SPECIAL PROVISIONS

These Special Provisions are changes to or addition to the requirements of the Project Manual Section 7-29 and are a part of the Contract Documents.

PROJECT MANUAL, SECTION 8 – SPECIAL PROVISIONS are provided for reference only subject to verification by the contactor.

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SP-1 Waler Wall Information
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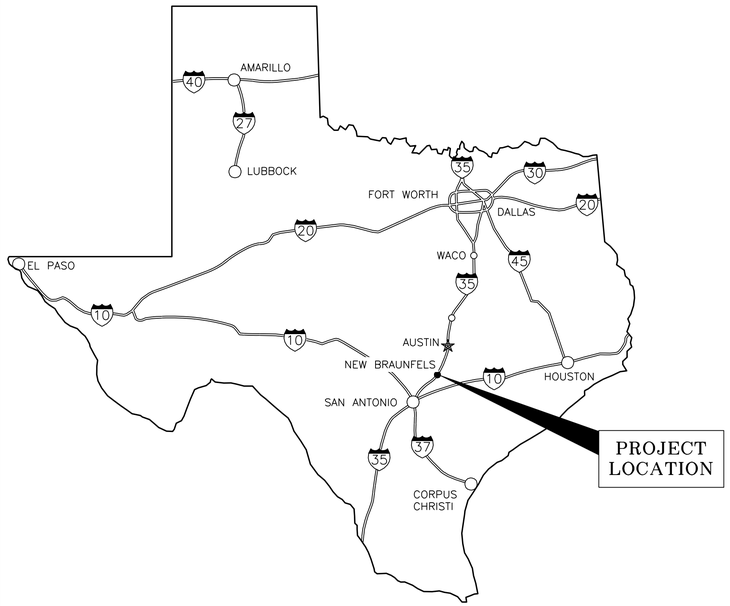
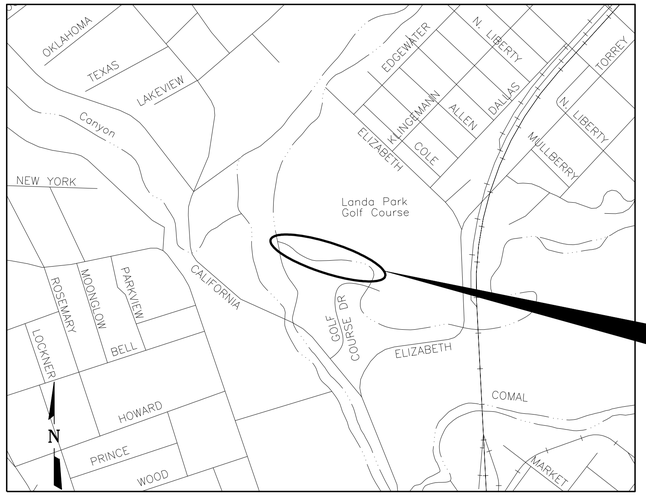
CITY OF NEW BRAUNFELS, TEXAS

CONSTRUCTION PLANS FOR

COMAL RIVER BANK RECLAMATION AND RIPARIAN ZONE RESTORATION



LOCATION MAP



VICINITY MAP

City of New Braunfels

This Record Drawing is a combination of the sealed engineering contract drawings for this project, modified by information furnished by the contractor reflecting changes in the Project made during construction. The original sealed drawings are on file at the offices of FREESE AND NICHOLS, INC.

RECORD DRAWINGS PREPARED ON: 12/14/2016

THE SEAL THAT ORIGINALLY APPEARED ON THIS DOCUMENT WAS AUTHORIZED BY M. LESLIE BOYD, P.E. TEXAS NO. 39453 ON 5/14/2014. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION OF THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

DECEMBER 2016

RECORD DRAWINGS

FREESE AND NICHOLS

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Austin, Texas 78759
Phone – (512) 617-3100
Fax – (512) 617-3101

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

NEB 13133

RECORD DRAWING

SYMBOLS LEGEND

—•—•—	EXISTING METAL BEAM GUARD RAIL FENCE
—x—x—	EXISTING FENCE
—o—o—	ENVIRONMENTAL BOOM LINE
—LOC—LOC—	LIMITS OF CONSTRUCTION
— — — —	PROPERTY LINE
—SF—SF—	SILT FENCE
—OHE— — —	EXISTING OVERHEAD ELECTRIC LINES
—●—	EXISTING POWER POLE
⊡	SURVEY CONTROL POINT
℄	CENTER LINE
	EXISTING GUY WIRE
○	EXISTING MANHOLE
Ø	DIAMETER
BM-X	BENCHMARK
M	EXISTING SURVEY MONUMENT
W	EXISTING WATER VALVE
L	EXISTING LEVEL GAUGE
V	EXISTING PIEZOMETER STEEL VAULT
P	EXISTING PIEZOMETER
I	EXISTING HOLES, NOT FOR CONTRACTOR USE
Ⓟ	NEW PIEZOMETERS
B	BASELINE
Ⓔ	NEW ENVIRONMENTAL CONTAINMENT BOOM LINE
P	PLATE THICKNESS
∇	WATER LEVELS
B-X	SOIL BORING
	TREE

DIRECTION IN WHICH SECTION IS TAKEN

SECTION NUMBER

SHEET ON WHICH SECTION IS SHOWN

DETAIL NUMBER

SHEET ON WHICH DETAIL IS TAKEN

DOWNSTREAM

LEFT — RIGHT

UPSTREAM

RELATIVE DIRECTIONS ASSUME VIEWER IS LOOKING DOWNSTREAM

ABBREVIATIONS

'	FEET
"	INCHES
A/C	AIR CONDITIONING
ACI	AMERICAN CONCRETE INSTITUTE
ADMIN.	ADMINISTRATION
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT.	ALTERNATE/ALTERNATIVE
APPROX.	APPROXIMATE
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
BEG.	BEGINNING
BLDG.	BUILDING
BLVD.	BOULEVARD
BM	BENCH MARK
BOT.	BOTTOM
CJ	CONSTRUCTION JOINT
C.	CONDUIT
C/C	CENTER TO CENTER
CONC.	CONCRETE
DEG.	DEGREES
DIA.	DIAMETER
D/S	DOWNSTREAM
E	EAST, EASTING
E/F	EACH FACE
E/W	EACH WAY
ELEC.	ELECTRIC
ELEV., EL	ELEVATION
EPA	ENVIRONMENTAL PROTECTION AGENCY
ETC	ETCETERA
EXIST.	EXISTING
FT.	FEET
GALV.	GALVANIZED
H	HIGH
HDPE	HIGH DENSITY POLYPROPYLENE
I.D.	INNER DIAMETER
IN.	INCHES
LB	POUND
L.G.	LARGE
LOC	LIMITS OF CONSTRUCTION
MAX.	MAXIMUM
MECH.	MECHANICAL
MIN.	MINIMUM
MSL	MEAN SEA LEVEL
N	NORTH, NORTHING
N/A	NOT APPLICABLE
NO.	NUMBER
NOI	NOTICE OF INTENT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTER DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P.L.	PLATE
P.T.	POINT
PSI	POUNDS PER SQUARE INCH
PP	POWER POLE
RB	ROCK BERM
RECT.	RECTANGULAR
REINF.	REINFORCED/REINFORCEMENT
R.O.W.	RIGHT OF WAY
SCH.	SCHEDULE
SHT.	SHEET
SF	SILT FENCE
S.S.	STAINLESS STEEL
STA.	STATION
SQ	SQUARE
SQFT	SQUARE FEET
T&B	TOP AND BOTTOM
T.O.	TOP OF
TYP.	TYPICAL
USACE	UNITED STATES ARMY CORP OF ENGINEERS
U/S	UPSTREAM
W	WIDE
W/	WITH
WW	WASTE WATER

DRAWING INDEX

SHEET NO.	DESCRIPTION
	COVER
1	DRAWING INDEX, SYMBOLS, AND ABBREVIATIONS
2	GENERAL NOTES
3	ACCESS AND SURVEY CONTROL (EXISTING CONDITIONS)
4	SITE IMPROVEMENTS PLAN VIEW AND WORK ITEMS
5	BANK STABILIZATION PLAN AND ELEVATION STA. 14+50 TO 12+00
6	BANK STABILIZATION PLAN AND ELEVATION STA. 12+00 TO 9+50
7	BANK STABILIZATION SCHEDULE AND TYPICAL SECTION
8	BANK STABILIZATION SECTIONS (A-D)
9	BANK STABILIZATION SECTIONS (E-H)
10	BANK STABILIZATION SECTIONS (I-L)
11	BANK STABILIZATION SECTIONS (M-N) AND MISC. STRUCTURAL DETAILS
12	SWALE DETAILS
13	RIPARIAN ZONE RESTORATION PLAN AND REPLANTING SCHEDULE
14	UPSTREAM TOE PROTECTION DETAILS
15	ENVIRONMENTAL CONTROLS

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CITY OF NEW BRAUNFELS, TEXAS
COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION

GENERAL
DRAWING INDEX, SYMBOLS, AND ABBREVIATIONS

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED MLB
DRAWN CJG
REVISED CJG/NO
CHECKED MLB
FILE NAME GN-ALL-INDEX.dwg

NO. | REVISION | BY | DATE

VERIFY SCALE 0 1 — Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET 1

SEQ. 2 OF 16

RECORD DRAWING

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GENERAL NOTES

1. ALL PHASES OF WORK UNDER THIS CONTRACT SHALL BE WITH STRICT ADHERENCE TO THE CODE OF ORDINANCES FOR THE CITY OF NEW BRAUNFELS, TEXAS, AND THE ACCOMPANYING SPECIFICATIONS. WHERE DIFFERENCES OCCUR BETWEEN THESE DOCUMENTS, THE MORE STRINGENT REQUIREMENT SHALL APPLY. FINAL DECISIONS OR JUDGMENTS ON INTERPRETATION OF THE SPECIFICATIONS AND/OR ON MATTERS NOT SPECIFICALLY COVERED BY THE ABOVE DOCUMENTS SHALL BE MADE BY THE DIRECTOR OF PUBLIC WORKS.

2. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO THE START OF CONSTRUCTION TO DETERMINE THE LOCATION OF EXISTING UTILITIES. THE CONTRACTOR SHALL NOTIFY THE UTILITIES AT LEAST 48 HOURS AND NOT MORE THAN 14 DAYS PRIOR TO START OF EXCAVATION OPERATIONS.

NEW BRAUNFELS UTILITES (SEWER, WATER, AND ELECTRIC)	(830) 629-8400
TIME WARNER CABLE	(830) 500-5706
CENTERPOINT ENERGY	(800) 545-6005
AT&T	(830) 303-1333
CITY PUBLIC WORKS	(830) 221-4020
TEXAS ONE CALL	811

3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY LOCATIONS AND SIZES OF ALL UTILITIES, INCLUDING ELECTRICAL AND COMMUNICATIONS DUCT BANKS.

4. IF, DURING ANY CONSTRUCTION ACTIVITIES, ARTIFACTS OR ITEMS ARE DISCOVERED WHICH MAY BE ANTIQUITIES OR OTHERWISE HAVE HISTORICAL OR CULTURAL VALUE UNDER APPLICABLE FEDERAL AND/OR STATE LAWS REGULATING ANTIQUITIES, CEASE ALL WORK IMMEDIATELY AND NOTIFY THE OWNER AND ENGINEER.

5. THE CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNERS AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTIONS WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING FROM LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.

6. 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 SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO DEVELOP THE CONTRACTOR'S PLANS TO IMPLEMENT THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S PLANS SHALL PROVIDE FOR ADEQUATE TRENCH SAFETY SYSTEMS THAT COMPLY WITH, AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL DEVELOP AND IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS WHICH GOVERNS THE PRESENCE OF ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

7. THE CONTRACTOR'S PERSONNEL SHALL BE WEARING IDENTIFYING CLOTHING OR HATS AT ALL TIMES.

8. CONTRACTOR ACTIVITIES SHALL OCCUR DURING NORMAL WORK HOURS PER GENERAL CONDITIONS. WORK OUTSIDE NORMAL HOURS IS ALLOWED ONLY WITH WRITTEN CONSENT OF OWNER.

9. NO ADDITIONAL PAYMENT SHALL BE MADE FOR ROCK, SAND, GRAVEL, OR OTHER UNSTABLE CONDITIONS ENCOUNTERED IN ANY WORK IMPLIED BY THESE DRAWINGS.

10. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION ANY DAMAGES DONE TO EXISTING INFRASTRUCTURE WHETHER PUBLIC OR PRIVATE, THAT IS TO REMAIN. NO ADDITIONAL PAYMENT WILL BE MADE FOR THESE REPAIRS.

11. CONTRACTOR SHALL CONTACT THE CONSTRUCTION INSPECTION DEPARTMENT AT THE CITY OF NEW BRAUNFELS, 830-221-4020, AT LEAST 24 HOURS PRIOR TO BEGINNING WORK FOR WHICH THE INSPECTION IS DESIRED.

12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS FOR THE SUPPORT AND PROTECTION OF ALL UTILITY POLES, GAS MAINS, TELEPHONE CABLES, SANITARY SEWER LINES, WATER LINES, ELECTRIC CABLES, DRAINAGE PIPES, ABOVE AND BELOW GROUND DURING CONSTRUCTION. THE CONTRACTOR IS LIABLE FOR ALL DAMAGE DONE TO SUCH EXISTING FACILITIES AS A RESULT OF THE CONTRACTOR'S OPERATION.

13. IN THE EVENT OF DAMAGE TO UNDERGROUND FACILITIES, WHETHER SHOWN OR NOT IN THE DRAWINGS, THE CONTRACTOR SHALL MAKE NECESSARY REPAIRS TO RESTORE THE FACILITY BACK IN SERVICE AND AT NO COST TO THE CITY. REPAIRS SHALL CONFORM TO THE REQUIREMENTS OF THE UTILITY OR AGENCY SERVICING THE FACILITY.

14. TREES, TREE LIMBS, AND SHRUBS WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION ACTIVITIES MAY BE REMOVED OR NEATLY TRIMMED BY THE CONTRACTOR ONLY AFTER APPROVAL FROM THE CITY ARBORIST THROUGH THE INSPECTOR. TREES AND SHRUBS WILL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR. ALL LIMBS AND BRANCHES SHALL BE REMOVED FROM THE PROJECT BY THE CONTRACTOR.

15. THE CONTRACTOR SHALL REMOVE FROM THE PROJECT AREA ALL SURPLUS MATERIAL. THIS SHALL BE INCIDENTAL AND NOT A SEPARATE PAY ITEM. SURPLUS MATERIALS FROM EXCAVATION, INCLUDING DIRT, CONCRETE TRASH, ETC., SHALL BE PROPERLY DISPOSED OF AT A SITE APPROVED BY THE CITY.

16. CONTRACTOR SHALL SECURE ALL PERMITS REQUIRED FOR CONSTRUCTION AND SHALL NOTIFY RESPECTIVE GOVERNMENTAL OR UTILITY AGENCIES AFFECTED BY CONSTRUCTION PRIOR TO THE BEGINNING OF CONSTRUCTION. CONTRACTOR SHALL COMPLY WITH EXISTING USACE PERMIT # SWF-2012-00240.

17. CONTRACTOR IS REQUIRED TO VERIFY PROJECT ELEVATIONS AND PROJECT SURVEY CONTROLS.

18. NO EXCESS EXCAVATED MATERIAL SHALL BE DEPOSITED IN LOW AREAS OR ALONG NATURAL DRAINAGE WAYS WITHOUT WRITTEN PERMISSION FROM THE CITY. IF THE CONTRACTOR PLACES EXCESS MATERIAL IN THE AREAS WITHOUT WRITTEN PERMISSION, HE WILL BE RESPONSIBLE FOR ALL DAMAGE RESULTING FROM SUCH FILL, AND HE SHALL REMOVE THE MATERIAL AT HIS OWN COST IF THE CITY SO DIRECTS. CONTRACTOR SHALL AT NO TIME ALLOW SEDIMENT AND STORM WATER RUNOFF FROM DISTURBED AREAS TO BE TRANSPORTED ONTO ADJACENT PROPERTY. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICES DURING CONSTRUCTION.

19. NO EXTRA PAY SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS BUT NOT INCLUDED ON THE BID PROPOSAL. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED IN THE PAY ITEM TO WHICH IT RELATES.

20. NO EQUIPMENT OR MATERIAL SHALL BE DEPOSITED ON PRIVATE PROPERTY WITHOUT WRITTEN PERMISSION FROM THE PROPERTY OWNER. IF THE CONTRACTOR PLACES EXCESS MATERIAL OR EQUIPMENT IN THE AREA WITHOUT WRITTEN PERMISSION, HE WILL BE RESPONSIBLE FOR ALL DAMAGES RESULTING FROM SUCH EQUIPMENT OR MATERIAL, AND HE SHALL REMOVE THE EQUIPMENT OR MATERIAL AT HIS OWN COST.

21. BLASTING IS NOT PERMITTED ON THIS PROJECT.

22. THESE PLANS DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR ITS EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK.

23. THE CONTRACTOR SHALL CLEAN UP AND RESTORE THE AREA OF OPERATIONS TO A CONDITION AS GOOD OR BETTER THAN WHAT EXISTED PRIOR TO CONSTRUCTION. CITY SHALL DETERMINE IF CLEANUP IS "AS GOOD OR BETTER."

24. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING NOTICE OF INTENT, SUBMITTING NOTICE OF TERMINATION, IMPLEMENTING A STORM WATER POLLUTION PREVENT PLAN, AND MEETING ALL TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMITTING REQUIREMENTS. THE EROSION CONTROL PLAN SHEETS SHOWN IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY.

25. CONTRACTOR SHALL PROVIDE MEASURES TO PREVENT AIRBORNE POLLUTION (DUST), BY PROVIDING WATER OR OTHER MEASURES APPROVED BY CITY OR CITY'S REPRESENTATIVE, AT NO ADDITIONAL COST AND SHALL BE CONSIDERED SUBSIDIARY TO THE COST OF THE PROJECT.

26. STAGING AREAS SHOWN ON THE PLANS ARE FOR GUIDANCE ONLY. CONTRACTOR SHALL SUBMIT WRITTEN REQUEST TO THE CITY OR CITY'S REPRESENTATIVE FOR APPROVAL OF ALL HAUL ROUTES, STAGING AREAS, MOBILIZATION, EQUIPMENT, AND MATERIAL STORAGE AND GENERAL PROJECT CONSTRUCTION MANAGEMENT.

27. THE CONTRACTOR'S HAUL ROUTE AND STAGING AREA SHALL BE APPROVED BY THE CITY AND UTILIZED WITHOUT DEVIATION DURING CONSTRUCTION, AND SHALL BE MAINTAINED AND LEFT IN CONDITION EQUAL TO OR BETTER THAN ITS CURRENT CONDITIONS AS DETERMINED BY THE CITY.

28. CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING THEIR STAGING AREA. THE CITY SHALL NOT BE RESPONSIBLE TO COMPENSATE THE CONTRACTOR FOR ANY LOSS OR DAMAGES TO THE CONTRACTOR'S EQUIPMENT AND STORED MATERIALS.

29. IT IS THE INTENT OF THE PLANS AND SPECIFICATIONS TO DESCRIBE THE NECESSARY EQUIPMENT AND WORK PROCEDURE. IF THE PLANS OR SPECIFICATIONS FAIL TO INCLUDE ANY NECESSARY COMPONENT OR WORK PROCEDURE TO OBTAIN A COMPLETE AND WORKABLE SYSTEM, THEN THE CONTRACTOR SHALL NOTIFY THE OWNER OF FAILURES OF PLANS OR SPECIFICATIONS PRIOR TO PROVIDING A WORKABLE SYSTEM.

30. CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING PHOTOGRAPHS OF ALL STAGING AREAS AND HAUL ROUTES PRIOR TO STORING MATERIALS OR USING AREAS FOR CONSTRUCTION ACTIVITIES, AND PROVIDING A CD OR USB DRIVE TO THE CITY OF NEW BRAUNFELS IN JPEG, TIF, OR PNG FORMAT OF THESE AREAS.

31. HYDRO-MULCH SEED/SOD SHALL BE FURNISHED TO ESTABLISH GROUND COVER OVER ALL DISTURBED AREAS AS AN EROSION CONTROL AND SITE RESTORATION MEASURE. THE CONTRACTOR SHALL NOT WAIT UNTIL COMPLETION OF THE ENTIRE PROJECT BEFORE PERFORMING THIS WORK. THE PROJECT SHALL NOT BE CONSIDERED FOR ACCEPTANCE BY THE CITY UNTIL ESTABLISHMENT OF 70% GROUND COVER IS ENSURED. SEED MIXTURE SHALL BE AS SPECIFIED FOR APPROPRIATE PLANTING SEASON.

32. ONCE CONSTRUCTION IS ACCEPTED AS COMPLETE, THE CITY SHALL BE RESPONSIBLE FOR MAINTAINING VEGETATION WITHIN THE DISTURBED AREAS OF THE PROJECT LIMITS. CONTRACTOR SHALL WARRANTY VEGETATION FOR 1 YEAR.

33. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL PLAN TO THE CITY TRAFFIC ENGINEER FOR APPROVAL PRIOR TO THE CONSTRUCTION OF THE PROJECT CONSISTENT WITH THE PROVISIONS SET FORTH IN THE "2006 TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL; DEVICES FOR STREETS AND HIGHWAYS" ISSUED UNDER THE AUTHORITY OF THE "STATE OF TEXAS UNIFORM ACT REGULATING TRAFFIC ON HIGHWAYS", CODIFIED AS ARTICLE 6701D VERNON'S CIVIL STATUES (SECTIONS 27, 29, 30, AND 31).

34. ALL BARRICADES, WARNING SIGNS, LIGHT DEVICES, ETC. FOR THE GUIDANCE AND PROTECTION OF TRAFFIC AND PEDESTRIANS MUST CONFORM TO THE INSTALLATION SHOWN IN THE 2006 TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

35. NOT ALL VEGETATION REQUIRED TO BE REMOVED FOR CONSTRUCTION IS SHOWN ON THE PLANS. THE SCOPE OF THE SURVEY WAS LIMITED TO SIGNIFICANT TREE SPECIES. CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL OTHER VEGETATION, SHRUBS, TREES, TREE STUMPS, AND BUSHES NOT SHOWN ON THE PLANS AS NECESSARY TO CONSTRUCT THE PROJECT AT NO ADDITIONAL COST TO THE CITY OF NEW BRAUNFELS.

36. CONTRACTOR SHALL NOTIFY THE OWNER OF DISCREPANCIES BETWEEN THE SITE CONDITIONS AND THESE CONSTRUCTION DOCUMENTS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATIONS.

37. ANY CONFLICTS BETWEEN THE CONTRACT DRAWINGS AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER. THE OWNER RESERVES THE RIGHT TO MAKE APPROPRIATE DECISION WITHOUT ANY EXTRA COST TO THE PROJECT.

38. THE CONTRACTOR SHALL PROVIDE THE CITY AN EMERGENCY TELEPHONE NUMBER FOR EVENINGS, WEEKENDS, AND HOLIDAYS BY THE FIRST WORKING DAY FOR THE PROJECT. THE CONTRACTOR SHALL RESPOND TO THE CITY STAFF WITHIN TWO HOURS OF THE INITIAL CONTACT.

39. THE CONTRACTOR SHALL NOT INTENTIONALLY PROCEED WITH CONSTRUCTION AS DESIGNED WHEN IT IS OBVIOUS THAT UNKNOWN OBSTRUCTION AND/OR GRADE DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN/CONSIDERED DURING DESIGN. SUCH CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATION.

40. NO ACTIVITY OUTSIDE THE DESIGNATED LIMITS OF CONSTRUCTION SHALL BE PERMITTED WITHOUT WRITTEN CONSENT FROM THE OWNER.

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CITY OF NEW BRAUNFELS, TEXAS
COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION

GENERAL

GENERAL NOTES

FN JOB NO.	NEB 13133
DATE	12/14/2016
DESIGNED	MLB
DRAWN	CJG
REVISED	CJG/NO
CHECKED	MLB
FILE NAME	GN-ALL-INDEX.dwg

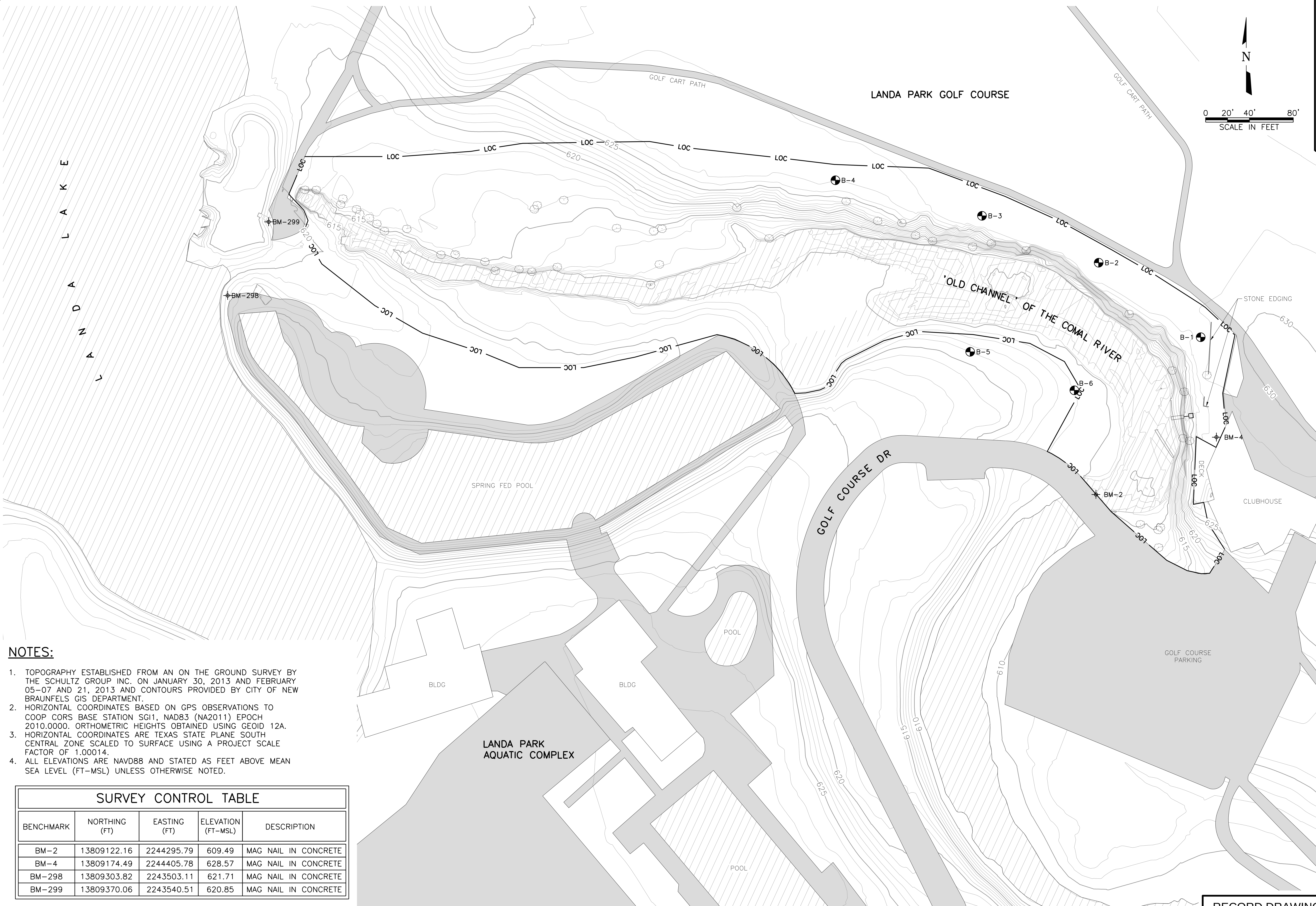
NO.	REVISION	BY	DATE

VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET 2

SEQ. 3 OF 16

RECORD DRAWING



NOTES:

1. TOPOGRAPHY ESTABLISHED FROM AN ON THE GROUND SURVEY BY THE SCHULTZ GROUP INC. ON JANUARY 30, 2013 AND FEBRUARY 05-07 AND 21, 2013 AND CONTOURS PROVIDED BY CITY OF NEW BRAUNFELS GIS DEPARTMENT.
2. HORIZONTAL COORDINATES BASED ON GPS OBSERVATIONS TO COOP CORS BASE STATION SGI1, NAD83 (NA2011) EPOCH 2010.0000. ORTHOMETRIC HEIGHTS OBTAINED USING GEOID 12A.
3. HORIZONTAL COORDINATES ARE TEXAS STATE PLANE SOUTH CENTRAL ZONE SCALED TO SURFACE USING A PROJECT SCALE FACTOR OF 1.00014.
4. ALL ELEVATIONS ARE NAVD88 AND STATED AS FEET ABOVE MEAN SEA LEVEL (FT-MSL) UNLESS OTHERWISE NOTED.

SURVEY CONTROL TABLE

BENCHMARK	NORTHING (FT)	EASTING (FT)	ELEVATION (FT-MSL)	DESCRIPTION
BM-2	13809122.16	2244295.79	609.49	MAG NAIL IN CONCRETE
BM-4	13809174.49	2244405.78	628.57	MAG NAIL IN CONCRETE
BM-298	13809303.82	2243503.11	621.71	MAG NAIL IN CONCRETE
BM-299	13809370.06	2243540.51	620.85	MAG NAIL IN CONCRETE

RECORD DRAWING

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CITY OF NEW BRAUNFELS, TEXAS
COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION
CIVIL
ACCESS AND SURVEY CONTROL (EXISTING CONDITIONS)

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-PL-LAND.dwg

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SHEET 3
SEQ. 4 OF 16

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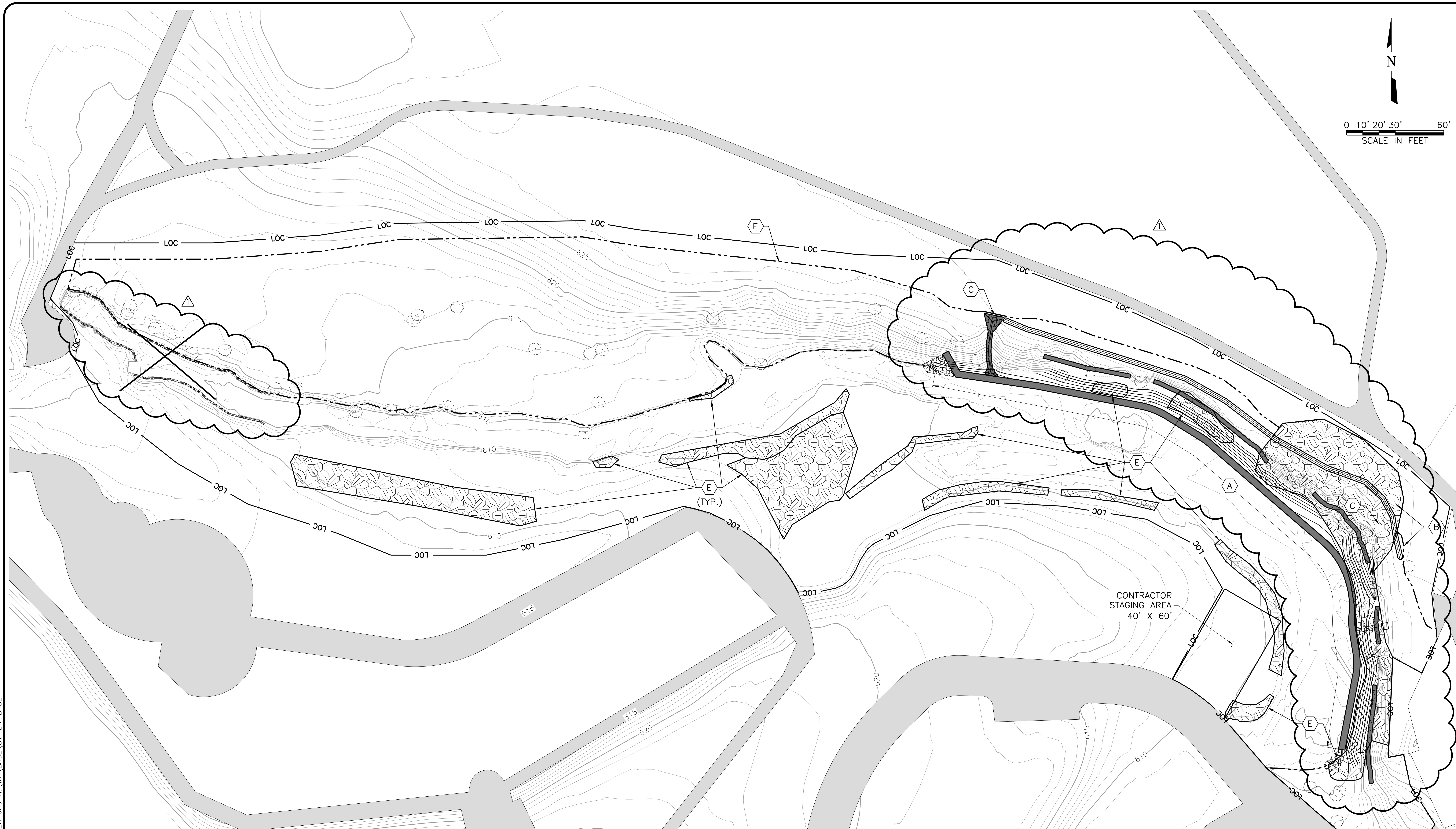

WORK ITEMS:

- (A) INSTALL TOE BLOCKS, WALERS, AND BACKFILL TO RECLAIM LEFT BANK
- (B) PROVIDE DIVERSION BERM AT SHOULDER OF LEFT BANK
- (C) INSTALL TWO GROUTED ROCK SWALES ON LEFT BANK
- ~~(D) INSTALL COIR ROLLS ON LEFT AND RIGHT BANKS~~ (revision 1)
- (E) REMOVE INVASIVE PLANT SPECIES AND REPLANT WITH NATIVE VEGETATION IN HERBS SPECIFIED
- (F) APPLY HYDRO-MULCH TO AREA OF LEFT BANK AS SHOWN AND ALL OTHER AREAS DISTURBED BY CONSTRUCTION ACTIVITIES

LEGEND:

- INVASIVE VEGETATION HERB SECTION
- COIR FIBER ROLL
- GROUTED ROCK SWALE
- EXISTING PAVING
- PROPOSED CONCRETE

Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

THE SEAL THAT ORIGINALLY APPEARED ON THIS DOCUMENT WAS AUTHORIZED BY M. LESLIE BOYD P.E. TEXAS NO: 39453 ON 5/14/2014. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION OF THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

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CITY OF NEW BRAUNFELS, TEXAS

COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION

CIVIL

SITE IMPROVEMENTS PLAN VIEW AND WORK ITEMS

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-PL-SITE01.dwg

VERIFY SCALE 0 1 Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET 4

RECORD DRAWING

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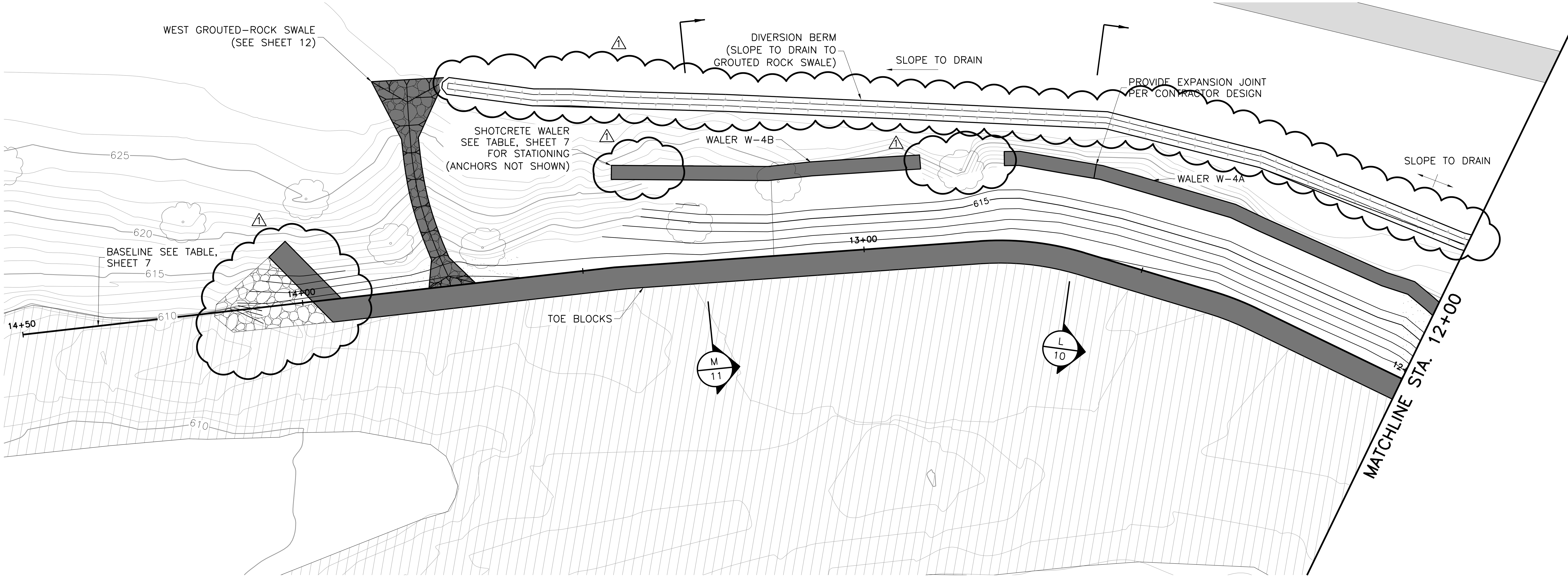
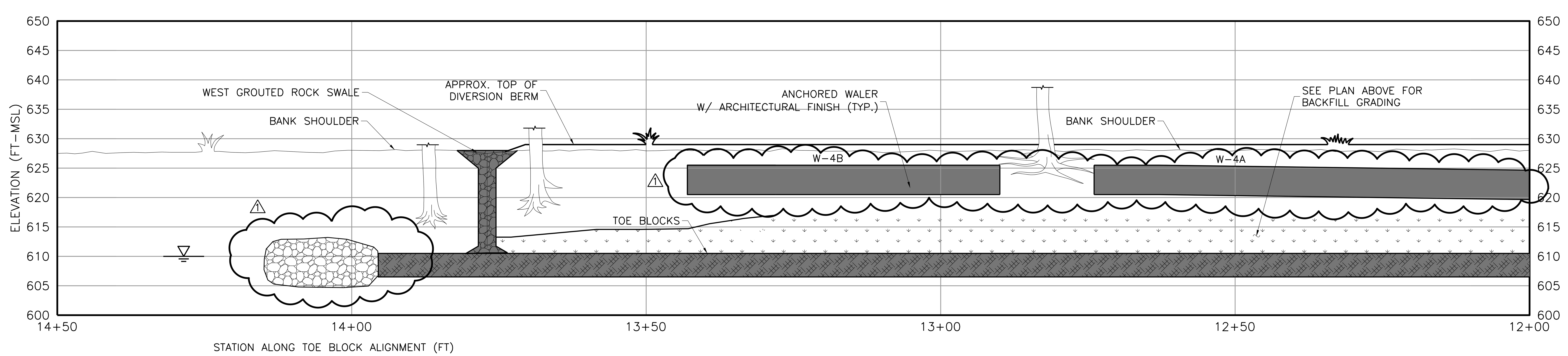
3 REFERENCE FILES: 39453, N:\STANDARD\34BORDER and N:\WR\BASE\CV-EX-BASE

Date: Dec 14, 2016 - 1:17pm User: 02462 File: N:\wr\Drawings\WR-NEB-PL-SITE01.dwg



1 BANK STABILIZATION PLAN

0 10' 20'
SCALE IN FEET



2 BANK STABILIZATION ELEVATION VIEW

0 10' 20'
SCALE IN FEET

NOTES:

1. TREES ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. SIZES, SHAPES, AND LOCATIONS OF TREES ARE APPROXIMATE. NOT ALL TREES ARE SHOWN.

