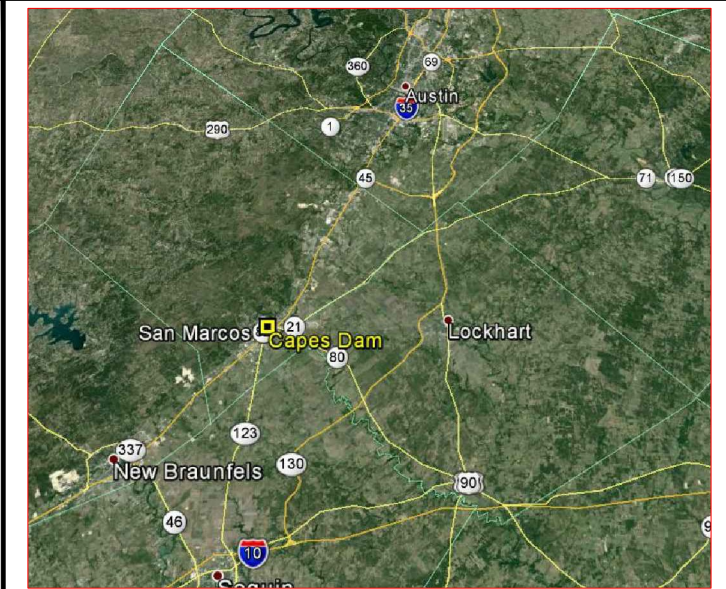
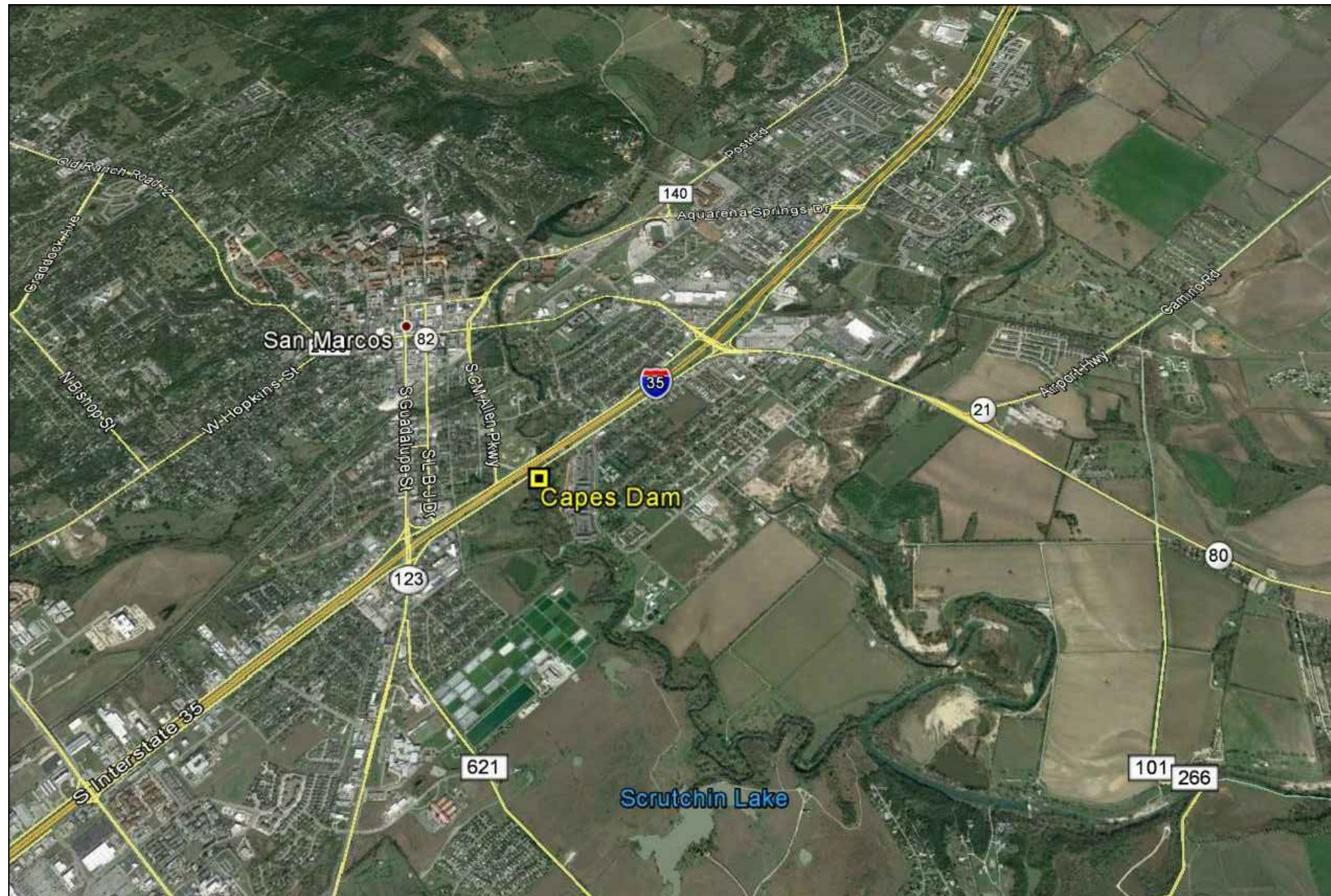




