

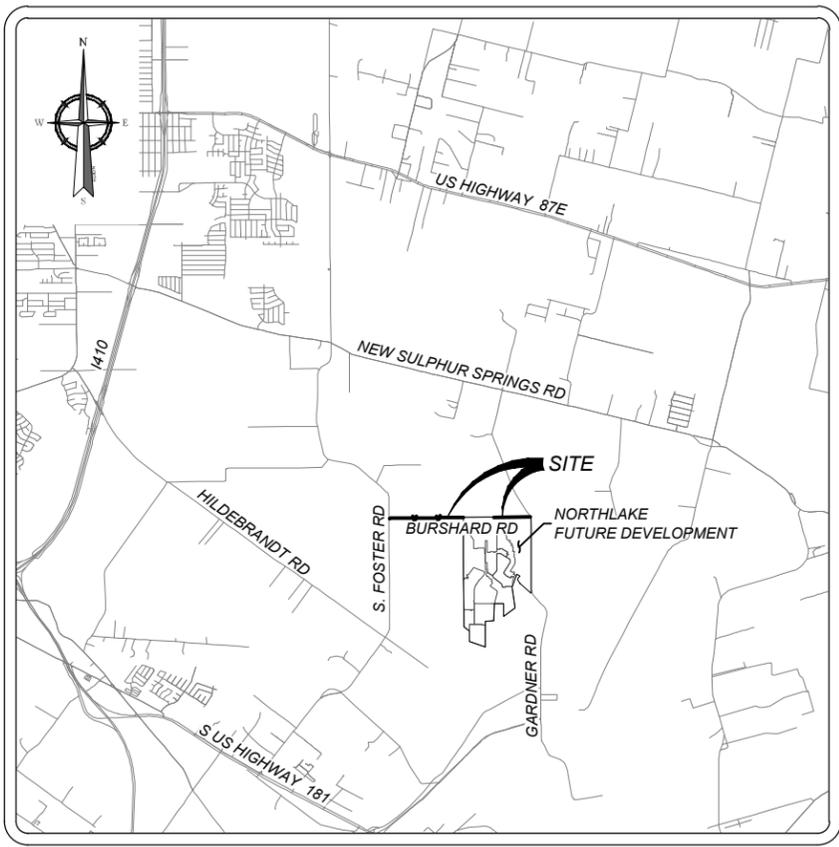
GENERAL NOTES

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 SITE(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 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 ECSUD 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 MANUFACTURER'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.

NORTHLAKE OFFSITE PHASE 1

BEXAR COUNTY, TEXAS

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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COLLIERS ENGINEERING & DESIGN
TBPE FIRM # 14909

03/03/2026

WATER IMPROVEMENTS
FOR
NORTHLAKE OFFSITE PHASE 1

BURSHARD RD
BEXAR COUNTY
TEXAS



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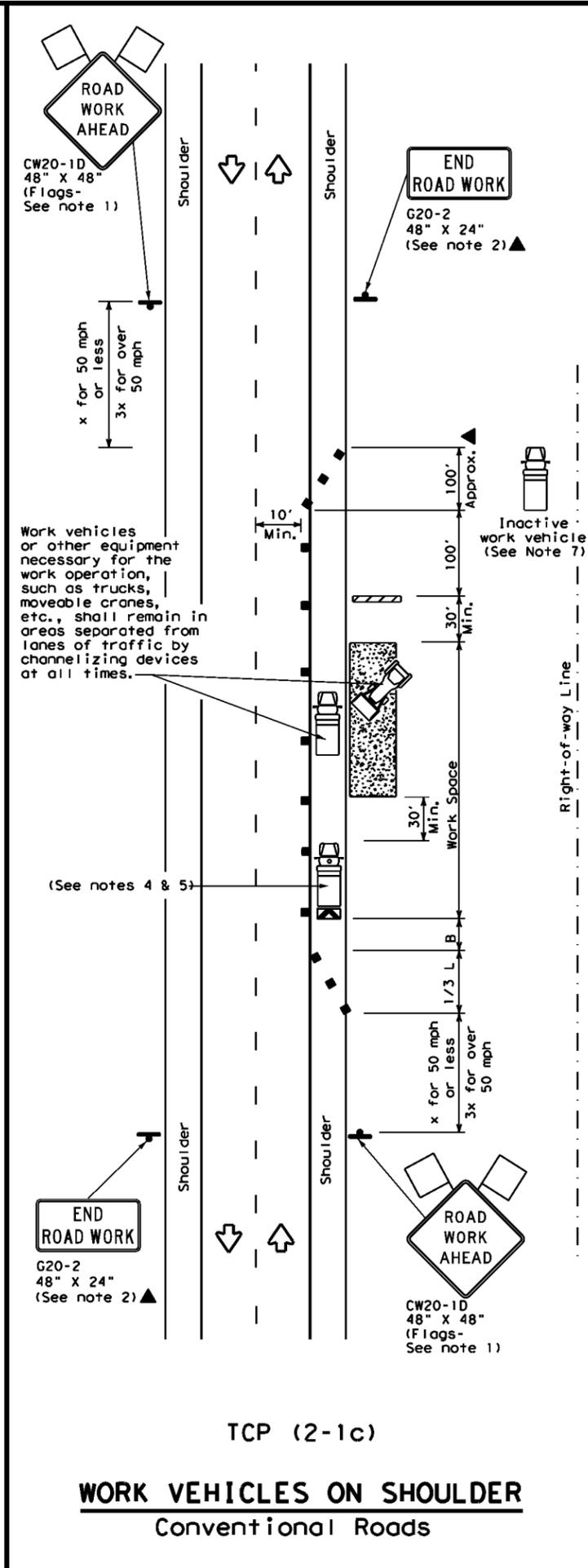
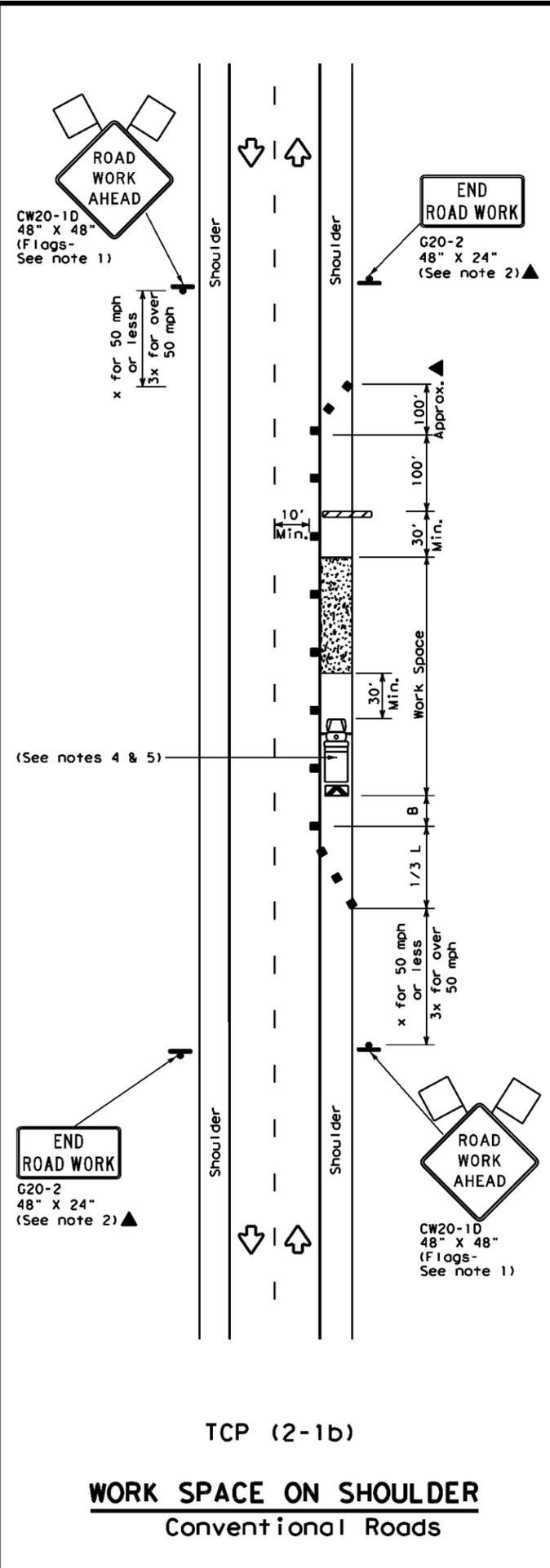
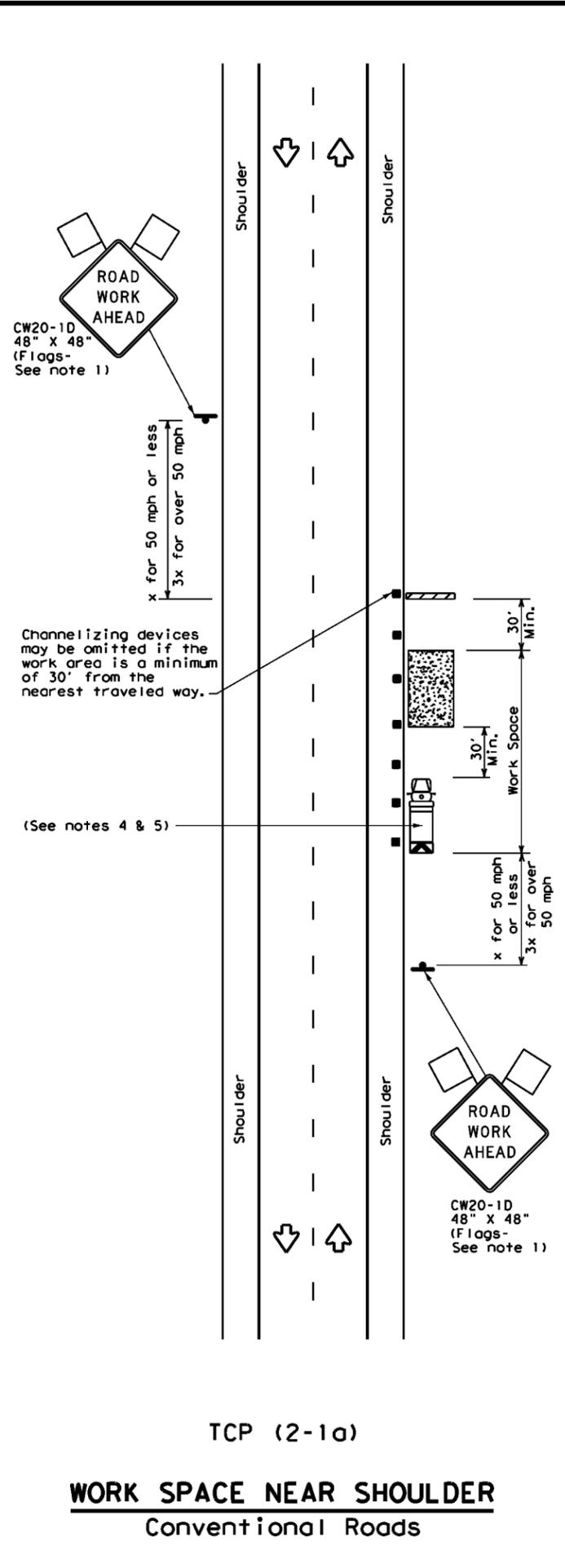
SHEET TITLE:
COVER SHEET