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CITY OF NEW BRAUNFELS, TEXAS
COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION

CIVIL
BANK STABILIZATION PLAN AND ELEVATION STA. 14+50 TO 12+00

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-PL-SITE02.dwg

VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET 5
SEQ. 6 OF 16

RECORD DRAWING

AC4D Rel 19.0s (LMS Tech) User: 02119
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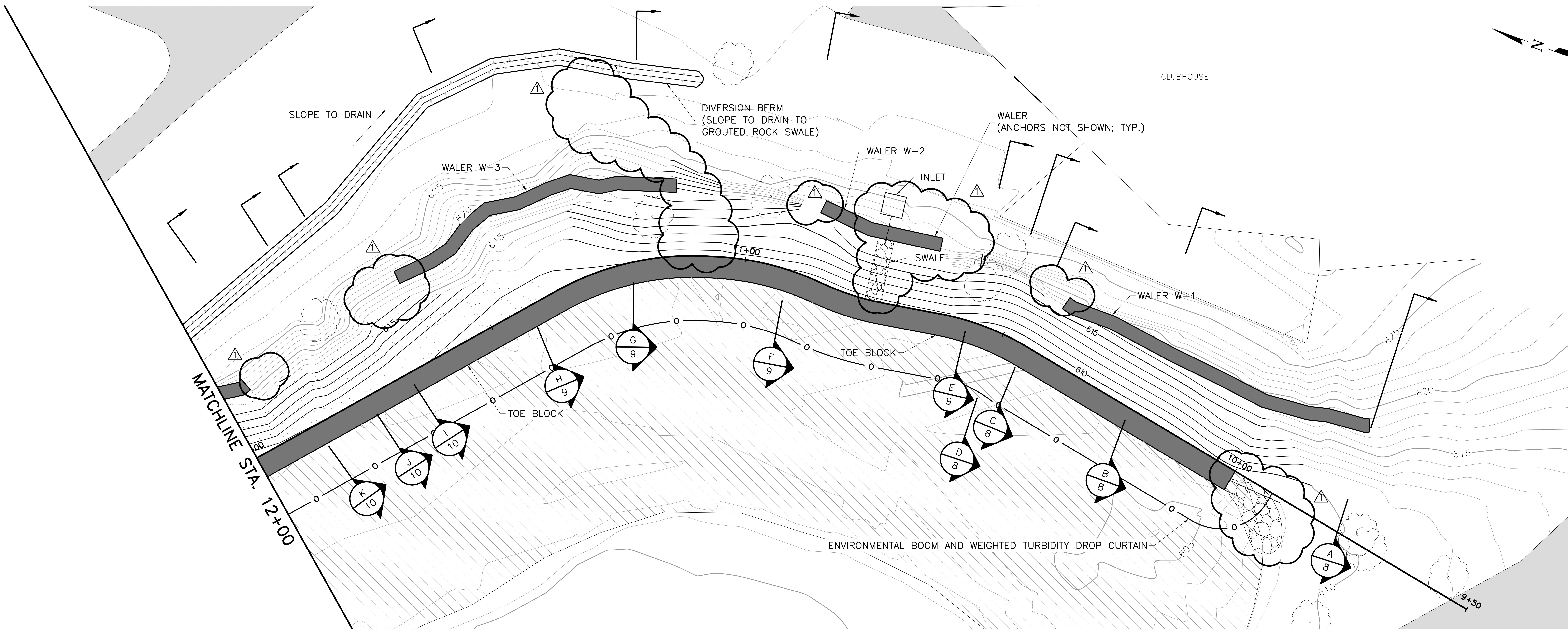
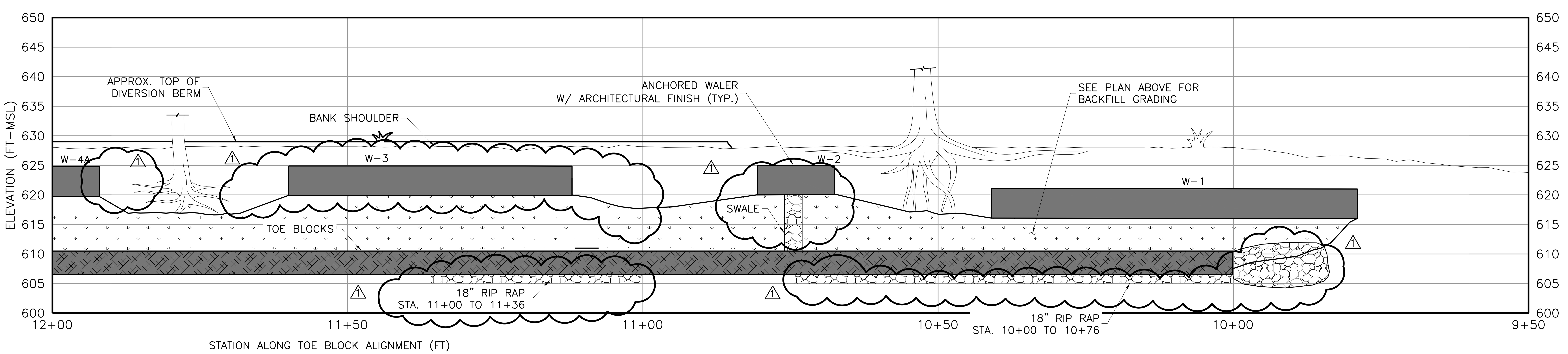
2 REFERENCE FILES: N:\STANDARD\34BORDER and N:\WR\BASE\CV-EX-BASE

Date: Dec 14, 2016 - 1:19pm User: 02462 File: N:\wr\Drawings\WR-NEB-PL-SITE02.dwg



1 BANK STABILIZATION PLAN

0 10' 20'
SCALE IN FEET



2 BANK STABILIZATION ELEVATION VIEW

0 10' 20'
SCALE IN FEET

NOTES:

1. TREES ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. SIZES, SHAPES, AND LOCATIONS OF TREES ARE APPROXIMATE. NOT ALL TREES ARE SHOWN.

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RIPARIAN ZONE RESTORATION

CIVIL
BANK STABILIZATION PLAN AND
ELEVATION STA. 12+00 TO 9+50

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

FN JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-PL-SITE02.dwg

VERIFY SCALE 0 1" Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET 6
SEQ. 7 OF 16

RECORD DRAWING

AC4D Rel 19.0s (LMS Tech) User: 02119
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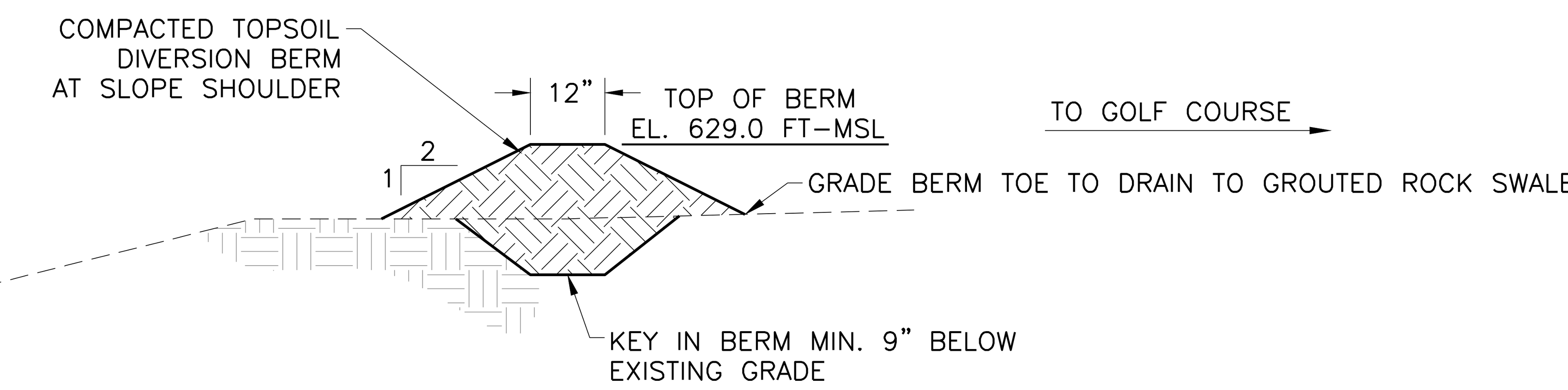

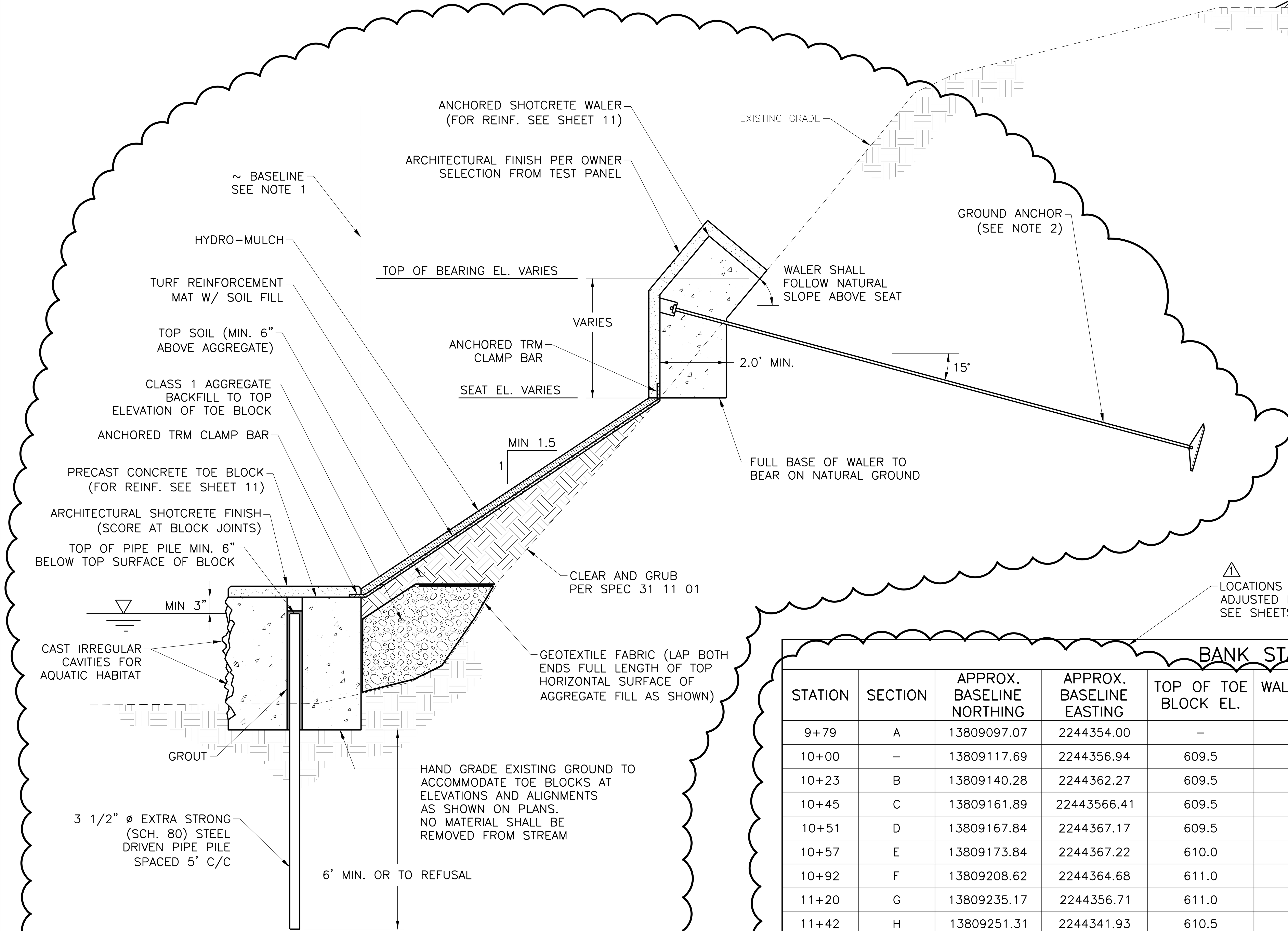

NOTES:

1. LOCATIONS LISTED AND SHOWN ARE APPROXIMATE. CONTRACTOR TO STAKE TOE BLOCK AND WALER LOCATIONS FOR APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO SELECT GROUND ANCHOR SYSTEM, TYPE, SPACING, BEARING PLATE, ANCHORAGE ETC. TO MEET LOAD REQUIREMENTS PER SPECIFICATION 03 37 19.
3. PERFORMANCE TESTING IS REQUIRED FOR FIRST GROUND ANCHOR AND 10% OF SUBSEQUENT ANCHORS AS SELECTED BY ENGINEER PER SPECIFICATION 03 37 19.
4. ALL GROUND ANCHORS NOT SUBJECT TO PERFORMANCE TESTING SHALL BE PROOF TESTED PER SPEC. 03 37 19.
5. CONTRACTOR SHALL PREPARE TEST PANEL OF ARCHITECTURAL TREATMENT FOR WALERS AND TOE BLOCKS FOR OWNER EVALUATION PRIOR TO PRODUCTION INSTALLATION.
6. OWNER WILL DESIGNATE AND MARK TREES TO REMAIN.

⚠ LOCATIONS AND ELEVATIONS WERE ADJUSTED IN THE FIELD. SEE SHEETS 5-6 AND 8-11.

BANK STABILIZATION SCHEDULE

STATION	SECTION	APPROX. BASELINE NORTHING	APPROX. BASELINE EASTING	TOP OF TOE BLOCK EL.	WALER SEAT EL.	TOP OF WALER BEARING EL.	NOTES
9+79	A	13809097.07	2244354.00	–	617.0	619.0	START OF W-1
10+00	–	13809117.69	2244356.94	609.5	617.0	620.0	START OF TOE BLOCK
10+23	B	13809140.28	2244362.27	609.5	617.0	620.0	
10+45	C	13809161.89	22443566.41	609.5	616.0	621.0	END OF W-1
10+51	D	13809167.84	2244367.17	609.5	–	–	NO WALER TO ACCOMODATE TREE AND ROOTS
10+57	E	13809173.84	2244367.22	610.0	617.0	621.4	START OF W-2
10+92	F	13809208.62	2244364.68	611.0	616.0	621.0	END OF W-2
11+20	G	13809235.17	2244356.71	611.0	616.0	620.0	START OF W-3
11+42	H	13809251.31	2244341.93	610.5	617.0	621.0	
11+68	I	13809268.32	2244322.27	611.0	617.0	621.0	END OF W-3
11+77	J	13809274.21	2244315.46	611.0	–	–	NO WALER TO ACCOMODATE TREE AND ROOTS
11+88	K	13809281.40	2244307.14	610.5	617.0	621.0	START OF W-4
12+63	L	13809326.52	2244247.50	611.5	617.0	621.0	
13+28	M	13809341.32	2244184.44	611.5	617.0	620.0	END OF W-4
13+77	–	13809349.25	2244136.09	611.0	–	–	APPROX. ℄ OF WEST SWALE AND END OF DIVERSION BERM
14+07	N	13809353.69	2244106.42	610.5	–	–	END OF TOE BLOCK

(1) TYPICAL BANK STABILIZATION SECTION

0 1' 2' 4'
1/2"=1'-0"

⚠ REVISED. SEE FIELD ORDER 001

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COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION
CIVIL
BANK STABILIZATION SCHEDULE AND TYPICAL SECTION

NO.	REVISION	BY	DATE
⚠	RECORD DRAWINGS	GH	12/8/16

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-XS-EMBK01.dwg

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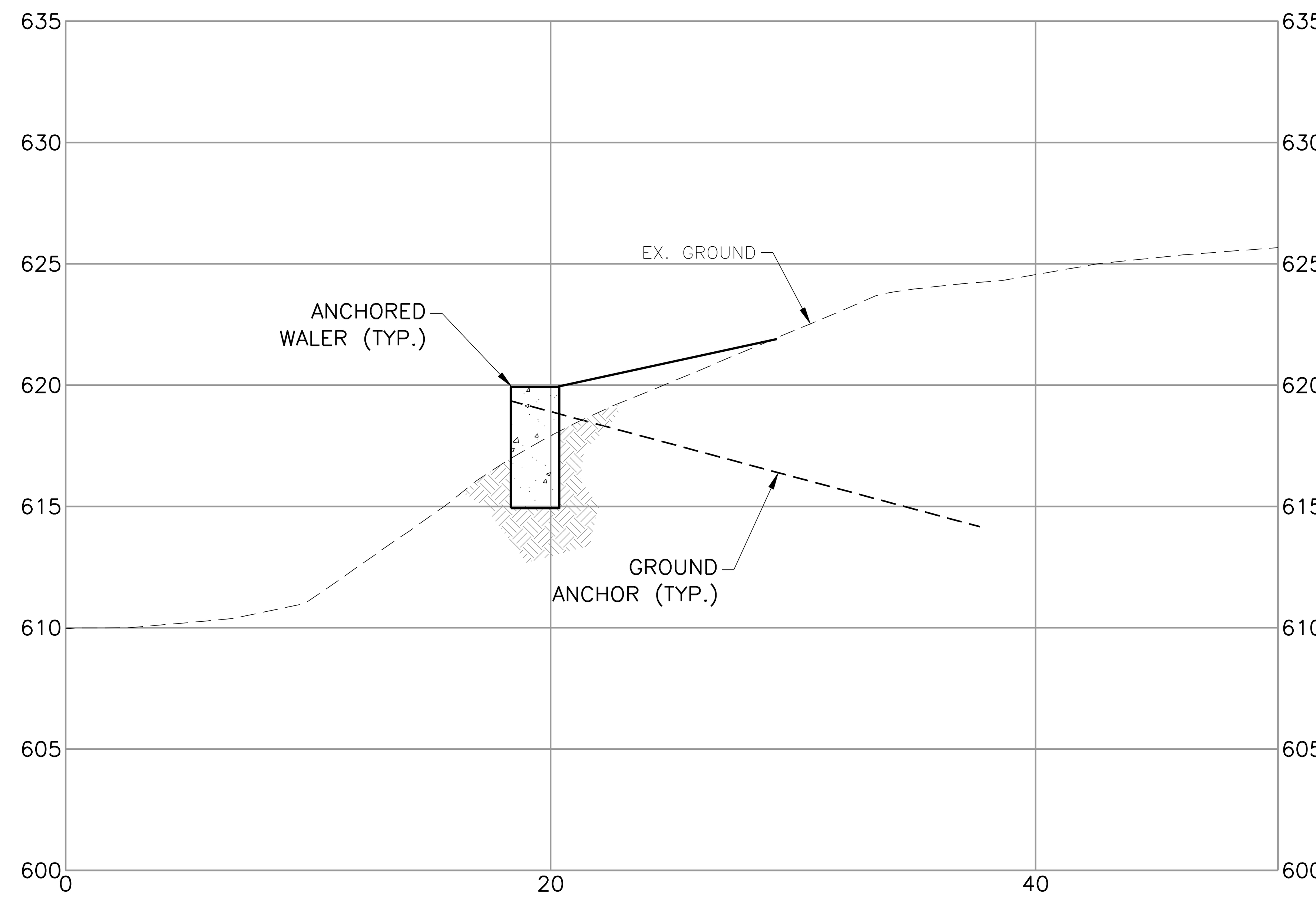
RECORD DRAWING

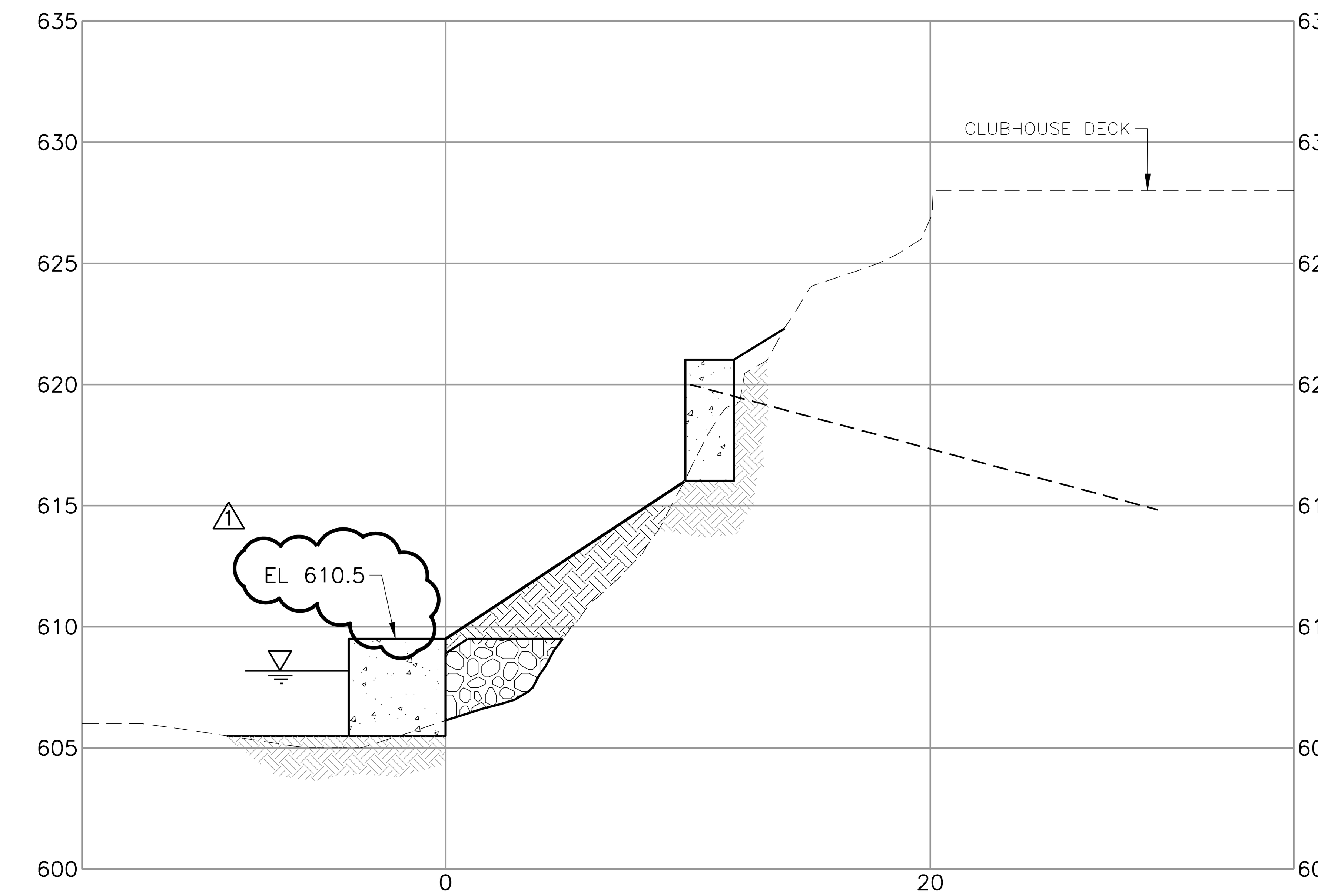
SHEET 7
SEQ. 8 OF 16

Date: Dec 14, 2016 – 1:20pm User: 02462 File: N:\wr\Drawings\WR-NEB-XS-EMBK01.dwg



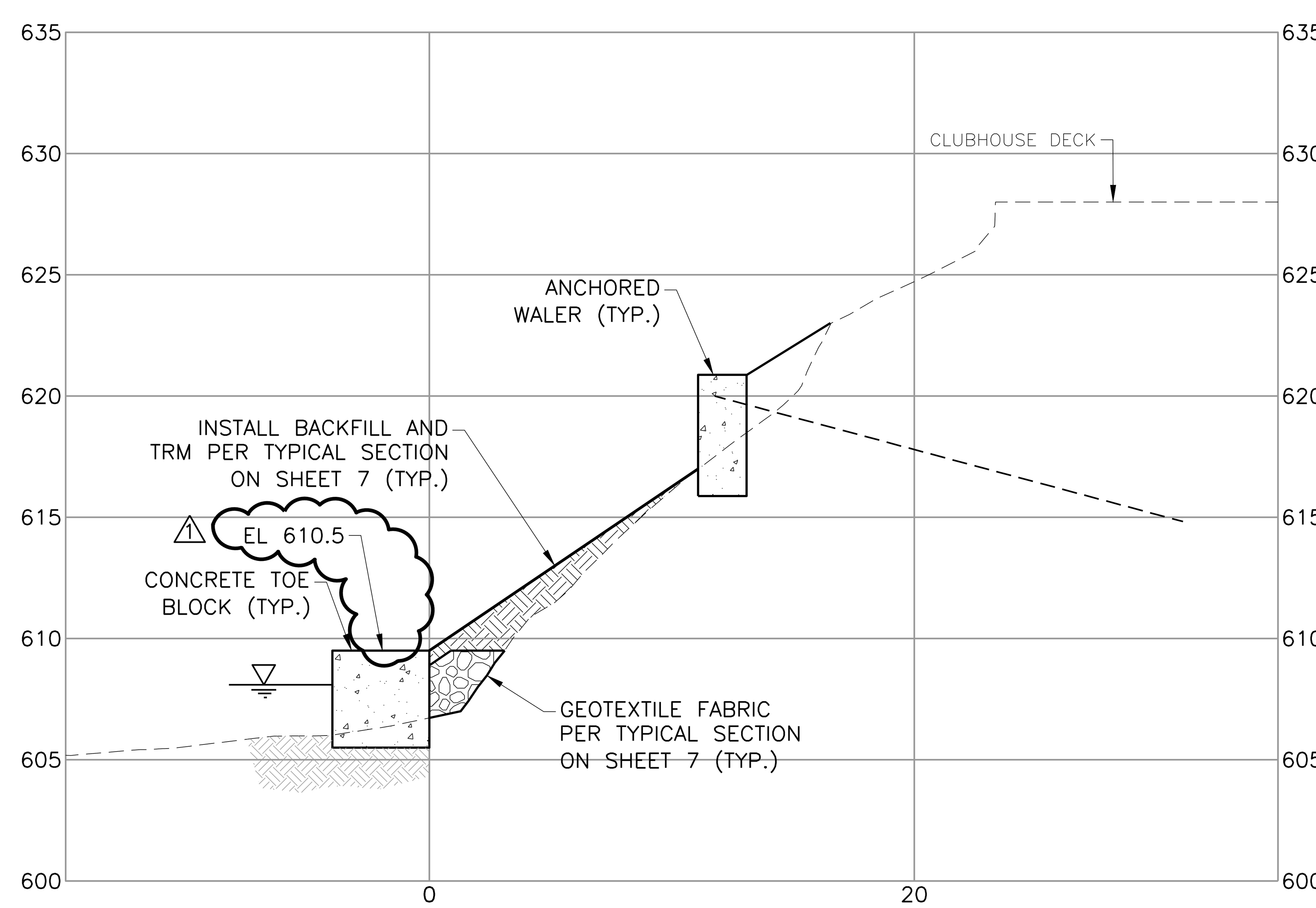
A/6 SECTION A

0 5' 10'
SCALE IN FEET



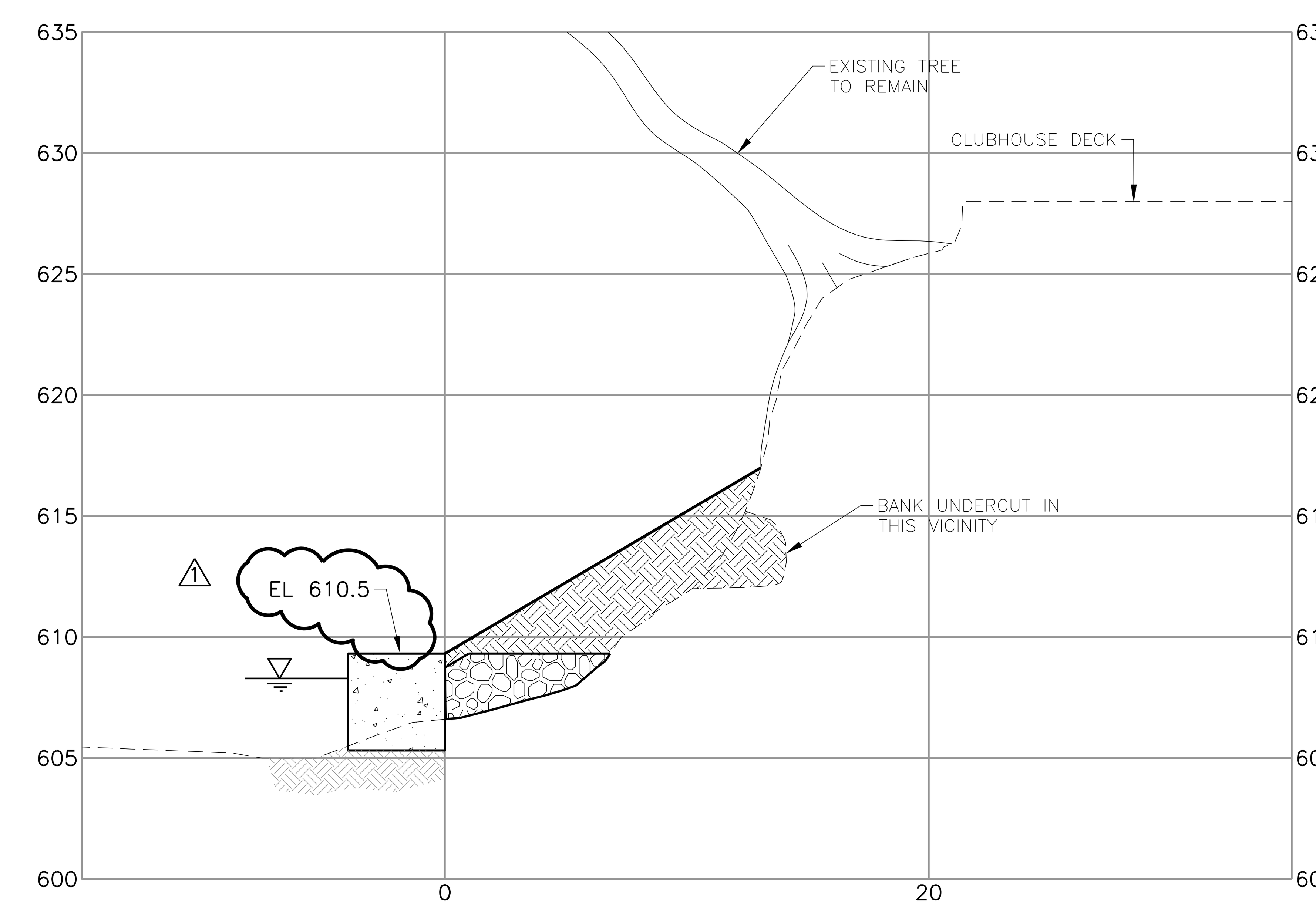
C/6 SECTION C

0 5' 10'
SCALE IN FEET



B/6 SECTION B

0 5' 10'
SCALE IN FEET



D/6 SECTION D

0 5' 10'
SCALE IN FEET

⚠ NOTE:
TOE BLOCK AND WALER LOCATIONS WERE FIELD ADJUSTED. SECTIONS MAY NOT BE ACCURATE.