U.S. FISH & WILDLIFE SERVICE

SAN MARCOS, TEXAS

CAPE'S DAM-BREACH & CHANNEL RESTORATION



VICINITY MAP
NO SCALE

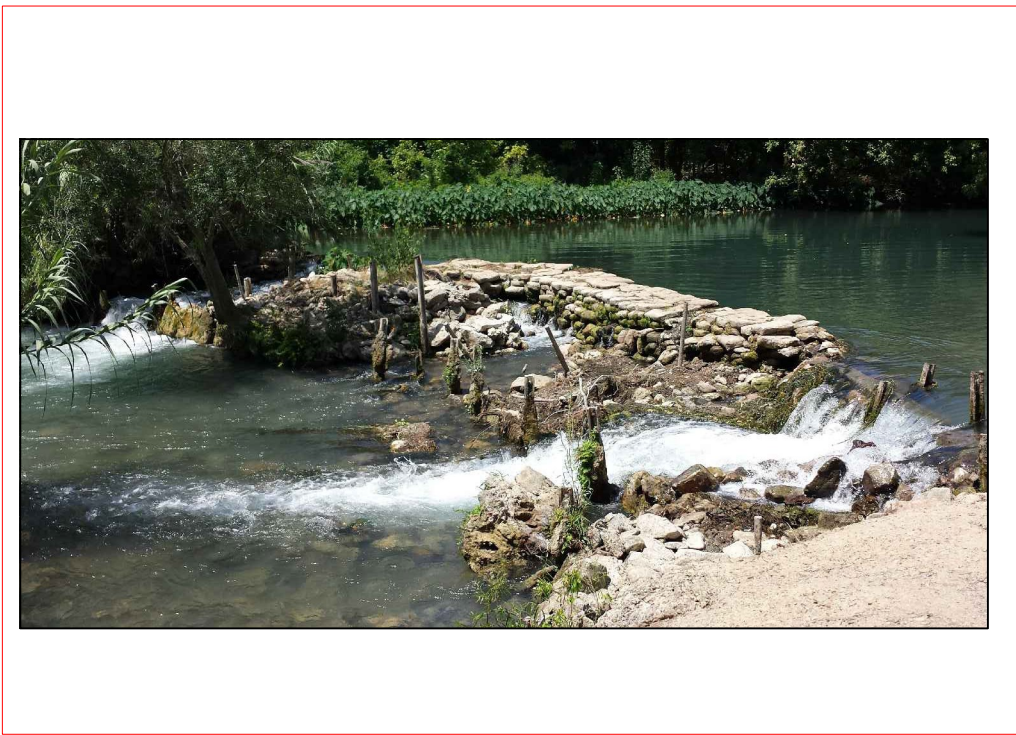
DRAWING INDEX

SHEET NO.	DRAWING TITLE
1 OF 12	VICINITY MAP, SITE PLAN AND DRAWING INDEX
2 OF 12	EXISTING SITE, ALIGNMENT & SECTION LINE SAMPLING LOCATIONS
3 OF 12	EXISTING SITE PHOTOS
4 OF 12	EXISTING & PROPOSED ALIGNMENT PROFILE DETAILS
5 OF 12	EXISTING SITE SECTION LINE DETAILS
6 OF 12	PROPOSED SITE SECTION LINE DETAILS AT DAM
7 OF 12	MILL RACE GRADE CONTROL & EROSION CONTROL DETAILS
8 OF 12	LOCATION OF ADDITIONAL STRUCTURES SCHEDULED FOR REMOVAL
9 OF 12	PHOTOS OF ADDITIONAL STRUCTURES SCHEDULED FOR REMOVAL
10 OF 12	NEW ACCESS POINT LOCATIONS
11 OF 12	NEW ACCESS POINT PHOTOS
12 OF 12	STAGING AREA LOCATION
13 OF X	PLAN DETAILS
14 OF X	PLAN DETAILS

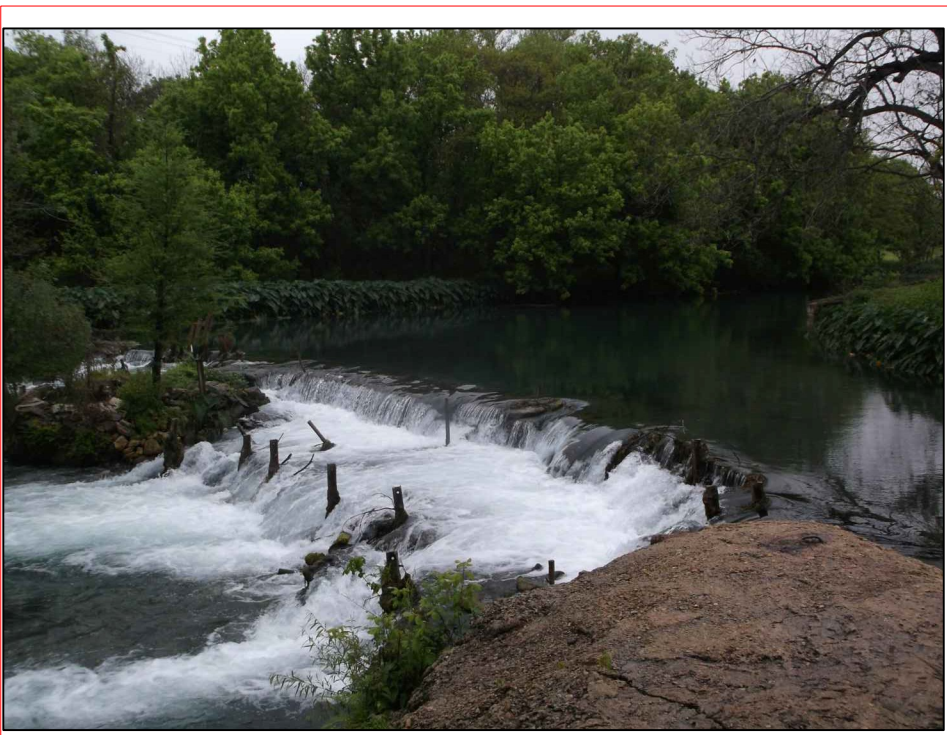


UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
REGION 6 ENGINEERING - DENVER, COLORADO

