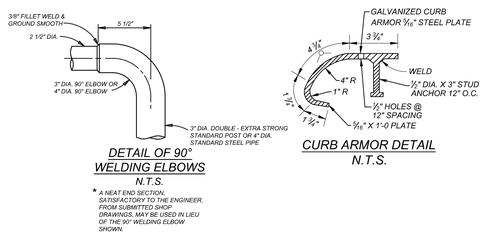
SIDEWALK BOX DETAIL
N.T.S.



SECTION "B3-B3"
N.T.S.



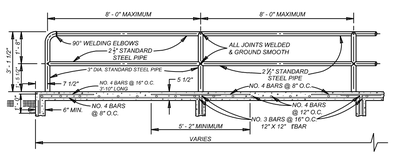
PIPE ANCHORAGE DETAILS
N.T.S.



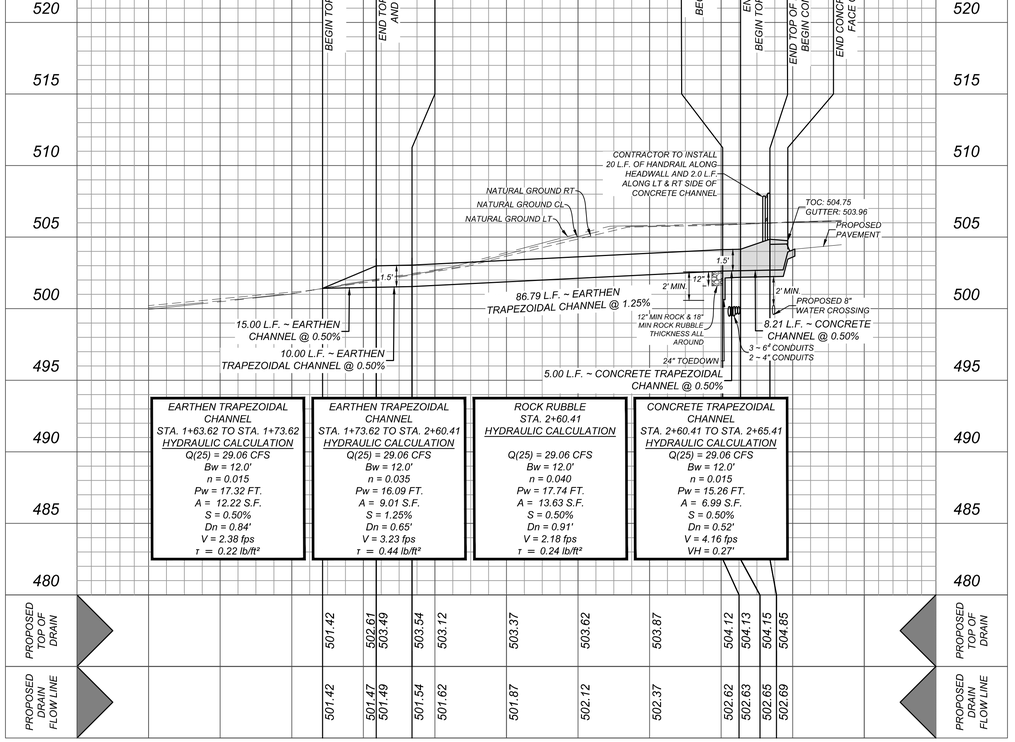
DETAIL OF 90° WELDING ELBOWS
N.T.S.

★ *A NEAT END SECTION, SATISFACTORY TO THE ENGINEER, FROM SUBMITTED SHOP DRAWINGS, MAY BE USED IN LIEU OF THE 90° WELDING ELBOW SHOWN.*

CURB ARMOR DETAIL
N.T.S.



TYPICAL SIDEWALK BRIDGE & SIDEWALK PIPE RAILING SECTION
N.T.S.



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REV	DATE	DRAWN BY	DESCRIPTION

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OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

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SAN ANTONIO (KFW)
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San Antonio, TX 78231
Phone: 210.979.8444
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: DR3146503 - ABC

SHEET TITLE: DRAIN "B" PLAN & PROFILE

SHEET NUMBER: 4.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\KFW\Drain\3031\4503 - ABC.dwg\4.1 By:ABEL.MONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CAUTION!!:

THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

CHANNEL LINING:

PLEASE SEE SHEET 4.7 FOR TABLE 9.3.8.1 - RETARDATION CLASS FOR LINING MATERIALS AND TABLE 9.3.8.2 - PERMISSIBLE SHEAR STRESSES FOR VARIOUS LININGS

AREA'S EXCEEDING CITY OF SAN ANTONIO PERMISSIBLE SHEAR STRESS WILL BE REINFORCED WITH PROPOSED RETARDANCE CLASS D OR TURF REINFORCEMENT MAT (TRM) AS APPROVED BY CITY OF SAN ANTONIO STANDARD SPECIFICATIONS UNDER CONSTRUCTION ITEM 554.

NOTE:

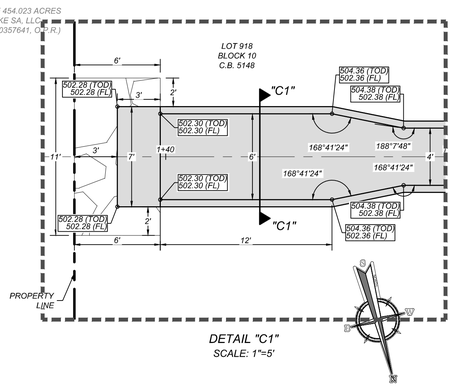
1. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.

2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.

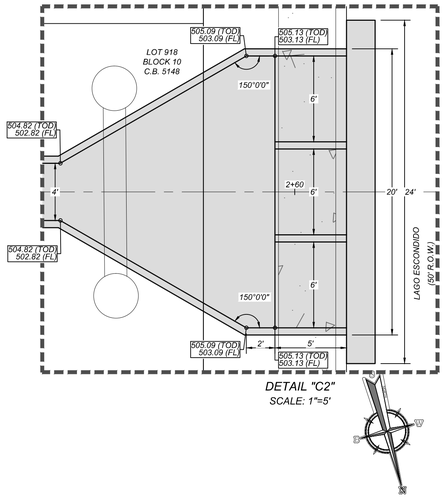
3. AT THE PRE-FINAL INSPECTION: THE ENGINEER MUST ISSUE CERTIFICATION TO THE CITY INSPECTOR THAT THE TURF REINFORCEMENT MAT (TRM) WAS INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE CERTIFICATION MUST ALSO NOTE THAT THE MATERIAL AND INSTALLATION HAS MET CITY AND MANUFACTURER SPECIFICATIONS.

BEXAR COUNTY R.O.W. NOTE

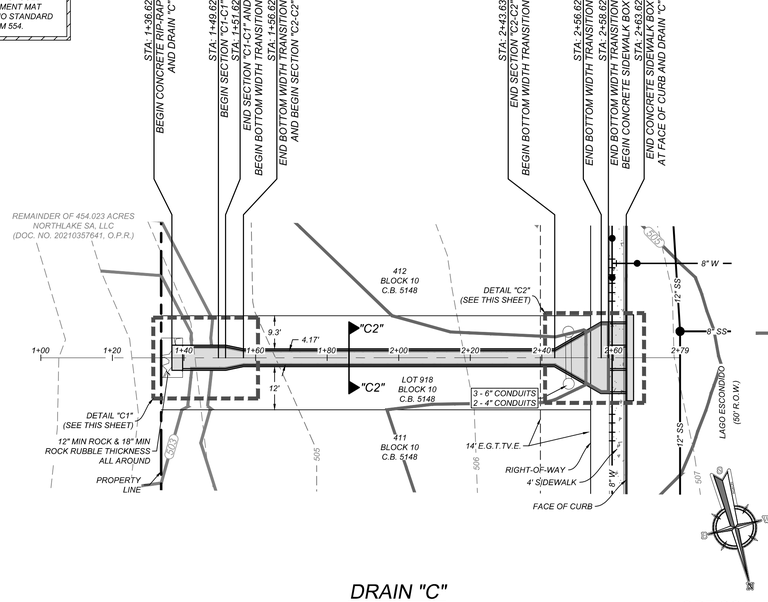
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.



DETAIL "C1"
SCALE: 1"=5'



DETAIL "C2"
SCALE: 1"=5'



LEGEND

- 735 — — = *EXISTING CONTOUR*
- 735 = *PROPOSED CONTOUR*
- = *FLOW ARROW*
- *C.B.* = *COUNTY BLOCK*
- *R.O.W.* = *RIGHT OF WAY*
- *E.G.T.TV.E.* = *ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT*

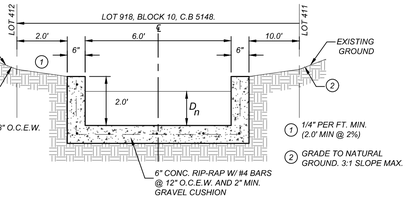
CURB OPENING HYDRAULIC CALCULATION

$L = \frac{Q_{25}}{Ch^{3/2}}$

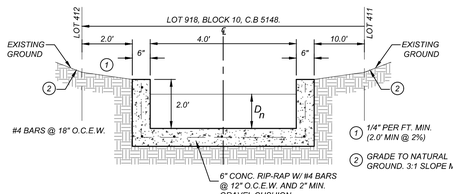
$L = \frac{35.21}{(3.087)\ (0.79)^{3/2}}$

$L = 16.24$ L.F.

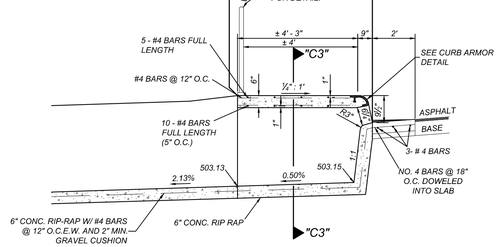
∴ *USE 18.0 L.F. CURB OPENING*



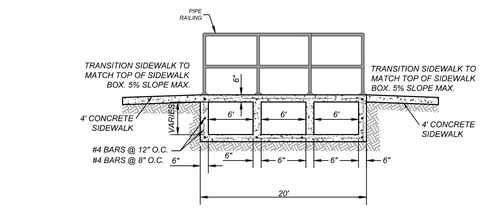
SECTION "C1-C1"
STA. 1+49.62 - STA. 1+51.62
N.T.S.



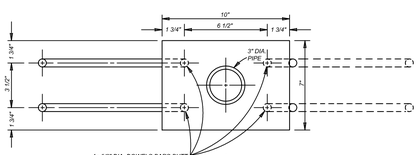
SECTION "C2-C2"
STA. 1+56.62 - STA. 2+43.63
N.T.S.



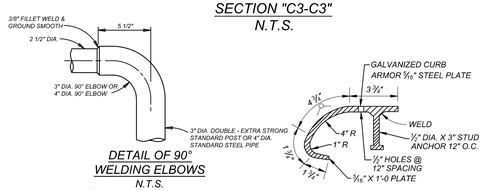
SIDEWALK BOX DETAIL
N.T.S.



SECTION "C3-C3"
N.T.S.



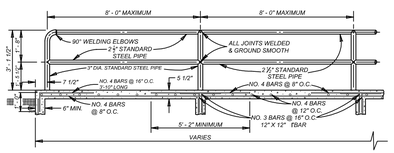
PIPE ANCHORAGE DETAILS
N.T.S.



DETAIL OF 90° WELDING ELBOWS
N.T.S.

* *A NEAT END SECTION, SATISFACTORY TO THE ENGINEER, FROM SUBMITTED SHOP DRAWINGS, MAY BE USED IN LIEU OF THE 90° WELDING ELBOW SHOWN.*

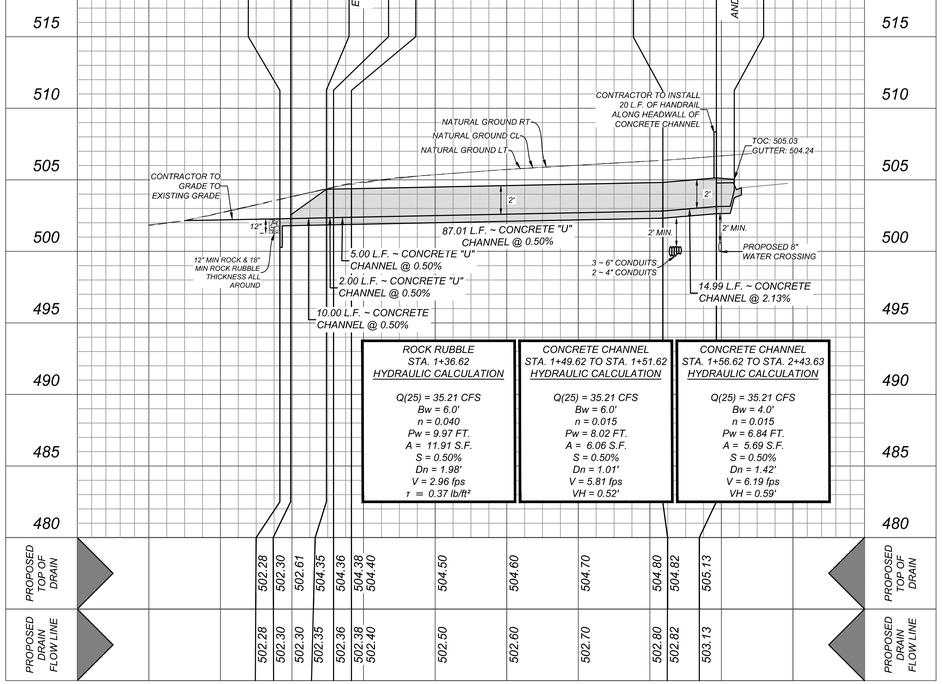
CURB ARMOR DETAIL
N.T.S.



TYPICAL SIDEWALK BRIDGE & SIDEWALK PIPE RAILING SECTION
N.T.S.

DRAIN "C"
STA: 1+00.00 - END

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



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125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
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3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
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TBPE Firm#: F-14909
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

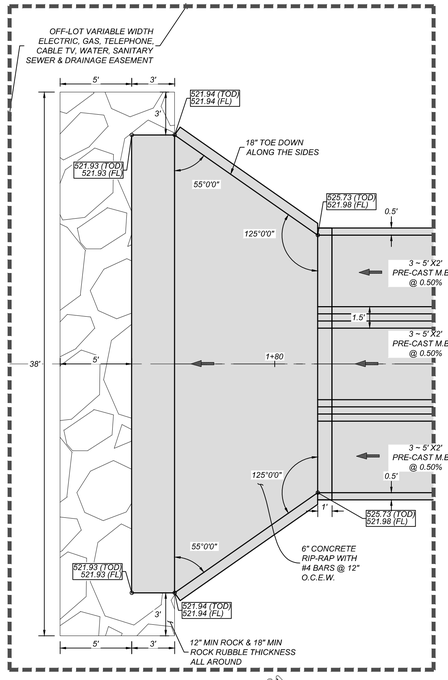
PROJECT NUMBER: 314-65-03
DRAWING NAME: DR3146503 - ABC

SHEET TITLE: DRAIN "C" PLAN & PROFILE

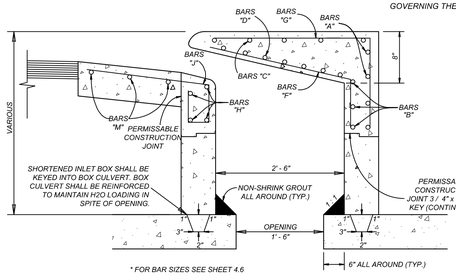
SHEET NUMBER: 4.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

\\ATX\Drives\3503146503 - ABC.dwg\4.2 By: ABEL.MONTALVO



DETAIL "D1"
SCALE: 1"=5'



* FOR BAR SIZES SEE SHEET 4.6

TYPE "C" INLET OVER PRECAST BOX CULVERT
N.T.S.

<u>TRENCH EXCAVATION SAFETY PROTECTION</u>

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

<u>CAUTION!!</u>

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<u>CHANNEL LINING:</u>

PLEASE SEE SHEET 4.7 FOR TABLE 9.3.8.1 - RETARDATION CLASS FOR LINING MATERIALS AND TABLE 9.3.8.2 - PERMISSIBLE SHEAR STRESSES FOR VARIOUS LININGS

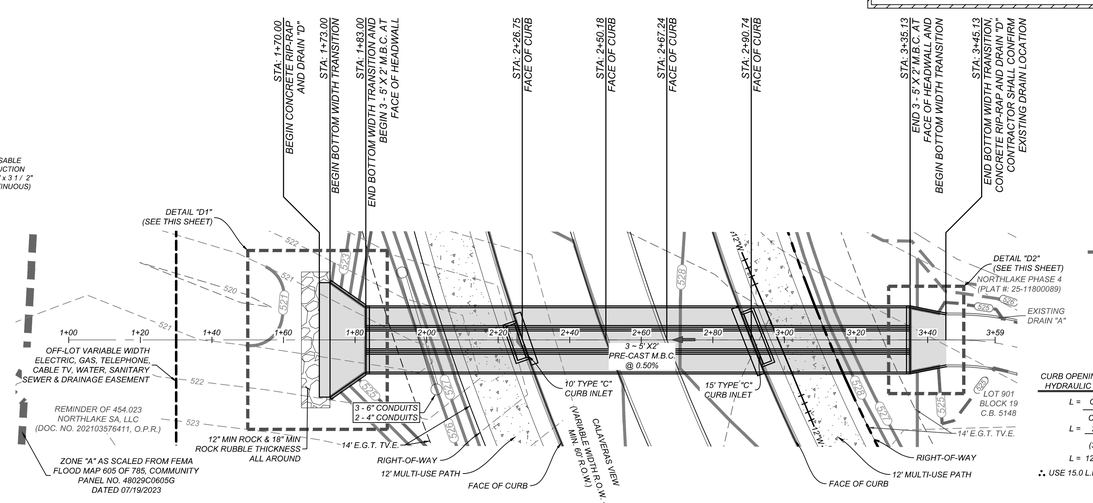
AREA'S EXCEEDING CITY OF SAN ANTONIO PERMISSIBLE SHEAR STRESS WILL BE REINFORCED WITH PROPOSED RETARDANCE CLASS D OR TURF REINFORCEMENT MAT (TRM) AS APPROVED BY CITY OF SAN ANTONIO STANDARD SPECIFICATIONS UNDER CONSTRUCTION ITEM 554.

NOTE:

1. *ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.*
2. *ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.*
3. *AT THE PRE-FINAL INSPECTION, THE ENGINEER MUST ISSUE CERTIFICATION TO THE CITY INSPECTOR THAT THE TURF REINFORCEMENT MAT (TRM) WAS INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE CERTIFICATION MUST ALSO NOTE THAT THE MATERIAL AND INSTALLATION HAS MET CITY AND MANUFACTURER SPECIFICATIONS.*

<u>BEXAR COUNTY R.O.W. NOTE</u>

A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.



DRAIN "D"
STA: 1+00.00 - END

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'

LEGEND

735	=	EXISTING CONTOUR
735	=	PROPOSED CONTOUR
	=	FLOW ARROW
C.B.	=	COUNTY BLOCK
R.O.W.	=	RIGHT OF WAY
E.G.T.TV.E.	=	ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT

CURB OPENING (UPSTREAM) HYDRAULIC CALCULATION

$L = \frac{Q_{25}}{Ch^{3/2}}$

$L = \frac{27.39}{(3.087)\ (0.79)^{3/2}}$

$L = 12.64$ L.F.

∴ USE 15.0 L.F. CURB OPENING

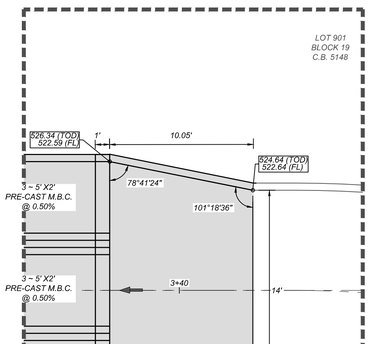
CURB OPENING (DOWNSTREAM) HYDRAULIC CALCULATION

$L = \frac{Q_{25}}{Ch^{3/2}}$

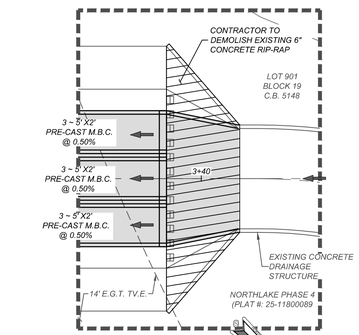
$L = \frac{20.17}{(3.087)\ (0.79)^{3/2}}$

$L = 9.31$ L.F.

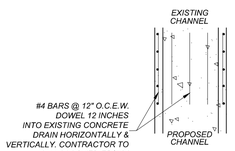
∴ USE 10.0 L.F. CURB OPENING



DETAIL "D2"
SCALE: 1"=5'

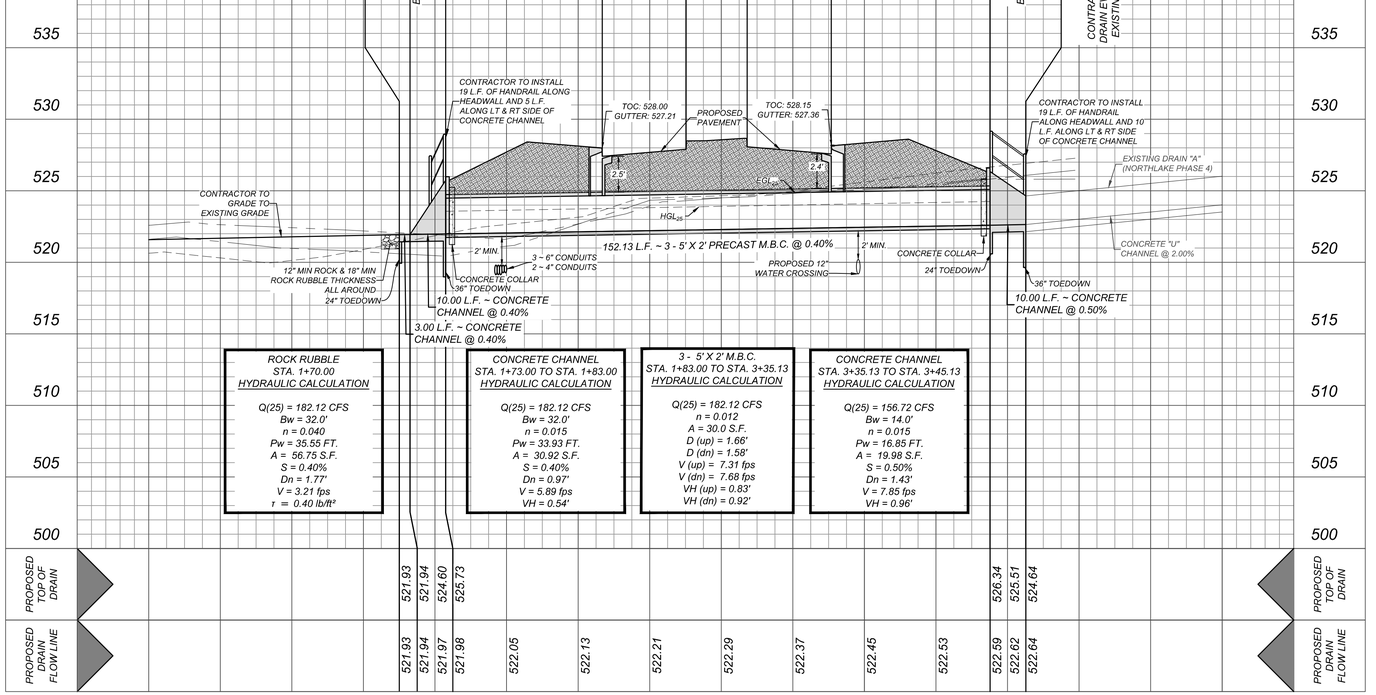


EX. DRAIN A
DEMOLITION PLAN -
SCALE: 1" = 10'



CONCRETE TIE-IN DETAIL
N.T.S.

MATERIAL	UNITS	QUANTITIES
6"" CONCRETE RIP-RAP	S.Y.	34.83
BAFFLE BLOCKS	C.Y.	0.25



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REV	DATE	DRAWN BY	DESCRIPTION
-	-	-	-

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

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3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: DR3146503 - D

SHEET TITLE: DRAIN "D" PLAN & PROFILE

SHEET NUMBER: 4.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

W:\Drain\503\146503 - D.dwg4.3 By: ABEL.MONTALVO

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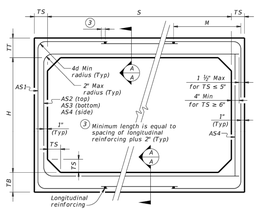
DATE:
FILE:

BOX DATA

SECTION DIMENSIONS							REINFORCING (sq. in. / ft.) (2)							(1) Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	Fill Height (ft.)	M (Min) (in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
5	2	8	8	6	< 2	-	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.0
5	2	6	6	6	< 3	44	0.22	0.20	0.16	0.14	-	-	-	5.1
5	2	6	6	6	3 - 5	44	0.16	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	5 - 10	36	0.15	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	15	36	0.20	0.18	0.18	0.14	-	-	-	5.1
5	2	6	6	6	20	36	0.26	0.23	0.24	0.14	-	-	-	5.1
5	2	6	6	6	25	36	0.33	0.29	0.29	0.14	-	-	-	5.1
5	2	6	6	6	30	36	0.39	0.34	0.35	0.14	-	-	-	5.1
5	3	8	7	6	< 2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.17	6.6
5	3	6	6	6	< 2 < 3	45	0.18	0.24	0.19	0.14	-	-	-	5.7
5	3	6	6	6	3 - 5	36	0.14	0.17	0.16	0.14	-	-	-	5.7
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	5.7
5	3	6	6	6	15	35	0.16	0.21	0.21	0.14	-	-	-	5.7
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	5.7
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	5.7
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	5.7
5	4	8	7	6	< 2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2
5	4	6	6	6	< 2 < 3	45	0.16	0.27	0.22	0.14	-	-	-	6.3
5	4	6	6	6	3 - 5	45	0.14	0.19	0.18	0.14	-	-	-	6.3
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	6.3
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	6.3
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	6.3
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	6.3
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	6.3
5	5	8	7	6	< 2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8
5	5	6	6	6	< 2 < 3	45	0.14	0.29	0.24	0.14	-	-	-	6.9
5	5	6	6	6	3 - 5	45	0.14	0.21	0.20	0.14	-	-	-	6.9
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	6.9
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	6.9
5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	-	-	6.9
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	6.9
5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	-	-	-	6.9

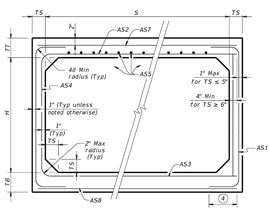
(1) For box length = 8'-0"

(2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



CORNER OPTION "A" CORNER OPTION "B"

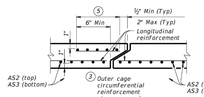
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

(4) Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ).



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:
Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)"

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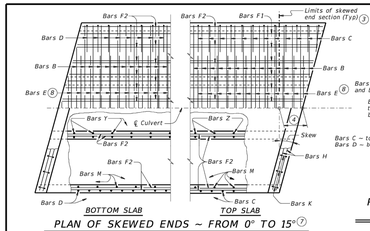
SINGLE BOX CULVERTS PRECAST 5'-0" SPAN

SCP-5

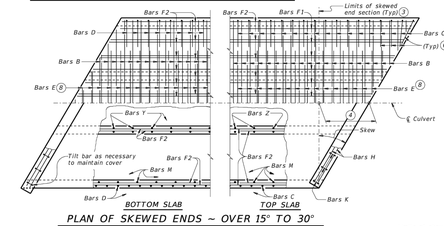
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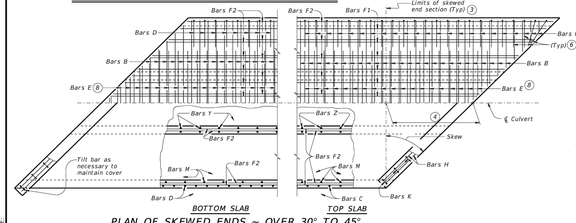
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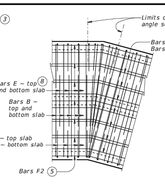
PLAN OF SKEWED ENDS ~ FROM 0° TO 15°



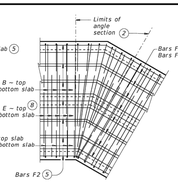
PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



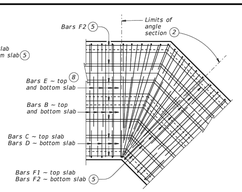
PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°

(1) For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.
For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, Class C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-0" centers-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop the Nba to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing". Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.
Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

(2) When the spacing between Bars B or Bars E becomes less than half of the normal spacing, cut bars to avoid conflict.

(3) The length of Bars B and Bars E will vary in the skewed end sections.

(4) (one half of overall width) x (tangent of the skew angle)

(5) Place Bars F1 and F2 continuously through the angle section. Bond Bars F1 and F2 to remain parallel to the walls of the box culvert.

(6) When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-0" for skews of 30° thru 45°.

(7) At the Contractor's option, for skews of 15° or less, place Bars B, C, D, and E parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B and Bars E shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets to accommodate the skew.

(8) Extend Bars E as shown on the MC standard sheet for direct traffic culverts.

CONSTRUCTION NOTES:
Do not use permanent forms.
When required, lap Bars H 1'-8" for uncoated or galvanized bars.
Provide a minimum of 1 ½" clear cover.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel, if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) with these exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for details of straight sections of culvert.
For skewed sections and angle sections, refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.
For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.

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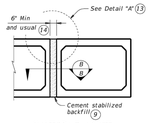
MULTIPLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

MC-MD

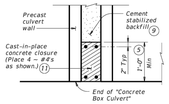
FILE: CD-MC-MD-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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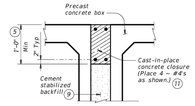
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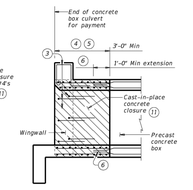
MULTIPLE UNIT PLACEMENT



SECTION B-B

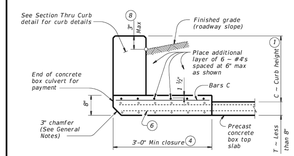


DETAIL "A" (13)

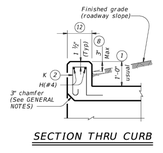


WINGWALL CONNECTION

(Also applies to safety end treatment.)



SECTION THRU TOP SLABS LESS THAN 8"

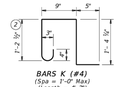


SECTION THRU CURB

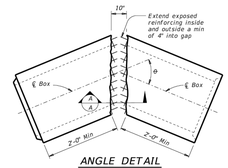
QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



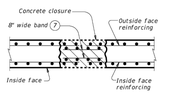
BARS C (#4)
(Spa = 1'-0" Max)



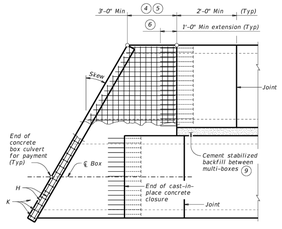
BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement.)

(1) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

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

(3) Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.

(4) Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast boxes short. Provide bends of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.

(5) For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.

(6) Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).

(7) Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.

(8) For vehicle safety, the following requirements must be met:
For structures without bridge rail, construct curbs no more than 3" above finished grade.
For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(9) Cement stabilized backfill between boxes is considered part of the box culvert for payment.

(10) All curb concrete and reinforcing is considered part of the box culvert for payment.

(11) Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.

(12) 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.

(13) For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".

(14) This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." No payment will be made for any additional material in the gap between adjacent boxes.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide ASTM A1064 welded wire reinforcement.
Provide Class C concrete (f'c = 3,600 psi) for the closures.
Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bars dimensions are out-to-out of bars.

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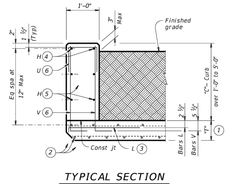
BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE: CD-SCP-MD-20.dgn	DN: GAF	CK: LRW	DW: BWH/TxDOT	CK: GAF
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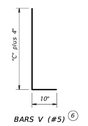
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DATE:
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TYPICAL SECTION

Used for curbs over 1'-0" to 5'-0"



BARS V (#5) (6)
Spaced at 12" Max



BARS L (#5) (3)
Spaced at 12" Max



OPTIONAL BARS L (#5) (3) (7)
Spaced at 12" Max



BARS U (#4) (6)
Spaced at 12" Max

(1) "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.

(2) Adjust normal culvert slab bars as necessary to clear obstructions.

(3) Place bars L as shown. Tilt hook as necessary to maintain cover.

(4) Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.

(5) Additional bars H(#4) as required to maintain 12" Max spacing.

(6) Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.

(7) Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.

(8) Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES (8)

Curb Height "C"	Conc (CY/LF)	Reinf Steel (LB/LF)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	15.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

CONSTRUCTION NOTES:
Adjust reinforcing steel as necessary to provide 1 ½" cover.
For vehicle safety, top of the curb must not project more than 3" above the finished grade.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class "C" concrete (f'c = 3,600 psi) minimum for curbs.
Provide bar laps, where required, as follows:
• Uncoated or galvanized — #4 = 1'-0" Min

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR11, PR22 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.
This Curb is considered as part of the Box Culvert for payment.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation — Bridge Division Standard

EXTENDED CURB DETAILS FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

ECD

FILE: CD-ECD-20.dgn	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

By: ABEL.MONTALVO
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: DRDT3146503

SHEET TITLE: DRAIN DETAILS (1 OF 4)

SHEET NUMBER: 4.4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Maximum Wingwall Height Hw	W	X	Y	Z	Bars J1 Size	Bars J1 Spa	Bars J2 Size	Bars J2 Spa	Estimated Quantities per ft of wing (2-wings) ④ Reinf (Lb/Ft)	Conc (CY/Ft)	Estimated Quantities per ft of toewall (1-toewall) Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
3'-9"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-0"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	158.59	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	11"	#6	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	11"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-3"	#9	less than 8"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2-wings)

Bar	Size	No.	Spa
D1	#6	–	1'-0"
D2	#6	–	1'-0"
E1	#4	–	1'-0"
F	#4	–	1'-0"
G	#6	–	8"
H1	#4	4	–
P	#4	–	1'-0"
V	#4	–	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No.	Spa
J3	#4	–	1'-0"
M2	#4	2	–
E2	#4	–	1'-0"



BARS D1



BARS D2

WING DIMENSION FORMULAS:
(All values are in feet.)

Hw = H + T + C
Lw = (Hw) (SL) + cosine (θ) for Type PW-1
= (Hw - 1') (SL) + cosine (θ) for Type PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) + cosine (θ) for Type PW-2 and Hw < 4'

For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U) + cosine (θ)

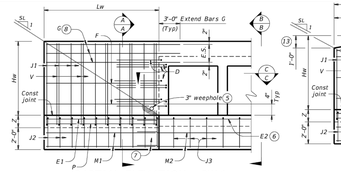
For precast culverts:
Ltw = ((N) (2 U + S) + (N - 1) (0.5)) + cosine (θ)
Total Wingwall Area (two wings – SF) = (Hw + 0.333') (Lw)
= (2)(Hw)(Lw) for Type PW-1
= (2)(Hw)(Lw) - 6 SF for Type PW-2 and Hw ≥ 4'
= (2)(Hw)(Lw) - 1.5 SF for Type PW-2 and Hw < 4'

Hw = Height of wingwall
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
SL:1 = Channel slope ratio (horizontal: 1 vertical, usual value is 2:1)
θ = Culvert skew

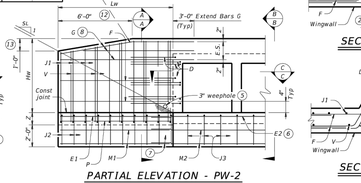
See applicable box culvert standard sheet for S, H, T, and U values.

1. Skew = 0°
2. At discharge end, chamfer may be ¾" minimum.
3. For 15° skew – 1°
   For 30° skew – 2°
   For 45° skew – 3°
4. Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
5. Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
6. Extend Bars E2 1'-6" minimum into the wingwall footing.
7. Lap Bars M1 1'-6" minimum with Bars M2.
8. Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
9. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
10. For vehicle safety, the following requirements must be met:
    - For structures without bridge rail, construct curbs no more than 3" above finished grade.
    - For structures with bridge rail, construct curbs flush with finished grade.

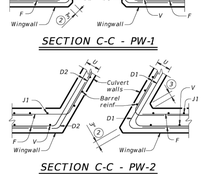
    Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
11. 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
12. 3'-0" for Hw < 4'.
13. 6" for Hw < 4'.



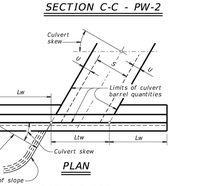
PARTIAL ELEVATION - PW-1



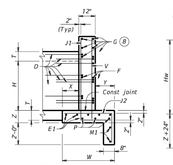
PARTIAL ELEVATION - PW-2



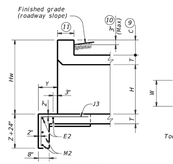
SECTION C-C - PW-1



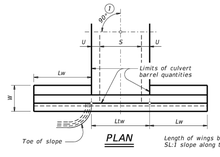
SECTION C-C - PW-2



SECTION A-A
(Showing wing reinforcement.)



SECTION B-B
(Showing wing reinforcement.)



PLAN
DETAILS FOR NON-SKEWED BOX CULVERTS

PLAN
DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° skew.)

DESIGNER NOTES:
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall. Type PW-2 can only be used for applications without a railing mounted to the wingwall.

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.

GENERAL NOTES:
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.
Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS
WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

FILE:	pwstd01-20.dgn	DN: GAI	CK: GAI	DW: TxDOT	CK: TxDOT
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REVISIONS		DIST	COUNTY		SHEET NO.

PW

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

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

TABLE OF WINGWALL REINFORCING (2-wings)

Bar	Size	No.	Spa
D	#5	–	1'-0"
E	#4	–	1'-0"
F	#4	–	1'-0"
G	#6	4	–
H	#4	4	–
P	#4	–	1'-0"
R	#5	6	–
V	#4	–	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	–	1'-0"
Q	#4	1	–
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:
(All values are in feet.)

Hw = H + T + C - 0.250'
Lw = (Hw - 0.333') (SL)
B = (Lw) tangent (30°)
Ltw = (Lw) + cosine (30°)

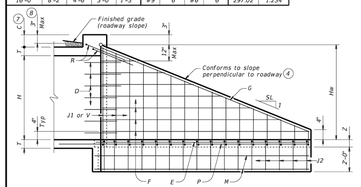
For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U)

For precast culverts:
Ltw = (N) (2U + S) + (N - 1) (0.5')

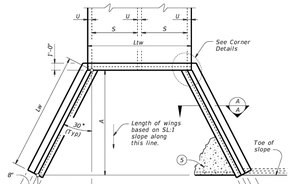
Total wingwall area (two wings – SF) = (Hw + 0.333') (Lw)

Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

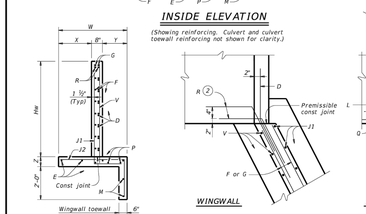
See applicable box culvert standard sheet for H, S, T, and U values.



INSIDE ELEVATION
(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

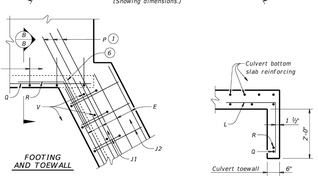


PLAN
(Showing dimensions.)



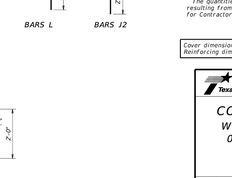
SECTION A-A

WINGWALL

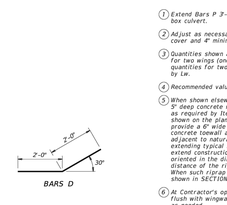


FOOTING AND TOEWALL

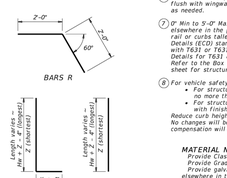
CORNER DETAILS
(Culvert and culvert toewall reinforcing not shown for clarity.)



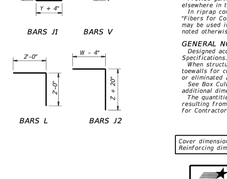
SECTION B-B



BARS D



BARS R



BARS J1

BARS V

BARS L

BARS J2

1. Extend Bars P 3'-0" minimum into bottom slab of box culvert.
2. Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.
3. Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
4. Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
5. When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap." Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete sawmill along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending the reinforcing steel in the box culvert; and extend construction joints at grooved joints and oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
6. At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
7. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
8. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

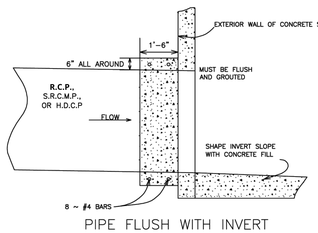
Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS
WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

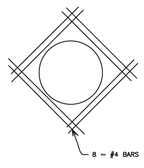
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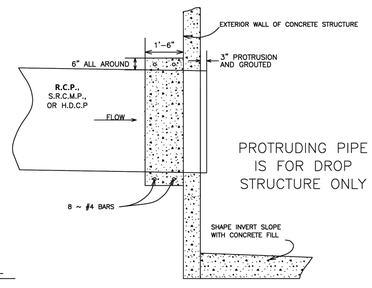
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©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A," 3,000 P.S.I. AT 28 DAYS.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4".
3. REINFORCING STEEL SHALL BE NEW BILLET STEEL, INTERMEDIATE GRADE, ASTM. A-15. THE DEFORMATION SHALL CONFORM TO ASTM. A-305.
4. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
5. ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD-CUT.
6. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.
7. INVERT OF JUNCTION BOX TO BE SHAPED WITH CONCRETE FILL (3,000 P.S.I. MIN.) TO EFFECT DRAINAGE TO OUTLET PIPE. COST SUBSIDIARY TO CLASS "A" CONCRETE (JUNCTION BOXES).



