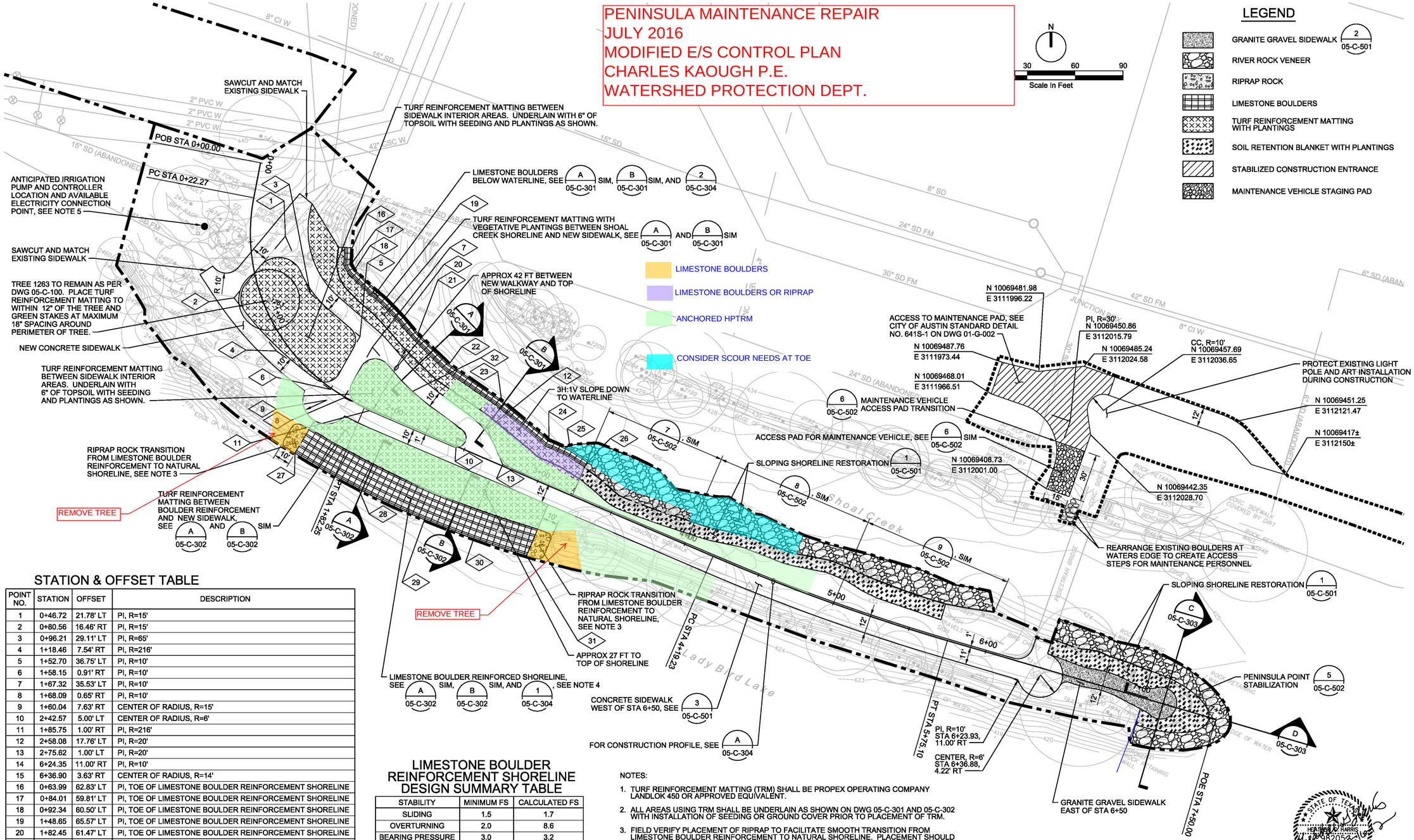
PENINSULA MAINTENANCE REPAIR
JULY 2016
MODIFIED E/S CONTROL PLAN
CHARLES KAOUGH P.E.
WATERSHED PROTECTION DEPT.



STATION & OFFSET TABLE

POINT NO.	STATION	OFFSET	DESCRIPTION
1	0+46.72	21.78' LT	PI, R=15'
2	0+80.56	16.46' RT	PI, R=15'
3	0+96.21	29.11' LT	PI, R=65'
4	1+18.46	7.54' RT	PI, R=216'
5	1+52.70	36.75' LT	PI, R=10'
6	1+58.15	0.91' RT	PI, R=10'
7	1+67.32	35.53' LT	PI, R=10'
8	1+68.09	0.65' RT	PI, R=10'
9	1+60.04	7.63' RT	CENTER OF RADIUS, R=15'
10	2+42.57	5.00' LT	CENTER OF RADIUS, R=6'
11	1+85.75	1.00' RT	PI, R=216'
12	2+58.08	17.76' LT	PI, R=20'
13	2+75.62	1.00' LT	PI, R=20'
14	6+24.35	11.00' RT	PI, R=10'
15	6+36.90	3.63' RT	CENTER OF RADIUS, R=14'
16	0+63.99	62.83' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
17	0+84.01	59.81' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
18	0+92.34	60.50' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
19	1+48.65	65.57' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
20	1+82.45	61.47' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
21	1+94.64	55.27' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
22	2+20.04	45.29' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
23	2+59.21	37.51' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
24	2+96.14	26.42' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
25	3+10.77	26.17' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
26	3+24.19	24.08' LT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
27	1+61.50	46.29' RT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
28	1+98.92	48.71' RT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
29	2+44.28	50.11' RT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
30	2+77.27	48.92' RT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
31	3+11.88	45.66' RT	PI, TOE OF LIMESTONE BOULDER REINFORCEMENT SHORELINE
32	2+05.23	20.05' LT	PI, R=137'

LIMESTONE BOULDER REINFORCEMENT SHORELINE DESIGN SUMMARY TABLE

STABILITY	MINIMUM FS	CALCULATED FS
SLIDING	1.5	1.7
OVERTURNING	2.0	8.6
BEARING PRESSURE	3.0	3.2
SLOPE STABILITY	1.3	1.3

* FS = FACTOR OF SAFETY

NOTE:
SLOPE STABILIZATION WAS DESIGNED IN GENERAL ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AND FWHA NHI-06-89 SOILS AND FOUNDATIONS REFERENCE MANUAL

NOTES:

1. TURF REINFORCEMENT MATTING (TRM) SHALL BE PROPEX OPERATING COMPANY LANDLOK 450 OR APPROVED EQUIVALENT.
2. ALL AREAS USING TRM SHALL BE UNDERLAIN AS SHOWN ON DWG 05-C-301 AND 05-C-302 WITH INSTALLATION OF SEEDING OR GROUND COVER PRIOR TO PLACEMENT OF TRM.
3. FIELD VERIFY PLACEMENT OF RIPRAP TO FACILITATE SMOOTH TRANSITION FROM LIMESTONE BOULDER REINFORCEMENT TO NATURAL SHORELINE. PLACEMENT SHOULD BE PERFORMED SUCH THAT FINISHED PRODUCT IS FREE OF ABRUPT TOPOGRAPHY CHANGES OR OUTCROPPINGS. LAYER SHALL BE A MINIMUM OF 24 INCHES UNDERLAIN WITH NON-WOVEN GEOTEXTILE.
4. CONTRACTOR SHALL CUT EXISTING IRRIGATION LINE FLUSH WITH THE OUTER LIMITS OF THE RIPRAP TRANSITION TO THE NATURAL SHORELINE AND BLOCK WITH A CONCRETE PLUG IN A MANNER SATISFACTORY TO THE OWNER'S REPRESENTATIVE.
5. FOR LANDSCAPE IRRIGATION, SEE SPECIAL SPECIFICATION 32.81.00. WATER SOURCE WILL BE RAW WATER FROM LADY BIRD LAKE OR AS APPROVED BY OWNER'S REPRESENTATIVE. RAW WATER PUMP WILL BE PROVIDED BY CONTRACTOR. USE OF EXISTING ELECTRICAL CONNECTION TO BE APPROVED BY GENE FAULK, 512-974-9507. CONTRACTOR TO PROVIDE WATER METER FOR WATER VOLUME REPORTING TO OWNER'S REPRESENTATIVE. DESIRED LOCATION OF PUMP CONTROLLER TO BE EXTERNAL WALL OF EXISTING BATHROOM BUILDING, IN A LOCKED COMPARTMENT.
6. CONTRACTOR SHALL WORK CAREFULLY AROUND EXISTING VEGETATION TO MINIMIZE DISTURBANCE TO ROOT SYSTEMS. MAKE MINOR ADJUSTMENTS TO THE FINAL LOCATION OF RIPRAP, SOIL RETENTION BLANKET, AND LIMESTONE BOULDER REINFORCEMENT IN THE FIELD TO PRESERVE EXISTING VEGETATION AS APPROVED BY THE ENGINEER.