RECORD DRAWING

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COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION
CIVIL
BANK STABILIZATION SECTIONS (A-D)

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-XS-EMBK01.dwg

VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET 8
SEQ. 9 OF 16

AcAD Rel 19.0s (LMS Tech) User: 02119
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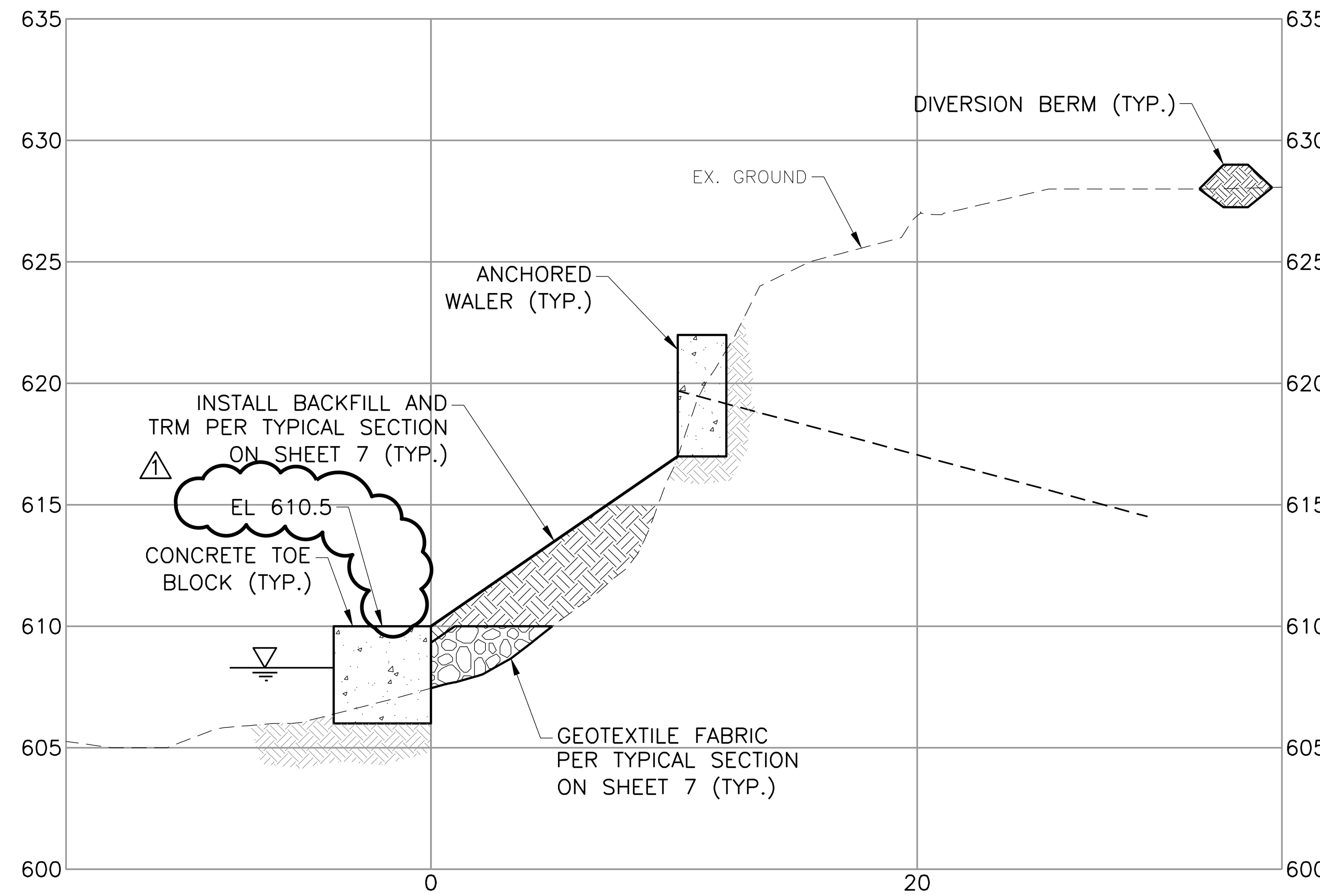
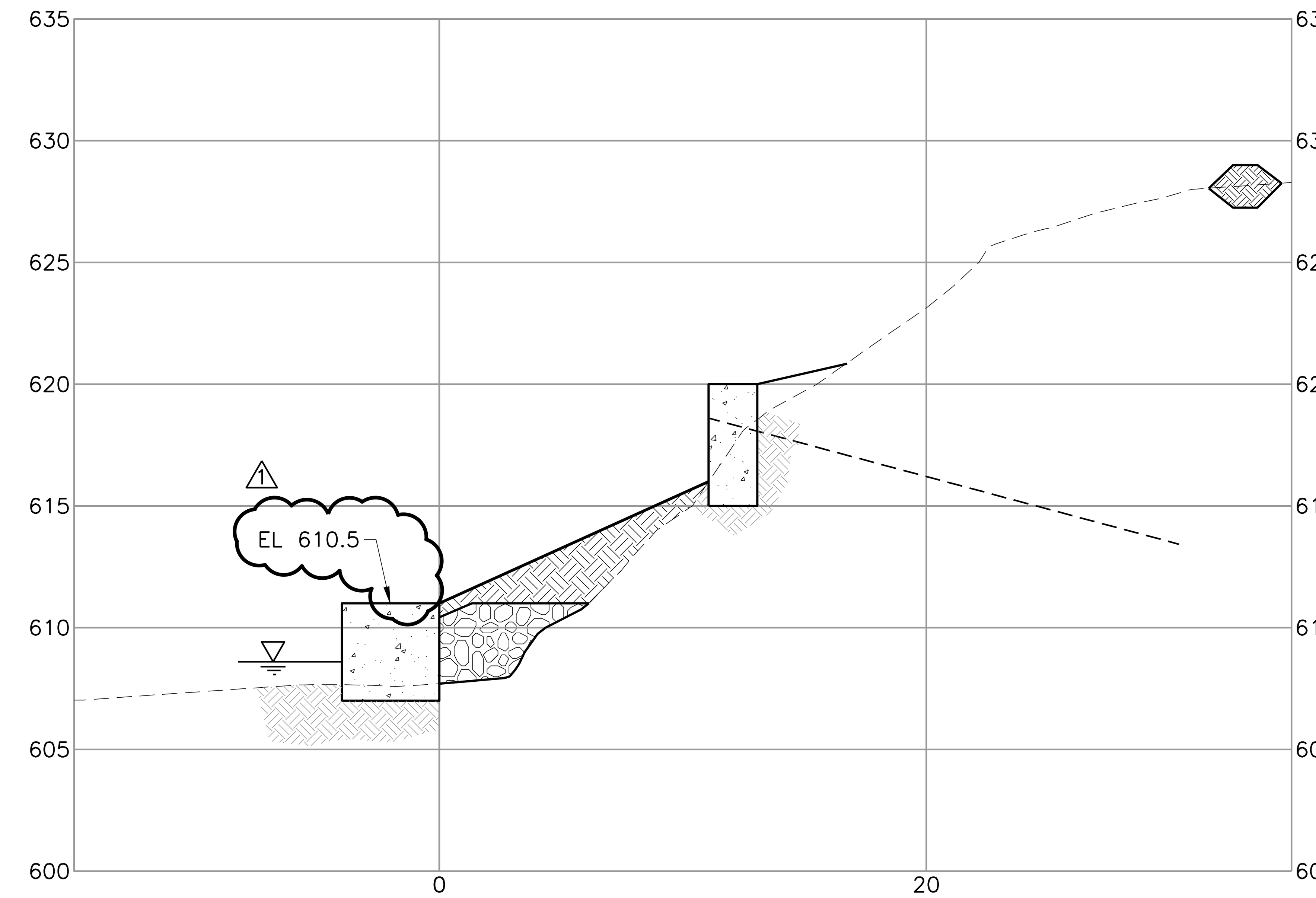


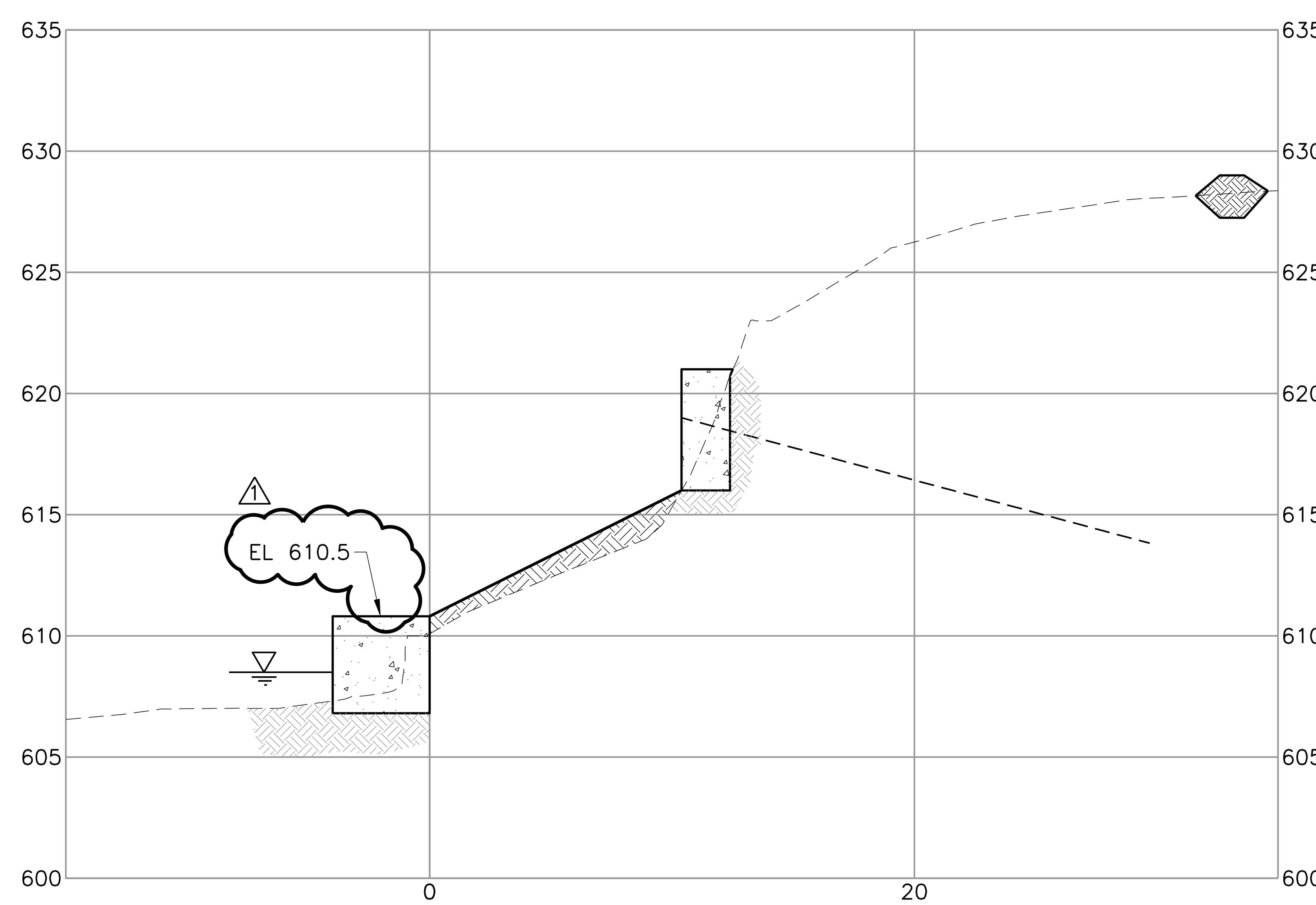
E/6 SECTION E

0 5' 10'
SCALE IN FEET



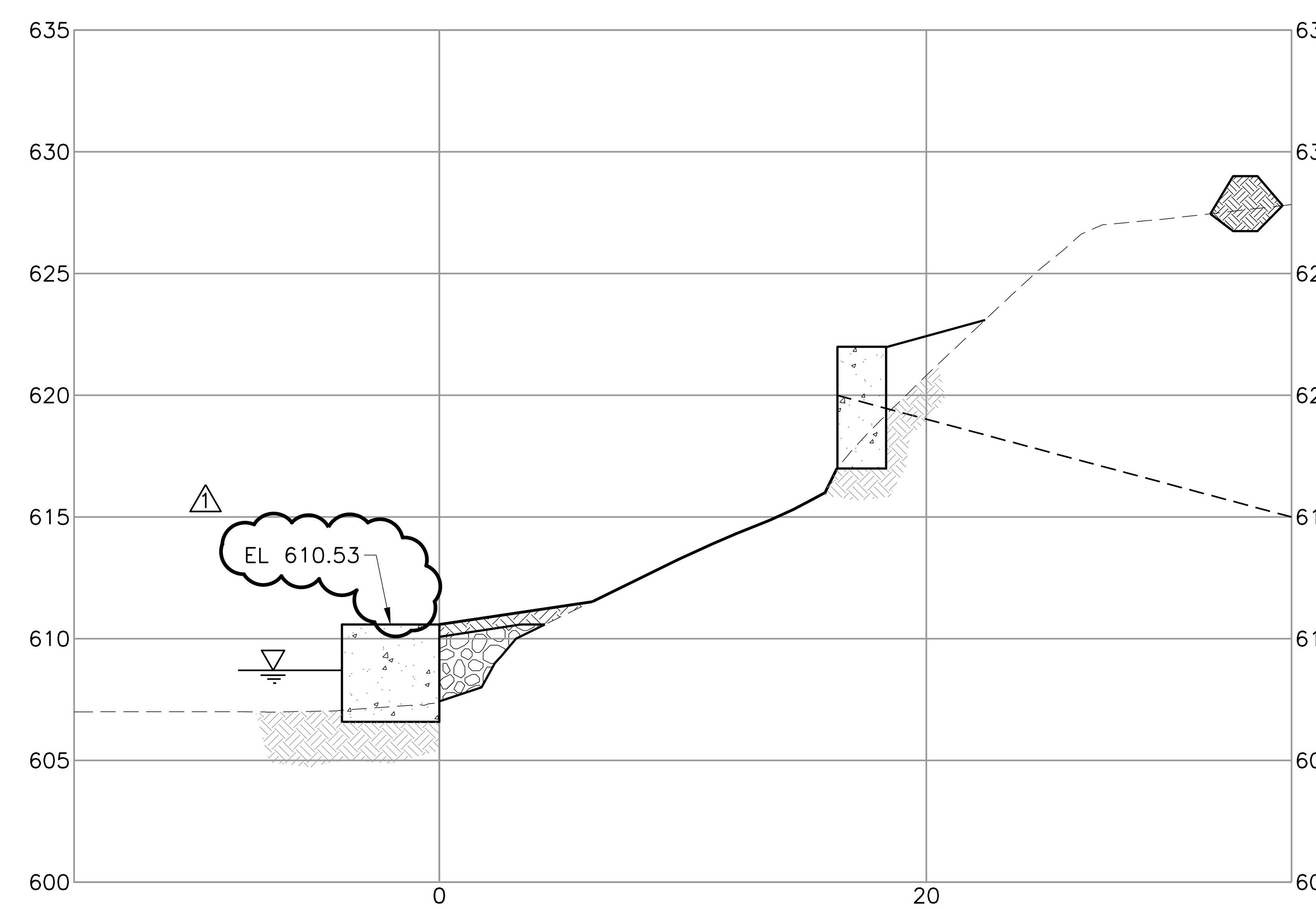
G/6 SECTION G

0 5' 10'
SCALE IN FEET



F/6 SECTION F

0 5' 10'
SCALE IN FEET



H/6 SECTION H

0 5' 10'
SCALE IN FEET

⚠ NOTE:
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COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION

CIVIL

BANK STABILIZATION SECTIONS (E–H)

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR–NEB–XS–EMBK01.dwg

VERIFY SCALE 0 1 Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET 9

SEQ. 10 OF 16

RECORD DRAWING

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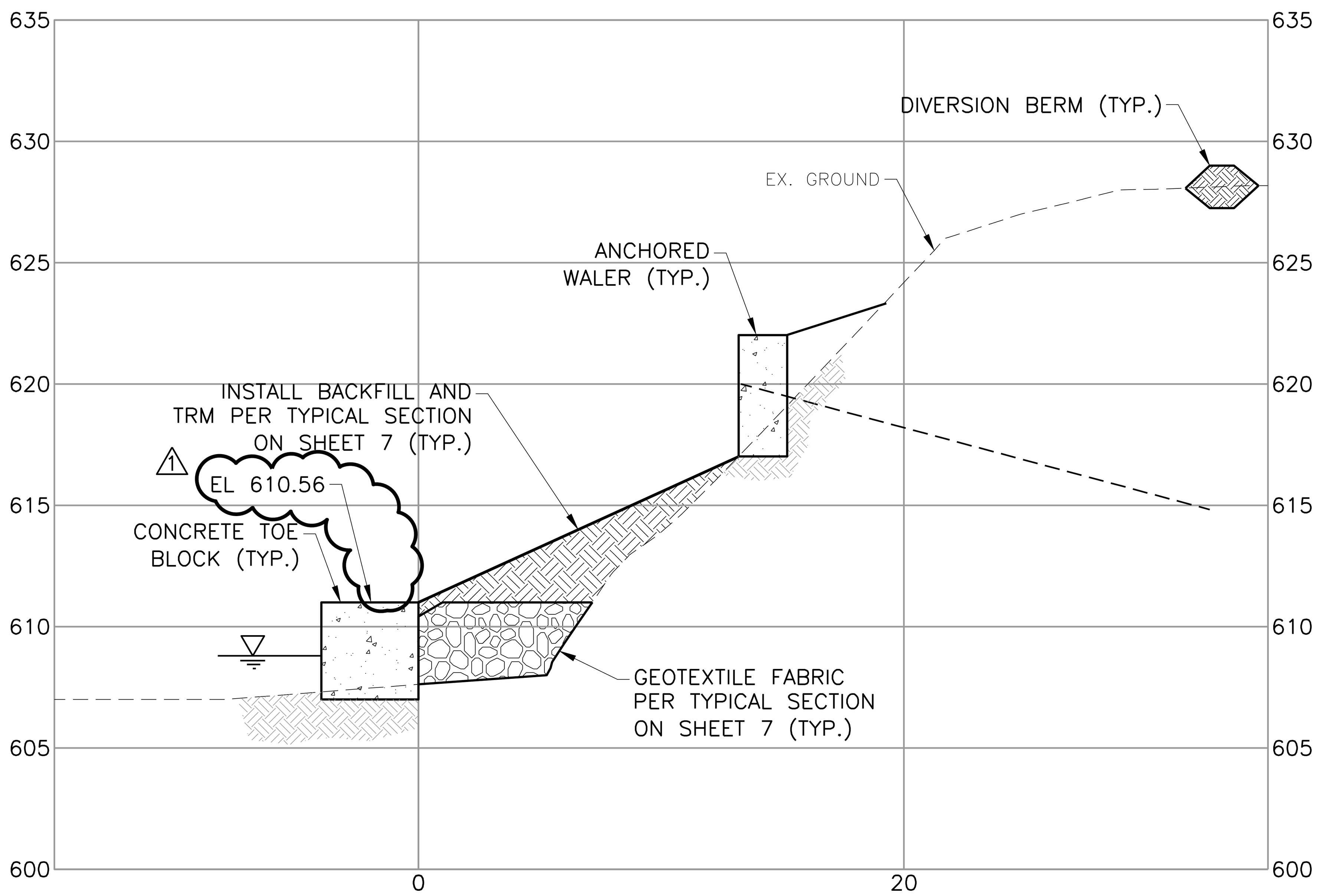
Date: Dec 14, 2016 – 1:21pm User: 02462 File: N:\wr\Drawings\WR-NEB-XS-EMBK01.dwg



SECTION I (I/6)

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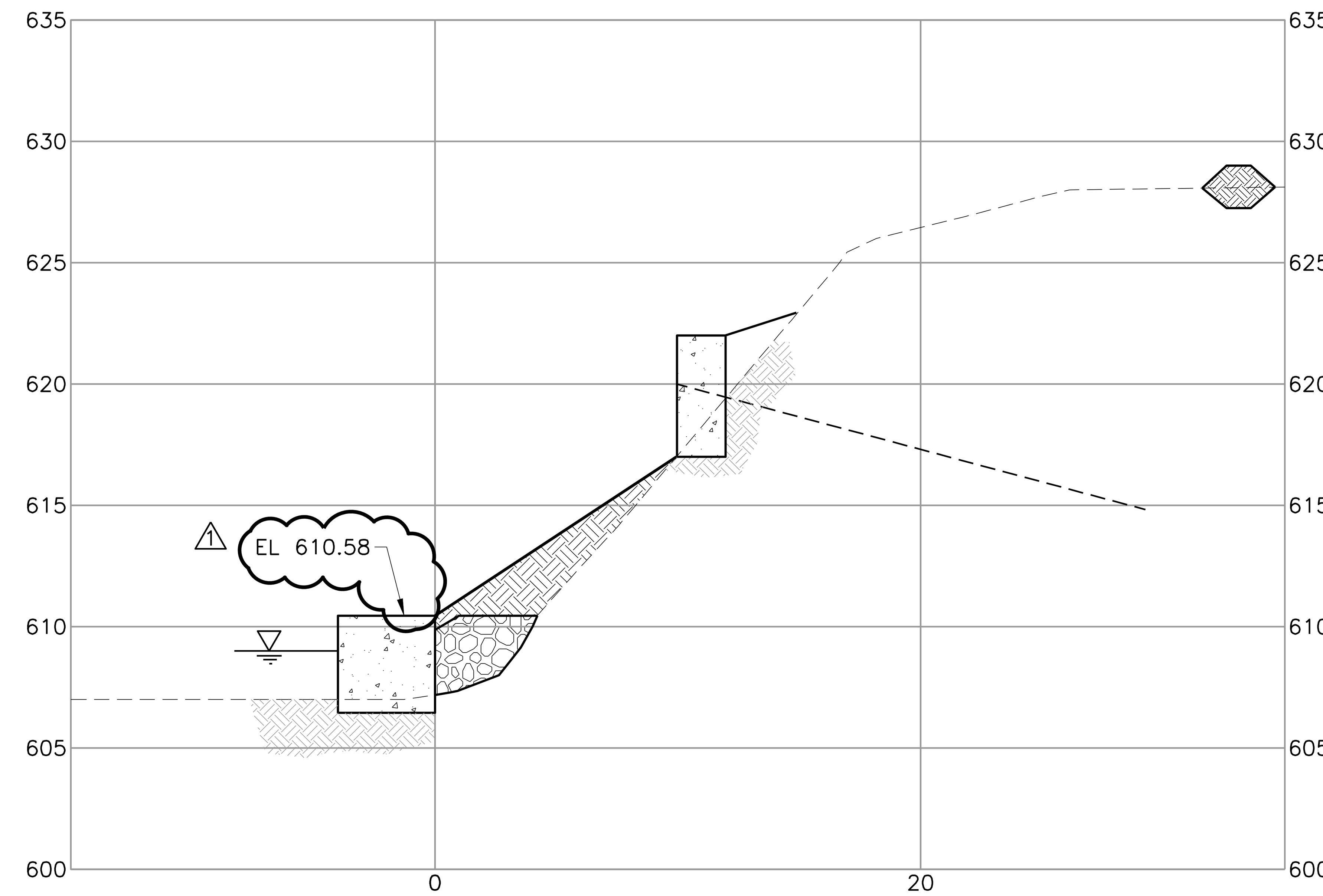
SCALE IN FEET



SECTION K (K/6)

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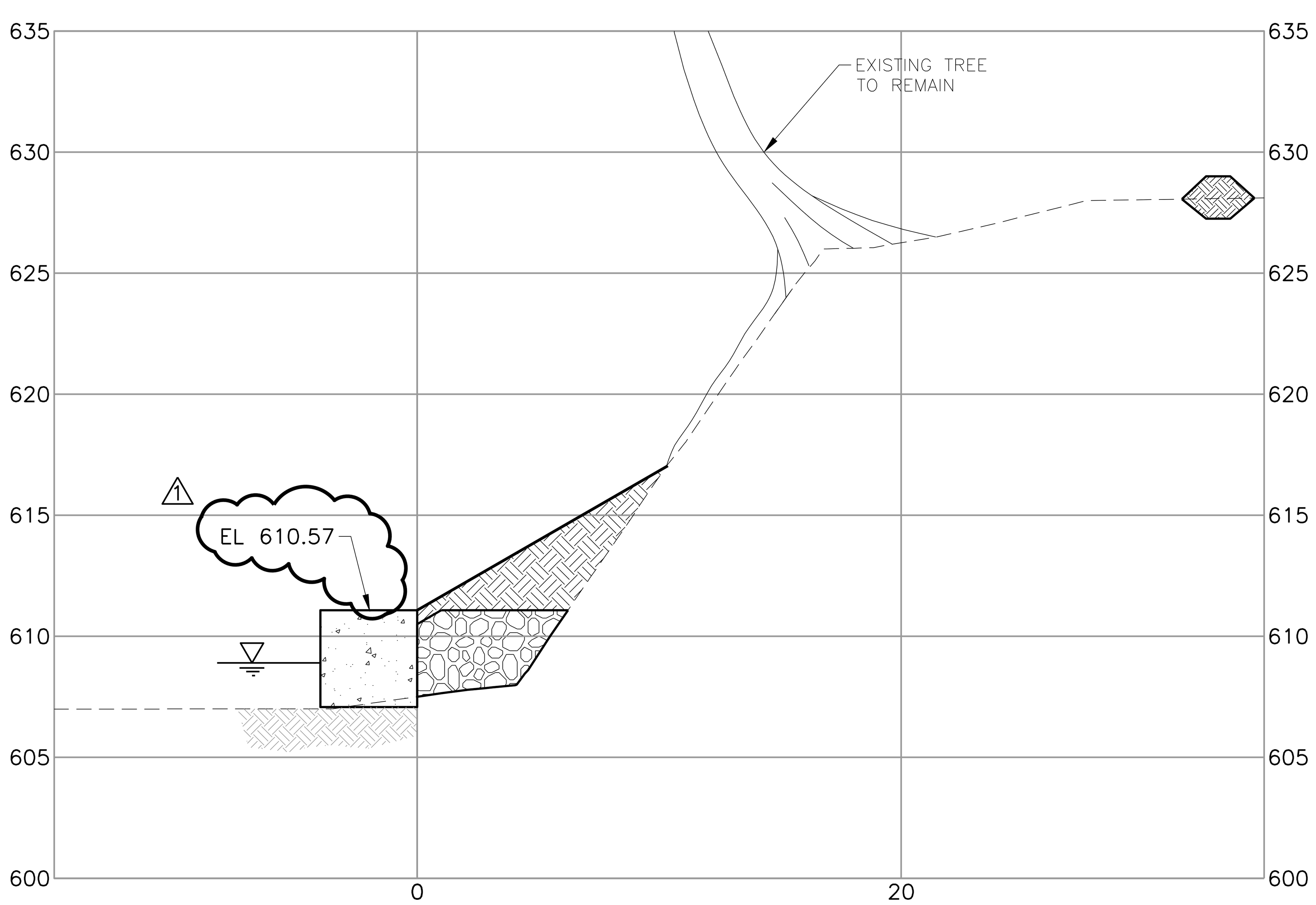
SCALE IN FEET



SECTION J (J/6)

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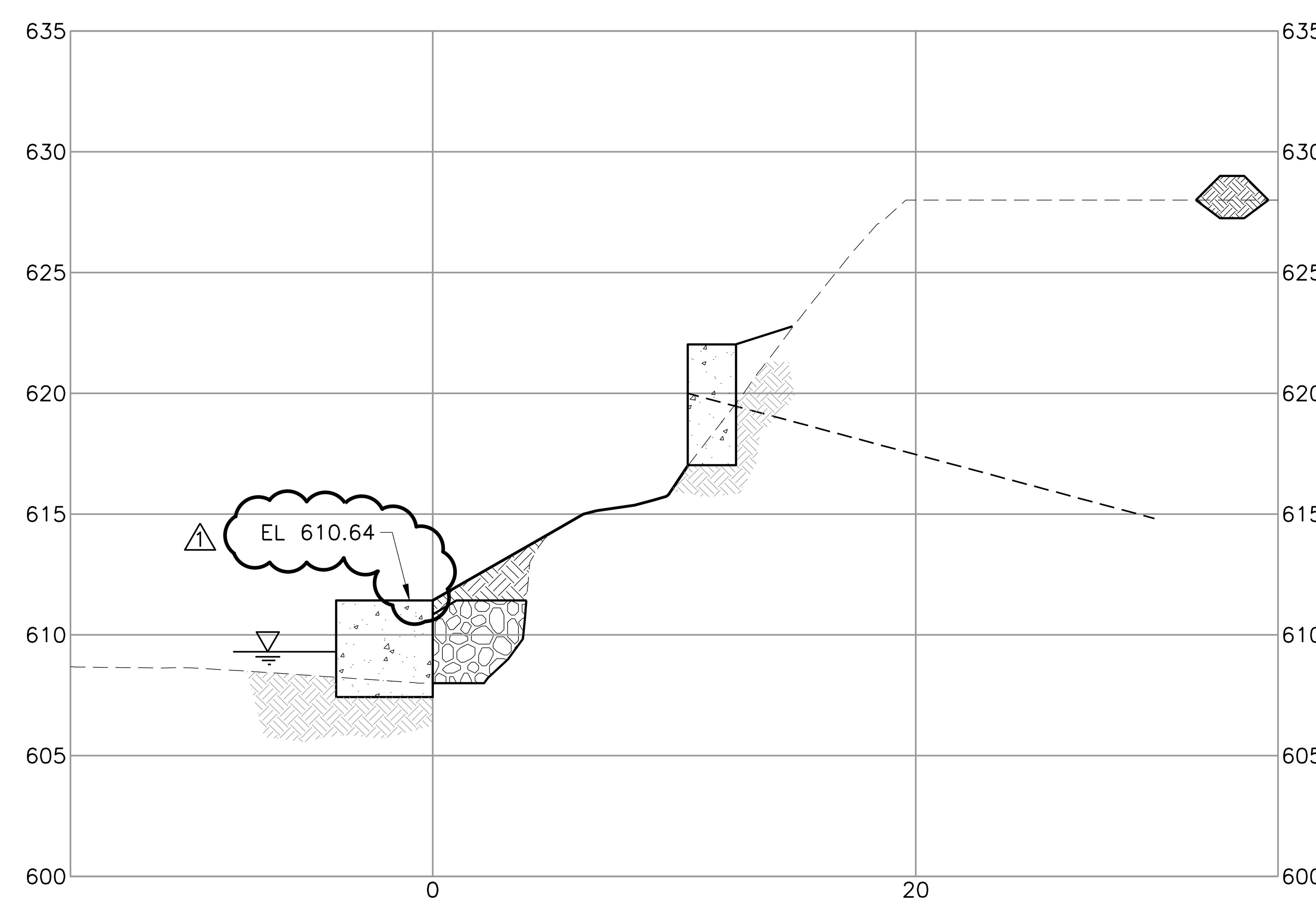
SCALE IN FEET



SECTION L (L/5)

0 5' 10'
SCALE IN FEET

⚠ NOTE:
TOE BLOCK AND WALER LOCATIONS WERE FIELD ADJUSTED. SECTIONS MAY NOT BE ACCURATE.

RECORD DRAWING

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COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION

CIVIL

BANK STABILIZATION SECTIONS (I-L)

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

FN JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-XS-EMBK01.dwg

VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

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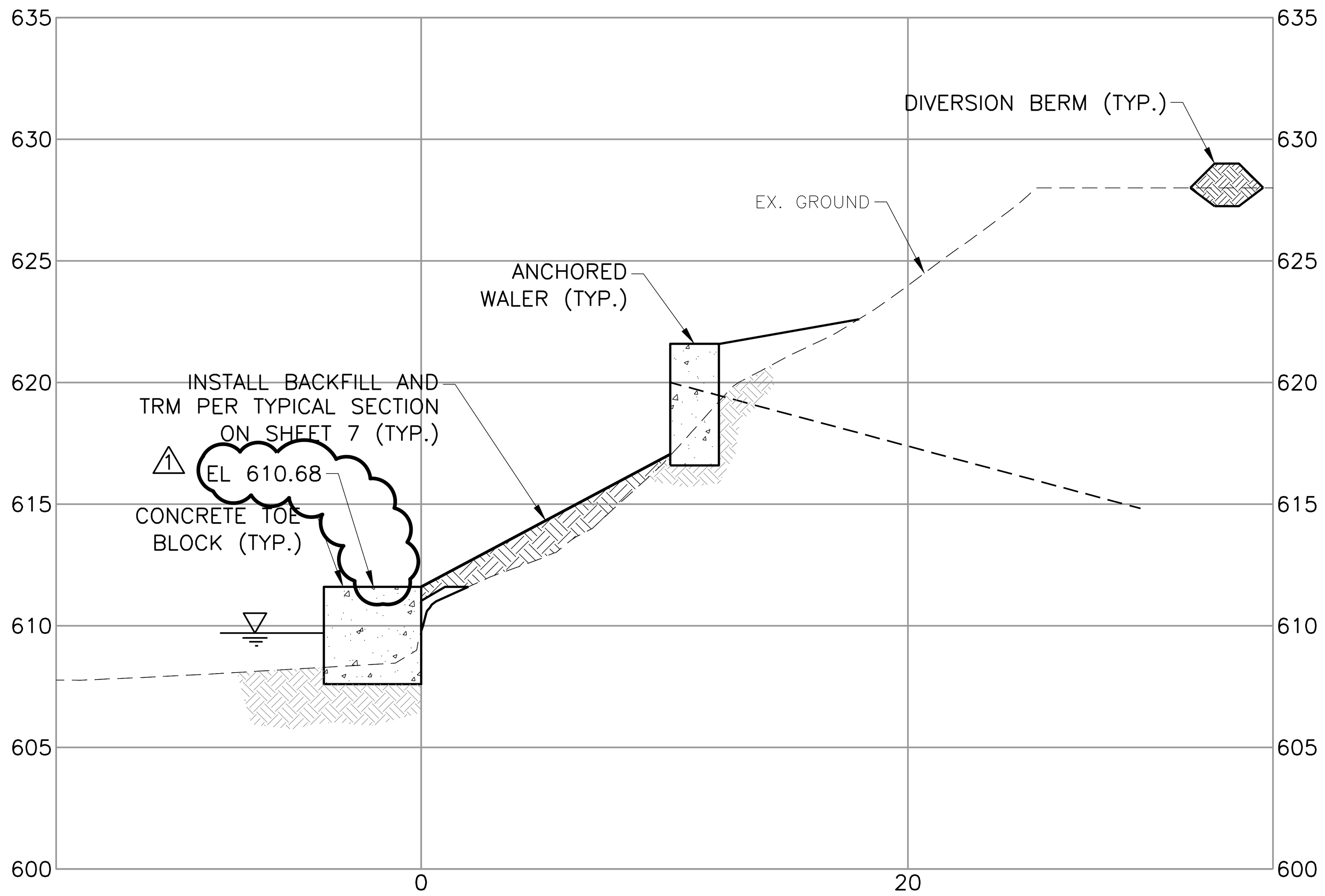
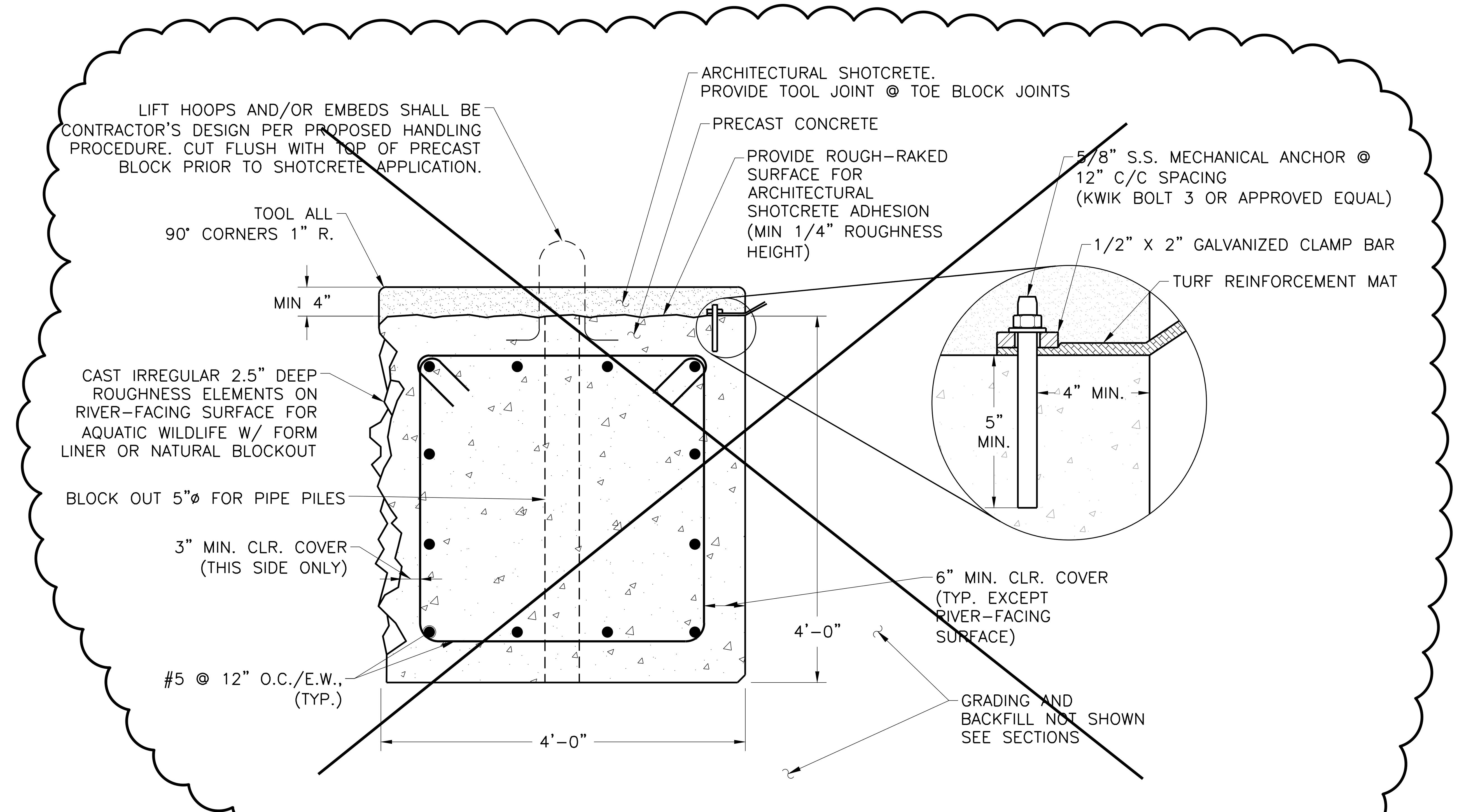


M 5 SECTION M

0 5' 10' SCALE IN FEET

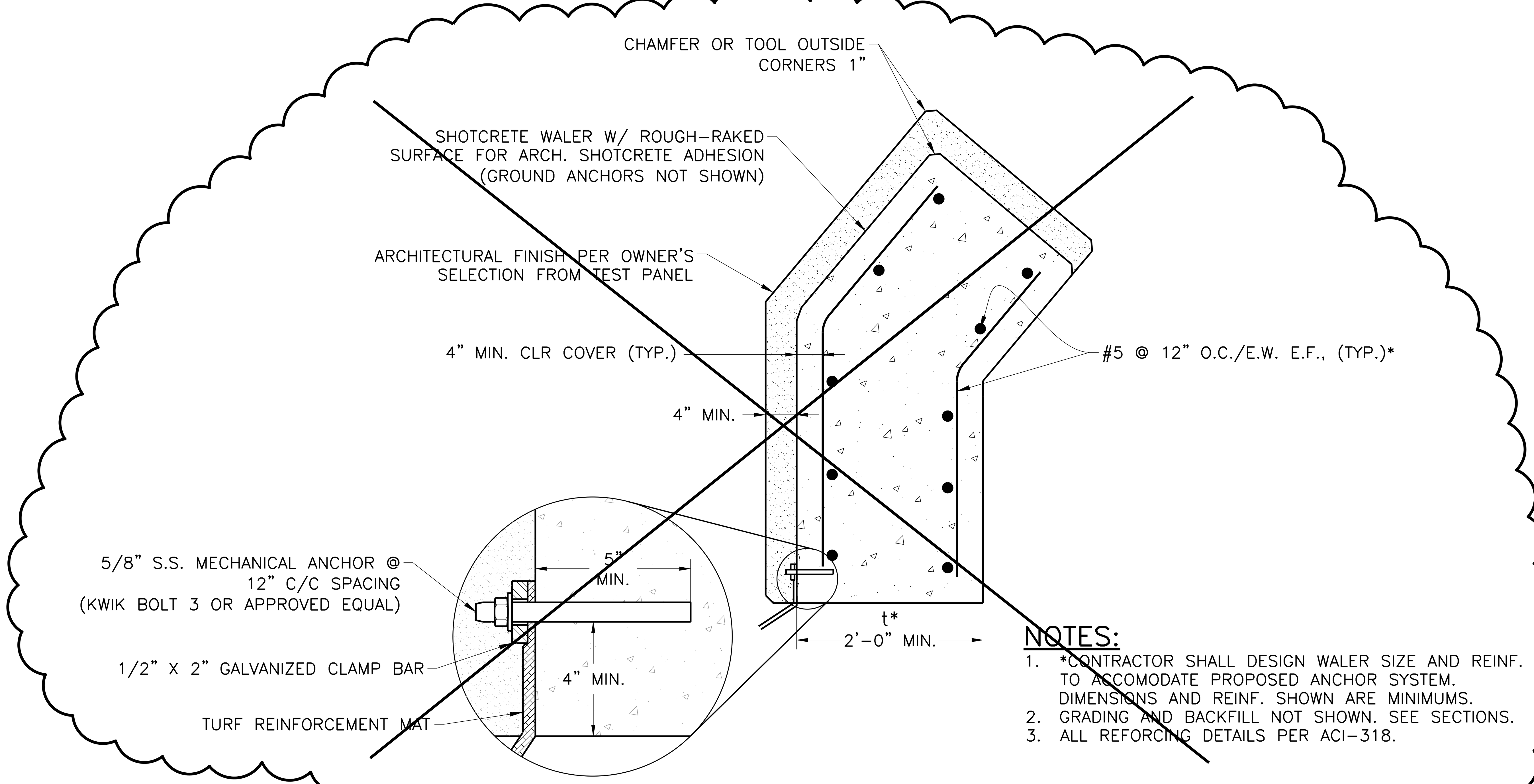
NOTE:
TOE BLOCK AND WALER LOCATIONS WERE FIELD ADJUSTED. SECTIONS MAY NOT BE ACCURATE.