PIPE FLUSH WITH INVERT





PROTRUDING PIPE IS FOR DROP STRUCTURE ONLY

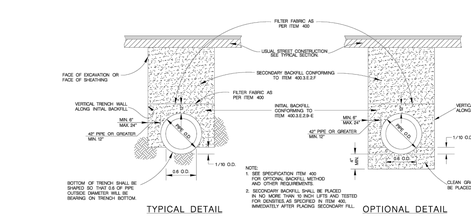
CONCRETE COLLAR DETAIL
(NOT TO SCALE)

JANUARY 2006

STANDARD PLANS
CITY OF SAN ANTONIO, TEXAS
DEVELOPMENT SERVICES

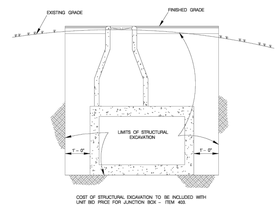
CONCRETE COLLAR DETAIL

DRAWN BY: ANDREY WINTER, P.E.	DATE	REVISIONS	SCALE: SEE ABOVE
CHECKED BY: SAM BENT, P.E.			DATE: 29 JANUARY 2006
			SHEET: 1 OF 1



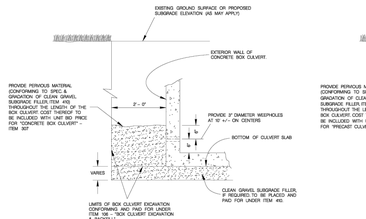
TYPICAL DETAIL
OPTIONAL DETAIL

PIPE BEDDING & BACKFILL DETAILS

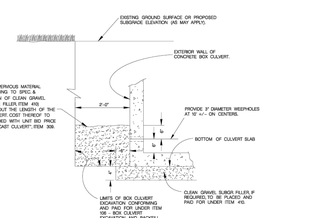


COST OF STRUCTURAL EXCAVATION TO BE INCLUDED WITH UNIT BID PRICE FOR "JUNCTION BOX – ITEM 465"

STRUCTURAL EXCAVATION AT JUNCTION BOXES
NO SCALE

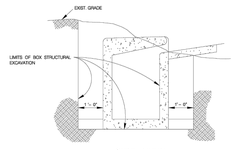


CAST-IN-PLACE BOX CULVERT

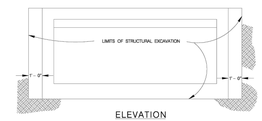


PRECAST BOX CULVERT

CONCRETE BOX CULVERT



SIDE VIEW



ELEVATION

COST OF STRUCTURAL EXCAVATION TO BE INCLUDED WITH UNIT BID PRICE FOR INLETS – ITEM 465.

STRUCTURAL EXCAVATIONS AT DRAINAGE INLETS
NO SCALE

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

PIPE BEDDING & MISCELLANEOUS DRAINAGE DETAILS

% SUBMITTAL	PROJECT NO.		DATE
DRAWN BY:	DSGN. BY:	CHKD. BY:	SHEET NO. OF

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
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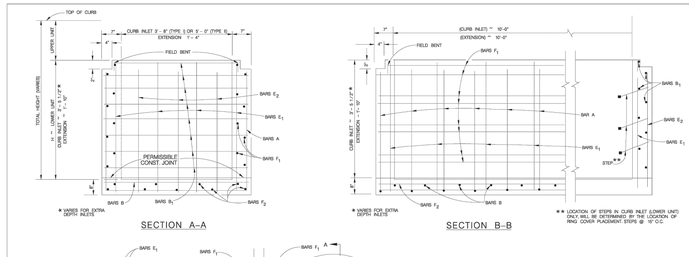
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AS SHOWN	JAN 2025	-	OE
PROJECT NUMBER: 314-65-03	DRAWING NAME: DRDT3146503		

SHEET TITLE:
DRAIN DETAILS (2 OF 4)

SHEET NUMBER:
4.5

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DATE:
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By: ABEL.MONTALVO



REINFORCING STEEL

LOWER UNIT 10' X 3' – 8" (TYPE I)					
BAR	NO.	SIZE	SPAC.	LENGTH	
A	12	#4	12"	VARIES	
B	11	#4	12"	4'-6"	
B_1	VARIES	#4	12"	4'-6"	
E_1	20	#4	18"±	VARIES	
E_2	6	#4	18"±	VARIES	
F_1	VARIES	#4	12"±	10'-10"	
F_2	9	#4	——	10'-10"	

LOWER UNIT 10' X 5' – 0" (TYPE II)					
BAR	NO.	SIZE	SPAC.	LENGTH	
A	12	#4	12"	VARIES	
B	11	#4	——	5'-6"	
B_1	VARIES	#4	——	5'-10"	
E_1	22	#4	18"±	VARIES	
E_2	8	#4	18"±	VARIES	
F_1	VARIES	#4	12"±	10'-10"	
F_2	11	#4	——	10'-10"	

GENERAL NOTES

1. S' INLETS AND 'S' EXTENSIONS MUST BE IN ACCORDANCE WITH THE LATEST TXDOT CURB INLET TYPE "C" AND EXTENSION TYPE E (S-C).
2. TYPE C-A INLET TO BE USED ONLY WHEN STORM DRAIN PIPE IS IN-LINE WITH CURB INLET AND APPROVED BY THE ENGINEER.
3. QUANTITIES SHOWN ARE FOR CONTRACTORS INFORMATION ONLY.
4. CONCRETE FOR STRUCTURES SHALL BE CLASS "A", 3000 PSI IN 28 DAYS.
5. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
6. ALL REINFORCING STEEL BARS SHALL HAVE A MINIMUM COVER OF 1 1/2".
7. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. A-615 GRADE 60 REQUIREMENTS.
8. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3 / 4".
9. DEPRESSION SLAB SHALL RECEIVE A WOOD FLOAT FINISH.
10. FACE OF INLET TO CONFORM TO FACE OF CURB LINE.
11. ALL SWIS INTERCEPTING MANHOLE RING & COVER SHALL BE CUT OR BENT.
12. PAYMENT FOR ALL EXCAVATION, BACK-FILLING CONCRETE, REINFORCING STEEL, RING AND COVER, CURB ARMOR AND STEPS SHALL BE INCLUDED IN THE UNIT COST OF ITEM 465 "STORM SEWER JUNCTION BOXES AND INLETS".
13. CAST IRON MANHOLE RING AND COVER TO BE PLACED NEXT TO OUTLET PIPE, EXCEPT FOR VERTICAL OUTLET PIPE IN WHICH CASE MANHOLE RING AND COVER WILL BE OFFSET.
14. GALVANIZED BOLTS, NUTS, WASHERS, PLATES AND GASKETS ARE SUBSIDIARY TO INLETS.
15. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE MEANS TO LIFT AND PLACE THE INLETS, WHEN USING PRECAST UNITS.
16. ALL BARS AT PIPE BLOCKOUT LOCATIONS SHALL BE CUT OR BENT.
17. ALL LOWER UNITS SHALL RECEIVE INVERT MORTAR SHAPING.
18. PIPE BLOCKOUTS IN INLET WALLS SHOULD NOT EXCEED 3' BEYOND THE OUTER SHELL OF THE PIPE, TAKING INTO ACCOUNT THE SHOW OF THE PIPE AS NECESSARY. CONSTRUCTION JOINT MAY BE RAISED A MAXIMUM OF 6".

PHASE CONSTRUCTION

NOTES FOR PHASE CONSTRUCTION (WHEN DIRECTED BY THE ENGINEER):

1. THE CURB INLET AND EXTENSION SHALL BE CONSTRUCTED TO A DEPTH "Hu" BELOW THE INLET AND EXTENSION GUTTER LINE ELEVATION.
2. CAP THE CURB INLET AND EXTENSION WITH A STEEL PLATE APPROVED BY THE ENGINEER AND CONSTRUCT THE ROADWAY OVER THE PLATE.
3. AFTER THE ROADWAY IS COMPLETED, BUT PRIOR TO THE FINAL HMAC OVERLAY, SAW CUT THE PAVEMENT, REMOVE THE PLATE AND COMPLETE THE UPPER PORTION OF THE CURB INLET AND / OR EXTENSION.

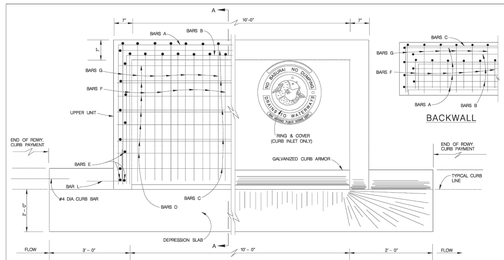
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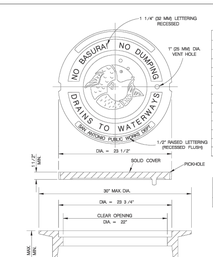
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CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II)
& INLET EXTENSION STANDARDS
SHEET 1 OF 3

% SUBMITTAL | PROJECT NO.: | DATE:

DRAWN BY V. VASQUEZ | DESIGN BY L.E. MALTOS, P.E. | CHKD. BY B.S. HOSSEINI, P.E. | SHEET NO.: | OF





NOTES FOR MANHOLE LID AND RING

1. FOR LID DESIGN OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT."
2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF HS-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 360 LBS.

SEE SHEET 1 OF 3 FOR GENERAL NOTES.

REINFORCING STEEL (FOR Hu = 11")

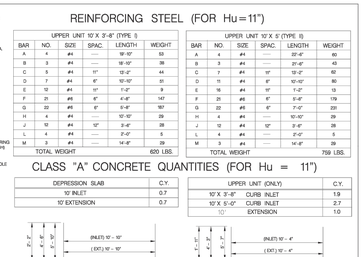
UPPER UNIT 10' X 3'-8" (TYPE I)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	——	18'-10"	55
B	3	#4	——	18'-10"	38
C	5	#4	11"	13'-2"	44
D	7	#4	6"	10'-10"	51
E	12	#4	11"	11'-2"	9
F	21	#6	6"	4'-8"	147
G	22	#6	6"	5'-6"	187
H	4	#4	——	10'-10"	29
J	12	#4	12"	2'-4"	29
L	4	#4	——	2'-0"	5
M	3	#4	——	14'-8"	39
TOTAL WEIGHT					620 LBS.

UPPER UNIT 10' X 5' (TYPE II)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	——	20'-4"	60
B	3	#4	——	21'-6"	43
C	7	#4	11"	13'-2"	62
D	11	#4	6"	10'-10"	80
E	16	#4	11"	11'-2"	13
F	25	#6	6"	5'-6"	179
G	22	#6	6"	7'-0"	230
H	4	#4	——	10'-10"	29
J	12	#4	12"	2'-6"	29
L	4	#4	——	2'-0"	5
M	3	#4	——	14'-8"	39
TOTAL WEIGHT					759 LBS.

CLASS "A" CONCRETE QUANTITIES (FOR Hu = 11")

DEPRESSION SLAB	C.Y.
10' INLET	0.7
10' EXTENSION	0.7

UPPER UNIT (ONLY)	C.Y.
10' X 3'-8" CURB INLET	1.9
10' X 5'-0" CURB INLET	2.7
10' EXTENSION	1.0



SEE SHEET 1 OF 3 FOR GENERAL NOTES.

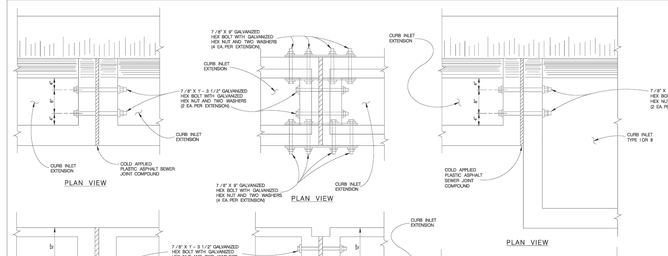
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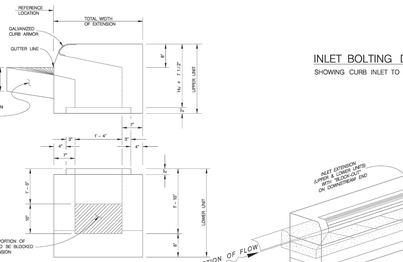
TYPE "C" INLET (TYPE I & II)
& INLET EXTENSION STANDARDS
SHEET 2 OF 3

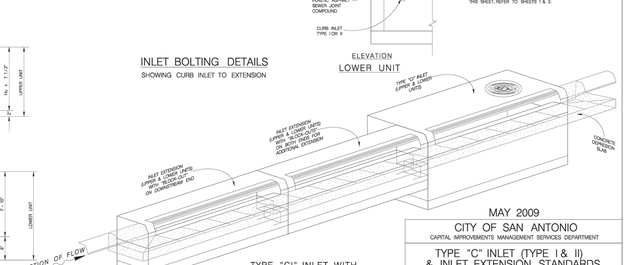
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INLET BOLTING DETAILS
SHOWING EXTENSION TO EXTENSION





UPPER UNIT EXTENSION (FOR Hu = 11")					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	——	19'-2"	41
B	3	#4	——	14'-2"	28
C	9	#4	11"	13'-2"	26
D	3	#4	6"	10'-10"	22
E	8	#4	11"	11'-2"	6
F	21	#6	6"	2'-0"	63
G	22	#6	6"	3'-4"	110
H	4	#4	——	10'-10"	29
J	12	#4	12"	3'-4"	29
L	4	#4	——	2'-0"	5
M	3	#4	——	14'-8"	39
REINFORCING STEEL				LBS.	387
CLASS "A" CONCRETE				C.Y.	1.0

LOWER UNIT EXTENSION					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	12	#4	12"	6'-2"	49
B	11	#4	12"	2'-2"	16
B_1	3	#4	#4	2'-2"	4
E_1	18	#4	18" ±	2'-3"	27
E_2	4	#4	18" ±	2'-1"	6
F_1	16	#4	12" ±	10'-10"	116
F_2	5	#4	——	10'-10"	36
REINFORCING STEEL				LBS.	254
CLASS "A" CONCRETE				C.Y.	1.4

GENERAL NOTES

1. WHEN INLET EXTENSIONS ARE REQUIRED FOR ON GRADE INLETS THE EXTENSIONS SHALL BE PLACED ON THE UPSTREAM END OF THE INLET.
2. FOR CURB INLET EXTENSION REINFORCING STEEL, NOTES & VARIOUS OTHER APPLICABLE DETAILS NOT FOUND ON THIS SHEET, REFER TO SHEETS 1 & 2.

INLET BOLTING DETAILS
SHOWING CURB INLET TO EXTENSION

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II)
& INLET EXTENSION STANDARDS
SHEET 3 OF 3

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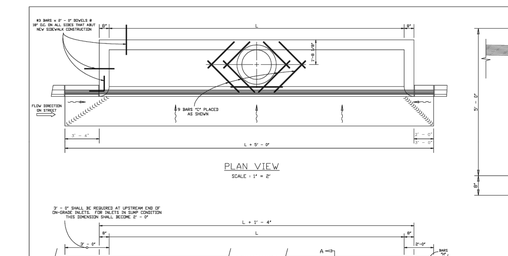

#3 BARS x 8' - 3" BOWED 3 @ 12" CTS. ALL SIDES THAT MEET NEW SIDEWALK CONSTRUCTION
L = 5' - 0"
FLOW DIRECTION (IN STREET)
#3 BARS "C" PLACED AS SHOWN
PLAN VIEW
SCALE : 1" = 2"
3" = 9" SHALL BE REQUIRED AT UPSTREAM END OF ON-GRADE INLETS. FOR INLETS IN SUMP CONDITION THIS DIMENSION SHALL BECOME 3" - 0"
L = 3' - 4"
FRONT VIEW
SCALE : 1" = 2"
MANHOLE LID & RING DETAIL (ITEM 409)
SCALE : 1" = 8"
OPENING DETAIL FOR CURB SECTION
SCALE : 1" = 4"
PERMISSABLE CONSTRUCTION JOINT
PERMISSABLE CONSTRUCTION JOINT
NOTE: SWPPS SHORT WITH 2500 PSI CONCRETE FILL AS REQUIRED. SWPPS SHALL BE PAID FOR INCLUDED WITH PAYMENT FOR CLASS "A" CONCRETE INLETS.
SECTION STREET TO WATER CROSS-SLOPE
SECTION "A–A"
SCALE : 1" = 1'
SIDE VIEW
SCALE : 1" = 1'
ISOMETRIC VIEW
BAR "A"
BAR "B"
BAR "F"
BAR "F1"
3" MIN. TO 6" MAX. FROM BACK OF CURB
SOLID COVER
#4 BARS @ 12" CTS.
#3 BARS @ 12" CTS.
#3 BARS @ 12" CTS.
#4 BARS @ 12" CTS.
#4 BARS @ 12" CTS.
#3

TABLE 9.3.8.1 - RETARDATION CLASS FOR LINING MATERIALS

Retardance Class	Cover	Condition
B	Bermuda grass	Good stand, tall (average 12 in. or 305 mm)
-	Native grass mixture little bluestem, bluestem, blue gamma, other short and long stem midwest grasses	Good stand, unmowed
-	Lespedeza sericea	Good stand, not woody, tall (average 19 in. or 480 mm)
-	Alfalfa	Good stand, uncut (average 11 in or 280 mm)
-	Blue gamma	Good stand, uncut (average 13 in. or 330 mm)
-	Crabgrass	Fair stand, uncut (10-to-48 in. or 55-to-1220 mm)
C	Bermuda grass	Good stand, mowed (average 6 in. or 150 mm)
-	Common lespedeza	Good stand, uncut (average 11 in. or 280 mm)
-	Grass-legume mixture: summer (orchard grass redtop, Italian ryegrass, and common lespedeza)	Good stand, uncut (6-8 in. or 150- 200 mm)
-	Centipede grass	Very dense cover (average 6 in. or 150 mm)
-	Kentucky bluegrass	Good stand, headed (6-12 in. or 150-305 mm)
D	Bermuda grass	Good stand, cut to 2.5 in. or 65 mm
-	Common lespedeza	Excellent stand, uncut (average 4.5 in. or 115 mm)
-	Buffalo grass	Good stand, uncut (3-6 in. or 75-150 mm)
-	Grass-legume mixture: fall, spring (orchard grass Italian ryegrass, and common lespedeza	Good Stand, uncut (4-5 in. or 100- 125 mm)
-	Lespedeza sericea	After cutting to 2 in. or 50 mm (very good before cutting)
E	Bermuda grass	Good stand, cut to 1.5 in. or 40 mm
-	Bermuda grass	Burned stubble

TABLE 9.3.8.2 - PERMISSIBLE SHEAR STRESSES FOR VARIOUS LININGS

Protective Cover	τ_d(lb./sq.ft.)	τ_d(N/m^2)
Retardance Class B Vegetation (See the "Retardation Class for Lining Materials" table above)	2.1	101
Retardance Class C Vegetation (See the "Retardation Class for Lining Materials" table above)	1	48
Retardance Class D Vegetation (See the "Retardation Class for Lining Materials" table above)	0.6	29
Retardance Class E Vegetation (See the "Retardation Class for Lining Materials" table above)	0.35	17
Woven Paper	0.15	7
Jute Net	0.45	22
Single Fiberglass	0.6	29
Double Fiberglass	0.85	41
Straw W/Net	1.45	69
Curled Wood Mat	1.55	74
Synthetic Mat	2	96
Gravel, D50 = 1 in. or 25 mm	0.4	19
Gravel, D50 = 2 in. or 50 mm	0.8	38
Rock, D50 = 6 in. or 150 mm	2.5	120
Rock, D50 = 12 in. or 300 mm	5	239
6-in. or 50-mm Gabions	35	1675
4-in. or 100-mm Geoweb	10	479
Soil Cement (8% cement)	>45	>2154
Dycel w/out Grass	>7	>335
Petraflex w/out Grass	>32	>1532
Armorflex w/out Grass	12-20	574-957
Erikamat w/3-in or 75-mm Asphalt	13-16	622-766
Erikamat w/1-in. or 25 mm Asphalt	<5	<239
Armorflex Class 30 with longitudinal and lateral cables, no grass	<5	>1628
Dycel 100, longitudinal cables, cells filled with mortar	<12	<574
Concrete construction blocks, granular filter underlayer	>20	>957
Wedge-shaped blocks with drainage slot	>25	>1197

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OMAR A. ESPINOSA
125560
LICENSED
PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

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Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: DRDT3146503

SHEET TITLE: DRAIN DETAILS (4 OF 4)

SHEET NUMBER: 4.7

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

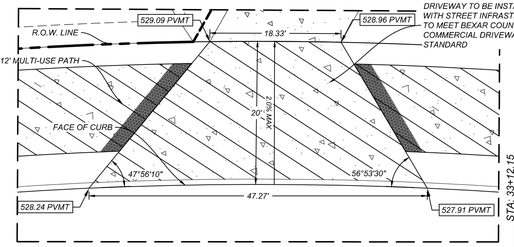
By: ABEL.MONTALVO
n:\fb2\civil\DRDT3146503.dwg\v4.7

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CAUTION!!:

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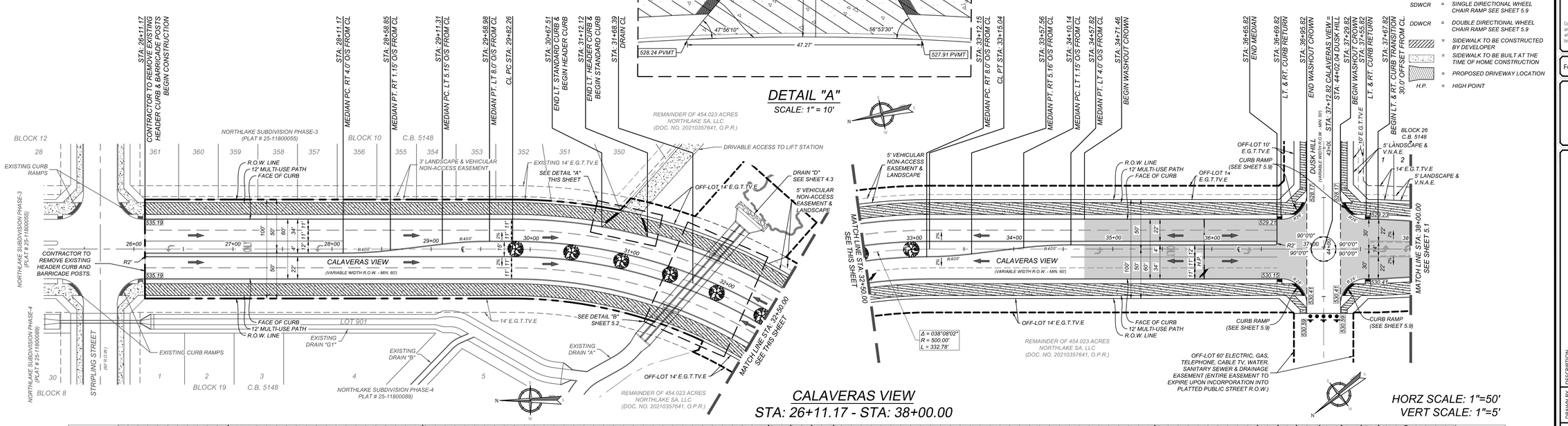
DETAIL "A"
SCALE: 1" = 10'

BEXAR COUNTY R.O.W. NOTE

A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

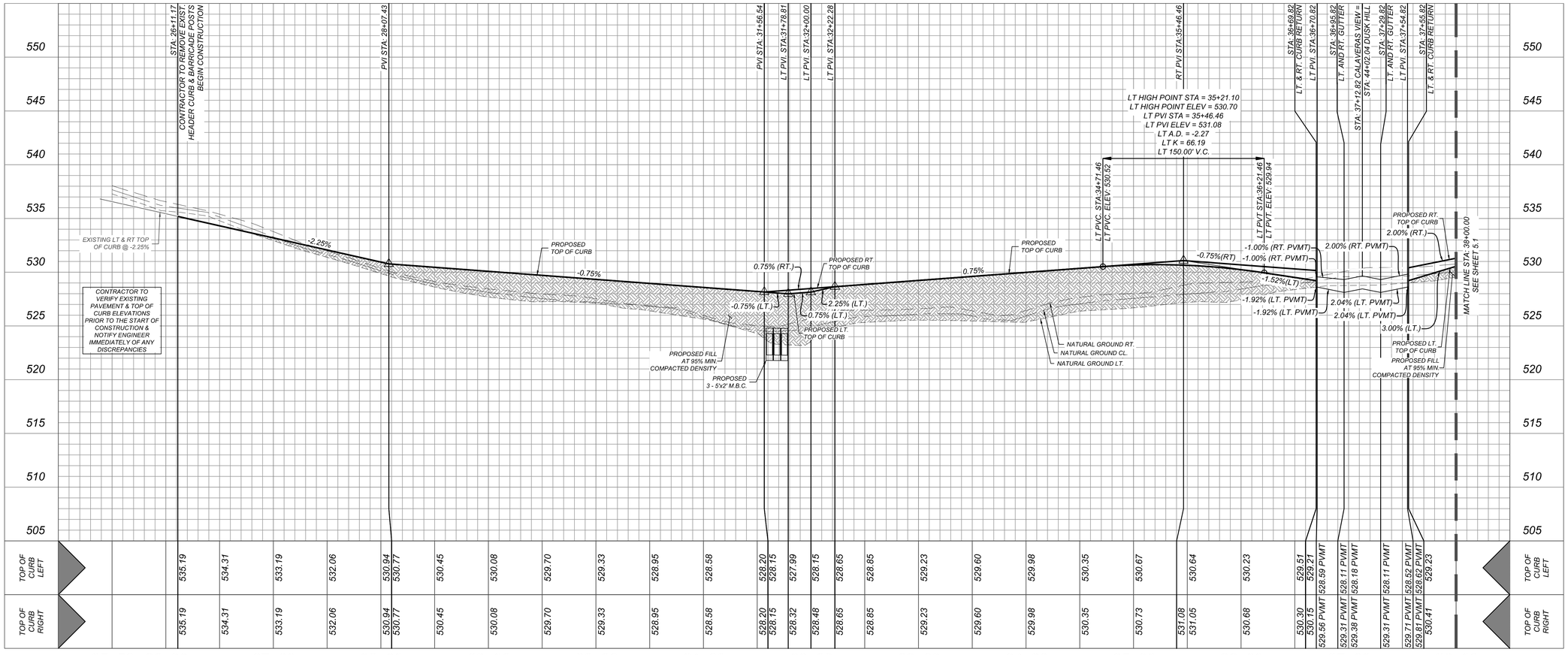
LEGEND

R.O.W.	=	RIGHT OF WAY
E.G.T.TV.E.	=	ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
	=	FLOW ARROW
	=	WASHOUT CROWN
(I)	=	WHEELCHAIR RAMP TYPE I SEE SHEET 5.9
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 5.9
SDWCR	=	SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
DDWCR	=	DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	=	PROPOSED DRIVEWAY LOCATION
H.P.	=	HIGH POINT



CALAVERAS VIEW
STA: 26+11.17 - STA: 38+00.00

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: STPP3146503

SHEET TITLE:
CALAVERAS VIEW
PLAN AND PROFILES

SHEET NUMBER:
5.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\ATSTREETS\STPP3146503.dwg\5.0 By: ABEL.MONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

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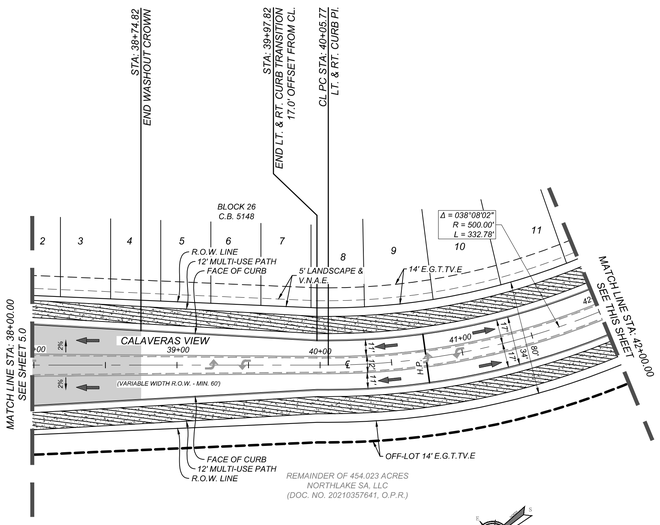
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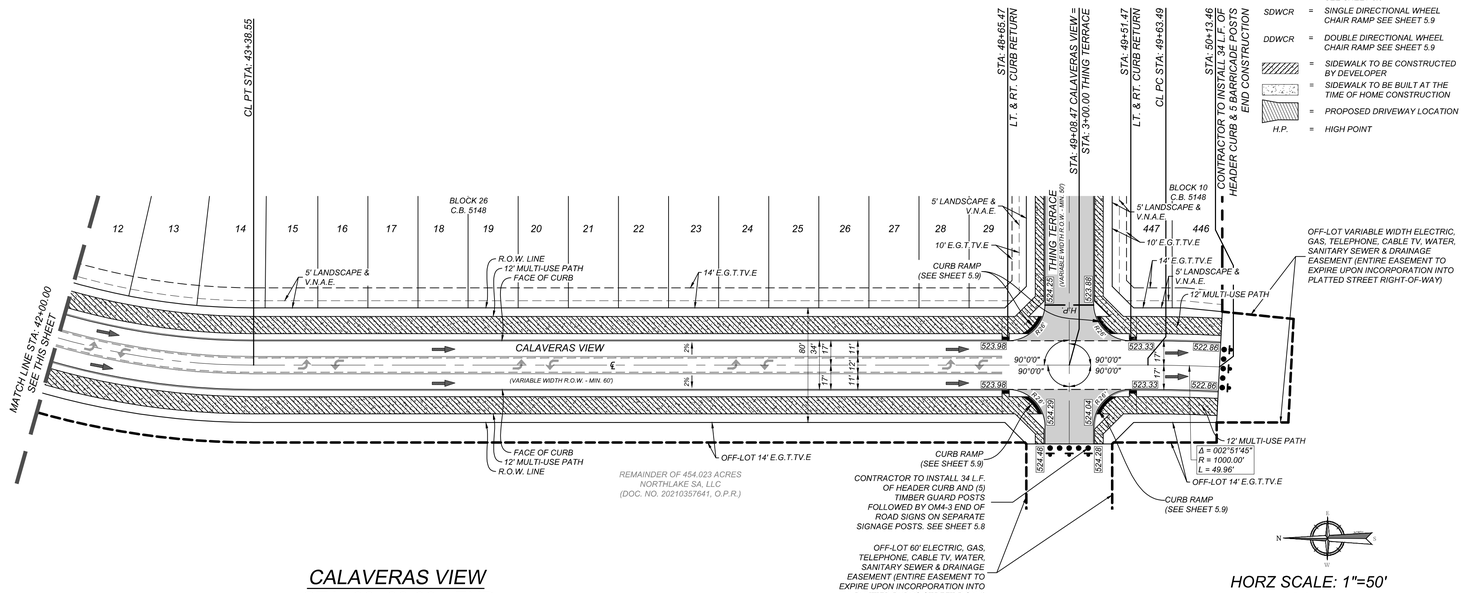
BEXAR COUNTY R.O.W. NOTE:

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LEGEND

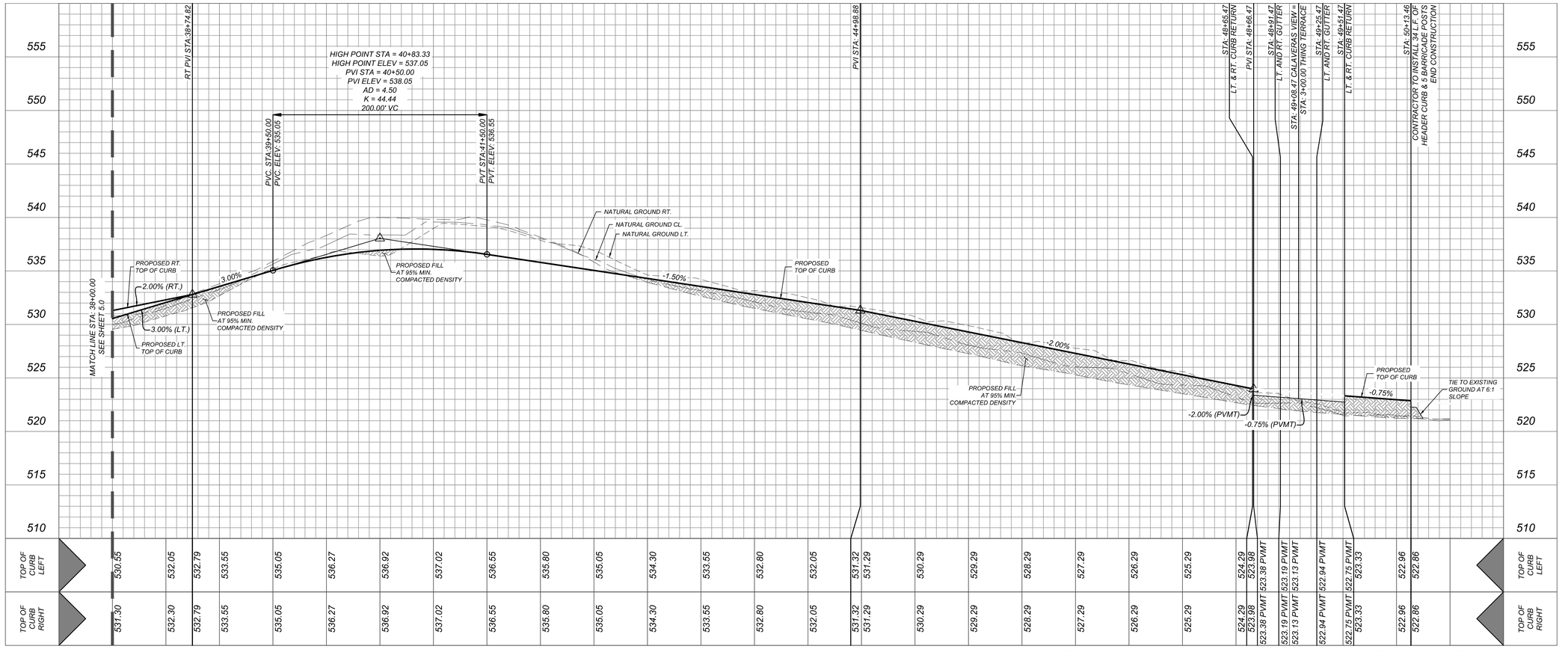
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	=	PROPOSED DRIVEWAY LOCATION
H.P.	=	HIGH POINT





CALAVERAS VIEW
STA: 38+00.00 - END

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

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BEXAR COUNTY
TEXAS

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: STP93146503

SHEET TITLE: CALAVERAS VIEW PLAN AND PROFILES

SHEET NUMBER: 5.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\ACTIVE\TEXAS\STP93146503.dwg\S 5.1 By: ABEL.MONTALVO

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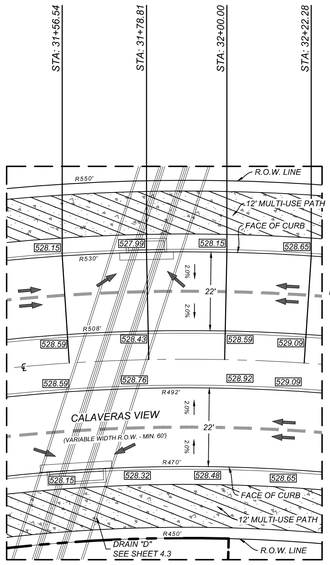
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BEXAR COUNTY R.O.W. NOTE:

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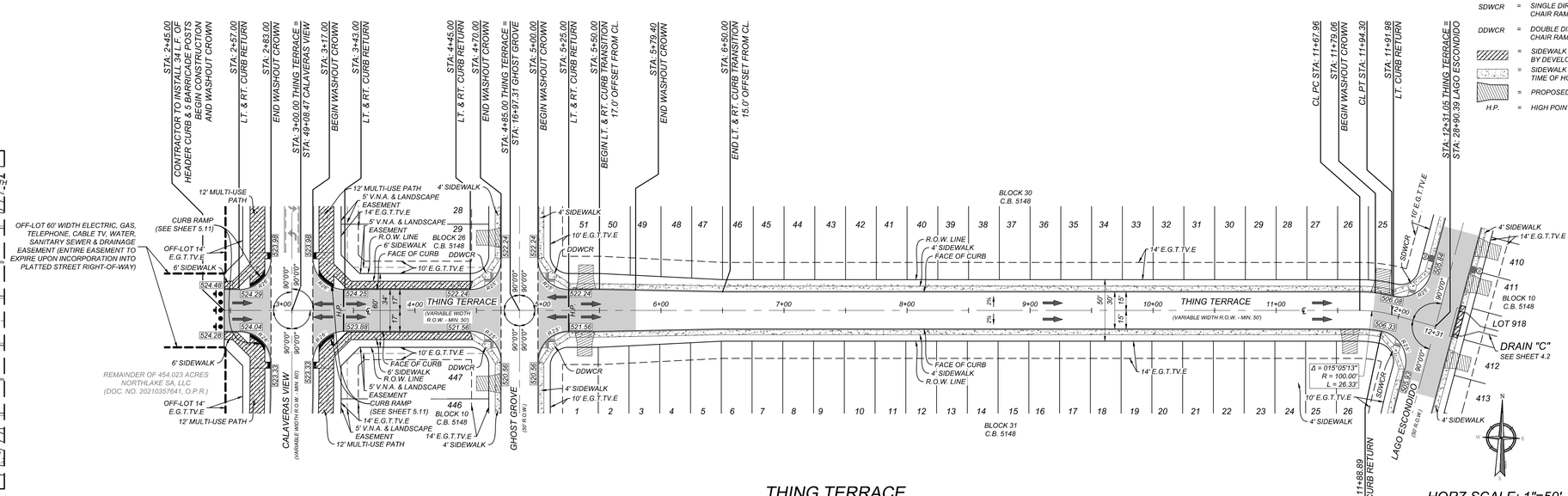
LEGEND

R.O.W.	=	RIGHT OF WAY
E.G.T.TV.E.	=	ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
	=	FLOW ARROW
	=	WASHOUT CROWN
(I)	=	WHEELCHAIR RAMP TYPE I SEE SHEET 5.9
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 5.9
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H.P.	=	HIGH POINT



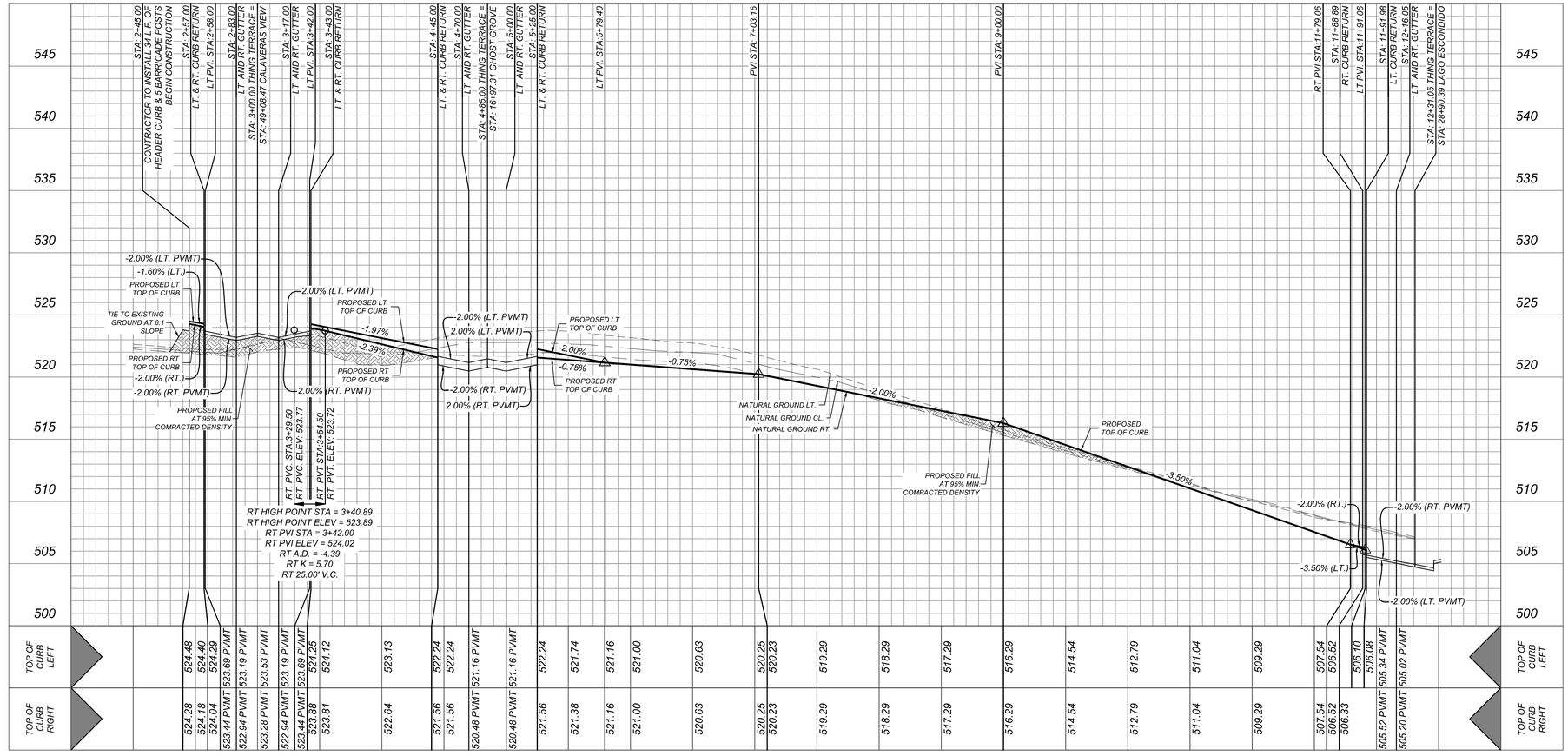
DETAIL "B"