SHEET NUMBER:
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DATE: FILE:



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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
 - Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
 - See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
 - Additional work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

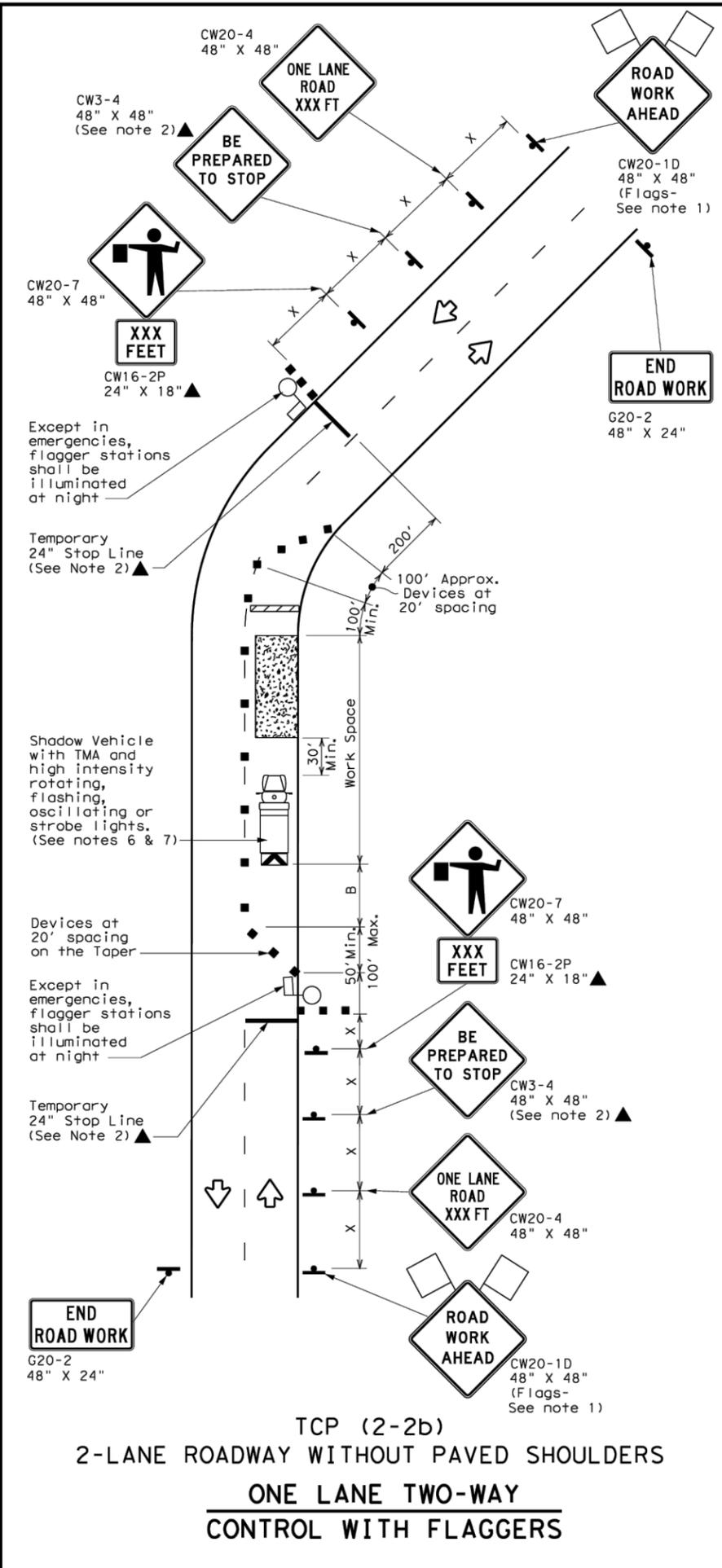
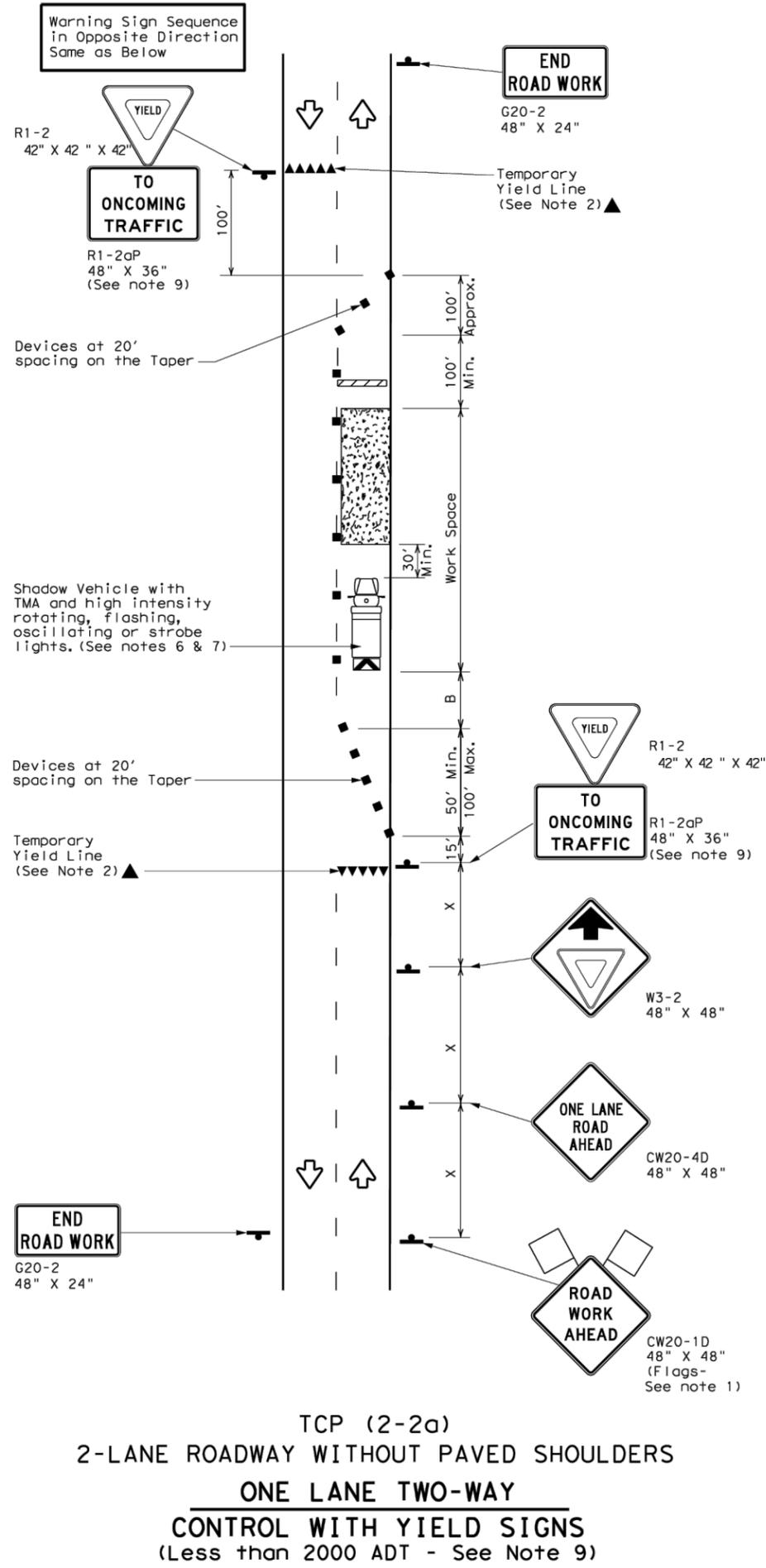
Texas Department of Transportation
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN
 CONVENTIONAL ROAD
 SHOULDER WORK**