ALIGNMENT TABLE

STATION	NORTHING	EASTING	RADIUS	LENGTH	DELTA
POB 0+00.00	10069612.47	3111509.63			
PC 0+22.27	10069590.60	3111505.42			
PI 1+17.28	10069497.30	3111487.47	118.00	159.98	77°40'54"
PT 1+82.25	10069459.85	3111574.79			
PC 4+19.23	10069366.44	3111792.57			
PI 4+97.26	10069335.69	3111864.29	1300.00	155.87	6°52'12"
PT 5+75.10	10069313.73	3111939.16			
POE 7+50.00	10069264.51	3112107.00			

STATE OF TEXAS
ROCH S.V. PLAYER
107958
LICENSED PROFESSIONAL ENGINEER

STATE OF TEXAS
FRANKLIN W. HARRIS
98205
LICENSED PROFESSIONAL ENGINEER

ROCH S.V. PLAYER P.E. 03/16/12 DATE

CITY OF AUSTIN 1839 GEORGIA

CH2MHILL®
TBPE FIRM NO. 2297

CIVIL
OVERALL SITE AND GRADING PLAN

LOWER SHOAL CREEK 5th TO LBL STREAM RESTORATION
AUSTIN, TEXAS
CITY OF AUSTIN

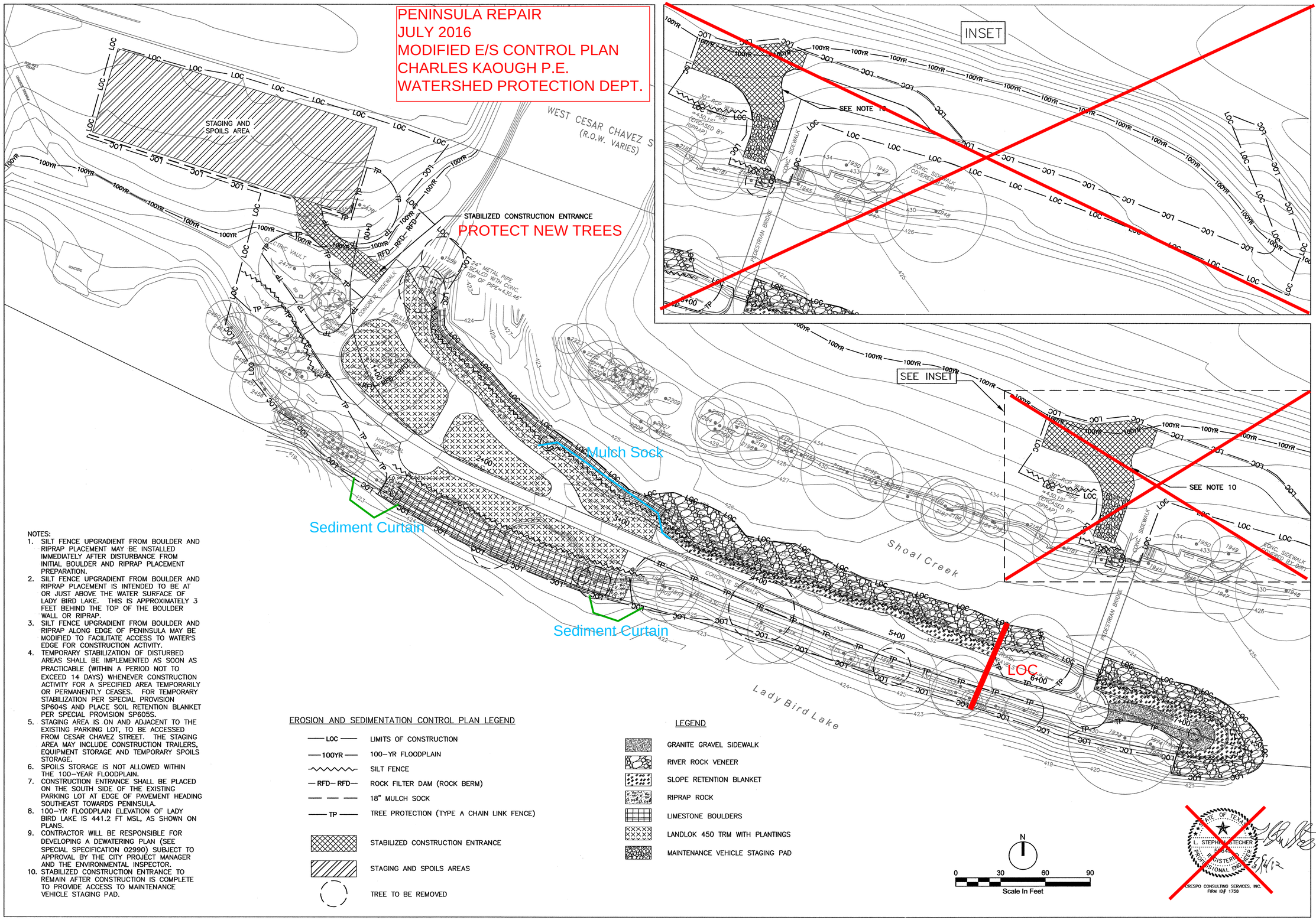
NO.	BY	DATE	REVISIONS REMARKS

SHEET INFORMATION
DATE MARCH 16, 2012
SHEET 9 OF 18
CAD REF. NO. 05-CS-100

GENERAL PERMIT PROGRAM

FILENAME: 05-CS-100_420483.dgn PLOT DATE: 2012\03\13 PLOT TIME: 1:34:57 PM

PENINSULA REPAIR
JULY 2016
MODIFIED E/S CONTROL PLAN
CHARLES KAOUGH P.E.
WATERSHED PROTECTION DEPT.



NOTES:
1. SILT FENCE UPGRADIENT FROM BOULDER AND RIPRAP PLACEMENT MAY BE INSTALLED IMMEDIATELY AFTER DISTURBANCE FROM INITIAL BOULDER AND RIPRAP PLACEMENT PREPARATION.
2. SILT FENCE UPGRADIENT FROM BOULDER AND RIPRAP PLACEMENT IS INTENDED TO BE AT OR JUST ABOVE THE WATER SURFACE OF LADY BIRD LAKE. THIS IS APPROXIMATELY 3 FEET BEHIND THE TOP OF THE BOULDER WALL OR RIPRAP.
3. SILT FENCE UPGRADIENT FROM BOULDER AND RIPRAP ALONG EDGE OF PENINSULA MAY BE MODIFIED TO FACILITATE ACCESS TO WATER'S EDGE FOR CONSTRUCTION ACTIVITY.
4. TEMPORARY STABILIZATION OF DISTURBED AREAS SHALL BE IMPLEMENTED AS SOON AS PRACTICABLE (WITHIN A PERIOD NOT TO EXCEED 14 DAYS) WHENEVER CONSTRUCTION ACTIVITY FOR A SPECIFIED AREA TEMPORARILY OR PERMANENTLY CEASES. FOR TEMPORARY STABILIZATION PER SPECIAL PROVISION SP604S AND PLACE SOIL RETENTION BLANKET PER SPECIAL PROVISION SP605S.
5. STAGING AREA IS ON AND ADJACENT TO THE EXISTING PARKING LOT, TO BE ACCESSED FROM CESAR CHAVEZ STREET. THE STAGING AREA MAY INCLUDE CONSTRUCTION TRAILERS, EQUIPMENT STORAGE AND TEMPORARY SPOILS STORAGE.
6. SPOILS STORAGE IS NOT ALLOWED WITHIN THE 100-YEAR FLOODPLAIN.
7. CONSTRUCTION ENTRANCE SHALL BE PLACED ON THE SOUTH SIDE OF THE EXISTING PARKING LOT AT EDGE OF PAVEMENT HEADING SOUTHEAST TOWARDS PENINSULA.
8. 100-YR FLOODPLAIN ELEVATION OF LADY BIRD LAKE IS 441.2 FT MSL, AS SHOWN ON PLANS.
9. CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING A DEWATERING PLAN (SEE SPECIAL SPECIFICATION 02990) SUBJECT TO APPROVAL BY THE CITY PROJECT MANAGER AND THE ENVIRONMENTAL INSPECTOR.
10. STABILIZED CONSTRUCTION ENTRANCE TO REMAIN AFTER CONSTRUCTION IS COMPLETE TO PROVIDE ACCESS TO MAINTENANCE VEHICLE STAGING PAD.