SCALE: 1" = 10'



THING TERRACE
STA: 2+45.00 - END

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: STPP3146503

SHEET TITLE: THING TERRACE PLAN AND PROFILES

SHEET NUMBER: 5.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\ATSTREETS\STPP3146503.dwg\S.2 By: ABEL.MONTALVO

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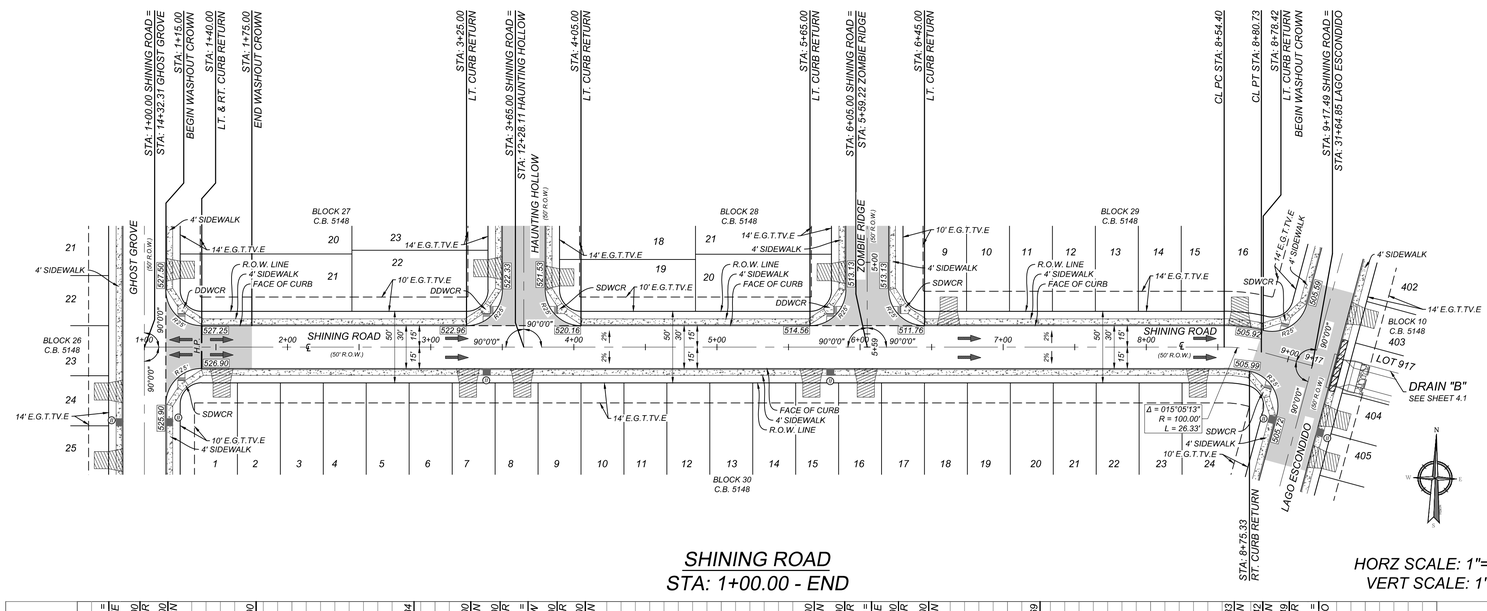
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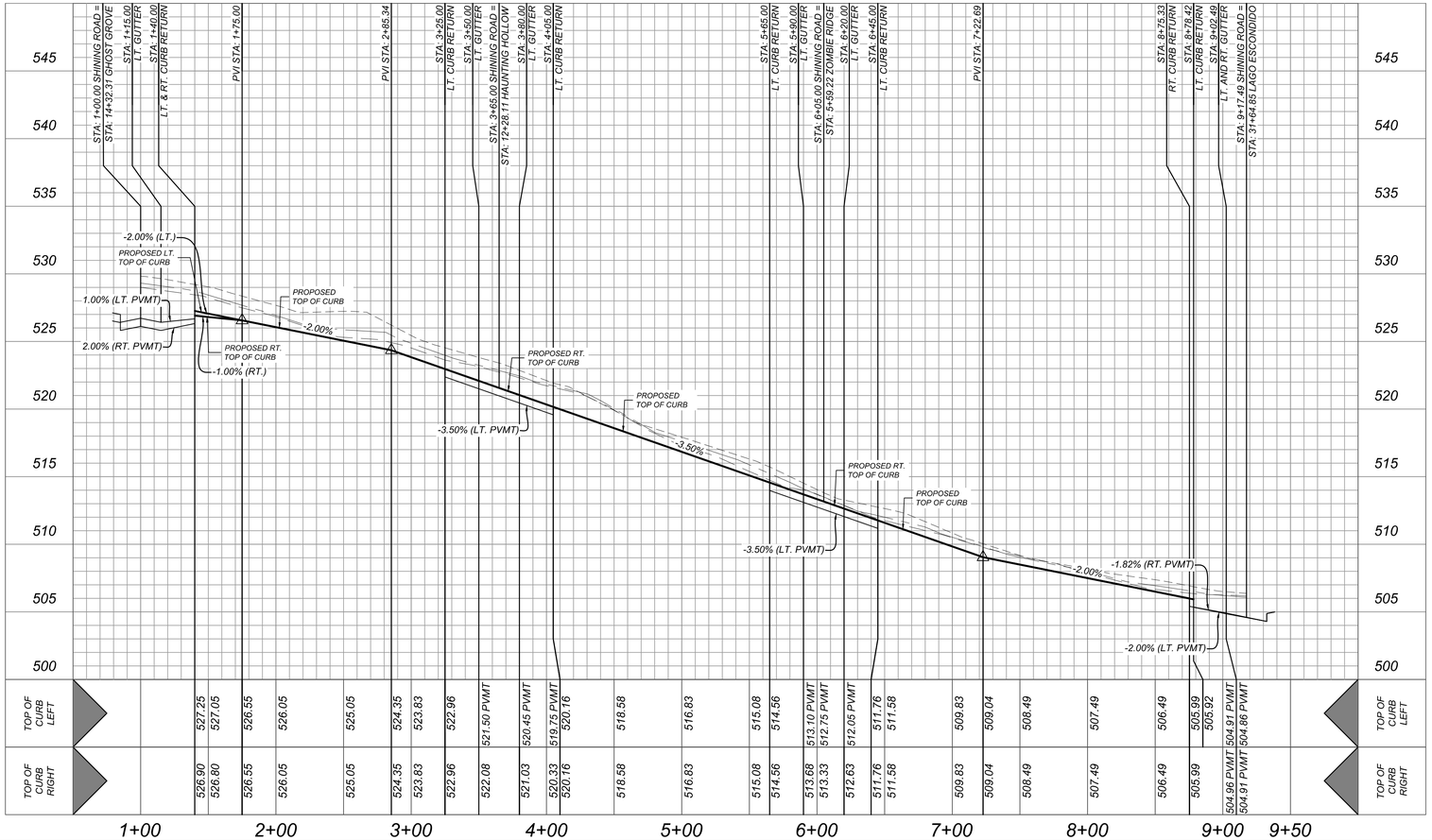
LEGEND

R.O.W.	=	RIGHT OF WAY
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H.P.	=	HIGH POINT



SHINING ROAD
STA: 1+00.00 - END

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: STPP3146503

SHEET TITLE: SHINING ROAD PLAN AND PROFILES

SHEET NUMBER: 5.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\STREETS\STPP3146503.dwg\C5.3 By: ABEL.MONTALVO

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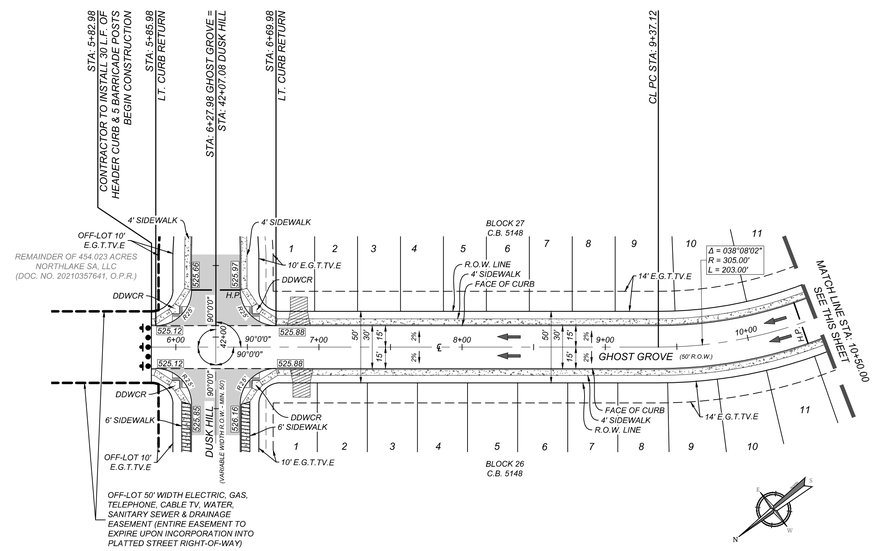
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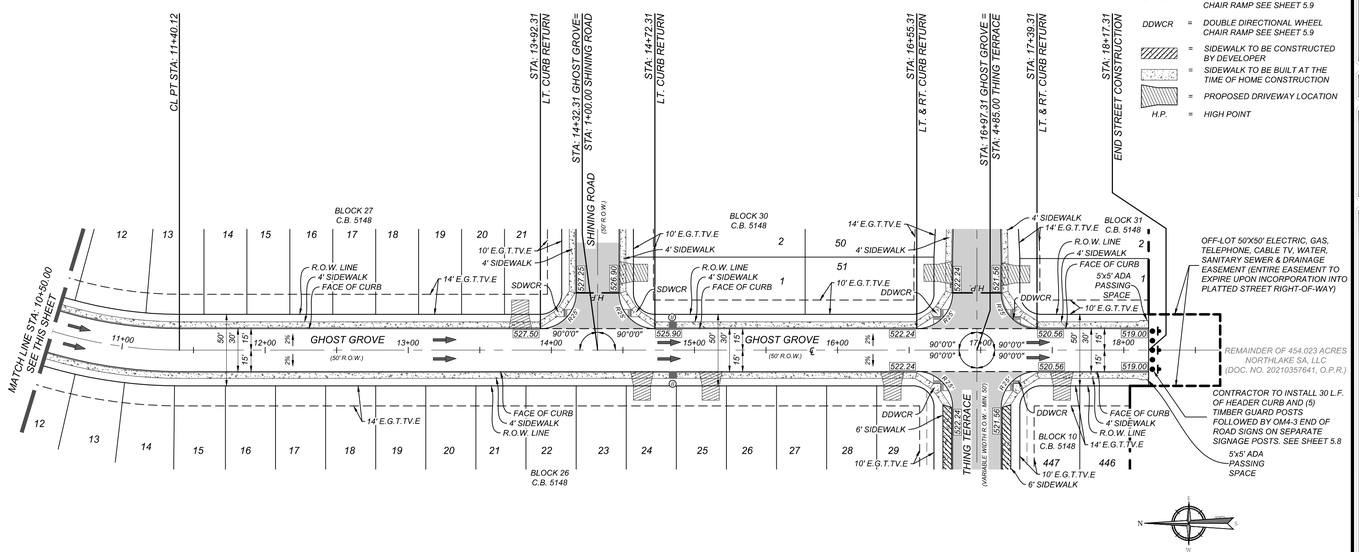
BEXAR COUNTY R.O.W. NOTE

A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

LEGEND

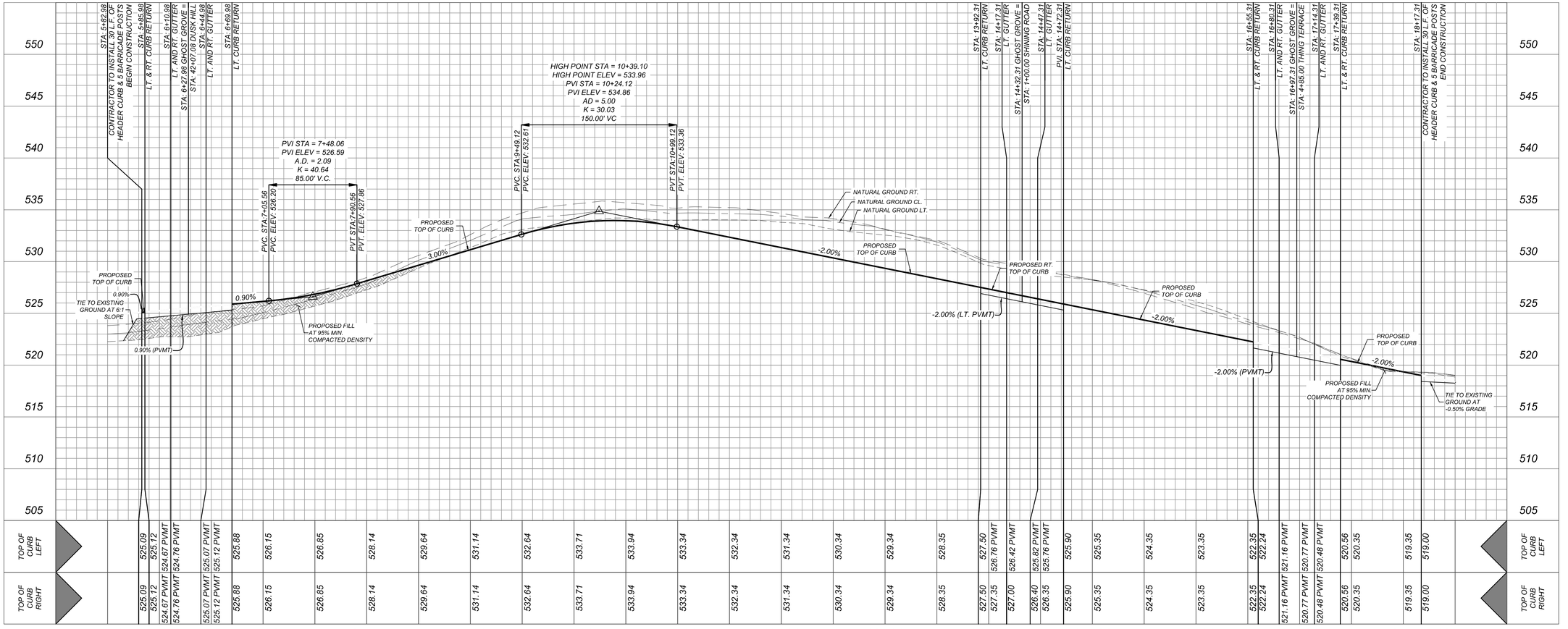
R.O.W.	=	RIGHT OF WAY
E.G.T.TV.E.	=	ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
	=	FLOW ARROW
	=	WASHOUT CROWN
(I)	=	WHEELCHAIR RAMP TYPE I SEE SHEET 5.9
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 5.9
SDWCR	=	SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
DDWCR	=	DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	=	PROPOSED DRIVEWAY LOCATION
H.P.	=	HIGH POINT





GHOST GROVE
STA: 5+82.98 - STA: 18+17.31

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

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SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14309
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: STPP3146503

SHEET TITLE: GHOST GROVE PLAN AND PROFILES

SHEET NUMBER: 5.4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\ASTREET\STPP3146503.dwg\S.4 By: ABEL.MONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

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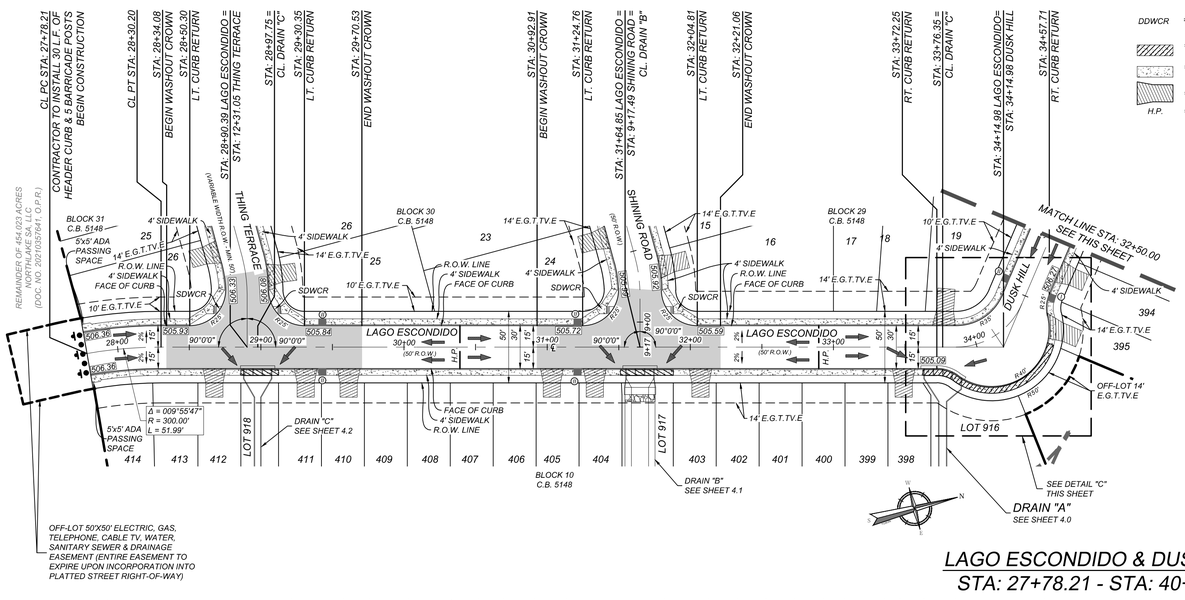
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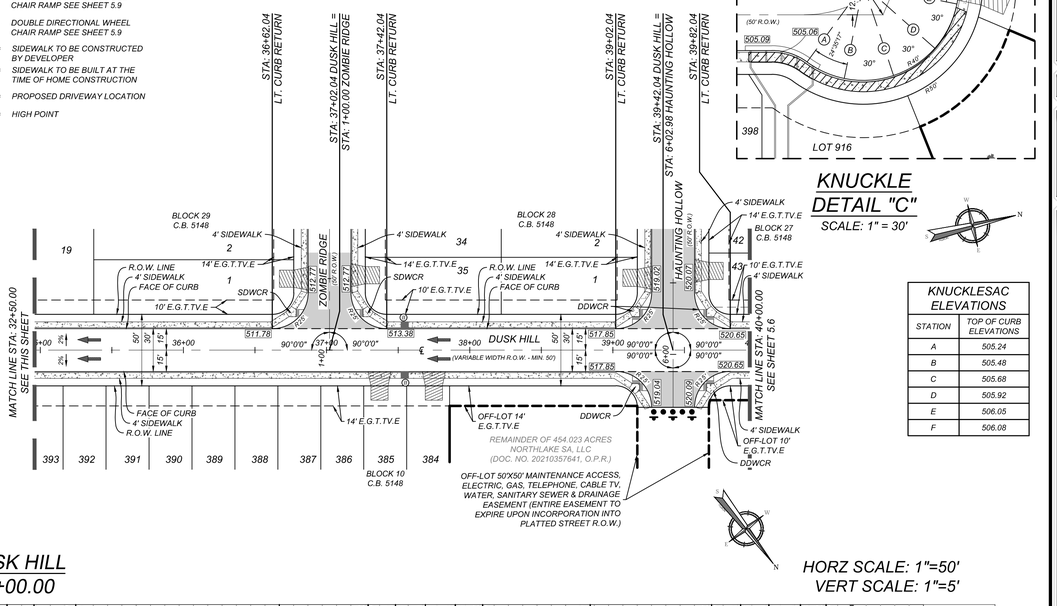
BEXAR COUNTY R.O.W. NOTE:

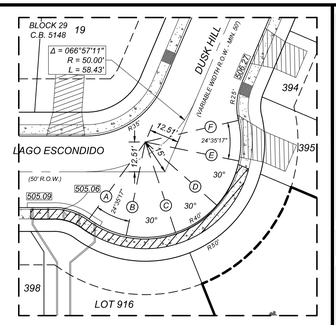
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

LEGEND

- R.O.W. = RIGHT OF WAY
- E.G.T.TV.E. = ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
- = FLOW ARROW
- = WASHOUT CROWN
- (I) = WHEELCHAIR RAMP TYPE I SEE SHEET 5.9
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- SDWCR = SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
- DDWCR = DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
- = SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
- = SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
- = PROPOSED DRIVEWAY LOCATION
- H.P. = HIGH POINT







KNUCKLE DETAIL "C"

SCALE: 1" = 30'

KNUCKLESAC ELEVATIONS	
STATION	TOP OF CURB ELEVATIONS
A	505.24
B	505.48
C	505.68
D	505.92
E	506.05
F	506.08

LAGO ESCONDIDO & DUSK HILL
STA: 27+78.21 - STA: 40+00.00

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'

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LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

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BEXAR COUNTY
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Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: STPP3146503

SHEET TITLE: LAGO ESCONDIDO & DUSK HILL PLAN AND PROFILES

SHEET NUMBER: 5.5

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\ACTIVE\TEXAS\STPP3146503\.dwg\5.5 By: ABEL.MONTALVO

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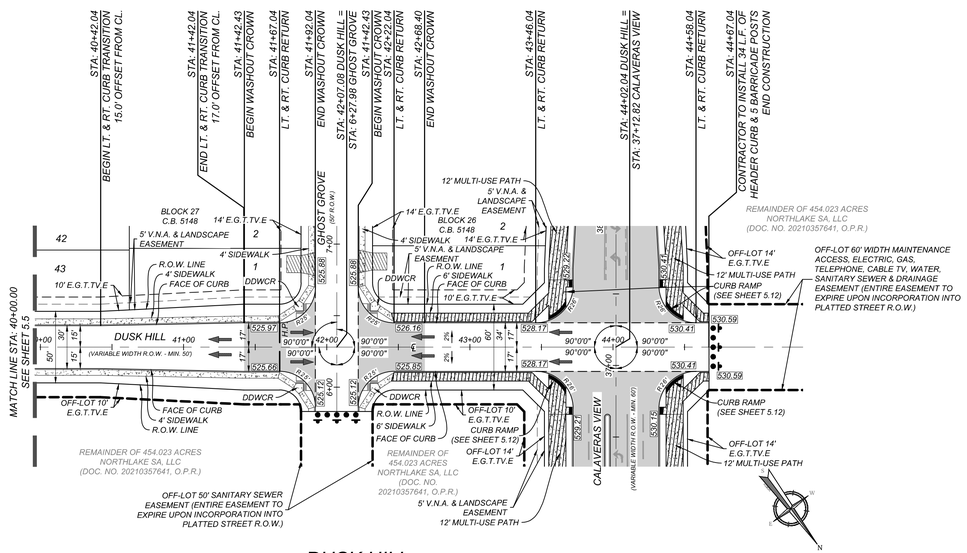
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BEXAR COUNTY R.O.W. NOTE

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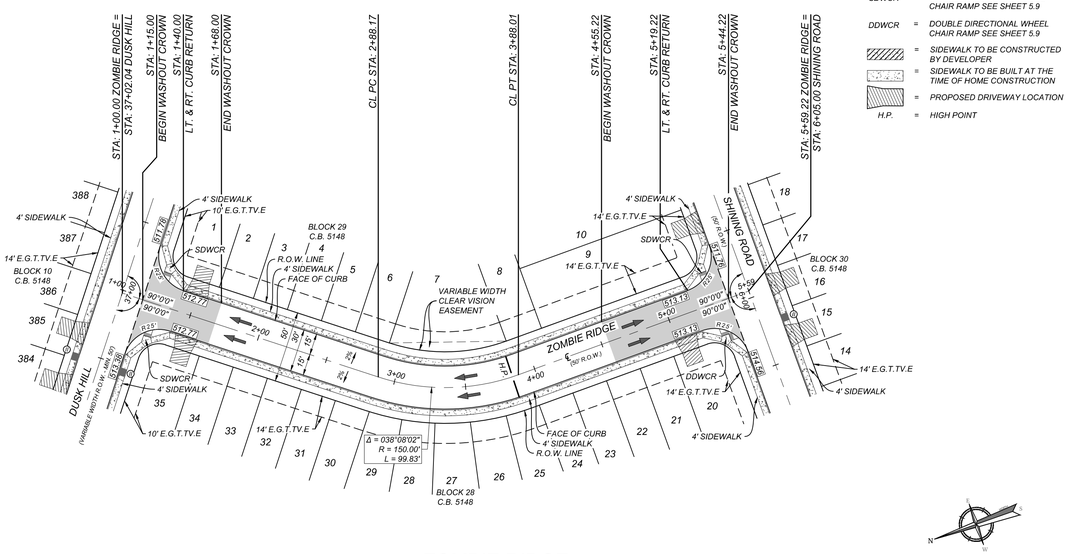
LEGEND

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H.P.	=	HIGH POINT



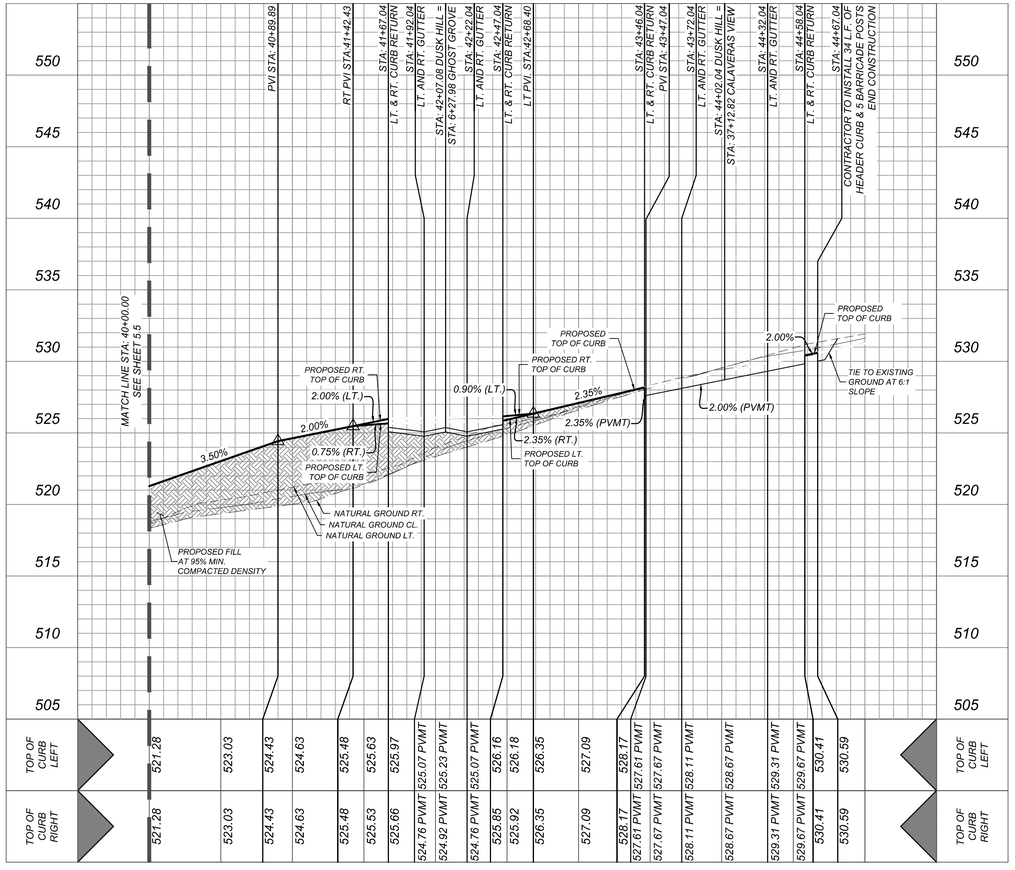
DUSK HILL
STA: 40+00.00 - END

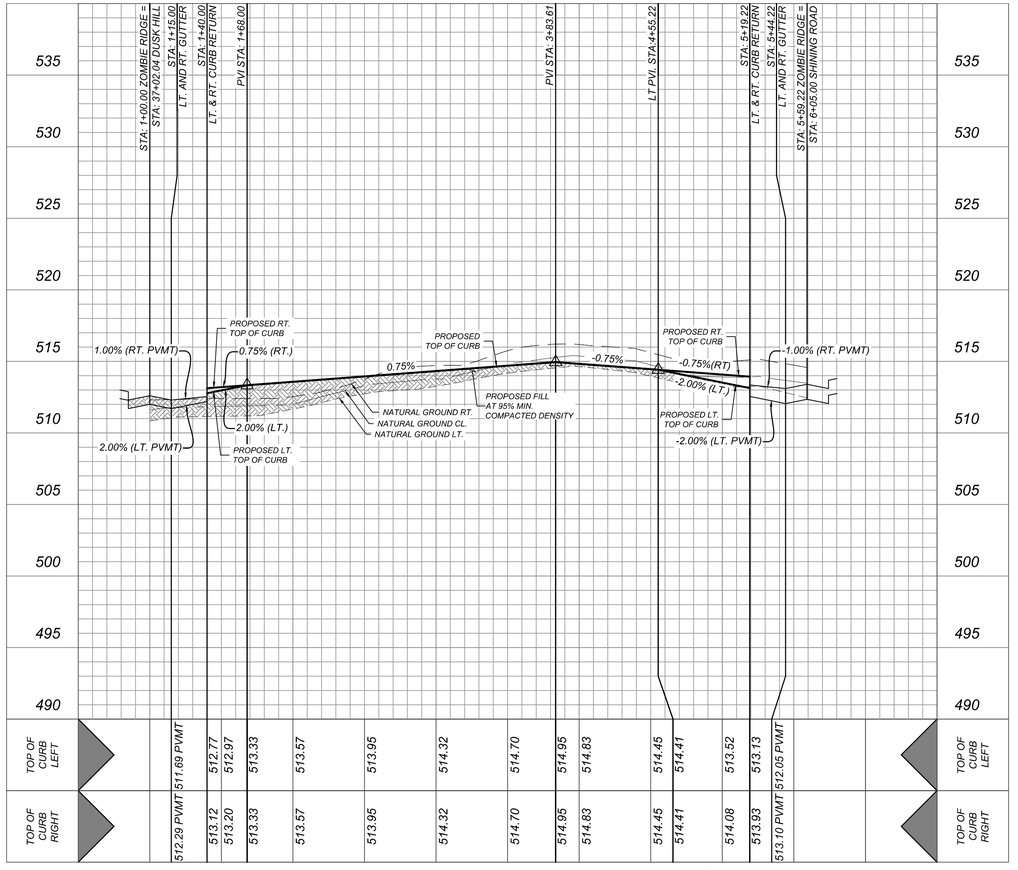
HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



ZOMBIE RIDGE
STA: 1+00.00 - END

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'





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PLAT# 25-11800192

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TEXAS

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: STPP3146503

SHEET TITLE:
DUSK HILL & ZOMBIE RIDGE PLAN AND PROFILES

SHEET NUMBER:
5.6

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\STREETS\STPP3146503.dwg\5.6 By: ABEL MONTALVO

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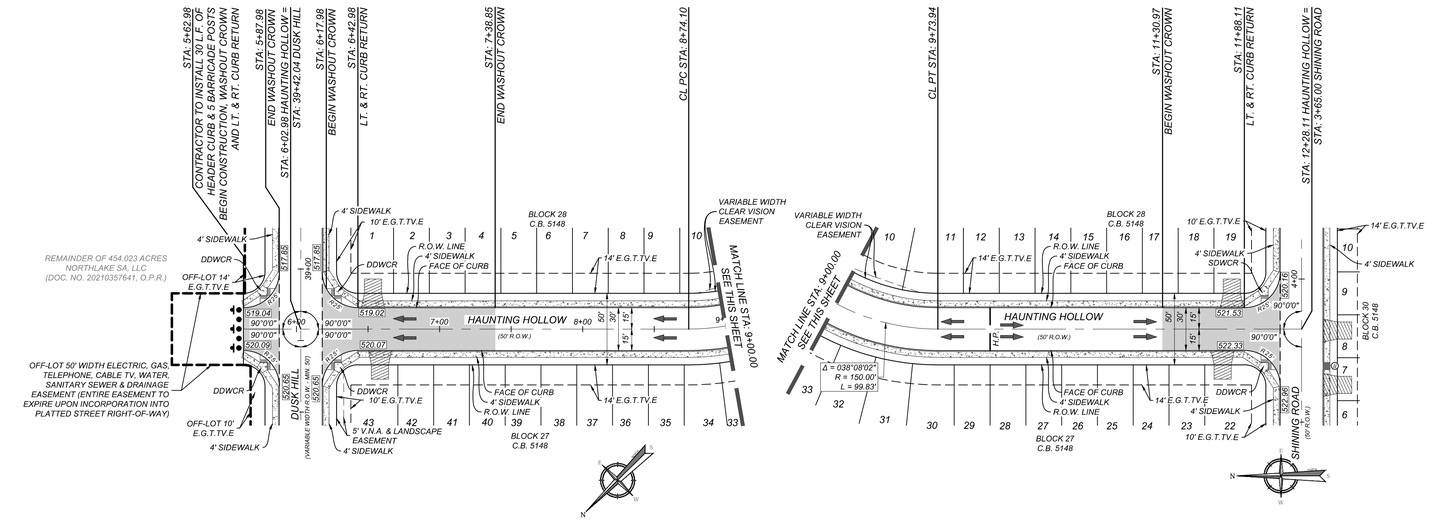
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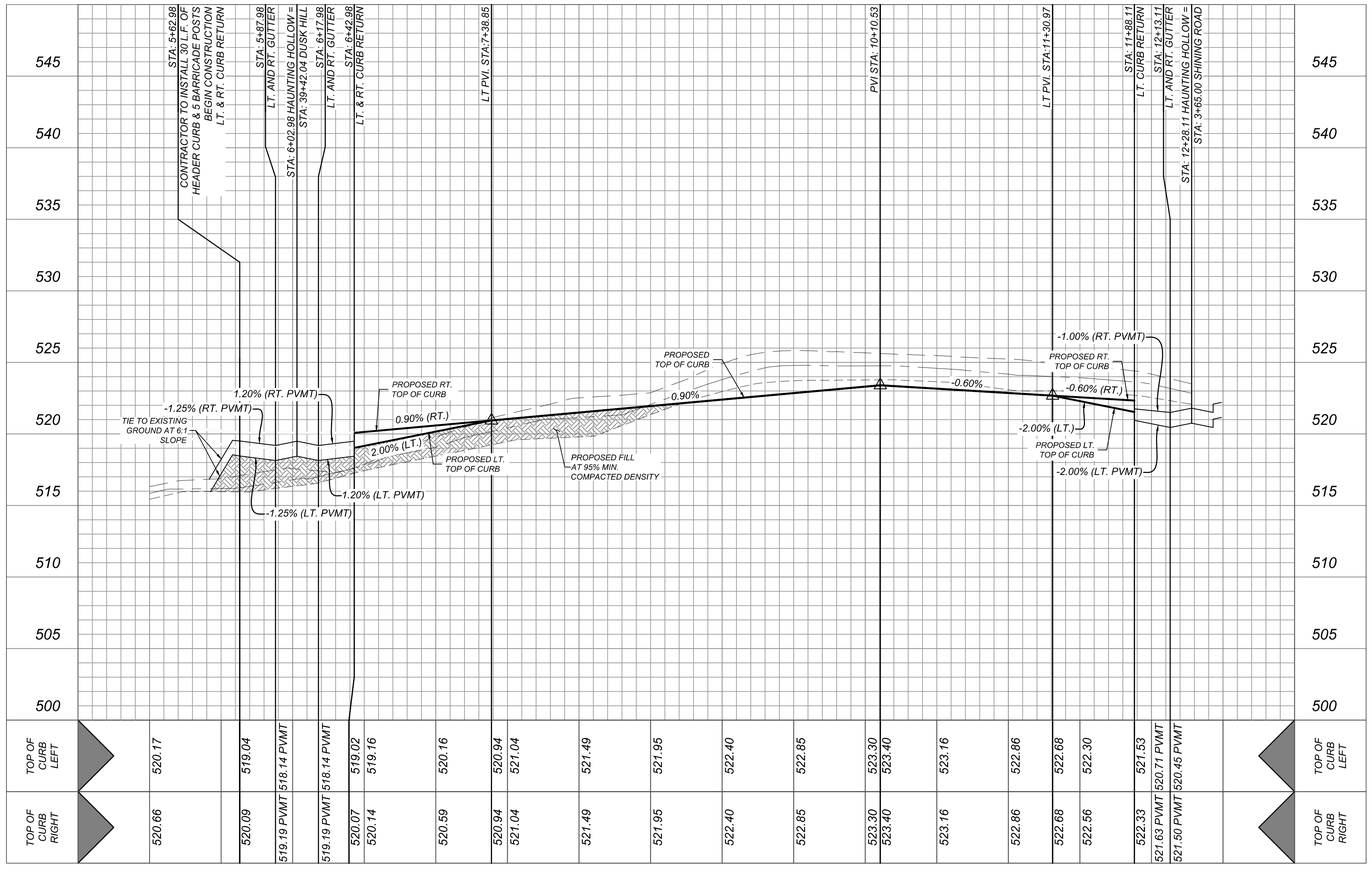
LEGEND

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H.P.	=	HIGH POINT



HAUNTING HOLLOW
STA: 5+62.98 - END

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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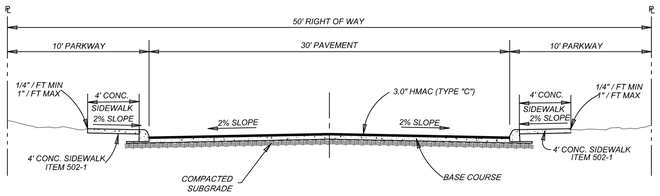
PROJECT NUMBER: 314-65-03
DRAWING NAME: STPP3146503

SHEET TITLE: HAUNTING HOLLOW PLAN AND PROFILES

SHEET NUMBER: 5.7

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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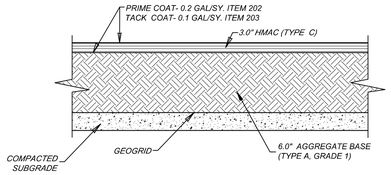


TYPICAL LOCAL "A" STREET SECTION

NOT TO SCALE

THING TERRACE: STA: 6+50.00 - END
SHINING ROAD: STA: 1+00.00 - END
GHOST GROVE: STA: 5+82.98 - 6+10.98
GHOST GROVE: STA: 6+44.98 - 16+80.31
GHOST GROVE: STA: 17+14.31 - 18+17.31
LAGO ESCONDIDO: STA: - 27+78.21 - 34+14.98

DUSK HILL: STA: 34+14.98 - 40+42.04
ZOMBIE RIDGE: STA: 1+00.00 - END
HAUNTING HOLLOW: STA: 5+62.98 - END



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE A

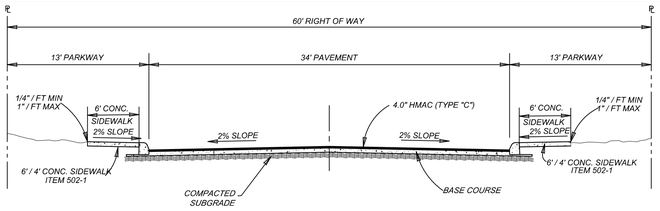
Pavement Section
3.0" HMAC (TYPE "C")
6.0" FLEXBASE COURSE (TYPE "A" GRADE 1)
8.0" COMPACTED SUBGRADE
Total: 17.0"
Structural No: 4.2
C.B.R = 4.9

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY PROFESSIONAL SERVICE INDUSTRIES, INC. PROJECT NO. 0312-3490 DATED 07/31/25.

2. REFERENCE PROJECT GEOTECHNICAL REPORT AND PROJECT SPECIFICATION FOR ADDITIONAL REQUIREMENTS AND ALTERNATE PAVEMENT SECTIONS.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING MATERIAL TESTING. TESTING TO BE PAID BY OWNER.

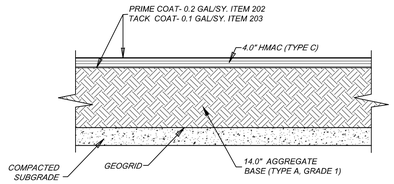
4. CONTRACTOR MAY LEAVE VERTICAL CUT BANKS AT R.O.W. LINE AND MEDIANS PROVIDED PROJECT GEOTECHNICAL ENGINEER DETERMINES ROCK IS COMPETENT TO STAND ON ITS OWN.



TYPICAL LOCAL "B" STREET SECTION

NOT TO SCALE

THING TERRACE: STA: 2+45.00 - 2+83.00
THING TERRACE: STA: 3+17.00 - 6+50.00
DUSK HILL: STA: 40+42.04 - 43+72.04
DUSK HILL: STA: 44+32.04 - 44+67.04



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE B

Pavement Section
4.0" HMAC (TYPE "C")
14" FLEXBASE COURSE (TYPE "A" GRADE 1)
8.0" COMPACTED SUBGRADE
Total: 26.0"
Structural No: 4.2
C.B.R = 4.9

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY PROFESSIONAL SERVICE INDUSTRIES, INC. PROJECT NO. 0312-3490 DATED 07/31/25.

2. REFERENCE PROJECT GEOTECHNICAL REPORT AND PROJECT SPECIFICATION FOR ADDITIONAL REQUIREMENTS AND ALTERNATE PAVEMENT SECTIONS.

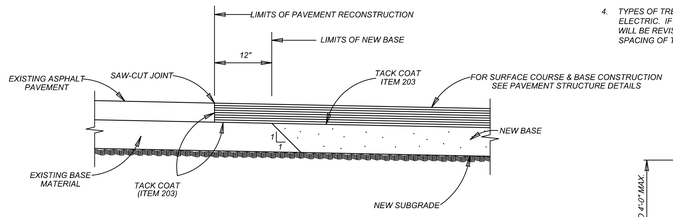
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING MATERIAL TESTING. TESTING TO BE PAID BY OWNER.