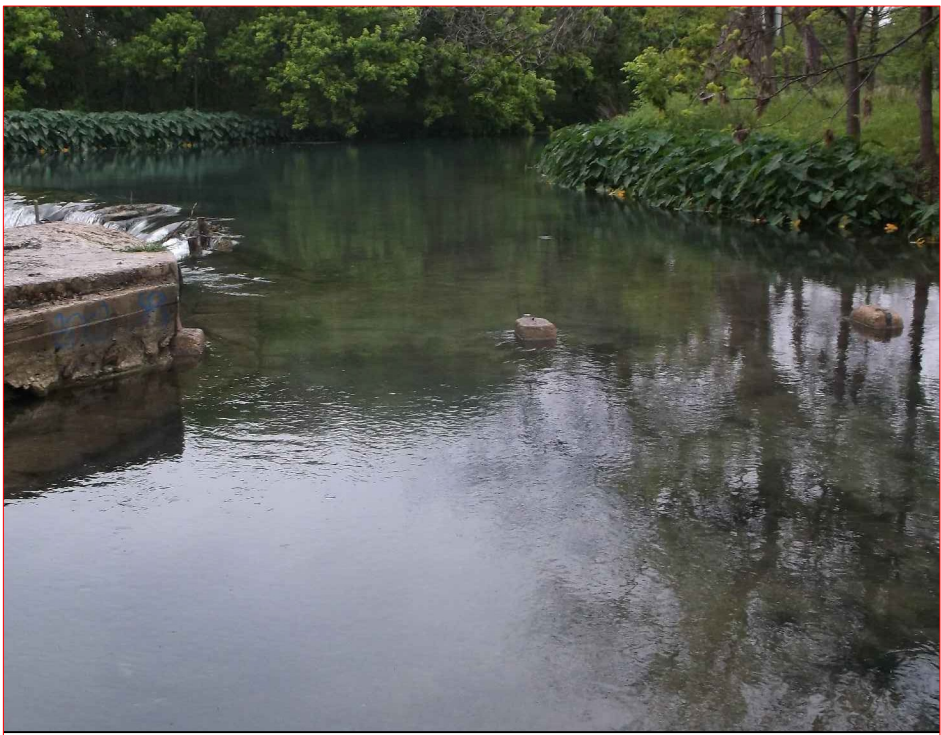
REGIONAL ENGINEER	DATE	SAN MARCOS, TEXAS		
PROGRAM SUPERVISOR	DATE	SAN MARCOS, RIVER		
ASST. REGIONAL DIR.	DATE	HAYS	TEXAS	
DIVISION	INITIALS / DATE	CAPE'S DAM-BREACH & CHANNEL RESTORATION		
SAFETY		VICINITY MAP, SITE PLAN AND DRAWING INDEX		
INDUSTRIAL HYGIENIST		DESIGNED : W. STANCILL	DRAWN : W. STANCILL	CHECKED : W. RICE
CULTURAL RESOURCES		DATE : 8/5/2016	PROJECT NO. : 6R-TX-2016-002	SHEET 1 OF 12