EROSION AND SEDIMENTATION CONTROL PLAN LEGEND

- LOC — LIMITS OF CONSTRUCTION
- 100YR — 100-YR FLOODPLAIN
- SILT FENCE
- RFD RFD — ROCK FILTER DAM (ROCK BERM)
- 18" MULCH SOCK
- TP — TREE PROTECTION (TYPE A CHAIN LINK FENCE)
- STABILIZED CONSTRUCTION ENTRANCE
- STAGING AND SPOILS AREAS
- TREE TO BE REMOVED

LEGEND

- GRANITE GRAVEL SIDEWALK
- RIVER ROCK VENEER
- SLOPE RETENTION BLANKET
- RIPRAP ROCK
- LIMESTONE BOULDERS
- LANDLOK 450 TRM WITH PLANTINGS
- MAINTENANCE VEHICLE STAGING PAD

CIVIL
EROSION AND SEDIMENTATION CONTROL PLAN

CH2MHILL®
TBPE FIRM NO. F-2397

LOWER SHOAL CREEK 5th TO
LBL STREAM RESTORATION
AUSTIN, TEXAS
CITY OF AUSTIN

REVISIONS

NO.	BY	DATE	REMARKS

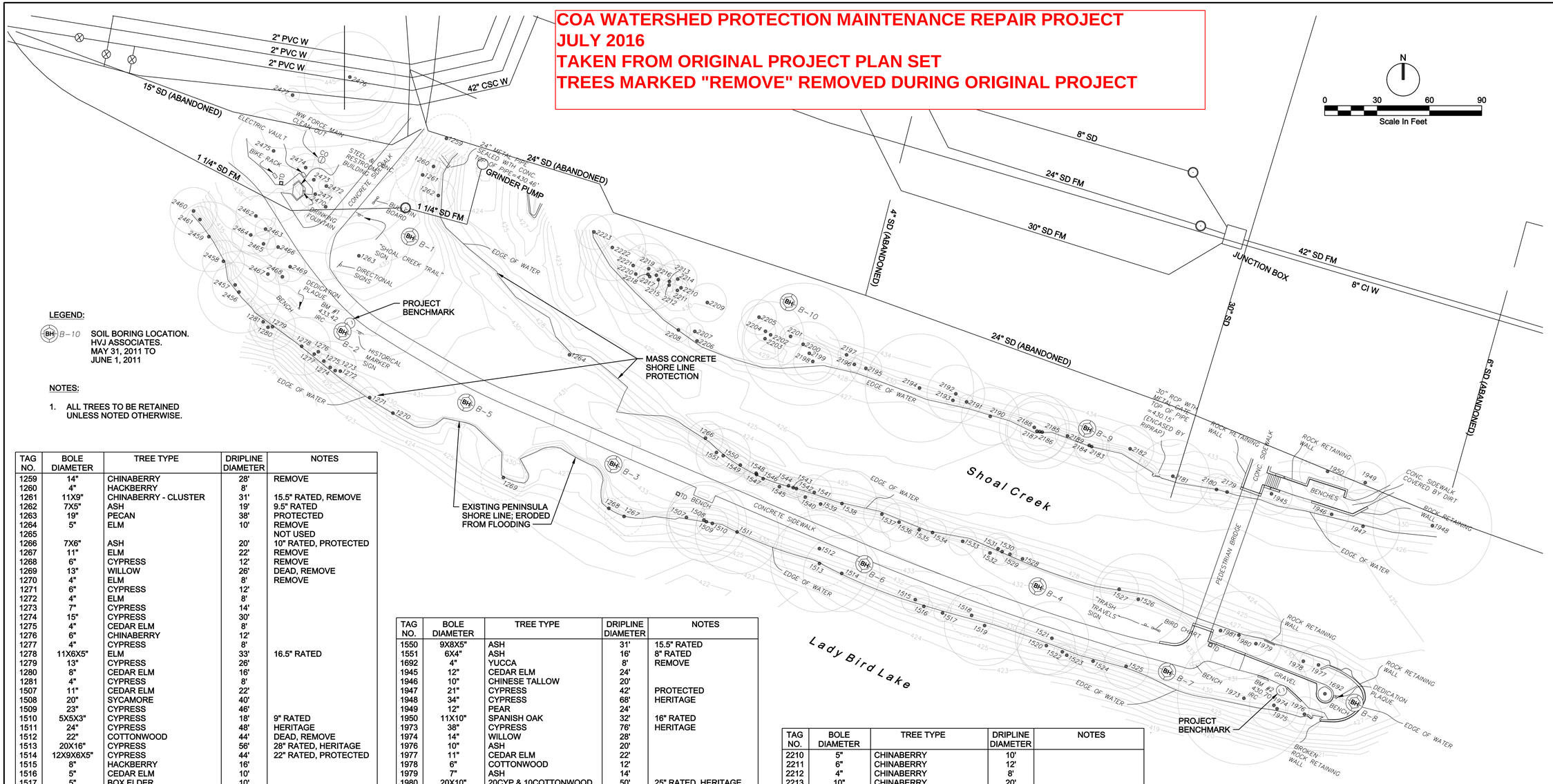
STATE OF TEXAS
L. STEPHEN STECHER
68548
REGISTERED
PROFESSIONAL ENGINEER
3/14/12

CRESPO CONSULTING SERVICES, INC.
FIRM ID# 1758

SHEET INFORMATION
DATE MARCH 14, 2012
SHEET 7 OF 18
CAD REF. NO. 05-C-201

GENERAL PERMIT PROGRAM

COA WATERSHED PROTECTION MAINTENANCE REPAIR PROJECT
JULY 2016
TAKEN FROM ORIGINAL PROJECT PLAN SET
TREES MARKED "REMOVE" REMOVED DURING ORIGINAL PROJECT



LEGEND:

BH B-10 SOIL BORING LOCATION. HVJ ASSOCIATES. MAY 31, 2011 TO JUNE 1, 2011

NOTES:

1. ALL TREES TO BE RETAINED UNLESS NOTED OTHERWISE.

TAG NO.	BOLE DIAMETER	TREE TYPE	DRIPLINE DIAMETER	NOTES
1259	14"	CHINABERRY	28'	REMOVE
1260	4"	HACKBERRY	8'	
1261	11X9"	CHINABERRY - CLUSTER	31'	15.5" RATED, REMOVE
1262	7X5"	ASH	19'	9.5" RATED
1263	19"	PECAN	38'	PROTECTED
1264	5"	ELM	10'	REMOVE
1265				NOT USED
1266	7X6"	ASH	20'	10" RATED, PROTECTED
1267	11"	ELM	22'	REMOVE
1268	6"	CYPRESS	12'	REMOVE
1269	13"	WILLOW	26'	DEAD, REMOVE
1270	4"	ELM	8'	REMOVE
1271	6"	CYPRESS	12'	
1272	4"	ELM	8'	
1273	7"	CYPRESS	14'	
1274	15"	CYPRESS	30'	
1275	4"	CEDAR ELM	8'	
1276	6"	CHINABERRY	12'	
1277	4"	CYPRESS	8'	
1278	11X6X5"	ELM	33'	16.5" RATED
1279	13"	CYPRESS	26'	
1280	8"	CEDAR ELM	16'	
1281	4"	CYPRESS	8'	
1507	11"	CEDAR ELM	22'	
1508	20"	SYCAMORE	40'	
1509	23"	CYPRESS	46'	
1510	5X5X3"	CYPRESS	18'	9" RATED
1511	24"	CYPRESS	48'	HERITAGE
1512	22"	COTTONWOOD	44'	DEAD, REMOVE
1513	20X16"	CYPRESS	56'	28" RATED, HERITAGE
1514	12X9X6X5"	CYPRESS	44'	22" RATED, PROTECTED
1515	8"	HACKBERRY	16'	
1516	5"	CEDAR ELM	10'	
1517	5"	BOX ELDER	10'	
1518	8X5X4"	HACKBERRY	25'	12.5" RATED, REMOVE
1519	23"	CYPRESS	46'	PROTECTED
1520	6X5X4X4X4X4"	CYPRESS	33'	16.5" RATED
1521	21"	CYPRESS	42'	21" PROTECTED
1522	5"	CEDAR ELM	10'	
1523	6"	BOX ELDER	12'	
1524	7"	SYCAMORE	14'	
1525	9X8"	CEDAR ELM	26'	13" RATED
1526	26"	CYPRESS - HERITAGE TREE	52'	HERITAGE
1527	11"	ASH	22'	
1528	6"	SYCAMORE	12'	
1529	4"	WILLOW	8'	
1530	8"	CEDAR ELM	16'	
1531	9"	WILLOW	18'	
1532	4"	CEDAR ELM	8'	
1533	8"	ASH	16'	
1534	8"	ASH	16'	
1535	5"	CEDAR ELM	10'	
1536	8X6"	ASH	22'	11" RATED
1537	8X5"	ASH	21'	10.5" RATED
1538	12X7X5X4"	ASH	40'	20" RATED, PROTECTED
1539	4"	ASH	8'	
1540	4"	CHINESE TALLOW	8'	
1541	10"	CHINESE TALLOW	20'	
1542	5"	CEDAR ELM	10'	
1543	6"	ASH	12'	
1544	5"	SYCAMORE	10'	
1545	4"	CHINESE TALLOW	8'	
1546	4"	SYCAMORE	8'	
1547	4"	CEDAR ELM	8'	
1548	7"	SYCAMORE	14'	
1549	5"	SYCAMORE	10'	