4. CONTRACTOR MAY LEAVE VERTICAL CUT BANKS AT R.O.W. LINE AND MEDIANS PROVIDED PROJECT GEOTECHNICAL ENGINEER DETERMINES ROCK IS COMPETENT TO STAND ON ITS OWN.

STREETSCAPE TREE PLANTING NOTES

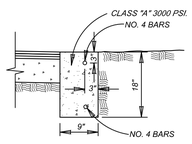
MEDIUM TREES (PER UDC) TO BE PLANTED EVERY 50 FEET ALONG CALAVERAS VIEW. MEDIAN PER "NEW TREE PLANTING DETAIL" ON THIS SHEET

1. SPECIES OF TREES TO BE DETERMINED BY DEVELOPER'S PROJECT LANDSCAPE ARCHITECT TO CONFIRM WITH THE STREETSCAPE PLANTING STANDARDS.
2. DEVELOPER TO PROVIDE MAINTENANCE ON PLANTED STREET TREES FOR A MINIMUM OF 3 YEARS.
3. ALL LANDSCAPE SHALL COMPLY WITH THE CLEAR VISION AREA AS DEFINED BY THE LATEST VERSION OF AASHTO'S "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS."
4. TYPES OF TREES AND SPACING ARE BASED ON UNDERGROUND ELECTRIC. IF OVERHEAD ELECTIRC IS REQUIRED BY CPS, PLANS WILL BE REVISED TO REFLECT CHANGES IN SIZE, TYPE, AND SPACING OF TREE, PER THE UDC.



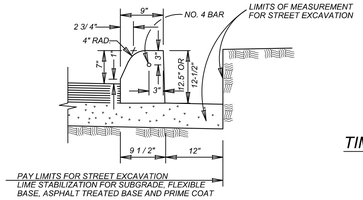
PAVEMENT JUNCTION DETAILS

NOT TO SCALE



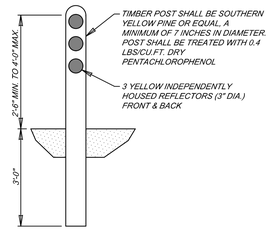
HEADER CURB

ITEM 500 ON SAND OR GRAVEL
NOT TO SCALE



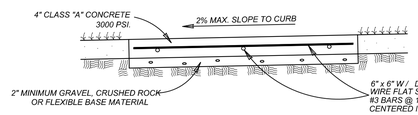
CONCRETE CURB

ITEM 500 ON FLEXIBLE BASE MATERIAL
NOT TO SCALE



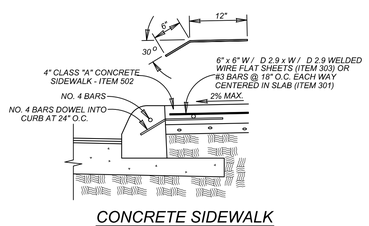
TIMBER GUARD POST DETAIL

NOT-TO-SCALE



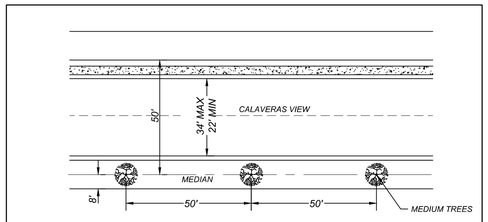
CONCRETE SIDEWALK SECTION

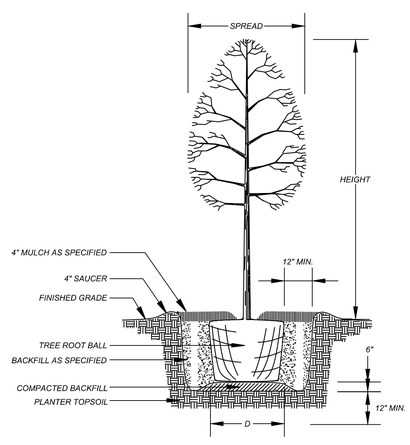
ITEM 502
NOT TO SCALE



CONCRETE SIDEWALK ABUTTING CURB SECTION

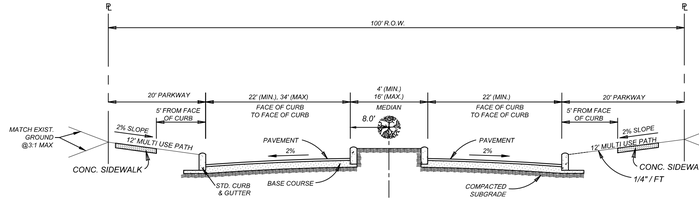
ITEM 502
NOT TO SCALE





NEW TREE PLANTING DETAIL

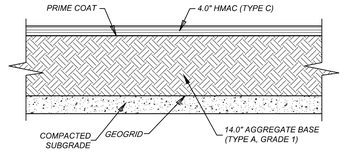
N. T. S.



R.O.W. STREET SECTION - COLLECTOR

NOT TO SCALE

CALAVERAS VIEW: STA: 26+11.17 - 37+67.82



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

DETAIL FOR MODIFIED ARTERIAL

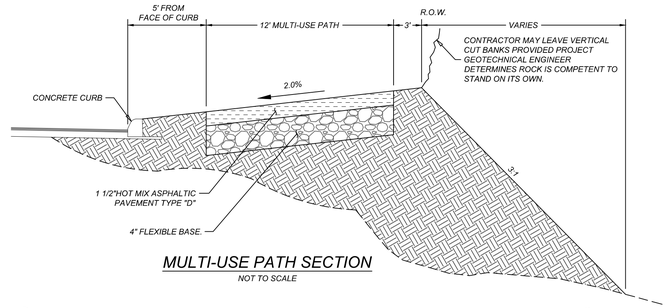
Pavement Section
4.0" HMAC TYPE "C"
14.0" AGGREGATED BASE (TYPE A, GRADE 1)
8.0" COMPACTED SUBGRADE
Total: 26.0"
Structural No: 4.2
CBR: 4.9

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY PROFESSIONAL SERVICE INDUSTRIES, INC. PROJECT NO. 0312-3490 DATED 07/31/25.

2. REFERENCE PROJECT GEOTECHNICAL REPORT AND PROJECT SPECIFICATION FOR ADDITIONAL REQUIREMENTS AND ALTERNATE PAVEMENT SECTIONS.

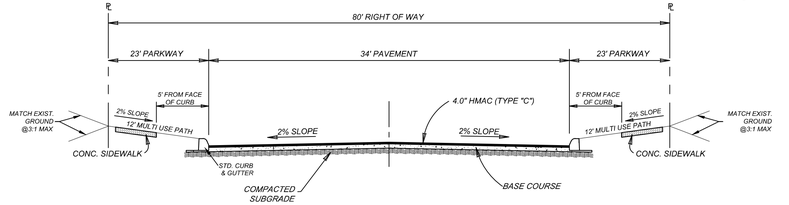
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING MATERIAL TESTING. TESTING TO BE PAID BY OWNER.

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MULTI-USE PATH SECTION

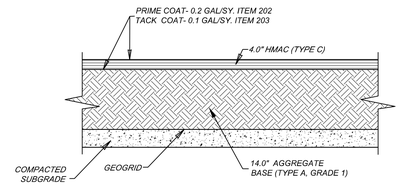
NOT TO SCALE



TYPICAL COLLECTOR "B" STREET SECTION

NOT TO SCALE

CALAVERAS VIEW: STA: 37+67.82 - 50+13.46



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE B

Pavement Section
4.0" HMAC (TYPE "C")
14" FLEXBASE COURSE (TYPE "A" GRADE 1)
8.0" COMPACTED SUBGRADE
Total: 26.0"
Structural No: 4.2
C.B.R = 4.9

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY PROFESSIONAL SERVICE INDUSTRIES, INC. PROJECT NO. 0312-3490 DATED 07/31/25.

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

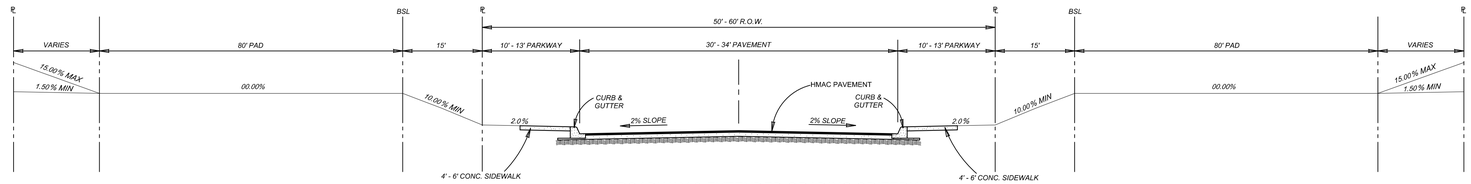
PROJECT NUMBER: 314-65-03
DRAWING NAME: STDT3146503

SHEET TITLE:
STREET DETAIL SHEET (1 OF 2)

SHEET NUMBER:
5.8

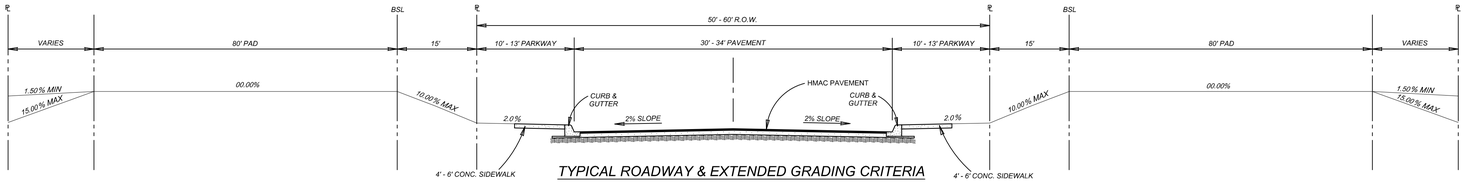
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

\\RSTREETS\STDT3146503.dwg\5.8 By: ABEL.MONTALVO



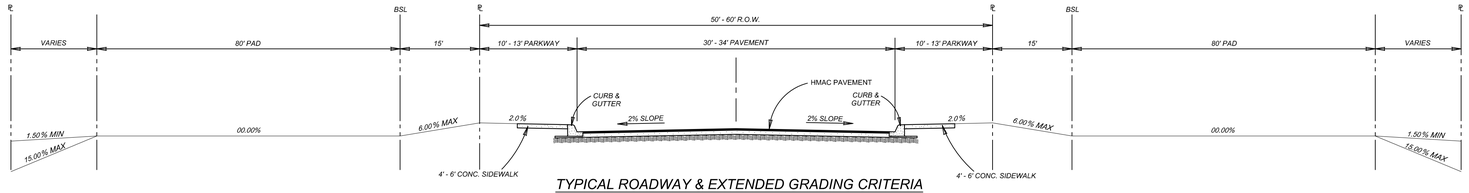
TYPICAL ROADWAY & EXTENDED GRADING CRITERIA

SCALE : NOT TO SCALE



TYPICAL ROADWAY & EXTENDED GRADING CRITERIA

SCALE : NOT TO SCALE



TYPICAL ROADWAY & EXTENDED GRADING CRITERIA

SCALE : NOT TO SCALE

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NORTHLAKE PHASE 2A
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SAN ANTONIO
BEXAR COUNTY
TEXAS

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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER:	DRAWING NAME:
314-65-03	STDT3146503

SHEET TITLE:
STREET DETAIL SHEET
(2 OF 2)

SHEET NUMBER:
5.8A

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

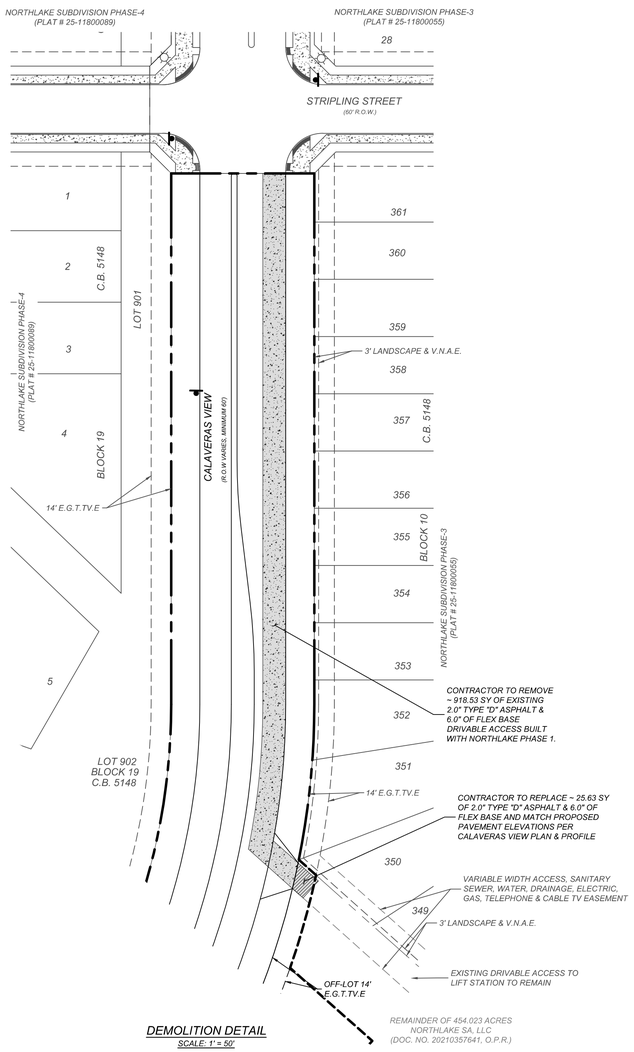
n:\STREETS\STDT3146503.dwg|5.8A By: ABEL.MONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

BEXAR COUNTY R.O.W. NOTE:

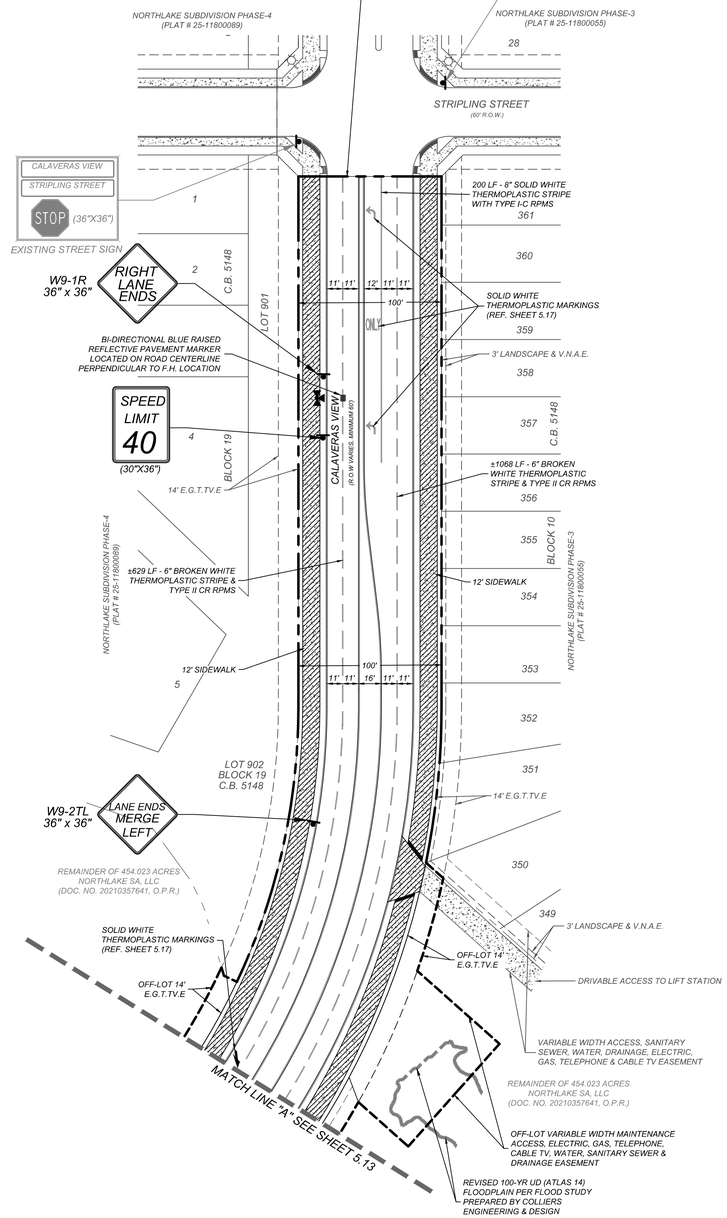
A BEXAR COUNY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.



DEMOLITION DETAIL

SCALE: 1" = 50'

MATERIAL	UNITS	QUANTITIES
2.0" TYPE "D" ASPHALT & 6.0" FLEX BASE	S.Y.	919



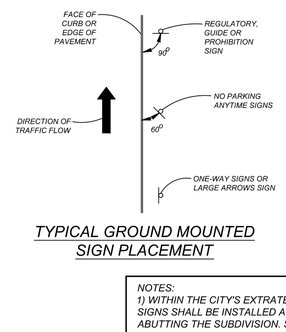
LEGEND

- = WASHOUT CROWN
- E.G.T.TV.E. = ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
- V.N.A.E. = VEHICULAR NON-ACCESS EASEMENT
- W.C.R. = WHEELCHAIR RAMPS SEE SHEET 5.9
- (I) = WHEELCHAIR RAMP TYPE I SEE SHEET 5.9
- (II) = WHEELCHAIR RAMP TYPE II SEE SHEET 5.9
- S.D.W.C.R. = SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
- D.D.W.C.R. = DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
- = SIDEWALK TO BE CONSTRUCTED BY DEVELOPER.
- = SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
- = PROPOSED DRIVEWAY LOCATIONS
- = PROPOSED FIRE HYDRANRT
- = EXISTING FIRE HYDRANRT

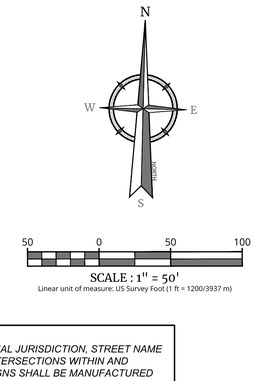


LOCATION MAP

SCALE: NOT-TO-SCALE



TYPICAL GROUND MOUNTED SIGN PLACEMENT



SCALE : 1" = 50'

Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

NOTES:

1) WITHIN THE CITY'S EXTRATERRITORIAL JURISDICTION, STREET NAME SIGNS SHALL BE INSTALLED AT ALL INTERSECTIONS WITHIN AND ABUTTING THE SUBDIVISION. SUCH SIGNS SHALL BE MANUFACTURED AND INSTALLED BY THE SUBDIVIDER IN ACCORDANCE TO SPECIFICATIONS OF, AND SUBJECT TO PLAN REVIEWS AND INSPECTIONS BY THE COUNTY DEPARTMENT OF PUBLIC WORKS.

2) REGULATORY AND WARNING TRAFFIC SIGNS SHALL BE INSTALLED WITHIN AND ABUTTING THE SUBDIVISION IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)," AS REQUIRED BY THE CITY'S DEVELOPMENT SERVICES DEPARTMENT OR COUNTY'S DEPARTMENT OF PUBLIC WORKS. SUCH SIGNS SHALL BE MANUFACTURED AND INSTALLED BY THE SUBDIVIDER IN ACCORDANCE TO SPECIFICATIONS OF, AND SUBJECT TO PLAN REVIEWS AND INSPECTIONS BY THE CITY'S DEVELOPMENT SERVICES DEPARTMENT OR COUNTY'S DEPARTMENT OF PUBLIC WORKS. WARNING AND REGULATORY SIGNS SHALL NOT BE ACCEPTED BY THE CITY UNTIL THE STREET HAS BEEN ACCEPTED FOR MAINTENANCE BY THE CITY.

STREET SIGN SYMBOL	DESCRIPTION	ITEM NUMBER
STOP	R1-1 30" X 30" (SINGLE LANE) 36" X 36" (MULTI LANE)	531.3
STREET NAME #####	STANDARD BEXAR COUNTY STREET NAME SIGN STD X 9"	531.57
	OM4-3 END-OF-ROADWAY MARKER 18" X 18"	531.56
	TYPE II BLUE PAVEMENT MARKER	537.8
ROAD ENDS	W14 - 1T 30" X 30"	531.53
500 FT.	XXX FT W16-2 30" X 18"	531.63
RIGHT LANE ENDS	W9-1R 36" X 36"	531.49
LANE ENDS MERGE LEFT	W9-2TL 36" X 36"	531.49
KEEP RIGHT	R4-7 24" X 30"	531.17

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED
PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

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TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03

DRAWING NAME: TS3146503-PH2A

SHEET TITLE: TRAFFIC SIGNAGE & SIDEWALK PLAN (1 OF 3)

SHEET NUMBER: 5.12

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

\\ATSTRETS\TS3146503-PH2A.dwg(5.12 By: ABEL.MONTALVO

NOTES:
1) WITHIN THE CITY'S EXTRATERRITORIAL JURISDICTION, STREET NAME SIGNS SHALL BE INSTALLED AT ALL INTERSECTIONS WITHIN AND ABUTTING THE SUBDIVISION. SUCH SIGNS SHALL BE MANUFACTURED AND INSTALLED BY THE SUBDIVIDER IN ACCORDANCE TO SPECIFICATIONS OF, AND SUBJECT TO PLAN REVIEWS AND INSPECTIONS BY THE COUNTY DEPARTMENT OF PUBLIC WORKS.

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REFER SHEET 5.12 FOR STREET SIGN SYMBOL AND ITEM NUMBER LEGEND

LEGEND

- = WASHOUT CROWN
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- W.C.R. = WHEELCHAIR RAMPS SEE SHEET 5.9
- Ⓘ = WHEELCHAIR RAMP TYPE I SEE SHEET 5.9
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- = PROPOSED DRIVEWAY LOCATIONS
- = PROPOSED FIRE HYDRANRT
- = EXISTING FIRE HYDRANRT

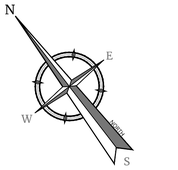


LOCATION MAP
SCALE: NOT-TO-SCALE

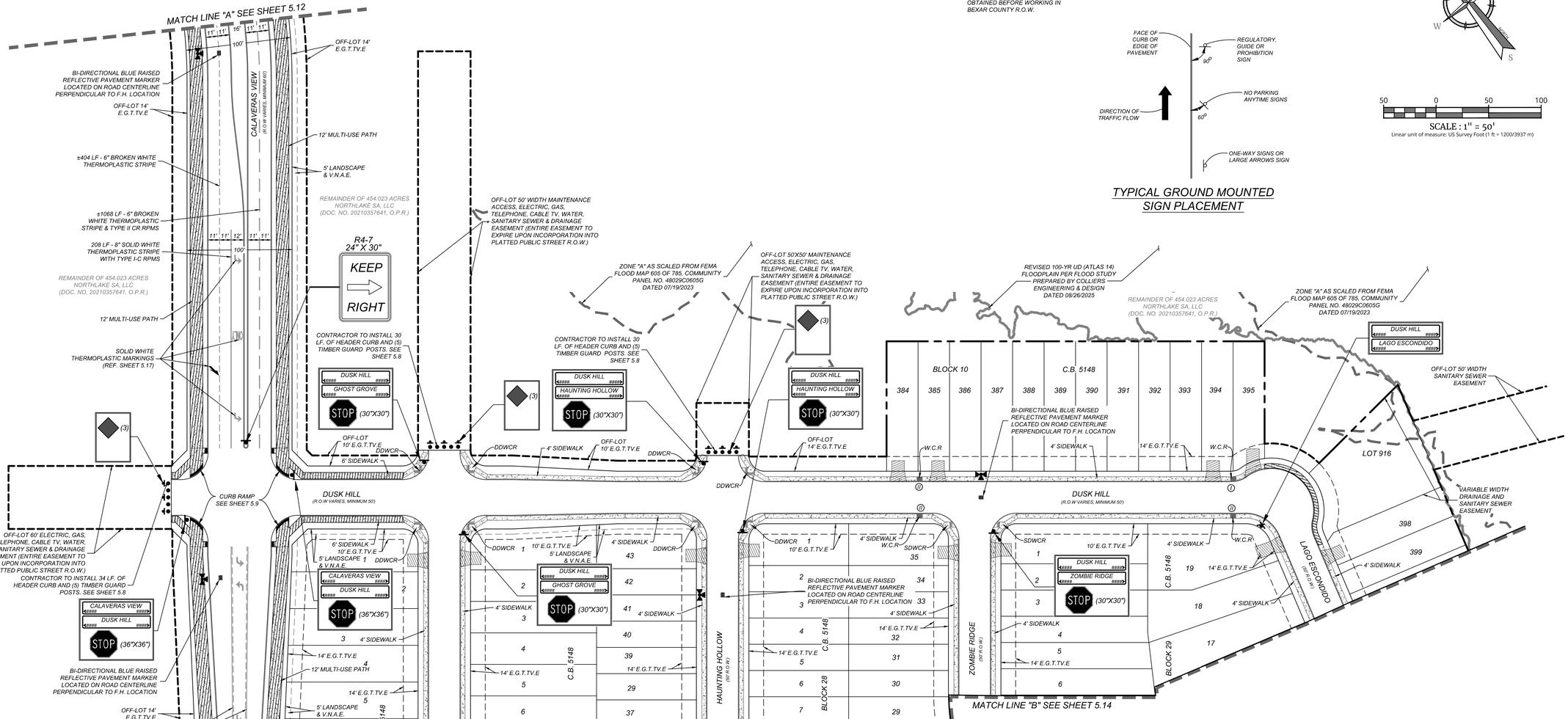
TRENCH EXCAVATION SAFETY PROTECTION
CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

BEXAR COUNTY R.O.W. NOTE:
A BEXAR COUNY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

TYPICAL GROUND MOUNTED SIGN PLACEMENT



50 0 50 100
SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)



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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED
PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: TS3146503-PH2A

SHEET TITLE:
TRAFFIC SIGNAGE & SIDEWALK PLAN (2 OF 3)

SHEET NUMBER:
5.13

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

i:\STREETS\TS3146503-PH2A.dwg[C5.13 By: ABEL.MONTALVO

NOTES:
1) WITHIN THE CITY'S EXTRATERRITORIAL JURISDICTION, STREET NAME SIGNS SHALL BE INSTALLED AT ALL INTERSECTIONS WITHIN AND ABUTTING THE SUBDIVISION. SUCH SIGNS SHALL BE MANUFACTURED AND INSTALLED BY THE SUBDIVIDER IN ACCORDANCE TO SPECIFICATIONS OF, AND SUBJECT TO PLAN REVIEWS AND INSPECTIONS BY THE COUNTY DEPARTMENT OF PUBLIC WORKS.

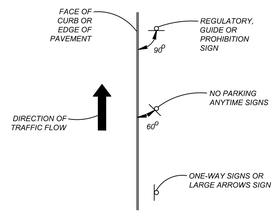
2) REGULATORY AND WARNING TRAFFIC SIGNS SHALL BE INSTALLED WITHIN AND ABUTTING THE SUBDIVISION IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)," AS REQUIRED BY THE CITY'S DEVELOPMENT SERVICES DEPARTMENT OR COUNTY'S DEPARTMENT OF PUBLIC WORKS. SUCH SIGNS SHALL BE MANUFACTURED AND INSTALLED BY THE SUBDIVIDER IN ACCORDANCE TO SPECIFICATIONS OF, AND SUBJECT TO PLAN REVIEWS AND INSPECTIONS BY THE CITY'S DEVELOPMENT SERVICES DEPARTMENT OR COUNTY'S DEPARTMENT OF PUBLIC WORKS. WARNING AND REGULATORY SIGNS SHALL NOT BE ACCEPTED BY THE CITY UNTIL THE STREET HAS BEEN ACCEPTED FOR MAINTENANCE BY THE CITY.

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

BEXAR COUNTY R.O.W. NOTE:

A BEXAR COUNY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.



TYPICAL GROUND MOUNTED SIGN PLACEMENT

REFER SHEET 5.12 FOR STREET SIGN SYMBOL AND ITEM NUMBER LEGEND

OFF-LOT 14' E.G.T.TV.E

BI-DIRECTIONAL BLUE RAISED REFLECTIVE PAVEMENT MARKER LOCATED ON ROAD CENTERLINE PERPENDICULAR TO F.H. LOCATION

±1106 LF - 6" SOLID YELLOW WITH 6" BROKEN YELLOW THERMOPLASTIC STRIPE WITH TYPE II A-A REFLECTIVE MARKERS

ROAD ENDS
500 FT.
SIGN TO BE RELOCATED 2,400 FT. S FROM PREVIOUS LOCATION

LEFT WHITE THERMOPLASTIC TURN ARROW PAVEMENT MARKING

CALAVERAS VIEW (R.O.W VARIES, MINIMUM 60')

GHOST GROVE (50' R.O.W.)

HAUNTING HOLLOW (50' R.O.W.)

ZOMBIE RIDGE (50' R.O.W.)

LAGO ESCONDIDO (50' R.O.W.)

SHINING ROAD (50' R.O.W.)

THING TERRACE (R.O.W VARIES, MINIMUM 50')

BLOCK 26 C.B. 5148 — BLOCK 27 C.B. 5148 — BLOCK 28 C.B. 5148 — BLOCK 29 C.B. 5148 — BLOCK 30 C.B. 5148 — BLOCK 31 C.B. 5148 — BLOCK 10 C.B. 5148

MATCH LINE "B" SEE SHEET 5.13

REMAINDER OF 454.023 ACRES NORTHLAKE SA, LLC (DOC. NO. 20210357641, O.P.R.)

UNPLATTED CITY PUBLIC SERVICE BOARD CITY OF SAN ANTONIO CALLED 234.61 ACRES CONDEMNATION PARCEL (NO CONVEYANCE DEED FOUND, DESCRIPTION IN VOLUME 6754, PAGE 403 O.P.R.)

LEGEND

- WASHOUT CROWN
- E.G.T.TV.E. = ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
- V.N.A.E. = VEHICULAR NON-ACCESS EASEMENT
- W.C.R. = WHEELCHAIR RAMPS SEE SHEET 5.9
- Ⓘ = WHEELCHAIR RAMP TYPE I SEE SHEET 5.9
- Ⓘⓘ = WHEELCHAIR RAMP TYPE II SEE SHEET 5.9
- S.D.W.C.R. = SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
- D.D.W.C.R. = DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.9
- = SIDEWALK TO BE CONSTRUCTED BY DEVELOPER.
- = SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
- = PROPOSED DRIVEWAY LOCATIONS
- = PROPOSED FIRE HYDRANRT
- = EXISTING FIRE HYDRANRT



LOCATION MAP
SCALE: NOT-TO-SCALE

N E S W HUDSON

50 0 50 100
SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS — OMAR A. ESPINOSA — 125560 — LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: TS3146503-PH2A

SHEET TITLE: TRAFFIC SIGNAGE & SIDEWALK PLAN (3 OF 3)

SHEET NUMBER: 5.14

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

By: ABEL MONTALVO

NORTHLAKE PHASE 2A

BEXAR COUNTY, TEXAS

SANITARY SEWER IMPROVEMENTS

SAWS STANDARD GENERAL CONSTRUCTION NOTES
ASSOCIATED WITH 2021 SAWS STANDARD SPECS
Updated January 2022

General Section

1. All materials and construction procedures within the scope of this contract shall be approved by the San Antonio Water System (SAWS) and comply with the Plans, Specifications, General Conditions and with the following as applicable:
   A. Current Texas Commission on Environmental Quality (TCEQ) "Design Criteria for Domestic Wastewater System", Texas Administrative Code (TAC) Title 30 Part 1 Chapter 217 and "Public Drinking Water", TAC Title 30 Part 1 Chapter 290.
   B. Current TXDOT "Standard Specifications for Construction of Highways, Streets and Drainage".
   C. Current "San Antonio Water System Standard Specifications for Water and Sanitary Sewer Construction".
   D. Current City of San Antonio "Standard Specifications for Public Works Construction".
   E. Current City of San Antonio "Utility Excavation Criteria Manual" (UECM).
2. The contractor shall not proceed with any pipe installation work until they obtain a copy of the approved Counter Permit or General Construction Permit (GCP) from the consultant and has been notified by SAWS Construction Inspection Division to proceed with the work and has arranged a meeting with the inspector and consultant for the work requirements. Work completed by the contractor without an approved Counter Permit and/or a GCP will be subject to removal and replacement at the expense of the contractors and/or the developer.
3. The Contractor shall obtain the SAWS Standard Details from the SAWS website, http://www.saws.org/business_center/specs. Unless otherwise noted within the design plans.
4. The Contractor is to make arrangements with the SAWS Construction Inspection Division at (210) 233-2973, on notification procedures that will be used to notify affected home residents and/or property owners 48 hours prior to beginning any work.
5. Location and depth of existing utilities and service laterals shown on the plans are understood to be approximate. Actual locations and depths must be field verified by the Contractor at least 1 week prior to construction. It shall be the Contractor's responsibility to locate utility service lines as required for construction and to protect them during construction at no cost to SAWS.
6. The Contractor shall verify the exact location of underground utilities and drainage structures at least 1-2 weeks prior to construction whether shown on plans or not. Please allow up to 7 business days for locates requesting pipe location markers on SAWS facilities. The following contact information are supplied for verification purposes:
   SAWS Utility Locates: http://www.saws.org/Service/Locates
   COSA Drainage (210) 207-0724 or (210) 207-6026
   COSA Traffic Signal Operations (210) 206-8480
   COSA Traffic Signal Damages (210) 207-3951
   Texas State Wide One Call Locator 1-800-545-6005 or 811
7. The Contractor shall be responsible for restoring existing fences, curbs, streets, driveways, sidewalks, landscaping and structures to its original or better condition if damages are made as a result of the project's construction.
8. All work in Texas Department of Transportation (TxDOT) and/or Bexar County right-of-way shall be done in accordance with respective construction specifications and permit requirements.
9. The Contractor shall comply with City of San Antonio or other governing municipality's tree ordinances when excavating near trees.
10. The Contractor shall not place any waste materials in the 100-year Flood Plain without first obtaining an approved Flood Plain Permit.
11. Holiday Work: Contractors will not be allowed to perform SAWS work on SAWS recognized holidays. Request should be sent to constworkreq@saws.org. Weekend Work: Contractors are required to notify the SAWS Inspection Construction Department 48 hours in advance to request weekend work. Request should be sent to constworkreq@saws.org. Any and all SAWS utility work installed without holiday/weekend approval will be subject to be uncovered for proper inspection.
12. Compaction note (Item 804): The contractor shall be responsible for meeting the compaction requirements on all trench backfill and for paying for the tests performed by a third party. Compaction tests will be done at one location point randomly selected, or as indicated by the SAWS Inspector and/or the test administrator, per each 12-inch loose lift per 400 linear feet at a minimum. This project will not be accepted and finalized by SAWS without this requirement being met and verified by providing all necessary documented test results.
13. A copy of all testing reports shall be forwarded to SAWS Construction Inspection Division.

Sewer Notes

1. The Contractor is responsible for ensuring that no Sanitary Sewer Overflow (SSO) occurs as a result of their work. All contractor personnel responsible for SSO prevention and control shall be trained on proper response. Should an SSO occur, the contractor shall:
   A. Identify the source of the SSO and notify SAWS Emergency Operations Center (EOC) immediately at (210) 233-2014. Provide the address of the spill and an estimated volume or flow.
   B. Attempt to eliminate the source of the SSO.
   C. Contain sewage from the SSO to the extent of preventing a possible contamination of waterways.
   D. Clean up spill site (return contained sewage to the collection system if possible) and properly dispose of contaminated soil/materials.
   E. Clean the affected sewer mains and remove any debris.
   F. Meet all post-SSO requirements as per the EPA Consent Decree, including line cleaning and televising the affected sewer mains (at SAWS direction) within 24 hours. Should the Contractor fail to address an SSO immediately and to SAWS satisfaction, they will be responsible for all costs incurred by SAWS, including any fines from EPA, TCEQ and/or any other Federal, State or Local Agencies. No separate measurement or payment shall be made for this work. All work shall be done according to guidelines set by the TCEQ and SAWS.
2. If bypass pumping is required, the Contractor shall perform such work in accordance with SAWS Standard Specification for Water and Sanitary Sewer Construction, Item No. 864, "Bypass Pumping".
3. Prior to tie-ins, any shutdowns of existing force mains of any size must be coordinated with the SAWS Construction Inspection Division at (210) 233-2973 at least one week in advance of the shutdown. The Contractor must also provide a sequence of work as related to the tie-ins; this is at no additional cost to SAWS or the project and it is the responsibility of the Contractor to sequence the work accordingly.
4. Sewer pipe where water line crosses shall be 160 psi and meet the requirements of ASTM D2241, TAC 217.53 and TCEQ 290.44(e)(4)(B). Contractor shall center a 20' joint of 160 psi pressure rated PVC at the proposed water crossing.
5. ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY: It shall be the responsibility of the Contractor to make allowances and adjustments for top of manholes to match the finished grade of the project's improvements. (NSPI)
6. Spills, Overflows, or Discharges of Wastewater: All spills, overflows, or discharges of wastewater, recycled water, petroleum products, or chemicals must be reported immediately to the SAWS Inspector assigned to the Counter Permit or General Construction Permit (GCP). This requirement applies to every spill, overflow, or discharge regardless of size.
7. Manhole and all pipe testing (including the TV inspection) must be performed and passed prior to Final Field Acceptance by SAWS Construction Inspection Division, as per the SAWS Specifications For Water and Sanitary Sewer Construction.
8. All PVC pipe over 14 feet of cover shall be extra strength with minimum pipe stiffness of 115 psi.



