

PALM DESERT GENERAL NOTES:

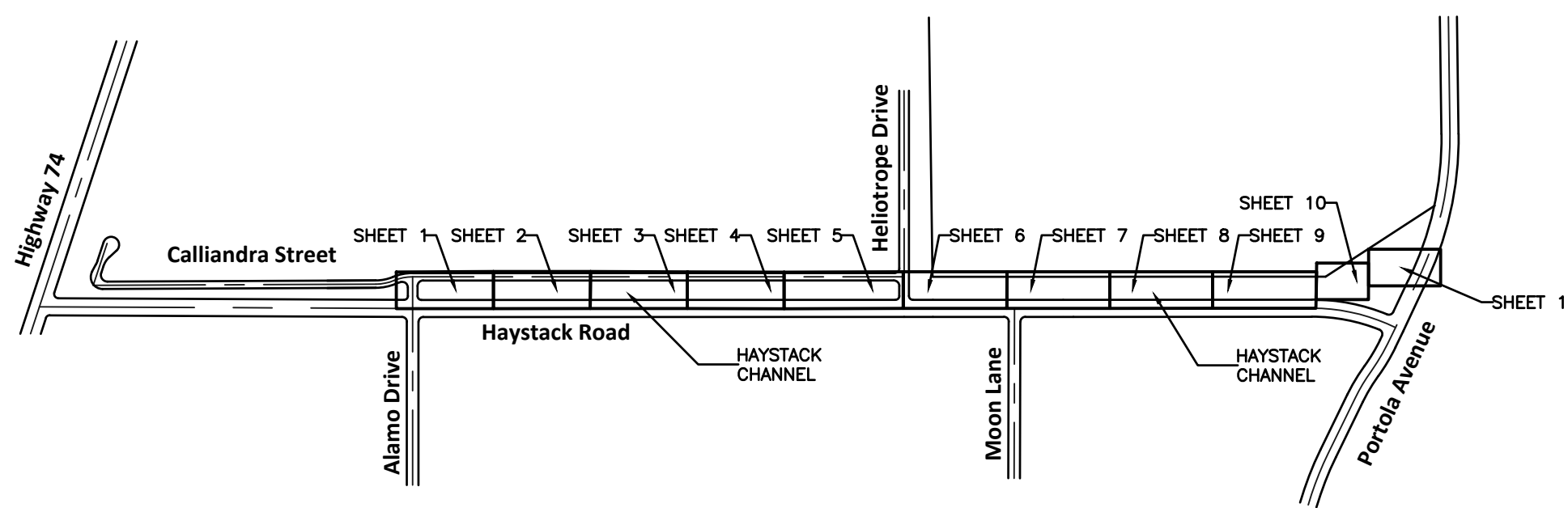
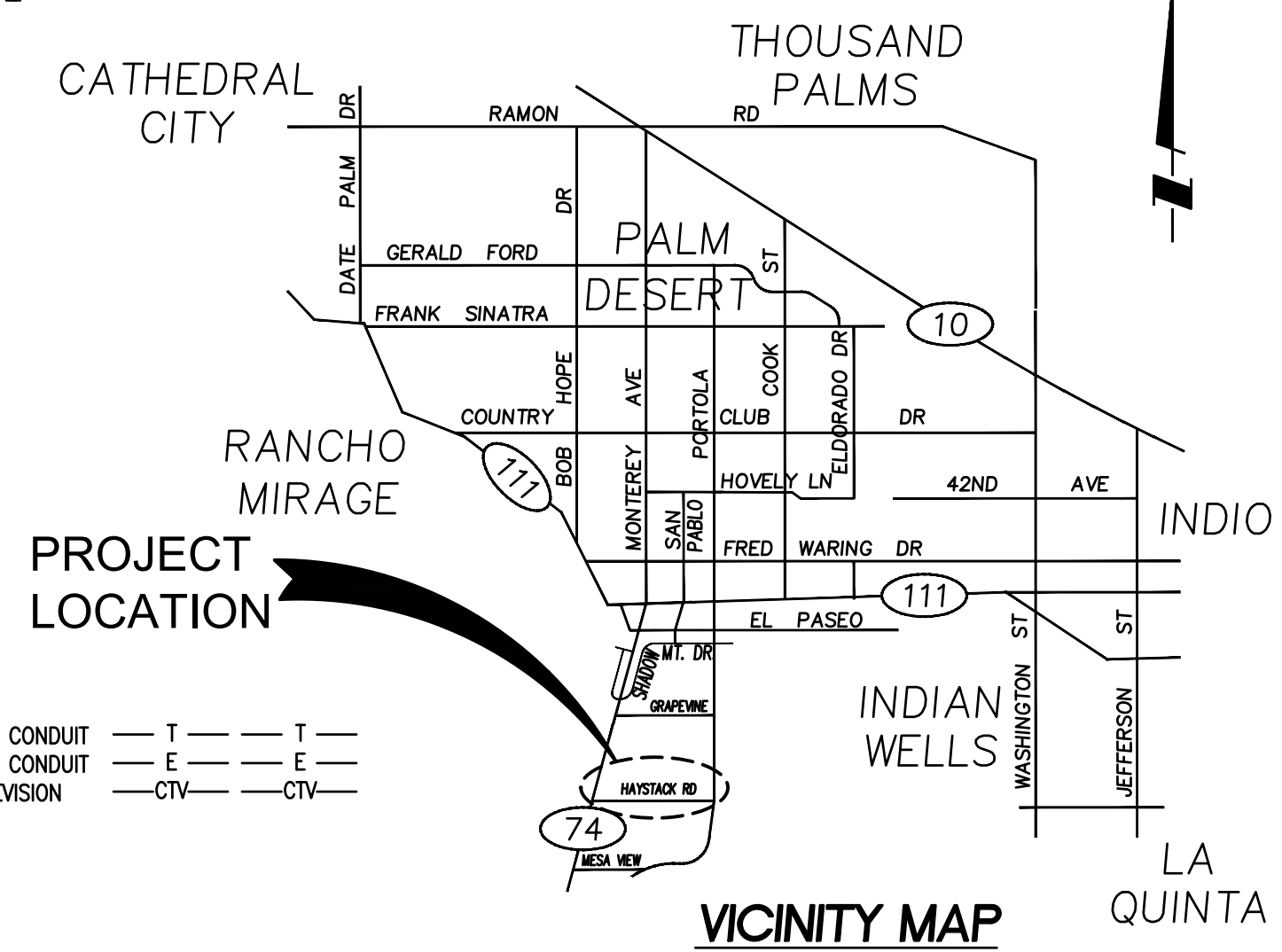
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THIS PLAN, THE STANDARD DRAWINGS AND SPECIFICATIONS OF THE CITY OF PALM DESERT, THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND THE CALTRANS STANDARD PLANS AND CALTRANS STANDARD SPECIFICATIONS WHEN APPLICABLE.
- NO CONSTRUCTION IS AUTHORIZED WITHOUT THE APPROPRIATE PERMITS ISSUED BY THE CITY OF PALM DESERT.
- THE ENGINEER-OF-WORK SHALL BE NOTIFIED WHEN CONSTRUCTION HAS COMMENCED.
- IN THE EVENT OF DISCREPANCIES AND/OR DEVIATIONS ARISING DURING CONSTRUCTION, THE ENGINEER-OF-WORK SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES TO ONSITE, OFFSITE AND ADJACENT UTILITIES, FACILITIES AND PROPERTIES.
- THE CONTRACTOR SHALL TAKE ALL NECESSARY AND PROPER PRECAUTIONS TO PROTECT ADJACENT PROPERTY OWNERS FROM ANY AND ALL DAMAGE THAT MAY OCCUR FROM STORM WATER RUNOFF AND/OR DEPOSITION OF DEBRIS RESULTING FROM ANY AND ALL WORK IN CONJUNCTION WITH CONSTRUCTION OF THESE IMPROVEMENT PLANS.
- THE CONTRACTOR, AT NO EXPENSE TO THE CITY, SHALL PROVIDE ALL NECESSARY SAMPLES AND TESTS THAT THE CITY ENGINEER MAY REQUIRE TO ASSURE THAT QUALITY OF MATERIAL AND WORKMANSHIP ARE IN ACCORDANCE WITH THE SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK AND SHALL MAINTAIN ALL FACILITIES, COMPLETED AND UNCOMPLETED, UNTIL ACCEPTED BY THE CITY.
- ALL SURVEY MONUMENTS WITHIN OR BOUNDING THE WORK LIMITS, WHETHER FOUND FROM RECORD OR BY INSPECTION, SHALL, PRIOR TO ANY CONSTRUCTION, BE LOCATED AND REFERENCED BY A LICENSED SURVEYOR OR A CIVIL ENGINEER AUTHORIZED TO PRACTICE LAND SURVEYING. THE REFERENCED MONUMENTS DISTURBED OR REMOVED DURING CONSTRUCTION SHALL BE RESET IN ACCORDANCE WITH SECTION 8771 OF THE LAND SURVEYORS ACT AND CITY STANDARDS AND REQUIREMENTS AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEERING DIVISION IN PALM DESERT AT (760) 776-6450 AT LEAST 48 HOURS PRIOR TO COMMENCING ANY WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL UTILITIES. FOR THE LOCATION OF UNDERGROUND UTILITIES OR FOR EMERGENCY ASSISTANCE CALL:

WATER	COACHELLA VALLEY WATER DISTRICT	760-398-2651
SEWER	COACHELLA VALLEY WATER DISTRICT	760-398-2651
ELECTRIC	SOUTHERN CALIFORNIA EDISON	760-202-4291
GAS	THE GAS COMPANY	1-800-427-2200
TELEPHONE	VERIZON CALIFORNIA, INC.	1-800-483-1000
CABLE	TIME WARNER	760-340-1312
DIG ALERT		1-800-422-4133
- THE ENGINEERING DIVISION DOES NOT ASSUME ANY RESPONSIBILITY FOR THE ACCURACY OF THE QUANTITIES SHOWN HEREON.
- THE STRUCTURAL SECTION SHALL BE AS PER THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION, HIGHWAY DESIGN MANUAL TEST NO. 301-F FOR DETERMINATION BY THE R-VALUE METHOD.
- THESE PLANS MAY BE SUBJECT TO REVIEW AND/OR REVISION BY THE CITY OF PALM DESERT ENGINEERING DIVISION, IF CONSTRUCTION HAS NOT COMMENCED WITHIN 12 MONTHS FROM THE DATE OF APPROVAL BY THE CITY ENGINEER.
- ALL P.C.C. AND A.C. REMOVALS SHALL BE OUTLINED TO NECESSARY WORKING LIMITS AND SAWCUT TO A MINIMUM DEPTH OF 2 INCHES PRIOR TO REMOVAL. ALL DEBRIS CREATED BY THE REMOVAL OPERATIONS SHALL BE DISPOSED OF AWAY FROM THE JOB SITE IN A MANNER AND LOCATION ACCEPTABLE TO ALL CONCERNED AGENCIES AND ORGANIZATIONS.
- ALL P.C.C. AND A.C. IMPROVEMENTS DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION BY THE CONTRACTOR AT NO COST TO THE CITY OF PALM DESERT.
- STREETS IN THE CONSTRUCTION AREA SHALL BE KEPT CLEAN AT ALL TIMES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING OF THE PROPOSED WORK AREA.
- NO PUBLIC STREET SHALL BE CLOSED TO TRAFFIC WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
- NO TRENCHES SHALL REMAIN OPEN OVERNIGHT WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
- FAILURE TO COMPLY WITH ANY OF THE ABOVE ITEMS SHALL BE SUFFICIENT CAUSE FOR THE CITY TO ARRANGE FOR NECESSARY WORK TO BE COMPLETED BY OTHERS. COSTS TO COMPLETE THE WORK BY OTHERS WILL BE CHARGED TO THE CONTRACTOR.
- ALL LANDSCAPING AND IRRIGATION THAT IS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REPAIRED OR REPLACED TO THE APPROVAL OF THE CITY AND THE PROPERTY OWNER.
- CONTRACTOR MUST OBTAIN APPROVAL FOR ANY LANE CLOSURES A MINIMUM OF 48 HOURS IN ADVANCE.
- CONTRACTOR SHALL CALL THE ENGINEERING DIVISION TO REQUEST INSPECTION A MINIMUM OF 24 HOURS PRIOR TO STARTING CONSTRUCTION. CONTRACTOR SHALL KEEP THE INSPECTOR INFORMED OF PROGRESS OF THE WORK ON A DAILY BASIS. IMPROVEMENTS PLACED WITHOUT INSPECTION MAY BE REJECTED AND ARE SUBJECT TO REMOVAL.