TAG NO.	BOLE DIAMETER	TREE TYPE	DRIPLINE DIAMETER	NOTES
1550	9X8X5"	ASH	31'	15.5" RATED
1551	6X4"	ASH	16'	8" RATED
1692	4"	YUCCA	8'	REMOVE
1945	12"	CEDAR ELM	24'	
1946	10"	CHINESE TALLOW	20'	
1947	21"	CYPRESS	42'	PROTECTED
1948	34"	CYPRESS	68'	HERITAGE
1949	12"	PEAR	24'	
1950	11X10"	SPANISH OAK	32'	16" RATED
1973	38"	CYPRESS	76'	HERITAGE
1974	14"	WILLOW	28'	
1976	10"	ASH	20'	
1977	11"	CEDAR ELM	22'	
1978	6"	COTTONWOOD	12'	
1979	7"	ASH	14'	
1980	20X10"	20CYP & 10COTTONWOOD	50'	25" RATED, HERITAGE
1981	5"	MULBERRY	10'	REMOVE
2179	10"	COTTONWOOD	20'	REMOVE
2180	9"	CYPRESS	18'	PROTECTED
2181	21"	CYPRESS	42'	PROTECTED
2182	10X7"	CRAPE MYRTLE	27'	13.5" RATED
2183	7X6"	CRAPE MYRTLE	20'	10" RATED
2184	8"	CHINESE TALLOW	16'	
2185	21"	COTTONWOOD	42'	PROTECTED
2186	11"	ASH	22'	
2187	17"	WILLOW	34'	
2188	20"	COTTONWOOD	40'	PROTECTED
2189	5X4"	SYCAMORE	14'	7" RATED
2190	8X8X5X4"	CRAPE MYRTLE	33'	16.5" RATED
2191	4"	CEDAR ELM	8'	
2192	10X5X4X4"	CRAPE MYRTLE	33'	16.5" RATED
2193	4"	ELM	8'	
2194	31"	CYPRESS	62'	HERITAGE
2195	9"	CHINESE TALLOW	18'	
2196	4"	HACKBERRY	8'	
2197	5"	HACKBERRY	10'	
2198	11"	WILLOW	22'	
2199	18"	WILLOW	36'	
2200	29X12"	WILLOW	70'	35" RATED, HERITAGE
2201	6"	BOX ELDER	12'	
2202	14X10"	WILLOW	38'	19" RATED, PROTECTED
2203	12"	WILLOW	24'	
2204	6"	ASH	12'	
2205	10"	SPANISH OAK	20'	
2206	5"	SYCAMORE	10'	
2207	5"	WILLOW	10'	
2208	7"	SYCAMORE	14'	
2209	11"	SPANISH OAK	22'	

TAG NO.	BOLE DIAMETER	TREE TYPE	DRIPLINE DIAMETER	NOTES
2210	5"	CHINABERRY	10'	
2211	6"	CHINABERRY	12'	
2212	4"	CHINABERRY	8'	
2213	10"	CHINABERRY	20'	
2214	8X6"	CHINABERRY	22'	
2215	6"	CHINABERRY	12'	
2216	7"	CHINABERRY	14'	
2217	19"	COTTONWOOD	38'	PROTECTED
2218	5"	SYCAMORE	10'	
2219	8"	BOX ELDER	16'	
2220	23"	WILLOW	46'	PROTECTED
2221	9"	ASH	18'	
2222	19"	CYPRESS	38'	PROTECTED
2223	5"	ELM	10'	
2456	23.5"	CYPRESS	47'	
2457	13"	CYPRESS	13'	
2458	9X6.5"	HACKBERRY	24'	
2459	17X6"	17CYP & 6ELM	40'	
2460	11X5"	REDBUD	27'	
2461	7.5"	REDBUD	15'	
2462	5.5X5X4X3"	CRAPE MYRTLE	23'	
2463	6"	CRAPE MYRTLE	12'	
2464	5X4.5X4X3"	CRAPE MYRTLE	22'	
2465	5X4.5"	CRAPE MYRTLE	14'	
2466	6.5"	CRAPE MYRTLE	13'	
2467	4.5X2"	CRAPE MYRTLE	9'	
2468	4"	CRAPE MYRTLE	8'	
2469	4.5X4X2X2"	CRAPE MYRTLE	17'	
2470	7X6"	CRAPE MYRTLE	10'	
2471	4.5X4.5X4"	CRAPE MYRTLE	18'	
2472	4.5"	CRAPE MYRTLE	9'	
2473	5X4.5X4.5X4"	CRAPE MYRTLE	23'	
2474	4.5X4X3.5"	CRAPE MYRTLE	16'	
2475	24"	LIVE OAK	48'	
2476	26"	LIVE OAK	52'	
2477	4"	CEDAR ELM	8'	

PROJECT BENCHMARKS

BM #1 - 1/2" IRON ROD WITH RED PLASTIC CAP SET IN THE GROUND +/- 195 FEET SOUTH OF W. CESAR CHAVEZ STREET BRIDGE CROSSING OVER SHOAL CREEK, 4 FEET SOUTH OF THE EDGE OF A CONCRETE SIDEWALK, 28 FEET NORTH OF THE NORTH BANK OF LADY BIRD LAKE AND 30.5 FEET EAST OF A DEDICATION PLAQUE LOCATED ON THE EAST SIDE OF A BENCH. (PENINSULA OF SHOAL BEACH PARK)
(GRID) N=10069488.079; E=3111509.814 ELEV=433.42

BM #2 - 1/2" IRON ROD WITH RED PLASTIC CAP SET IN THE GROUND ON THE SOUTH SIDE OF A GRAVEL PATH, 31.5 FEET WEST OF A DEDICATION PLAQUE LOCATED ON THE WEST SIDE OF A BENCH AND 57 FEET EAST OF THE SOUTH END OF A PEDESTRIAN BRIDGE. (EAST END OF PENINSULA OF SHOAL BEACH PARK)
(GRID) N=10069277.631; E=3112043.852 ELEV=430.70