TCP (2-1) - 18

FILE: tcp2-1-18.dgn	DN:	CKI	DW:	CKI
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS				
2-94 4-98				
8-95 2-12				
1-97 2-18				
DIST			COUNTY	SHEET NO.
				10

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LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = WS ² / 60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L = WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70	700'	770'	840'	70'	140'	800'	475'	730'	
75	750'	825'	900'	75'	150'	900'	540'	820'	

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

TYPICAL USAGE

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

GENERAL NOTES

- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
 - Flaggers should use two-way radios or other methods of communication to control traffic.
 - Length of work space should be based on the ability of flaggers to communicate.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-2a)**
- The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
 - The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.
- TCP (2-2b)**
- Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
 - If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
 - Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation Traffic Operations Division Standard

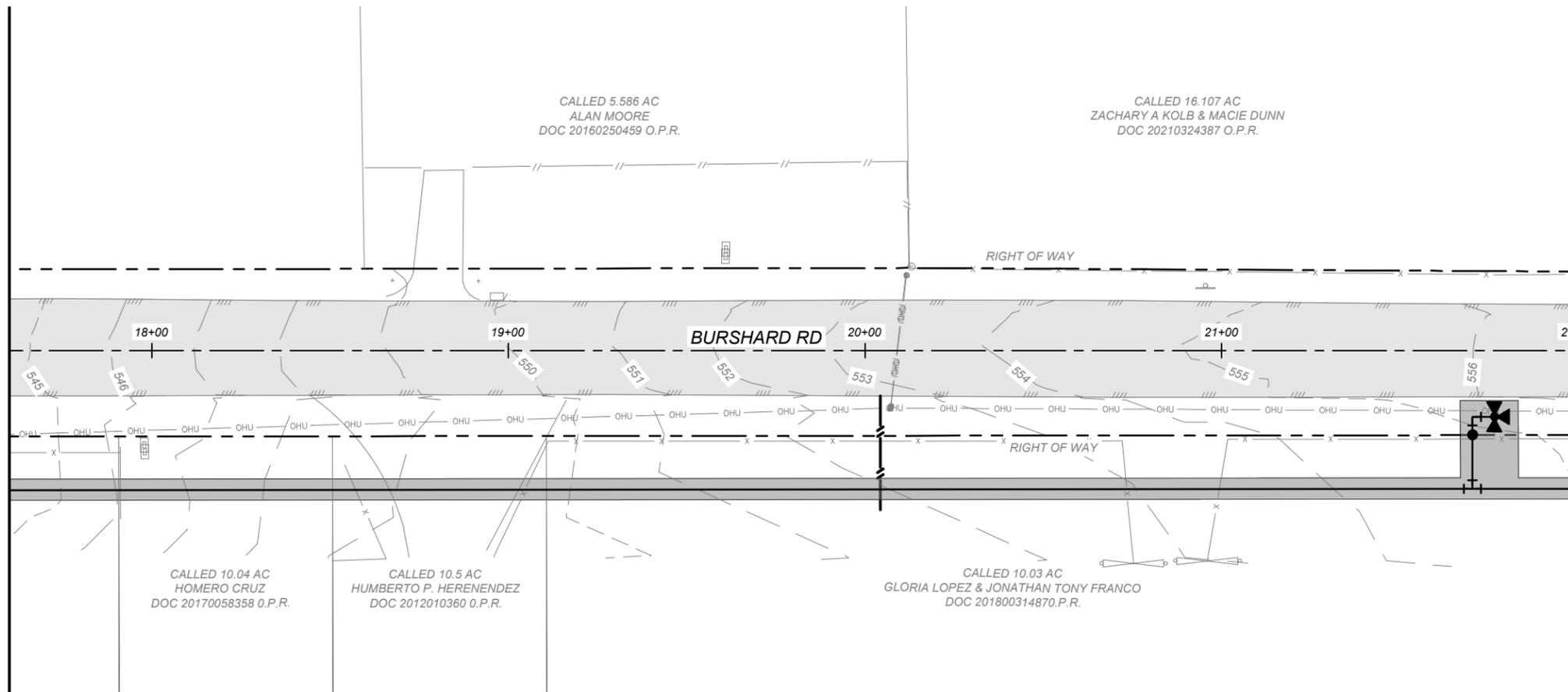
TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP (2-2) - 18

FILE:	tcp2-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS					
8-95	3-03				
1-97	2-12				
4-98	2-18				
DIST				COUNTY	SHEET NO.
					11