CAPES DAM, ~ 300 CFS, VIEW ACROSS DAM FROM MILLRACE INLET



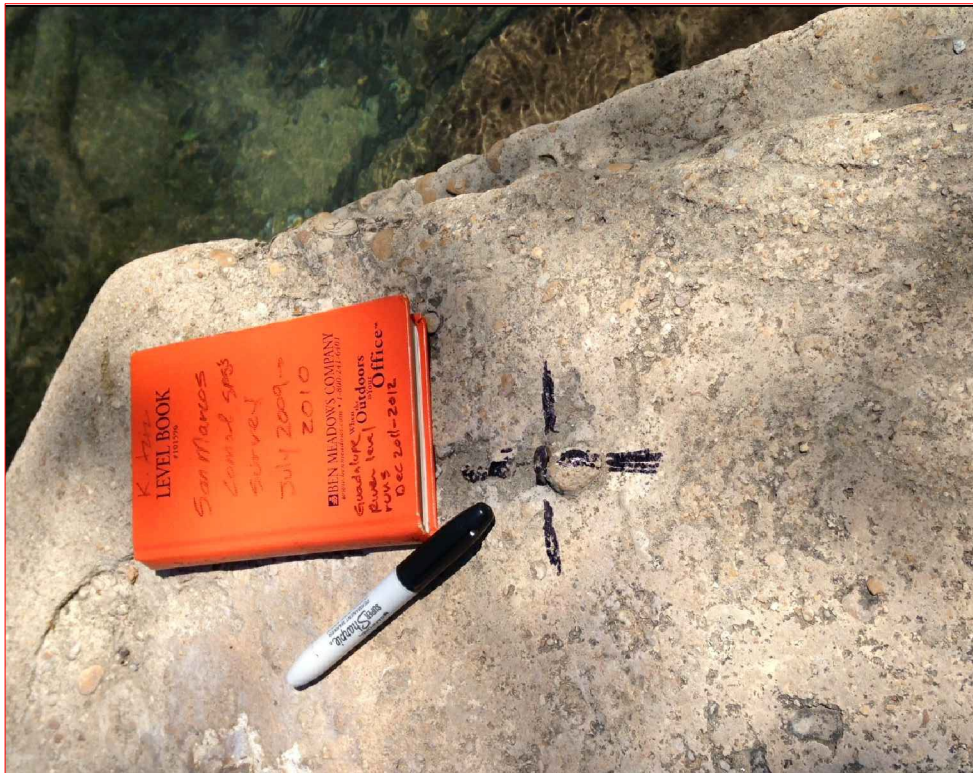
CAPES DAM, ~ 600 CFS, VIEW ACROSS DAM FROM MILLRACE INLET



MILLRACE INLET, VIEW DOWNSTREAM TO UPSTREAM



CAPES DAM, ~ 600 CFS, VIEW DOWNSTREAM TO UPSTREAM



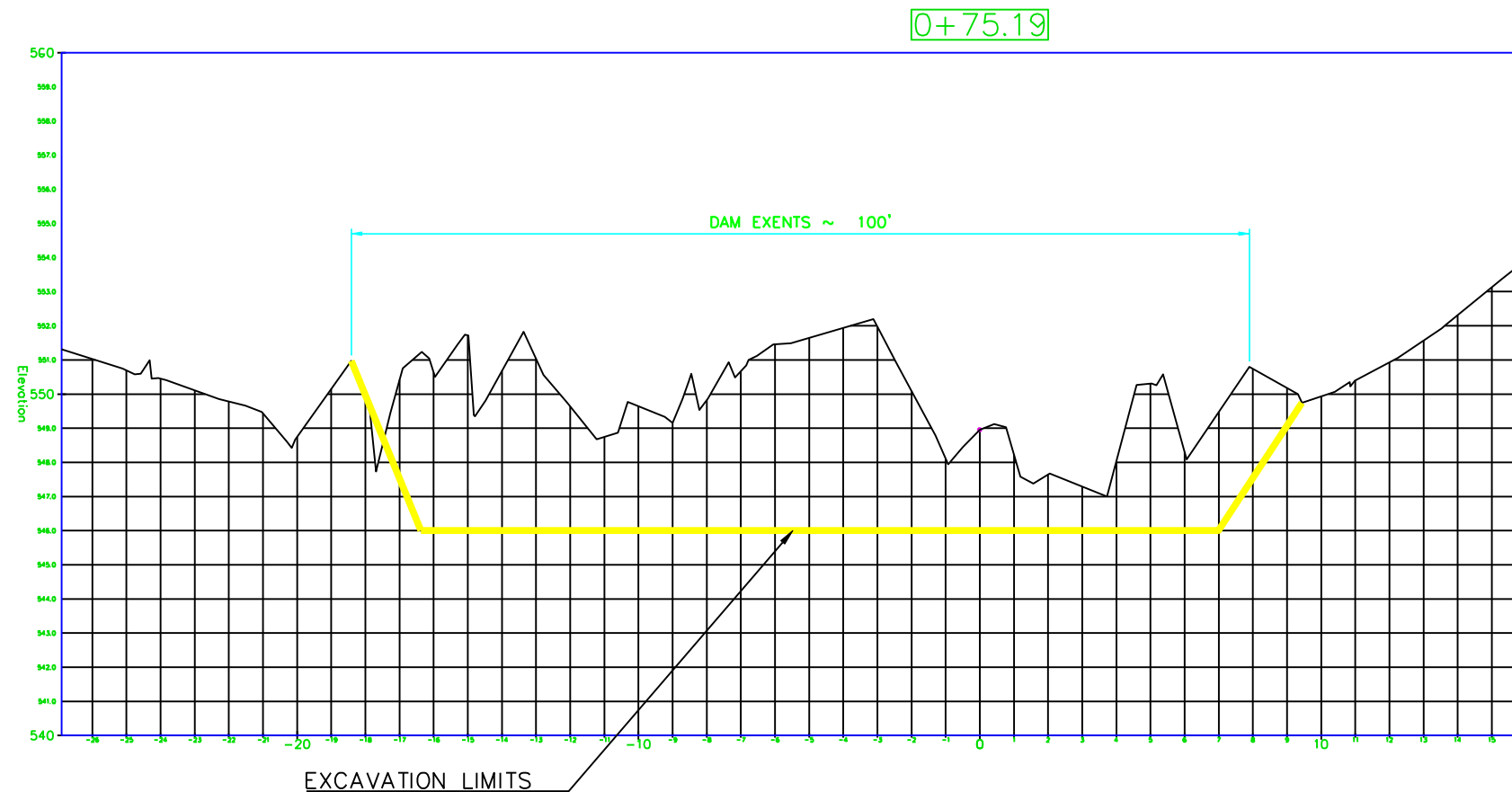
MILLRACE BENCH MARK CLOSEUP



MILLRACE ENTRANCE, VIEW LEFT BANK TO RIGHT BANK

EXISTING SITE
NO SCALE

SAN MARCOS, TEXAS		EXISTING SITE PHOTOS			SUB-SHEET
CAPES DAM-BREACH & CHANNEL RESTORATION					3
DESIGNED W STANCILL	DRAWN W STANCILL	CHECKED W RICE	DATE 8/2016	DRAWING NO GR-TX-2016-002	SHEET 3 OF 12



EXISTING AND PROPOSED CROSS SECTION PROFILE PARALLEL WITHLONG AXIS OF DAM CENTERLINE

NOTES:

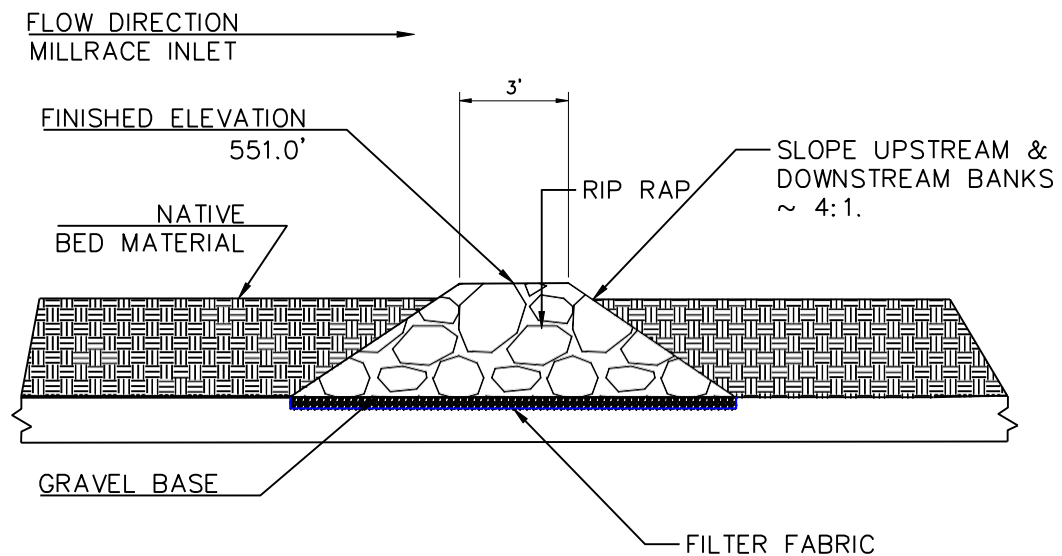
ELEVATIONS ARE REPORTED AS NGVD-88 AND TIED TO THE BENCHMARK LOCATED ON THE RIGHT BANK OF THE MILL RACE RIGHT BANK CONCRETE WALL. SEE SHEET 3 (EXISTING SITE PHOTOS).