IN THE CITY OF PALM DESERT, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

CHANNEL IMPROVEMENT PLAN

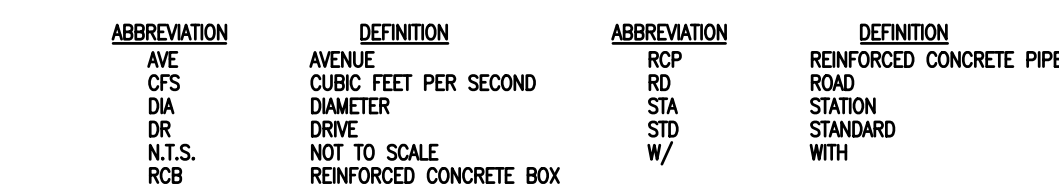
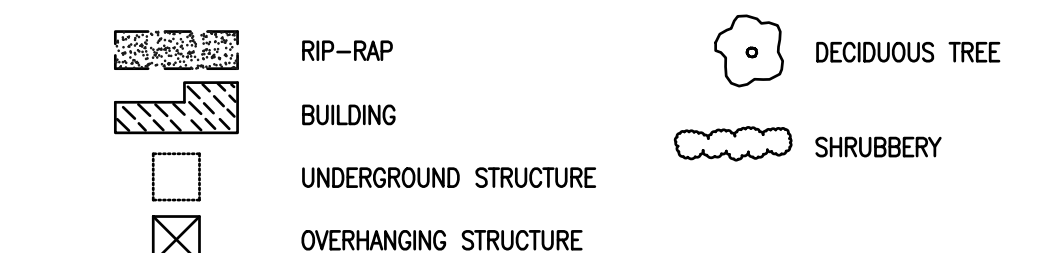
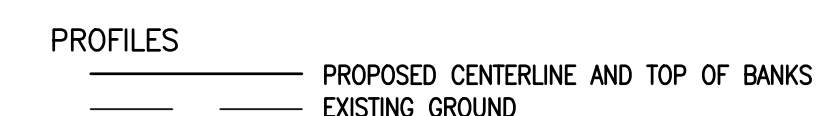
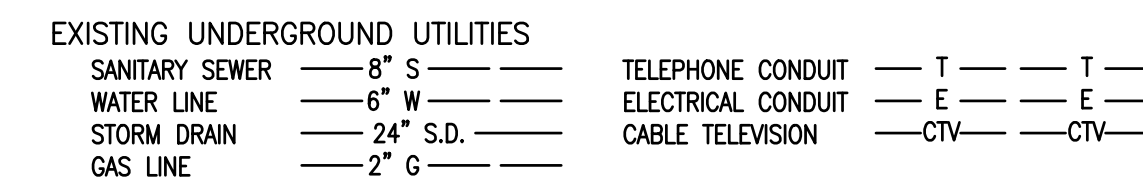
FOR
HAYSTACK CHANNEL REHABILITATION PROJECT
 FROM SR-74 TO PORTOLA AVENUE