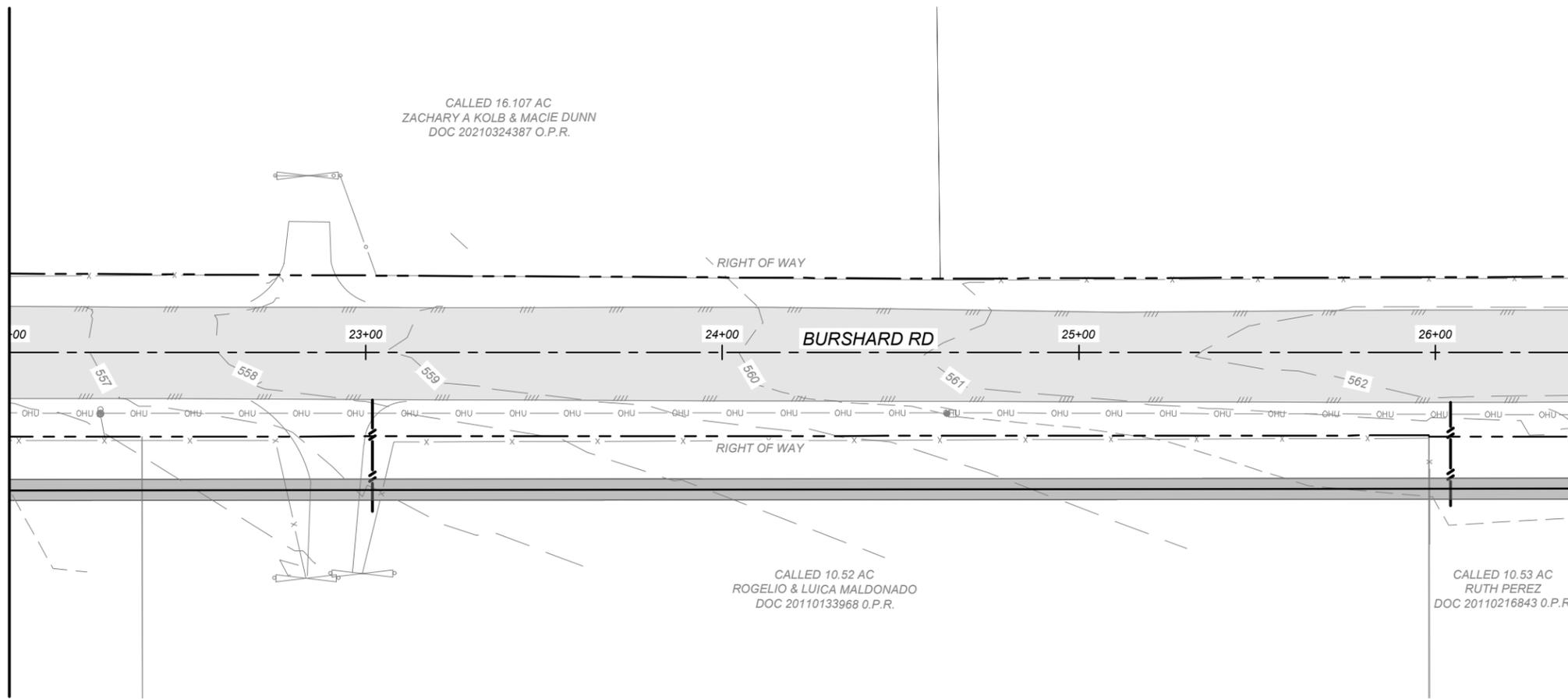
DATE:
FILE:

MATCH LINE STA. 17+60 (SEE SHEET 25)

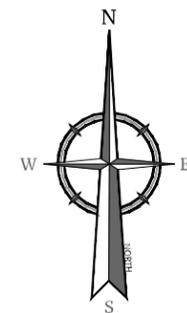


MATCH LINE STA. 22+00 (SEE THIS SHEET)

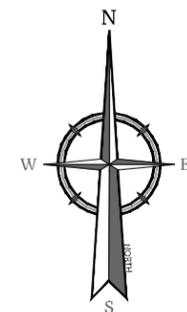
MATCH LINE STA. 22+00 (SEE THIS SHEET)



MATCH LINE STA. 26+40 (SEE SHEET 27)

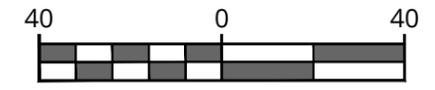


- LEGEND**
- PROPOSED WATER MAIN = ————
 - EXISTING CONTOUR = - - - - - 740 - - - - -
 - STABILIZED CONSTRUCTION EXIT/ENTRANCE = [Pattern]
 - DISTURBED AREA = [Shaded Box]
 - SILT FENCE = || ———— ||
 - ROCK FILTER DAM = [Circle Pattern]



BENCHMARK:
ELEVATIONS HEREON ARE BASED ON BENCHMARK #

BASIS OF BEARINGS:
BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD 83 (2011), U.S. SURVEY FEET.



SCALE : 1" = 40'
SELECT LINEAR UNIT OF MEASURE



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Call before you dig. STATE REQUIRED FILE NUMBER FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DESCRIPTION

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STANFORD NGUYEN, P.E.
TEXAS LICENSE #

COLLIERS ENGINEERING & DESIGN
TBPE FIRM # 14909

03/03/2026

WATER IMPROVEMENTS
FOR
NORTHLAKE OFFSITE
PHASE 1

BURSHARD RD
BEXAR COUNTY
TEXAS

HOUSTON
13501 Katy Freeway,
Suite 1350
Houston, TX 77079
Phone: 281.674.7560
COLLIERS ENGINEERING & DESIGN, INC.
DOING BUSINESS AS MASER CONSULTING

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN:	Mar-26	XXX	XXX
PROJECT NUMBER:	DRAWING NAME:		
24012718A	C-SPPP.DWG		

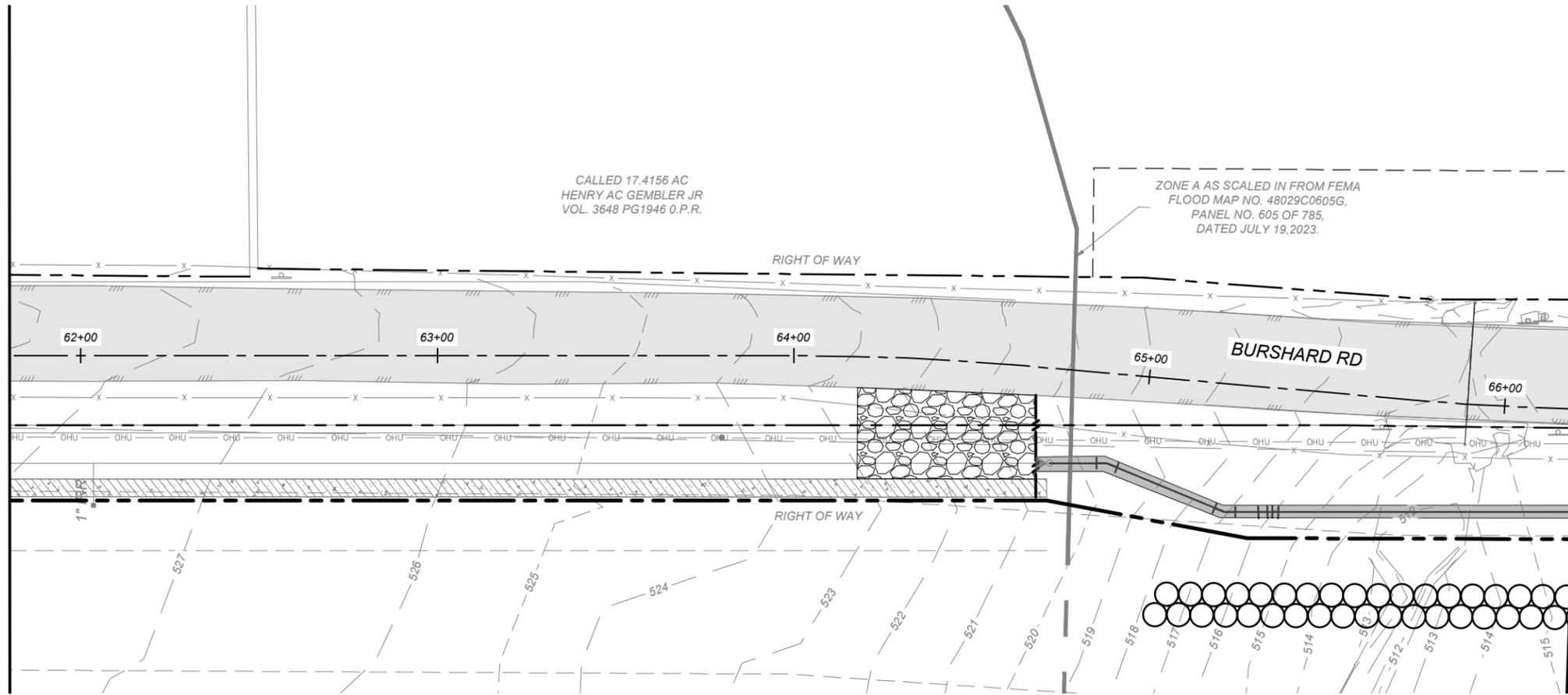
SHEET TITLE:
BURSHARD RD
SWPPP
STA. 17+60 TO STA. 26+40