DAM REMOVAL & CHANNEL EXCAVATION

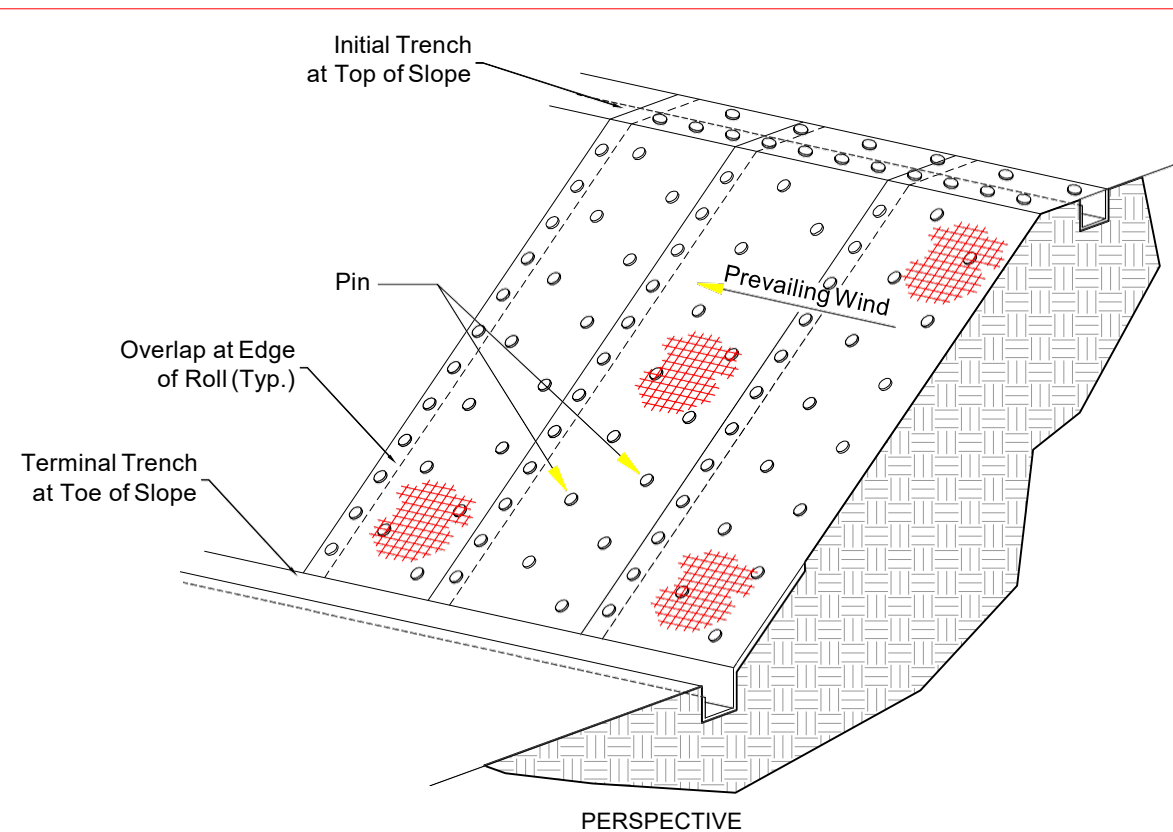
1. DAM WILL BE EXCAVATED FROM BANKLINE TO BANKLINE TO AN ELEVATION OF 546.0' OR REFUSAL.
2. EXCAVATED BANKLINES WILL BE SLOPED TO ~ 2:1 BUT FOLLOW THE EXISTING BANKLINE CONDITIONS WHERE POSSIBLE.
3. ALL EXCESS EXCAVATED MATERIAL WILL BE REMOVED FROM THE CHANNEL AND TRANSPORTED OFF SITE.
4. EXCAVATED MATERIAL TRANSPORTED OFF SITE WILL BE NO LARGER THAN 8 CUBIC FT.
5. REBAR WILL NOT BE REMOVED FROM EXCAVATED MATERIAL.
6. SILT AND OTHER DEPOSITIONAL MATERIAL STORED IN THE RESERVOIR AREA (UPSTREAM OF DAM) WILL NOT BE EXCAVATED.
7. THE LEFT BANK CHANNEL REQUIRES RESTORATION. THIS WORK WILL NOT COMMENCE UNTIL THE EXCAVATED CHANNEL HAS REACHED ITS NEW EQUILIBRIUM (NATURAL GRADE AND PLAN-FORM) AS DETERMINED BY THE US FISH & WILDLIFE SERVICE'S FIELD STAFF.
8. **IF AND WHEN NEEDED, INSTALL ROCK GRADE CONTROL STRUCTURE AT MILLRACE INLET TO CONTROL HEAD CUTTING AS DEPICTED ON SHEET 7 (BANK STAB & EROSION CONT).**

PROPOSED SITE
NO SCALE

SAN MARCOS, TEXAS		PROPOSED SITE			SUB-SHEET
CAPES DAM-BREACH & CHANNEL RESTORATION		SECTION LINE DETAILS AT DAM			6
DESIGNED W. STANCILL	DRAWN W. STANCILL	CHECKED W. RICE	DATE 8/2016	DRAWING NO. GR-TX-2016-002	SHEET 6 OF 12



CENTERLINE PROFILE VIEW: RIP RAP GRADE CONTROL STRUCTURE



PLAN VIEW: INSTALLATION OF JUTE BANK STABILIZATION MATERIAL

PROPOSED SITE
NO SCALE



CAPES DAM AREA: EROSION CONTROL INSTALLATION LOCATIONS

NOTES:

RIGHT BANK REFERS TO RIGHT SIDE OF RIVER LOOKING IN THE DOWNSTREAM DIRECTION.

RIGHT BANK EROSION CONTROL:

1. COVER SECTION OF RIGHT BANK EXPOSED DURING DAM REMOVAL WITH JUTE FIBER ROLL.
2. JUTE FIBER ROLL MATERIAL EXTENDS Laterally along the bank for ~ 60' AS DEPICTED IN THE ATTACHED PHOTO.

MILL RACE ENTRANCE (ONLY IF NEEDED TO AVOID HEAD CUTTING)

(INSTALL ROCK GRADE CONTROL STRUCTURE, ONLY IF AND/WHEN NEEDED, TO CONTROL HEAD CUTTING INTO THE MILLRACE.

1. EXCAVATE MILL RACE ENTRANCE TO ELEVATION 545.0' AND BACKFILL WITH RIP RAP TO ELEVATION 551.0.
2. INSTALL 6" OF GRAVEL OVER GEOTEXTILE FILTER FABRIC BEFORE BACKFILLING EXCAVATED AREA WITH RIP RAP.
3. RIP RAP EXTENDS HORIZONTALLY ~ 40' FROM BANKLINE TO BANKLINE AS DEPICTED IN THE ATTACHED PHOTO.
4. KEY RIP RAP INTO LEFT BANK 5'.
5. RIP RAP SHALL BE TIED INTO THE RIGHT BANK (CONCRETE LINED SIDE) TO MAXIMUM POSSIBLE EXTENT WITHOUT EXCAVATING THE CONCRETE.
6. ENGINEER WILL STAKE GRADE CONTROL STRUCTURE EXTENTS PRIOR TO CONSTRUCTION.

SAN MARCOS, TEXAS					SUB-SHEET
CAPES DAM-BREACH & CHANNEL RESTORATION					7
DESIGNED W. STANCILL	DRAWN W. STANCILL	CHECKED W. RICE	DATE 8/2016	DRAWING NO. GR-TX-2016-002	SHEET 7 OF 12

**MILL RACE GRADE CONTROL
& EROSION CONTROL DETAILS**



NOTES

LOCATIONS DEPICTED ON IMAGE ARE APPROXIMATE. SEE GPS COORDINATES AND PICTURES ON SHEET 9 FOR DETAILED LOCATIONS.

ACCESS TO STRUCTURES 1, 2, AND 3 ARE GAINED FROM THE STAGING AREA DEPICTED ON SHEET 12.

ACCESS TO STRUCTURE 4 IS GAINED FROM CAPE STREET AS DEPICTED ON SHEET 12.