1 PRECAST CONCRETE TOE BLOCK REINF. DETAIL

0 6" 1' 2' 1"=1'-0"

NOT USED. REDI-ROCK SUBSTITUTED



NOTES:
1. *CONTRACTOR SHALL DESIGN WALER SIZE AND REINF. TO ACCOMODATE PROPOSED ANCHOR SYSTEM. DIMENSIONS AND REINF. SHOWN ARE MINIMUMS.
2. GRADING AND BACKFILL NOT SHOWN. SEE SECTIONS.
3. ALL REFORCING DETAILS PER ACI-318.

2 SHOTCRETE WALER REINF. DETAIL

0 6" 1' 2' 1"=1'-0"

NOT USED. SEE FIELD ORDER 001

RECORD DRAWING

Freese and Nichols, Inc. Texas Registered Engineering Firm F-2144

THE SEAL THAT ORIGINALLY APPEARED ON THIS DOCUMENT WAS AUTHORIZED BY M. LESLIE BOYD P.E. TEXAS NO. ... ON ... ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION OF THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT

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CITY OF NEW BRAUNFELS, TEXAS
COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION
CIVIL
BANK STABILIZATION SECTIONS (M-N) AND MISC. STRUCTURAL DETAILS

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

FN JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-XS-EMBK01.dwg

VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET 11
SEQ. 12 OF 16

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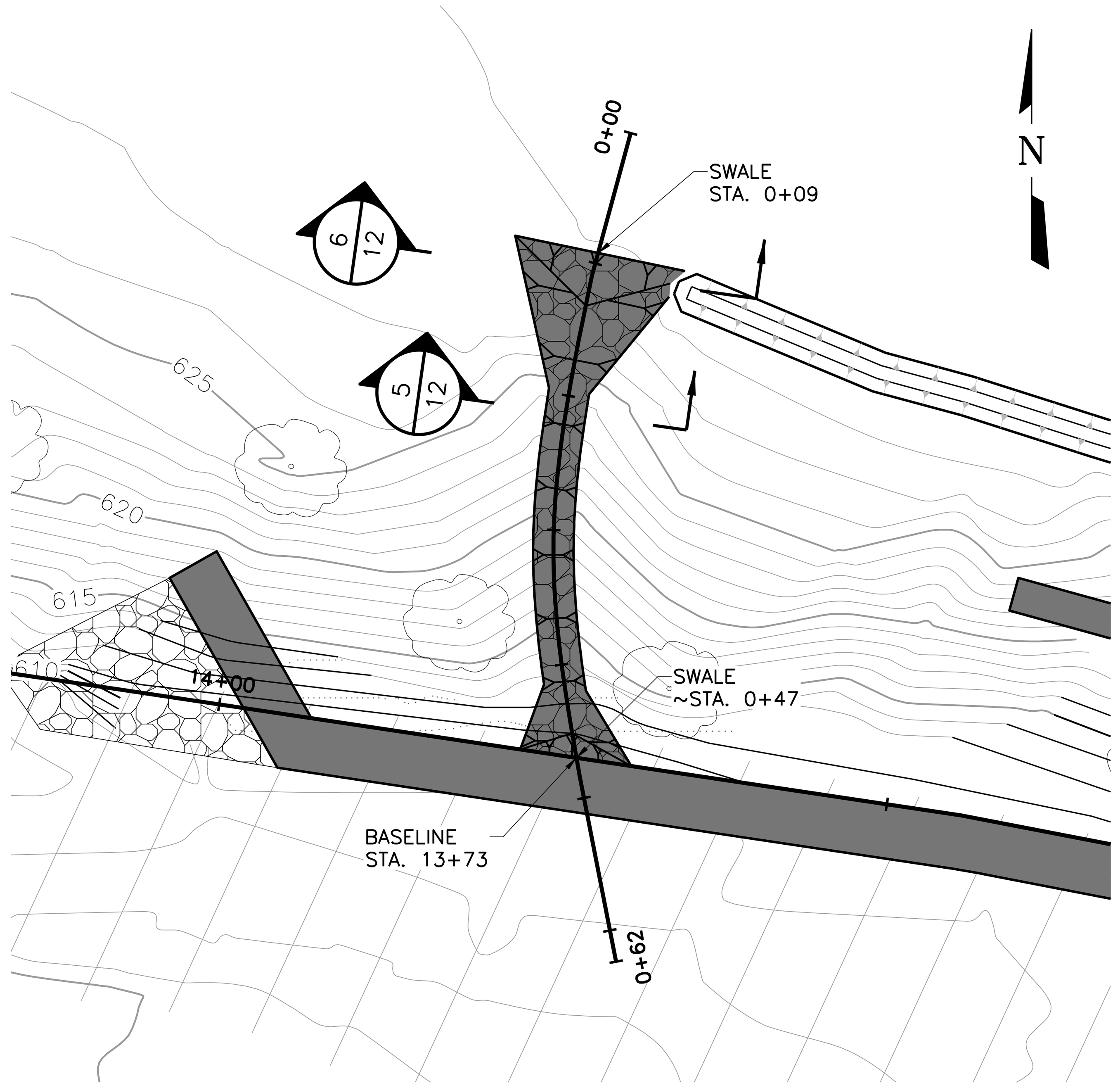
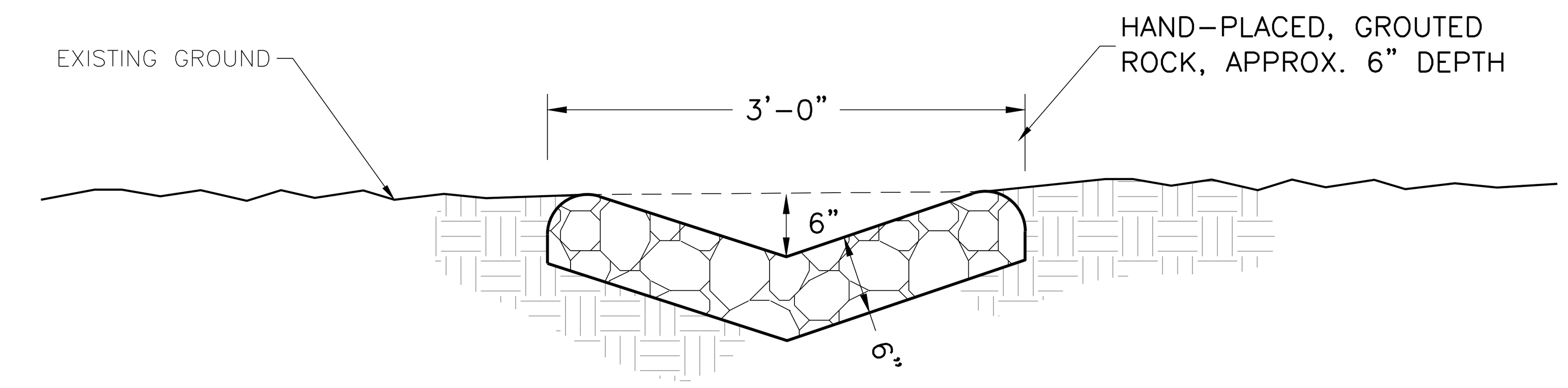
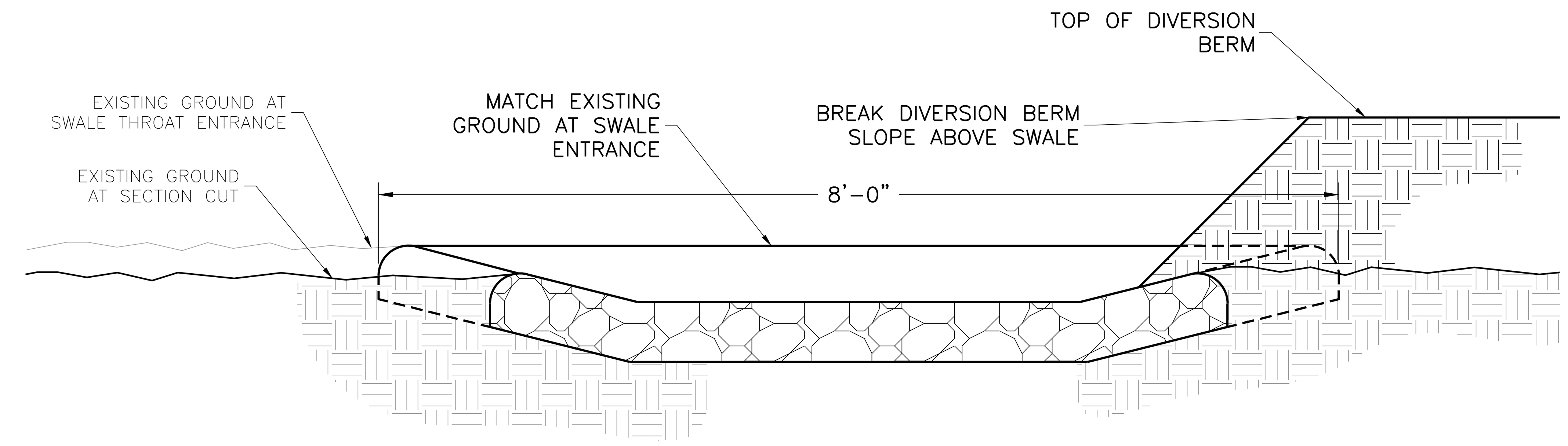
Date: Dec 14, 2016 - 1:21pm User: 02462 File: N:\wr\Drawings\WR-NEB-XS-EMBK01.dwg



1 WEST SWALE PLAN
0 10' 20'
SCALE IN FEET

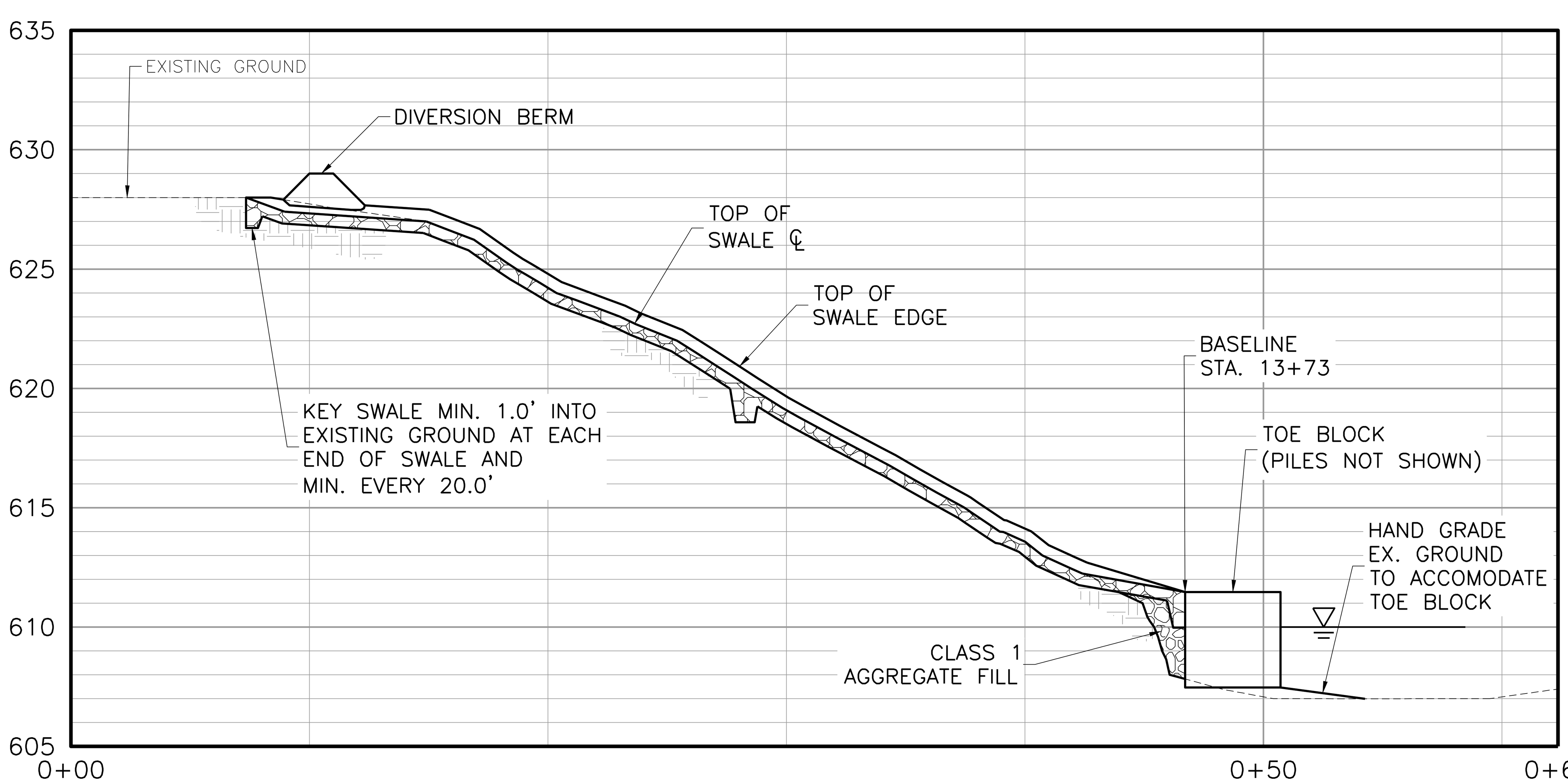


5/12 TYPICAL SWALE SECTION
0 6" 1' 2'
1"=1'-0"

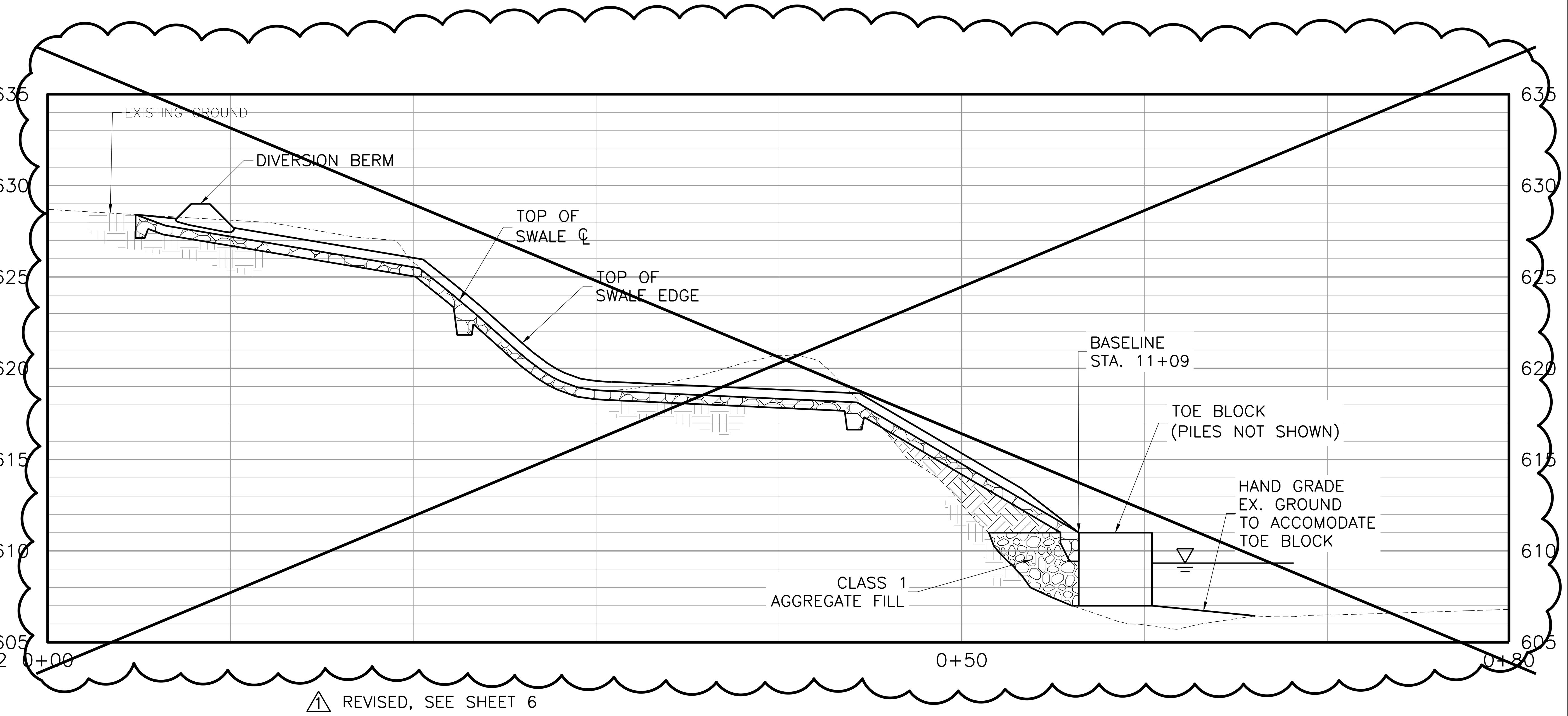


6/12 TYPICAL SWALE THROAT SECTION
0 6" 1' 2'
1"=1'-0"

NOTE: SWALE LOCATIONS SHOWN ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY LOCAL TOPOGRAPHY AND ADJUST SWALE ALIGNMENT FOR POSITIVE DRAINAGE.



3 WEST SWALE PROFILE
0 5' 10'
SCALE IN FEET



⚠ REVISED, SEE SHEET 6

4 EAST SWALE PROFILE
0 5' 10'
SCALE IN FEET

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COMAL RIVER BANK RECLAMTION AND
RIPARIAN ZONE RESTORATION
CIVIL

SWALE DETAILS

NO.	REVISION	BY	DATE
⚠	RECORD DRAWINGS	GH	12/8/16

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-DT-MISC02.dwg

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SHEET 12
SEQ. 13 OF 16

RECORD DRAWING

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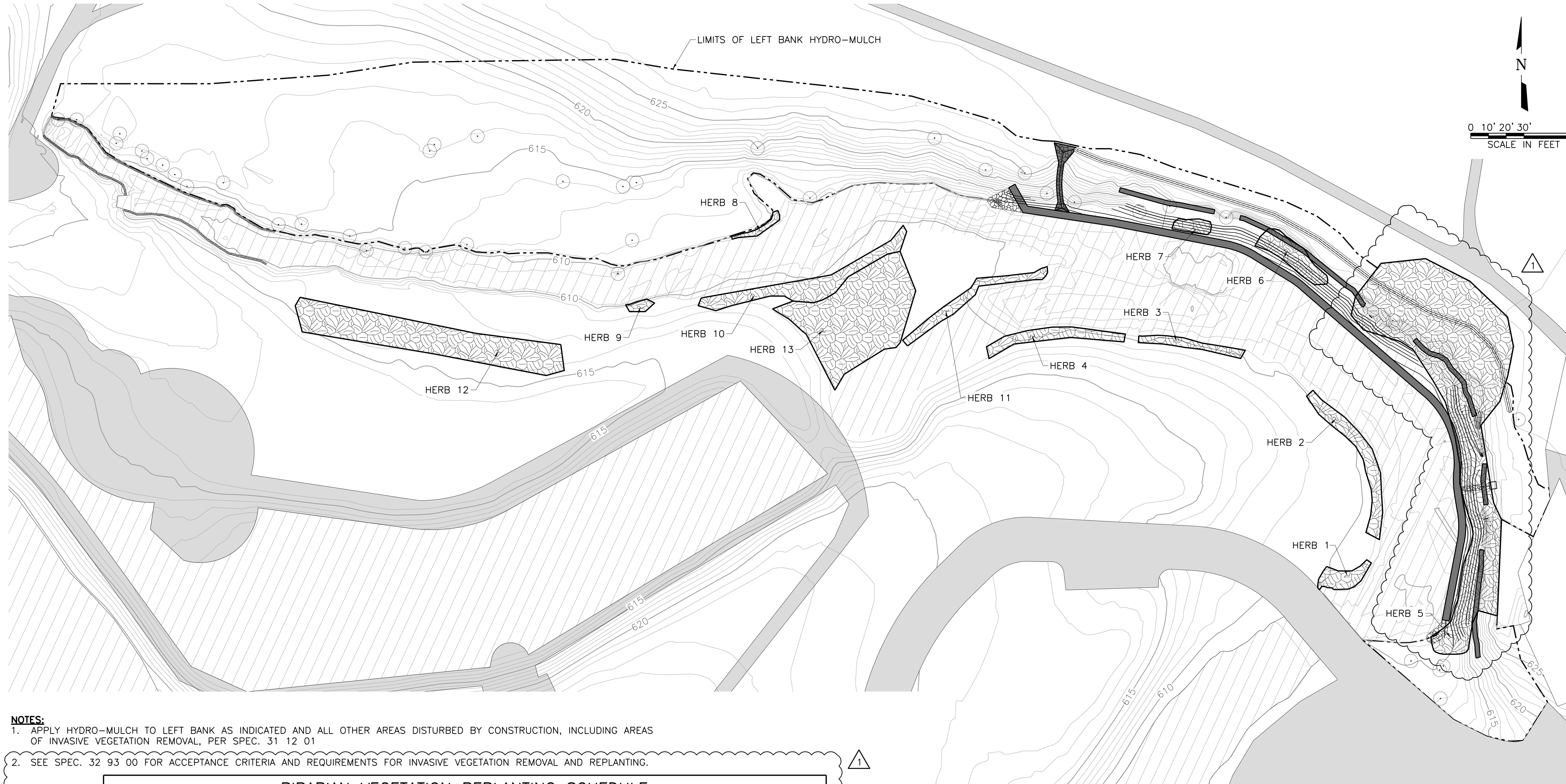

NOTES:

1. APPLY HYDRO-MULCH TO LEFT BANK AS INDICATED AND ALL OTHER AREAS DISTURBED BY CONSTRUCTION, INCLUDING AREAS OF INVASIVE VEGETATION REMOVAL, PER SPEC. 31 12 01
2. SEE SPEC. 32 93 00 FOR ACCEPTANCE CRITERIA AND REQUIREMENTS FOR INVASIVE VEGETATION REMOVAL AND REPLANTING. (1)

RIPARIAN VEGETATION REPLANTING SCHEDULE

HERB SECTION	APPROX AREA (SQ FT)	INVASIVE VEGETATION TYPE TO REMOVE	PROPOSED VEGETATION REPLANTING
1	270	Elephant Ear, Chinese Tallow	Acmella Repens, Lippia nodiflora, Bidens laevis, Solidago sp.
2	660	Elephant Ear	Acmella Repens, Lippia nodiflora, Bidens laevis, Solidago sp.,
3	270	Elephant Ear	Justicia Americana, Pluchea odorata, Carex emoryi
4	480	Elephant Ear	Pluchea odorata, Teucrium canadense, Sambucus Canadensis, Carex emoryi
5	7,280	Elephant Ear, Waxleaf Ligustrum	Solidago sp, Justicia Americana
6	490	Giant Reed	Sambucus Canadensis, Ungnadia speciosa, Elymus virginicus, Chasmanthium latifolium
7	150	Elephant Ear	Sambucus Canadensis, Ungnadia speciosa, Elymus virginicus
8	90	Elephant Ear, Chinese Tallow	Justicia americana, Carex emoryi
9	70	Elephant Ear, Chinese Tallow	Justicia americana, Carex emoryi
10	980	Elephant Ear, Chinese Tallow	Justicia americana, Carex emoryi, Acmella repens, Bacopa monnieri
11	450	Elephant Ear	Justicia Americana, Teucrium canadense, Bidens laevis, Carex emoryi, Schoenoplectus tabernaemontani
12	2,590	Four O'Clock	Hydro-mulch w/ native grass seed mixture only
13	2,930	Chinese Tallow	Teucrium canadense, Pluchea odorata, Chasmanthium latifolium

RECORD DRAWING

CITY OF NEW BRAUNFELS, TEXAS
COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION
CIVIL
RIPARIAN ZONE RESTORATION PLAN AND REPLANTING SCHEDULE

FREESE AND NICHOLS
10431 Morado Circle, Suite 300
Austin, Texas 78759
Phone - (512) 617-3100
Fax - (512) 617-3101
Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

NO.	REVISION	BY	DATE
1	ADDENDUM NO. 1	MBL	4/16/15

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
DRAWN CJE
REVISED CJE
CHECKED MLB
FILE NAME WR-NEB-DT-MISC01.dwg

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SHEET 13

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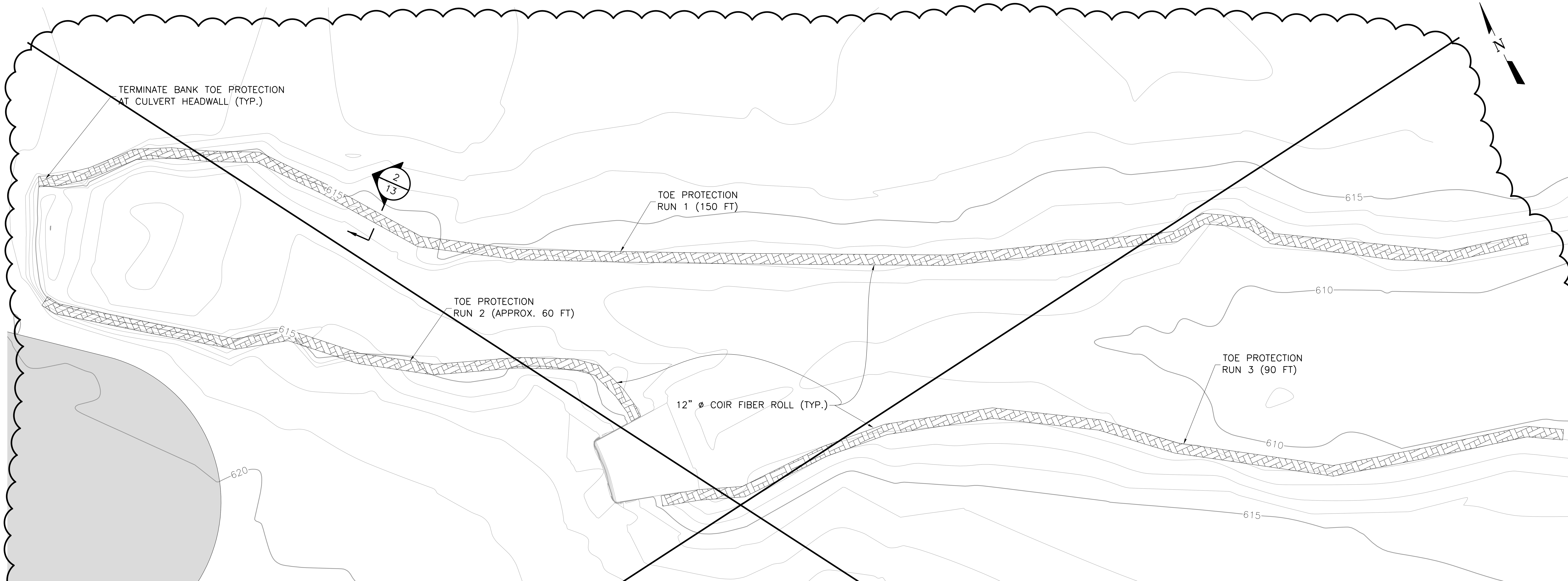
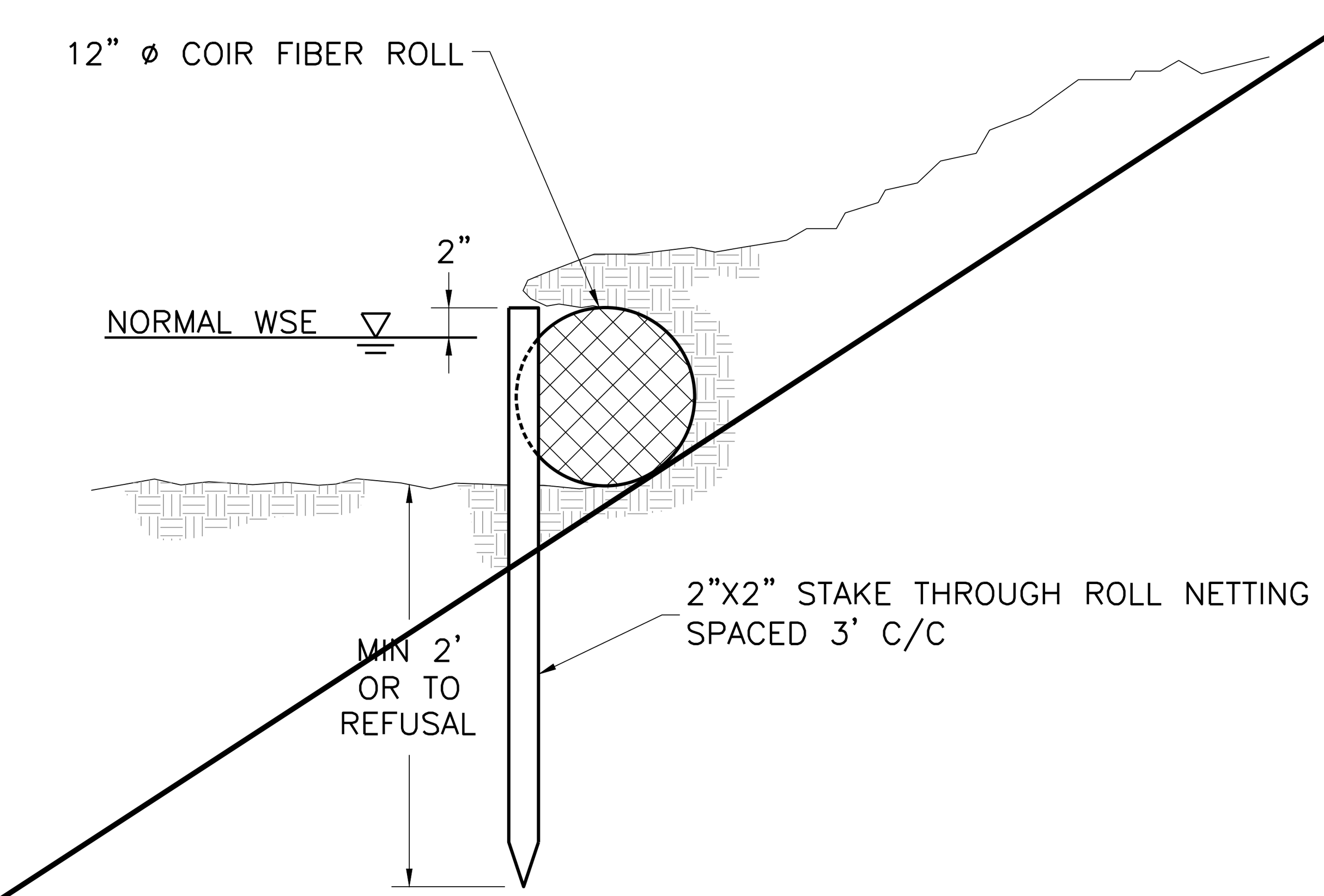


1 TOE PROTECTION PLAN

0 5' 10' SCALE IN FEET

NOTES:

1. INSTALL COIR ROLLS IN FULL CONTACT WITH SOIL. REMOVE ROCK AS NECESSARY.
2. COIR FIBER ROLL SHALL BE PER SPEC. 32 94 00



2 TYPICAL COIR ROLL SECTION

0 6" 1' 2' 1"=1'-0"

⚠ COIR ROLLS NOT INSTALLED

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Texas Registered Engineering Firm F-2144

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CITY OF NEW BRAUNFELS, TEXAS
COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION
CIVIL

UPSTREAM TOE PROTECTION DETAILS

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

F&N JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED GH
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VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

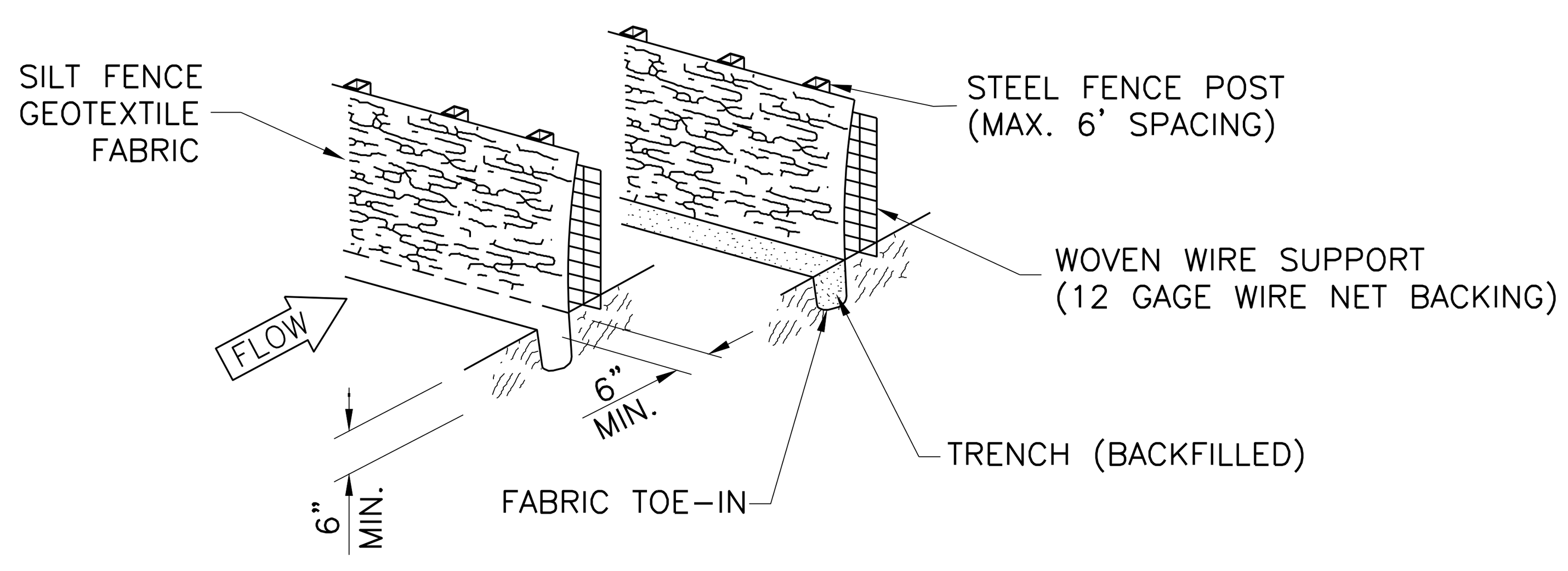
SHEET 14

SEQ. 15 OF 16

RECORD DRAWING

SILT FENCE INSTALLATION:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE.
2. THE TOE OF THE SILT FENCE SHALL BE PLACED IN A TRENCH A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE. THE TRENCH SHALL BE BACKFILLED WITH COMPACTED MATERIAL. THE MINIMUM HEIGHT OF THE SILT FENCE ABOVE THE EXISTING GROUND SHALL BE 24 INCHES.
3. WHERE FENCE CAN NOT BE TRENCHED (e.g. PAVEMENT), WEIGHT FABRIC FLAP WITH ROCK ON THE UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER THE FENCE.
4. SILT FENCE SHALL BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHALL BE A 3 FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.
5. INSPECTION SHALL BE MADE WEEKLY AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY, AS NEEDED, BY THE CONTRACTOR.
6. WHEN SILT REACHES A DEPTH OF 6 INCHES, IT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.
7. SILT FENCE SHALL BE REMOVED AFTER THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE THE FLOW OF STORM FLOW OR DRAINAGE.