LOCATION MAP

SCALE: NOT-TO-SCALE

OWNER/DEVELOPER:
LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TEXAS 78216
(210) 403-6200

Sheet List Table

SHEET TITLE	SHEET NUMBER
SANITARY SEWER COVER SHEET	6.0
OVERALL SANITARY SEWER PLAN (1 OF 2)	6.1
OVERALL SANITARY SEWER PLAN (2 OF 2)	6.2
LINE 'A' PLAN AND PROFILES	6.3
LINE 'B' PLAN AND PROFILES	6.4
LINE 'C' PLAN AND PROFILES	6.5
LINE 'D' PLAN AND PROFILES	6.6
LINE 'D' & 'E' PLAN AND PROFILES	6.7
LINE 'F' PLAN AND PROFILES	6.8
LINE 'G' & 'H' PLAN AND PROFILES	6.9
LINE 'I' PLAN AND PROFILES	6.10

LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.		
DEVELOPER'S ADDRESS: 100 NE LOOP 410, SUITE 1155		
CITY: SAN ANTONIO	STATE: TEXAS	ZIP: 78216
PHONE#:	FAX#:	TOTAL ACREAGE: 32.14 ACRES
SAWS BLOCK MAP#: 210546,212546,212544,212542,212540		TOTAL EDU'S: 234
TOTAL LINEAR FOOTAGE OF PIPE:	1,133 LF ~ 12" SDR 26 5,662 LF ~ 8" SDR 26	PLAT NO.: 25-11800192
NUMBER OF LOTS: 234	SAWS JOB#: 25-1558	

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED
PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

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TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER:	DRAWING NAME:
314-65-03	CVO53146503

SHEET TITLE:
SANITARY SEWER COVER SHEET

SHEET NUMBER:
6.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

By: SDSEPH

TRENCH EXCAVATION SAFETY PROTECTION

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COMPACTION NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS IND/CATED BY THE SAWS INSPECTOR/TEST ADMINISTRATOR, PER EACH 12 INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. PERMITS AND/OR WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

MANHOLE NOTE:

ALL MANHOLES MUST BE WATERTIGHT, WITH WATERTIGHT RINGS AND COVERS. THESE MANHOLES MUST BE VENTED PER SAWS STANDARD SPECIFICATIONS

NOTES:

1. *SEWER PIPE WHERE WATER LINE CROSSES SHALL BE MEET THE REQUIREMENTS OF ASTM D2241. CONTRACTOR SHALL CENTER A 20 FOOT JOINT OF 160 P.S.I. PRESSURE RATED P.V.C. AT THE PROPOSED WATER CROSSING (NO SEPARATE PAY ITEM). REFERENCE SHEET 6.0, SANITARY SEWER GENERAL NOTES, S.A.W.S. CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS.*
2. *REF. THIS SHEET FOR BENCHMARK INFORMATION.*
3. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
4. *REF. THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.*
5. *ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.*

CAUTION!!:

THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	SS
PROPOSED SANITARY SEWER LATERAL	=	
ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT (PLAT NUMBER	=	*E.G.T.TV.E*
EXISTING WATER MAIN	=	EW
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	ESS
EXISTING SANITARY SEWER MANHOLE	=	ESS

BENCHMARKS

BM # 12
DESC: SIR 3' IR ORANGE CAP
N:13673087.91
E:2183389.95
ELEV: 540.88

BM # 13
DESC: SIR 3' IR ORANGE CAP
N:13669082.81
E:2183437.35
ELEV: 502.00

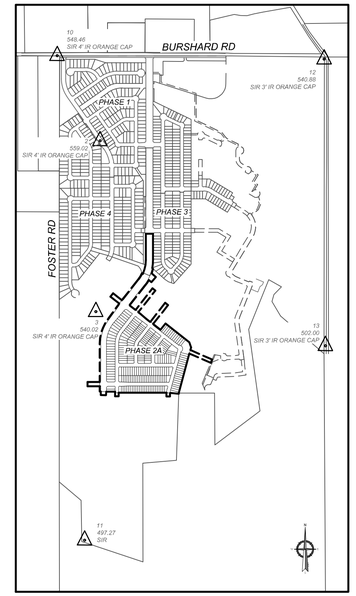
BM # 11
DESC: SIR
N:13666339.65
E:2180933.31
ELEV: 497.27

BM # 3
DESC: SIR 4' IR ORANGE CAP
N:13669534.66
E:2180226.14
ELEV: 540.02

BM # 2
DESC: SIR 4' IR ORANGE CAP
N:13671923.18
E:2180267.19
ELEV: 559.02

BM # 10
DESC: SIR 4' IR ORANGE CAP
N:13673108.57
E:2179660.24
ELEV: 548.46

★ *CONTRACTOR TO RUN LEVEL LOOP THROUGH BM'S PROVIDED TO CONFIRM BEFORE CONSTRUCTION. CONTACT ENGINEER/SURVEYOR IMMEDIATELY IF ELEVATIONS DO NOT MATCH THOSE SHOWN.*

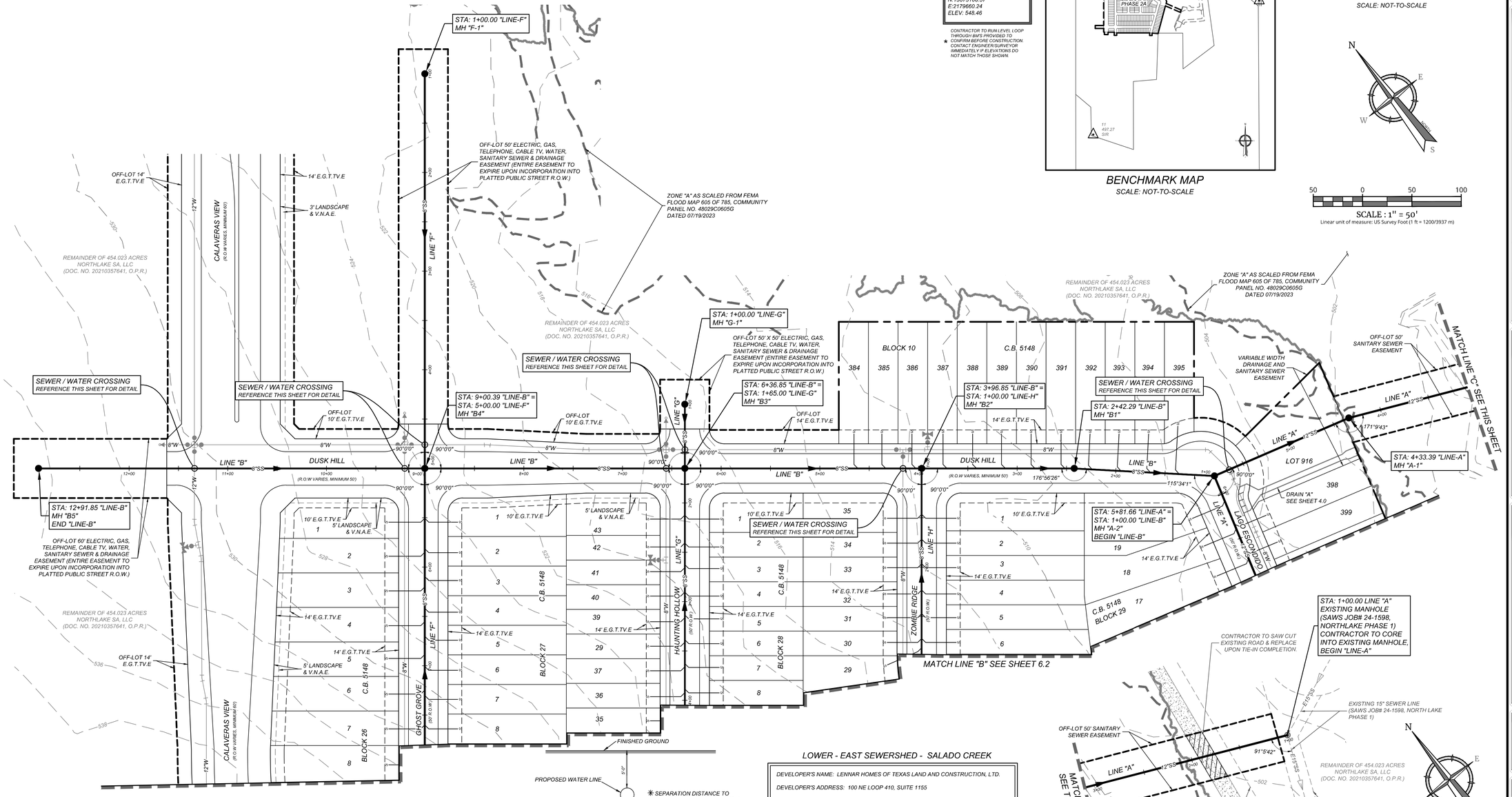


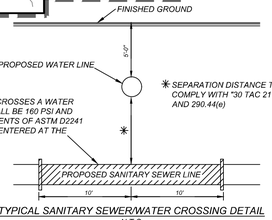
BENCHMARK MAP
SCALE: NOT-TO-SCALE



LOCATION MAP
SCALE: NOT-TO-SCALE

SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)





TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME:	*LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.*		
DEVELOPER'S ADDRESS:	*100 NE LOOP 410, SUITE 1155*		
CITY:	*SAN ANTONIO*	*STATE:* *TEXAS*	*ZIP:* *78216*
PHONE#:		*FAX#:*	*TOTAL ACREAGE:* *32.14 ACRES*
SAWS BLOCK MAP#:	*210546,212546,212544,212542,212540*		*TOTAL EDU'S:* *234*
TOTAL LINEAR FOOTAGE OF PIPE:	*1,133 LF – 12" SDR 26* *5,662 LF – 8" SDR 26*		*PLAT NO.:* *25-11800192*
NUMBER OF LOTS: *234*		*SAWS JOB#:* *25-1558*	

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: OS3146503-PH2A

SHEET TITLE:
OVERALL SANITARY SEWER PLAN (1 OF 2)

SHEET NUMBER:
6.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Job\SEWER\OS3146503-PH2A.dwg\6.1 By: SJOSEPH

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

COMPACTION NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTRATOR, PER EACH 12 INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. PERMITS AND/OR WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

NOTES:

1. *SEWER PIPE WHERE WATER LINE CROSSES SHALL BE MEET THE REQUIREMENTS OF ASTM D2241. CONTRACTOR SHALL CENTER A 20 FOOT JOINT OF 160 P.S.I. PRESSURE RATED P.V.C. AT THE PROPOSED WATER CROSSING (NO SEPARATE PAY ITEM). REFERENCE SHEET 6.0, SANITARY SEWER GENERAL NOTES, S.A.W.S. CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS.*
2. *REF. SHEET 6.1 FOR BENCHMARK INFORMATION.*
3. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
4. *REF. THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL*
5. *ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.*

CAUTION!!:

THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO; WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

MANHOLE NOTE:

ALL MANHOLES MUST BE WATERTIGHT, WITH WATERTIGHT RINGS AND COVERS. THESE MANHOLES MUST BE VENTED PER SAWS STANDARD SPECIFICATIONS

LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.		
DEVELOPER'S ADDRESS: 100 NE LOOP 410, SUITE 1155		
CITY: SAN ANTONIO	STATE: TEXAS	ZIP: 78216
PHONE#:	FAX#:	TOTAL ACREAGE: 32.14 ACRES
SAWS BLOCK MAP#: 210546,212546,212544,212542,212540		TOTAL EDUS: 234
TOTAL LINEAR FOOTAGE OF PIPE:	1,133 LF ~ 12" SDR 26 5,662 LF ~ 8" SDR 26	PLAT NO.: 25-11800192
NUMBER OF LOTS: 234	SAWS JOB#: 25-1558	

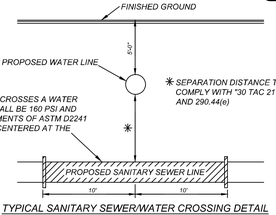
LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	SS
PROPOSED SANITARY SEWER LATERAL	=	
ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT (PLAT NUMBER	=	E.G.T.TV.E
EXISTING WATER MAIN	=	EW
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	ESS
EXISTING SANITARY SEWER MANHOLE	=	ESS



LOCATION MAP

SCALE: NOT-TO-SCALE

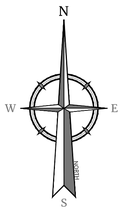


WHERE SEWER PIPE CROSSES A WATER LINE, THE SEWER SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT THE WATER CROSSING.

✳ *SEPARATION DISTANCE TO COMPLY WITH "30 TAC 217.53(d) AND 290.44(e)*

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

N.T.S.



SCALE : 1" = 50'

Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED
PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-1909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025		OE

PROJECT NUMBER: 314-65-03

DRAWING NAME: 053146503-PH2A

SHEET TITLE: OVERALL SANITARY SEWER PLAN (2 OF 2)

SHEET NUMBER: 6.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

\\IR\SEWER\053146503-PH2A.dwg\6.2 By: SDSEPH

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

COMPACTION NOTE:

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CAUTION!!:

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NOTE:

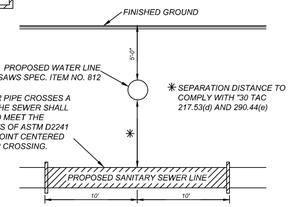
M.H. EXCEEDING 20 FT DEPTH WILL BE SUBJECTED TO GET REVISED WITH FUTURE DEVELOPMENT TO ENSURE SAWS DEPTH CRITERIA IS MET.

NOTES:

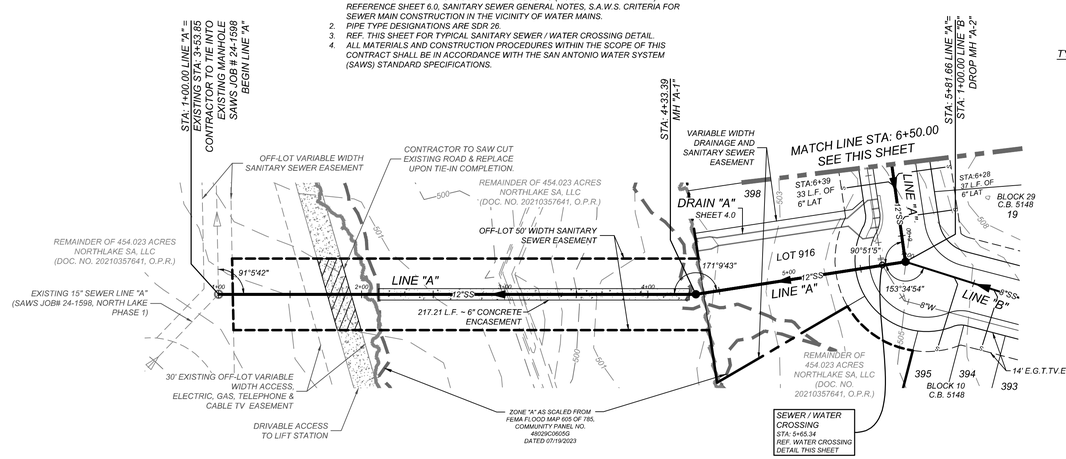
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2. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
3. *REF. THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.*
4. *ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.*

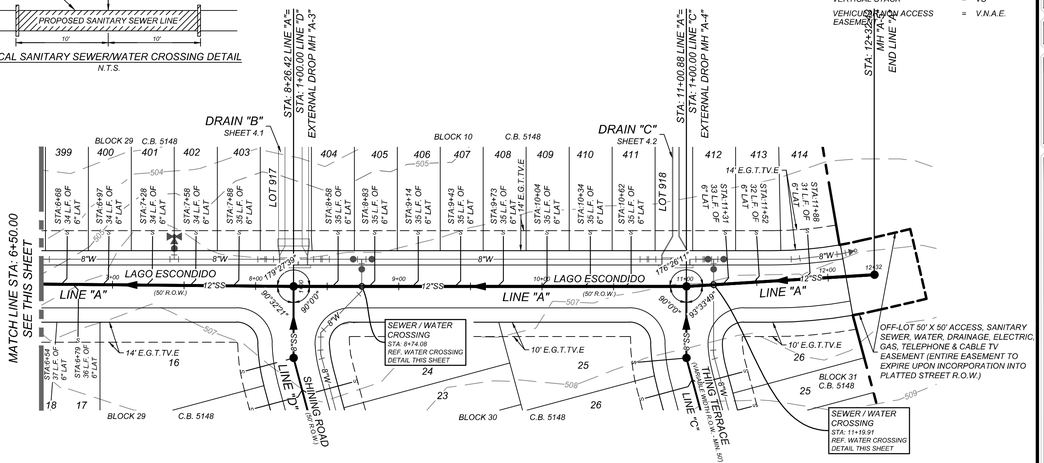
MANHOLE NOTE:

ALL MANHOLES MUST BE WATERTIGHT, WITH WATERTIGHT RINGS AND COVERS. THESE MANHOLES MUST BE VENTED PER SAWS DETAIL DD852-02.



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

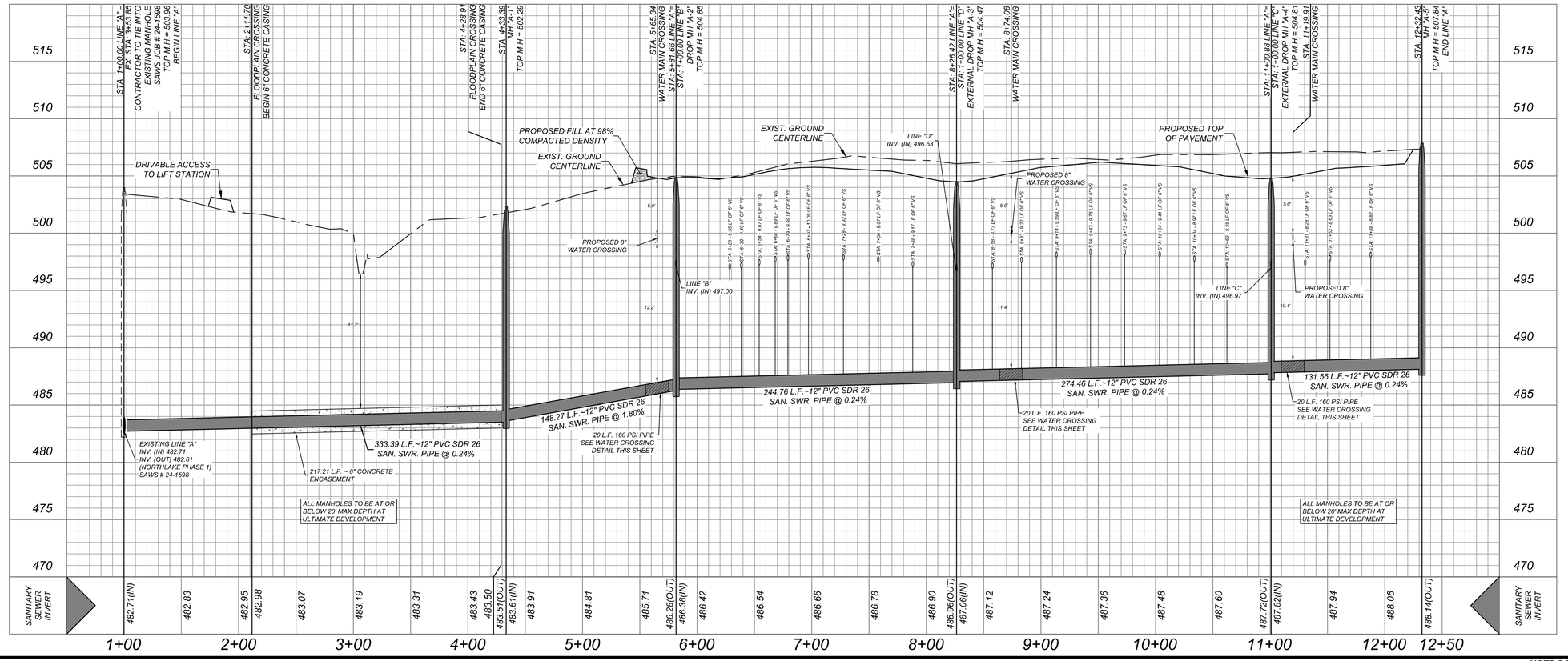




SCALE : 1" = 5'
VERTICAL

SCALE : 1" = 50'
HORIZONTAL

LINE "A"
STA: 1+00.00 - END



LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.			
DEVELOPER'S ADDRESS: 100 NE LOOP 410, SUITE 1155			
CITY: SAN ANTONIO	STATE: TEXAS	ZIP: 78216	
PHONE#:	FAX#:	TOTAL ACREAGE: 32.14 ACRES	
SAWS BLOCK MAP#: 210546,212546,212544,212542,212540		TOTAL EDU'S: 234	
TOTAL LINEAR FOOTAGE OF PIPE:	1,133 LF ~ 12" SDR 26 5,662 LF ~ 8" SDR 26	PLAT NO.: 25-11800192	
NUMBER OF LOTS: 234	SAWS JOB#: 25-1558		

LEGEND

RIGHT OF WAY	=	R.O.W.
COUNTY BLOCK	=	C.B.
EXISTING SANITARY SEWER	=	ESS
PROPOSED SANITARY SEWER	=	SS
EXISTING WATER	=	EW
PROPOSED WATER	=	W
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	E.G.T.TV.E
LINEAR FEET	=	LF
LATERAL	=	LAT
VERTICAL STACK	=	VS
VEHICULAR NON ACCESS EASEMENT	=	V.N.A.E.

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED
PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: SSPP3146503

SHEET TITLE: LINE 'A' PLAN AND PROFILES

SHEET NUMBER: 6.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\WORK\WER\SSPP3314\6503.dwg(6.3 By: SOSEPHA

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

COMPACTION NOTE:

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NOTES:

1. *SEWER PIPE WHERE WATER LINE CROSSES SHALL BE MEET THE REQUIREMENTS OF ASTM D2241, CONTRACTOR SHALL CENTER A 20 FOOT JOINT OF 160 P.S.I. PRESSURE RATED P.V.C. AT THE PROPOSED WATER CROSSING (NO SEPARATE PAY ITEM). REFERENCE SHEET 6.0, SANITARY SEWER GENERAL NOTES, S.A.W.S. CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS.*
2. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
3. *REF. THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.*
4. *ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.*

CAUTION!!:

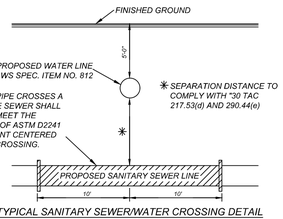
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

NOTE:

M.H. EXCEEDING 20 FT DEPTH WILL BE SUBJECTED TO GET REVISED WITH FUTURE DEVELOPMENT TO ENSURE SAWS DEPTH CRITERIA IS MET.

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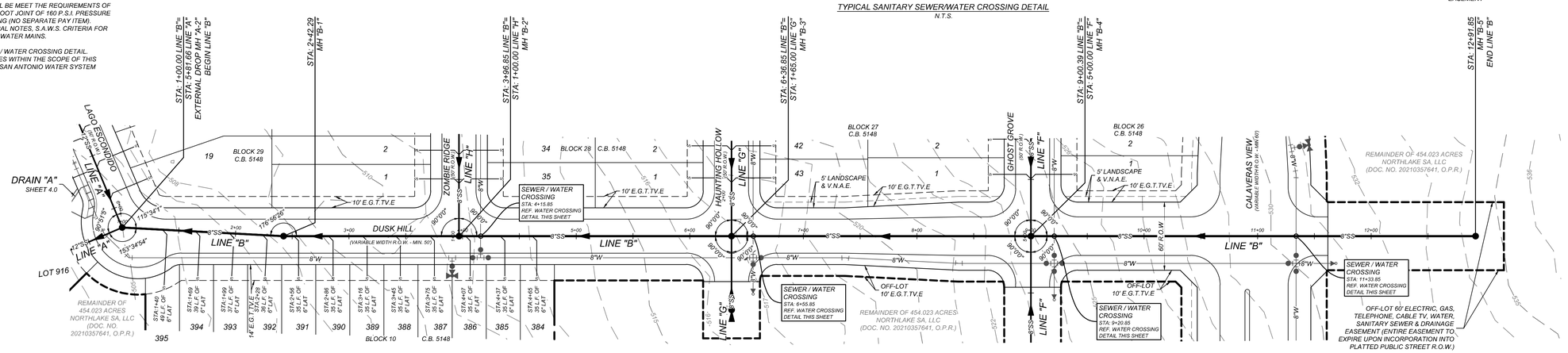
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME:	*LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.*		
DEVELOPER'S ADDRESS:	*100 NE LOOP 410, SUITE 1155*		
CITY:	*SAN ANTONIO*	*STATE:* *TEXAS*	*ZIP:* *78216*
PHONE#:		*FAX#:*	*TOTAL ACREAGE:* *32.14 ACRES*
SAWS BLOCK MAP#:	*210546,212546,212544,212542,212540*		*TOTAL EDU'S:* *234*
TOTAL LINEAR FOOTAGE OF PIPE:	*1,133 LF ~ 12" SDR 26 5,662 LF ~ 8" SDR 26*		*PLAT NO.:* *25-11800192*
NUMBER OF LOTS: *234*		*SAWS JOB#:* *25-1558*	

LEGEND

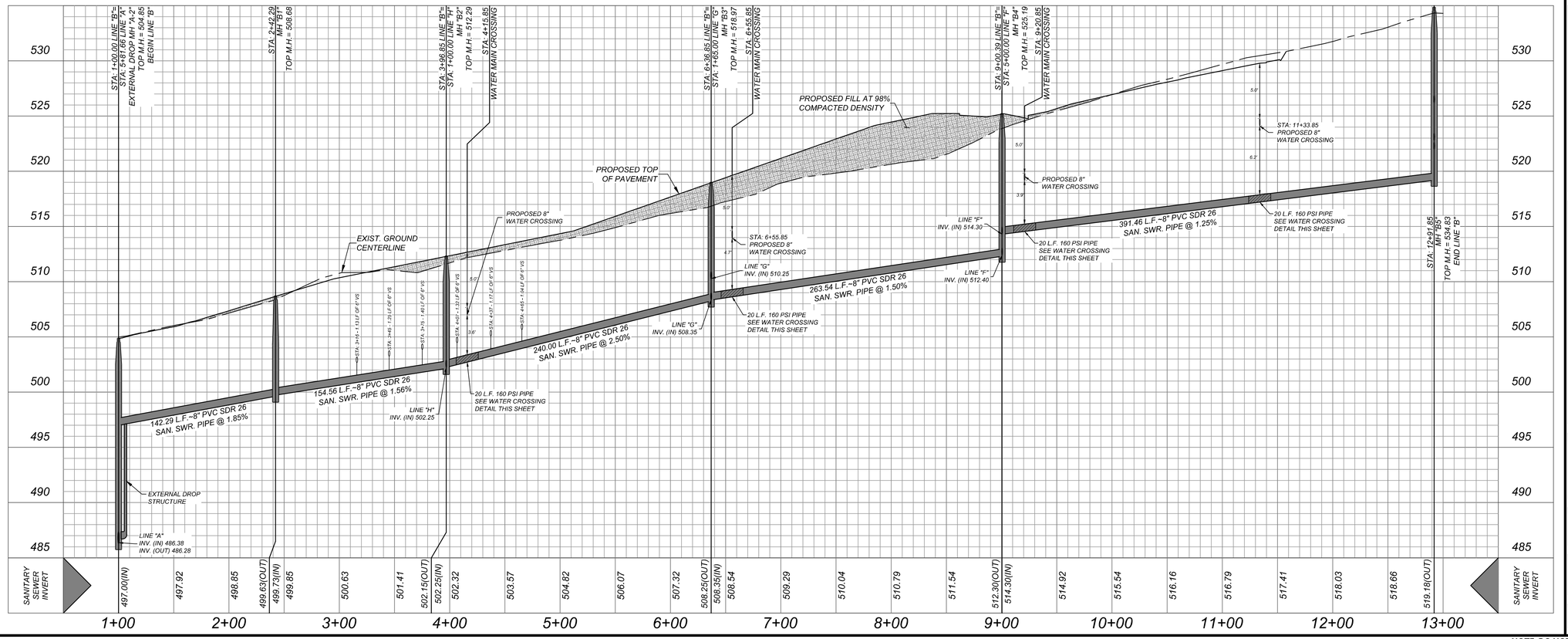
RIGHT OF WAY	=	*R.O.W.*
COUNTY BLOCK	=	*C.B.*
EXISTING SANITARY SEWER	=	*ESS*
PROPOSED SANITARY SEWER	=	*SS*
EXISTING WATER	=	*EW*
PROPOSED WATER	=	*W*
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	*E.G.T.TV.E*
LINEAR FEET	=	*LF*
LATERAL	=	*LAT*
VERTICAL STACK	=	*VS*
VEHICULAR NON ACCESS EASEMENT	=	*V.N.A.E.*



SCALE : 1" = 5'
VERTICAL

SCALE : 1" = 50'
HORIZONTAL

LINE "B"
STA: 1+00.00 - END



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REV	DATE	DRAWN BY	DESCRIPTION

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LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: SSPP3146503

SHEET TITLE: LINE 'B' PLAN AND PROFILES

SHEET NUMBER: 6.4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\KFW\SEWER\SSPP3146503.dwg[6.4 By: SOSEPHI

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

COMPACTION NOTE:

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NOTES:

1. *SEWER PIPE WHERE WATER LINE CROSSES SHALL BE MEET THE REQUIREMENTS OF ASTM D2241. CONTRACTOR SHALL CENTER A 20 FOOT JOINT OF 160 P.S.I. PRESSURE RATED P.V.C. AT THE PROPOSED WATER CROSSING (NO SEPARATE PAY ITEM). REFERENCE SHEET 6.0, SANITARY SEWER GENERAL NOTES, S.A.W.S. CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS.*
2. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
3. *REF. THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.*
4. *ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.*

CAUTION!!:

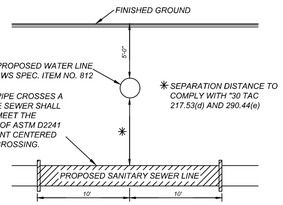
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NOTE:

M.H. EXCEEDING 20 FT DEPTH WILL BE SUBJECTED TO GET REVISED WITH FUTURE DEVELOPMENT TO ENSURE SAWS DEPTH CRITERIA IS MET.

MANHOLE NOTE:

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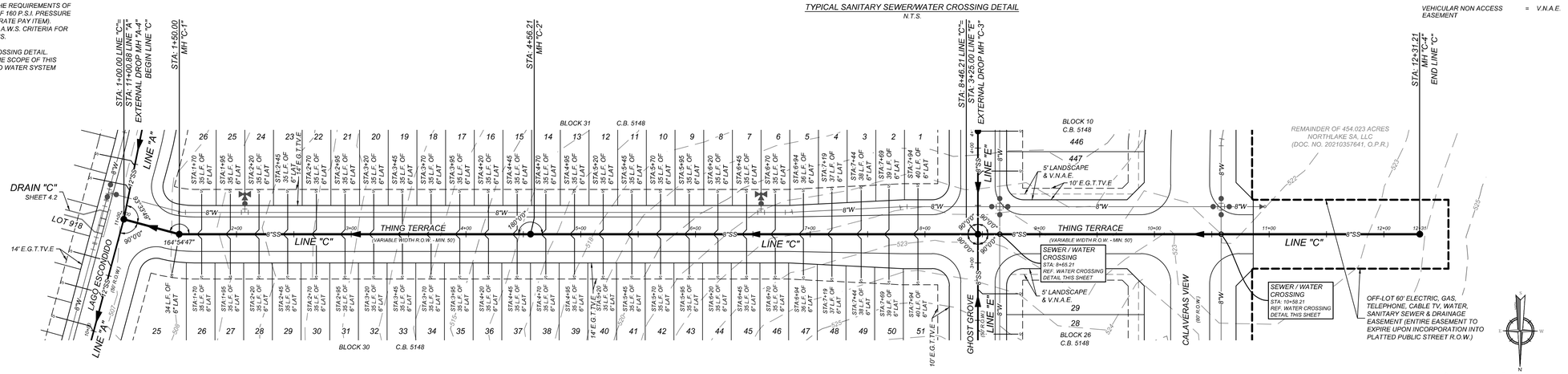
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.			
DEVELOPER'S ADDRESS: 100 NE LOOP 410, SUITE 1155			
CITY: SAN ANTONIO	STATE: TEXAS	ZIP: 78216	
PHONE#:	FAX#:	TOTAL ACREAGE: 32.14 ACRES	
SAWS BLOCK MAP#: 210546,212546,212544,212542,212540		TOTAL EDU'S: 234	
TOTAL LINEAR FOOTAGE OF PIPE:	1,133 LF ~ 12" SDR 26 5,662 LF ~ 8" SDR 26	PLAT NO.: 25-11800192	
NUMBER OF LOTS: 234	SAWS JOB#: 25-1558		

LEGEND

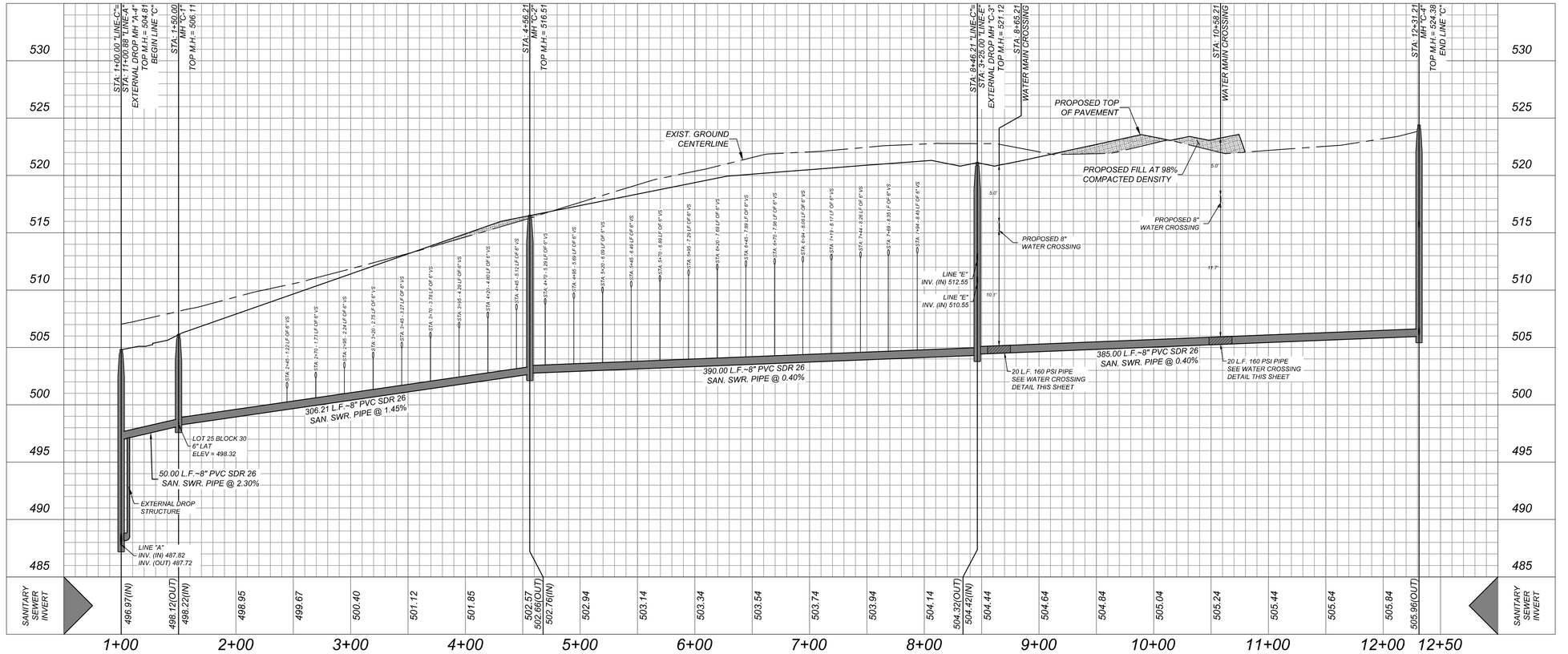
RIGHT OF WAY	=	R.O.W.
COUNTY BLOCK	=	C.B.
EXISTING SANITARY SEWER	=	ESS
PROPOSED SANITARY SEWER	=	SS
EXISTING WATER	=	EW
PROPOSED WATER	=	W
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	E.G.T.TV.E
LINEAR FEET	=	LF
LATERAL	=	LAT
VERTICAL STACK	=	VS
VEHICULAR NON ACCESS EASEMENT	=	V.N.A.E.



SCALE : 1" = 5'
VERTICAL

SCALE : 1" = 50'
HORIZONTAL

LINE "C"
STA: 1+00.00 - END



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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: SSPP3146503

SHEET TITLE: LINE 'C' PLAN AND PROFILES

SHEET NUMBER: 6.5

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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TRENCH EXCAVATION SAFETY PROTECTION

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2. PIPE TYPE DESIGNATIONS ARE SDR 26.
3. REF. THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
4. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.

CAUTION!!:

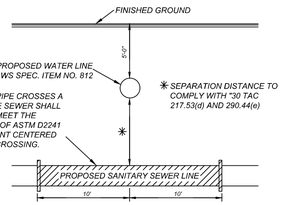
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TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.

DEVELOPER'S ADDRESS: 100 NE LOOP 410, SUITE 1155

CITY: SAN ANTONIO STATE: TEXAS ZIP: 78216

PHONE#: FAX#: TOTAL ACREAGE: 32.14 ACRES

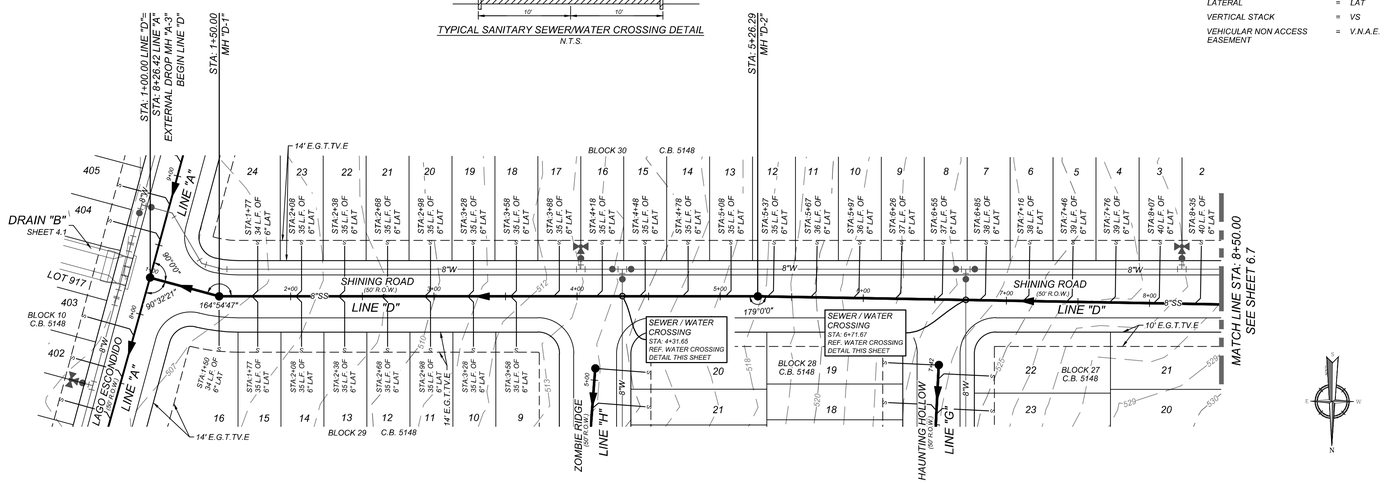
SAWS BLOCK MAP#: 210546,212546,212544,212542,212540 TOTAL EDU'S: 234

TOTAL LINEAR FOOTAGE OF PIPE: 1,133 LF ~ 12" SDR 26 5,662 LF ~ 8" SDR 26 PLAT NO.: 25-11800192

NUMBER OF LOTS: 234 SAWS JOB#: 25-1558

LEGEND

RIGHT OF WAY	=	R.O.W.
COUNTY BLOCK	=	C.B.
EXISTING SANITARY SEWER	=	ESS
PROPOSED SANITARY SEWER	=	SS
EXISTING WATER	=	EW
PROPOSED WATER	=	W
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	E.G.T.TV.E
LINEAR FEET	=	LF
LATERAL	=	LAT
VERTICAL STACK	=	VS
VEHICULAR NON ACCESS EASEMENT	=	V.N.A.E.

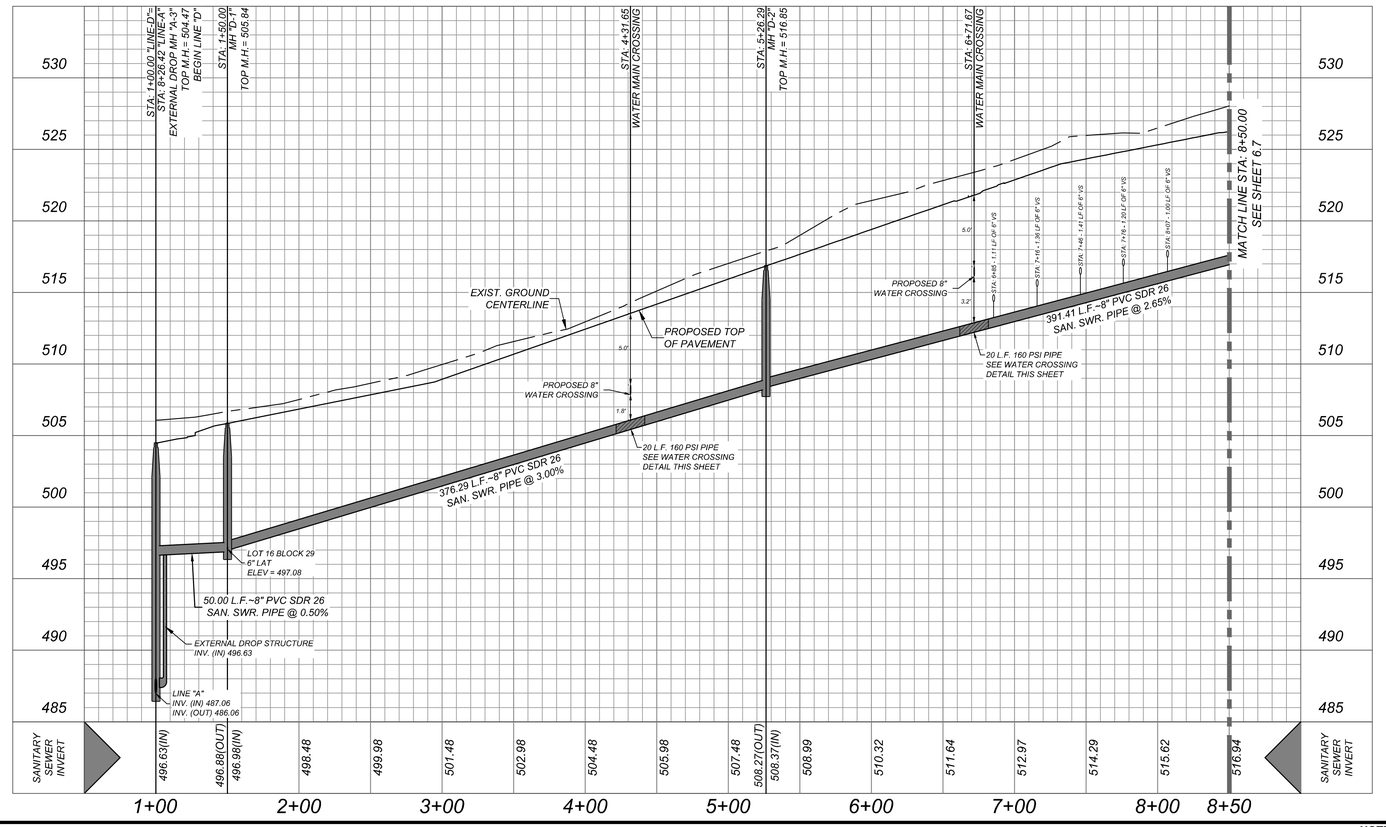


SCALE : 1" = 5'
VERTICAL

SCALE : 1" = 50'
HORIZONTAL

LINE "D"

STA: 1+00.00 - 8+50.00



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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: SSPP3146503

SHEET TITLE: LINE 'D' PLAN AND PROFILES

SHEET NUMBER: 6.6

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\ARCHIVES\SSPP3146503.dwg|6.6 By: SOSEPHI

TRENCH EXCAVATION SAFETY PROTECTION

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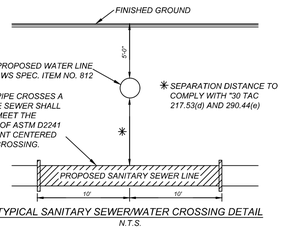
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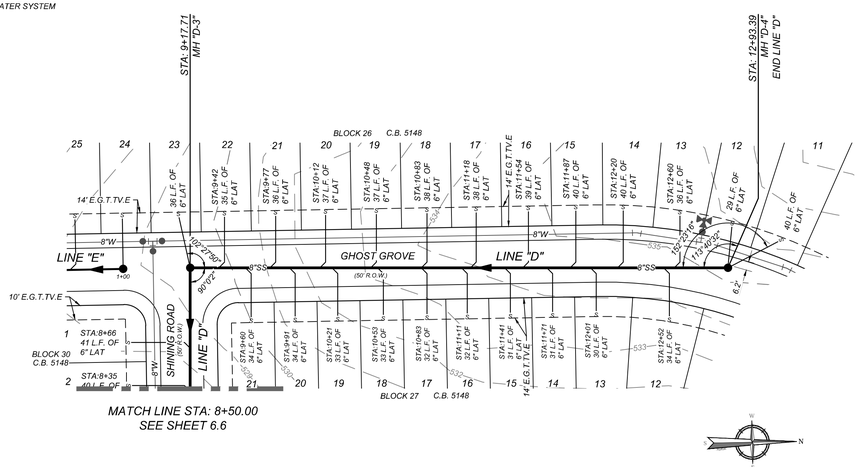
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

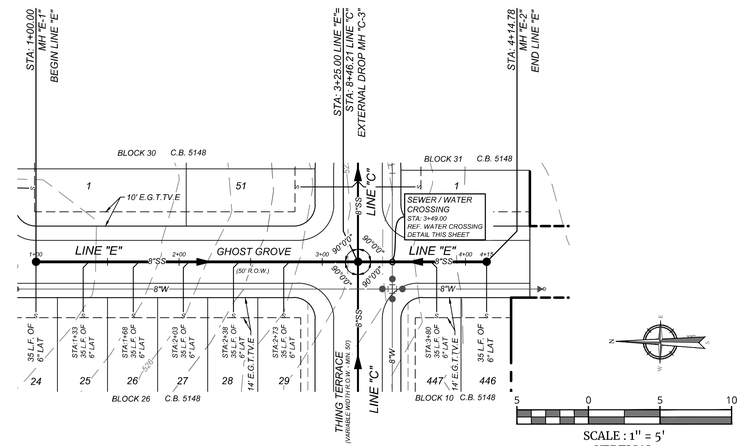
LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.			
DEVELOPER'S ADDRESS: 100 NE LOOP 410, SUITE 1155			
CITY: SAN ANTONIO	STATE: TEXAS	ZIP: 78216	
PHONE#:	FAX#:	TOTAL ACREAGE: 32.14 ACRES	
SAWS BLOCK MAP#: 210546,212546,212544,212542,212540		TOTAL EDU'S: 234	
TOTAL LINEAR FOOTAGE OF PIPE:	1,133 LF ~ 12" SDR 26 5,662 LF ~ 8" SDR 26	PLAT NO.: 25-11800192	
NUMBER OF LOTS: 234	SAWS JOB#: 25-1558		

LEGEND

RIGHT OF WAY	=	R.O.W.
COUNTY BLOCK	=	C.B.
EXISTING SANITARY SEWER	=	ESS
PROPOSED SANITARY SEWER	=	SS
EXISTING WATER	=	EW
PROPOSED WATER	=	W
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	E.G.T.TV.E
LINEAR FEET	=	LF
LATERAL	=	LAT
VERTICAL STACK	=	VS
VEHICULAR NON ACCESS EASEMENT	=	V.N.A.E.