DEFICIENT STRUCTURE 1

1. LOCATION: -97.931534; 29.872978.
2. STRUCTURE IS A CONCRETE-SLAB COMPROMISED BY BANK EROSION.
3. NO INFORMATION EXISTS ON THE SLABS CONDITION OR EMBEDMENT DEPTH.
4. THE CONCRETE-SLAB SHALL BE BROKEN INTO PIECES NO LARGER THAN 8 CUBIC FEET AND EXPORTED OFF SITE.

DEFICIENT STRUCTURE 2

1. LOCATION: -97.931794; 29.872696.
2. STRUCTURE IS A CONCRETE-SLAB COMPROMISED BY BANK EROSION.
3. NO INFORMATION EXISTS ON THE SLABS CONDITION OR EMBEDMENT DEPTH.
4. THE CONCRETE-SLAB SHALL BE BROKEN INTO PIECES NO LARGER THAN 8 CUBIC FEET AND EXPORTED OFF SITE.

DEFICIENT STRUCTURE 3

1. LOCATION: -97.931934; 29.870159.
2. STRUCTURES INCLUDE A CONCRETE BRIDGE AND CONCRETE RUBBLE PLACED ON THE BANK FOR EROSION PROTECTION.
3. NO INFORMATION EXISTS ON THE SLABS CONDITION OR EMBEDMENT DEPTH.
4. THE CONCRETE-SLAB SHALL BE BROKEN INTO PIECES NO LARGER THAN 8 CUBIC FEET AND EXPORTED OFF SITE.

DEFICIENT STRUCTURE 4

1. LOCATION: -97.931456; 29.869921.
2. STRUCTURE INCLUDES A DIVERSION STRUCTURE CONSTRUCTED OF CONCRETE.
3. NO INFORMATION EXISTS ON THE STRUCTURES CONDITION OR EMBEDMENT DEPTH.
4. THE STRUCTURE SHALL BE BROKEN INTO PIECES NO LARGER THAN 8 CUBIC FEET AND TRANSPORTED OFF SITE.

SAN MARCOS, TEXAS		DEFICIENT INFRASTRUCTURE REQUIRING REMOVAL			SUB-SHEET
CAPES DAM-BREACH & CHANNEL RESTORATION		IN CONJUNCTION WITH DAM REMOVAL			8
DESIGNED W STANCILL	DRAWN W STANCILL	CHECKED W RICE	DATE 8/2016	DRAWING NO GR-TX-2016-002	SHEET 8 OF 13



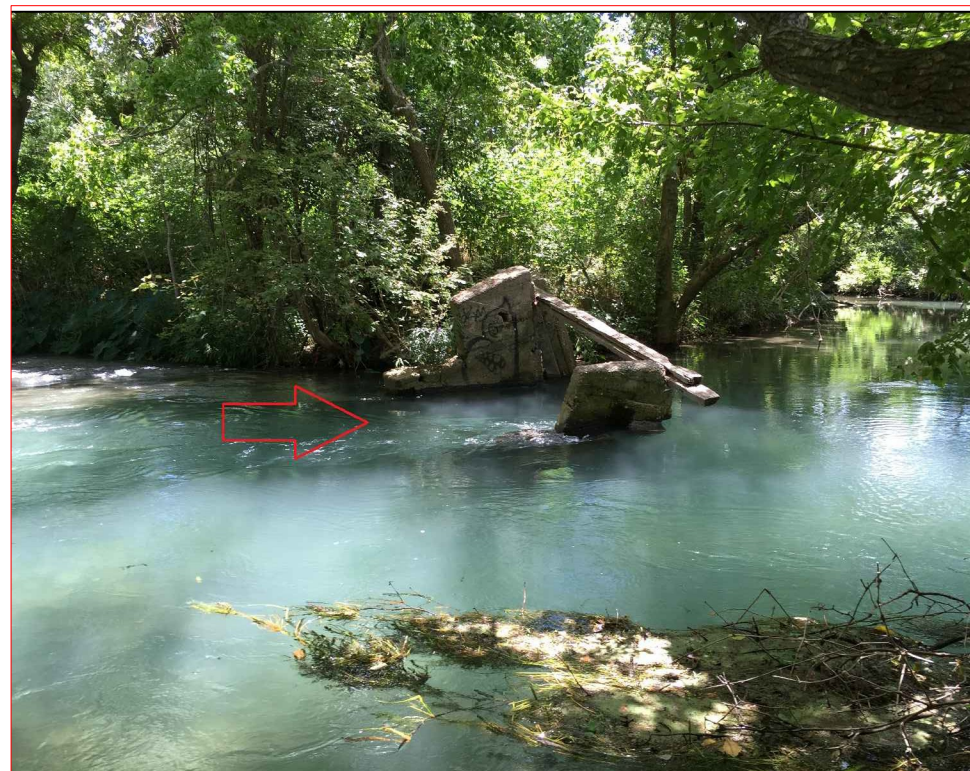
DEFICIENT STRUCTURE 1. CONCRETE BANK-STABILIZAION STRUCTURE



DEFICIENT STRUCTURE 2. CONCRETE BANK-STABILIZATION STRUCTURE



DEFICIENT STRUCTURE 3. COMPROMISED BRIDGE & BANK-STABILIZATION



DEFICIENT STRUCTURE 4. COMPROMISED WATER CONTROL STRUCTURE

EXISTING SITE
NO SCALE



NOTES

LOCATIONS DEPICTED ON IMAGE ARE APPROXIMATE. SEE GPS COORDINATES AND PICTURES ON SHEET 11 FOR DETAILED LOCATIONS. ACCESS POINT DEVELOPMENT STYLES AND METHODS DEPICTED ON SHEET 11 ARE TYPICAL. ACCESS POINTS WILL BE CONSTRUCTED AS DETERMINED BY THE CITY OF SAN MARCOS.

ACCESS TO POINTS 1, 2, AND 3 WILL GAINED FROM THE STAGING AREA DEPICTED ON SHEET 12.

ACCESS TO POINTS 4 AND 5 ARE GAINED FROM CAPE STREET AS DEPICTED.