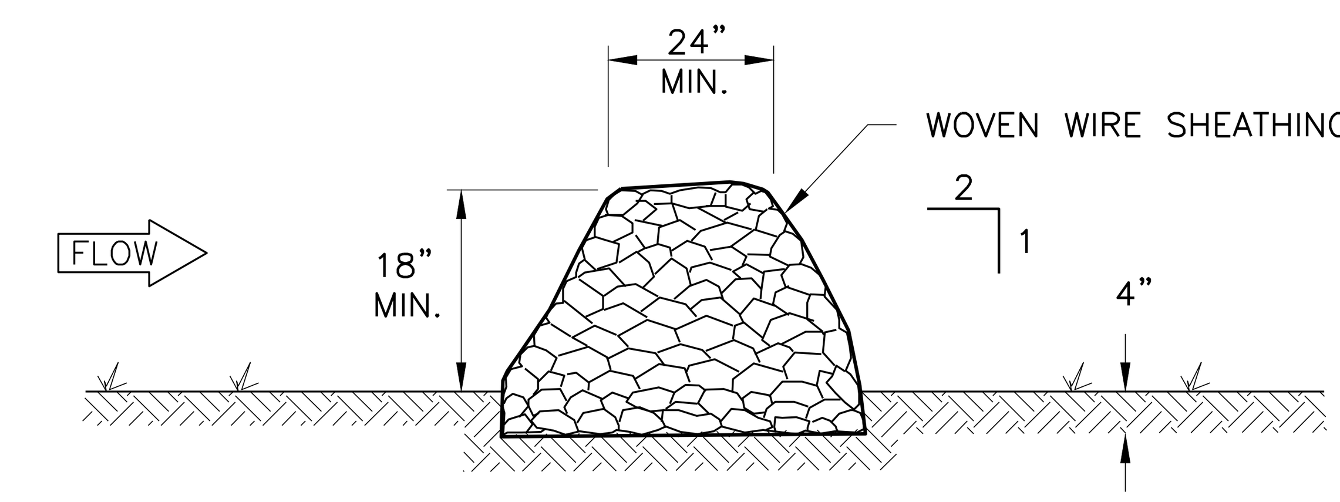
SILT FENCE
NOT TO SCALE

EROSION/SEDIMENTATION CONTROL NOTES:

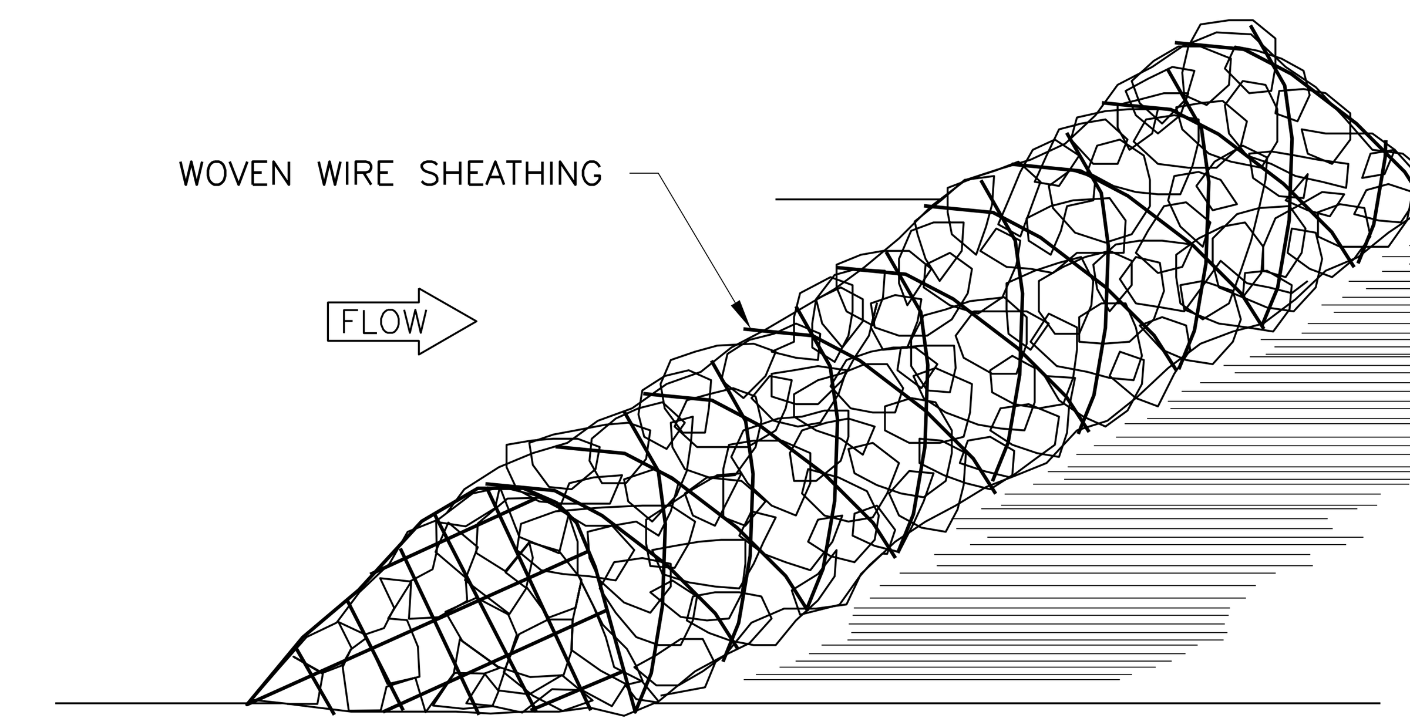
1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING AND GRUBBING, EXCAVATION, DRILLING, OR ROAD CONSTRUCTION).
2. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE ENVIRONMENTAL CRITERIA SPECIFICATIONS AND THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN.
3. ANY SIGNIFICANT VARIATION IN MATERIALS OR LOCATIONS OF CONTROLS OR FENCES FROM THOSE SHOWN ON THE APPROVED PLANS MUST BE APPROVED BY THE OWNER.
4. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS AND AFTER 1/2" INCH STORM EVENT WITHIN 24 HOURS TO ENSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.
5. PRIOR TO FINAL ACCEPTANCE, TEMPORARY CONTRACTOR ACCESS MUST BE REMOVED, ACCUMULATED SEDIMENT AND DEBRIS REMOVED FROM THE WATERWAY, AND THE AREA RESTORED TO THE ORIGINAL CONDITION IN ACCORDANCE WITH THE PROJECT AUTHORIZATION UNDER USACE NATIONWIDE PERMIT NO. 3.
6. FIELD REVISIONS TO THE EROSION AND SEDIMENTATION CONTROL PLAN MAY BE REQUIRED BY THE ENVIRONMENTAL INSPECTOR DURING THE COURSE OF THE CONSTRUCTION TO CORRECT CONTROL INADEQUACIES. MAJOR REVISIONS MUST BE APPROVED BY THE OWNER.

EROSION CONTROL PLAN NOTES:

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) REGULATIONS IN ACCORDANCE WITH TEXAS WATER CODE 26.040 AND CLEAN WATER ACT SECTION 402 CONCERNING EROSION AND SEDIMENT CONTROL.
2. THE CONTRACTOR SHALL IMPLEMENT THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES; AND (A) SIGN A COMPLETED SITE NOTICE (ATTACHMENT 1 OF THE TPDES GENERAL PERMIT WITHIN THE SWPPP); (B) POST A SIGNED COPY OF THE SITE NOTICE AT THE CONSTRUCTION SITE IN A LOCATION WHERE IT IS READILY AVAILABLE FOR VIEWING PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES, AND (C) MAINTAIN THE NOTICE IN THAT LOCATION UNTIL COMPLETION OF THE CONSTRUCTION ACTIVITY.
3. THE CONTRACTOR SHALL COMPLY WITH THE STORM WATER POLLUTION PREVENTION PLAN AND STORM WATER MANAGEMENT PLANS, AS PART OF THE ABOVE REGULATIONS. THE INSPECTION AND MAINTENANCE OF THE EROSION PREVENTION MEASURES SHALL BE THE CONTRACTORS RESPONSIBILITY THROUGHOUT ALL PHASES OF THE CONSTRUCTION.
4. THE EROSION CONTROL DETAILS SHOWN ON THIS SHEET SHALL BE USED BY THE CONTRACTOR AS A GUIDE. THESE DETAILS DO NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS GOVERNING EROSION AND SEDIMENT CONTROL. ADDITIONAL EROSION CONTROL MEASURES SHALL BE PROVIDED IF NECESSARY BY THE CONTRACTOR IN ORDER TO COMPLY WITH ALL REGULATIONS, AT NO EXTRA COST TO THE OWNER.
5. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY CONSTRUCTION ACTIVITIES. THEY SHALL REMAIN IN PLACE UNTIL AFTER CONSTRUCTION IS COMPLETE AND THE SITE HAS BEEN STABILIZED.
6. THE MINIMUM EROSION AND SEDIMENT CONTROL DEVICES TO BE USED ON THIS PROJECT SHALL BE HAY BALES AND/OR SILT FENCE.
7. THE CONTRACTOR SHALL TAKE MEASURES NECESSARY TO PREVENT THE TRACKING OR FLOWING OF SEDIMENT ONTO ANY ADJACENT STREETS OR INTO THE RIVER OR LAKE DURING ALL PHASES OF CONSTRUCTION.
8. THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) PROPOSES TO ISSUE A GENERAL PERMIT (GENERAL PERMIT NO. TXR150000) FOR CONSTRUCTION STORM WATER RUNOFF.



CROSS SECTION



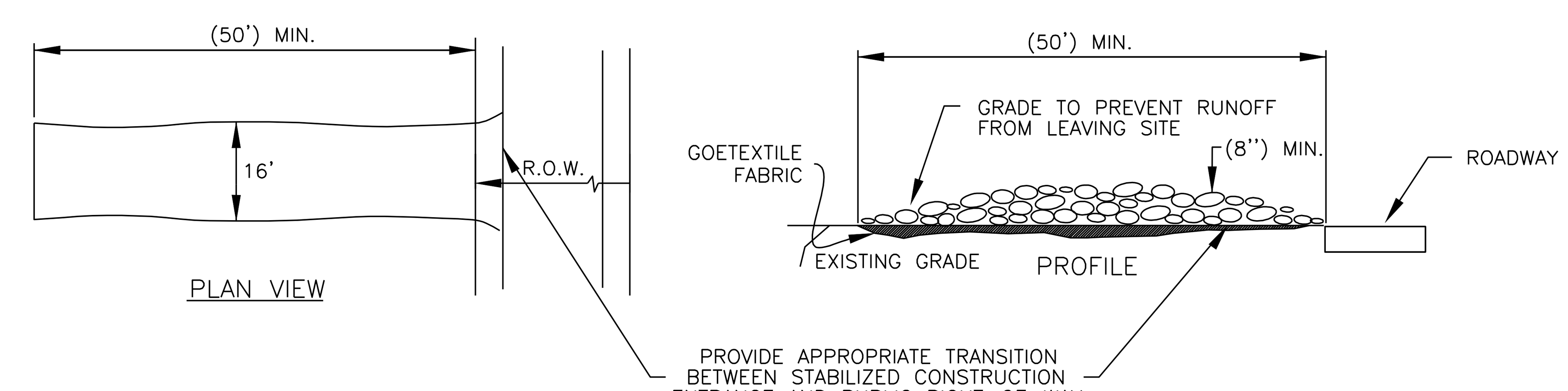
ROCK BERM DIVERSION DIKE
NOT TO SCALE

ROCK BERM:

1. USE ONLY OPEN GRADE ROCK 4-8 INCH DIAMETER FOR STREAM FLOW CONDITION; USE OPEN GRADED ROCK 3-5 INCHES DIAMETER FOR OTHER CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM ONE INCH OPENING AND MINIMUM WIRE DIAMETER OF 20 GAUGE.
3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN WIRE SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED SITE AND IN A MANNER AS TO NOT CREATE A SILTATION PROBLEM.
5. DAILY INSPECTION SHALL BE MADE ON SEVERE SERVICE ROCK BERMS; SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE FOOT.
6. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

GENERAL ENVIRONMENTAL NOTES:

1. PREVENT POLLUTION OF WATERS WITH PETROLEUM PRODUCTS OR OTHER HAZARDOUS OR REGULATED SUBSTANCES. TAKE SPECIAL MEASURES TO PREVENT CHEMICALS, FUELS, OILS, GREASES, HERBICIDES, AND INSECTICIDES FROM ENTERING DRAINAGE WAYS.
2. PROMPTLY REPAIR EQUIPMENT LEAKING OIL, HYDRAULIC FLUID, HYDROCARBONS, FUEL, ETC. IMMEDIATELY REMOVE AND REPLACE, AS NECESSARY, ALL SOILS ON WHICH SUCH LEAKAGE OCCURS. PREVENT THE SPREAD OF LEAKED FLUIDS OR FLUID CONTAMINATED MATERIALS FROM THE ORIGINAL LEAK AREA. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROPER HANDLING AND DISPOSAL OF ALL SUCH CONTAMINATED MATERIALS.
3. PROVIDE SECONDARY CONTAINMENT AROUND ANY FUEL AND CHEMICAL STORAGE AREAS TO ENSURE THAT SPILLS FROM ANY SUCH AREAS DO NOT DISCHARGE FROM THE SECONDARY CONTAINMENT AREA. THE SECONDARY CONTAINMENT CAPACITY SHALL BE ADEQUATE TO CONTAIN THE CAPACITY OF THE LARGEST TANK/CONTAINER PLUS SUFFICIENT FREEBOARD TO CONTAIN PRECIPITATION.
4. PRECAUTION SHALL BE TAKEN DURING EQUIPMENT FUELING AND CHEMICAL TRANSFER OPERATIONS IN ORDER TO PREVENT SPILLS FROM OCCURRING AND TO MINIMIZE THE IMPACT OF ANY SPILL THAT DOES OCCUR. ALL FUEL AND CHEMICAL TRANSFERS SHALL BE CONTINUOUSLY MONITORED. ADDITIONALLY, THERE SHALL BE A PROHIBITION AGAINST ON-SITE TOPPING OFF OF TANKS AND EQUIPMENT.
5. MAINTAIN APPROPRIATE EQUIPMENT ON SITE FOR RESPONDING TO ANY OIL, FUEL, OR HAZARDOUS SUBSTANCE SPILL.
6. PROVIDE PROTECTED STORAGE FOR CHEMICALS, SOLVENTS, AND OTHER POTENTIALLY HAZARDOUS MATERIALS.
7. DO NOT ALLOW WATER USED IN ON-SITE MATERIAL PROCESSING AND CLEANUP, AND OTHER WASTEWATERS TO ENTER A DRAINAGE WAY OR STREAM.



NOTES:
1. STONE SIZE: 3"-5" OPEN GRADED ROCK.
2. LENGTH: AS EFFECTIVE BUT NOT LESS THAN 50'.
3. THICKNESS: NOT LESS THAN 8".
4. WIDTH: NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS/EGRESS.
5. WASHING: WHEN NECESSARY, VEHICLE WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE AND DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
6. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AS WELL AS REPAIR AND CLEAN OUT OF ANY MEASURE DEVICES USED TO TRAP SEDIMENT. ALL SEDIMENTS THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
7. DRAINAGE: ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
8. PROVIDE GEOTEXTILE FABRIC BETWEEN NATURAL GRADE AND 3"-5" ROCK.

STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE

Freese and Nichols, Inc.
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CITY OF NEW BRAUNFELS, TEXAS
COMAL RIVER BANK RECLAMTION AND RIPARIAN ZONE RESTORATION

ENVIRONMENTAL CONTROLS

NO.	REVISION	BY	DATE
1	RECORD DRAWINGS	GH	12/8/16

FN JOB NO. NEB 13133
DATE 12/14/2016
DESIGNED CJE
DRAWN CJE
REVISED DGM
CHECKED MLB
FILE NAME WR-NEB-DT-EROS.DWG

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

RECORD DRAWING

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REFERENCE FILE: N:\STANDARD\34BORDER
Date: Dec 14, 2016 - 1:26pm User: 02462 File: N:\wr\Drawings\WR-NEB-DT-EROS.DWG

SP-2 Geotechnical Engineering Study
Raba Kistner Geotechnical Engineering Study ANA21-031-00 (Following this page)

RABA KISTNER

GEOTECHNICAL ENGINEERING STUDY

FOR

LANDA GOLF COURSE
CLUBHOUSE DECK REPLACEMENT
NEW BRAUNFELS, TEXAS

211 Trade Center, Suite 300
New Braunfels, TX 78130

P 830.214.0544
F 830.214.0627
TBPE Firm F-3257

WWW.RKCI.COM

Project No. ANA21-031-00
July 29, 2021

Mr. Adam L. Michie, P.E.
Capital Project Manager
City of New Braunfels
550 Landa Street
New Braunfels, Texas 78130

RE: Geotechnical Engineering Study
Landa Golf Course
Clubhouse Deck Replacement
New Braunfels, Texas

Dear Mr. Michie:

RABA KISTNER Consultants Inc. (RKCI) is pleased to submit the report of our Geotechnical Engineering Study for the above-referenced project. This study was performed in accordance with RKCI Proposal No. PNA21-043-00, dated May 11, 2021. The purpose of this study was to drill borings within the proposed clubhouse deck, to perform laboratory testing to classify and characterize subsurface conditions, and to prepare an engineering report presenting foundation design and construction recommendations for the proposed club house deck.

The following report contains our design recommendations and considerations based on our current understanding of finished floor elevations, design tolerances and structural loads. There may be alternatives for value engineering of the foundation system, and RKCI recommends that a meeting be held with the Owner and design team to evaluate these alternatives.

We appreciate the opportunity to be of service to you on this project. Should you have any questions about the information presented in this report, or if we may be of additional assistance with value engineering or on the materials testing-quality control program during construction, please call.

Very truly yours,

RABA KISTNER CONSULTANTS, INC.

Dylan A. Bunn, E.I.T.
Graduate Engineer

T. Ian Perez, P.E.
Associate

DAB/TIP/slh

Attachments

Copies Submitted: Above (1) – Email Only

GEOTECHNICAL ENGINEERING STUDY

For

LANDA GOLF COURSE
CLUBHOUSE DECK REPLACEMENT
NEW BRAUNFELS, TEXAS

Prepared for

CITY OF NEW BRAUNFELS
New Braunfels, Texas

Prepared by

RABA KISTNER CONSULTANTS, INC.
New Braunfels, Texas

PROJECT NO. ANA21-031-00

July 29, 2021

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ATTACHMENTS

The following figures are attached and complete this report:

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Important Information About Your Geotechnical Engineering Report

INTRODUCTION

RABA KISTNER Consultants Inc. (RKCI) has completed the authorized subsurface exploration and foundation analysis for the proposed deck replacement located at the Landa Park Golf Course Clubhouse, 180 Golf Course Road, in New Braunfels, Texas, as illustrated on Figure 1. This report briefly describes the procedures utilized during this study and presents our findings along with our recommendations for foundation design and construction considerations.

PROJECT DESCRIPTION

Under consideration in this study is a new deck to replace the existing deck located on the western side of the Landa Park Golf Course Clubhouse, overlooking Blieders Creek at 180 Golf Course Road in New Braunfels, Texas. It is our understanding that at the time of this study, site grading plans were not yet available. We understand that concentrated loads to be carried by the foundation system will range from 10 to 50 kips; that helical piers are being considered to support the proposed deck, and that there will be no ground supported foundation elements at grade.

LIMITATIONS

This engineering report has been prepared in accordance with accepted Geotechnical Engineering practices in the region of south/central Texas and for the use of the City of New Braunfels (CLIENT) and its representatives for design purposes. This report may not contain sufficient information for purposes of other parties or other uses. This report is not intended for use in determining construction means and methods. The attachments and report text should not be used separately.

The recommendations submitted in this report are based on the data obtained from 2 borings drilled at this site and the project information provided to us. If the project information described in this report is incorrect, is altered, or if new information is available, we should be retained to review and modify our recommendations.

This report may not reflect the actual variations of the subsurface conditions across the site. The nature and extent of variations across the site may not become evident until construction commences. The construction process itself may also alter subsurface conditions. If variations appear evident at the time of construction, it may be necessary to reevaluate our recommendations after performing on-site observations and tests to establish the engineering impact of the variations.

The scope of our Geotechnical Engineering Study does not include an environmental assessment of the air, soil, rock, or water conditions either on or adjacent to the site. No environmental opinions are presented in this report.

BORINGS AND LABORATORY TESTS

Subsurface conditions at the site were evaluated by 2 borings drilled at the locations shown on the Boring Location Map, Figure 1. These locations are approximate and distances were measured using a hand-held, recreational-grade GPS locator. Based on the USGS Comal County GIS database, ground surface elevations were estimated to be 610 and 628 ft at Borings B-1 and B-2, respectively. The borings were drilled to depths of 50 ft below the existing ground surface using a truck-mounted drilling rig. Texas Cone Penetrometer testing was conducted at 5 ft intervals. During drilling operations, grab samples of the subsurface materials were collected at 5 ft intervals with intermittent Shelby Tubes where possible.

Each sample was visually classified in the laboratory by a member of our geotechnical engineering staff. The geotechnical engineering properties of the strata were evaluated by natural moisture content testing, Atterberg limits determinations, grain size analyses (percent passing a No. 200 sieve), and unconfined compression of undisturbed soil samples.

The results of all laboratory tests are presented in graphical or numerical form on the boring logs illustrated on Figures 2 and 3. A key to classification terms and symbols used on the logs is presented on Figure 4. The results of the laboratory and field testing are also tabulated on Figure 5 for ease of reference.

Texas Cone Penetrometer (TCP) test results are noted as “blows per foot” on the boring log (divided into 6 in. increments) where “blows per ft” refers to the number of blows by a falling hammer required for 1 ft of penetration into soil/weak rock. Where hard or dense materials were encountered, each increment was terminated at 50 blows even if 6 in. of penetration had not been achieved in that increment.

Samples will be retained in our laboratory for 30 days after submittal of this report. Other arrangements may be provided at the request of the Client.

GENERAL SITE CONDITIONS

SITE DESCRIPTION

The project site is at the existing Landa Park Golf Course Clubhouse located at 180 Golf Course Road in New Braunfels, Texas. Existing structures include the golf course clubhouse, existing deck, and retaining wall, and the associated infrastructure to support access and service to the golf course. The golf course clubhouse is immediately adjacent to Blieders Creek and the proposed deck will overlook the creek. The topography generally slopes downward toward the south with vertical relief of about 30 ft across the site. Surface drainage is visually estimated to range from fair to good.

GEOLOGY

A review of the *Geologic Atlas of Texas, San Antonio Sheet*, indicates that this site is naturally underlain by fluviatile terrace deposits which are stream bed deposits typically consisting of clays, sands, silts, and gravels. Such deposits can contain point bars, cutbanks, oxbows, and abandoned channel segments associated with variations in stream bed activity. As a result, soil profiles in terrace deposit areas may vary greatly over relatively short distances. Key geotechnical engineering concerns for development supported on this

formation are the expansive nature of the clays, the consistency or relative density of the deposits, and the absence/presence as well as thickness of potentially water-bearing gravels.

SEISMIC CONSIDERATIONS

Based on the soil borings conducted for this investigation, the upper 100 feet of soil may be characterized as "very dense soil and soft rock" and a **Class C** Site Class Definition (Chapter 20 of ASCE 7) has been assigned to this site.

On the basis of the Structural Engineers Association of California/Office of Statewide Health Planning and Development (SEAOC/OSHPD) website[1] which utilizes the International Building Code (IBC) and U.S. Seismic Design Maps to develop seismic design parameters, the following seismic considerations are associated with this site.

- **S_s = 0.073 g**
- **S_1 = 0.031 g**
- **S_{ms} = 0.088 g**
- **S_{m1} = 0.053 g**
- **S_{DS} = 0.058 g**
- **S_{D1} = 0.035 g**

Based on the parameters listed above as well as Tables 1613.3.5(1) and 1613.3.5(2) of the 2012 IBC, the Seismic Design Category for both short period and 1 second response accelerations is **A**. As part of the assumptions required to complete the calculations, a Risk Category of "III" was selected.

STRATIGRAPHY

The subsurface stratigraphy at this site can generally be described as plastic, dark brown to brown clay with gravel, overlying moderately plastic light brown to light tan silty clays. These silty clays overlie tan to gray gravelly clay which overlies very hard, gray shale. The gray shale extends to at least the termination depth of our borings. Each stratum has been designated by grouping soils that possess similar physical and engineering characteristics. The boring logs should be consulted for more specific stratigraphic information. The lines designating the interfaces between strata on the boring logs represent approximate boundaries. Transitions between strata may be gradual.

GROUNDWATER

Groundwater was observed in both borings during drilling operations. The depths to water (post drill) and to the bottom of the borings, as well as the depth where groundwater was encountered is tabulated below.

[1] https://seismicmaps.org

Boring No.	Depth Groundwater Seepage Encountered (ft)	Depth to Water (Upon Completion) (ft)	Depth to Bottom of Boring (ft)
B-1	3	2.0	50
B-2	25	19.9	50

It is possible for groundwater to exist beneath this site at shallow depths on a transient basis, particularly at strata interfaces, within granular soils, and following periods of precipitation. Fluctuations in groundwater levels occur due to variation in rainfall and surface water run-off. The construction process itself may also cause variations in the groundwater level.

FOUNDATION ANALYSIS

EXPANSIVE SOIL-RELATED MOVEMENTS

The anticipated ground movements due to swelling of the underlying soils at the site were estimated for slab-on-grade construction using the empirical procedure, Texas Department of Transportation (TxDOT) Tex-124-E, Method for Determining the Potential Vertical Rise (PVR). PVR values ranging from 1-1/2 to 2 in. were estimated for the stratigraphic conditions encountered in our borings. A surcharge load of 1 psi (concrete slab and sand layer), an active zone of 15 ft, and dry moisture conditions were assumed in estimating the above PVR values.

The TxDOT method of estimating expansive soil-related movements is based on empirical correlations utilizing the measured plasticity indices and assuming typical seasonal fluctuations in moisture content. If desired, other methods of estimating expansive soil-related movements are available, such as estimations based on swell tests and/or soil-suction analyses. However, the performance of these tests and the detailed analysis of expansive soil-related movements were beyond the scope of the current study. It should also be noted that actual movements can exceed the calculated PVR values due to isolated changes in moisture content (such as due to leaks, landscape watering, etc.) or if water seeps into the soils to greater depths than the assumed active zone depth due to deep trenching or excavations.

Overexcavation and Select Fill Replacement

To reduce expansive soil-related movements in at-grade construction, a portion of the upper highly expansive subgrade clays in the deck area can be removed by overexcavating and backfilling with a suitable select fill material. PVR values have been estimated for overexcavation and select fill replacement to various depths below the existing ground surface and are summarized in the table below. Recommendations for the selection and placement of select backfill materials are addressed in a subsequent section of this report.

Depth of Overexcavation and Select Fill Replacement (ft)*	Estimated PVR (in.)
0	1-1/2
1	1-1/4
2	1
3	3/4
4	1/2 in. or less

*below the ground surface elevation existing at the time of our study.

FOUNDATION RECOMMENDATIONS

FOUNDATION OPTIONS

The following recommendations are based on the data obtained from our field and laboratory studies, our past experience with geotechnical conditions similar to those at this site, and our engineering design analyses.

The following alternatives are available to support the structures:

- Drilled, straight-shaft piers; or
- Helical piers.

The owner may select either one of these foundation systems depending on the performance criteria established for the structures. Cost analyses have not been conducted for any foundation system and are beyond the scope of this study. It is our understanding that helical piers are being considered for improvements.

SITE GRADING

We have prepared all foundation recommendations based on the existing ground surface and the stratigraphic conditions encountered at the time of our study. If site grading plans differ from existing grade by more than plus or minus 1 ft, RKCI must be retained to review the site grading plans prior to bidding the project for construction. This will enable RKCI to provide input for any changes in our original recommendations that may be required as a result of site grading operations or other considerations.

AREA FLATWORK

It should be noted that ground-supported flatwork such as walkways, courtyards, etc. will be subject to the same magnitude of potential soil-related movements as discussed previously (see *Expansive Soil-Related Movement* section). Thus, where these types of elements abut rigid building foundations or isolated/suspended structures, differential movements should be anticipated. As a minimum, we recommend that flexible joints be provided where such elements abut the main structure to allow for differential movement at these locations. Where the potential for differential movement is objectionable,

it may be beneficial to consider methods of reducing anticipated movements or to consider structurally suspending critical areas to match the adjacent building performance.

DRILLED, STRAIGHT-SHAFT PIERS

Axial Capacity

We have computed allowable downward vertical capacities for 18, 24, 30, 36, and 42 in. diameter drilled piers. Straight-shaft piers should be designed as end bearing and friction units using the capacities presented graphically on the "Drilled Pier Axial Capacity Curves" on Figure 6. Side shear resistance was neglected to the elevations presented on the drilled pier capacity curves. If soft soils are encountered during drilling within the elevations that contribute to pier capacity, the piers should be extended by the length that the pier penetrates the soft soils to maintain the required capacity of the piers. RKCI will need to be present to observe that the excavated soils are consistent with the soils encountered near the termination depths of our borings.

Pier capacity curves were developed using the TxDOT Geotechnical Manual dated March 2018. The capacity curves are based on the TCP blow count data from the borings. The indicated capacities on these figures are for dead plus live loads. Dead loads should not exceed two-thirds of the computed capacities.

Pier Shafts

The pier shafts will be subject to potential uplift forces if the surrounding expansive soils within the active zone are subjected to alternate drying and wetting conditions. The maximum potential uplift force acting on the shaft may be estimated by:

$$F_u = 50*D$$

where:

F_u = uplift force in kips; and
D = diameter of the shaft in feet.

Uplift Resistance

Resistance to uplift forces exerted on the drilled, straight-shaft piers will be provided by the sustained compressive axial force (dead load) plus the allowable uplift resistance provided by the soil. The resistance provided by the soil depends on the shear strength of the soils adjacent to the pier shaft and below the depth of the active zone. The allowable uplift resistance provided by the soils at this site may be estimated using the "Drilled Pier Uplift Capacity Curves" presented graphically on Figure 7. Side shear resistance was neglected to the elevations presented on the uplift capacity curves.

Reinforcing steel will be required in each pier shaft to withstand a net force equal to the uplift force minus the uplift resistive force and the sustained compressive load carried by that pier. We recommend that each

pier be reinforced to withstand this net force or an amount equal to 0.75 percent of the cross-sectional area of the shaft, whichever is greater.

To effectively reduce pier group effects and reduction in individual pier capacity, piers should be located with a minimum center-to-center spacing of three shaft diameters.

Estimated Settlements

Based on the maximum allowable loads for a single pier, we estimate total settlements on the order of 1/2 in. to 1 in. to mobilize allowable static capacities. Post-construction settlement will be dependent on the final structural loading, pier spacing, and group size. We recommend that RKCI be retained to review the final loads and pier group layouts, to review pier capacities and to check estimated foundation settlements.

Pier Spacing

Where possible, we recommend that the piers be spaced at a center to center distance of at least three shaft diameters on-center for straight-shaft piers. Such spacing will not require a reduction in the load carrying capacity of the individual piers.

If design and/or construction restraints require that piers be spaced closer than the recommended three shaft diameters, RKCI must re-evaluate the allowable bearing capacities presented above for the individual piers. Reductions in load carrying capacities may be required depending upon individual loading and spacing conditions.

Lateral Resistance

Resistance to lateral loads and the expected pier behavior under the applied loading conditions will depend not only on subsurface conditions, but also on loading conditions, the pier size, and the engineering properties of the pier. Once pier sizes, concrete strength, and reinforcement are finalized, piers should be analyzed to determine the resulting lateral deflection, maximum bending moment, and ultimate bending moment. This type of analysis is typically performed utilizing a computer analysis program and usually requires a trial and error procedure to appropriately size the piers and meet project tolerances.

To assist the design engineer in this procedure, we are providing the following soil parameters for use in analysis. These parameters are in accordance with the input requirements of one of the more commonly used computer programs for laterally loaded piles, the LPile program. If a different program is used for analysis, different parameters and limitations may be required than what were assumed in selecting the parameters given below. Thus, if a program other than LPile is used, RKCI must be notified of the analysis method, so that we can review and revise our recommendations if required. Evaluating the lateral resistance on different pier sizes is outside our scope of work at this time.