SHEET NUMBER:
26 OF 32

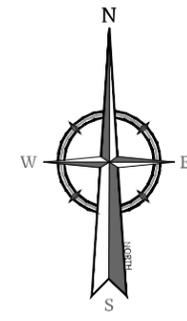
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Plot: Mar-26-2026 10:56:11 User: JD: Henry, henn...
 File: C:\arc\projects\AC0261\DWG\Burshard\Water Main - 24012718.dwg Project: Burshard Water Main SWPPP

SEE SHEET 28



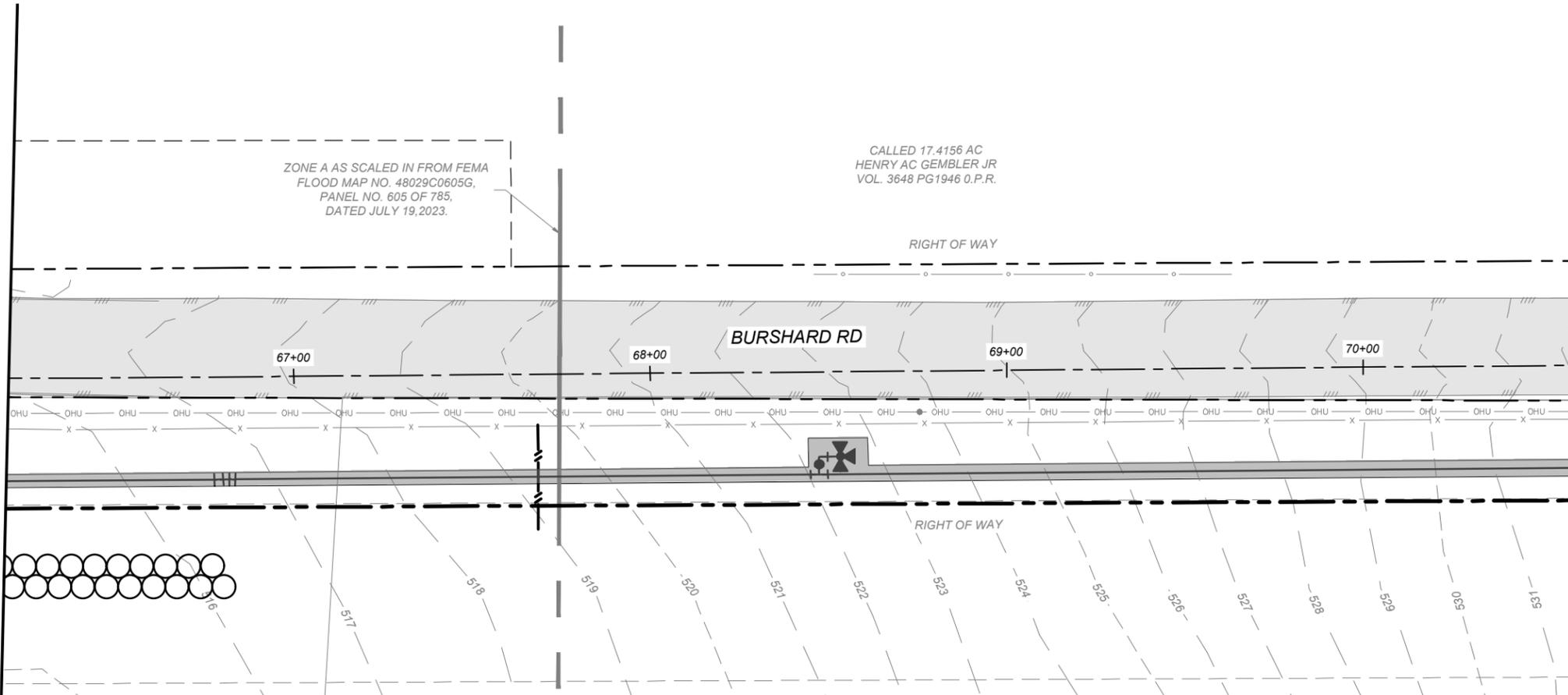
MATCH LINE STA. 66+20 (SEE THIS SHEET)



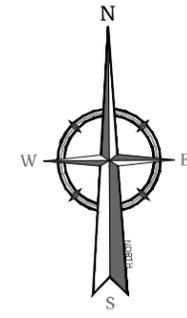
LEGEND

PROPOSED WATER MAIN	=	
EXISTING CONTOUR	=	
STABILIZED CONSTRUCTION EXIT/ENTRANCE	=	
DISTURBED AREA	=	
SILT FENCE	=	
ROCK FILTER DAM	=	

MATCH LINE STA. 66+20 (SEE THIS SHEET)

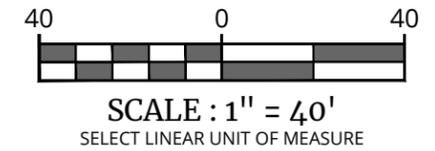


MATCH LINE STA. 70+60 (SEE SHEET 30)



BENCHMARK:
ELEVATIONS HEREON ARE BASED ON BENCHMARK #

BASIS OF BEARINGS:
BEARINGS ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD 83 (2011), U.S. SURVEY FEET.



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Know what's below. Call before you dig. STATE REQUIRED FILE NUMBER FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DESCRIPTION

THIS DOCUMENT IS FOR INTERIM REVIEW AND NOT FOR BIDDING, CONSTRUCTION, OR PERMIT PURPOSES.

STANFORD NGUYEN, P.E.
TEXAS LICENSE #

COLLIERS ENGINEERING & DESIGN
TBPE FIRM # 14909

03/03/2026

WATER IMPROVEMENTS
FOR
NORTHLAKE OFFSITE
PHASE 1

BURSHARD RD
BEXAR COUNTY
TEXAS

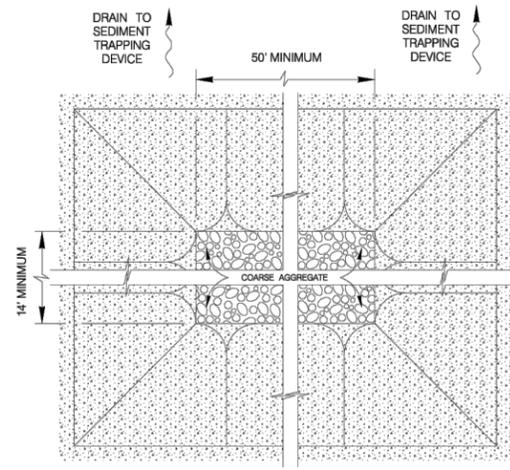
Colliers
Engineering & Design
FIRM ID #14909