NEW ACCESS POINT 1

1. LOCATION: -97.931534; 29.872978.
2. SEE SITE PHOTO ON SHEET 11.

NEW ACCESS POINT 2

1. LOCATION: -97.931794; 29.872696.
2. SEE SITE PHOTO ON SHEET 11.

NEW ACCESS POINT 3

1. LOCATION: -97.931914; 29.872242.
2. SEE SITE PHOTO ON SHEET 11.

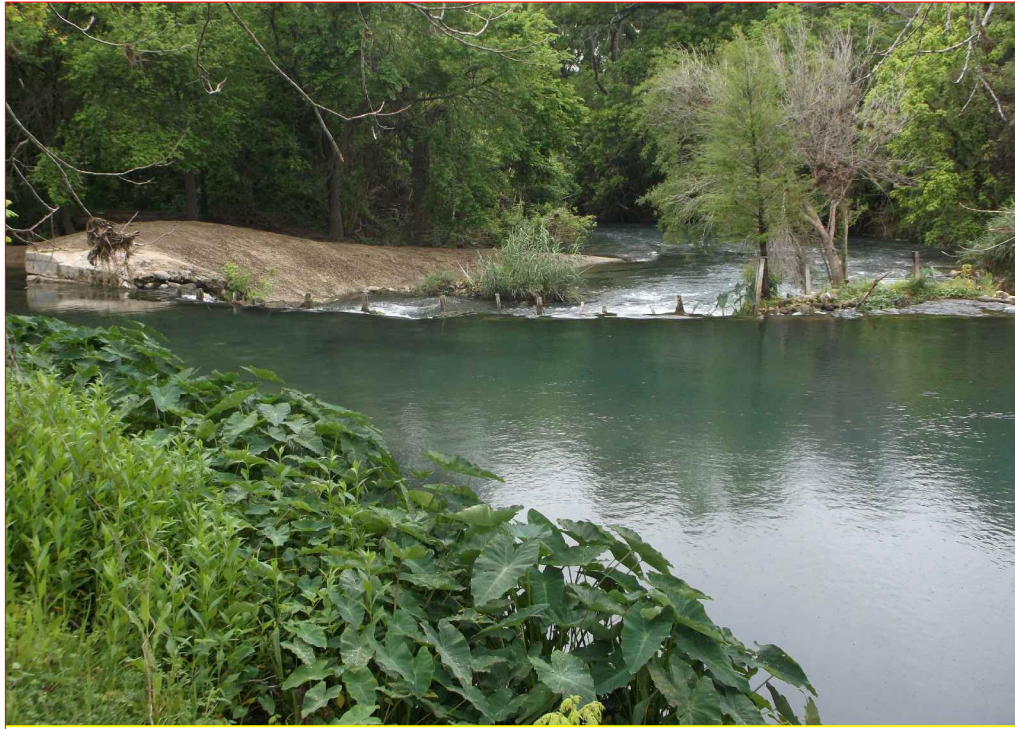
NEW ACCESS POINT 4

1. LOCATION: -97.931456; 29.869921.
2. SEE SITE PHOTO ON SHEET 11.

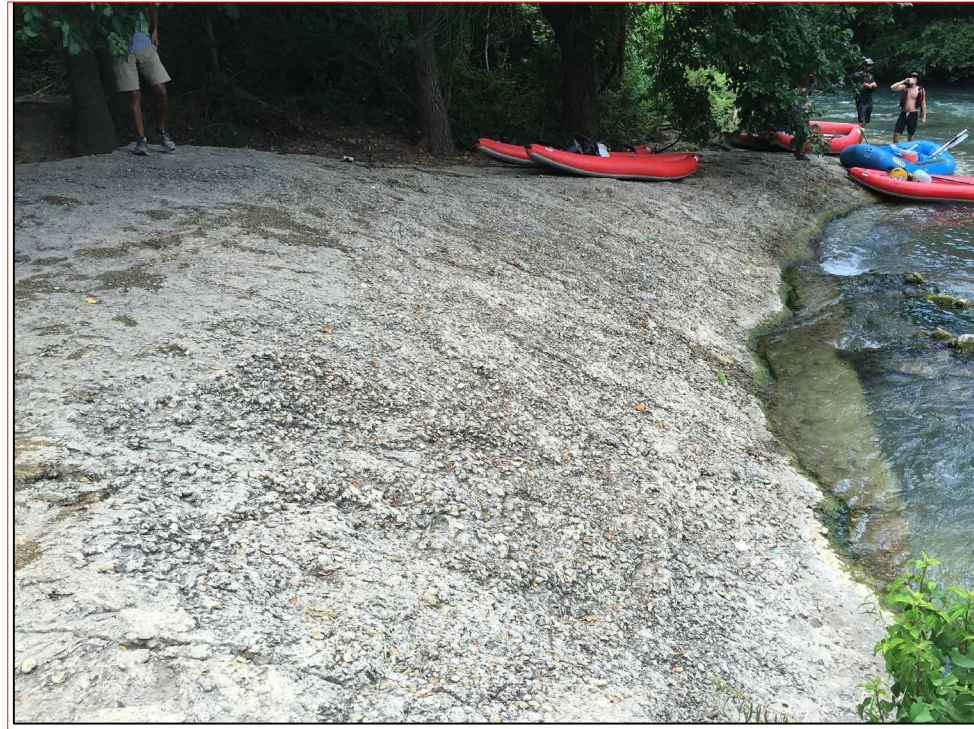
NEW ACCESS POINT 5

1. LOCATION: -97.930576; 29.869486.
2. SEE SITE PHOTO ON SHEET 11.

SAN MARCOS, TEXAS		NEW ACCESS POINT LOCATIONS			SUB-SHEET
CAPES DAM-BREACH & CHANNEL RESTORATION		FUTURE CONSTRUCTION			10
DESIGNED W STANCILL	DRAWN W STANCILL	CHECKED W RICE	DATE 8/2016	DRAWING NO GR-TX-2016-002	SHEET 10 OF 12