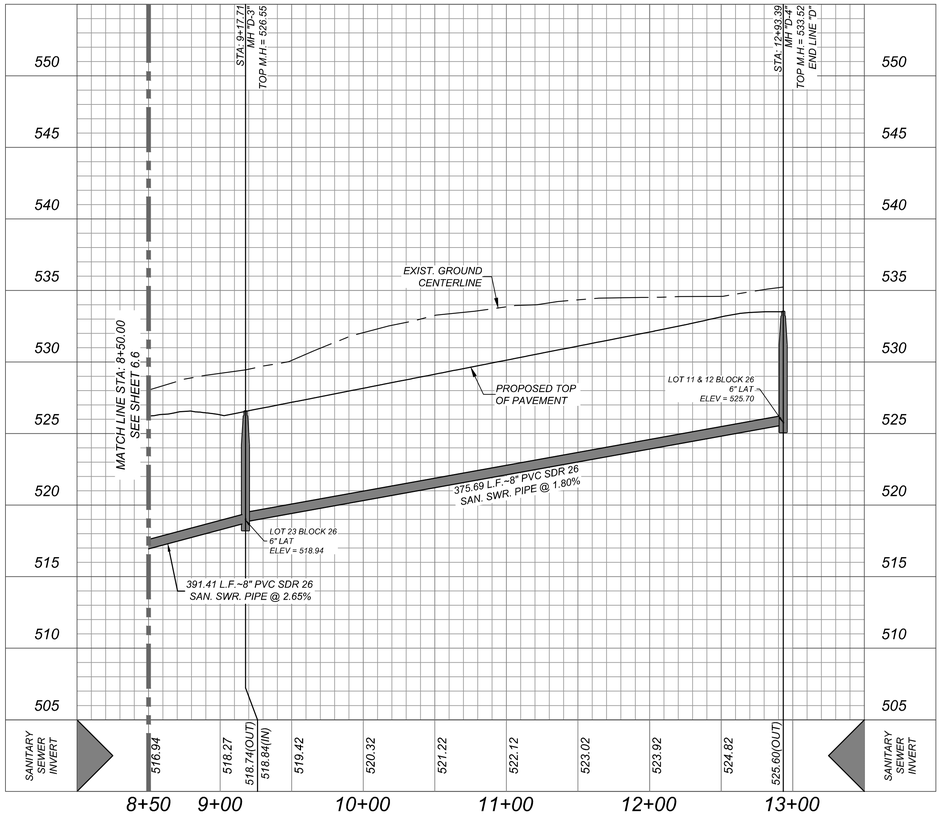


SCALE : 1" = 5'
VERTICAL

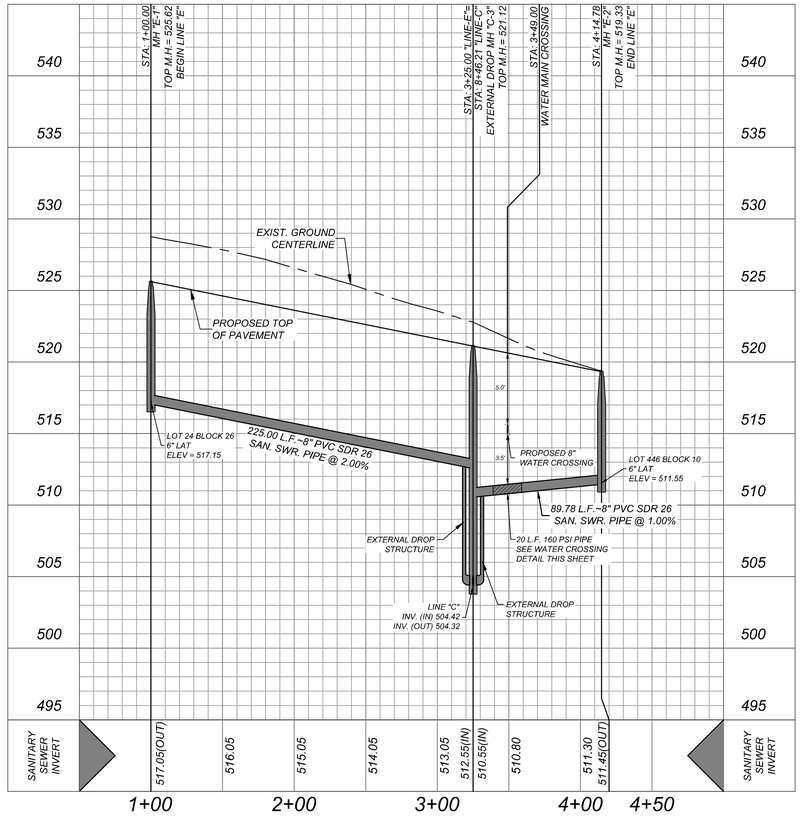
SCALE : 1" = 50'
HORIZONTAL

LINE "D"
STA: 8+50.00 - END

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



LINE "E"
STA: 1+00.00 - END



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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

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TBPE Firm#: F-14909
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: SSPP3146503

SHEET TITLE: LINE 'D' & 'E' PLAN AND PROFILES

SHEET NUMBER: 6.7

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\KFW\ENGSSPP3146503.dwg[6.7 By: SOSEPHI

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NOTE:

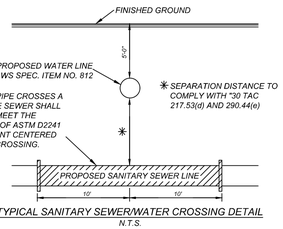
M.H. EXCEEDING 20 FT DEPTH WILL BE SUBJECTED TO GET REVISED WITH FUTURE DEVELOPMENT TO ENSURE SAWS DEPTH CRITERIA IS MET.

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2. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
3. *REF. THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.*
4. *ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.*

MANHOLE NOTE:

ALL MANHOLES MUST BE WATERTIGHT, WITH WATERTIGHT RINGS AND COVERS. THESE MANHOLES MUST BE VENTED PER SAWS DETAIL DD852-02.



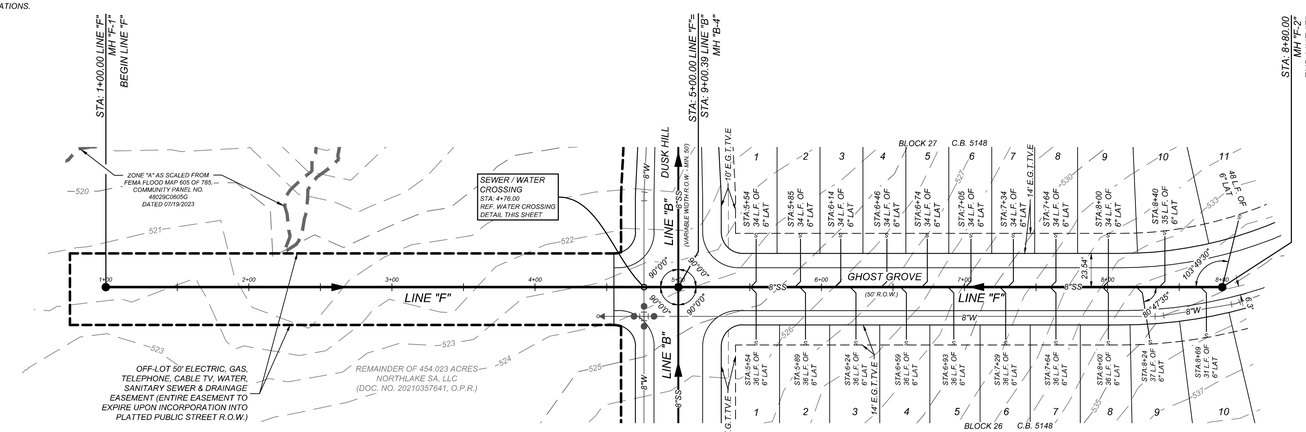
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.			
DEVELOPER'S ADDRESS: 100 NE LOOP 410, SUITE 1155			
CITY: SAN ANTONIO	STATE: TEXAS	ZIP: 78216	
PHONE#:	FAX#:	TOTAL ACREAGE: 32.14 ACRES	
SAWS BLOCK MAP#: 210546,212546,212544,212542,212540		TOTAL EDU'S: 234	
TOTAL LINEAR FOOTAGE OF PIPE:	1,133 LF ~ 12" SDR 26 5,662 LF ~ 8" SDR 26	PLAT NO.: 25-11800192	
NUMBER OF LOTS: 234	SAWS JOB#: 25-1558		

LEGEND

RIGHT OF WAY	=	R.O.W.
COUNTY BLOCK	=	C.B.
EXISTING SANITARY SEWER	=	ESS
PROPOSED SANITARY SEWER	=	SS
EXISTING WATER	=	EW
PROPOSED WATER	=	W
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	E.G.T.TV.E
LINEAR FEET	=	LF
LATERAL	=	LAT
VERTICAL STACK	=	VS
VEHICULAR NON ACCESS EASEMENT	=	V.N.A.E.

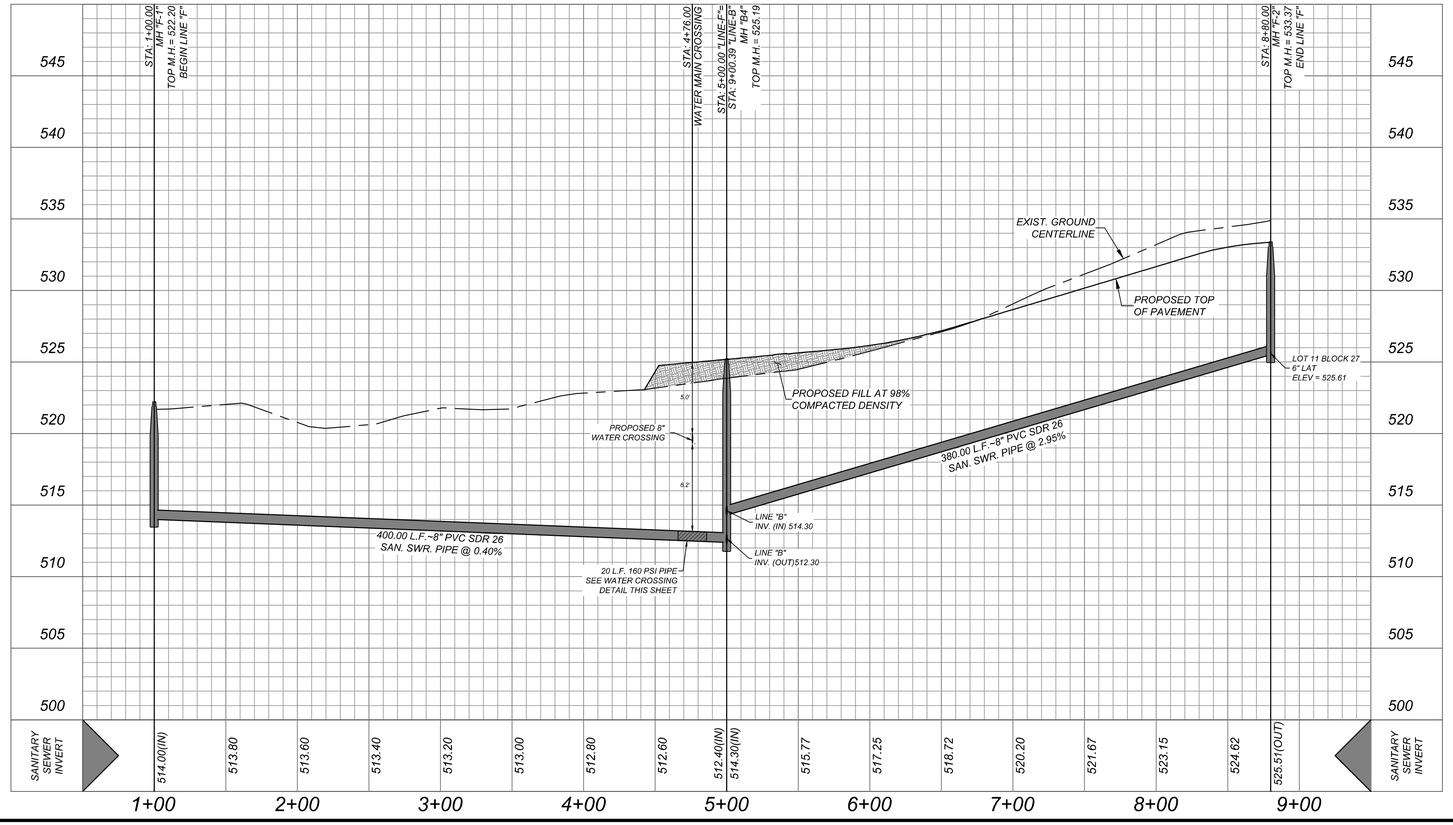




5 0 5 10
SCALE : 1" = 5'
VERTICAL

50 0 50 100
SCALE : 1" = 50'
HORIZONTAL

LINE "F"
STA: 1+00.00 - END



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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: SSPP3146503

SHEET TITLE: LINE 'F' PLAN AND PROFILES

SHEET NUMBER: 6.8

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

M:\RS\WER\SSPP3146503.dwg[6.8 By: SOSEPH

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

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NOTE:

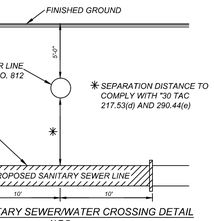
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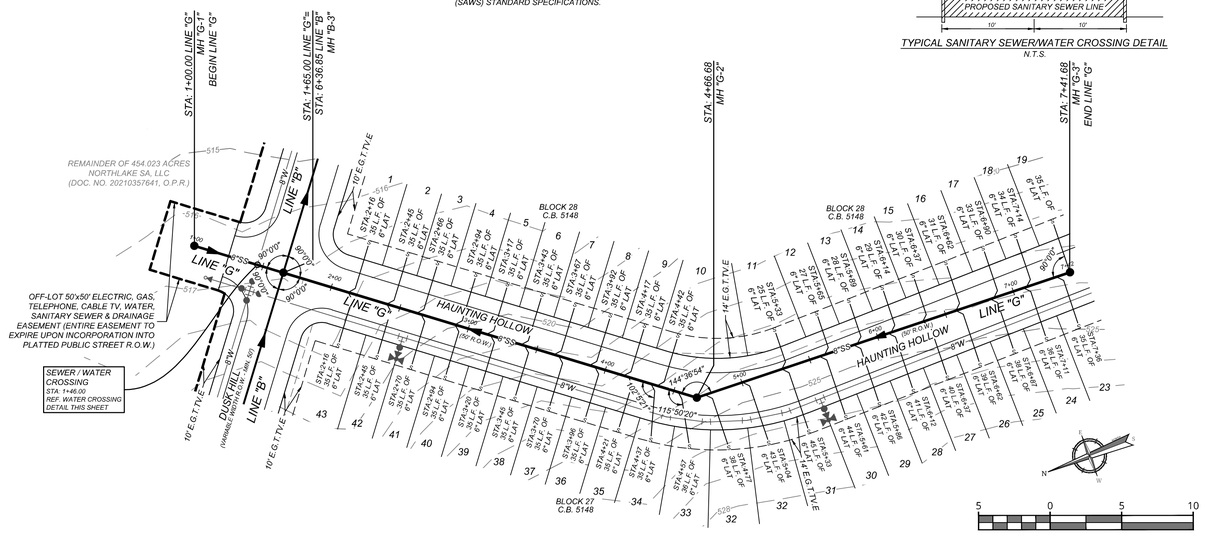
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME:	*LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.*		
DEVELOPER'S ADDRESS:	*100 NE LOOP 410, SUITE 1155*		
CITY: SAN ANTONIO	*STATE: TEXAS*	*ZIP: 78216*	
PHONE#:	*FAX#:*	*TOTAL ACREAGE:*	*32.14 ACRES*
SAWS BLOCK MAP#:	*210546,212546,212544,212542,212540*	*TOTAL EDU'S:*	*234*
TOTAL LINEAR FOOTAGE OF PIPE:	*1,133 LF ~ 12" SDR 26 5,662 LF ~ 8" SDR 26*	*PLAT NO.:*	*25-11800192*
NUMBER OF LOTS: 234	*SAWS JOB#: 25-1558*		

LEGEND

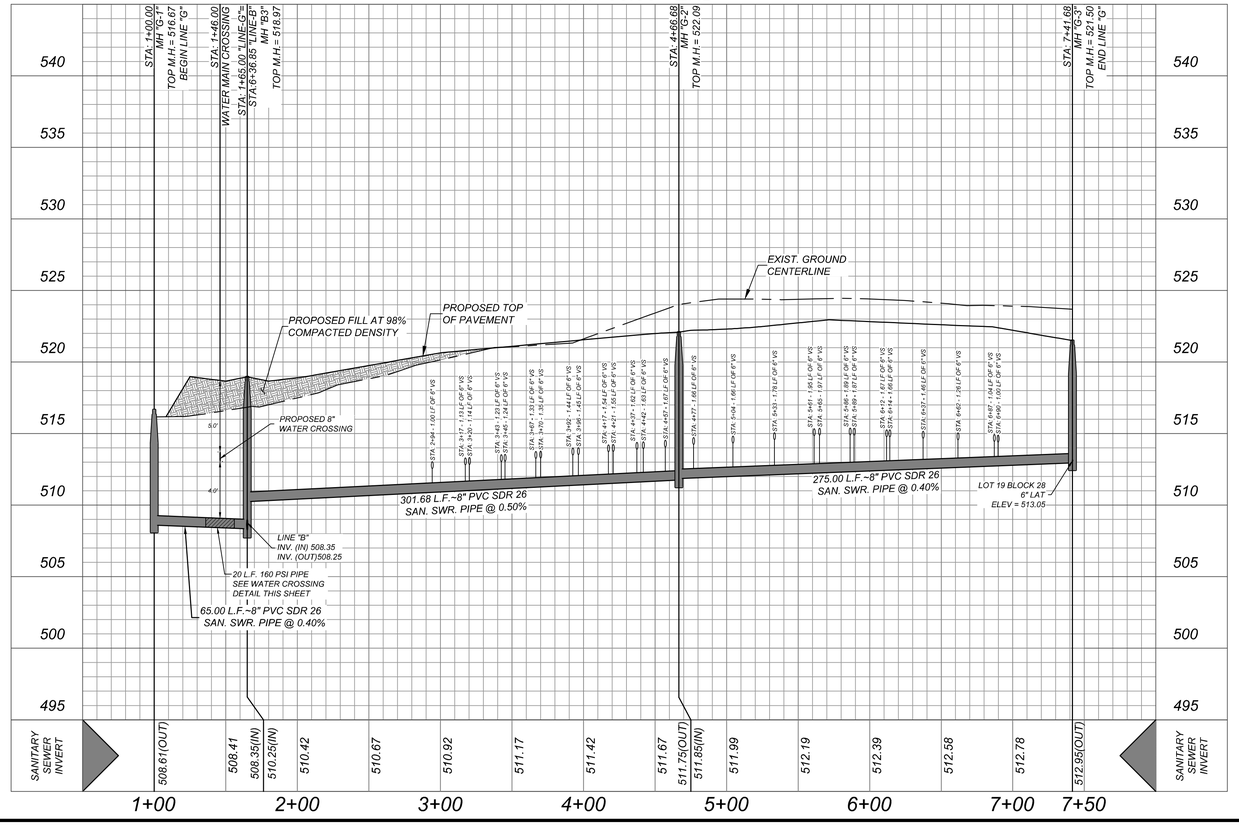
RIGHT OF WAY	=	*R.O.W.*
COUNTY BLOCK	=	*C.B.*
EXISTING SANITARY SEWER	=	*ESS*
PROPOSED SANITARY SEWER	=	*SS*
EXISTING WATER	=	*EW*
PROPOSED WATER	=	*W*
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	*E.G.T.TV.E*
LINEAR FEET	=	*LF*
LATERAL	=	*LAT*
VERTICAL STACK	=	*VS*
VEHICULAR NON ACCESS EASEMENT	=	*V.N.A.E.*



SCALE : 1" = 5'
VERTICAL

SCALE : 1" = 50'
HORIZONTAL

LINE "G"
STA: 1+00.00 - END



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REV	DATE	DRAWN BY	DESCRIPTION
	-	-	-

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OMAR A. ESPINOSA
125560
LICENSED
PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: SSPP3146503

SHEET TITLE: LINE 'G' PLAN AND PROFILES

SHEET NUMBER: 6.9

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\#SAWS\WES\SSPP3146503.dwg\6.9 By: SJOSEPH

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CAUTION!!:

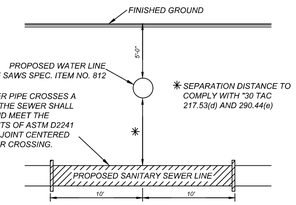
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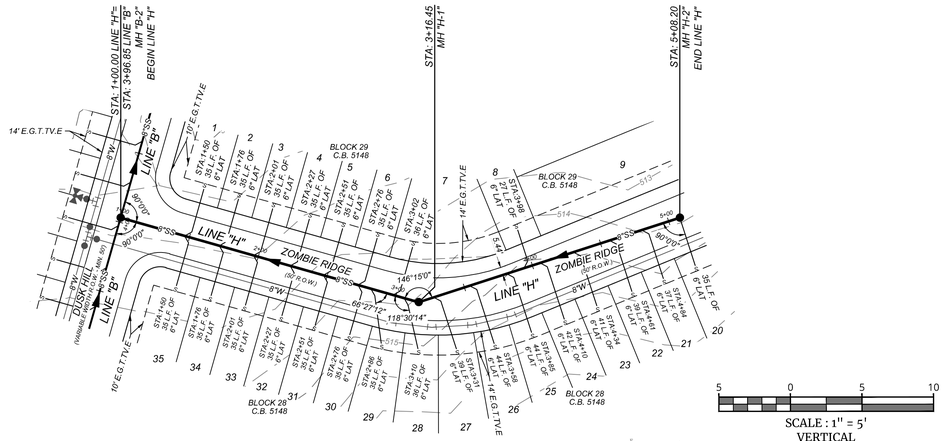
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

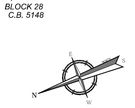
LOWER - EAST SEWERSHED - SALADO CREEK

DEVELOPER'S NAME:	*LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.*		
DEVELOPER'S ADDRESS:	*100 NE LOOP 410, SUITE 1155*		
CITY:	*SAN ANTONIO*	*STATE:* *TEXAS*	*ZIP:* *78216*
PHONE#:		*FAX#:*	*TOTAL ACREAGE:* *32.14 ACRES*
SAWS BLOCK MAP#:	*210546,212546,212544,212542,212540*		*TOTAL EDU'S:* *234*
TOTAL LINEAR FOOTAGE OF PIPE:	*1,133 LF ~ 12" SDR 26* *5,662 LF ~ 8" SDR 26*		*PLAT NO.:* *25-11800192*
NUMBER OF LOTS: *234*		*SAWS JOB#:* *25-1558*	

LEGEND

RIGHT OF WAY	=	*R.O.W.*
COUNTY BLOCK	=	*C.B.*
EXISTING SANITARY SEWER	=	*ESS*
PROPOSED SANITARY SEWER	=	*SS*
EXISTING WATER	=	*EW*
PROPOSED WATER	=	*W*
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	*E.G.T.TV.E*
LINEAR FEET	=	*LF*
LATERAL	=	*LAT*
VERTICAL STACK	=	*VS*
VEHICULAR NON ACCESS EASEMENT	=	*V.N.A.E.*

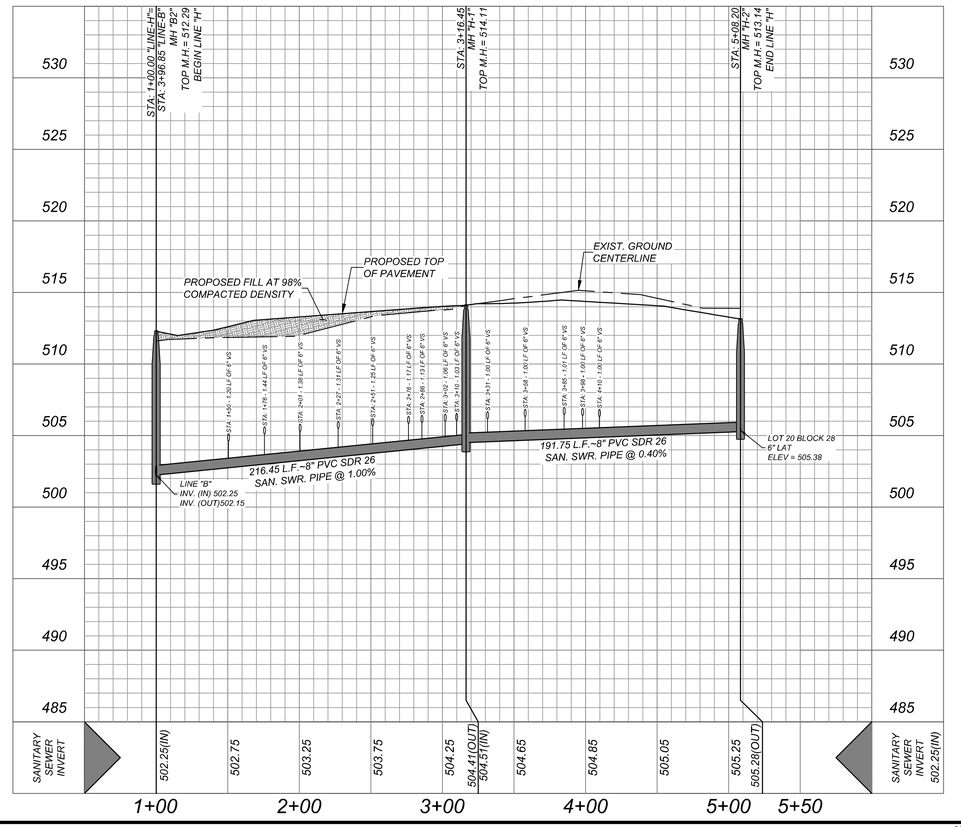




5 0 5 10
SCALE : 1" = 5'
VERTICAL

50 0 50 100
SCALE : 1" = 50'
HORIZONTAL

LINE "H"
STA: 1+00.00 - END



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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: SSPP3146503

SHEET TITLE:
LINE 'H' PLAN AND PROFILES

SHEET NUMBER:
6.10

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

By: SOSEPH
m:\ARCHIVES\SSPP3146503.dwg(6.10

NORTHLAKE PHASE 2A

BEXAR COUNTY, TEXAS

WATER IMPROVEMENTS

GENERAL NOTES

1. ALL VALVES SHALL REMAIN CLOSED UNTIL MAINS HAVE BEEN DISINFECTED, FLUSHED, AND RELEASED FOR PUBLIC USE BY THE ENGINEER.

2. EXISTING UTILITIES SHOWN ARE TAKEN FROM VARIOUS UTILITY COMPANY RECORDS. CONTRACTORS SHALL VERIFY THE EXACT LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO BEGINNING CONSTRUCTION. CONTRACTORS SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING UTILITIES AND DRAINAGE STRUCTURES DURING CONSTRUCTION.

3. ALL EXCAVATION SHALL BE UNCLASSIFIED REGARDLESS OF MATERIAL ENCOUNTERED.

4. BIDDERS ARE NOTIFIED TO MAKE SUBSURFACE INVESTIGATIONS AS THEY DEEM NECESSARY. NO ADDITIONAL PAYMENT WILL BE MADE FOR WATER, SAND, GRAVEL OR OTHER UNSTABLE CONDITIONS ENCOUNTERED IN EXCAVATIONS.

5. DETOUR OF TRAFFIC AROUND WORK ACTIVITIES, MAINTENANCE OF TRAFFIC CONTROL SIGNS, AND FLAGMEN ARE THE CONTRACTOR'S RESPONSIBILITY. NO SEPARATE PAYMENT WILL BE MADE.

6. THE CONTRACTOR SHALL PROTECT ALL OPEN EXCAVATIONS AND EQUIPMENT FROM CHILDREN, PEDESTRIANS, AND VEHICLES IN THE AREA.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION OF ALL FENCES IN THE WORK AREA TO THEIR ORIGINAL CONDITION PRIOR TO COMPLETION OF THE CONTRACT. THIS SHALL APPLY TO ALL FENCES IN THE WORK AREA WHETHER THEY ARE SHOWN ON THE PLANS OR NOT.

8. CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES, MARKS, ETC. ANY CONSTRUCTION STAKES, MARKS, ETC., DESTROYED OR REMOVED BY THE CONTRACTOR OR HIS EMPLOYEES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

9. THE CONTRACTOR SHALL CONFER WITH EACH INDIVIDUAL PROPERTY OWNER AS TO THE LOCATION OF EACH INDIVIDUAL METER BOX.

10. CONTRACTOR SHALL DISINFECT ALL NEW WATER MAINS BEFORE TYING INTO EXISTING WATER MAINS.

11. ALL VALVES SHALL BE PERMANENTLY MARKED BY THE USE OF A VALVE MARKER. NO SEPARATE PAY ITEM.

12. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

13. CONTRACTOR SHALL MAINTAIN FENCING FOR THE CONTAINMENT OF LIVESTOCK DURING CONSTRUCTION. ALL FENCES REMOVED FOR CONSTRUCTION SHALL BE REPLACED. ALL REQUIRED FENCING SHALL BE INCIDENTAL TO CONSTRUCTION AND NOT A SEPARATE PAY ITEM.

14. ALL DRIVEWAYS, INCLUDING DRAIN PIPES, CULVERTS AND HEADWALLS, DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR TO EQUAL OR BETTER THAN PRECONSTRUCTION CONDITION. ASPHALT DRIVES ARE NOT ALLOWED TO BE CUT WITHOUT OWNERS PERMISSION. INSTALLATION OF WATER MAINS CROSSING CONCRETE DRIVES WILL BE BORED. ALL DRAIN PIPE, CULVERT AND HEADWALL REPAIR SHALL BE INCIDENTAL TO CONSTRUCTION AND NOT A SEPARATE PAY ITEM. DRIVEWAY PAVEMENT REPAIR SHALL BE PAID FOR AS PER ITEM NO. 02950, "CUTTING AND PATCHING ASPHALT PAVEMENT, ASPHALT DRIVES, CONCRETE DRIVES, OR GRAVEL ROADS AND DRIVES". PAYMENT FOR BORES UNDER CONCRETE DRIVES DRIVES SHALL BE PAID FOR AS PER ITEM 02445 "BORING AND CASING PIPE UNDER HIGHWAYS, RAILROADS, OR OTHER AREAS".

15. LOCATIONS OF COMBINATION AIR VALVES WHERE SHOWN ON PLANS ARE APPROXIMATE. FINAL LOCATIONS TO BE ADJUSTED IN FIELD AT TIME OF CONSTRUCTION AT THE DIRECTION OF THE ENGINEER.

16. ALL WORK SHALL BE SCHEDULED TO TAKE PLACE ON MONDAY THROUGH FRIDAY, DURING NORMAL WORK HOURS. CONTRACTOR SHALL NOTIFY MWSC 48 HOURS PRIOR TO SERVICE SHUT OFF AFFECTING CUSTOMERS. SERVICE SHALL NOT BE SHUT OFF FOR MORE THAN EIGHT (8) HOURS AT A TIME.

17. THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO PROPERTY, INCLUDING, BUT NOT LIMITED TO, FENCES, PAVEMENT, DRIVEWAYS, LAWNS, CULVERTS, AND TREES, AT NO COST TO THE OWNER.

18. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL AT ALL CULVERT, STREAM AND DRAINAGE SWALES CROSSINGS. EROSION CONTROL MEASURES SHALL INCLUDE AS A MINIMUM SILT FENCES. SILT FENCES SHALL BE INSTALLED PRIOR TO DISTURBANCE OF THE WORK AREAS AND SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION OF THE DISTURBED AREAS UPSTREAM. EROSION CONTROL SHALL BE COORDINATED WITH THE ENGINEER.

19. THE CONTRACTOR SHALL REMOVE AND REPLACE ANY MAILBOXES, TRAFFIC OR ROAD SIGNS ENCOUNTERED. NO SEPARATE PAY ITEM.

20. CONTRACTOR SHALL SUBMIT TO ENGINEER PROPOSED CONSTRUCTION SEQUENCE PRIOR TO BEGINNING CONSTRUCTION.

21. ALL FITTINGS ARE TO BE DUCTILE IRON, MECHANICAL JOINT TYPE, UNLESS OTHERWISE NOTED ON PLANS.

22. ALL THRUST BLOCKS SHALL BE INSPECTED BY OWNER AND/OR ENGINEER PRIOR TO BACKFILLING.

23. ALL EXISTING VALVES SHOWN ON PLANS TO BE ABANDONED, SHALL HAVE BOXES REMOVED AND SHALL BE BACKFILLED ACCORDING TO SPECIFICATIONS. NO SEPARATE PAY ITEM.

24. CONTRACTOR SHALL CONTAIN ALL CONSTRUCTION AND STAGING WITHIN EXISTING UTILITY EASEMENTS, UNLESS OTHER ARRANGEMENTS ARE MADE WITH OWNER AND/OR TxDOT.

25. WHERE THE NEW WATER MAIN SHOWN ON THE PLANS REQUIRES CROSSING AN EXISTING WATER MAIN OR OTHER UTILITY, THE CONTRACTOR SHALL VERTICALLY DEFLECT THE PROPOSED WATER MAIN. DEFLECTION SHALL BE IN ACCORDANCE WITH THE PIPE MANUFACTURE'S RECOMMENDATIONS. FITTINGS ARE NOT PERMISSIBLE, UNLESS OTHERWISE SHOWN ON THE PLANS. NO SEPARATE PAY ITEM.

26. WATER MAINS SHALL BE INSTALLED WITH 48" MINIMUM COVER OVER THE TOP OF THE PIPE AND A MAXIMUM DEPTH OF BURY OF 60", UNLESS OTHERWISE NOTED ON THE PLANS OR DIRECTED BY THE ENGINEER.

27. CONTRACTOR TO PROVIDE POSITIVE DRAINAGE AWAY FROM ALL CONCRETE FOUNDATIONS, VAULT BOXES AND OVERFLOW BOXES THROUGHOUT THE PROJECT SITE.

28. BUY AMERICAN STANDARDS SHALL BE ADHERED TO CONCERNING ALL STEEL OR IRON BASED MATERIALS.

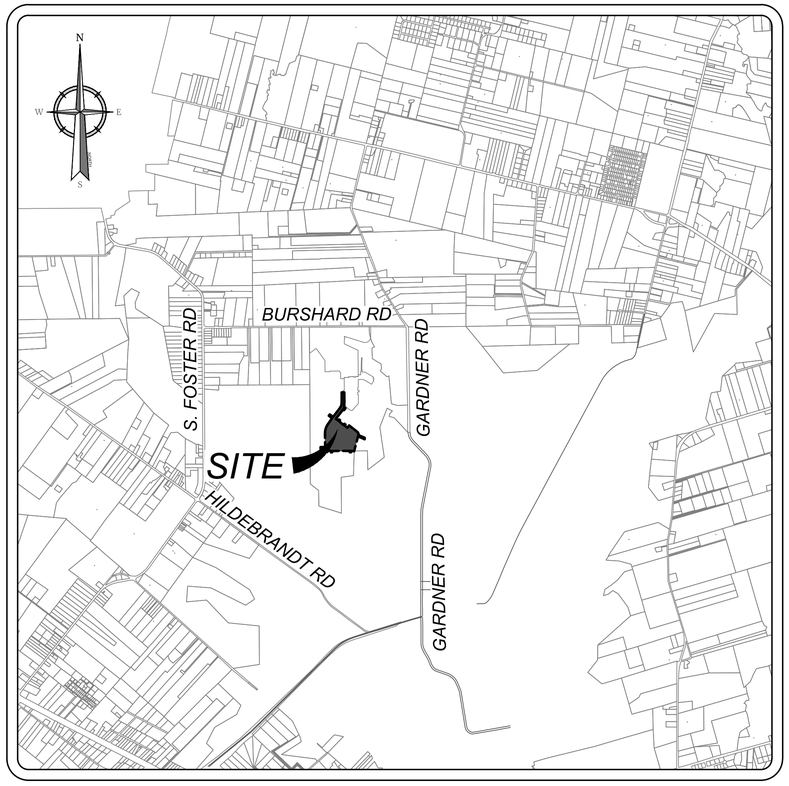
29. ALL GATE VALVES SHALL "OPEN RIGHT".

30. AN AIR RELEASE VALVE SHALL BE INSTALLED AT THE HIGHEST ELEVATION POINT(S) OF THE WATER DISTRIBUTION SYSTEM LOCATED WITHIN A DEVELOPMENT. THE EXACT LOCATION SHALL BE COORDINATED IN THE FIELD AND VERIFIED AGAINST THE FINAL GRADING PLAN. INSTALLATION SHALL BE IN ACCORDANCE WITH THE ECSUD STANDARDS AND THE MANUFACTURER'S RECOMMENDATIONS. PROVIDE A VALVE BOX OR APPROVED ENCLOSURE FOR ACCESS AND MAINTENANCE.

31. A MINIMUM OF ONE (1) WATER SAMPLE STATION SHALL BE INSTALLED WITHIN A DEVELOPMENT TO ALLOW FOR ROUTINE WATER QUALITY MONITORING. THE SAMPLE STATION SHALL BE LOCATED NEAR THE SUBDIVISION ENTRANCE OFF A WATER MAIN IN A PUBLICLY ACCESSIBLE AREA, OR AT A REPRESENTATIVE LOCATION APPROVED BY ECSUD. THE STATION SHALL BE INSTALLED PER ECSUD STANDARDS, MANUFACTURER'S SPECIFICATIONS AND IN COMPLIANCE WITH ALL APPLICABLE HEALTH AND SAFETY REGULATIONS. COORDINATE FINAL LOCATION WITH ECSUD PRIOR TO INSTALLATION. ALL COMPONENTS SHALL BE SUITABLE FOR POTABLE WATER USE, AND THE STATION SHALL BE PROTECTED FROM FREEZING, TAMPERING, AND OTHER ENVIRONMENTAL FACTORS.

32. WHEN INSTALLING A CUT-IN TEE TO TIE INTO AN EXISTING WATER MAIN, MECHANICAL BELL JOINT RESTRAINTS SHALL BE PROVIDED ON ALL ADJACENT EXISTING PIPE JOINTS TO PREVENT SEPARATION DUE TO THRUST FORCES. RESTRAINTS SHALL BE INSTALLED ON A MINIMUM OF ONE FULL LENGTH OF PIPE ON EACH SIDE OF THE NEW TEE, OR AS REQUIRED BY ECSUD STANDARDS. ALL RESTRAINT DEVICES SHALL BE COMPATIBLE WITH THE EXISTING PIPE MATERIAL AND PRESSURE CLASS, AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. COORDINATE WITH ECSUD FOR FINAL APPROVAL OF RESTRAINT TYPE AND EXTENT.

33. ALL CONNECTIONS TO EXISTING WATER MAINS SHALL BE PERFORMED USING THE HIGH TEST HYPOCHLORITE (HTH) METHOD IN ACCORDANCE WITH AWWA C651 DISINFECTION PROCEDURES. THE HTH METHOD SHALL INVOLVE THE APPLICATION OF A CHLORINE SOLUTION DIRECTLY TO ALL INTERIOR SURFACES OF THE NEW FITTINGS, PIPE, AND APPURTENANCES IMMEDIATELY PRIOR TO INSTALLATION. THIS INCLUDES SWABBING OR SPRAYING WITH A MINIMUM 1% CHLORINE SOLUTION. NO OTHER DISINFECTION METHOD WILL BE ACCEPTED FOR TIE-INS. ALL WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF ECSUD AND IN COMPLIANCE WITH THEIR STANDARDS. PROPER FLUSHING AND BACTERIOLOGICAL TESTING SHALL FOLLOW PRIOR TO PLACING THE MAIN INTO SERVICE.