CITY OF AUSTIN 1839 CAPITAL

CIVIL

EXISTING CONDITIONS AND TREE REMOVAL PLAN

CH2MHILL®
TBPE FIRM NO. 2297

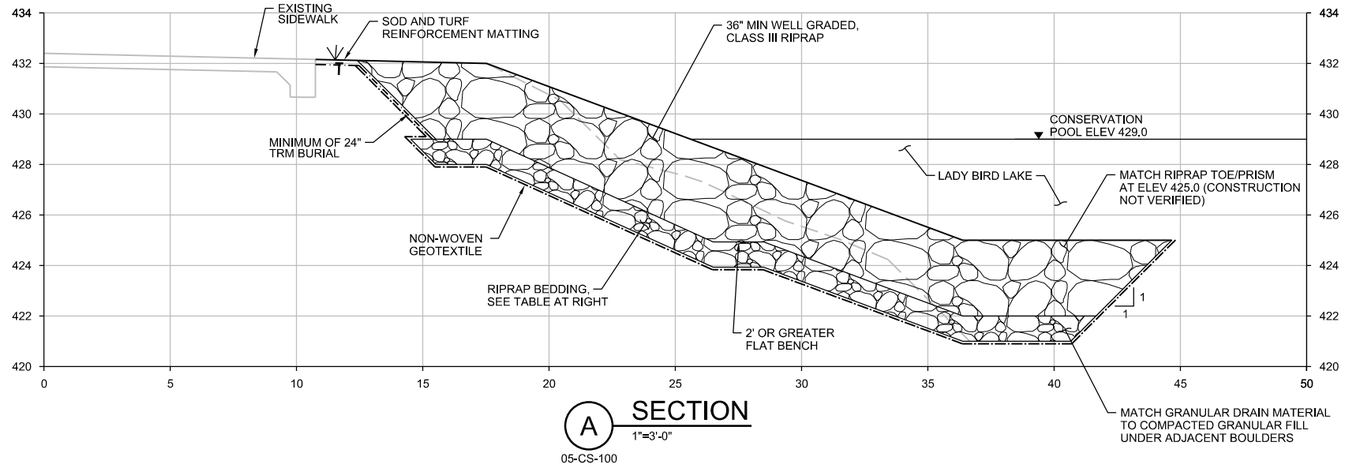
LOWER SHOAL CREEK 5th TO
LBL STREAM RESTORATION
AUSTIN, TEXAS
CITY OF AUSTIN

NO.	BY	DATE	REMARKS
			REVISIONS

SHEET INFORMATION
DATE MARCH 16, 2012
SHEET 5 OF 18
CAD REF. NO. 05-C-100

GENERAL PERMIT PROGRAM

FILENAME: 05-C-100_420483.dgn PLOT DATE: 2012\03\13 PLOT TIME: 1:06:15 PM

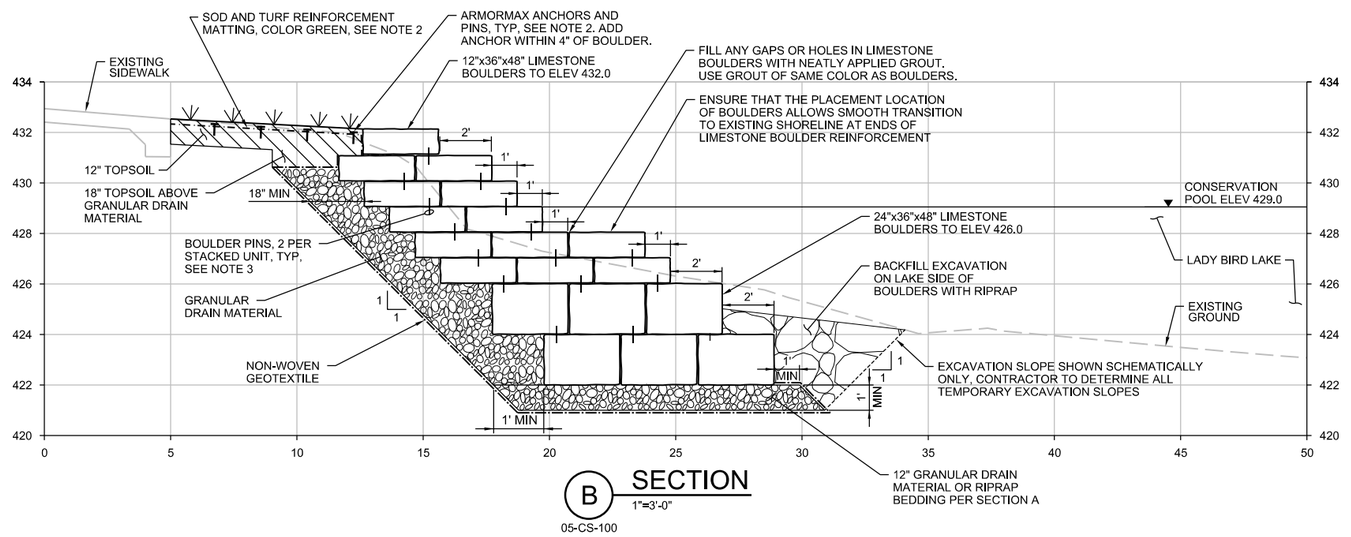


A SECTION
1"=3'-0"
05-CS-100

SECTION A NOTES:
1. REMOVE EXISTING RIPRAP TRANSITION BETWEEN BOULDERS AND EXISTING GROUND.
2. RIPRAP MUST BE ANGULAR AND WELL-GRADED.
3. PLACE RIPRAP IN A CONTROLLED MANNER TO AVOID SEGREGATION AND TO WORK SMALLER STONES INTO VOIDS BETWEEN LARGER STONES.
4. RIPRAP SHALL BE A MINIMUM OF 36" IN THICKNESS.
5. DO NOT GROUT RIPRAP.
6. USE GRANULAR DRAIN MATERIAL AS TRANSITION FROM ROCK TO EXISTING GROUND ON WESTERN EDGE (MINIMUM 12" THICKNESS).

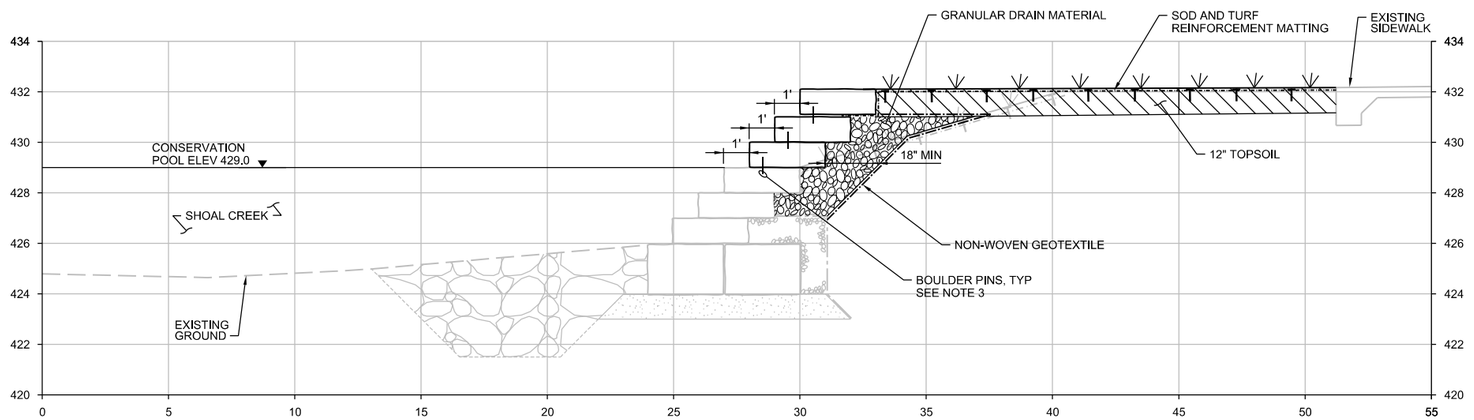
PROTECTION RIPRAP BEDDING MATERIAL GRADATION REQUIREMENTS	
SIEVE SIZE (SQ MESH)	% BY WEIGHT PASSING
3 IN	100
1-1/2 IN	50-80
3/4 IN	20-60
NO. 4	0-15
NO. 10	0-5

FROM TxDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES, ITEM 432, TABLE 2



B SECTION
1"=3'-0"
05-CS-100

SECTION B NOTES:
1. REMOVE EXISTING RIPRAP TRANSITION BETWEEN BOULDERS AND EXISTING GROUND.
2. TURF REINFORCEMENT MATTING, ANCHORS, AND PINS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. BOULDER PINS SHALL CONSIST OF #8 REBAR WITH WATER SEAL EPOXY. EMBED PINS 4" MINIMUM INTO EACH BOULDER 6" FROM EDGE SHOWN. PINS SHALL BE 2 FEET CENTER TO CENTER.
4. EXCAVATION NOT ADDRESSED WITH RIPRAP SHALL BE BACKFILLED WITH COMPACTED NATIVE SOIL.



C SECTION
1"=3'-0"
05-CS-100

SECTION C NOTES:
1. REMOVE EXISTING TURF REINFORCEMENT MATTING, FABRIC, AND RIPRAP INSTALLED FOLLOWING ORIGINAL CONSTRUCTION.
2. TURF REINFORCEMENT MATTING AND STAKES SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. BOULDER PINS SHALL CONSIST OF #8 REBAR WITH WATER SEAL EPOXY. EMBED PINS 4" MINIMUM INTO EACH BOULDER 6" FROM EDGE SHOWN. PINS SHALL BE 2 FEET CENTER TO CENTER.

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW UNDER THE AUTHORITY OF HEATHER G. HARRIS, P.E. 98205 ON DECEMBER 8, 2015. IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

CITY OF AUSTIN 1839 GROWING

CIVIL
SITE SECTIONS

CH2MHILL®
TBPE FIRM NO. 2297

LOWER SHOAL CREEK 5th TO
LBL STREAM RESTORATION
AUSTIN, TEXAS
CITY OF AUSTIN

REVISIONS			
NO.	BY	DATE	REMARKS

SHEET INFORMATION
DATE DECEMBER 8, 2015
SHEET 2 OF 2
CAD REF. NO. 05-C-201

GENERAL PERMIT PROGRAM

FILENAME: 05-C-201_480097.dgn PLOT DATE: 2015\12\08 PLOT TIME: 12:01:04 PM

NOTES:
1. TURF REINFORCEMENT MATTING (TRM) SHALL BE PROPEX OPERATING COMPANY ARMORMAX OR APPROVED EQUIVALENT.
2. INSTALL TRM PER MANUFACTURER'S INSTRUCTIONS. NOTIFY ENGINEER PRIOR TO INSTALLATION IF DISCREPANCIES BETWEEN MANUFACTURER'S INSTRUCTIONS AND THIS PLAN SET ARE IDENTIFIED.
3. PROVIDE A 6" MINIMUM TRM OVERLAP WITH THE EXISTING TRM. ADD A ROW OF PINS ALONG THAT OVERLAP, AS WELL AS B1 GRIPPLE ANCHORS IN THE RECOMMENDED ANCHOR PATTERN FOR OVERLAPS.
4. SHINGLE THE TRM IN THE DIRECTION OF FLOW AS THE WATER COMES FROM SHOAL CREEK INTO LADYBIRD LAKE.
5. CONTACT CITY OF AUSTIN LANDSCAPE ARCHITECT AT LEAST 48 HOURS PRIOR TO APPLICATION OF TOPSOIL FOR ANY ONSITE CONDITIONS-BASED DIRECTION.
6. FOR TRM INSTALLATION: APPLY 0.5" TOPSOIL, INSTALL BLANKET, AND ENSURE CONNECTION WITH SOIL UNDERNEATH. LIGHTLY APPLY ADDITIONAL TOPSOIL ABOVE THE MAT (0.5-0.75" SOIL MAXIMUM) TO FILL VOIDS IN THE TRM. THE TRM WILL BE VISIBLE THROUGH THE SOIL IN SOME AREAS. PIN SOD TO MAT USING SOD STAPLES (4" OR 6" STAPLES). APPLY CELEBRATION BERMUDAGRASS SOD IN OPEN AREAS. APPLY ZOYSIA SPECIES SOD SPECIFIED BY CITY OF AUSTIN LANDSCAPE ARCHITECT IN SHADED AREAS.