INDEX MAP
 1"=600'

CONSTRUCTION NOTES		QTY. EST.
1	REMOVE AND DISPOSE ITEMS FROM SHEET 1 OF 4 OF AS-BUILT PLANS. (INFILTRATOR EQUALIZER 36 LEACHING SYSTEM W/ ROCK BED)	1 EA
2	INSTALL 12" PVC - C-900	200 LF
3	INSTALL 24"x24" GRATE INLETS PER BROOKS 2424 CB	2 EA
4	REMOVE INTERFERING PORTION OF EXISTING 8" PIPE AND CONNECT TO PROPOSED 12" PVC WITH 90° BEND.	2 EA
5	INSTALL UNDERGROUND INFILTRATION SYSTEM	4 EA
6	REMOVE AND REPLACE DAMAGED IRRIGATION SYSTEM	LS
7	INSTALL UNROUTED ROCK RIP-RAP LEVEE PER LA COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL - LEVEE CRITERIA	10,000 CY
8	CONSTRUCT JUNCTION STRUCTURE NO. 6 PER RCFCD STD. NO. JS231	3 EA
9	CONSTRUCT 20' WIDE ACCESS ROAD ALONG NORTH SIDE OF CHANNEL PER RCFCD STD. CH323	2,700 LF
10	RELOCATE EXISTING POWERPOLES	3 EA
11	INSTALL 1/2 TON RIP-RAP	200 CY

SHEET INDEX	
1	COVER SHEET
2-10	CHANNEL IMPROVEMENT PLAN
11-20	DETAILS



PROJECT INFO

PROJECT:
 TRACT OR PARCEL MAP NUMBER AND LOT PRECISE PLAN OR CUP CASE NUMBER
 HAYSTACK CHANNEL REHABILITATION
 PALM DESERT, CA 92260

FEMA FLOOD DATA:
 FLOOD ZONE X, 06065C2209H, APRIL 19, 2017
 AREA PROTECTED BY LEVEES.

TOPOGRAPHIC AND BOUNDARY SURVEY:
 SURVEY PERFORMED BY: INLAND AERIAL SURVEYS, INC.
 DATE OF SURVEY: 08/24/2022

EARTHWORK QUANTITIES:
 RAW CUT: 12,640 CY
 RAW FILL: 5,180 CY
 SHRINKAGE:
 IMPORT:
 EXPORT: 7,460 CY

APN AND LEGAL DESCRIPTION:
 630-190-054, 630-190-051, 630-250-050
 LEGAL DESCRIPTION (I.E. LOT X OF TR XXXXX OR THE NW QUARTER OF THE SOUTH HALF OF SECTION XX, TOWNSHIP X SOUTH, RANGE X EAST, SAN BERNADINO BASE MERIDIAN.)

CIVIL ENGINEER:
 JOHN M. BRUDIN
 ERSC, INC.
 1861 W. REDLANDS BLVD.
 REDLANDS, CA 92373
 PHONE 909-890-1255
 FAX 909-890-0995

OWNER:
 RYAN GAYLER
 CITY OF PALM DESERT
 73510 FRED WARING DR
 PALM DESERT, CA 92260
 PHONE 760-346-0611
 FAX 760-340-0574

SOILS ENGINEER:
 ALLEN D. EVANS, PE, GE
 INLAND FOUNDATION ENGINEERING, INC.
 1310 SOUTH SANTA FE AVE.
 SAN JACINTO, CA 92583
 PHONE 951-654-1555

REFERENCE DATA:
 CIP-1196

SOILS ENGINEER'S CERTIFICATE

WE HAVE REVIEWED THIS GRADING PLAN AND FOUND IT TO BE IN SUBSTANTIAL CONFORMANCE WITH THE RECOMMENDATIONS OF OUR SOILS REPORT FILE DATED 08/03/2022.