LOCATION MAP

SCALE: NOT-TO-SCALE

OWNER/DEVELOPER:
LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TEXAS 78216
(210) 403-6200

SHEET INDEX

SHEET TITLE	SHEET NUMBER
WATER DISTRIBUTION COVER SHEET	7.0
OVERALL WATER PLAN (1 OF 3)	7.1
OVERALL WATER PLAN (2 OF 3)	7.2
OVERALL WATER PLAN (3 OF 3)	7.3
WATER DETAIL SHEET (1 OF 3)	7.4
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WATER DETAIL SHEET (3 OF 3)	7.6

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REV	DATE	DRAWN BY	DESCRIPTION

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LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#:F-14809
TBPLS Firm#: 10194550

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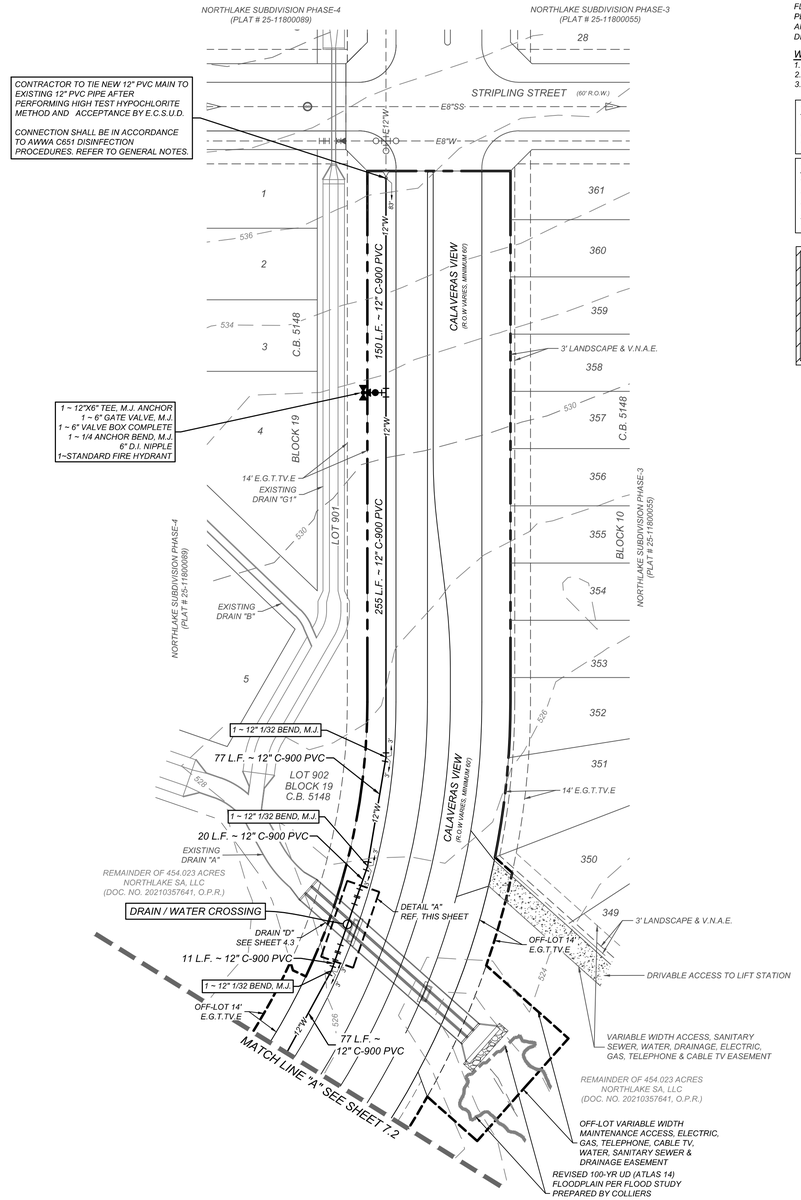
PROJECT NUMBER: 314-65-03
DRAWING NAME: CVOW3146503

SHEET TITLE: WATER DISTRIBUTION COVER SHEET

SHEET NUMBER: 7.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\WATER\CVOW3146503.dwg(7.0 By:ABEL.MONTALVO



TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

COMPACTION NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE ECSUD & SAWS INSPECTOR/TEST ADMINISTRATOR, PER EACH 12 INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. PERMITS AND/OR WILL NOT BE ACCEPTED AND FINALIZED BY ECSUD & SARA WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

JOINT RESTRAINT NOTE:

CONTRACTOR SHALL INSTALL RETAINER GLANDS AT ALL FITTINGS AND PROVIDE JOINT RESTRAINING HARNESS OR FIELD LOCK GASKETS AT ALL JOINTS WITHIN THE LENGTH SHOWN. CONTRACTOR SHALL INSURE THAT ALL TEES, BENDS, VALVES, ETC. HAVE A MINIMUM OF 5 FT OF PIPE WITH NO JOINTS ON EACH SIDE OF THE FITTING. JOINT RESTRAINTS AND RETAINER GLANDS SHALL BE CALCULATED BY ECSUD APPROVED PROGRAMS. THERE WILL BE NO SEPARATE PAY ITEM FOR RETAINER GLANDS AND OTHER JOINT RESTRAINING HARNESS AND GASKETS, BUT SHALL BE SUBSIDIARY TO THE UNIT COST PER LINEAL FOOT OF PIPE INSTALLED.

FIRE FLOW NOTE:

IN AN EFFORT TO MEET THE CITY OF SAN ANTONIO'S FIRE FLOW REQUIREMENTS FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, THE PUBLIC WATER MAIN SYSTEM HAS BEEN DESIGNED FOR A MINIMUM FIRE FLOW DEMAND OF 1,500 GPM AT 25 PSI RESIDUAL PRESSURE. THE FIRE FLOW REQUIREMENTS FOR INDIVIDUAL STRUCTURES WILL BE REVIEWED DURING THE BUILDING PERMIT PROCESS IN ACCORDANCE WITH THE PROCEDURES SET FORTH BY THE CITY OF SAN ANTONIO DIRECTOR OF DEVELOPMENT SERVICES DEPARTMENT AND THE SAN ANTONIO FIRE DEPARTMENT FIRE MARSHAL.

WATER PLAN NOTES:

1. *ALL VALVES SHALL READ "OPEN RIGHT"*
2. *ALL PVC PIPE SHALL BE C-900 CLASS 150.*
3. *LONG WATER SERVICES REQUIRE 2" PVC CASING*

NOTE:
PRESSURE REDUCING VALVES TO BE THE RESPONSIBILITY OF THE HOME BUILDER WHERE REQUIRED

NOTE:
CONTRACTOR SHALL COORDINATE WITH EAST CENTRAL SPECIAL UTILITY DISTRICT TO VERIFY THE LOCATION OF ISOLATION VALVES. OPERATION OF ISOLATION VALVES SHALL ONLY BE MADE WITH THE APPROVAL AND PRESENCE OF EAST CENTRAL WATER DISTRICT PERSONNEL

CAUTION!!:
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

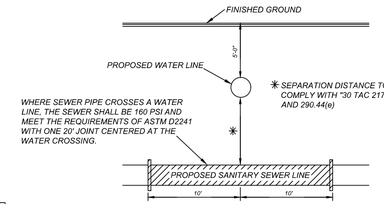
LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED 1" WATER SERVICE WITH 5/8" METER & BOX	=	W
PROPOSED WATER 1" IRRIGATION SERVICE WITH 1" METER & BOX	=	IRR
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	*E.G.T.TV.E*
PROPOSED VEHICULAR NON-ACCESS EASEMENT	=	*V.N.A.E*
PROPOSED CLEAR VISION EASEMENT	=	*C.V.E*
EXISTING WATER MAIN	=	EW
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	ESS
EXISTING SANITARY SEWER MANHOLE	=	
RESTRAINED LENGTH (TOTAL)	=	⊗



LOCATION MAP

SCALE: NOT-TO-SCALE

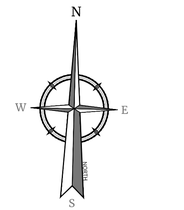


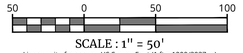
WHERE SEWER PIPE CROSSES A WATER LINE, THE SEWER SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT THE WATER CROSSING.

✳ *SEPARATION DISTANCE TO COMPLY WITH "30 TAC 217.53(d) AND 290.44(e)*

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

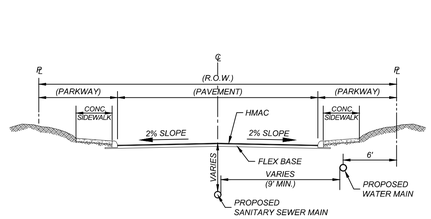
N.T.S.





SCALE : 1'' = 50'

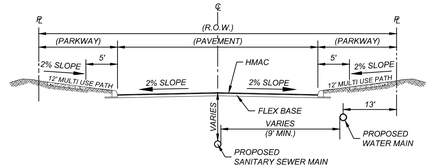
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)



TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
60' R.O.W.	34'	13'	4'

TYPICAL STREET SECTION

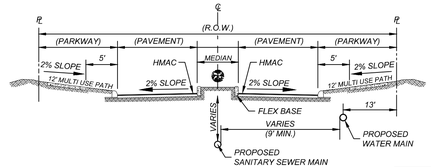
N.T.S.



TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
80' R.O.W.	34'	23'	12'

COLLECTOR TYPE "C" STREET SECTION

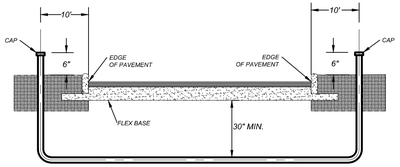
N.T.S.



TYPE	PAVEMENT WIDTH	MEDIAN WIDTH	PARKWAY WIDTH
100' R.O.W.	34' MAX, 22' MIN	16' MAX, 4' MIN	20'

COLLECTOR TYPE "C" STREET SECTION

N.T.S.



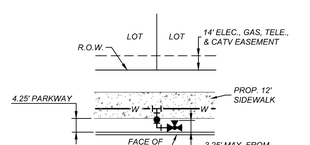
TYPICAL CONDUIT DETAIL

N.T.S.

NOTE:
CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH CPS FACILITY AT ALL STREETS AND DRAIN CROSSING 9' BUILT AHEAD OF CPS CONSTRUCTION. SLEEVES MUST ALSO BE LOCATED FOR CPS CREWS DURING CONSTRUCTION. (SEPARATE ITEM) SEE THIS SHEET FOR CONDUIT CROSSING DETAIL AND SCHEDULE.

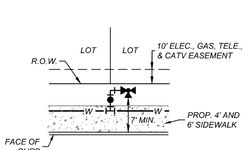
CONDUIT NOTES:

1. *CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).*
2. *CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 36 INCHES BELOW PROPOSED FINISHED GRADE. SCHEDULE 80 TO BE USED FOR CPS CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.*
3. *ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.*
4. *ALL CONDUIT SLEEVES TO BE USED FOR ELECTRIC, GAS, OR TELECOMMUNICATION UTILITY CROSSINGS SHALL BE INSTALLED TO MEET OR EXCEED DESIGN REQUIREMENTS FOR THE UTILITY AGENCY WHICH THEY ARE SERVING, INCLUDING BUT NOT LIMITED TO THE DEPTH, TRENCH PLACEMENT, AND PROXIMITY TO OTHER UTILITIES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING AND INSTALLING THE CONDUIT SLEEVES TO MEET THESE SPECIFICATIONS INCLUDING COORDINATING WITH THE UTILITY AGENCY FOR ANY REQUIRED INSPECTIONS*



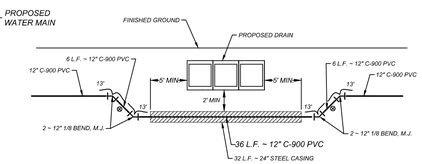
TYPICAL FIRE HYDRANT DETAIL (CALAVERAS VIEW)

N.T.S.



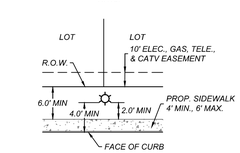
TYPICAL FIRE HYDRANT DETAIL

N.T.S.



DETAIL "A" VERTICAL OFFSET

N.T.S.



TYPICAL STREETLIGHT DETAIL

N.T.S

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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025		OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: OW3146503-PH2A

SHEET TITLE:
OVERALL WATER PLAN (1 OF 3)

SHEET NUMBER: 7.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\#WATER\OW3146503-PH2A.dwg(7.1 By: ABEL.MONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

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COMPACTION NOTE:

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WATER PLAN NOTES:

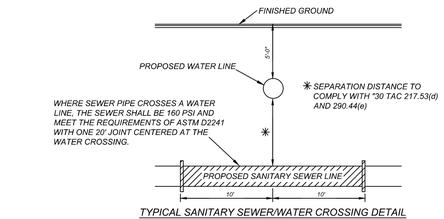
1. *ALL VALVES SHALL READ "OPEN RIGHT"*
2. *ALL PVC PIPE SHALL BE C-900 CLASS 150.*
3. *LONG WATER SERVICES REQUIRE 2" PVC CASING*

NOTE:
PRESSURE REDUCING VALVES TO BE THE RESPONSIBILITY OF THE HOME BUILDER WHERE REQUIRED

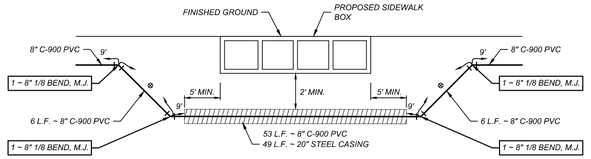
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REFER SHEET 7.0 FOR STREET SECTION



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.



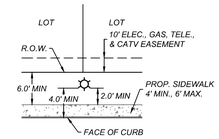
DETAIL "B"
VERTICAL OFFSET
N.T.S.

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED 1" WATER SERVICE WITH 5/8" METER & BOX	=	W
PROPOSED WATER 1" IRRIGATION SERVICE WITH 1" METER & BOX	=	IRR
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	E.G.T.TV.E
PROPOSED VEHICULAR NON-ACCESS EASEMENT	=	V.N.A.E
PROPOSED CLEAR VISION EASEMENT	=	C.V.E
EXISTING WATER MAIN	=	EW
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	ESS
EXISTING SANITARY SEWER MANHOLE	=	
RESTRAINED LENGTH (TOTAL)	=	



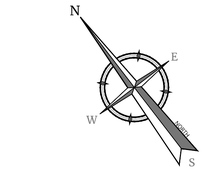
LOCATION MAP
SCALE: NOT-TO-SCALE

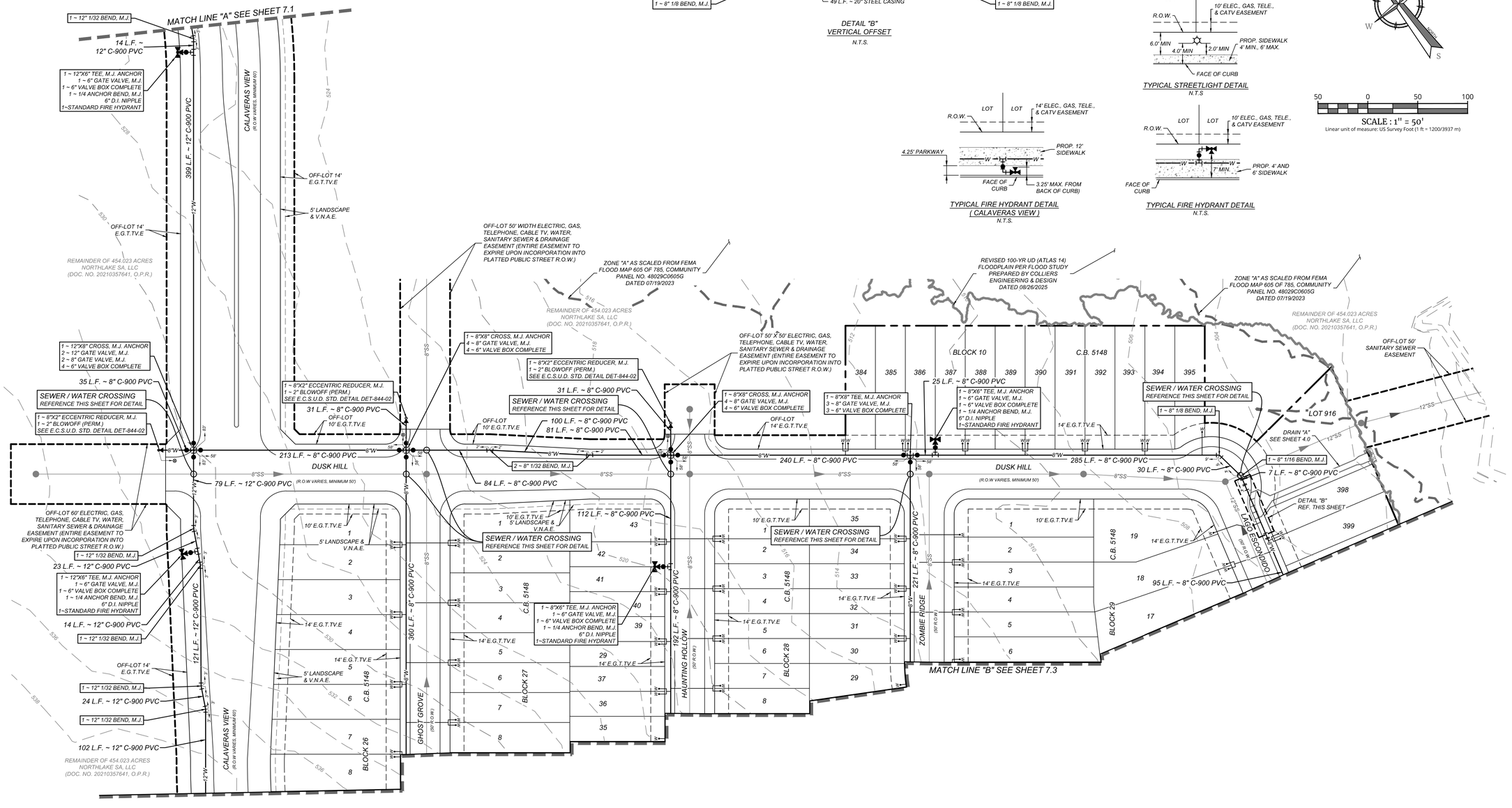


TYPICAL STREETLIGHT DETAIL
N.T.S

TYPICAL FIRE HYDRANT DETAIL
(CALAVERAS VIEW)
N.T.S.

TYPICAL FIRE HYDRANT DETAIL
N.T.S.





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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: OW3146503-PH2A

SHEET TITLE:
OVERALL WATER PLAN (2 OF 3)

SHEET NUMBER:
7.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

M:\WATER\OW3146503-PH2A.dwg7.2 By: ABEL.MONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

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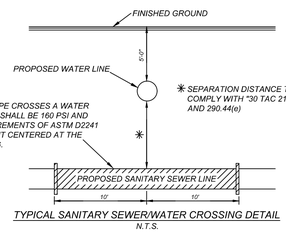
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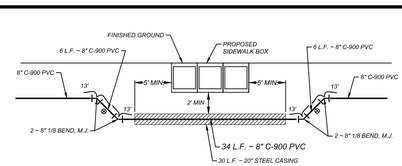
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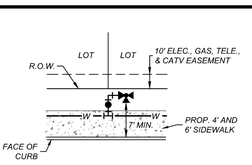


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

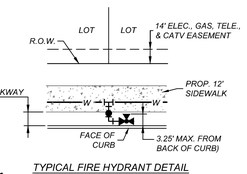
REFER SHEET 7.0 FOR STREET SECTION



DETAIL "C"
VERTICAL OFFSET
N.T.S.



TYPICAL FIRE HYDRANT DETAIL
N.T.S.



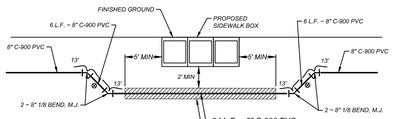
TYPICAL FIRE HYDRANT DETAIL
(CALAVERAS VIEW)
N.T.S.

LEGEND

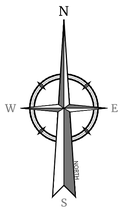
PROPOSED WATER MAIN	=	W
PROPOSED 1" WATER SERVICE WITH 5/8" METER & BOX	=	W
PROPOSED WATER 1" IRRIGATION SERVICE WITH 1" METER & BOX	=	W
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	=	E.G.T.TV.E
PROPOSED VEHICULAR NON-ACCESS EASEMENT	=	V.N.A.E
PROPOSED CLEAR VISION EASEMENT	=	C.V.E
EXISTING WATER MAIN	=	EW
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	ESS
EXISTING SANITARY SEWER MANHOLE	=	
RESTRAINED LENGTH (TOTAL)	=	⊗



LOCATION MAP
SCALE: NOT-TO-SCALE



DETAIL "D"
VERTICAL OFFSET
N.T.S.



50 0 50 100
SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

MATCH LINE "B" SEE SHEET 7.2

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REV	DATE	DESCRIPTION	DRAWN BY

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

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San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#:F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER:	DRAWING NAME:
314-65-03	OW3146503-PH2A

SHEET TITLE:
OVERALL WATER PLAN (3 OF 3)

SHEET NUMBER:
7.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\PROJECTS\314-65-03-PH2A\Dwg\7.3 By: ABEL MONTALVO

TESTING OF PRESSURE PIPELINES

1.0 DESCRIPTION

This item shall govern the furnishing of all labor, materials, tools, equipment and related items required to perform hydrostatic testing of Ductile Iron and Polyvinyl Chloride (PVC) pressure pipelines for integrity and leakage.

2.0 MATERIALS

Not applicable.

3.0 CONSTRUCTION METHODS

A. For Ductile Iron Pipe, make hydrostatic pressure and leakage tests on entire pipeline in accordance with AWWA Standard C600-99, Section 5.2.

B. For PVC Pipe, make hydrostatic pressure and leakage tests on entire pipeline in accordance with AWWA Standard C605-94, Section 7.3.

C. Furnish all labor equipment, including test pump with regulated by-pass meters and gauges required for conducting pipeline tests. Furnish equipment and necessary piping as required to transport water used in testing from source to test location.

D. Schedule time and sequence of testing, subject to observation and approval by the Owner or Owner's Representative. Provide adequate labor, tools and equipment to operate valves and to locate and repair leaks discovered during the initial filling of the pipeline prior to actual testing or during the course of the tests.

E. After the pipe has been laid and backfilled and the backfill has been jetted or otherwise consolidated, subject all newly laid pipe or valved section thereof to the hydrostatic pressure specified below for the particular type of pipe. The duration of each pressure test shall be at least four hours, unless otherwise specified or noted on the plans. Disconnect all meters, fixtures, devices or appliances which are connected to the pipeline system and which might be damaged if subjected to the specified test pressure. Cap or plug the ends of the branch lines during the testing procedures.

F. Fill each valved (capped or plugged) section of pipe slowly with water and expel all air. If permanent air vents are not located at all high points, install corporation or blow-of cocks at such points so that the air can be expelled as filling takes place. After verification that all air has been expelled, close the cocks and keep the pipe filled until tested. Examine uncovered pipe, fittings, valves, hydrants and joints while under test pressure. Visible leaks shall be stopped. Remove and replace cracked or defective pipe, fittings, valves or hydrants discovered during testing. Replacement shall be with sound material. Repeat the test until specified requirements are achieved.

G. Where any section of a pipeline is proved with concrete thrust blocking, do not make hydrostatic pressure test until at least five days have elapsed after installation of the blocking.

H. Pressure/Leakage Tests

1. The duration of the hydrostatic test shall be a minimum of four (4) hours.
2. The pipeline shall be tested so that the pressure at the highest point in the test section is not less than 200 psi.
3. The maximum allowable leakage is the number of gallons per hour as determined by the following formulas.

a. For Ductile Iron Pipe:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

Where:
L = allowable leakage, in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of the pipe, in inches
P = 200, in psig

b. For PVC Pipe:

$$L = \frac{ND\sqrt{P}}{7{,}400}$$

Where:
L = allowable leakage, in gallons per hour
N= number of joints in the length of pipeline tested
D= nominal diameter of the pipe, in inches
P = 200, in psig

H. Final Acceptance

1. No pipe installation will be accepted until known leaks have been repaired, whether or not leakage is within allowable limits. Locate and repair leaks at no additional cost to the Owner.
2. The Contractor will certify that all required pressure and leakage tests have been successfully completed before the pipeline is accepted.

I. Special Project Requirements

Water Source. Obtaining water for testing purposes shall be the responsibility of the Contractor. The Contractor shall provide all equipment and labor required to transport water from the source to the test point.

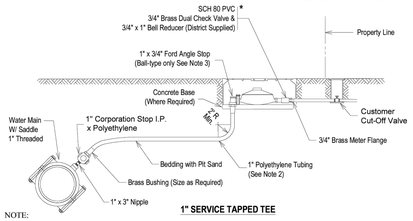
4.0 MEASUREMENT AND PAYMENT

No direct measurement or payment will be made for the work to be done or the equipment to be furnished under this item, but shall be considered subsidiary to the particular items of work for which unit prices are required in the proposal.

East Central	TESTING FOR PRESSURE PIPELINES	APPROVED	REVISED
		JULY 2022	
		DET-100-Ø1	SHEET 1 OF 1

PIPE TAPPING SCHEDULE	
PIPE DIAMETER	SERVICE SIZE
	1"
6" A.C.	Tap With Service Saddle
6" C.I. or D.I.	Tap With Service Saddle
8" A.C.	Tap With Service Saddle
8" C.I. or D.I.	Tap With Service Saddle
8" PVC	Tap With Service Saddle
10" A.C.	Tap With Service Saddle
10" C.I. or D.I.	Tap With Service Saddle
10" PVC	Tap With Service Saddle
12" A.C.	Tap With Service Saddle
12" C.I. or D.I.	Tap With Service Saddle
12" PVC	Tap With Service Saddle
16" A.C.	Tap With Service Saddle
16" C.I. or D.I.	Tap With Service Saddle

* Tailpieces Supplied by ECSUD w/ Cost of Meter

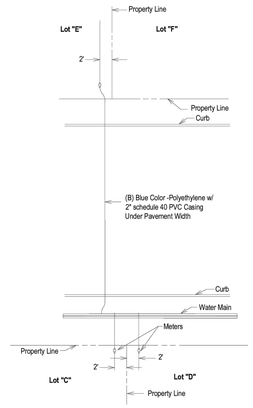


1" SERVICE TAPPED TEE

NOTE:
1. No Direct Tap to Main, Saddle Required
2. Polyethylene Shall be 250 psi Rated - Color Blue
3. FORD Angle Stop BA43-342-WNL
4. Meter Box Shall be DFW 36C
5. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT Tee (T441-774NL)

FOR PERFERED MANUFACTURERS SEE STANDARD SPECIFICATIONS

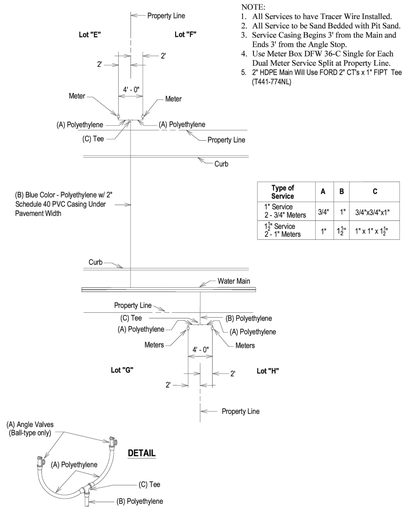
East Central	1" SERVICE INSTALLATION TAPPING SCHEDULE	APPROVED	REVISED
		FEBRUARY 2025	
		DET-824-Ø1	SHEET 1 OF 1



NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Begins 3' from the Main and Ends 3' from the Angle Stop.
4. Use Meter Box DFW 36-C for Single Services
5. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT Tee (T441-774NL)

SINGLE SERVICE LINE - SINGLE METER

East Central	TYPICAL SERVICE ARRANGEMENT	APPROVED	REVISED
		FEBRUARY 2025	
		DET-824-Ø5	SHEET 1 OF 4

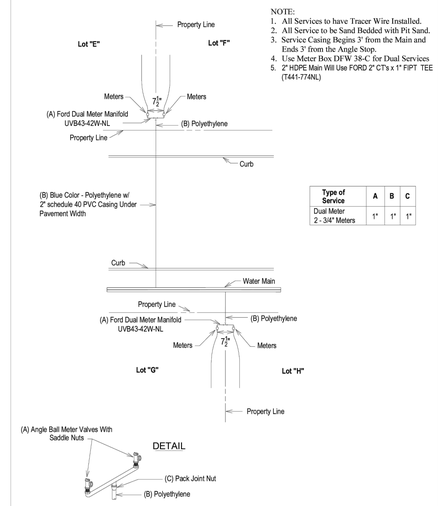


Type of Service	A	B	C
1" Service 2 - 3/4" Meters	3/4"	1"	3/4"x3/4"x1"
1 1/2" Service 2 - 1" Meters	1"	1 1/2"	1" x 1" x 1 1/2"

NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Begins 3' from the Main and Ends 3' from the Angle Stop.
4. Use Meter Box DFW 36-C Single for Each Dual Meter Service Split at Property Line.
5. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT Tee (T441-774NL)

SINGLE SERVICE LINE - DUAL METER

East Central	TYPICAL RURAL SERVICE ARRANGEMENT	APPROVED	REVISED
		FEBRUARY 2025	
		DET-824-Ø5	SHEET 2 OF 4

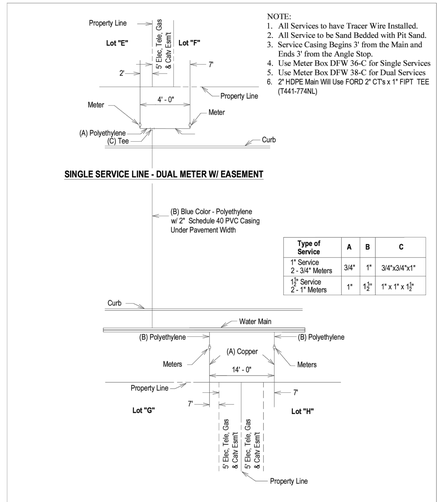


Type of Service	A	B	C
Dual Meter 2 - 3/4" Meters	1"	1"	1"

NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Begins 3' from the Main and Ends 3' from the Angle Stop.
4. Use Meter Box DFW 38-C for Dual Services
5. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT TEE (T441-774NL)

SINGLE SERVICE LINE - DUAL METER

East Central	TYPICAL HIGH DENSITY RESIDENTIAL SERVICE ARRANGEMENT	APPROVED	REVISED
		FEBRUARY 2025	
		DET-824-Ø5	SHEET 3 OF 4



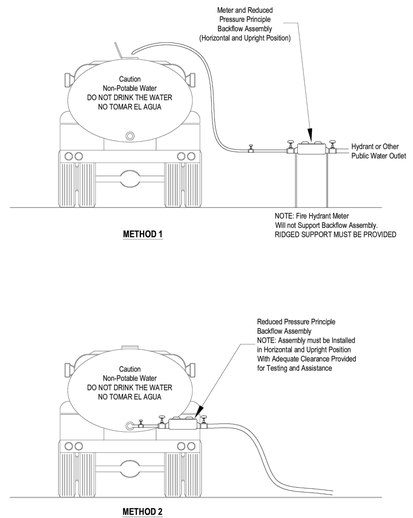
NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Begins 3' from the Main and Ends 3' from the Angle Stop.
4. Use Meter Box DFW 36-C for Single Services
5. Use Meter Box DFW 38-C for Dual Services
6. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT TEE (T441-774NL)

SINGLE SERVICE LINE - DUAL METER W/ EASEMENT

Type of Service	A	B	C
1" Service 2 - 3/4" Meters	3/4"	1"	3/4"x3/4"x1"
1 1/2" Service 2 - 1" Meters	1"	1 1/2"	1" x 1" x 1 1/2"

SINGLE SERVICE LINE W/ EASEMENT

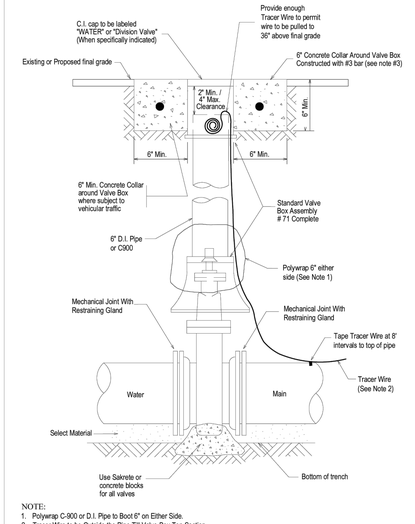
East Central	TYPICAL SERVICE ARRANGEMENT	APPROVED	REVISED
		FEBRUARY 2025	
		DET-824-Ø5	SHEET 4 OF 4



METHOD 1

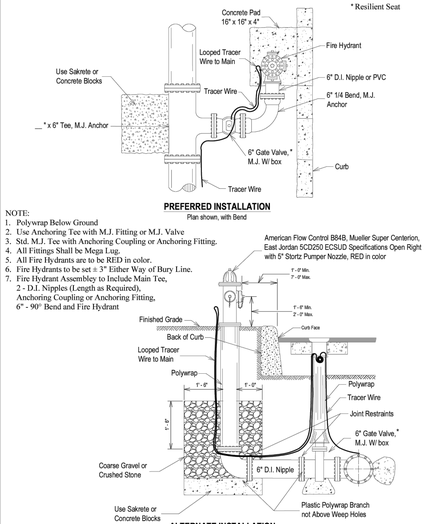
METHOD 2

East Central	BACKFLOW PREVENTION PREVENTION FOR WATER HAULING EQUIPMENT AND/OR MIXING TANKS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-826-Ø1	SHEET 1 OF 1



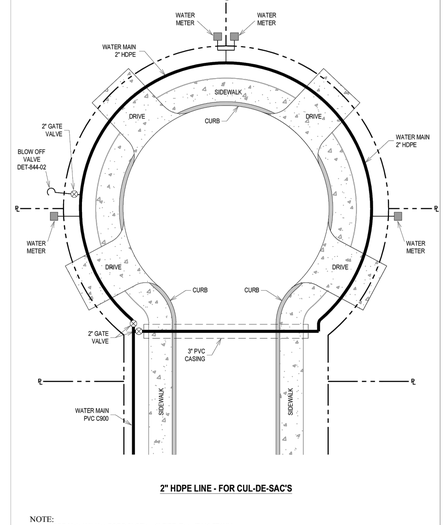
NOTE:
1. Polywrap C-900 or D.I. Pipe to Boot 6" on Either Side.
2. Tracer Wire to be Outside the Pipe Till Valve Box Top Section.
3. Min. 18" Concrete Form Tube Centered Around Valve Box for Concrete Collar W/ #3 Bar.

East Central	INSTALLATION OF NON-GEARED GATE VALVE WITH VALVE BOX AND EXTENSION	APPROVED	REVISED
		JULY 2022	
		DET-828-Ø1	SHEET 1 OF 1



NOTE:
1. Polywrap Below Ground
2. Use Anchoring Tee with M.J. Fitting or M.J. Valve
3. Std. M.J. Tee with Anchoring Coupling or Anchoring Fitting.
4. All Fittings Shall be Mega Lug.
5. All Fire Hydrants are to be RED in color.
6. Fire Hydrants to be set ± 3" Either Way of Bury Line.
7. Fire Hydrant Assembley to Include Main Tee, 2 - D.I. Nipples (Length as Required), Anchoring Coupling or Anchoring Fitting, 6" - 90° Bend and Fire Hydrant

East Central	FIRE HYDRANT INSTALLATION	APPROVED	REVISED
		FEBRUARY 2025	
		DET-834-Ø1	SHEET 1 OF 1



2" HDPE LINE - FOR CUL-DE-SAC'S

NOTE:
1. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT Tee (T441-774NL)
2. 2" HDPE Main Will Use FORD 2" CT's Tee w/ FIPT Branch (T771-777-AWTNL) for Blow-Off

East Central	TYPICAL CUL-DE-SAC LAYOUT WITH 2" HDPE WATER LINE	APPROVED	REVISED
		JUNE 2025	
		DET-835-Ø1	SHEET 1 OF 1

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Formerly Known as KFW

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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER: 314-65-03
DRAWING NAME: DTOW3146503

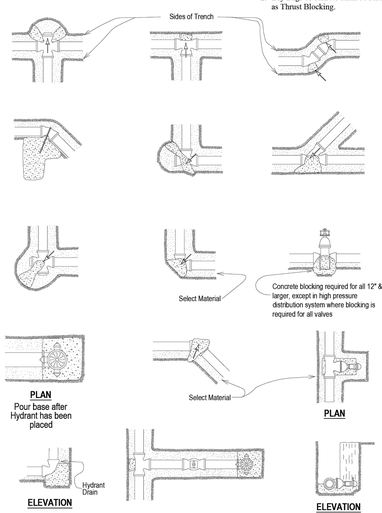
SHEET TITLE: WATER DETAIL SHEET (1 OF 3)

SHEET NUMBER: 7.4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

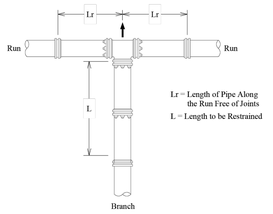
By:JEOGELIO.BERBONES
i:\WATER\DTOW3146503.dwg7.4

NOTE:
1. All Fittings Shall be Mega Lug
2. Dry Bags of Sakrete Shall be Placed as Thrust Blocking.



THRUST BLOCKS FOR FITTINGS (WATER ONLY)

APPROVED	REVISED
FEBRUARY 2025	
DET-839-Ø1	SHEET 1 OF 1



RESTRAINED LENGTH FOR TEES			
PIPE SIZE (Inch)	BRANCH SIZE (Inch)	LENGTH OF RUN (Feet)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
6	4	0	42
6	4	5	7
6	4	10	1
6	6	0	59
6	6	5	35
6	6	10	11
8	4	0	42
8	4	5	1
8	6	0	59
8	6	5	28
8	6	10	1
8	8	0	77
8	8	5	53
8	8	10	30
8	8	15	6

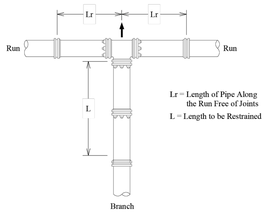
RESTRAINED LENGTH DESIGN

Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 Feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

RESTRAINED LENGTHS FOR TEES INSTALLED ON 6" TO 8" MAINS

APPROVED	REVISED
FEBRUARY 2025	
DET-839-02	SHEET 1 OF 4



RESTRAINED LENGTH FOR TEES			
PIPE SIZE (Inch)	BRANCH SIZE (Inch)	LENGTH OF RUN (Feet)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
12	4	0	42
12	4	5	1
12	6	0	59
12	6	5	13
12	6	10	1
12	8	0	77
12	8	5	42
12	8	10	7
12	8	15	1
12	12	0	109
12	12	5	86
12	12	10	63
12	12	15	39

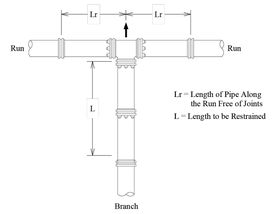
RESTRAINED LENGTH DESIGN

Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 Feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

RESTRAINED LENGTHS FOR TEES INSTALLED ON 12" MAINS

APPROVED	REVISED
FEBRUARY 2025	
DET-839-02	SHEET 2 OF 4



RESTRAINED LENGTH FOR TEES			
PIPE SIZE (Inch)	BRANCH SIZE (Inch)	LENGTH OF RUN (Feet)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
16	6	0	50
16	6	5	2
16	6	10	1
16	6	15	1
16	8	0	64
16	8	5	28
16	8	10	1
16	8	15	1
16	12	0	94
16	12	5	69
16	12	10	45
16	12	15	21
16	16	0	117
16	16	5	97
16	16	10	78
16	16	15	59

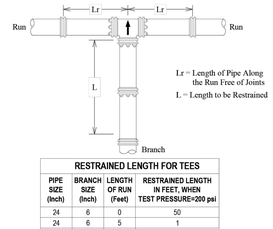
RESTRAINED LENGTH DESIGN

Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 Feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

RESTRAINED LENGTHS FOR TEES INSTALLED ON 16" MAINS

APPROVED	REVISED
FEBRUARY 2025	
DET-839-02	SHEET 3 OF 4



RESTRAINED LENGTH FOR TEES			
PIPE SIZE (Inch)	BRANCH SIZE (Inch)	LENGTH OF RUN (Feet)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
24	6	0	50
24	6	5	1
24	6	10	1
24	6	15	1
24	8	0	64
24	8	5	7
24	8	10	1
24	8	15	1
24	12	0	94
24	12	5	56
24	12	10	18
24	12	15	1
24	16	0	117
24	16	5	87
24	16	10	57
24	16	15	27
24	20	0	145
24	20	5	121
24	20	10	97
24	20	15	73
24	24	0	172
24	24	5	152
24	24	10	133
24	24	15	113

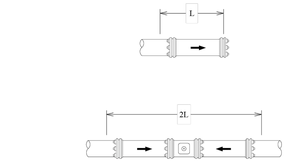
RESTRAINED LENGTH DESIGN

Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 Feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

RESTRAINED LENGTHS FOR TEES INSTALLED ON 24" MAINS

APPROVED	REVISED
FEBRUARY 2025	
DET-839-02	SHEET 4 OF 4



L = Length to be Restrained

PIPE SIZE (Inch)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
6	59
8	77
10	93
12	109
16	117
20	145
24	172

RESTRAINED LENGTH DESIGN

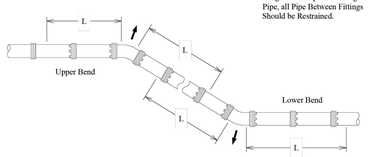
Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.

RESTRAINED LENGTHS FOR DEAD ENDS / INLINE VALVES ON 6" THRU 24" MAINS

APPROVED	REVISED
FEBRUARY 2025	
DET-839-03	SHEET 1 OF 1

L = Length to be Restrained on Both Sides of Fitting. When Restrained Lengths Overlap on the Diagonal Pipe, all Pipe Between Fittings Should be Restrained.