N
0 30 60 90
Scale In Feet

LEGEND
- SUPPLEMENTAL RIPRAP
- TURF REINFORCEMENT MATTING (TRM) - OPEN AREA, SEE NOTES 1-6
- TURF REINFORCEMENT MATTING (TRM) - SHADED AREA, SEE NOTES 1-6
- RIPRAP
- LIMESTONE BOULDERS

REMOVE PREVIOUSY INSTALLED MATERIALS (ORIGINAL TRM AND FABRIC/RIPRAP PLACED AFTER ORIGINAL CONSTRUCTION) AND PLACE LIMESTONE BOULDERS AS SHOWN IN SECTION C/C-201. EASTERN BOUNDARY WILL BE RIPRAP INSTALLED DURING ORIGINAL CONSTRUCTION. ENSURE CONTACT BETWEEN BOULDERS AND RIPRAP AND TRANSITION SMOOTHLY TO EXISTING GRADE.

1/2 CRITICAL ROOT ZONE, TREE #1271

REMOVE EXISTING RIPRAP TRANSITION MATERIAL. REPLACE WITH 36" THICK, WELL GRADED, CLASS III RIPRAP. SEE SECT A/C-201 FOR ADDITIONAL DETAIL. REMAIN OUTSIDE THE 1/2 CRITICAL ROOT ZONE OF TREE #1271 DURING CONSTRUCTION.

VERIFY RIPRAP TOE EXTENTS PER ORIGINAL DRAWINGS. ADD SUPPLEMENTAL MATERIAL (WELL GRADED, CLASS V RIPRAP) IF DISCREPANCIES ARE FOUND. DO NOT REPLACE RIVER ROCK VENEER.

VERIFY THAT RIPRAP TOE HAS BEEN PLACED AND REMAINS INTACT, SIMILAR TO SECT B/C-201. ADD SUPPLEMENTAL WELL GRADED, CLASS III RIPRAP IF DISCREPANCIES ARE FOUND.

REMOVE SILT FENCING LEFT BY CONTRACTOR

IN THIS AREA, EXISTING UNDERSTORY ON BANK TO REMAIN AND WILL DICTATE TOTAL SQUARE FOOTAGE OF TRM APPLICATION

TIE INTO EXISTING BOULDER ELEVATION (A)

LINE A-D: ELEVATION OF THE TOP ROW OF BOULDERS SHOULD BE LEVEL WITH ADJACENT LAND TO NORTH

1/2 CRITICAL ROOT ZONE, TREE #1507

LINE C-D: INTERSECTS NO CLOSER THAN 1/2 THE RADIUS OF THE CRITICAL ROOT ZONE OF TREE #1507

TIE INTO EXISTING BOULDER LOCATION AND ELEVATION (B)

REMOVE EXISTING RIPRAP TRANSITION MATERIAL. REPLACE WITH LIMESTONE BOULDER WALL SIMILAR TO ORIGINAL CONSTRUCTION. SEE SECT B/C-201 FOR ADDITIONAL DETAIL. REMAIN OUTSIDE THE 1/2 CRITICAL ROOT ZONE OF TREE #1507 DURING CONSTRUCTION. TRANSITION TO EXISTING SHORELINE BY KEYING INTO BANK.

1 LIMESTONE WALL EXTENSION
1"=5'

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CITY OF AUSTIN 1839 CAPITAL OF TEXAS

CIVIL
OVERALL SITE AND GRADING PLAN

CH2MHILL®
TBPE FIRM NO. 2237

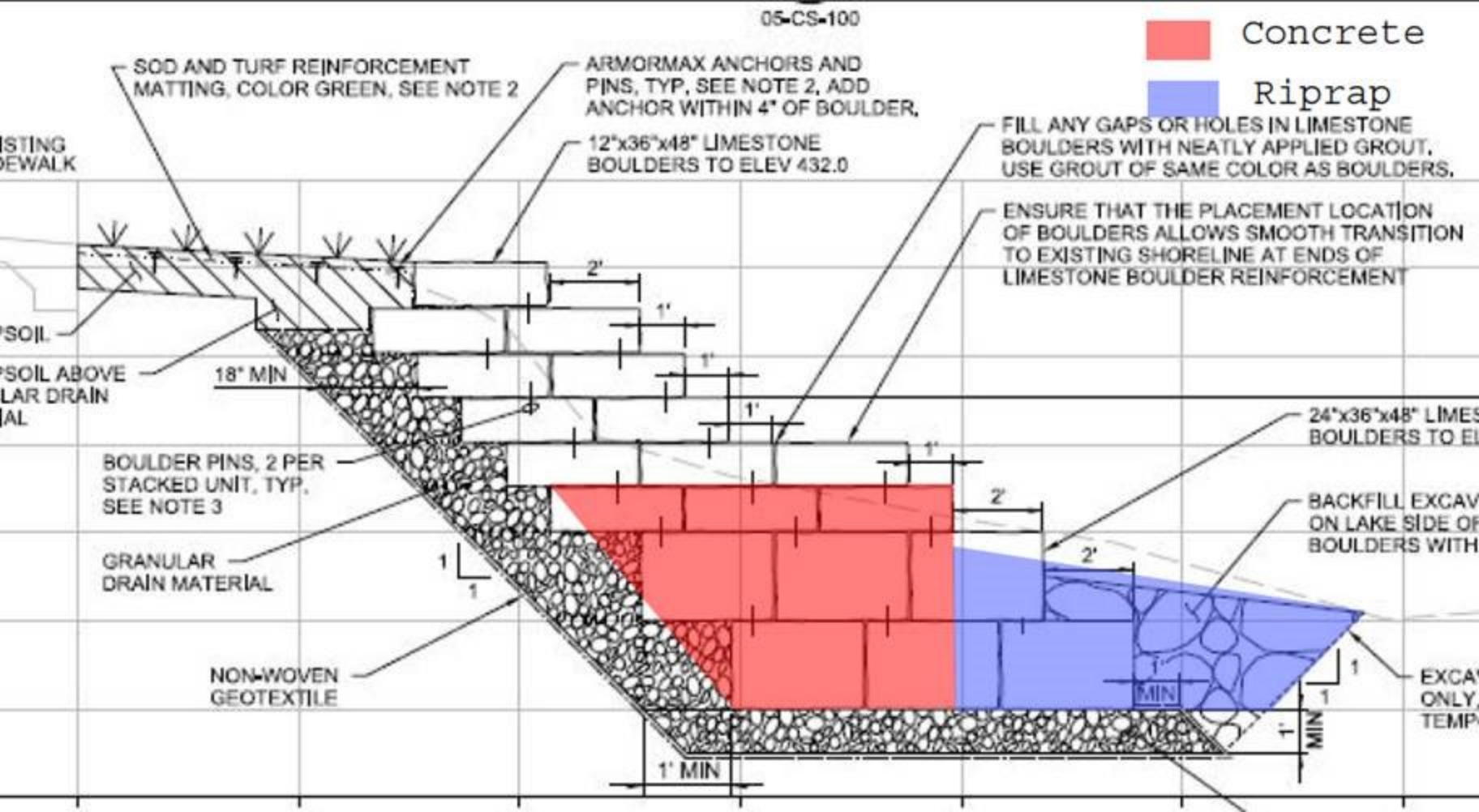
LOWER SHOAL CREEK 5th TO LBL STREAM RESTORATION
AUSTIN, TEXAS
CITY OF AUSTIN

NO.	BY	DATE	REVISIONS REMARKS

SHEET INFORMATION
DATE DECEMBER 8, 2015
SHEET 1 OF 2
CAD REF. NO. 05-CS-100

GENERAL PERMIT PROGRAM

FILENAME: 05-CS-100_480097.dgn PLOT DATE: 2015\12\08 PLOT TIME: 11:15:28 AM


05-CS-100
Concrete
Riprap
SOD AND TURF REINFORCEMENT MATTING, COLOR GREEN, SEE NOTE 2
ARMORMAX ANCHORS AND PINS, TYP, SEE NOTE 2, ADD ANCHOR WITHIN 4" OF BOULDER.
12"x36"x48" LIMESTONE BOULDERS TO ELEV 432.0
FILL ANY GAPS OR HOLES IN LIMESTONE BOULDERS WITH NEATLY APPLIED GROUT. USE GROUT OF SAME COLOR AS BOULDERS.
ENSURE THAT THE PLACEMENT LOCATION OF BOULDERS ALLOWS SMOOTH TRANSITION TO EXISTING SHORELINE AT ENDS OF LIMESTONE BOULDER REINFORCEMENT
18" MIN
BOULDER PINS, 2 PER STACKED UNIT, TYP. SEE NOTE 3
GRANULAR DRAIN MATERIAL
NON-WOVEN GEOTEXTILE
2'
1'
1'
1'
1'
2'
2'
1
1
1' MIN
1' MIN
1' MIN
1
1
BACKFILL EXCAV
ON LAKE SIDE OF
BOULDERS WITH
EXCA
ONLY
TEMP