ALLEN D. EVANS, PE, GE
 EXP. DATE 03/31/2025
 INLAND FOUNDATION ENGINEERING, INC.
 1310 SOUTH SANTA FE AVENUE, SAN JACINTO, CA 92583

**ANY MODIFICATION OF THIS PLAN
 MUST BE APPROVED BY THE CITY
 PRIOR TO CONSTRUCTION.**

CITY PERMIT #:

CITY ISSUE DATE:

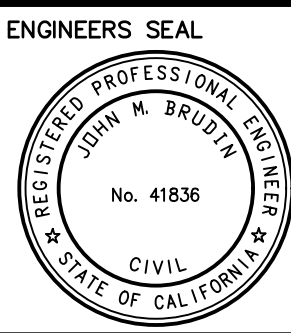
FOR CITY USE ONLY



BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.

BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS SURVEY IS THE STATE PLANE COORDINATE SYSTEM NAD83 ZONE 6, AS DETERMINED LOCALLY BY THE LINE BETWEEN USCG&S STATIONS AC5161 AND DX0739. THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

ENGINEER	BY	DATE	REVISIONS	CITY	APPR.	DATE



ERSC
 Engineering Resources of Southern California
 1861 West Redlands Blvd.
 Redlands, CA 92373
 P: 909.890.1255
 F: 909.890.0995

PREPARED UNDER THE DIRECT SUPERVISION OF:
 JOHN M. BRUDIN, R.C.E. 41836
 DATE: EXP. 03/31/24

CITY OF PALM DESERT
 DEPARTMENT OF DEVELOPMENT SERVICES
 APPROVED BY:
 JOHN D. TANNER III, P.E.
 ACTING CITY ENGINEER
 R.C.E. 60132, EXP. 6/30/2022
 DATE: _____

REVIEWED AND RECOMMENDED BY:
 DATE: _____

PLAN CHECKED BY:

CIVIL	_____
TRAFFIC	_____
LANDSCAPE	_____



CITY OF PALM DESERT
**HAYSTACK CHANNEL REHABILITATION
 CHANNEL IMPROVEMENT PLAN**

LEGAL DESCRIPTION (I.E. LOCATED IN A PORTION OF THE NW 1/4 OF SECTION 19, T5S, R6E, S8BM)

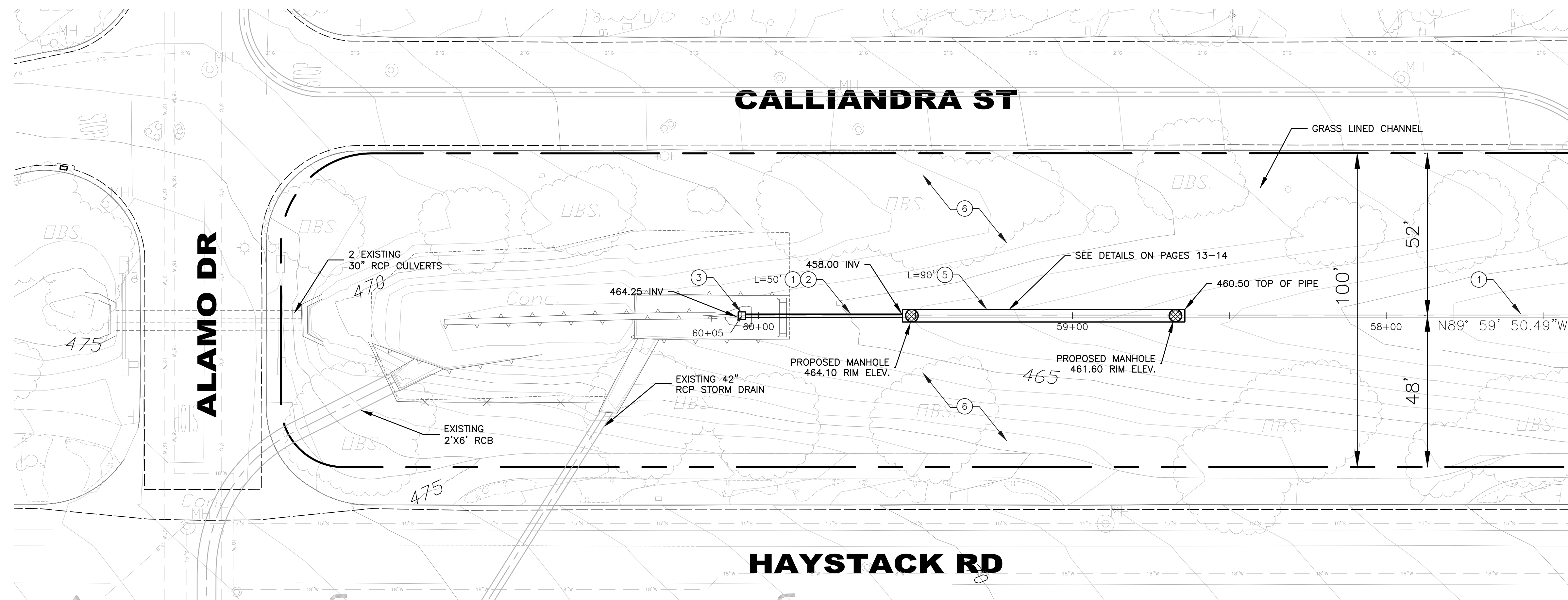
SHEET **1**
 OF
 SHEETS **20**
 CITY FILE NUMBER