PIPE SIZE (Inch)	BEND ANGLE (deg.)	LOW SIDE DEPTH	UPPER BEND RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi	LOWER BEND RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
6	45	5	24	8
6	22.5	5	12	4
6	11.25	5	6	2
6	45	10	24	5
6	22.5	10	12	2
6	11.25	10	6	1
8	45	5	32	11
8	22.5	5	15	5
8	11.25	5	8	3
8	45	10	32	7
8	22.5	10	15	3
8	11.25	10	8	2
12	45	5	45	16
12	22.5	5	22	7
12	11.25	5	11	4
12	45	10	45	10
12	22.5	10	22	5
12	11.25	10	11	2

RESTRAINED LENGTH DESIGN

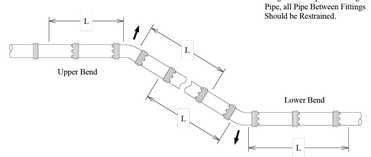
Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

RESTRAINED LENGTHS VERTICAL OFFSETS INSTALLED ON 6" THRU 12" MAINS

APPROVED	REVISED
FEBRUARY 2025	
DET-839-04	SHEET 1 OF 2

L = Length to be Restrained on Both Sides of Fitting. When Restrained Lengths Overlap on the Diagonal Pipe, all Pipe Between Fittings Should be Restrained.



PIPE SIZE (Inch)	BEND ANGLE (deg.)	LOW SIDE DEPTH	UPPER BEND RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi	LOWER BEND RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
16	45	5	70	22
16	22.5	5	34	11
16	11.25	5	17	6
16	45	10	70	14
16	22.5	10	34	7
16	11.25	10	17	4
24	45	5	102	32
24	22.5	5	49	16
24	11.25	5	25	8
24	45	10	102	21
24	22.5	10	49	10
24	11.25	10	25	5

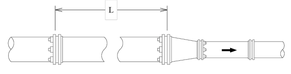
RESTRAINED LENGTH DESIGN

Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

RESTRAINED LENGTHS VERTICAL OFFSETS INSTALLED ON 16" THRU 24" MAINS

APPROVED	REVISED
FEBRUARY 2025	
DET-839-04	SHEET 2 OF 2



L = Length to be Restrained

PIPE SIZE (Inch)	SMALL SIZE (Inch)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
6	4	30
8	4	55
8	6	32
12	4	95
12	6	80
12	8	58
16	6	97
16	8	83
16	12	43
24	6	159
24	8	150
24	12	124
24	16	96
24	20	53

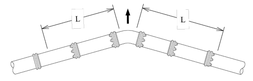
RESTRAINED LENGTH DESIGN

Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

RESTRAINED LENGTHS FOR REDUCERS ON 6" THRU 24" MAINS

APPROVED	REVISED
FEBRUARY 2025	
DET-839-05	SHEET 1 OF 1



L = Length to be Restrained on Both Sides of Fitting

PIPE SIZE (Inch)	BEND ANGLE (deg)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
6	90	23
6	45	9
6	22.5	5
6	11.25	2
8	90	30
8	45	12
8	22.5	6
8	11.25	3
12	90	43
12	45	18
12	22.5	8
12	11.25	4
16	90	59
16	45	25
16	22.5	12
16	11.25	6
24	90	86
24	45	36
24	22.5	17
24	11.25	9

RESTRAINED LENGTH DESIGN

Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

RESTRAINED LENGTHS FOR HORIZONTAL BENDS ON 6" THRU 24" MAINS

APPROVED	REVISED
FEBRUARY 2025	
DET-839-06	SHEET 1 OF 1

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

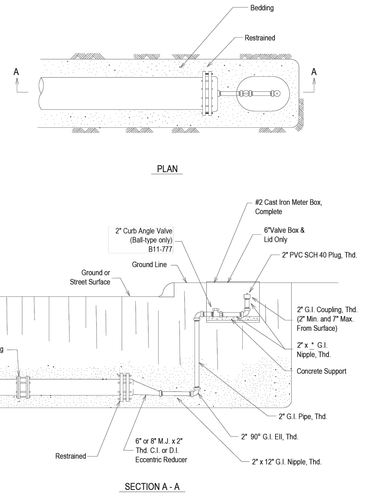
PROJECT NUMBER: 314-65-03
DRAWING NAME: DTOW3146503

SHEET TITLE: WATER DETAIL SHEET (2 OF 3)

SHEET NUMBER: 7.5

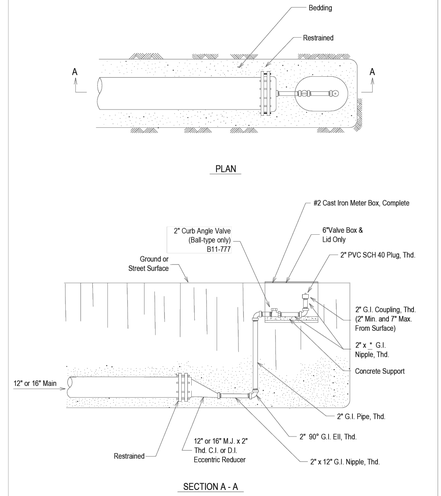
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

By:ROGELIO.BERRONES
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* Cut to Fit in Meter Box

East Central Steel	2" PERMANENT BLOW-OFF ASSEMBLY ON 6" AND 8" MAINS	APPROVED JANUARY 2025	REVISED JULY 2025
		DET-844-02	SHEET 1 OF 2



* Cut to Fit in Meter Box

East Central Steel	2" PERMANENT BLOW-OFF ASSEMBLY ON 12" AND 16" MAINS	APPROVED JANUARY 2025	REVISED JULY 2025
		DET-844-02	SHEET 2 OF 2

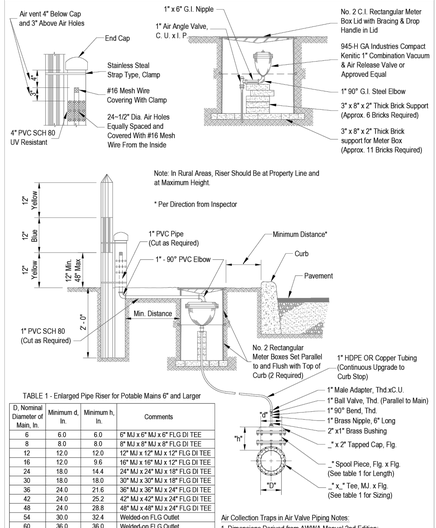
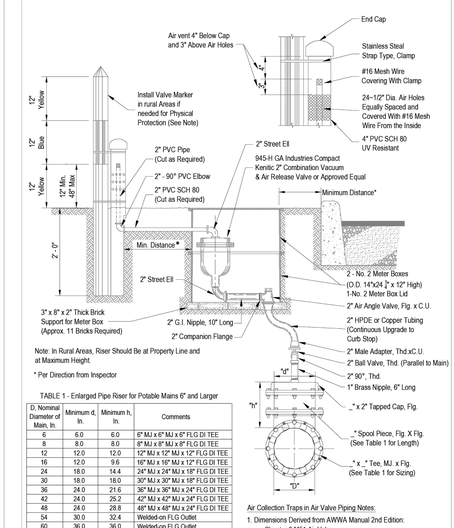


TABLE 1 - Enlarged Pipe Riser for Potable Mains 6" and Larger

D, Nominal Diameter of Main, In.	Minimum d, In.	Minimum h, In.	Comments
6	6.0	6.0	6" MJ x 6" MJ x 6" FLG DI TEE
8	8.0	8.0	8" MJ x 8" MJ x 8" FLG DI TEE
12	12.0	12.0	12" MJ x 12" MJ x 12" FLG DI TEE
16	12.0	9.6	16" MJ x 16" MJ x 12" FLG DI TEE
24	18.0	14.4	24" MJ x 24" MJ x 18" FLG DI TEE
30	18.0	18.0	30" MJ x 30" MJ x 18" FLG DI TEE
36	24.0	21.6	36" MJ x 36" MJ x 24" FLG DI TEE
42	24.0	25.2	42" MJ x 42" MJ x 24" FLG DI TEE
48	24.0	28.8	48" MJ x 48" MJ x 24" FLG DI TEE
54	30.0	32.4	Welded-on FLG Outlet
60	36.0	36.0	Welded-on FLG Outlet
66	24.0	23.1	Welded-on FLG Outlet
72	24.0	25.2	Welded-on FLG Outlet

Air Collection Traps in Air Valve Piping Notes:
1. Dimensions Derived from AWWA Manual 2nd Edition: Chapter 6 M51 Air Valves: Air-Release, AirVacuum & Combination

East Central Steel	INSTALLATION OF 1" AIR RELEASE VALVE	APPROVED FEBRUARY 2025	REVISED
		DET-846-Ø1	SHEET 1 OF 1



Note: In Rural Areas, Riser Should Be at Property Line and at Maximum Height.

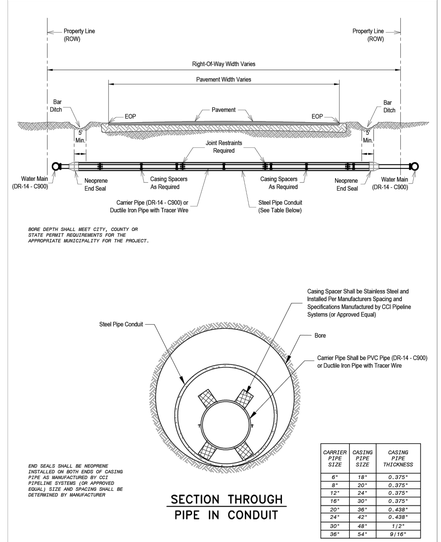
* Per Direction from Inspector

TABLE 1 - Enlarged Pipe Riser for Potable Mains 6" and Larger

D, Nominal Diameter of Main, In.	Minimum d, In.	Minimum h, In.	Comments
6	6.0	6.0	6" MJ x 6" MJ x 6" FLG DI TEE
8	8.0	8.0	8" MJ x 8" MJ x 8" FLG DI TEE
12	12.0	12.0	12" MJ x 12" MJ x 12" FLG DI TEE
16	12.0	9.6	16" MJ x 16" MJ x 12" FLG DI TEE
24	18.0	14.4	24" MJ x 24" MJ x 18" FLG DI TEE
30	18.0	18.0	30" MJ x 30" MJ x 18" FLG DI TEE
36	24.0	21.6	36" MJ x 36" MJ x 24" FLG DI TEE
42	24.0	25.2	42" MJ x 42" MJ x 24" FLG DI TEE
48	24.0	28.8	48" MJ x 48" MJ x 24" FLG DI TEE
54	30.0	32.4	Welded-on FLG Outlet
60	36.0	36.0	Welded-on FLG Outlet
66	24.0	23.1	Welded-on FLG Outlet
72	24.0	25.2	Welded-on FLG Outlet

Air Collection Traps in Air Valve Piping Notes:
1. Dimensions Derived from AWWA Manual 2nd Edition: Chapter 6 M51 Air Valves: Air-Release, AirVacuum & Combination

East Central Steel	INSTALLATION OF 2" AIR RELEASE VALVE	APPROVED FEBRUARY 2025	REVISED
		DET-846-Ø2	SHEET 1 OF 1



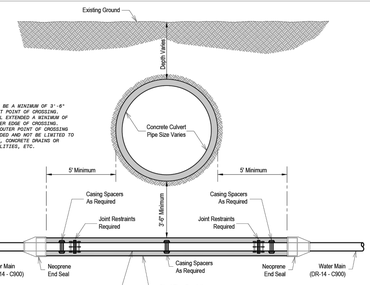
BORE DEPTH SHALL MEET CITY, COUNTY OR STATE PERMIT REQUIREMENTS FOR THE APPROPRIATE MUNICIPALITY FOR THE PROJECT.

END SEALS SHALL BE NEOPRENE INSTALLED ON BOTH ENDS OF CASING PIPE AS MANUFACTURED BY CCI PIPELINE SYSTEMS (OR APPROVED EQUAL) SIZE AND SPACING SHALL BE DETERMINED BY MANUFACTURER

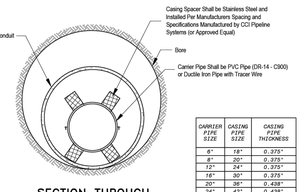
CARRIER PIPE SIZE	CASING PIPE SIZE	CASING PIPE THICKNESS
6"	18"	0.375"
8"	20"	0.375"
12"	24"	0.375"
16"	30"	0.375"
20"	36"	0.438"
24"	42"	0.438"
30"	48"	1/2"
36"	54"	9/16"

SECTION THROUGH PIPE IN CONDUIT

East Central Steel	TYPICAL ROAD BORE DETAIL	APPROVED FEBRUARY 2025	REVISED
		DET-847-Ø1	SHEET 3 OF 3



DEPTH SHALL BE A MINIMUM OF 3'-6" BELOW LOWEST POINT OF CROSSING. LENGTH SHALL EXTENDED A MINIMUM OF 5' PAST OUTER EDGE OF CROSSING. LOWEST AND OUTER POINT OF CROSSING SHALL INCLUDED AND NOT BE LIMITED TO STORM DRAIN, CONCRETE DRAINS OR EXITING UTILITIES, ETC.

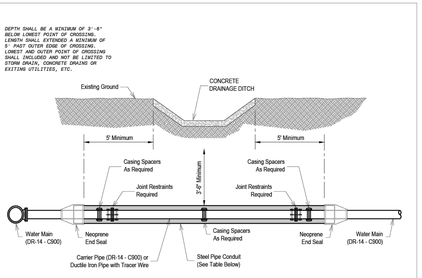


END SEALS SHALL BE NEOPRENE INSTALLED ON BOTH ENDS OF CASING PIPE AS MANUFACTURED BY CCI PIPELINE SYSTEMS (OR APPROVED EQUAL) SIZE AND SPACING SHALL BE DETERMINED BY MANUFACTURER

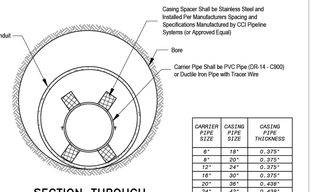
CARRIER PIPE SIZE	CASING PIPE SIZE	CASING PIPE THICKNESS
6"	18"	0.375"
8"	20"	0.375"
12"	24"	0.375"
16"	30"	0.375"
20"	36"	0.438"
24"	42"	0.438"
30"	48"	1/2"
36"	54"	9/16"

SECTION THROUGH PIPE IN CONDUIT

East Central Steel	TYPICAL BORE CROSSING UNDER CONCRETE CULVERT / STORM SEWER	APPROVED JANUARY 2025	REVISED FEBRUARY 2025
		DET-847-Ø1	SHEET 2 OF 3



DEPTH SHALL BE A MINIMUM OF 3'-6" BELOW LOWEST POINT OF CROSSING. LENGTH SHALL EXTENDED A MINIMUM OF 5' PAST OUTER EDGE OF CROSSING. LOWEST AND OUTER POINT OF CROSSING SHALL INCLUDED AND NOT BE LIMITED TO STORM DRAIN, CONCRETE DRAINS OR EXITING UTILITIES, ETC.

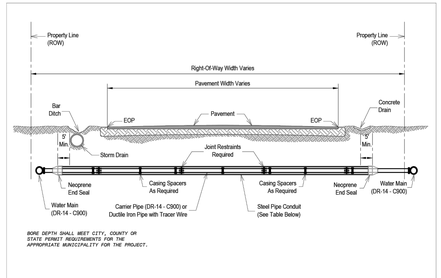


END SEALS SHALL BE NEOPRENE INSTALLED ON BOTH ENDS OF CASING PIPE AS MANUFACTURED BY CCI PIPELINE SYSTEMS (OR APPROVED EQUAL) SIZE AND SPACING SHALL BE DETERMINED BY MANUFACTURER

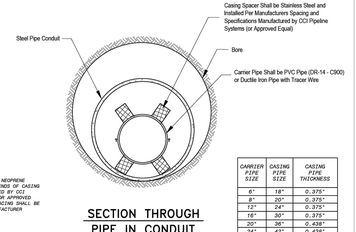
CARRIER PIPE SIZE	CASING PIPE SIZE	CASING PIPE THICKNESS
6"	18"	0.375"
8"	20"	0.375"
12"	24"	0.375"
16"	30"	0.375"
20"	36"	0.438"
24"	42"	0.438"
30"	48"	1/2"
36"	54"	9/16"

SECTION THROUGH PIPE IN CONDUIT

East Central Steel	TYPICAL BORE CROSSING UNDER DITCH WITH CONCRETE BOTTOM	APPROVED FEBRUARY 2025	REVISED
		DET-847-Ø1	SHEET 3 OF 3



BORE DEPTH SHALL MEET CITY, COUNTY OR STATE PERMIT REQUIREMENTS FOR THE APPROPRIATE MUNICIPALITY FOR THE PROJECT.

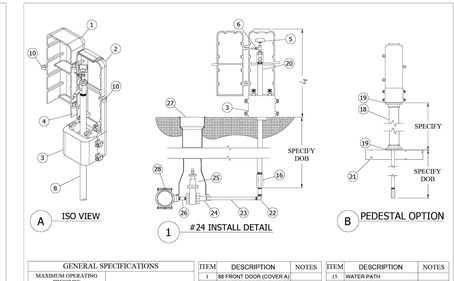


END SEALS SHALL BE NEOPRENE INSTALLED ON BOTH ENDS OF CASING PIPE AS MANUFACTURED BY CCI PIPELINE SYSTEMS (OR APPROVED EQUAL) SIZE AND SPACING SHALL BE DETERMINED BY MANUFACTURER

CARRIER PIPE SIZE	CASING PIPE SIZE	CASING PIPE THICKNESS
6"	18"	0.375"
8"	20"	0.375"
12"	24"	0.375"
16"	30"	0.375"
20"	36"	0.438"
24"	42"	0.438"
30"	48"	1/2"
36"	54"	9/16"

SECTION THROUGH PIPE IN CONDUIT

East Central Steel	TYPICAL BORE CROSSING UNDER ROAD	APPROVED FEBRUARY 2025	REVISED
		DET-847-Ø1	SHEET 3 OF 3



GENERAL SPECIFICATIONS	
MAXIMUM OPERATING PRESSURE:	
STATION MATERIALS:	303, 304, 316, & 18-8 STAINLESS STEEL, BUNA-N
ENCLOSURE MATERIAL: ENCLOSURE COLOR:	CAST 319 ALUMINUM BLUE
WETTED MATERIALS:	BUNA-N RUBBER, 303, 304, 316 & 18-8 STAINLESS STEEL
DEPTH OF BURY: WEIGHT:	SPECIFY ~35 LBS @ 3' DOB
ADDITIONAL PEDESTAL WEIGHT:	~30 LBS FOR 3' PEDESTAL
CUSTOM LOGO: NSF CERT:	

ITEM	DESCRIPTION	NOTES
1	8ß FRONT DOOR (COVER A)	
2	8ß REAR DOOR (COVER B)	
3	8ß BASE	2 PIECES
4	1/2" UNTHREADED NOZZLE	
5	OPERATING HANDLE	
6	DRAIN HOSE BARB	
7	DRAIN CAP	
8	1" S.S. BARREL	
9	S.S. OPERATING ROD	NOT SHOWN
10	LOCKING HOLE	
11	VALVE CORE	NOTE 5
12	VALVE SEAT CARRIER	NOTE 5
13	OPERATING SCREW	NOTE 5
14	SEAT O-RING	NOTE 5

ITEM	DESCRIPTION	NOTES
15	WATER PATH	
16	VALVE BODY	
17	INLET HOLES	
18	PEDESTAL	
19	PEDESTAL GASKET	
20	PACKING NUT	
21	CONCRETE	
22	3/4" S.S. ELBOW	
23	3/4" S.S. PIPE	AS REQ.
24	BRASS BUSHING	2" x 1"
25	2" GATE VALVE W/ OPP NUT	
26	2" x 3" NIPPLE	BRASS
27	VALVE BOX	
28	SADDLE CLAMP	2" THREAD

Sampling Station shall be _____' bury, with a 1" FIP inlet, and 1/2" unthreaded blow off and sampling bibb.

Station shall be enclosed in a lockable, cast aluminum box with hinged openings.

When open, the station shall require no key for operation, and all water flow shall pass thru an all stainless steel waterway. All operational components shall be of stainless steel and serviceable / replaceable from above ground with no digging or excavation needed.

The operating screw shall be located underground and inside of the valve body. The operating screw, when turned via the handle, shall raise and lower a valve seat carrier, for controlling the flow of water through the hydrant. The station shall utilize an o-ring for sealing of the valve core to valve seat carrier to shut off the flow of water. The operating rod shall be supported on both ends, via the packing nut and the valve seat carrier to prevent the station from vibrating/pulsing under high pressures and to ensure a smooth sample stream.

When open, the water shall flow through the 6 openings of the valve seat carrier, up and around the valve core, up the stand pipe and out through the nozzle.

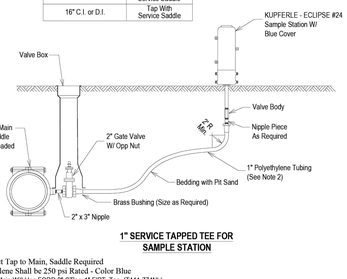
The operating rod shall be hollow. A secondary drain port shall be located on the hollow operating rod, underneath the handle and when open shall allow for evacuation of any water remaining inside the station, via pump or compressed air blow off, to prevent freezing.

The station shall be model #24 as manufactured by Kupferle Water Solutions, St. Louis MO. 63102 or approved equal.

Notes:
1.) The color shall be Blue, check with the manufacturer for color options, and specify accordingly.
2.) When installed on or with concrete, Kupferle recommends the use of a gasket or barrier between the enclosure/pedestal and the concrete surface, when purchasing the station, if concrete install is specified on the order Kupferle will provide said gasket. the enclosure clamp on the bottom of the enclosure base will fit inside a 4" pvc pipe.
3.) Prolonged exposure to strong chlorides which can be present in concrete, cleaning agents, and sometime even potable water can lead to possible enclosure corrosion. regular maintenance and drying the station after use are the best methods for optimal station longevity.
4.) In corrosive solids the buried pipe should be prepped for additional resistance to corrosion. Kupferle recommends spraying all underground piping and fittings with bituminous epoxy tar, allowing proper time to dry, and then wrapping the parts.

East Central Steel	#24 SAMPLING STATION SPEC SHEET	APPROVED FEBRUARY 2025	REVISED
		DET-824-Ø4	SHEET 1 OF 1

PIPE TAPPING SCHEDULE	
PIPE DIAMETER	SERVICE SIZE
6" A.C.	1" Tap With Service Saddle
6" C.I. or D.I.	Tap With Service Saddle
8" A.C.	Tap With Service Saddle
8" C.I. or D.I.	Tap With Service Saddle
8" PVC	Tap With Service Saddle
10" A.C.	Tap With Service Saddle
10" C.I. or D.I.	Tap With Service Saddle
10" PVC	Tap With Service Saddle
12" A.C.	Tap With Service Saddle
12" C.I. or D.I.	Tap With Service Saddle
12" PVC	Tap With Service Saddle
16" A.C.	Tap With Service Saddle
16" C.I. or D.I.	Tap With Service Saddle



1" SERVICE TAPPED TEE FOR SAMPLE STATION

NOTE:
1. No Direct Tap to Main, Saddle Required
2. Polyethylene Shall be 250 psi Rated - Color Blue
3. 2" HDPE Main Will Use FORD 2" CTs x 1" FIPT Tee (T441-7T4NL) FOR PERSFERED MANUFACTURERS SEE STANDARD SPECIFICATIONS
5. Tracer wire to be Installed and Taped in 8' Intervals from Main to Sample Station. See DET-828-01

East Central Steel	1" SERVICE INSTALLATION TAPPING SCHEDULE FOR SAMPLE STATIONS ONLY	APPROVED FEBRUARY 2025	REVISED
		DET-824-Ø3	SHEET 1 OF 1

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

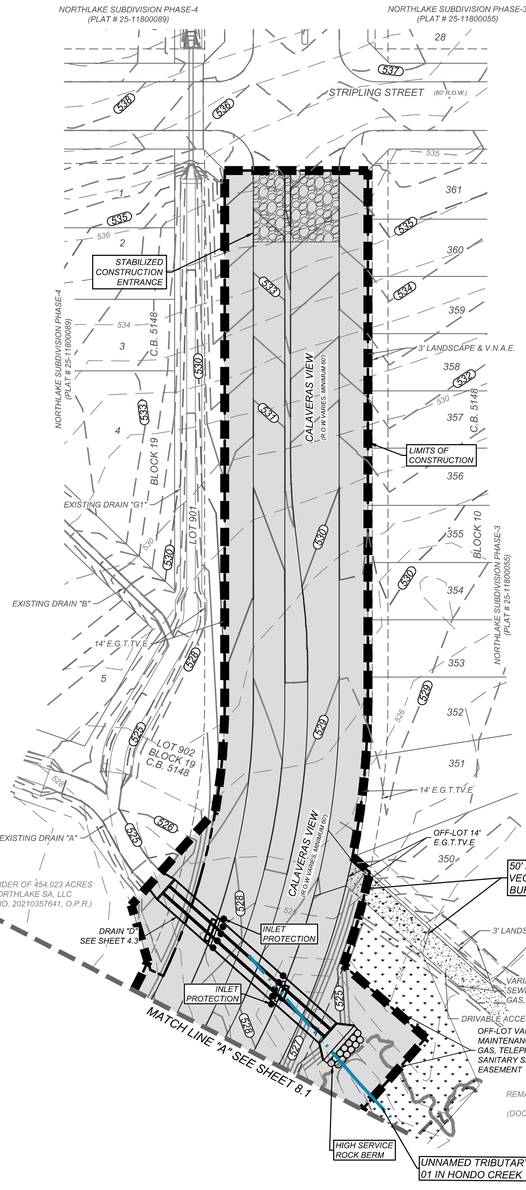
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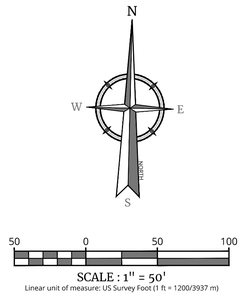
SHEET TITLE: WATER DETAIL SHEET (3 OF 3)

SHEET NUMBER: 7.6

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

By:ROGELIO.BERRONES
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LOCATION MAP

SCALE: NOT-TO-SCALE

LEGEND

LIMITS OF CONSTRUCTION	=	
EXISTING CONTOURS	=	570
PROPOSED CONTOURS	=	1008
FLOW ARROW	=	
SILT FENCE PHASE I	=	
SILT FENCE PHASE II	=	
TYPE 4 SACK GABIONS	=	
DISTURBED AREA	=	
STABILIZED CONSTRUCTION ENTRANCE/EXIT	=	
CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.	=	
NATURAL VEGETATIVE BUFFER	=	
CONCRETE TRUCK WASHOUT PIT	=	
ROCK BERM	=	
INLET WITH PROTECTION (GRAVEL FILTERS BAGS)	=	
ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E.G.T.TV.E
VEHICULAR NON-ACCESS EASEMENT	=	V.N.A.E.

INSTALLATION:

1. ALL OPERATORS SHALL SUBMIT A NOTICE OF INTENT (NOI) AT LEAST 48 HOURS IN ADVANCE AND ALL BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE IN PLACE PRIOR TO STARTING CONSTRUCTION ACTIVITIES.
2. CONTRACTOR TO ENSURE THAT STRUCTURAL BMP'S ARE INSTALLED WITHIN THE LIMITS OF THE SITE BOUNDARY.
3. CONTRACTOR MAY INSTALL THE BEST MANAGEMENT PRACTICES IN PHASES THAT COINCIDE WITH THE DISTURBANCE OF UP GRADIENT AREAS. THIS PHASING SHOULD BE NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
4. CONTRACTOR TO VERIFY SUFFICIENT VEGETATION IN AREAS DENOTED AS VEGETATED FILTER STRIP. IF INSUFFICIENT VEGETATION EXISTS, CONTRACTOR SHALL IMPLEMENT A DIFFERENT BEST MANAGEMENT PRACTICE AND WILL SHOW IT ON THIS PLAN WITH NOTATION IN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.

MAINTENANCE AND INSPECTION:

1. CONTRACTOR SHOULD LIMIT CONSTRUCTION ACTIVITIES TO ONLY THOSE AREAS SHOWN TO BE DISTURBED ON THIS PLAN. IF ADDITIONAL VEGETATED AREAS ARE DISTURBED, THEY SHOULD BE PROTECTED WITH APPROPRIATE BEST MANAGEMENT PRACTICES UNTIL THE AREAS HAVE BEEN STABILIZED AS PER THE SPECIFICATIONS OF THE SWPPP. THE AREAS OF THIS ADDITIONAL SOIL DISTURBANCE AND THE MEASURES USED SHOULD BE SHOWN ON THE SITE PLAN AND NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND INSPECTION OF BMP'S AS PER THE SPECIFICATIONS OF THE SWPPP. THE CONTRACTOR MAY MODIFY THE CONTROLS AS NECESSARY TO PREVENT SEDIMENT RUNOFF. THESE MODIFICATIONS SHOULD BE SHOWN AND THE SITE PLAN AND NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
3. LOCATION OF CONSTRUCTION ENTRANCE/EXIT, CONCRETE WASHOUT PIT, AND EQUIPMENT AND STORAGE ARE TO BE FIELD DETERMINED. LOCATIONS SHALL BE UPDATED ON THIS PLAN.

GENERAL:

1. THIS EXHIBIT IS TO BE USED FOR THE PURPOSES OF STORMWATER POLLUTION PREVENTION ONLY. ALL OTHER CIVIL ENGINEERING INFORMATION SHOULD BE OBTAINED FROM THE APPROPRIATE CONSTRUCTION DOCUMENTS.
2. THE PURPOSE OF THE SIGNATURE AND SEAL OF THE ENGINEER ON THIS DOCUMENT IS TO DEMONSTRATE COMPLIANCE WITH THE TPDES STORMWATER POLLUTION PREVENTION PLAN REGULATIONS ONLY.
3. ALL OWNERS/OPERATORS ARE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH THE STORMWATER POLLUTION PREVENTION PLAN AND COMPLYING WITH THE REGULATIONS CONTAINED WITHIN IT.

PROJECT COMPLETION:

1. ALL DISTURBED AREAS ARES NOT COVERED BY IMPERVIOUS COVER ARE TO BE STABILIZED PER THE SWPPP AND PROJECT SPECIFICATIONS PRIOR TO REMOVAL OF ANY BMP'S AND/OR PRIOR TO FILING A NOTICE OF TERMINATION (NOT).
2. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN PHASES IF ALL UPGRADIENT AREAS HAVE BEEN STABILIZED PER SWPPP AND PROJECT SPECIFICATIONS. THIS PHASING SHOULD BE NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
3. CONTRACTOR TO ENSURE THEY HAVE MET ALL REQUIREMENTS OF THE SWPPP BEFORE FILING A NOTICE OF TERMINATION (NOT).

COORDINATION NOTE:

1. CONTACT TIME WARNER TO COORDINATE CABLE TV SERVICE. (210) 244-0500
2. CONDUIT FOR ELECTRICAL SERVICE. CONFIRM REQUIREMENTS AND COORDINATE WITH CPS FOR INSPECTION. (210) 353-2246.
3. CONTACT AT&T TO COORDINATE TELEPHONE SERVICE. 1-800-449-7928.
4. CONTRACTOR TO COORDINATE WITH CPS PRIOR TO CONSTRUCTION TO PLAN ELECTRIC SERVICE.
5. CONTRACTOR TO COORDINATE WITH SAWS TO PLAN WATER AND SANITARY SEWER SERVICES (210) 704-7297
6. CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.

SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER:	DRAWING NAME:
314-65-03	SW3P3146503-PH2A

SHEET TITLE:

STORMWATER POLLUTION PREVENTION PLAN (1 OF 3)

SHEET NUMBER:

8.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

M:\SW3P\314650\3-PH2A.dwg(8.0 By: ABEL.MONTALVO

INSTALLATION:

1. ALL OPERATORS SHALL SUBMIT A NOTICE OF INTENT (NOI) AT LEAST 48 HOURS IN ADVANCE AND ALL BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE IN PLACE PRIOR TO STARTING CONSTRUCTION ACTIVITIES.
2. CONTRACTOR TO ENSURE THAT STRUCTURAL BMP'S ARE INSTALLED WITHIN THE LIMITS OF THE SITE BOUNDARY.
3. CONTRACTOR MAY INSTALL THE BEST MANAGEMENT PRACTICES IN PHASES THAT COINCIDE WITH THE DISTURBANCE OF UP GRADIENT AREAS. THIS PHASING SHOULD BE NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
4. CONTRACTOR TO VERIFY SUFFICIENT VEGETATION IN AREAS DENOTED AS VEGETATED FILTER STRIP. IF INSUFFICIENT VEGETATION EXISTS, CONTRACTOR SHALL IMPLEMENT A DIFFERENT BEST MANAGEMENT PRACTICE AND WILL SHOW IT ON THIS PLAN WITH NOTATION IN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.

MAINTENANCE AND INSPECTION:

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COORDINATION NOTE:

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6. CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.

LEGEND

LIMITS OF CONSTRUCTION	=	
EXISTING CONTOURS	=	570
PROPOSED CONTOURS	=	1008
FLOW ARROW	=	
SILT FENCE PHASE I	=	
SILT FENCE PHASE II	=	
TYPE 4 SACK GABIONS	=	
DISTURBED AREA	=	
STABILIZED CONSTRUCTION ENTRANCE/EXIT	=	
CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.	=	
NATURAL VEGETATIVE BUFFER	=	
CONCRETE TRUCK WASHOUT PIT	=	
ROCK BERM	=	
INLET WITH PROTECTION (GRAVEL FILTERS BAGS)	=	
ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E.G.T.TV.E
VEHICULAR NON-ACCESS EASEMENT	=	V.N.A.E.



LOCATION MAP

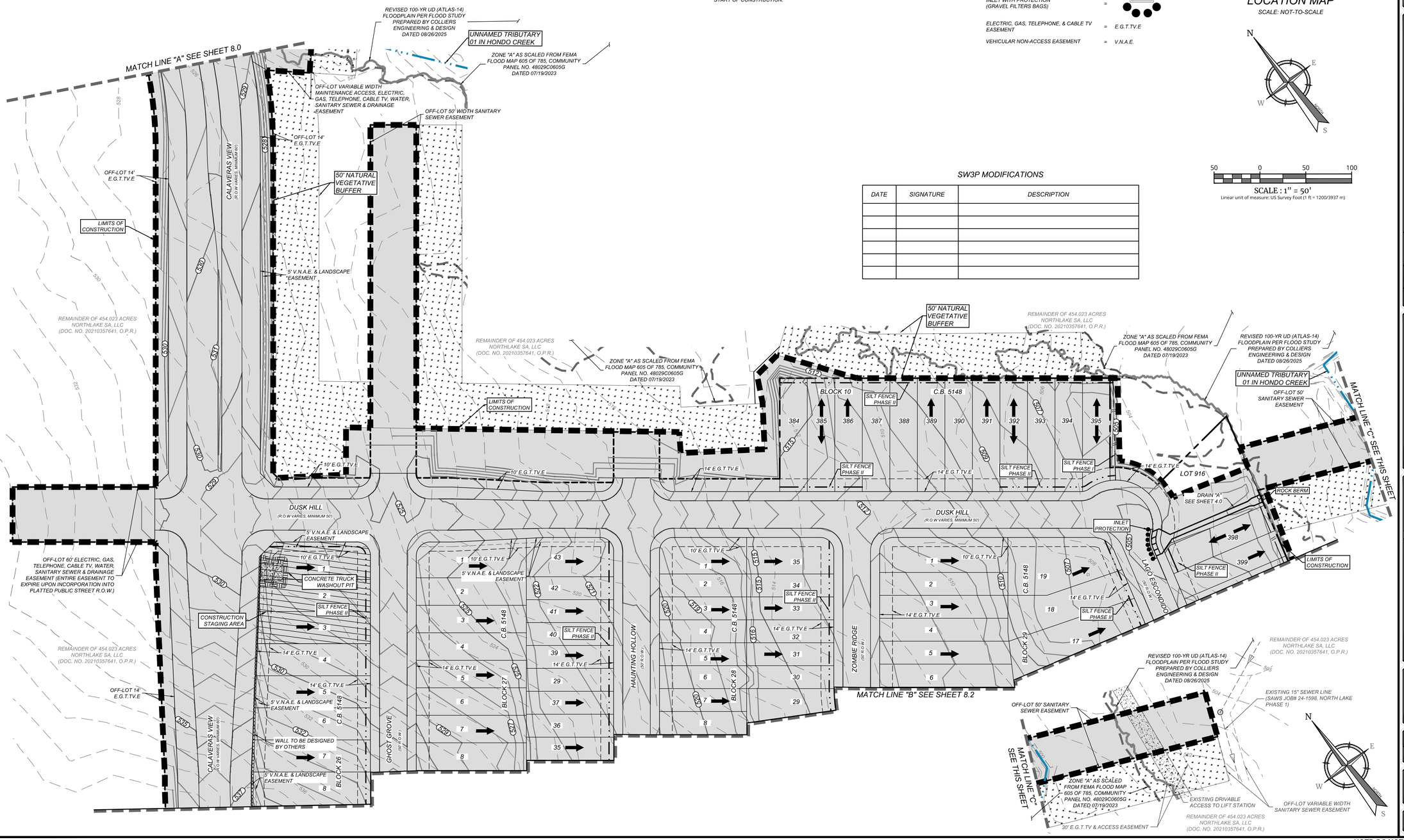
SCALE: NOT-TO-SCALE

SCALE : 1" = 50'

Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION



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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
OMAR A. ESPINOSA
125560
LICENSED PROFESSIONAL ENGINEER

NORTHLAKE PHASE 2A
PLAT# 25-11800192

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design

SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER:	DRAWING NAME:
314-65-03	SW3P146503-PH2A

SHEET TITLE:

STORMWATER POLLUTION PREVENTION PLAN (2 OF 3)

SHEET NUMBER:

8.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

I:\SW3P\314\65\03-PH2A.dwg[8.1 By: ABE.MONTALVO

INSTALLATION:

1. ALL OPERATORS SHALL SUBMIT A NOTICE OF INTENT (NOI) AT LEAST 48 HOURS IN ADVANCE AND ALL BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE IN PLACE PRIOR TO STARTING CONSTRUCTION ACTIVITIES.
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COORDINATION NOTE:

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6. CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.

SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

LEGEND

- LIMITS OF CONSTRUCTION =
- EXISTING CONTOURS = 570
- PROPOSED CONTOURS = 1008
- FLOW ARROW =
- SILT FENCE PHASE I =
- SILT FENCE PHASE II =
- TYPE 4 SACK GABIONS =
- DISTURBED AREA =
- STABILIZED CONSTRUCTION ENTRANCE/EXIT =
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA =
- NATURAL VEGETATIVE BUFFER =
- CONCRETE TRUCK WASHOUT PIT =
- ROCK BERM =
- INLET WITH PROTECTION (GRAVEL FILTERS BAGS) =
- ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT = E.G.T.TV.E
- VEHICULAR NON-ACCESS EASEMENT = V.N.A.E.



LOCATION MAP

SCALE: NOT-TO-SCALE

SCALE : 1" = 50'

Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

OFF-LOT 14' E.G.T.TV.E
CALAVERAS VIEW (R.O.W VARIES, MINIMUM 50')
GHOST GROVE (50' R.O.W.)
HAUNTING HOLLOW (50' R.O.W.)
ZOMBIE RIDGE (50' R.O.W.)
LAGO ESCONDIDO (50' R.O.W.)
SHINING ROAD (50' R.O.W.)
THING TERRACE (R.O.W VARIES, MINIMUM 50')
MATCH LINE "B" SEE SHEET 8.1
LIMITS OF CONSTRUCTION
REMAINDER OF 454.023 ACRES NORTHLAKE SA, LLC (DOC. NO. 20210357641, O.P.R.)
BLOCK 25 C.B. 5148
BLOCK 27 C.B. 5148
BLOCK 28 C.B. 5148
BLOCK 29 C.B. 5148
BLOCK 30 C.B. 5148
BLOCK 31 C.B. 5148
BLOCK 10 C.B. 5148
SILT FENCE PHASE II
SILT FENCE PHASE I
14' E.G.T.TV.E
10' E.G.T.TV.E
5' V.N.A.E. & LANDSCAPE EASEMENT
5' LANDSCAPE & V.N.A.E.
VARIABLE WIDTH CLEAR VISION EASEMENT
OFF-LOT 60' ELECTRIC, GAS, TELEPHONE, CABLE TV, WATER, SANITARY SEWER & DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W.)
OFF-LOT VARIABLE WIDTH ELECTRIC, GAS, TELEPHONE, CABLE TV, WATER, SANITARY SEWER & DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W.)
OFF-LOT 50' X 50' ELECTRIC, GAS, TELEPHONE, CABLE TV, WATER, SANITARY SEWER & DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W.)
50' NATURAL VEGETATIVE BUFFER
INLET PROTECTION
ROCK BERM
WALL
LOT 917
LOT 918
DRAIN "B" SEE SHEET 4.1
DRAIN "C" SEE SHEET 4.2
UNPLATTED CITY PUBLIC SERVICE BOARD CITY OF SAN ANTONIO CALLED 234.61 ACRES CONDEMNATION PARCEL (NO CONVEYANCE DEED FOUND, DESCRIPTION IN VOLUME 6754, PAGE 403 O.P.R.)

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	JAN 2025	-	OE

PROJECT NUMBER:	DRAWING NAME:
314-65-03	SW3P3146503-PH2A

SHEET TITLE:
STORMWATER POLLUTION PREVENTION PLAN (3 OF 3)

SHEET NUMBER:
8.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

W:\SW3P3146503-PH2A.dwg\8.2 By: ABEL.MONTALVO