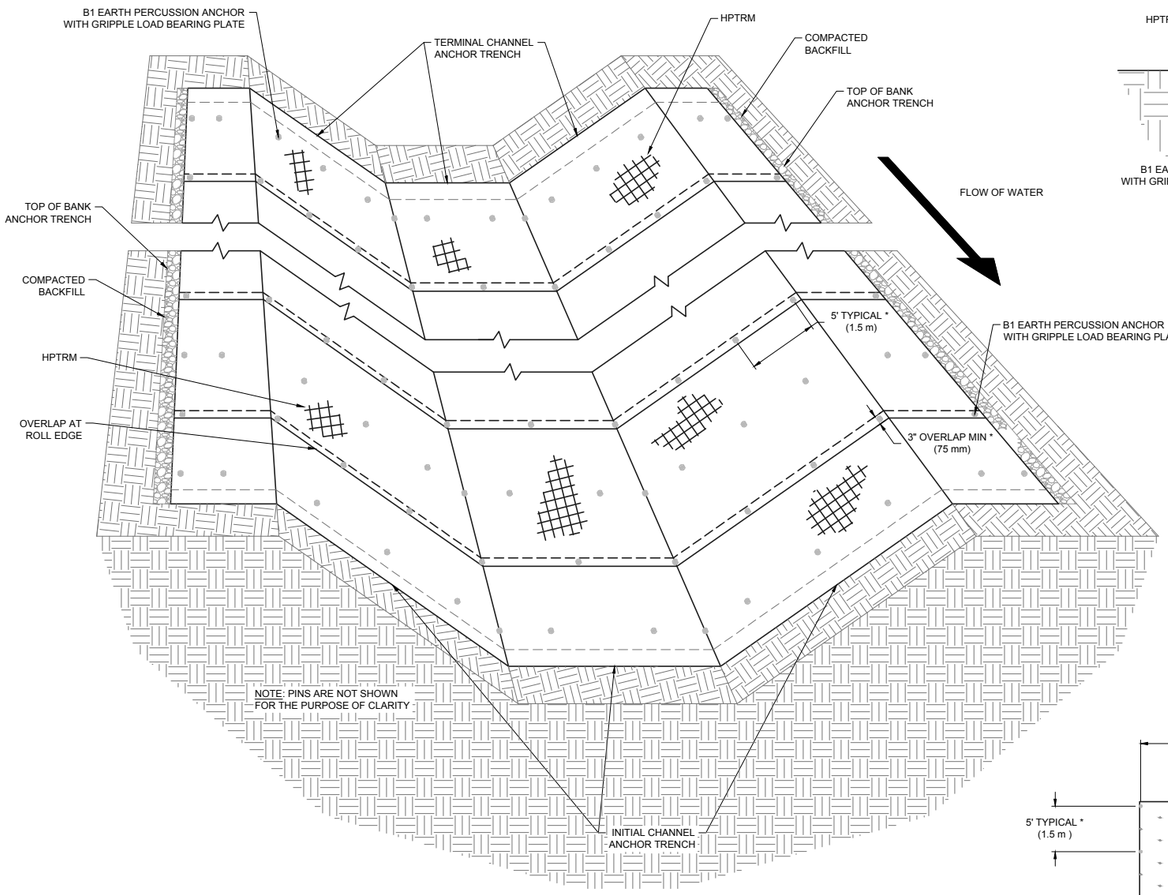


FIGURE 1: INSTALLATION OF ARMORMAX SYSTEM IN A CHANNEL

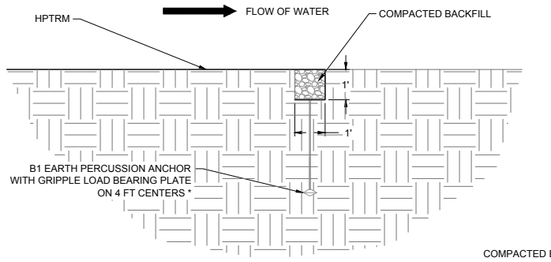


FIGURE 2: INITIAL CHANNEL ANCHOR TRENCH (DOWNSTREAM) DETAIL

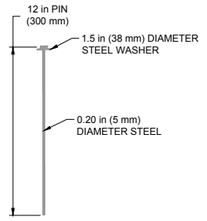
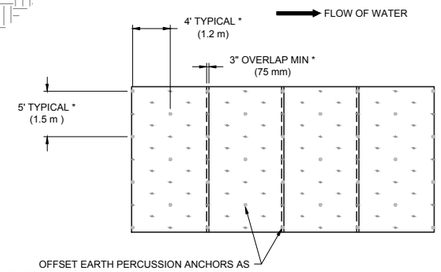


FIGURE 4: PIN DETAIL

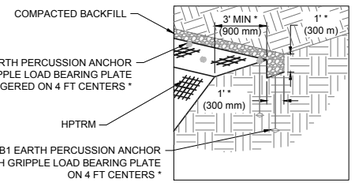


NOTE: NO END OF ROLL OVERLAP ALLOWED ON FACE OF A LEVEE

B1 EARTH PERCUSSION ANCHOR WITH GRIPPLE LOAD BEARING PLATE

12" PIN

FIGURE 6: ANCHOR / PIN PATTERN AND LONGITUDINAL EDGE DETAIL



NOTE: SEED OR SOD ALL DISTURBED AREAS

FIGURE 3:TOP OF BANK (TOB) ANCHOR TRENCH

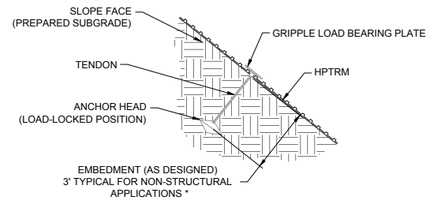


FIGURE 5: EARTH PERCUSSION ANCHOR DETAIL

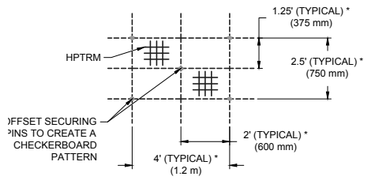


FIGURE 7: PIN PATTERN DETAIL SPECIFIC TO B1 ANCHOR RATIO OF 0.5 ANCHORS/YD² (FOR EARTH PERCUSSION ANCHOR RATIOS OTHER THAN THE ABOVE, PLEASE CONSULT WITH PROPEX ENGINEERING SERVICES AT 423-553-2450)

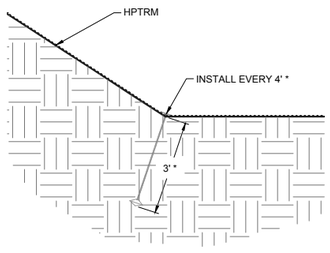


FIGURE 8: BREAK IN SLOPE INTERFACE DETAIL FOR CHANNELS

NOTE: HPTRM SHOULD BE SHINGLED IN THE DIRECTION OF THE DOWN SLOPE AND FLOW

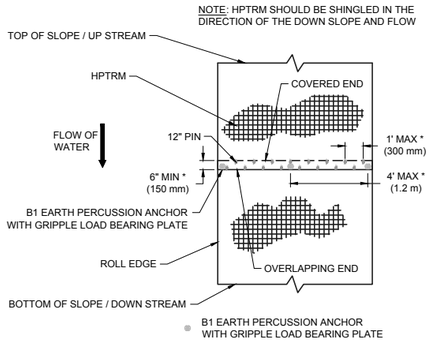


FIGURE 9: OVERLAP AT ROLL END DETAIL

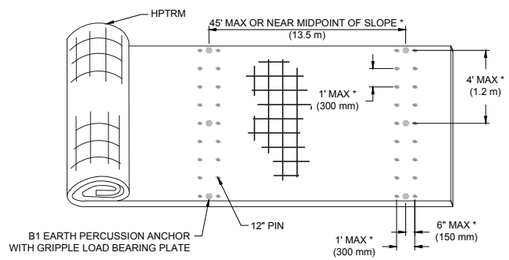


FIGURE 10: SIMULATED CHECK SLOT DETAIL

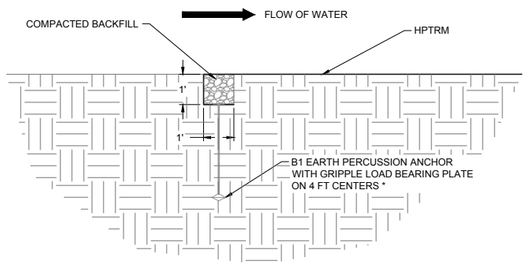


FIGURE 11: TERMINAL CHANNEL ANCHOR TRENCH (UPSTREAM) DETAIL

NOTES:
1) These Installation details are for channel applications. For slopes and levees, please consult the Propex Website for the Slope and Levee Drawing S100.
2) Please consult the Propex Website for the most up to date details.

Propex™ Geotextile Systems

Please note that the information presented herein is general information only. It is for conceptual use only and not intended to be used for construction. While every effort has been made to ensure its accuracy, this information should not be used for a specific application without independent professional examination and verification of its suitability, applicability, and accuracy.