The soil-related parameters required for input into the LPile program are summarized in the tables below:

Assumed Behavior for Analysis	Elevation (ft)	c (tsf)	k_s (pci)	k_c (pci)	ε_{50}	γ (pcf)
Soft Clay (Matlock)	628 to 597	0.25	30	-	0.02	100
Stiff Clay without free water (Reese & Welch)	597 to 560	4.00	2,000	800	0.004	135

*Depth below the existing ground surface at the time of our study. Additional fill placed in the deck area to achieve the proposed FFE should be modeled as soft clay (matlock) as presented above.

Where: c = undrained cohesion
k_s = p-y modulus (static)
k_c = p-y modulus (cyclic)
ε_{50} = strain factor
γ = effective unit weight

The parameters presented in the above table do not include factors of safety. Per the general procedures of Section 1810.3.3.2 of the IBC 2012 edition, the allowable lateral capacity shall not exceed one-half of the lateral load that produces a lateral movement of 1-inch at the ground surface.

It should be noted that where piers are spaced closer than three shaft diameters center to center, a modification factor should be applied to the p-y curves to account for a group effect. We recommend the following p-Multipliers for the corresponding center to center pier spacings.

Spacing (in shaft diameters)	p-Multiplier
3	1.0
2	0.75
1	0.50

HELICAL PIERS

It is our understanding that helical piers may be considered to support the structure. Helical pier capacity is achieved through end bearing on the helix plates and skin friction on the shaft. Helical piers are typically rotated into place until the required torque is achieved, utilizing a torque to capacity correlation. These correlations are dependent on the size, type, and configuration of the selected helical piers and are considered proprietary.

The boring logs included herein may be used by the selected contractor and structural engineer designing the foundation system to develop the required capacity. Key geotechnical considerations for helical piers at this site will be the ability to advance the piers through the gravel layers and the hard clay shale.

ADDITIONAL CONSIDERATIONS

As with any project where new additions are to be connected to an existing structure, differential movements between the existing structure and addition should be anticipated. To reduce possible differential movements, it is typically desirable to match the old and the new foundation types. However, this will not eliminate the potential for differential movements since the existing and new structures are constructed at different times. Therefore, the recommendations and options discussed in this report should be carefully considered by the design team to obtain the desired performance of the new structural system. As a minimum, control/expansion joints are recommended at connection points between the old and new structures and between architectural trim materials along walls/ceilings.

Should excavations adjacent to existing structures be required, precautions should be taken not to undermine or damage existing grade beams, footings, and/or utility lines.

FOUNDATION CONSTRUCTION CONSIDERATIONS

SITE DRAINAGE

Drainage is an important key to the successful performance of any foundation. Good surface drainage should be established prior to and maintained after construction to help prevent water from ponding within or adjacent to the deck foundation and to facilitate rapid drainage away from the foundation. Failure to provide positive drainage away from the structure can result in localized differential vertical movements in floor slabs.

Also to help control drainage in the vicinity of the structure, we recommend that roof/gutter downspouts and landscaping irrigation systems not be located adjacent to the deck foundation. Where a select fill overbuild is provided outside of the floor slab/foundation footprint, the surface should be sealed with an impermeable layer (pavement or clay cap) to reduce infiltration of both irrigation and surface waters. Careful consideration should also be given to the location of water bearing utilities, as well as to provisions for drainage in the event of leaks in water bearing utilities. All leaks should be immediately repaired.

Furthermore, as discussed in a previous section of this report, based on our past experience and findings in our test borings shallow groundwater seepage should be anticipated at the time of construction as a result of the proximity to the adjacent creek.

SELECT FILL

If needed, materials used as select fill for final site grading preferably should be crushed stone or gravel aggregate. We recommend that materials specified for use as select fill meet the TxDOT 2004 Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, Item 247, Flexible Base, Type A, Grades 1-2 or 3.

Soils classified as CH, CL, MH, ML, SM, GM, OH, OL and Pt under the USCS are **not** considered suitable for use as select fill materials at this site. The native soils at this site are **not** considered suitable for use as select fill materials.

Select fill should be placed in loose lifts not exceeding 8 in. in thickness and compacted to at least 95 percent of maximum density as determined by TxDOT, Tex-113-E, Compaction Test. The moisture content of the fill should be maintained within the range of 2 percentage points below to 2 percentage points above the optimum moisture content until final compaction. Should fill be required resulting in thicknesses of 8 ft or greater, we should be retained to evaluate the conditions and the placement recommendations.

DRILLED PIERS

Each drilled pier excavation must be examined by an RKCI representative who is familiar with the geotechnical aspects of the soil stratigraphy, the structural configuration, foundation design details and assumptions, prior to placing concrete. This is to observe that:

- The shaft has been excavated to the specified dimensions at the correct depth established by the previously mentioned criteria;
- The pier excavation remains dry prior to concrete placement, with less than 1 inch of water at the base of the excavation;
- The shaft has been drilled plumb within specified tolerances along its total length; and
- Excessive cuttings, buildup and soft, compressible materials have been removed from the bottom of the excavation.

If pier excavations are unable to be kept dry prior to placement of concrete, the tremie method should be used to place concrete. Utilization of the tremie method does not replace our recommendation of pier casing.

Reinforcement and Concrete Placement

Reinforcing steel should be checked for size and placement prior to concrete placement. Placement of concrete should be accomplished as soon as possible after excavation to reduce changes in the moisture content or the state of stress of the foundation materials. No foundation element should be left open overnight without concreting.

Temporary Casing and Slurry Techniques

Groundwater seepage was encountered during our field operations thus, groundwater seepage and/or side sloughing should be expected at the time of construction, depending on climatic conditions prevalent at the time of construction. Additionally, gravel and gravelly soils were encountered in our borings which may cause sidewall sloughing of the pier excavations. Therefore, we recommend that the bid documents require the foundation contractor to specify unit costs for different lengths of casing and unit costs for slurry drilling techniques that may be required. Temporary casing and slurry techniques should be conducted in accordance with TxDOT 2014 Standard Specifications for Construction of Highways, Streets and Bridges, Item 416, *Drilled Shaft Foundations.*

EXCAVATION SLOPING AND BENCHING

If utility trenches or other excavations extend to or below a depth of 5 ft below construction grade, the contractor or others shall be required to develop a trench safety plan to protect personnel entering the trench or trench vicinity. The collection of specific geotechnical data and the development of such a plan, which could include designs for sloping and benching or various types of temporary shoring, are beyond the scope of the current study. Any such designs and safety plans shall be developed in accordance with current OSHA guidelines and other applicable industry standards.

As discussed previously, we estimate that groundwater seepage may be encountered at an approximate elevation of 608 ft. Provisions must be made to handle groundwater seepage and all necessary precautions must be taken to protect employees against the hazards posed by water accumulation. According to the OSHA regulations, any soil/rock from which water is seeping is classified as a Type "C" soil and should be sloped no steeper than 1-1/2:1 (horizontal/vertical).

EXCAVATION EQUIPMENT

Hard to very hard shale was encountered in our borings. Thus, the need of rock excavation equipment should be anticipated for construction of the drilled piers at this site and should be considered should helical piers be utilized to support the proposed deck. Our boring logs are not intended for use in determining construction means and methods and may therefore be misleading if used for that purpose. We recommend that earth-work and utility contractors interested in bidding on the work perform their own tests in the form of test pits to determine the quantities of the different materials to be excavated, as well as the preferred excavation methods and equipment for this site.

CONSTRUCTION RELATED SERVICES

CONSTRUCTION MATERIALS TESTING AND OBSERVATION SERVICES

As presented in the attachment to this report, *Important Information About Your Geotechnical Engineering Report*, subsurface conditions can vary across a project site. The conditions described in this report are based on interpolations derived from a limited number of data points. Variations will be encountered during construction, and only the geotechnical design engineer will be able to determine if these conditions are different than those assumed for design.

Construction problems resulting from variations or anomalies in subsurface conditions are among the most prevalent on construction projects and often lead to delays, changes, cost overruns, and disputes. These variations and anomalies can best be addressed if the geotechnical engineer of record, RKCI is retained to perform construction observation and testing services during the construction of the project. This is because:

- RKCI has an intimate understanding of the geotechnical engineering report's findings and recommendations. RKCI understands how the report should be interpreted and can provide such interpretations on site, on the client's behalf.
- RKCI knows what subsurface conditions are anticipated at the site.

- RKCI is familiar with the goals of the owner and project design professionals, having worked with them in the development of the geotechnical workscope. This enables RKCI to suggest remedial measures (when needed) which help meet the owner's and the design teams' requirements.
- RKCI has a vested interest in client satisfaction, and thus assigns qualified personnel whose principal concern is client satisfaction. This concern is exhibited by the manner in which contractors' work is tested, evaluated and reported, and in selection of alternative approaches when such may become necessary.
- RKCI cannot be held accountable for problems which result due to misinterpretation of our findings or recommendations when we are not on hand to provide the interpretation which is required.

BUDGETING FOR CONSTRUCTION TESTING

Appropriate budgets need to be developed for the required construction testing and observation activities. At the appropriate time before construction, we advise that RKCI and the project designers meet and jointly develop the testing budgets, as well as review the testing specifications as it pertains to this project.

Once the construction testing budget and scope of work are finalized, we encourage a preconstruction meeting with the selected contractor to review the scope of work to make sure it is consistent with the construction means and methods proposed by the contractor. RKCI looks forward to the opportunity to provide continued support on this project, and would welcome the opportunity to meet with the Project Team to develop both a scope and budget for these services.

* * * * * * * * * * * * * * * * * * *

ATTACHMENTS

THE ELEVATIONS ON THIS MAP DO NOT REPRESENT SURVEYED LOCATIONS AND WERE TAKEN FROM THE USGS COMAL COUNTY GIS DATABASE

RABA KISTNER
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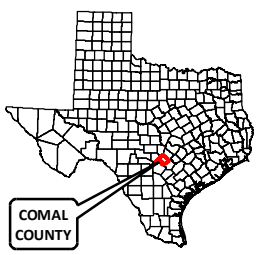
New Braunfels, TX 78130
(830)214-0544 TEL
(830)214-0627 FAX
www.rkci.com
TBPE Firm Number 3257

SOURCE: Aerial photograph obtained from Google Earth Pro - 2020

BORING LOCATION MAP

LANDA GOLF COURSE
CLUBHOUSE DECK REPLACEMENT
NEW BRAUNFELS, TEXAS



PROJECT No.:	ANA21-031-00
ISSUE DATE:	07/15/2021
DRAWN BY:	JMR
CHECKED BY:	DAB
REVIEWED BY:	TIP

FIGURE

1

NOTE: This Drawing is Provided for Illustration Only, May Not be to Scale and is Not Suitable for Design or Construction Purposes

LOG OF BORING NO. B-1

Landa Golf Course
Clubhouse Deck Replacement
New Braunfels, Texas

RABA KISTNER
TBPE Firm Registration No. F-3257

DRILLING METHOD: Straight Flight Auger

LOCATION: N 29.71119; W 98.13202

SURFACE ELEVATION: 610 ft

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WEIGHT, pcf	SHEAR STRENGTH, TONS/FT^2 (0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0) / PLASTIC LIMIT, WATER CONTENT, LIQUID LIMIT (10 20 30 40 50 60 70 80)	PLASTICITY INDEX	% -200
0			CLAY, Very Soft, Dark Brown, with gravel				28	
			-groundwater encountered at 3 ft	6				
5			CLAY, Gravelley (River Gravel), Stiff, Gray	NR				
				20				54
10								
			SHALE, Very Hard, Gray	100/2.75"				
15								
				100/2.25"				
20								
				100/0.75"				
25								
				100/1.5"				
30								
				100/1.75"				
35								
				100/2.5"				

DEPTH DRILLED:	50.0 ft	**DEPTH TO WATER:**	2 ft	**PROJ. No.:**	ANA21-031-00
DATE DRILLED:	6/28/2021	**DATE MEASURED:**	6/28/2021	**FIGURE:**	2a

NOTE: THESE LOGS SHOULD NOT BE USED SEPARATELY FROM THE PROJECT REPORT

LOG OF BORING NO. B-1

Landa Golf Course
Clubhouse Deck Replacement
New Braunfels, Texas

RABA KISTNER
TBPE Firm Registration No. F-3257

DRILLING METHOD: Straight Flight Auger

LOCATION: N 29.71119; W 98.13202

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WEIGHT, pcf	SHEAR STRENGTH, TONS/FT^2 (0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70 80)	PLASTICITY INDEX	% -200
			SURFACE ELEVATION: 610 ft					
			SHALE, Very Hard, Gray *(continued)*					
				100/1.5"				
45								
				100/1.5"				
50								
55								
60								
65								
70								
75								

NOTE: THESE LOGS SHOULD NOT BE USED SEPARATELY FROM THE PROJECT REPORT

DEPTH DRILLED:	50.0 ft	**DEPTH TO WATER:**	2 ft	**PROJ. No.:**	ANA21-031-00
DATE DRILLED:	6/28/2021	**DATE MEASURED:**	6/28/2021	**FIGURE:**	2b

LOG OF BORING NO. B-2

Landa Golf Course
Clubhouse Deck Replacement
New Braunfels, Texas

RABA KISTNER
TBPE Firm Registration No. F-3257

DRILLING METHOD: Straight Flight Auger

LOCATION: N 29.71152; W 98.13179

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WEIGHT, pcf	SHEAR STRENGTH, TONS/FT^2 (0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70 80)	PLASTICITY INDEX	% -200
			SURFACE ELEVATION: 628 ft					
			FILL MATERIAL: CLAY, Sandy, Tan					
			CLAY, Soft, Brown	12			37	
5			CLAY, Very Stiff, Light Brown, with silt	52	106		14	
10							13	
			CLAY, Silty, Soft, Light Tan, with gray mottling	17				
15			CLAY, Gravelly, Stiff to Very Stiff, Tan	27				61
20								
25			-groundwater encountered at 25 ft	74				
			SHALE, Very Hard, Gray	100/3"				
30								
				100/1.5"				
35								
				100/2.5"				

DEPTH DRILLED: 50.0 ft
DATE DRILLED: 6/28/2021

DEPTH TO WATER: 19.9 ft
DATE MEASURED: 6/28/2021

PROJ. No.: ANA21-031-00
FIGURE: 3a

NOTE: THESE LOGS SHOULD NOT BE USED SEPARATELY FROM THE PROJECT REPORT

LOG OF BORING NO. B-2

Landa Golf Course
Clubhouse Deck Replacement
New Braunfels, Texas

RABA KISTNER
TBPE Firm Registration No. F-3257

DRILLING METHOD: Straight Flight Auger

LOCATION: N 29.71152; W 98.13179

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WEIGHT, pcf	SHEAR STRENGTH, TONS/FT^2 (0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0) / PLASTIC LIMIT / WATER CONTENT / LIQUID LIMIT (10 20 30 40 50 60 70 80)	PLASTICITY INDEX	% -200
			SURFACE ELEVATION: 628 ft					
			SHALE, Very Hard, Gray *(continued)*					
				100/4"				
45								
				100/1.75"				
50								
55								
60								
65								
70								
75								

NOTE: THESE LOGS SHOULD NOT BE USED SEPARATELY FROM THE PROJECT REPORT

DEPTH DRILLED:	50.0 ft	**DEPTH TO WATER:**	19.9 ft	**PROJ. No.:**	ANA21-031-00
DATE DRILLED:	6/28/2021	**DATE MEASURED:**	6/28/2021	**FIGURE:**	3b

KEY TO TERMS AND SYMBOLS

MATERIAL TYPES

SOIL TERMS


CALCAREOUS


CALICHE


CLAY


CLAYEY


GRAVEL


GRAVELLY


PEAT


SAND


SANDY


SILT


SILTY


FILL

ROCK TERMS


CHALK


CLAYSTONE


CLAY-SHALE


CONGLOMERATE


DOLOMITE


IGNEOUS


LIMESTONE


MARL


METAMORPHIC


SANDSTONE


SHALE


SILTSTONE

OTHER


ASPHALT


BASE


CONCRETE/CEMENT


BRICKS / PAVERS


WASTE


NO INFORMATION

WELL CONSTRUCTION AND PLUGGING MATERIALS


BLANK PIPE


SCREEN


BENTONITE


CEMENT GROUT


BENTONITE & CUTTINGS


CONCRETE/CEMENT


CUTTINGS


GRAVEL


SAND


VOLCLAY

SAMPLE TYPES

AIR ROTARY

GRAB SAMPLE

CORE

GEOPROBE SAMPLER

ROTOSONIC -DAMAGED

MUD ROTARY

NO RECOVERY

NX CORE

PITCHER

ROTOSONIC -INTACT

SHELBY TUBE

SPLIT BARREL

SPLIT SPOON

TEXAS CONE PENETROMETER

DISTURBED

STRENGTH TEST TYPES

POCKET PENETROMETER

TORVANE

UNCONFINED COMPRESSION

TRIAXIAL COMPRESSION UNCONSOLIDATED-UNDRAINED

TRIAXIAL COMPRESSION CONSOLIDATED-UNDRAINED

NOTE: VALUES SYMBOLIZED ON BORING LOGS REPRESENT SHEAR STRENGTHS UNLESS OTHERWISE NOTED

PROJECT NO. ANA21-031-00

RESULTS OF SOIL SAMPLE ANALYSES

PROJECT NAME: Landa Golf Course
Clubhouse Deck Replacement
New Braunfels, Texas

FILE NAME: ANA21-031-00.GPJ 7/21/2021

Boring No.	Sample Depth (ft)	Blows per ft	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	USCS	Dry Unit Weight (pcf)	% -200 Sieve	Shear Strength (tsf)	Strength Test
B-1	0.0 to 3.0		16	48	20	28	CL				
	3.0 to 5.0	6									
	5.0 to 8.0	NR									
	8.0 to 10.0	20									
	10.0 to 13.0		21						54		
	13.0 to 15.0	100/2.75"									
	15.0 to 18.0		22								
	18.0 to 20.0	100/2.25"									
	20.0 to 23.0		24								
	23.0 to 25.0	100/0.75"									
	25.0 to 28.0		31								
	28.0 to 30.0	100/1.5"									
	30.0 to 33.0		23								
	33.0 to 35.0	100/1.75"									
	35.0 to 38.0		22								
	38.0 to 40.0	100/2.5"									
	40.0 to 43.0		28								
	43.0 to 45.0	100/1.5"									
	45.0 to 48.0		28								
	48.0 to 50.0	100/1.5"									
B-2	1.0 to 3.0		20	53	16	37	CH			1.13	PP
	3.0 to 5.0	12									
	6.0 to 8.0		14	31	17	14	CL	106		1.40	UC
	8.0 to 10.0	52									
	10.0 to 13.0		15	27	14	13	CL				
	13.0 to 15.0	17									
	15.0 to 18.0		14								
	18.0 to 20.0	27									
	20.0 to 23.0		14						61		
	23.0 to 25.0	74									
	25.0 to 28.0		8								
	28.0 to 30.0	100/3"									
	30.0 to 33.0		21								
	33.0 to 35.0	100/1.5"									
	35.0 to 38.0		26								
	38.0 to 40.0	100/2.5"									
	40.0 to 43.0		27								
	43.0 to 45.0	100/4"									
	45.0 to 48.0		27								

PP = Pocket Penetrometer TV = Torvane UC = Unconfined Compression FV = Field Vane UU = Unconsolidated Undrained Triaxial

CU = Consolidated Undrained Triaxial

PROJECT NO. ANA21-031-00

RESULTS OF SOIL SAMPLE ANALYSES

PROJECT NAME: Landa Golf Course
Clubhouse Deck Replacement
New Braunfels, Texas

FILE NAME: ANA21-031-00.GPJ 7/21/2021

Boring No.	Sample Depth (ft)	Blows per ft	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	USCS	Dry Unit Weight (pcf)	% -200 Sieve	Shear Strength (tsf)	Strength Test
B-2	48.0 to 50.0	100/1.75"									

PP = Pocket Penetrometer TV = Torvane UC = Unconfined Compression FV = Field Vane UU = Unconsolidated Undrained Triaxial

CU = Consolidated Undrained Triaxial

PROJECT NO. ANA21-031-00

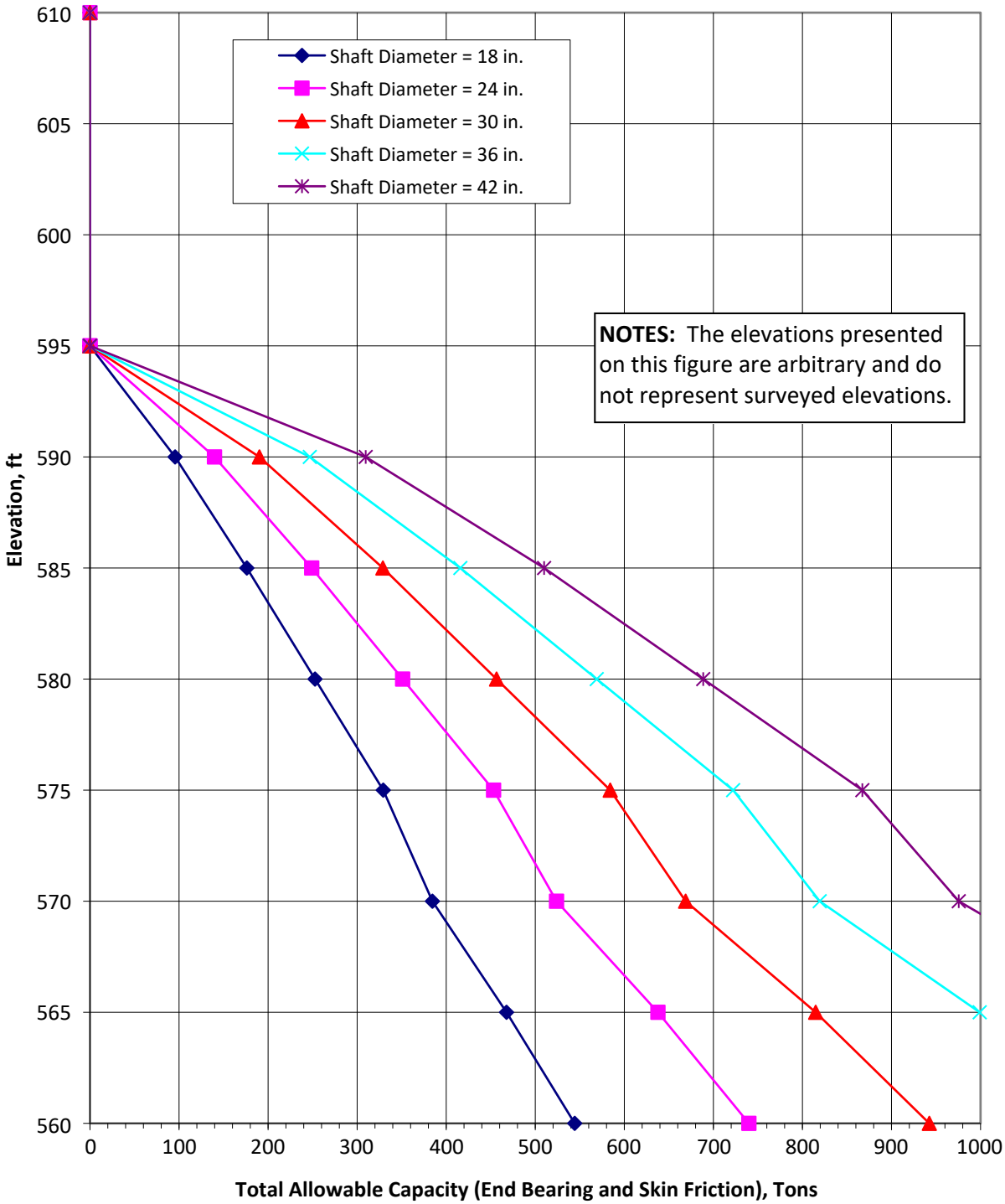
DRILLED PIER AXIAL CAPACITY CURVE

Straight Shaft Piers

Landa Golf Course Clubhouse Deck Replacement

New Braunfels, Texas

(Boring B-1)



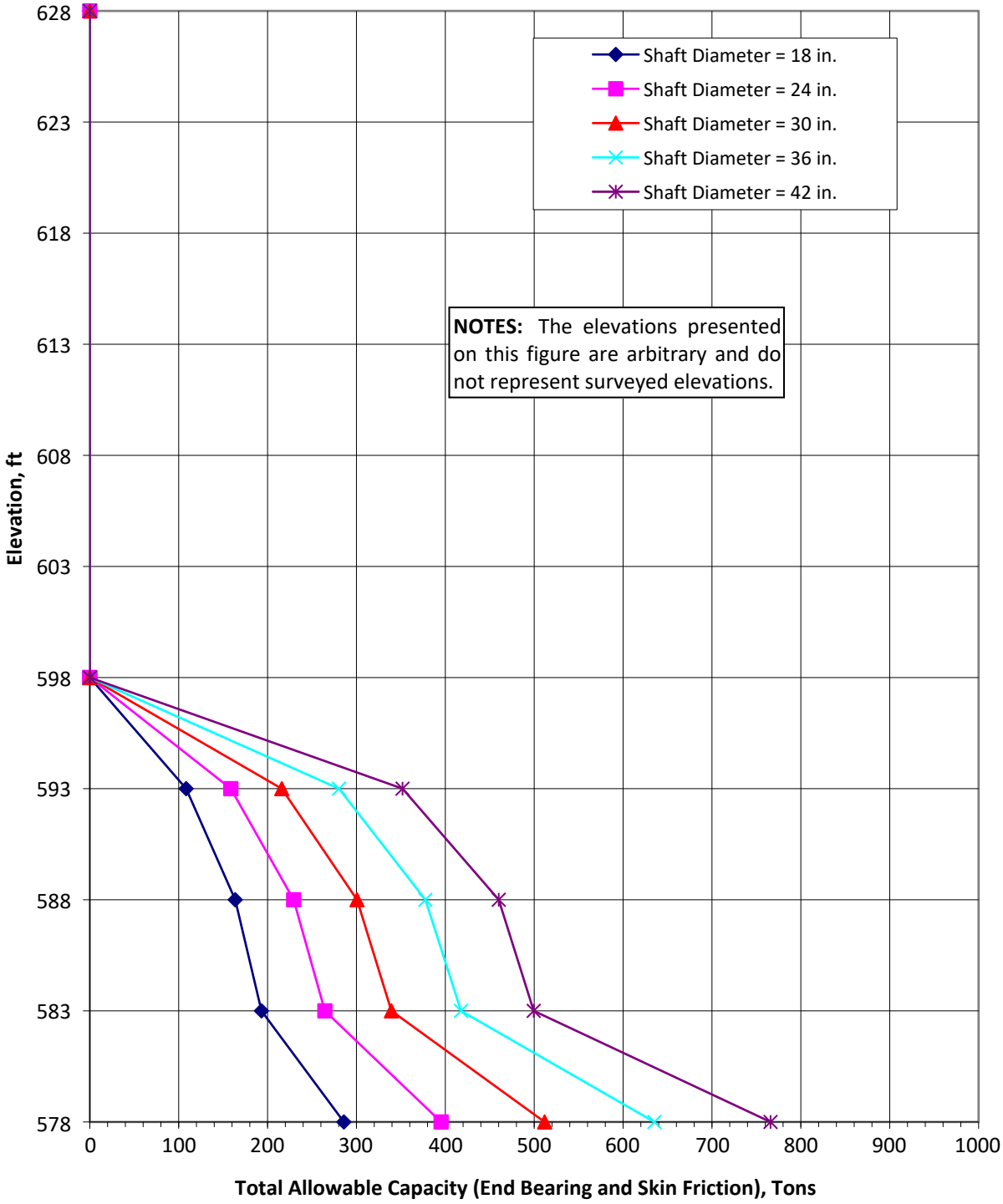
DRILLED PIER AXIAL CAPACITY CURVE

Straight Shaft Piers

Landa Golf Course Clubhouse Deck Replacement

New Braunfels, Texas

(Boring B-2)



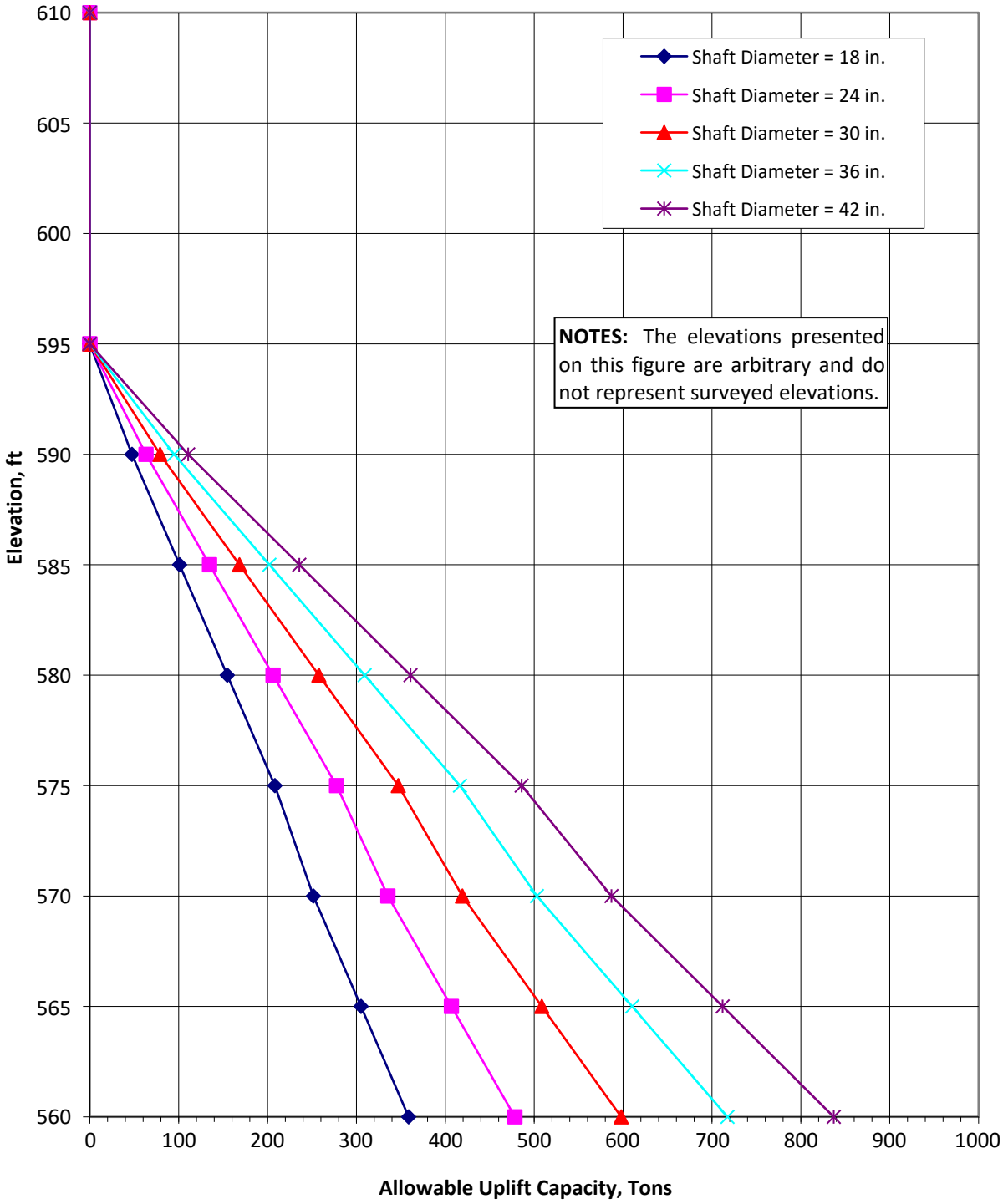
DRILLED PIER UPLIFT CAPACITY CURVE

Straight Shaft Piers

Landa Golf Course Clubhouse Deck Replacement

New Braunfels, Texas

(Boring B-1)



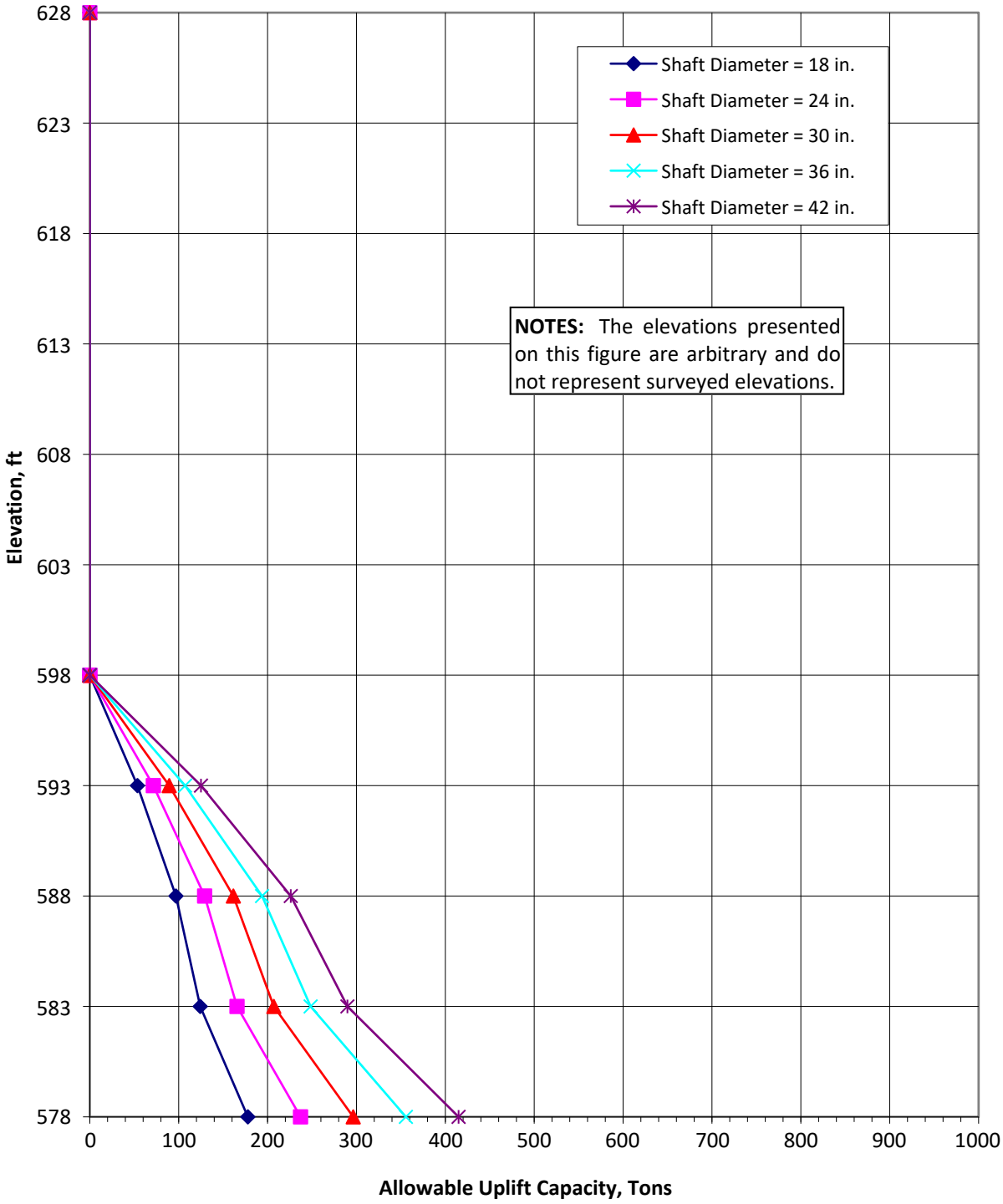
DRILLED PIER UPLIFT CAPACITY CURVE

Straight Shaft Piers

Landa Golf Course Clubhouse Deck Replacement

New Braunfels, Texas

(Boring B-2)



Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you —* should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

IIGER06045.0M

CONSULTANTS • ENVIRONMENTAL • FACILITIES • INFRASTRUCTURE

San Antonio, TX

Austin, TX	Dallas , TX	McAllen, TX
Brownsville, TX	El Paso, TX	Mexico
Corpus Christi , TX	Houston, TX	Salt Lake City, UT

SP-3 Existing Floor Material
Record flooring submittal from previous remodel project (Following this page)

F.A. NUNNELLY CO.
GENERAL CONTRACTOR
Three Generations of Integrity

Submittal Transmittal

Detailed, Grouped by Each Number

NB Golf Clubhouse Remodel (NB-028)
180 Golf course Rd.
New Braunfels, TX 78130

Project # 1412
Tel: 830-221-4389 Fax: 830-608-2112

City of New Braunfels

Date: 7/29/2014 **Reference Number: 0020**

Transmitted To:	Jennifer Cain City of New Braunfels New Braunfels, TX 78130 Tel: 830.221.4646 Fax:	**Transmitted By:**	Catherine Jaquez F. A. Nunnelly Co. 2922 Pan Am Expressway San Antonio, TX 78208 Tel: 210-277-7070 Fax: 210-277-7072

Qty	Submittal Package No	Description	Due Date	Package Action
1	0014 - 09650 -	Laminate Flooring		

Transmitted For	Delivered Via	Tracking Number
Approval	Email	

Items	Qty	Description	Notes	Item Action
0001	1	Laminate Flooring PD includes prep instructions; storage and handling and install methods		Sent
0002	0	Laminate Flooring Sample Selection		Previously Approved
0003	0	Laminate Flooring Verification Samples		Not Required
0004	0	Laminate Flooring Manufacturers		Not Required
0005	0	Laminate Flooring O&M Closeouts		To be submitted at a later date
0006	1	Laminate Flooring 8 YEAR Warranty		Sent
0007	0	Laminate Flooring EXTRA STOCK 10% Laminate; 2 full lengths of T-molding		To be submitted at a later date

Cc:	Company Name	Contact Name	Copies	Notes
	CgM and Associates and Architects	Robert Bruce	1	
	F. A. Nunnelly Co.	Matthew Foyt	1	

Remarks

Signature **Signed Date**

Department

Submittal Cover Sheet

Submittal No.: 0014-09 6270 Project No: 14-028

Date Submitted: 07.29.14

Engineer:

General Contractor: F.A. Nunnelly, Co.