CONSTRUCTION NOTES

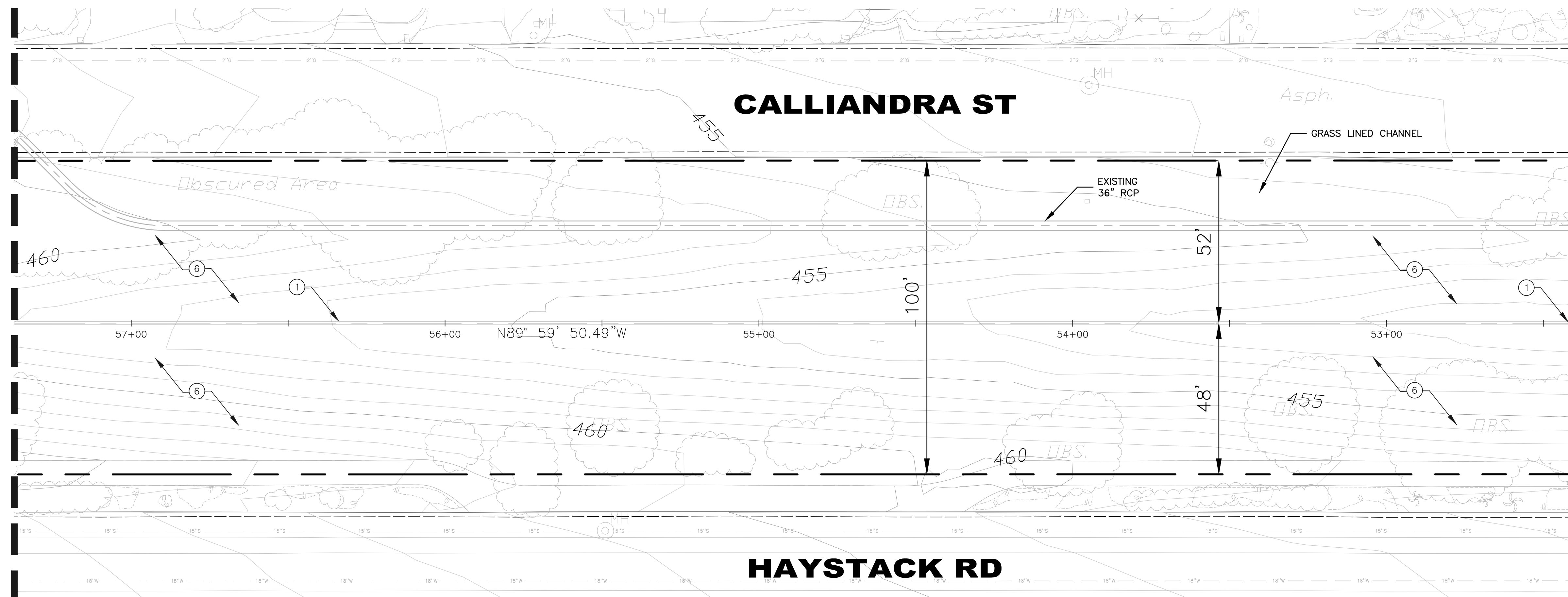
- 1 REMOVE AND DISPOSE ITEMS FROM CITY OF PALM DESERT, CHANNEL IMPROVEMENTS PROJECT NUMBER 500B-97, SHEET 1 OF 4. (INFILTRATOR EQUILIZER 36 LEACHING SYSTEM W/ ROCK BED)
- 2 INSTALL 12" PVC - C-900
- 3 INSTALL 24" X 24" GRATE INLETS PER BROOKS 2424 CB
- 5 INSTALL 48" DIA. UNDERGROUND INFILTRATION SYSTEM PER DETAILS, SHEETS 13-20
- 6 REMOVE AND REPLACE DAMAGED IRRIGATION SYSTEM

HYDROLOGY DATA

STATION RANGE	Q100
60+05-52+00	322 CFS
52+00-47+50	348 CFS
47+50-38+50	543 CFS
38+50-34+50	595 CFS
34+50-15+50	600 CFS
15+50-10+50	826 CFS
10+50-10+00	930 CFS