△		ARMORMAX® BY PROPEX	ANCHOR REINFORCED VEGETATED SYSTEM, ARVS		
△			CONCEPTUAL ARMORMAX® INSTALLATION DETAILS FOR CHANNELS		
△	C100T				
Rev		Date: 02/03/2012	Drawn By: D.LOIZEAUX	Scale: NTS	*ALL DIMENSIONS ARE TO BE VERIFIED BY THE ENGINEER

ARMORMAX® SYSTEM IN A CHANNEL (NON-STRUCTURAL APPLICATION) GENERAL INSTALLATION GUIDELINES

PRE-CONSTRUCTION

A pre-construction meeting shall be held with the construction team and a representative from Propex ®. This meeting shall be scheduled by the contractor with at least two weeks notice. Also, Propex suggests that installation monitoring of the ArmorMax System be performed by a qualified independent third party.

SITE PREPARATION

- Grade and compact area of ArmorMax System installation as directed and approved by Engineer. Subgrade shall be uniform and smooth. Remove all rocks, clods, vegetation or other objects so the installed mat will have direct contact with soil surface.
- Prepare seedbed by loosening the top 2-3 in (50-75 mm) minimum of soil. This may be accomplished with a rotary tiller on slopes 3:1 or flatter.
- Perform a site specific soil test to determine what amendments such as lime and fertilizer to incorporate.
- Do not mulch areas where mat is to be placed.

SEEDING

- Keep seeded areas moist as necessary to establish vegetation. When watering seeded areas, use fine spray to prevent erosion of seeds or soil. If as a result of a rain, prepared seedbed becomes crusted or eroded, or if eroded places, ruts or depressions exist for any reason, rework soil until smooth and reseed such areas.
- Apply an amount equivalent to 50% of the total seed mixture required to be installed on the soil surface before installing the High Performance Turf Reinforcement Mat (HPTRM).
- Disturbed areas shall be reseeded.
- Consult project plans and/or specifications for seed types and application rates.

GENERAL INSTALLATION GUIDELINES FOR STORM WATER CHANNELS

- Figure 1 shows general installation layout and details for ArmorMax System in storm water channels. (The details on this page are for 8.5 ft wide HPTRM roll widths. for 10.5 ft wide applications see Drawing #C100A)
- Excavate an Initial Channel (IC) Anchor Trench 1 ft wide x 1 ft deep (300 mm x 300 mm) minimum wide across the channel at downstream end of project (see Figure 2). Deeper initial trench and/or hard armoring may be required in channels that have the potential for scour.
- Excavate the Top of Bank (TOB) Anchor Trench 1 ft wide x 1 ft deep (300 x 300 mm) minimum wide along both sides of the installation (see Figure 3). Each TOB Anchor Trench shall be located 3 ft (900 mm) minimum over crest of bank.
- Beginning at the downstream end of the channel, place HPTRM roll end i nto a TOB Anchor Trench and secure with Gripple Earth Percussion Anchors on 4 ft (1.2 m) centers (see Figure 3).
- Unroll HPTRM down the first channel bank and up the opposing channel bank, terminating the HPTRM roll end into the opposite TOB Anchor Trench and secure with Gripple Earth Percussion Anchors on 4 ft (1.2 m) centers (see Figure 3).
- Place the HPTRM roll edge into IC Anchor Trench. Secure HPTRM roll edge in Initial Channel Anchor Trench with Gripple Earth Percussion Anchors on 4 ft (1.2 M) centers (see Figure 2).
- Position adjacent rolls and secure in Initial Channel Anchor Trench in same manner.
- Continue installation as described above, overlapping adjacent rolls as follows:
  - A. Roll edge overlap: 3 in (75 mm) minimum overlap with upstream mat on top. Secure with one row of pins on 12 in (300 mm) centers and with one row of Gripple Earth Percussion Anchors on the designed anchor pin pattern detail in Figure 6. A typical spacing on the overlapping seams for the Gripple Earth Percussion Anchors is 5 ft (1.5 m).
  - B. Roll end overlap for slopes: 6 in (150 mm) minimum overlap with upslope mat on top. Secure with two rows of pins staggered 6 in (150 mm) apart on 12 in (300 mm) centers and with one row of Gripple Earth Percussion Anchors on 4 ft (1.2 m) centers (see Figure 9).
- Secure mat using pins and Gripple Earth Percussion Anchors. For appropriate frequency and pattern, see the typical Anchor/Pin Pattern Detail (see Figure 6) and the Pin Pattern Detail (see Figure 7).See Toe Interface Detail (Figure 8) for special anchoring patterns for breaks in slope.
- For channel bank heights or channel bottom widths greater than 45 ft (13.7 m), install simulated check slots per Figure 10. This method includes placing two rows of pins 12 in (300 mm) apart on 12 in (300 mm) centers and one row of Gripple Earth Percussion Anchors between the rows of pins on 4 ft (1.2 m) centers at 45 ft (13.7 m) maximum intervals (see Figure 10) or across the midpoint of the slope for slope lengths less than 60 ft (18.2 m).
- Excavate Terminal Channel (TC) Anchor Trench 12 in wide x 12 in deep (300 x 300 mm) minimum across the channel at the upstream end of the project (see Figure 11). Deeper terminal trench and/or hard armoring may be required in channels that have the potential for scour.
- Place the HPTRM roll edge into TC Anchor Trench. Secure HPTRM roll edge in TC Anchor Trench with Gripple Earth Percussion Anchors on 4 ft (1.2 M) centers (see Figure 11).
- Backfill and compact soil into each trench as directed and approved by Engineer.
- When required, the Engineer is to create project details for transition to structures along the longitudinal edge or to address water flowing perpendicular to the seams.

GROUND PINNING AND ANCHORING DEVICES

- Metal pins should be at least 0.20 in (5 mm) diameter steel with a 1 1/2 in (38 mm) steel washer at the head of the pin (see Figure 8). Metal pins should be driven flush to the soil surface. Pins should be between 12-24 in (300-600 mm) long and have sufficient ground penetration to resist pullout. Longer pins may be required for looser soils. Heavier metal stakes may be required in rocky soils. Depending on soil pH and design life of the pin, galvanized or stainless steel pins may be required. Consult project plans and/or specifications for tie down device details.
- Gripple Earth Percussion Anchor assembly consists of an anchor head, stranded cable, gripping device and two crimping ferrules. Materials of each component have been selected to achieve an expected life of more than 50 years. The anchor head is made from die cast aluminum and is bullet nosed in shape to penetrate a turf mat without breaking strands of the mat. The cable is zinc-aluminum coated carbon steel and is of 1 x19 construction. The ferrules are made from aluminum. The grip is die cast from zinc and uses a ceramic roller to clamp the cable in place. The one piece zinc top plate will have openings on the top to facilitate vegetative growth and the grip plate is approximately 0.2 inches thick and so will only protrude above the surface of the mat that far after installation. The grip is designed such that the top of the cable can be cut below the top surface of the grip in a recessed cavity. See Figure 10.

SPECIAL TRANSITIONS

- For applications that require special transitions (i.e. connections to riprap, concrete, T-Walls, etc.), refer to the project specific drawings or consult with Propex Engineering Service at 423-553-2450.

VEGETATION ESTABLISHMENT

- Installed ArmorMax System shall be re-seeded and soil-filled or sodded as is required by the project documents.
- After seeding, spread and lightly rake 1/2 - 3/4 in (12-19 mm) of fine site soil or topsoil into the mat and completely fill the voids using backside of rake or other flat tool. For slopes 3:1 or flatter, roll the entire ArmorMax installation with a drum roller to compact seed and soil tightly into the matrix.
- Smooth soil-fill in order to just expose the top of the HPTRM. Do not place excessive soil above the mat.
- If equipment must operate on the mat, make sure it is of the rubber-tired type. No tracked equipment or sharp turns are allowed on the mat.
- Avoid any traffic over the mat if loose or wet soil conditions exist.
- Broadcast additional seed and install a Landlok® Erosion Control Blanket (ECB) above the soil-filled mat as required by the Engineer. For levees or slopes steeper than 3:1, the addition of the ECB may be required or alternate methods of retaining the soil fill may be considered. Please contact the project engineer or Propex Engineering Services at (423) 553-2450.
- Irrigate as necessary to establish and maintain vegetation. Frequent, light irrigation will need to be applied to seeded areas if no natural rain events have occurred within two weeks of seeding and shall continue until 75% of vegetation has established and has reached a height of 2 inches. Do not over irrigate.

CONTRACTORS MAINTENANCE AND GUARANTEE PERIOD

It shall be the responsibility of the Owner to maintain all seed and ArmorMax areas after Engineer's acceptance. Maintenance shall consist of watering and weeding, repair of all erosion and any re-seeding as necessary to establish a uniform stand of the specified grasses. A minimum of 70% of the area seed shall be covered with no bare or dead spots greater than 10 ft² (1 m²). Seeded areas shall not be mowed prior to establishment of 70% vegetative density and a minimum grass growth of 4 inches (100 mm). Mower height shall not be set lower than 4 inches (100 mm). Throughout the duration of the project, the contractor shall be responsible for mowing to facilitate growth and shall not let the vegetation in the seeded areas exceed 18 inches (450 mm). In addition, the Contractor shall water all grassed areas as often as necessary to establish satisfactory growth and to maintain its growth throughout the duration of the project.

Replanting is to be performed within 14 calendar days of notification by the Engineer.