Subcontractor/Supplier: San Antonio Floor Finishers, Inc.

Specification Section No.: 096270

Specification Section Name: Laminate Flooring

Item Submitted: Artestick Vinyl Flooring

Remarks:

Please submit to:

City of New Braunfels
Attn: Jennifer Cain
424 S. Castell Ave.
New Braunfels, TX 78130

F.A. NUNNELLY
GENERAL CONTRACTOR

Submittal Packages

Summary, Grouped by Package Number with Register Items

NB Golf Clubhouse Remodel (NB-028)
180 Golf course Rd.
New Braunfels, TX 78130

Project # 1412
Tel: 830-221-4389 Fax: 830-608-2112

City of New Braunfels

Item No	Register No	Rev	Spec Section	Sub Section	Description	Rec'd On	Returned	Action	Logged By	Closed
0014 - 09650 -			**Laminate Flooring**							
0001	00064	0	096270	1.3A	Laminate Flooring PD includes prep instructions; storage and handling and install methods	7/25/2014				No
0002	00065	0	096270	1.3B	Laminate Flooring Sample Selection	Previously submitted. CONB selected the "Centennial Plus" on 07/02/14				No
0003	00066	0	096270	1.3C	Laminate Flooring Verification Samples	Not required				No
0004	00067	0	096270	1.3D	Laminate Flooring Manufacturers	Not required				No
0005	00068	0	096270	1.3E	Laminate Flooring O&M Closeouts	To be submitted with Closeout at a later date				No
0006	00069	0	096270	1.7A	Laminate Flooring 8 YEAR Warranty	7/25/2014				No
0007	00070	0	096270	1.8	Laminate Flooring EXTRA STOCK 10% Laminate; 2 full lengths of T-molding	To be submitted with Closeout at a later date				No

F.A. Nunnelly Company

This submittal has been reviewed for compliance with the requirements of the work and of the contract documents. F.A. Nunnelly is not responsible for any discrepancies between these drawings and/or materials and the contract plans and specifications. These drawings and/or materials are subject to strict compliance with plans and specifications and no deviations are authorized unless specifically authorized by F.A. Nunnelly in writing.

Submittal No.: 0014-09650-0

Reviewed By: : C. Jaquez Date: 07/29/201411:10:39 AM

TECHNICAL DETAILS	AMERICAN PLANK	RUSTICO	CENTENNIAL PLUS	BARNWOOD	ENGLISH SLATE	ENGLISH STONE	REGENCY PLANK	REGENCY TILE	FORESTWOOD	GRAND STRIPWOOD	NATURAL TEXTURES
SIZE / INCHES:	6" x 36"	6" x 48"	6" x 48"	6" x 36"	18" x 18"	18" x 18"	6" x 48"	18" x 18"	4" x 36"	6" x 48"	18" x 18"
GAUGE:	.080" (2.0mm)	.080" (2.0mm)	.080" (2.0mm)	.080" (2.0mm)	.080" (2.0mm)	.080" (2.0mm)	1/8" (3.0mm)	1/8" (3.0mm)	1/8" (3.0mm)	1/8" (3.0mm)	1/8" (3.0mm)
DURABLE WEAR LAYER:	6 mil	12 mil	12 mil	12 mil	12 mil	12 mil	20 mil	20 mil	30 mil	30 mil	30 mil
FINISH:	PVC	Ceramic Bead	Ceramic Bead	Ceramic Bead	Ceramic Bead	Ceramic Bead	Ceramic Bead	Ceramic Bead	Ceramic Bead	Ceramic Bead	Ceramic Bead
EDGE DETAIL:	Square	Square	Square	Square	Square	Square	Square	Square	Square	Square	Square
EMBOSSING:	Barnside	Barnside	Barnside	In Register	Slate	Honed Stone	Wood Tick/Barnside*	Slate/Honed Stone*	Wood Tick	Barnside	Slate / Honed Stone*
SQ.FT. / CARTON:	36	36	30	36	36	36	36	36	36	36	36
PIECES / CARTON:	24	18	15	24	16	16	18	16	36	18	16
CARTONS / PALLET:	66	66	102	66	64	64	60	48	50	60	44
PALLETS / CONTAINER:	19	20	16	20	20	20	16	20	19	16	20
WEIGHT / CARTON:	28.5lbs	29lbs	23.6lbs	40.8lbs	27.3lbs	27.3lbs	48lbs	28lbs	40lbs	40.6lbs	36.4lbs
RESIDENTIAL WARRANTY:	7 Year Limited	25 Year Limited	25 Year Limited	25 Year Limited	25 Year Limited	25 Year Limited	Lifetime Limited	Lifetime Limited	Lifetime Limited	Lifetime Limited	Lifetime Limited
COMMERCIAL WARRANTY:	Not applicable	8 Year Limited	8 Year Limited	8 Year Limited	8 Year Limited	8 Year Limited	15 Years Limited	15 Years Limited	15 Years Limited	15 Years Limited	15 Years Limited
*depending on pattern #											

INSTALLATION

and

TECHNICAL GUIDE

Note: This document supersedes all printed and electronic Installation and Technical Guides previously distributed for Metroflor®.

IMPORTANT NOTES

MOISTURE: Metroflor® Corp. recommends all concrete subfloors (new and old) be tested using Calcium Chloride Test ASTM F1869 or Relative Humidity Test ASTM F 2170. New concrete slabs must cure for a minimum of 90 days. Even existing concrete slabs can have moisture problems. Never install Artistek® Floors where surface or subfloor moisture is present. Excessive moisture will cause failure. The installer is responsible for conducting a moisture test several days prior to installation to be sure that moisture is at recommended levels, since moisture will directly affect the cure, set and bond of adhesives. See adhesive pail for details. Electronic meter testing is not considered a replacement for a Calcium Chloride Test or Relative Humidity Test.

pH LEVELS: Perform pH tests before installing Artistek® Floors. Follow the Prevail™ adhesive instructions located on the label for further information.

PRODUCT ACCLIMATION: The HVAC system should be operating at least one week before installation. Artistek® Floors, Prevail™ adhesive, and the subfloor must be acclimated at a temperature between 65° and 85°F for 48 hours before, during and after installation. Do not open Artistek® Floors cartons during acclimation. Spread the cartons no more than three high and at least 4 inches apart, positioning them away from heating and cooling ducts and direct sunlight. After installation, maintain a constant room temperature between 55° and 85°F. These guidelines have been set in order to prevent excessive expansion and contraction of the product after installation.

ATTENTION

If Artistek® Floors luxury resilient tile and plank will be combined in a single installation, the products must be the same gauge and edge treatment. Carefully inspect Artistek® Floors luxury resilient tile and plank for visual defects prior to beginning the installation. Do not install Artistek® Floors with damage, visual defects or severe color variations.

Metroflor® Grab-Tak Tiles are NOT WARRANTED for use over radiant heat floors.
Metroflor® Grab-Tak Tiles do not require additional adhesive. With the exception of recommendations for radiant heat floors and adhesive use and application, the installation instructions outlined in this guide apply to Metroflor® Grab-Tak Tiles.

WARNING

Various Federal, State and Local government agencies have regulations governing the removal of in- place asbestos-containing material. If you contemplate the removal of a resilient floor covering structure that contains (or is presumed to contain) asbestos, you must review and comply with all applicable regulations. Do not sand, dry sweep, dry scrape, drill, saw, bead blast, or mechanically chip or pulverize existing resilient flooring, backing, lining felt, asphalt "cut-back" adhesive, or other adhesive. These products may contain asbestos fibers and/or crystalline silica. Avoid creating dust. Inhalation of such dust is a cancer and respiratory tract hazard. Smoking by individuals exposed to asbestos fibers greatly increases the risk of bodily harm. Unless positively certain that the product is a non-asbestos containing material, you must presume it contains asbestos. Regulations may require that the material be tested to determine asbestos content. RFCI™'s Recommended Work Practices for Removal of Resilient Floor Covering are a defined set of instructions addressed to the task of removing all resilient floor covering structures. For further information, contact the Resilient Floor Covering Institute website at **www.rfci.com.**

SUBFLOOR and INSTALLATION REQUIREMENTS

Approved Subfloors

A. **CONCRETE:** Concrete substrates must be clean and dry, smooth, and structurally sound. They must be free of dust, dirt, paint, varnish, oil, grease, solvent, wax, existing adhesives and other extraneous material including curing and parting compounds, sealers and surface hardeners that may interfere with the adhesive bond. Do not use on chemically cleaned substrates or those treated with silicate compounds. Even after old glued-down carpet has been removed and the subfloor has been scraped, it should not be assumed that the concrete is porous. Often, the old adhesive has sealed the floor. Be aware that porous subfloors may require a different trowel size for adhesive application than non-porous subfloors. See Prevail™ adhesive pail label for trowel size recommendations. If oil, grease or other contaminants have deeply penetrated the concrete and cannot be thoroughly removed, Artistek® Floors cannot be installed. If latex liquid has been used to seal off old cutback adhesives, the concrete should be considered non-porous. All concrete must have compression strength of 3,500 psi or greater.

B. **LIGHTWEIGHT CONCRETE:** The minimum density of the concrete should be greater than 90 lbs per cubic foot. The minimum compressive strength should be 2,500 psi or greater. Gypsum-based concretes are not recommended. If installing over gypsum or other forms of lightweight underlayment, apply an acrylic based primer-sealer coat before troweling or rolling on the adhesive as specified by the underlayment manufacturer.

C. **WOOD SUBFLOORS:** Should be standard double-layer construction, with a finished thickness of at least 1" and should have 18" of well-ventilated air space underneath. Crawl spaces should be insulated and protected by a vapor barrier. Do not install vinyl flooring over a sleeper type subfloor, or over plywood that is directly over a concrete slab. All wood subfloors must meet national and local building code guidelines.

   1) **PLYWOOD:** Use only American Plywood Association (APA) underlayment grade plywood, minimum ¼" thickness. Allow expansion spacing between plywood butt joints of 1/32"–1/16". When installing underlayment, stagger cross-joints 4' on an 8' panel (minimum 16"), lightly butt the panels, and set fasteners flush or slightly below the surface level of the underlayment. Fill underlayment seams, nail holes and any indentations with an approved Portland Cement-type floor patch, allow recommended drying time, and sand the patch smooth. All dust must be COMPLETELY removed to ensure a strong adhesive bond. Vacuum or sweep thoroughly, then apply adhesive. Manufacturer-certified poplar, birch and spruce plywood underlayment, with a fully sanded face and exterior glue can also be used.

   2) **LAUAN PLYWOOD:** Use only Type 1 lauan exterior grade "BB" or "CC" for underlayment. The use of lesser grades of lauan plywood is unacceptable and may cause severe problems including discoloration, indentation, loss of bond and delamination when used as an underlayment.
   NOTE: The use of underlayments such as lauan and other extremely porous wood or particleboard underlayments will reduce the flash and working time of adhesives. It is best to apply an acrylic-based primer-sealer to any porous underlayment prior to installing Artistek® Floors. A manufacturer's certification of lauan grade must accompany any claim involving the use of a lauan underlayment.

D. **RADIANT HEAT:** Radiant heat components must be cast at least 1/2" below the concrete slab. The heating system must operate for at least two weeks prior to installation. Radiant heat floors should be turned off 3 days prior to installation and remain off for at least 6 days after installation to allow the adhesive to fully cure. After 6 days, turn the radiant heating system back on beginning at 65°F, and gradually increase the temperature every 24 hours in 5° increments to a maximum operating temperature 85°F. Consult the radiant heat system manufacturer for further information.

E. **QUARRY TILE, TERRAZZO and CERAMIC TILE:** Skim coat grout lines with embossing floor leveler. Fill in dips and voids with cementitious leveling compounds to level the subfloor.

Non-Approved Subfloors

Non-approved subfloors include, but are not limited to: Oriented strand board (OSB), particleboard, hardboard, treated plywood, strip wood floors, chipboard, waferboard, Masonite, knotty plywood, glass mesh tile boards, cementitious tile backer boards, fire-retardant or preservative-treated plywood, asphalt tile, rubber tile, self-stick tile. NOTE: Any appearance or performance-related issues associated with the underlayment are the responsibility of the installer and/or underlayment manufacturer.

SUBFLOOR PREPARATION

CONCRETE SLABS: *NOTE: All concrete, whether new or old, must be tested for moisture using either the calcium chloride test or a test for relative humidity. Concrete should also be tested for pH, porosity and bond prior to installing Artistek® Floors.* The installer is responsible for performing moisture tests. Moisture will retard and prevent adhesive from setting, resulting in installation failure. See Prevail™ adhesive pail labels for details. New concrete should cure under well-ventilated conditions for at least 90 days and must be tested for moisture and pH before installing Artistek® Floors. Do not install if excessive moisture, hydrostatic pressure, or alkaline conditions are evident. Concrete substrates must be clean and dry, smooth, and structurally sound. They must be free of dust, dirt, paint, varnish, oil, grease, solvent, wax, existing adhesives and other extraneous material including curing and parting compounds, sealers and surface hardeners that may interfere with the adhesive bond. Remove any curing agents from concrete surfaces. Level any high spots and fill in all cracks, holes and minor depressions with a Portland Cement-based filler, then sand smooth. Installation failures due to the above issues are not the responsibility of Metroflor® Corp. and warranties will not apply. Whenever questionable surfaces are involved, Metroflor® Corp. recommends a bond test as described later in this section.

PATCHING & LEVELING: Use only Portland-Cement based patching and leveling compounds. Allow at least 24 hours for underlayment drying before installing Artistek® Floors. Self-leveling underlayments may have very high moisture content requiring longer curing times, up to 10 days. Check with a moisture meter before starting installation. *Note: Adding latex to levelers will normally make the floor NON-POROUS. Test for porosity and follow non-porous adhesive recommendations if necessary.* Follow the manufacturer's instructions, and do not over-water underlayments. The installer is responsible for observing cure times, moisture content, adhesive bonding and the structural integrity of any leveling or patch compound used.

EMBOSSING LEVELERS: Embossing levelers are for use on sheet goods with textures that could telegraph through Artistek® Floors. If self-leveling underlayments are used they must fully cure before installing Artistek® Floors. Test self-leveling compounds for moisture before installing. The installer is fully responsible for moisture and leveler-related issues. *Note: The use of levelers on sheet goods will not create a porous subfloor.*

SEALERS: Metroflor® Corp. does not endorse the use of any concrete or floor sealers against moisture. If moisture is present, DO NOT INSTALL Artistek® Floors. Encapsulator compounds will protect the installation against alkalinity. Some also serve as a barrier between old and new adhesives to deaden old adhesive tack, prevent plasticizer migration and seal over dust and old adhesive residues, including cutback. Most latex and acrylic-based encapsulator compounds are compatible with Prevail™ adhesives. Existing adhesives must be mechanically scraped down to a bare minimum residue flat with the substrate before applying the encapsulator compound. Apply the compound evenly across the entire surface of the floor according to the manufacturer's instructions. There must be no gaps in the application. Allow to dry completely before applying new adhesives.

NOTE: Metroflor® Corp. warrants Artistek® Floors and Prevail™ adhesives to be free from defects. The condition of the subfloor and adhesion problems resulting from the use of non-recommended, improper, or incorrectly prepared sealers, embossing levelers, patches, concrete, gypsum-based products and other such items, are the sole responsibility of the installer and/or manufacturer of the particular sub-flooring product.

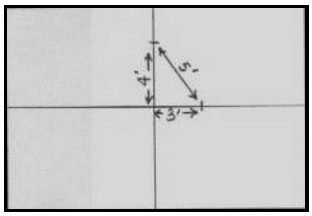
ADHESIVE BOND TEST: Use the following test to determine if a subfloor is compatible for use with Prevail™ adhesives, or to determine if the porous or non-porous adhesive application method is required: Using the flooring and adhesive suitable for the subfloor, install a 3" x 3" section following the recommended installation procedures. Tape the edges with duct tape to prevent the adhesive from drying prematurely. Select light traffic areas such as those located next to walls or columns. After 48 hours, the adhesive should be dry and the flooring should be difficult to remove. Note: the adhesive is dry at this point, but not cured. Full cure and maximum bond will not occur for 6-8 days. On large installations, tests should be performed every 50 linear feet. Bond testing may take some time to complete, but the cost and time involved in a floor failure are considerably more.

TILE INSTALLATION 12" X 12", 12" X 24", 16" X 16", 16" X 32" and 18" X 18"

Layout of the Room for Squarely Laid Fields

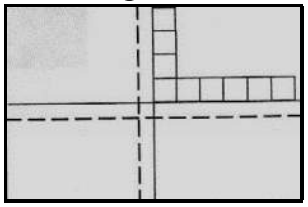
To square the area to be covered, first find the center of one end of the main rectangle. Locate the same point at the other end wall. Snap a chalk line between these points to mark the center line on the floor. Then measure along this center line to find the middle of the room.

Figure 1



At the center point, mark off a line across the room at exactly right angles to the first line. This may be accomplished by the 3-4-5 triangle method. (**See Figure 1**) Measure 4 feet toward each side wall from the center point. Then, measure 3 feet from the center point along the longer line, and measure exactly 5 feet from the 3-foot mark on the center line to the 4-foot mark on the crossline. If the 5-foot measurements do not come out exactly 5 feet, the center crossing lines are not at a true right angle. For large rooms, multiples of the above dimensions may be used to obtain greater accuracy. (6-8-10, 9-12-15, and so on.) Dry-lay a row of tiles from the center line to the side wall to determine the space left for the borders. If the resulting border is too small, move the starting point over a half tile width so that it straddles the center line. Repeat the same procedure lengthwise of the room. (This can readily be figured out from the room dimensions without putting down the tiles if desired.)

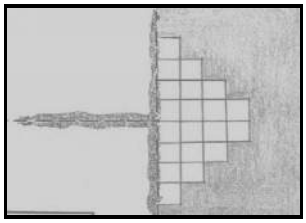
Figure 2



If the center row of tiles straddles one or both center lines, additional guidelines should be snapped on the floor one-half tiles' width on either one or both center lines, as required.
(See Figure 2)

Figure 3

After the border widths have been determined and the center starting lines have been snapped, spread the recommended adhesive on the center lines leaving portions of the lines at center and near each wall uncovered. **(See Figure 3)**

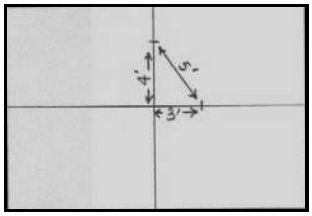


Do not apply more adhesive than can be worked. Follow the adhesive manufacturer's recommendations. Lay the tiles from the center of the room, working towards the walls as shown. Position tiles without sliding them through the adhesive.

IMPORTANT: All flooring must by rolled with a minimum 100-lb roller after installation. Use a hand roller in areas not reached with a 100-lb. roller.

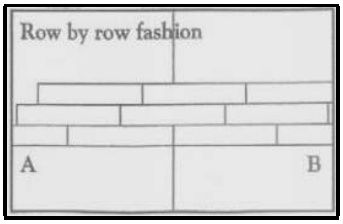
PLANK INSTALLATION 3" X 36", 4" X 36", 6" X 36", 6" X 48" and 9" X 36"

Figure A



At the center point, mark off a line across the room at exactly right angles to the first line. This may be accomplished by the 3-4-5 triangle method. (**See Figure A**) Measure 4 feet toward each side wall from the center point. Then, measure 3 feet from the center point along the longer line, and measure exactly 5 feet from the 3-foot mark on the center line to the 4-foot mark on the crossline. If the 5-foot measurements do not come out exactly 5 feet, the center crossing lines are not at a true right angle. For large rooms, multiples of the above dimensions may be used to obtain greater accuracy. (6-8-10, 9-12-15, and so on.)

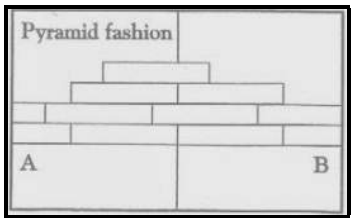
Figure B



Spread the adhesive over one-half the area and after it is ready, start laying the planks from the right angle formed in the center of the room by center lines. Carefully place the first piece of plank at the junction of the chalk lines. Continue to lay the plank, making sure each plank flush against the chalk line and tight against the adjoining plank. Make sure the plank is well seated into the adhesive paying special attention, to the edges. Lay row by row, or in a pyramid fashion as shown below.

(See Figures B and C)

Figure C



Lay the material from the center of the room, working towards the walls as shown. It is imperative that the first row is placed precisely and accurately against the reference line as you begin installation. Position planks without sliding them through the adhesive.

IMPORTANT: All flooring must by rolled with a minimum 100-lb roller after installation. Use a hand roller in areas not reached with a 100-lb. roller.

Note: All warranties and guarantees pertaining to the suitability and performance of any product not recommended by Metroflor® Corp. rests with the material manufacturer or the installation contractor and NOT with Metroflor® Corp.

To register and activate your product warranty, please visit www.artistekfloor.com and click on the Warranty/Maintenance tab. The registration information you provide will be used only to register your purchase and for no other purpose.

For further information, inquiries and troubleshooting please contact:

Metroflor® Corp.
119 Thomas Street
Calhoun GA 30701
888-235-6672
www.Metroflorcorp.com

Appendix

PREVAIL™ ADHESIVE RECOMMENDATIONS

Prevail™ Product	Adhesive Type	Usage	pH Tolerance	RH Limits	Spread Rate (Porous)	Spread Rate (Non-Porous)	LEED Qualfied	FloorScore Certified	Commercially Rated	Residentially Rated	Plywood	Concrete	Radiant Floors
PR-30-GS	Cyanoacrylate	Grip Strip Adhesive	N/A	N/A	150 sf per tube	150 sf per tube	NO	NO	√	√	√	√	√
PR-100-U	Hard-Set Acrylic	Double Glue Down over Prevail™ Pad	10	80%	900 sf-rolled per 4 gal pail	900 sf-rolled per 4 gal pail	YES	NO	√	√	√	√	√
PR-3100	Spray Acrylic	Sheet, LVT	10	90%	140-160 sf per 22 oz can	150-200 sf per 22 oz can	YES	YES	√	√	√	√	√
PR-3500	Wet Set	LVT	9	80%	100-125 sf per gal	150-180 sf per gal	YES	YES	√	√	√	√	√
PR-4000	2-Part Epoxy	Sheet, LVT	9	75%	130-150 sf per gal	130-150 sf per gal	YES	YES	√	√	√	√	√
PR-4500	Premium PSA	LVT	10	87%	180-200 sf per gal	220-260 sf per gal	YES	YES	√	√	√	√	√
PR-5000	PSA	LVT	9	75%	100-125 sf per gal	150-180 sf per gal	YES	YES	√	√	√	√	√
PR-6000	PSA	Sheet, LVT	10	85%	160-180 sf per gal	200-220 sf per gal	YES	YES	√	√	√	√	√
1 year Shelf Life on ALL Adhesives in Unopened Properly Stored Containers													

PREVAIL™ FLOORCARE PRODUCTS

Product	UPC	Item #	Usage
Prevail™ Neutral Cleaner	088969701275 (qt) 088969701282 (gal)	PR-VICL-QT PR-VICL-GL	A concentrated cleaner for maintaining all Metroflor® vinyl products and finishes.
Prevail™ RTU Neutral Cleaner	088969701640 (22 oz)	PR-RTU-22	A ready-to-use cleaner for maintaining all Metroflor® vinyl products and finishes.
Prevail™ Matte Finish	088969701251 (qt) 088969701268 (gal)	PR-MAFN-QT PR-MAFN-GL	Apply to Artistek® Floors to protect and renew the look of the flooring.
Prevail™ Gloss Finish	088969701237 (qt) 088969701244 (gal)	PR-GLFN-QT PR-GLFN-GL	Apply to Artistek® Floors to protect and renew the look of the flooring.
Prevail™ Vinyl Stripper	088969701299 (qt)	PR-VIST-QT	Concentrated stripper. Removes most detergent-resistant waxes and acrylic finishes.
Prevail™ Black Scuff & Adhesive Remover	088969701305 (22 oz)	PR-BSAR-22	Emulsifies adhesives, removes black scuffs and soil. Effective on grease, crayon, and lipstick.
Prevail™ Scratch Remover	088969701336 (22 oz)	PR-KSR-22	Conceals surface scratches and micro hazing caused by fine particle abrasion on vinyl flooring. Reduces the visibility of scratches under furniture, near entrances and other high traffic areas.

Visit www.Metroflorprevail.com for more information about the entire PREVAIL™ line of adhesives and accessories.

LIMITED WARRANTY

Effective: April 15, 2014

Products & Coverage

Metroflor warrants that its Artistek Floors® will be free from manufacturing defects and, under normal use and maintenance, will not wear, fade or stain resulting in loss of original pattern and color, for a specified length of time from the date of purchase as set forth in the 'Warranty Coverage/Periods' Chart on the right. This Limited Warranty only applies provided the flooring covered by this warranty is installed and maintained according to the *Artistek Floors Installation & Maintenance Manual.*

Pre-Installation

Metroflor warrants that its flooring is free of visual defects. You and/or your installer should carefully inspect each piece before installation. Any pieces that appear to have defects should not be installed. Metroflor will not be responsible for any claim for flooring installed with visual defects.

Installation

This Limited Warranty covers materials and fair market-value labor if professional installation was paid for when the flooring was originally installed, and only if the flooring was installed using Prevail™ Adhesive. The use of any other adhesive during installation will void the warranty if problems/issues arise as a result of the use of an adhesive other than Prevail™ Adhesive. Please refer to the current *Artistek Floors Installation & Maintenance Manual* for the type(s) of Prevail™ Adhesive(s) that should be used during installation. All other instructions contained in the current Installation Manual must be followed when installing Artistek Floors, or this warranty will be voided. Please check the Artistek Floors website for the current Manual.

Replacement/Repairs

Metroflor reserves the right to repair any flooring and/or to use its own source to obtain an installer for replacement flooring. If Metroflor repairs or replaces any flooring as a result of a warranty claim, you will be required to clear, at your own expense, any items placed over the affected areas subsequent to the original installation. In the event that Metroflor repairs or replaces any flooring covered under this Limited Warranty, this Limited Warranty shall remain in effect with respect to such flooring for a period limited to the remaining eligible duration of the original Limited Warranty.

Terms for Warranty

If a defect covered by this Limited Warranty is found within the warranty period and reported in writing to the merchant from which the flooring was purchased, Metroflor will supply new flooring material of similar color, pattern and quality to replace the defective area. Metroflor will also pay fair market-value labor if professional installation was paid for when the flooring was originally installed. Labor costs will not be covered if professional installation was **not** paid for when the flooring was originally installed.

In case of questions regarding the terms of this Limited Warranty, contact customer service at (888) 235-6672. Metroflor reserves the right to inspect any flooring, request samples, secure photographs or any other information as may be required to ascertain the nature of any claim under this Limited Warranty.

Exclusions

The following are not covered by this Limited Warranty:

- Dissatisfaction or damage due to improper installation or maintenance
- Damage caused by fire or burns, intentional abuse, flooding, construction or installation
- Damage caused by vacuum cleaner beater bar, indentations or damage caused by improper rolling loads, caster wheels, chairs or other furniture without proper floor protectors and cuts from sharp objects
- Surface scratches or scuffing
- Changes in color or sheen from exposure to sunlight or due to use of rubber-backed mats

Warranted Products	Warranty Coverage / Periods	
	Manufacturing Defect or Wear, Fade or Stain*	
	Residential	Commercial
Group A	Limited Lifetime	15 Years
Group B	25 Years	8 Years
Group C	15 Years	6 Years
Group D	7 Years	3 Years Light*
Group E	7 Years	Residential Only**

***DEFINITIONS / To Be Covered:**

"Wear" must be through the wear layer to the degree that the printed pattern is affected or altered.
"Fade" must be to the degree that the floor is permanently discolored.
"Stain" must be from normal household cleaning agents, chemicals or routine care & maintenance.

DEFINITIONS / Groups:

"Group A" (Limited Lifetime Residential / 15-Years Commercial)

1. Forestwood & Forestwood II
2. Grand Stripwood & Grand Stripwood II
3. Natural Textures & Natural Textures II
4. Regency Plank and Tile

"Group B" (25-Years Residential / 8-Years Commercial)

1. Barnwood (**12 mil** wearlayer)
2. Centennial Plus
3. Rustico
4. English Slate ***with* Ceramic Bead Finish**
5. English Stone ***with* Ceramic Bead Finish**

"Group C" (15-Years Residential / 6-Years Commercial)

1. American Plank Plus
2. Centennial Plank and Tile
3. English Slate ***without* Ceramic Bead Finish**
4. English Stone ***without* Ceramic Bead Finish**

"Group D" (7-Years Residential / 3-Years Light Commercial*)

American Plank CB

*For light commercial environments such as private offices, common areas in multiunit dwellings, reception areas and public buildings or businesses which are not subject to frequent and harsh traffic.

"Group E" (7-Years Residential; **NO** Commercial Warranty**)

American Plank and Tile

**With respect to American Plank and Tile products, this warranty applies only to a resident homeowner of a single-family home.

All Products Sold via the Internet Come with a 1-Year Warranty against Manufacturing Defect & "Wear, Fade or Stain" as defined above.

- Exterior applications
- Loss of gloss
- Minor shading, color or texture differences between samples or printed color photographs or illustrations and delivered product
- Flooring sold as irregulars or trial grade materials or "as is"

- This Limited Warranty is void if, prior to installation, this flooring is not acclimated to room temperature (between 65°F and 85°F) at job site between 24 and 48 hours and, if post-installation, such flooring is not continuously maintained at such temperature
- Flooring sold via the internet after the 1-year warranty period as set forth in the chart within this Limited Warranty
- Loss due to loss of time, inconvenience, incidental expenses (such as telephone calls, labor and/or materials) incurred in the removal or reinstallation of the affected material, and any other incidental or consequential damages

Some states do not allow the exclusion or limitation of incidental or consequential damages so that the above limitations and exclusions may not apply. Your Limited Warranty gives you specific legal rights, and you may have other legal rights, which vary from state to state.

This Limited Warranty is in lieu of any other warranties, expressed or implied. Please keep your receipt or obtain it from the original purchaser. Metroflor requires the receipt in order to verify date of purchase to help resolve any problems.

Warranty Owner

This Limited Warranty applies only to the original purchaser and the original installation site and is not transferable and, with respect to the residential warranty, applies only to a resident homeowner.

GENERAL CARE & MAINTENANCE

Although ARTISTEK FLOORS are durable, all floor coverings require some care to look their best and many problems can be prevented before they occur. The type and frequency of traffic on your floor will determine the frequency of maintenance needed. The type of floor and even the color will also have some bearing on how much care may be necessary. For example, solid color floors will visually show scuffs, scratches, dirt and general wear to a greater degree than multi-colors of chips or patterns. Of course, white or light colors will visually show staining to a greater degree than darker colors. For this reason, solid color and white floors should receive special attention in regard to preventative maintenance and the amount of care provided. Good judgment when choosing the type and style of floor will help prevent maintenance problems before the floor is even installed!

Here are the proper steps for protecting and maintaining your ARTISTEK FLOORS:

In order to prevent indentations and scratches, provide glass, plastic or other non-staining cups with flat under surfaces not less than 2" in width for the legs of heavy furniture or appliances. Equip swiveled-type office chairs and other rolling furniture with broad surface non-staining casters at least 2" in diameter. Remove small diameter buttons from the legs of straight chairs and replace with metal glides that have bearing surfaces no less than 1" in diameter.

Protect your floor against burns. Burns from the glowing end of a cigarette, matches, or other extremely hot items can damage ARTISTEK FLOORS.

Do not flood floor or subject to frequent standing water. Problems associated with excessive moisture can affect the job site and should be addressed. ARTISTEK FLOORS plank and tile should not be used as a Moisture Reduction System.

Protect your floor from tracked-in-dirt and grit particles by using walk-off mats at all outside entrances. Take time to remove any imbedded grit particles from shoe soles before entering the room. Avoid the use of rubber-backed mats, as certain rubber compounds can permanently stain vinyl. Avoid tracking in tar or asphalt from driveways, as this can also discolor vinyl. Do not use vinegar, one-step cleaner/polishes or oil soaps on ARTISTEK FLOORS products.

All ARTISTEK FLOORS have a good resistance to stains. They are not affected by most common household spills: however, any spill should be cleaned up immediately. The longer the spilled materials are left on the floor, the greater the risk of permanently staining the floor. For information regarding the proper method or solution to use on a specific stain, contact Metroflor's Technical Service at (888) 235-6672.

Avoid exposure to direct sunlight for prolonged periods. During peak sunlight hours, the use of the drapes or blinds is recommended. Prolonged direct sunlight can result in discoloration, and excessive temperatures might cause tile / plank expansion or delamination.

Do not use vinegar as a cleaning agent on ARTISTEK FLOORS vinyl Products.

The volume of traffic on ARTISTEK FLOORS will determine the frequency of maintenance needed.

The type of floor, and even the color, will have some bearing on how much care may be necessary.

Regular adherence to an effective maintenance program should include:

Thorough dirt and grit regulation, prompt removal of spills and stains and taking measures as noted above for heavy furniture or casters to protect the floor's surface.

The most effective part of any floor maintenance program is the simplest: sweep, dust mop or vacuum ARTISTEK FLOORS DAILY, or more frequently if needed.

Initial Maintenance Upon Completion of the Installation:

Sweep or vacuum without using the "beater bar" to thoroughly remove dust and debris.

Lightly damp mop with Prevail Neutral Cleaner following instructions on the bottle. Remove any scuffs and excessive soil by careful scrubbing.

Certain types of rubber heel marks may be removed by rubbing with a cloth dampened in Prevail Black Scuff and Adhesive Remover.

Stain Removal:

To remove stubborn spots or stains from ARTISTEK FLOORS Luxury Vinyl floors, always begin with mild cleaners such as Prevail Neutral Cleaner. If this fails to remove stain, use mineral spirits. Do not use harsh solvents such as lacquer thinner or straight acetone, as these can permanently soften and damage the vinyl surface.

For extreme staining (paints, permanent markers, dyes) try applying fingernail polish remover containing acetone (not straight acetone) applied to a soft cloth and rubbing. Subsequent to this cleaning procedure for stubborn spots, please clean the affected area with clear water to remove any residue. Any damage resulting from use of pure solvents IS NOT covered by warranty. Always test stronger cleaning agents on sample pieces or in unnoticeable areas first.