HOUSTON
13501 Katy Freeway,
Suite 1350
Houston, TX 77079
Phone: 281.674.7560
COLLIERS ENGINEERING & DESIGN, INC.
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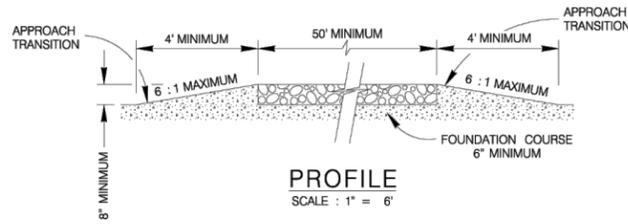
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AS SHOWN:	Mar-26	XXX	XXX
PROJECT NUMBER:	DRAWING NAME:		
24012718A	C-SPPP.DWG		

SHEET TITLE:
BURSHARD RD
SWPPP
STA. 61+80 TO STA. 70+60

SHEET NUMBER:
29 OF 32



PLAN
SCALE : 1" = 6'

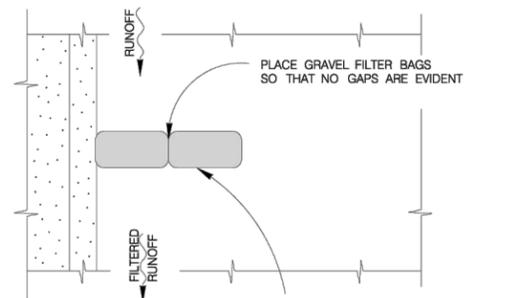


PROFILE
SCALE : 1" = 6'

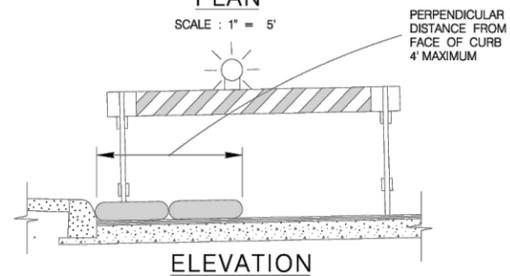
GENERAL NOTES

1. THE LENGTH OF THE TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6 : 1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
4. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

CONSTRUCTION EXIT - TYPE 1



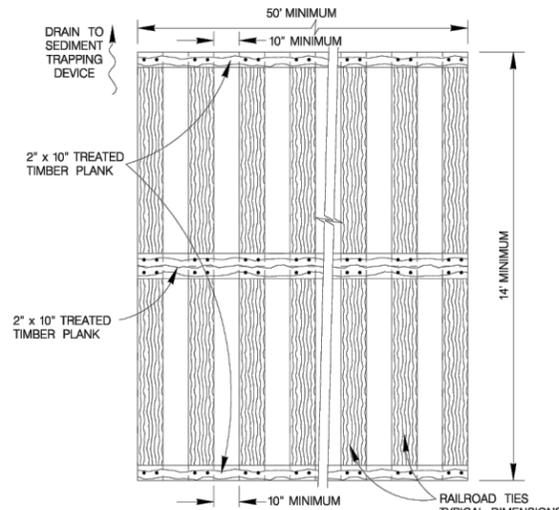
PLAN
SCALE : 1" = 5'



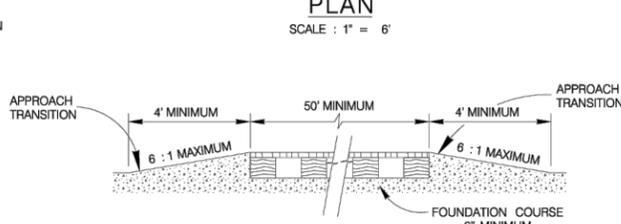
ELEVATION
SCALE : 1" = 5'

NOTE: STRADDLE GRAVEL FILTER BAGS WITH TYPE 1 BARRICADES MOUNTED WITH TYPE "A" FLASHING WARNING LIGHT. SEE BARRICADE CONSTRUCTION SIGN DETAILS. PLACE FLASHING LIGHTS AWAY FROM GUTTER, FLUSH WITH OUTSIDE EDGE OF BAG CONFIGURATION.

GRAVEL FILTER BAGS



PLAN
SCALE : 1" = 6'

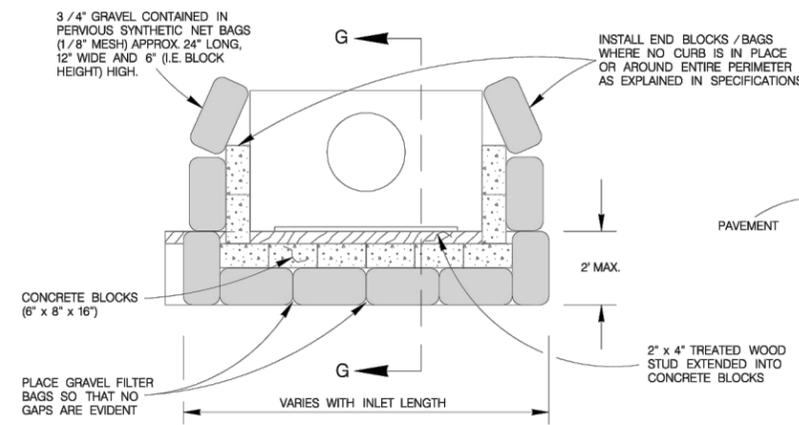


PROFILE
SCALE : 1" = 6'

GENERAL NOTES

1. THE LENGTH OF THE TYPE 2 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE TREATED TIMBER PLANKS SHALL BE ATTACHED TO THE RAILROAD TIES WITH 1/2" x 6" MIN. LAG BOLTS. OTHER FASTENERS MAY BE USED AS APPROVED BY THE ENGINEER.
3. THE TREATED TIMBER PLANKS SHALL BE #2 GRADE MIN, AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
4. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6 : 1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL AS APPROVED BY THE ENGINEER.
6. THE CONSTRUCTION EXIT SHOULD BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
7. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

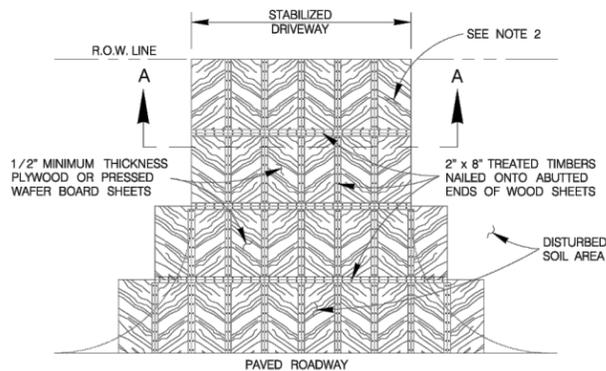
CONSTRUCTION EXIT - TYPE 2



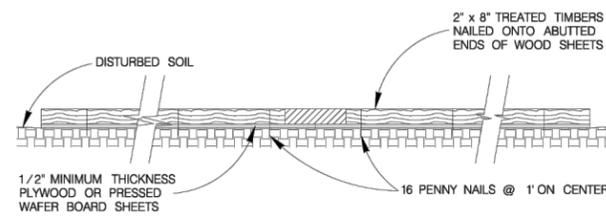
PLAN
SCALE : 1" = 5'

NOTE: GRAVEL FILTERS CAN BE USED ON PAVEMENT OR BARE GROUND.