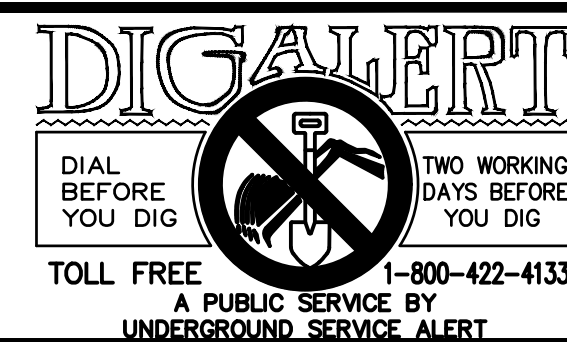
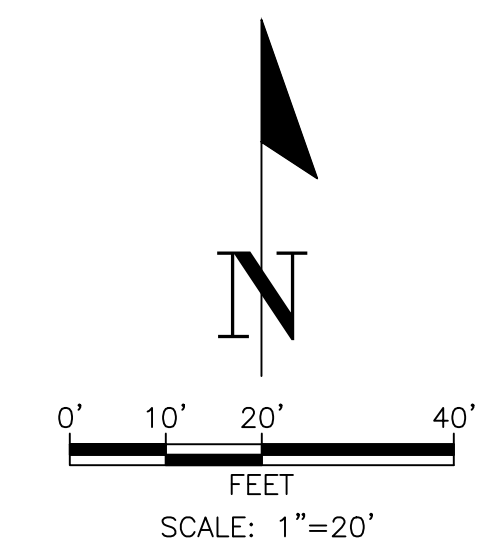


MATCH LINE
SEE BELOW
STA 57+50



MATCH LINE
SEE ABOVE
STA 57+50

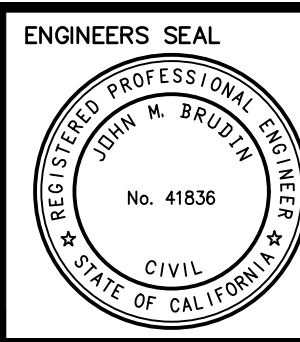
MATCH LINE
SEE SHEET 3
STA 52+50



BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHWEST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.
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ENGINEER			REVISIONS			CITY		ENGINEERS SEAL	
MARK	BY	DATE				APPR.	DATE		

CITY

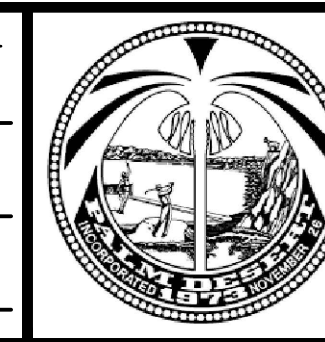


ERSC
Engineering Resources of Southern California
1861 West Redlands Blvd.
Redlands, CA 92373
P: 909.890.1255
F: 909.890.0995

PREPARED UNDER THE DIRECT SUPERVISION OF:
JOHN M. BRUDIN, R.C.E. 41836
DATE: EXP. 03/31/24

CITY OF PALM DESERT
DEPARTMENT OF DEVELOPMENT SERVICES
APPROVED BY:
MARIA FRASERI, P.E.
RCE #56005
CITY ENGINEER
DATE: _____
REVIEWED AND RECOMMENDED BY: DATE: _____