MAINTENANCE FOR ARTISTEK COMMERCIAL FLOORS

Routine Commercial Maintenance:

ARTISTEK FLOORS vinyl plank and tile has excellent durability and a history of performing well in commercial installations as long as a sound maintenance program is followed. Light daily sweeping, dust mopping or vacuuming without the "beater bar" will prevent dirt and grit particles from being ground into the surface of the plank or tile. Non-rubber, walk-off mats should be used to control the amount of dirt and grit reaching the floor. The mats should be as wide as the doorway and thick enough to trap dirt. Frequent light mopping will prevent the floor from becoming heavily soiled and will remove most spills and stains. The amount and type of traffic will dictate the frequency of washing. Wash the floor by damp mopping with Prevail Neutral Cleaner diluted with warm water following instructions on the bottle.

If the floor receives hard use and becomes extremely dirty, as in heavy-traffic commercial installations, an occasional scrubbing may be necessary. This can be accomplished by using a low speed buffer with a red scrubbing-polyester or nylon pad. Spray the floor with diluted Prevail Neutral Cleaner and work the solution over the floor using the buffer and the scrubbing pad. Once this is accomplished, remove the dirty residue by damp mopping with clear water or with a wet-vacuum.

Thank you for purchasing ARTISTEK FLOORS. If you have further questions, please call us at (888) 235-6672.

METROFLOR® CORPORATION

For further information, please call Metroflor® Technical Support Services at **(888) 235-6672,** or visit our website at **www.metroflorcorp.com.**

SP-4 Existing Ceiling Insulation
Record insulation submittal from previous remodel project (Following this page)

City of New Braunfels

Department

Submittal Cover Sheet

Submittal No.: 0004-07210-0 Project No: 14-028

Date Submitted: 08/19/14

Engineer:

General Contractor: F.A. Nunnelly, Co.

Subcontractor/Supplier: MASCO – Williams Insulation

Specification Section No.: 072119

Specification Section Name: Foamed in Place Insulation

Item Submitted: Icynene LD-C-50 Polyurethane Foam

Remarks:

Please submit to:

City of New Braunfels
Attn: Jennifer Cain
424 S. Castell Ave.
New Braunfels, TX 78130

F.A. NUNNELLY
GENERAL CONTRACTOR

Submittal Transmittal

Detailed, Grouped by Each Number

NB Golf Clubhouse Remodel (NB-028)
180 Golf course Rd.
New Braunfels, TX 78130

Project # 1412
Tel: 830-221-4389 Fax: 830-608-2112

City of New Braunfels

Date: 8/19/2014 **Reference Number: 0030**

Transmitted To:	Catherine Jaquez F. A. Nunnelly Co. 2922 Pan Am Expressway San Antonio, TX 78208 Tel: 210-277-7070 Fax: 210-277-7072	**Transmitted By:**	Jennifer Cain City of New Braunfels New Braunfels, TX 78130 Tel: 830.221.4646 Fax:

Qty	Submittal Package No	Description	Due Date	Package Action
1	0004 - 07210 - 0	Foamed-In-Place Insulation		

Transmitted For	Delivered Via	Tracking Number
Approval	Email	

Items	Qty	Description	Notes	Item Action
0001	1	Foamed in Place insulation PD		
0002	1	Foamed in Place insulation Manufacturer's Instructions		
0003	1	Foamed in Place insulation Certificates		

Cc:	Company Name	Contact Name	Copies	Notes
	CgM and Associates and Architects	Robert Bruce	1	
	F. A. Nunnelly Co.	Matthew Foyt	1	

Remarks

Signature **Signed Date**

F.A. NUNNELLY
GENERAL CONTRACTOR

Submittal Packages

Summary, Grouped by Package Number with Register Items

NB Golf Clubhouse Remodel (NB-028)
180 Golf course Rd.
New Braunfels, TX 78130

Project # 1412
Tel: 830-221-4389 Fax: 830-608-2112

City of New Braunfels

Item No	Register No	Rev	Spec Section	Sub Section	Description	Rec'd On	Returned	Action	Logged By	Closed
0004 - 07210 - 0			**Foamed-In-Place Insulation**							
0001	00004	0	072119	1.03A	Foamed in Place insulation PD	8/19/2014				No
0002	00018	0	072119	1.03B	Foamed in Place insulation Manufacturer's Instructions	8/19/2014				No
0003	00019	0	07219	1.03C	Foamed in Place insulation Certificates	8/19/2014				No

F.A. Nunnelly Company

This submittal has been reviewed for compliance with the requirements of the work and of the contract documents. F.A. Nunnelly is not responsible for any discrepancies between these drawings and/or materials and the contract plans and specifications. These drawings and/or materials are subject to strict compliance with plans and specifications and no deviations are authorized unless specifically authorized by F.A. Nunnelly in writing.

Submittal No.: 0004-07210-0 Foamed in Place Insulation

Reviewed By: : C. Jaquez Date: 08/19/20144:13:26 PM

THIS FORM NEEDS TO BE COMPLETED BY THE CITY OF NEW BRAUNFELS AND RETURNED WITH THE SUBMITTAL PACKAGE.

Customer Notice and Acknowledgement Concerning the Application of Spray Foam Products

I have been given and understand the following documents concerning the Spray Foam Product(s) being applied in my building (initial applicable items):

Initials ***(Circle one)***

_____ Yes No Material Safety Data Sheet (MSDS/SDS) for the finished Spray Foam Product(s).

_____ Yes No MSDS/SDS for intumescent coating.

_____ Yes No _____ ICC-ES Evaluation Report — Supplier and Product Specific

I have been advised as follows:

_____ Yes No Not applicable The attic is not to be used for storage.

_____ Yes No Not applicable The attic access is only to be used to maintain mechanical equipment.

_____ Yes No Not applicable All people and pets must vacate the building prior to the application of the Spray Foam Product(s) and not reenter the building for a period of time which is the longer of the manufacturer recommended waiting period or 24 hours after spraying has been completed.

_____ Yes No Not applicable The HVAC must be shut off and/or sealed prior to the application of the Spray Foam Product(s) and not turned on and/or opened for a period of time which is the longer of the manufacturer recommended waiting period or 24 hours after spraying has been completed.

_____ Yes No Not applicable All portable personal belongings in the spray area must be removed or covered to avoid accidental overspray of the Spray Foam Product(s) insulation and coatings.

_____ Yes No Other trades cannot occupy the facility unless proper PPE is used for (*fill in #*)_____ hours after application.

_____ Yes No Ventilation will be required for (*fill in #*)_____ hours after spraying application.

_____ The Contractor is not responsible for damage to portable or uncovered personal belongings left in the Work Zone during spraying.

_____ This Notice and Acknowledgement form does not alter, change, or amend any terms and conditions agreed upon by the parties and expressly set forth in the Work Agreement or other contract documents which govern this project.

_____ The Contractor is not responsible for moving portable articles in the way of Spray Foam application.

_____ The Contractor is not responsible for shutting off and/or sealing the HVAC unit.

Signatures:

I affix my signature as proof of the statements made above.

_____ Contractor

_____ Building Owner

_____ Date

_____ Tenant (if applicable)

Comments / Additional Points of Consideration:

International Fireproof Technology, Inc.

17528 Von Karman Avenue, Irvine CA 92614

Material Safety Data Sheet - DC315

Emergency Telephone Number: CHEMTREC 1-800-424-9300

HMIS	
Health Hazard	1
Fire Hazard	0
Reactivity	0
Personal Protection	E

1. Product and Company Identification

Product:	Water Based Fire Retardant Paint
Product Code:	DC315
Company:	International Fireproof Technology Inc. 17528 Von Karman Avenue Irvine, CA 92614
Phone:	949-975-8588
MSDS Creation Date:	February 20, 2012

NFPA Rating	
Health Hazard	1
Fire Hazard	0
Reactivity	0

2. Composition/Information on Ingredients

Ingredient:	CAS No.	Percent (by weight)
Ammonium Polyphosphate	68333-79-9	25-45 %
Melamine	108-78-1	10-25 %
Pentaerythritol	115-77-5	10-25 %
PVAC Resin	9003-20-7	5-30 %
Titanium Dioxide	13463-67-7	5-10%
Water		20-40%

3. Hazards Identification

Emergency Overview: None

Potential Health Effects:

General:	No Danger
Inhalation:	Spray application may create aerosols which may result in irritation of the upper respiratory track, throat and nose.
Ingestion:	If ingested, may cause irritation to the mouth, esophagus and stomach.
Skin Contact:	Prolonged or repeated exposure may irritate skin.
Eye Contact:	May cause irritation upon direct contact.

4. First Aid Measures

Inhalation:	If inhaled, leave the area to obtain fresh air. Seek medical attention.
Ingestion:	If swallowed, do NOT induce vomiting. Drink large amounts of water and seek medical attention immediately. Never give anything by mouth to an unconscious person.
Skin Contact:	Wash thoroughly with soap and water. Seek medical attention if irritation develops or persists.
Eye Contact:	In case of eye contact, flush with plenty of water for 15 minutes. Seek medical attention if irritation or symptoms of overexposure persists.

Note to Physician:	None

5. Fire Fighting Measures

Flash Point:	No Data
Lower Flammability Limit:	Not Applicable
Upper Flammability Limit:	Not Applicable
Fire Hazard:	Nonflammable
Explosion Hazard:	Not considered an explosion hazard.
Fire Extinguishing Media:	No restriction on the type of extinguisher.
Protection of fire fighter:	As in any fire, wear Self Contained Breathing Apparatus (SCBA). MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental Release Measures

Steps to be taken in case of spill or leak:	Maintain adequate ventilation. Prevent runoff into sewers, ditches and waterways. Use sand or other material to dam or contain spill. Soak up with an inert absorbent. Store in a closed container until disposal.

7. Handling and Storage

Handling:	Use with adequate ventilation. Avoid breathing vapor and contact with eyes, skin and clothing. Wash hands thoroughly with soap and water after handling as a standard hygienic practice.
Storage:	Period ≤ 12 months. Keep containers tightly closed. Avoid direct sunlight and protect from freezing.
Special Comments:	Store between 50°F – 86°F（10°C - 30°C）in a closed container in a protected area.

8. Exposure Controls / Personal Protection

Engineering Control:	Use appropriate engineering controls such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Good general ventilation should be sufficient to control airborne levels. Where such systems are not effective, wear suitable personal protective equipment, which performs satisfactorily and meets OSHA or recognized standards. Consult with local procedures for selection, training, inspection and maintenance of personal protective equipment.
Personal Respirators:	Wear a NIOSH approved air purifying respirator during spray application.
Skin Protection:	Wear chemical resistant gloves, face shield and synthetic apron or coveralls to prevent contact with eyes, skin and clothing.
Eye / Face Protection:	Wear appropriate protective glasses or splash goggles as described by 29 CFR 1910.133, OSHA eye and face protection regulation.

9. Physical and Chemical Properties

Appearance:	White liquid
Odor:	Mild latex odor
Data relevant to safety:	
Flash point:	Not applicable
Ignition temperature:	Not applicable
Self-ignition temperature:	Not applicable

Color:	White
Particle size:	< 90μm
Solid Content:	65 ± 3.0%
Density:	1.35 ± 0.10
pH:	7.0 ± 1.0
Thinner:	Water
VOC Content:	< 50 grams/liter

10. Stability and Reactivity

Stability:	Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:	Thermal decomposition products or combustion: Ammonia, inorganic acids, carbon monoxide, carbon dioxide.
Hazardous Polymerization:	Not reported.
Incompatibilities:	Organic solvents
Conditions to Avoid:	Heat, flames, high temperatures condition (>113℉ or＞45°C), strong alkaline, strong acid and strong oxidizing agents.

11. Toxicological Information

Acute oral toxicity (LD50):	None
Irritant effect on skin:	Prolonged or repeated exposure may irritate skin.
Irritant effect on eyes:	Slightly irritant

12. Ecological Information

Ecological effect:	Fish toxicity (LC50): None
Environmental Fate:	When released into the soil, this material is not expected to leach into groundwater. When released into water, this material is not expected to evaporate significantly.

13. Disposal Considerations

Waste Disposal:	Dispose waste by sanitary landfill or incineration in accordance with appropriate regulations.

14. Transport Information

Shipping Name:	Product Name: Fire Retardant Paint
Product Code: DC315	
Size:	5 Gal. Pail, 55 Gal. Drum
Road transport:	Non-hazardous goods
Inland waterways transport:	Non-hazardous goods
Marine transport:	Non-hazardous goods
Air transport:	Non-hazardous goods
Dispatch by post:	Permitted

15. Regulatory Information

Health hazardous goods:	Not Applicable
Environmental hazardous goods:	Not Applicable
Fire hazardous goods:	Not Applicable

16. Other Information

Hazard Warning:	None

Cautions:	Avoid contact with eyes and skin. Do not breathe vapors, dust or mist. Use with adequate ventilation. Wash thoroughly after handling.
Product Use:	Fire Retardant Paint
Disclaimer:	The information contained in this data sheet pertains to this product as it is currently formulated, and is based on present scientific and technical knowledge. This information is provided without warranty of any kind and should not, therefore, be construed as guaranteeing specific properties of the products described or their suitability for a particular application. Employers should use this information only as a supplement to other information gathered by them and must make independent determination of suitability and completeness of information from all sources to assure proper use of these materials and the safety and health of employees.

6747 Campobello Rd., Mississauga, Ontario, L5N 2L7, Canada
Tel: 905.363.4040 Toll Free: 800.758.7325 Fax: 905.363.0102

MATERIAL SAFETY DATA SHEET

Product Name: ICYNENE LD-C-50™
Also known as The Icynene Insulation System®:
Gold Seal® and Base Seal®

MSDS (F) Spray ICYNENE LD-C-50™

Section 1: Chemical, Product and Company Information

Product Name: ICYNENE LD-C-50® Polyurethane Foam

Also known as The Icynene Insulation System®

ICYNENE LD-C-50™ is a trademark of Icynene Inc. The Icynene Insulation System®, Gold Seal® and Base Seal® are registered trademarks of Icynene Inc.

Product Use: **SPRAY-ON CELLULAR PLASTIC INSULATION**

Product Code: **Not Applicable**

Section 2: Ingredient Information

Ingredient	CAS No:	Wt.%:
Polyurethane Foam		100

Section 3: PHYSICAL DATA

Appearance: Cream coloured cellular foam of "angel food cake" consistency and appearance (may become yellow to light brown if exposed to sunlight for extended period of time).

Solubility In Water: Insoluble.

Density: 0.5 lbs./cubic foot

Odour: None

Emissions: Safe for occupancy after 24 hrs, no emissions detectable after 30 days.

Section 4: FIRE & EXPLOSION HAZARD DATA

Flammability: Combustion occurs at 400°F (material will not sustain combustion on its own)

Flame Spread: Less than 25

Smoke Developed: Less than 450

Method Used: ASTM E84

Melting: Does not melt

Flammable Limits: LFL: - not determined
UFL: - not determined

Extinguishing Media: Water, carbon dioxide, dry chemical or foam.

Fire & Explosion Hazards: Prevent breathing of combustion fumes (smoke)

MATERIAL SAFETY DATA SHEET

Product Name: ICYNENE LD-C-50™
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Fire Fighting Equipment:	Firefighters must wear a self-contained breathing apparatus to avoid breathing smoke generated by combustion.

Section 5:	**REACTIVITY DATA**
Stability:	Stable under all normal conditions
Incompatibility:	Compatible with all products

Section 6:	**ENVIRONMENTAL & DISPOSAL INFORMATION**
Disposal Method:	Follow all federal, provincial, state and local regulations.

Section 7:	**HEALTH HAZARD DATA**
Detectable Emissions:	No detectable emissions
Systemic & Other Effects:	Material is completely inert and will not cause physiological harm when exposed to skin, accidentally ingested or through inhalation. VOC and toxicological tests indicate no detectable vapors 24 hours after installation.
Ingestion:	The consequences of ingestion of large amounts are unknown
Dust Inhalation:	May cause mechanical irritation to the respiratory system
Eye Protection:	Use glasses when cutting foam
Skin Protection:	Dust from foam cutting may cause irritation

Section 8:	**FIRST AID**
Ingestion:	Medical advice should be obtained
Inhalation:	Remove to fresh air, consult a physician
Eye Contact:	Flush with water to remove particles
Skin Contact:	No special precautions required

Section 9: **ADDITIONAL INFORMATION**

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH, BUT NO WARRANTY EXPRESS OR IMPLIED, IS MADE. CONTACT ICYNENE INC. FOR FURTHER INFORMATION.

Section 10:	**PREPARATION INFORMATION:**
Prepared by:	Stephanie Holborne, R&D Chemist
Telephone:	1-800-758-7325
Date of Preparation:	**Jan 17, 2013**

MATERIAL SAFETY DATA SHEET

Product Name: ICYNENE LD-C-50™
Also known as The Icynene Insulation System®:
Gold Seal® and Base Seal®

MSDS (F) Spray ICYNENE LD-C-50™

HEALTH AND SAFETY STATEMENT FOR CERTIFIED ICYNENE SPRAYERS

Icynene products have an excellent health and safety record spanning more than 350,000 insulation projects over more than 25 years. Nonetheless, safe handling practices during and immediately following installation are required to eliminate the possibility of health effects from exposure to isocyanates. Asthma, other lung problems, and irritation of the nose and throat can result from inhalation of isocyanates. Direct contact with the skin and eyes can result in irritation. Different individuals will react differently to the same exposures; some will be more sensitive than others. Severe asthma attacks have been reported in some sensitized workers exposed repeatedly to isocyanates while not wearing proper protective equipment. Some reports indicate a reaction and sensitization can occur following a single, sustained occupational exposure to isocyanates without proper protective equipment above the OSHA permissible exposure limit. But sensitization might not occur immediately in some individuals. Consistent use of personal proper protective equipment to prevent exposure during spraying and within the 24 hour-period after spraying is completed is critical to eliminating the health hazard. Once sensitization has occurred, a worker might not be able work safely with spray foam insulation again.

Sprayers, sprayer helpers, and anyone else present during spraying or within 24 hours after spraying is complete: You must wear proper Personal Protective Equipment (PPE) at all times during spray, including full-body-coverage, chemical-protective clothing and a NIOSH-certified respirator with fresh air supply. While spraying and for 24 hours after spraying is completed, no one must be allowed within 50 feet of the sprayed foam without wearing this type of PPE at all times. Adequate active, negative pressure ventilation (exhaust fans) of the job site must be in place during spray and for 24 hours after spray is complete.

Independent studies indicate that with 24 hours' active ventilation after spraying is completed, Icynene spray foam insulation is safely cured.

PRODUCT SPECIFICATION

1. PRODUCT NAME

ICYNENE LD-C-50®

ICYNENE LD-C-50® is a trademark for light density, open celled, flexible, 100% water-blown polyurethane foam insulation manufactured by Icynene Inc. ICYNENE LD-C-50® spray formula is a nominal 0.5 lbs/ft^3 density, free rise material.

2. MANUFACTURER

ICYNENE LD-C-50® is made on-site from liquid components manufactured by Icynene Inc. Installation and on-site manufacturing is supplied by independent Icynene Licensed Dealers.

3. PRODUCT DESCRIPTION

ICYNENE LD-C-50®, the "classic" light density formulation of Icynene has been installed in buildings since 1986. Icynene is the pioneer of high yield, 100% water-blown polyurethane foam technology for air-sealing and insulating buildings.

ICYNENE LD-C-50® insulates and air-seals in one step for maximum energy conservation while minimizing the environmental impact during manufacturing and construction. Significantly reducing air leakage means ICYNENE LD-C-50® contributes to a healthier, quieter and more comfortable indoor environment, while reducing energy consumption and related greenhouse gas emissions by as much as 50%.

ICYNENE LD-C-50® is an effective vapor permeable air barrier material that can move with the building to maintain the air barrier characteristic against energy-robbing air leakage for the life of the building. Convective air movement inside wall cavities is virtually eliminated, providing more uniform temperatures throughout the building.

The result is superior quality construction, with higher comfort levels and lower heating and/or cooling costs. Energy savings will vary depending on building design, location, etc.

ICYNENE LD-C-50® is applied by spraying liquid components onto an open wall, crawlspace, ceiling surface or cathedral ceiling. There it expands approximately 100:1 in seconds to provide a flexible foam blanket of millions of tiny air cells, filling building cavities, cracks and crevices in the process. It adheres to most construction materials, sealing out air infiltration.

Excess material is easily trimmed off, leaving a surface ready for drywall or other code-compliant finish.

4. TECHNICAL DATA

(Based on Core Samples)

Thermal Performance

Thermal resistance (ASTM C518)

- R/in = R3.7 hr. ft^2 °F/BTU

Average insulation contribution in a full fill stud wall:

- 2" x 4" = R13
- 2" x 6" = R20

ICYNENE LD-C-50® provides more effective performance than the equivalent R-value of air permeable insulation materials. ICYNENE LD-C-50® is not subject to loss of R-value due to aging, windy conditions, settling, convection or air infiltration; nor will it be prone to traditional moisture intrusion via air leakage.

A FACT SHEET with R-value data is available upon request.

Air Permeance/Air Barrier /Air-Seal

ICYNENE LD-C-50® fills any shaped cavity, and adheres most construction materials, creating assemblies with very low air permeance. Additional interior or exterior air infiltration protection is subject to applicable codes.

Air permeability of core foam:

ASTM E283 data

- 0.009 L/s·m^2 @ 75 Pa for 3.5"

Air permeability of a 2" x 6" wood framed wall assembly:

ASTM E 2178 data

- 0.01 L/s·m^2 @ 75 Pa for 5.5"

All buildings insulated and air-sealed with ICYNENE LD-C-50® must be designed to include adequate mechanical ventilation/ outdoor air supply. See ASHRAE Standard 62 – Ventilation for Acceptable Indoor Air Quality.

Water Vapor Permeance

ICYNENE LD-C-50® is water vapor permeable and allows moisture to diffuse through the insulation and dissipate from the building envelope.

Water vapor transmission properties:

(ASTM E96 Desiccant Method)

- 11 perms @ 5.5"

In those situations that warrant a vapor retarder, a supplemental layer of polyethylene may be used. Alternately, low vapor permeance paint either directly on the foam or as a primer for the interior drywall may be used.

Water Absorption Properties

Water can be forced into the foam under pressure because it is open celled. Water will drain by gravity, given favorable drying potential, and upon drying all chemical and physical properties are fully restored.

Acoustical Properties

Performance in a 2" x 4" wood stud wall:

STC Sound Transmission Class - 37

Hz. Freq.	125	250	500	1000	2000	4000
ASTM E90	19	30	31	42	38	46

NRC Noise Reduction Coefficient - 70

Hz. Freq.	125	250	500	1000	2000	4000
ASTM C423	.11	.43	.89	.72	.71	.67

Burn Characteristics

ICYNENE LD-C-50® is a combustible product and is therefore, consumed by flame, but will not sustain flame upon removal of the flame source. It leaves a charred foam residue. It will not melt or drip. ICYNENE LD-C-50® is subject to all applicable National/State and County building codes regarding fire prevention. Requirements for Thermal Barrier and Ignition Barrier coverings must be met as per the applicable building code having jurisdiction.

U.S. Fire Testing

Surface Burning Characteristics of (ASTM E84) @ 5" Thickness

Flame Spread	≤25
Smoke Development	≤450

*Flame spread rating not intended to reflect hazards under actual fire conditions.

Electrical Wiring

ICYNENE LD-C-50® has been evaluated with energized 14/3 and 12/2 residential wiring (max. 122°F). It is chemically compatible with typical electrical wiring coverings.

Note: For any insulation of knob and tube wiring, please reference local electrical code.

Corrosion

ICYNENE LD-C-50® did not cause corrosion when evaluated in contact with steel at 120°F and 85% relative humidity conditions.

Plastic Piping

ICYNENE LD-C-50® is compatible in direct contact with CPVC piping systems, as per Paschal Engineering Study for the Spray Polyurethane Foam Alliance (SPFA).

Bacterial or Fungal Growth and Food Value

Independent testing conducted by Texas Tech University has confirmed that ICYNENE LD-C-50® is not a source of food for mold; and as an air barrier material, it resists the airborne introduction of moisture, nutrients, and mold spores into the building envelope.

Environmental / Health / Safety

ICYNENE LD-C-50® is 100% water-blown and therefore contains no ozone-depleting blowing agents. It is also PBDE-free. It has been thoroughly evaluated for in-situ emissions by industry and government experts. VOC emissions are below 1/100th of the safe concentration level (TLV) within hours following the application of ICYNENE LD-C-50®.

Proper handling and use is required to avoid exposure to reactive chemicals in their unreacted state. For more information, contact the Spray Polyurethane Foam Alliance or the American Chemistry Council. Newly insulated areas have been shown to be safe for occupancy 24 hours after installation is complete.

ICYNENE LD-C-50® is CHPS E.Q. 2.2/Section 01350 Compliant and listed as such in the Collaborative for High Performance Schools (CHPS) Low Emitting Materials (LEM) Table.

Under LEED guidelines, products that are CHPS E.Q. 2.2/Section 01350 Compliant are considered Environmentally Preferable Products.

The reaction used to create ICYNENE LD-C-50® generates Carbon Dioxide to expand the foam. Carbon Dioxide has a very low Global Warming Potential (GWP of 1).

Not intended for exterior use. Not to be installed within 3" of heat emitting devices or where the temperature is in excess of 200°F, as per ASTM C411 or in accordance with applicable codes.

5. INSTALLATION

ICYNENE LD-C-50® is installed by a network of Licensed Dealers, trained in the installation of ICYNENE LD-C-50®.

Installation is generally independent of environmental conditions. It can be installed in hot, humid or freezing conditions. Surface preparation is generally not necessary. Within seconds, the foaming process is complete.

For information on Health and Safety, refer to the Spray Polyurethane Foam Alliance Health and Safety guidance documents at www.spraypolyurethane.com

6. AVAILABILITY

Check regional Yellow Pages™ or contact Icynene Inc. at 800-758-7325 or our website at www.Icynene.com for a local Icynene Licensed Dealer.

7. WARRANTY

WHEN INSTALLED PROPERLY IN ACCORDANCE WITH INSTRUCTIONS, THE COMPANY WARRANTS THAT THE PROPERTIES OF THE PRODUCT MEET PRODUCT SPECIFICATIONS AS OUTLINED IN THIS PRODUCT SPECIFICATION SHEET. SAVE AND EXCEPT ANY EXCLUSIONS REFERENCED IN THE WARRANTY.

8. TECHNICAL

Icynene Licensed Dealers and Icynene Inc. provide support on both technical and regulatory issues. Architectural specifications in CSI 3-Part format and design details are available upon request.

9. REGULATORY

ICYNENE LD-C-50® has been tested as per the requirements of the International Code Council – Evaluation Service's AC377 Acceptance Criteria (June 2009).

The following evaluation reports apply to this product:

- ICC ESR-1826

Based on the 3rd party test evidence submitted, this product was found to comply with:
- IRC – 2006 – 2009
- IBC – 2006 – 2009
- IECC – 2006 – 2009

10. RELATED REFERENCES

All physical properties were determined through testing by accredited third-party agencies. Icynene Inc. reserves the right to change specifications in its effort of continuous improvement. Please confirm that technical data literature is current.

11. PACKAGING AND STORAGE

Packaging	55 U.S. gallon steel drums
Component 'A'	550 lb. per drum
	Base Seal® MDI
Component 'B'	500 lb. per drum
	ICYNENE LD-C-50® (Gold Seal®) Resin

Storage

Component A, Base Seal® MDI and Component B, ICYNENE LD-C-50® Resin ideally should be stored between 60°F and 90°F.

Component A, Base Seal®, should be protected from freezing.

Component B, ICYNENE LD-C-50® (Gold Seal®) Resin, can be frozen but must be protected from overheating 120°F and prolonged storage above 100°F.

Component B, ICYNENE LD-C-50® (Gold Seal®) Resin, may separate during storage and should be mixed thoroughly prior to use.

12. INSTALLATION SPECIFICATIONS

Must be installed by Icynene Licensed Dealers. Refer to the Icynene Installer's Manual for expanded information.

ICYNENE®

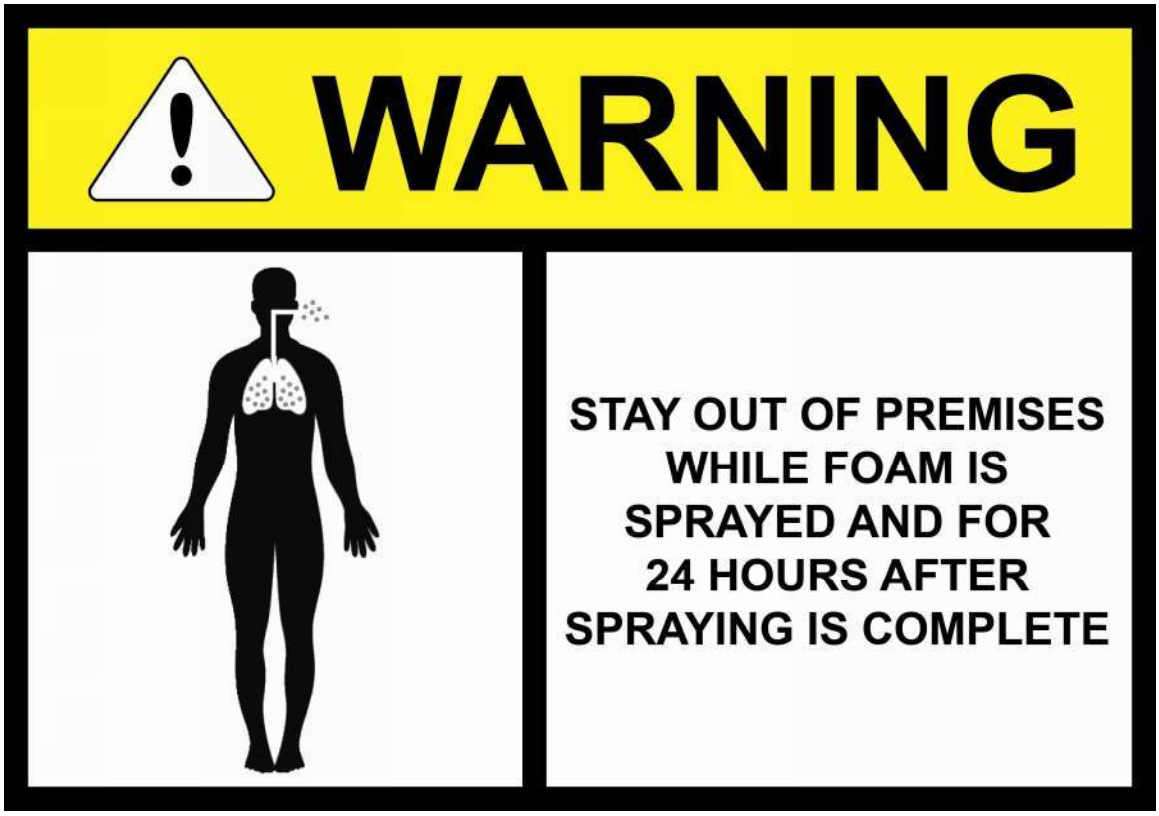
Telephone: 905.363.4040
Toll Free: 800.758.7325
Facsimile: 905.363.0102
Website: www.Icynene.com
E-mail: inquiry@Icynene.com

HEALTH AND SAFETY STATEMENT FOR HOMEOWNERS

Icynene products have an excellent health and safety record spanning more than 350,000 insulation projects over more than 25 years. Nonetheless, safe handling practices during and immediately following installation are required to eliminate the possibility of health effects from exposure to isocyanates. Asthma, other lung problems, and irritation of the nose and throat can result from inhalation of isocyanates. Direct contact with the skin and eyes can result in irritation. Different individuals will react differently to the same exposures; some will be more sensitive than others.

Everyone (other than Icynene-certified spray technicians) must vacate the job site, remaining completely out of the building and at least 50 feet away, while the spray is applied and for at least 24 hours after spraying is completed to allow active ventilation of the job site and to ensure the foam chemicals are completely cured. No exceptions.

Independent studies indicate that with 24 hours' active ventilation after spraying is completed, Icynene spray foam insulation is safely cured.



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Sprayers, sprayer helpers, and anyone else present during spraying or within 24 hours after spraying is complete: You must wear proper Personal Protective Equipment (PPE) at all times during spray, including full-body-coverage, chemical-protective clothing and a NIOSH-certified respirator with fresh air supply. While spraying and for 24 hours after spraying is completed, no one must be allowed within 50 feet of the sprayed foam without wearing this type of PPE at all times. Adequate active, negative pressure ventilation (exhaust fans) of the job site must be in place during spray and for 24 hours after spray is complete.

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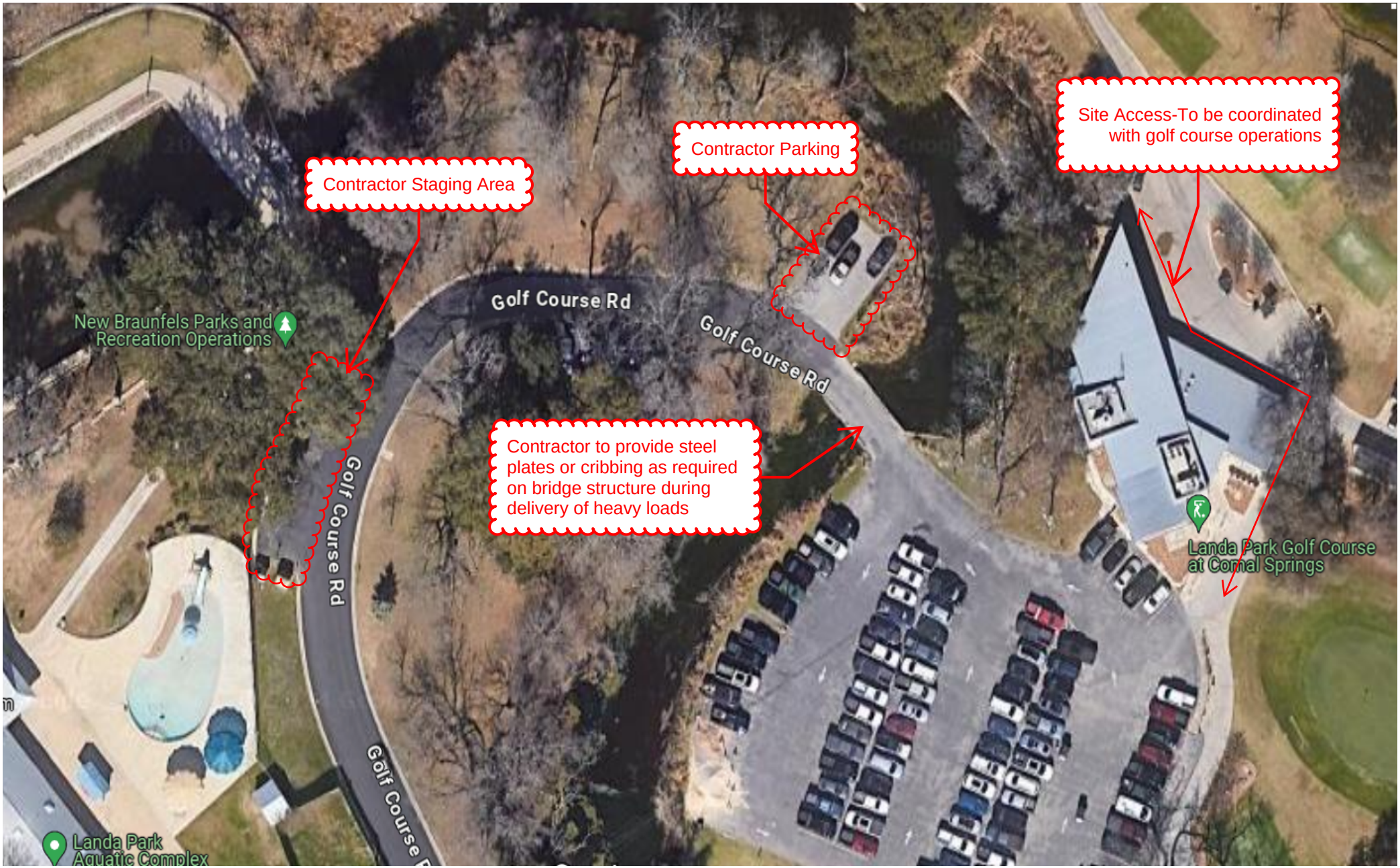
SP-5 Site Access and Staging

1. Staging and Access Map provided for reference (Following this page)

CSP24-002 Golf Course Clubhouse Deck Addition
Addendum #1 Staging and Access Map



END OF SECTION