CURB INLET GRAVEL FILTER



PLAN
SCALE : 1" = 20'

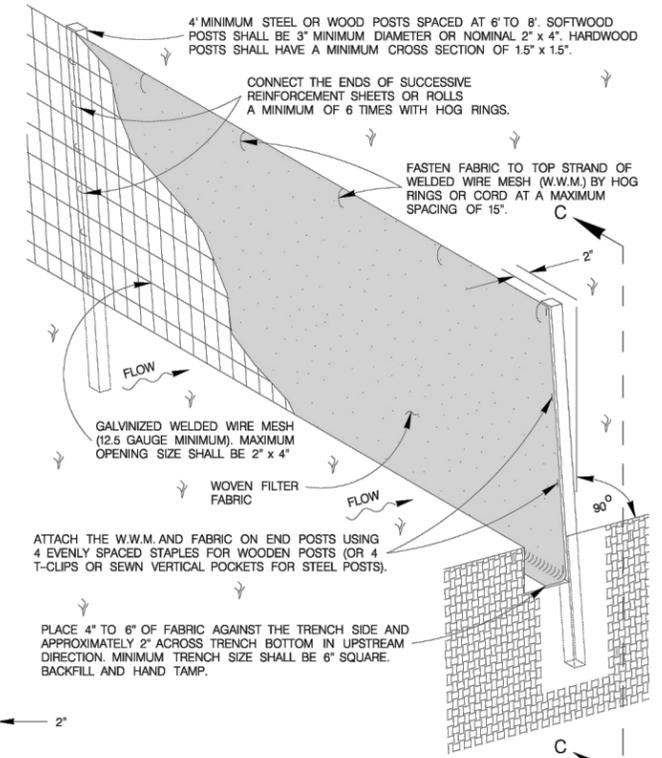


SECTION A-A
SCALE : 1" = 2'

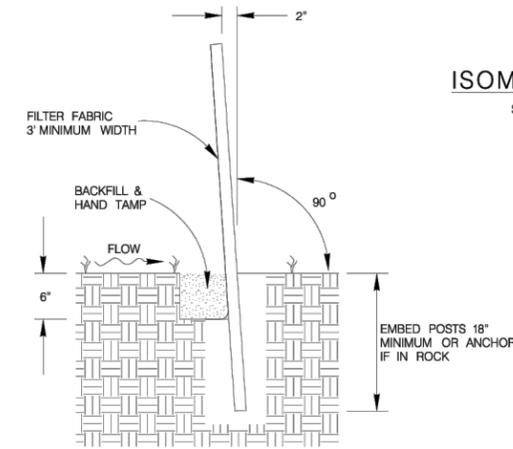
GENERAL NOTES

1. THE LENGTH OF THE TYPE 3 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. THE TYPE 3 CONSTRUCTION EXIT MAY BE CONSTRUCTED FROM OPEN GRADED CRUSHED STONE WITH A SIZE OF 2 TO 4 INCHES SPREAD A MINIMUM OF 4 INCHES THICK TO THE LIMITS SHOWN ON THE PLANS.
3. THE TREATED TIMBER PLANKS SHALL BE #2 GRADE MIN, AND SHOULD BE FREE FROM LARGE AND LOOSE KNOTS.
4. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

CONSTRUCTION EXIT - TYPE 3



ISOMETRIC VIEW
SCALE : 1" = 2'



SECTION C-C
SCALE : 1" = 2'

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUN-OFF. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.

SEDIMENT CONTROL FENCE SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 100 GPM / FT SQUARED. SEDIMENT CONTROL FENCE IS NOT RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA LARGER THAN 2 ACRES.

GENERAL NOTES

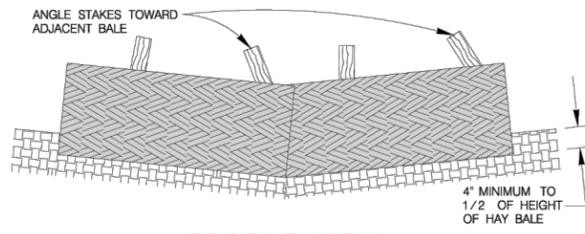
1. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

TEMPORARY SEDIMENT CONTROL FENCE

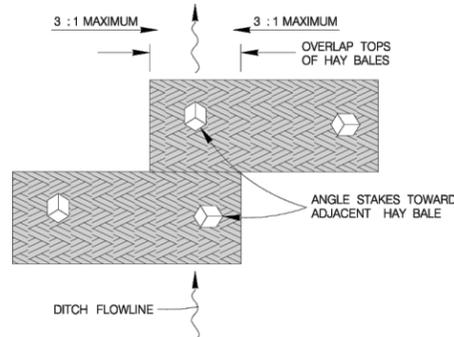
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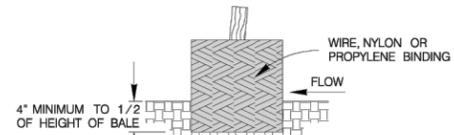
TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 1



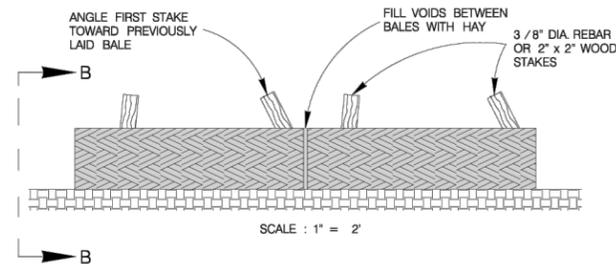
PROFILE VIEW
SCALE : 1" = 2'



PLAN VIEW
SCALE : 1" = 2'



SECTION B-B
SCALE : 1" = 2'



BALED HAY USAGE GUIDELINES

A BALED HAY INSTALLATION MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUNOFF. A TWO YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED. THE INSTALLATION SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 5 GPM /FT SQUARED OF CROSS SECTIONAL AREA. BALED HAY MAY BE USED AT THE FOLLOWING LOCATIONS:

1. WHERE THE RUNOFF APPROACHING THE BALED HAY FLOWS OVER DISTURBED SOIL FOR LESS THAN 100'. IF THE SLOPE OF THE DISTURBED SOIL EXCEEDS 10 %, THE LENGTH OF SLOPE UPSTREAM OF THE BALED HAY SHOULD BE LESS THAN 50'.
2. WHERE THE INSTALLATION WILL BE REQUIRED FOR LESS THAN 3 MONTHS.
3. WHERE THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 1/2 ACRE.

FOR BALED HAY INSTALLATIONS IN SMALL DITCHES, THE FOLLOWING ADDITIONAL CONDI-TIONAL CONSIDERATIONS APPLY:

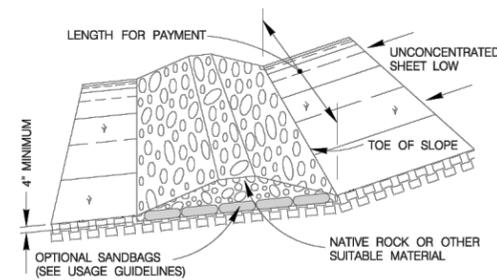
1. THE DITCH SIDESLOPES SHOULD BE GRADED AS FLAT AS POSSIBLE TO MAXIMIZE THE DRAINAGE FLOW RATE THRU THE HAY.
2. THE DITCH SHOULD BE GRADED LARGE ENOUGH TO CONTAIN THE OVERLAPPING DRAINAGE WHEN SEDIMENT HAS FILLED TO THE TOP OF THE BALED HAY.

BALES SHOULD BE REPLACED USUALLY EVERY 2 MONTHS OR MORE OFTEN DURING WET WEATHER WHEN LOSS OF STRUCTURAL INTERGRITY IS ACCELERATED.

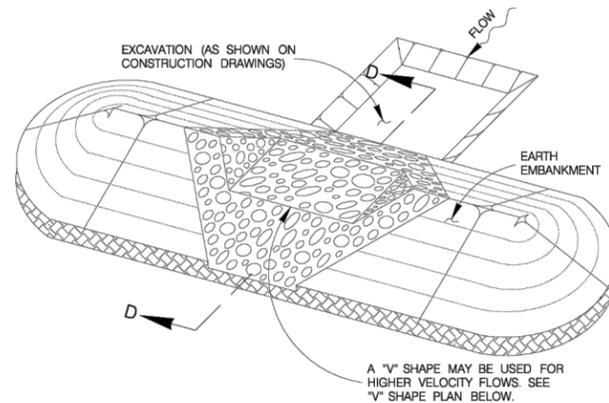
GENERAL NOTES

1. HAY BALES SHALL BE A MINIMUM OF 30" IN LENGTH AND WEIGH A MINIMUM OF 50 LBS.
2. HAY BALES SHALL BE BOUND BY EITHER WIRE OR NYLON OR POLYPROPYLENE STRING. THE BALES SHALL BE COMPOSED ENTIRELY OF VEGETABLE MATTER.
3. HAY BALES SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4" AND, WHERE POSSIBLE, ONE-HALF THE HEIGHT OF THE BALE.
4. HAY BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES. THE BALES SHALL BE PLACED WITH BINDINGS PARALLEL TO THE GROUND.
5. HAY BALES SHALL BE SECURELY ANCHORED IN PLACE WITH 3/8" DIA REBAR OR 2" x 2" WOOD STAKES DRIVEN THROUGH THE BALES. THE FIRST STAKE SHALL BE ANGLED TOWARDS THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