NEW ACCESS POINT 1, UPSTREAM OF MILLRACE INLET



NEW ACCESS POINT 2; DOWNSTREAM OF MILLRACE INLET



NEW ACCESS POINT 3



NEW ACCESS POINT 4



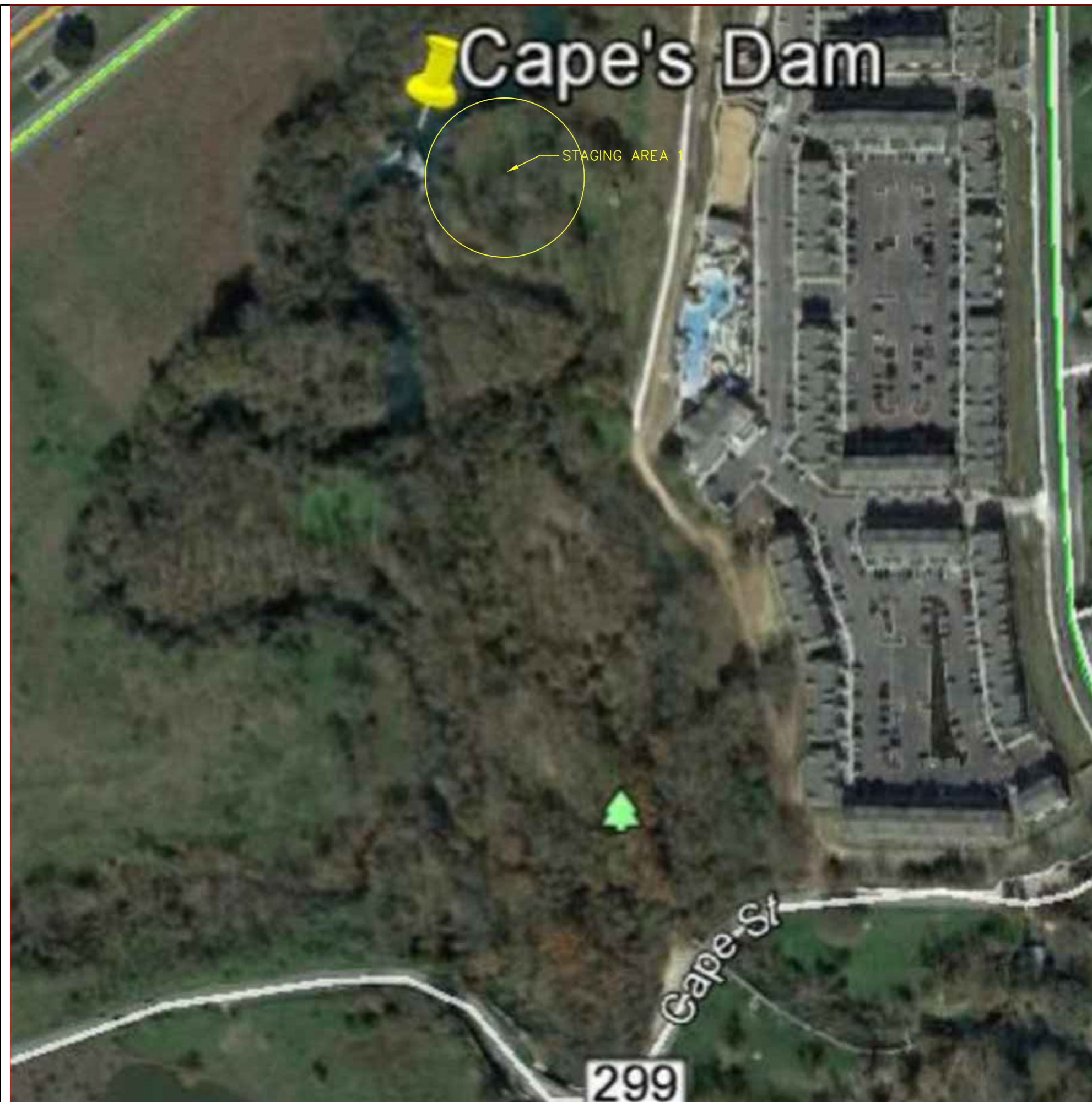
NEW ACCESS POINT 5



NEW ACCESS POINT DESIGN (TYPICAL)

EXISTING SITE
NO SCALE

SAN MARCOS, TEXAS		NEW ACCESS POINTS			SUB-SHEET
CAPES DAM-BREACH & CHANNEL RESTORATION		SITE PHOTOS			11
DESIGNED W STANCILL	DRAWN W STANCILL	CHECKED W RICE	DATE 8/2016	DRAWING NO GR-TX-2016-002	SHEET 11 OF 12



NOTES

LOCATIONS DEPICTED ON IMAGE ARE APPROXIMATE. SEE GPS COORDINATES AND PICTURES FOR DETAILED LOCATIONS. STAGING AREA IS APPROXIMATELY 0.5 ACRES. EQUIPMENT AND MATERIALS WILL BE STORED AT STAGING AREA.

STAGING AREA

1. LOCATION: -97.931534; 29.872978.
2. ACCESS TO STAGING AREA WILL BE GAINED FROM EXISTING TRAIL UNDER THE JURISDICTION OF THE CITY OF SAN MARCOS, TEXAS.
3. STAGING AREA WILL BE REHABILITATED AFTER DECONSTRUCTION IS COMPLETED.

SAN MARCOS, TEXAS		NEW ACCESS POINT LOCATIONS			SUB-SHEET
CAPES DAM-BREACH & CHANNEL RESTORATION		FUTURE CONSTRUCTION			12
DESIGNED W STANCILL	DRAWN W STANCILL	CHECKED W RICE	DATE 8/2016	DRAWING NO GR-TX-2016-002	SHEET 12 OF 12

Capes Dam Removal					
Project Performance Tracking and Reporting					
Product	Start	Finish	Actual work	Actual duration	Explanations
Design, Engineer	03/30/16	08/05/16	128	128	Turned in latest plans to USACE and Historical Commission.
Complete USACE Application	05/02/16	05/06/16	4	132	Completed.
Army Corps 404 Nationwide Permit	05/09/16	06/24/16	46	178	Submitted. Waiting for SHPO approval of MOA.
TPWD Sand and Gravel Permit	05/09/16	06/24/16	0	178	In progress. On track.
TCEQ Dam Removal Information Sheet	05/09/16	06/24/16	0	178	Completed.
SHPO Consultation	05/09/16	06/24/16	0	178	In progress. Development of MOA with THC, SM, USFWS
NEPA Catogorical Exclusion	05/09/16	06/24/16	0	178	In progress. On track.
GLO Notification	05/09/16	06/24/16	0	178	Completed.
Section 7 Consultation	05/09/16	09/23/16	137	315	Request submitted 05/03/2016. In progress. On track.
Dam Removal/ Temporary Bank Stabilization	09/26/16	12/31/16	96	411	Will only take about a week to do the work, but must be scheduled first
Temporary Restoration of Disturbed Area	01/01/17	03/31/17	5	416	Revegetate with native plans to avoid non-native intrusion
Natural Sediment Removal and River Adjustment			?		Dependant upon river flows/flooding events
Rebuild Riverbank in Proper Place			?		Dependant upon river flows/flooding events
Restoration of work area			5 years		Dependant upon river flows/flooding events