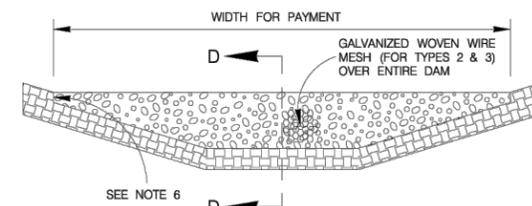
BALED HAY FOR EROSION CONTROL



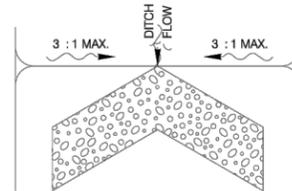
TYPE 1 FILTER DAM AT TOE OF SLOPE
SCALE : 1" = 10'



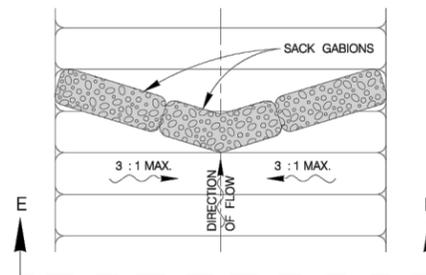
TYPE 1 & 2 FILTER DAM AT SEDIMENT TRAP
SCALE : 1" = 10'



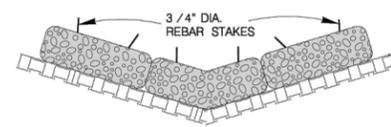
TYPE 1, 2 & 3 FILTER DAM AT CHANNEL SECTIONS
SCALE : 1" = 6'



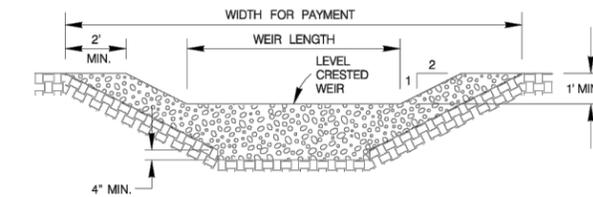
"V" SHAPE PLAN VIEW
NOT TO SCALE



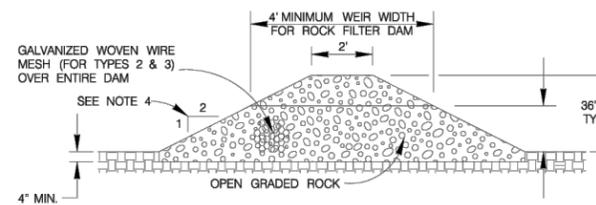
PLAN VIEW
SCALE : 1" = 10'



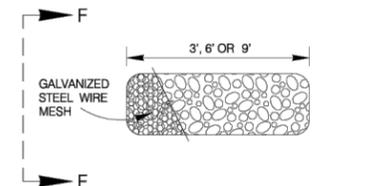
SECTION E-E
SCALE : 1" = 10'
TYPE 4 FILTER DAM AT DITCHES & SMALLER CHANNELS PLAN VIEW



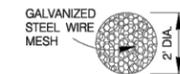
PROFILE OF TYPE 1 & 2 FILTER DAM AT SEDIMENT TRAP
SCALE : 1" = 6'



SECTION D-D
SCALE : 1" = 6'



TYPE 4 SACK GABION DETAIL
SCALE : 1" = 6'



SECTION F-F
SCALE : 1" = 6'

ROCK FILTER DAM USAGE GUIDELINES

ROCK FILTER DAMS SHOULD BE CONSTRUCTED DOWNSTREAM FROM DISTURBED AREAS TO INTERCEPT SEDIMENT FROM OVERLOAD RUNOFF AND /OR CONCENTRATED FLOW. THE DAMS SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 60 GPM /FT SQUARED OF CROSS SECTIONAL AREA. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE.

TYPE 1 (18" HIGH WITH NO WIRE MESH):

TYPE 1 MAY BE USED AT THE TOE OF SLOPES, AROUND INLETS, IN SMALL DITCHES AND AT DIKE OR SWALE OUTLETS. THIS TYPE OF DAM IS RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA OF 5 ACRES OR LESS. TYPE 1 MAY NOT BE USED IN CONCENTRATED HIGH VELOCITY FLOWS (APPROXIMATELY 8 FT./SEC. OR MORE) IN WHICH AGGREGATE WASH OUT MAY OCCUR. SANDBAGS MAY BE USED AT THE EMBEDDED FOUNDATION (4" DEEP MIN.) FOR BETTER FILTERING EFFICIENCY OF LOW FLOWS IF CALLED FOR ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

TYPE 2 (18" HIGH WITH WIRE MESH):

TYPE 2 MAY BE USED IN DITCHES AND AT DIKE OR SWALE OUTLETS.

TYPE 3 (36" HIGH WITH WIRE MESH):

TYPE 3 MAY BE USED IN STREAM FLOW AND SHOULD BE SECURED TO THE STREAM BED.

TYPE 4 (SACK GABIONS):

TYPE 4 MAY BE USED IN DITCHES AND SMALLER CHANNELS TO FORM AN EROSION CONTROL DAM.

GENERAL NOTES

1. IF SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER, FILTER DAMS SHOULD BE PLACED NEAR THE TOE OF SLOPES WHERE EROSION IS ANTICIPATED, UPSTREAM AND / OR DOWNSTREAM AT DRAINAGE STRUCTURES, AND IN ROADWAY DITCHES AND CHANNELS TO COLLECT SEDIMENT.
2. MATERIALS (AGGREGATE, WIRE MESH, SANDBAGS, ETC.) SHALL BE AS INDICATED BY THE SPECIFICATION FOR ROCK FILTER DAMS FOR EROSION AND SEDIMENTATION CONTROL.
3. THE ROCK FILTER DAM DIMENSIONS SHALL BE AS INDICATED ON THE STORM WATER POLLUTION PREVENTION PLANS.
4. SIDE SLOPES SHOULD BE 2 : 1 OR FLATTER. DAMS WITHIN THE SAFETY ZONE SHALL HAVE SIDE SLOPES OF 6 : 1 OR FLATTER.
5. MAINTAIN A MINIMUM OF 1' BETWEEN TOP OF ROCK FILTER DAM WEIR AND TOP OF EMBANKMENT FOR FILTER DAMS AT SEDIMENT TRAPS.
6. FILTER DAMS SHOULD BE EMBEDDED A MINIMUM OF 4" INTO THE EXISTING GROUND.
7. THE SEDIMENT TRAP FOR PONDING OF SEDIMENT LADEN RUNOFF SHALL BE OF THE DIMENSIONS SHOWN ON THE PLANS.
8. ROCK FILTER DAM TYPES 2 & 3 SHALL BE SECURED WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1" DIAMETER HEXAGONAL OPENINGS. THE AGGREGATE SHALL BE PLACED ON THE MESH TO THE HEIGHT AND SLOPES SPECIFIED. THE MESH SHALL BE FOLDED AT THE UPSTREAM SIDE OVER THE AGGREGATE AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS. IN STREAM USE, THE MESH SHOULD BE SECURED OR STAKED TO THE STREAM BED PRIOR TO AGGREGATE PLACEMENT.
9. SACK GABIONS SHOULD BE STAKED DOWN WITH 3/4" DIA REBAR STAKES.
10. FLOW OUTLET SHOULD BE ONTO A STABILIZED AREA (VEGETATION, ROCK, ETC.).
11. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

JANUARY 2005

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 2

ROCK FILTER DAMS