PLAN CHECKED BY:
CIVIL
TRAFFIC
LANDSCAPE



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
STATION 60+05 TO 52+50

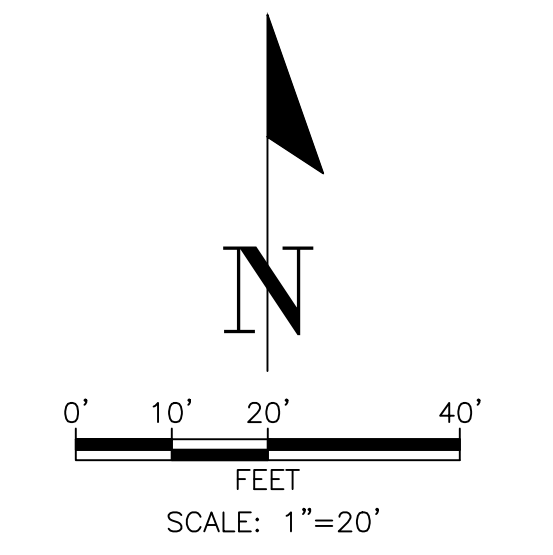
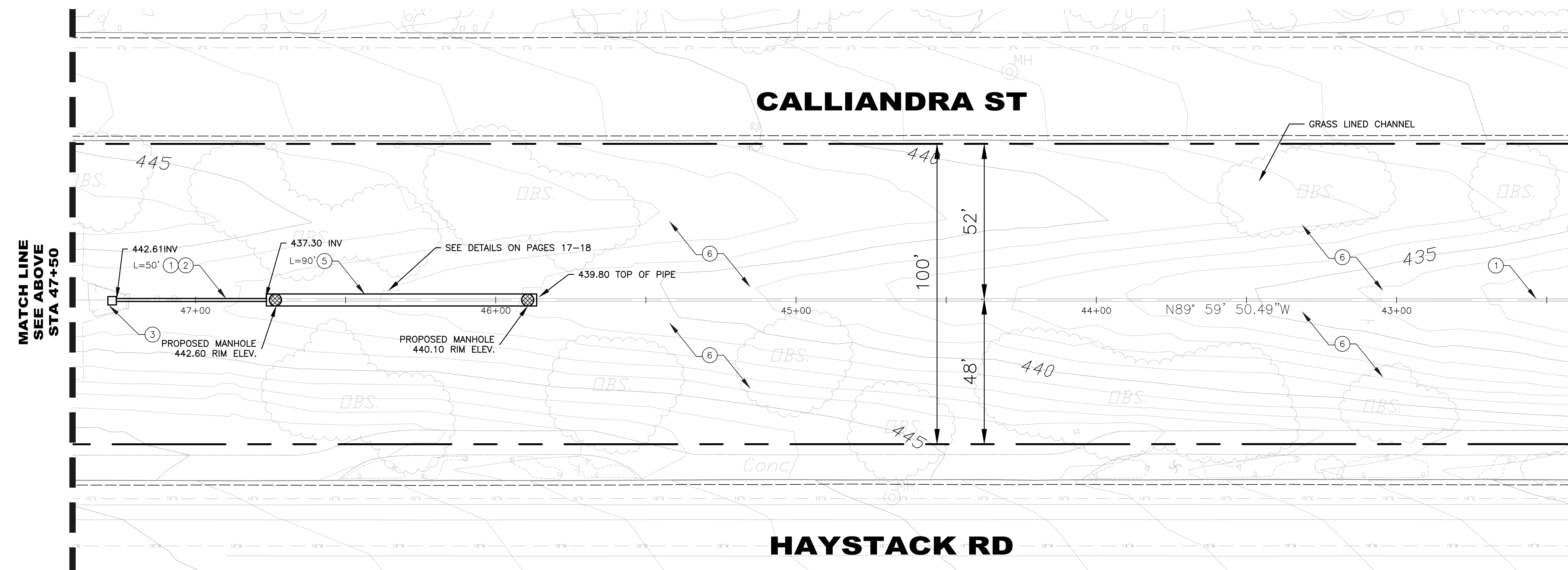
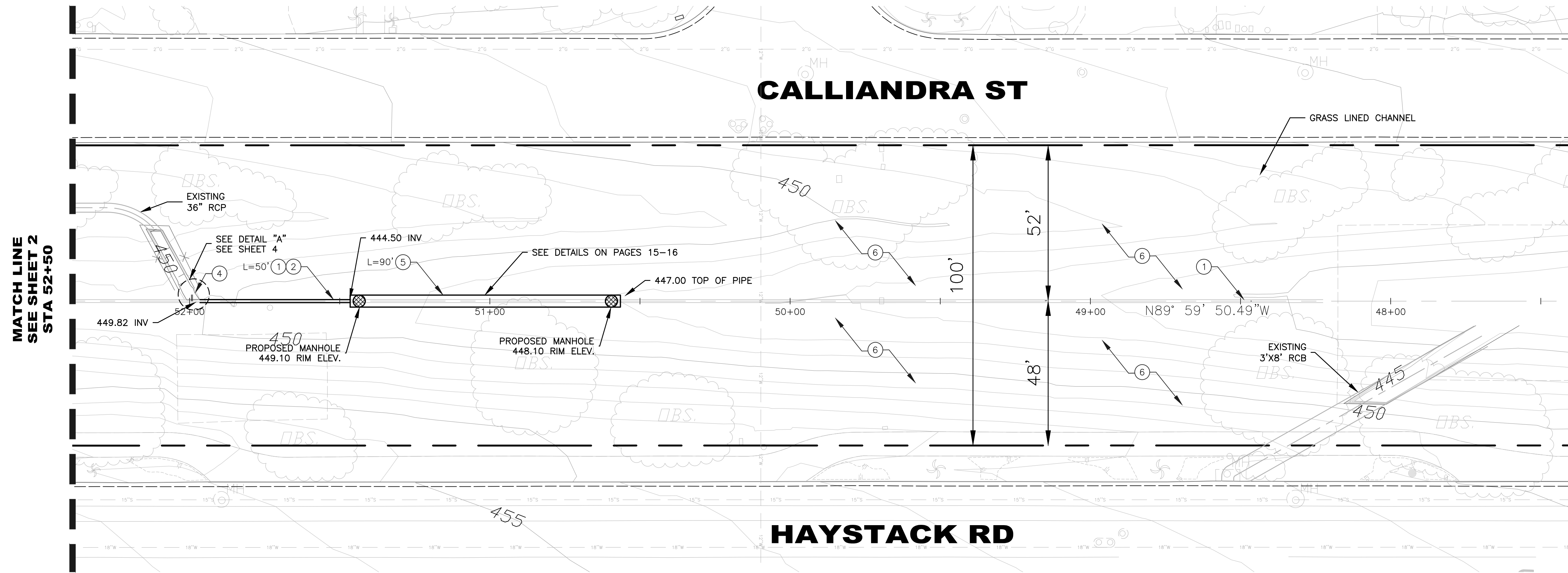
SHEET **2**
OF
SHEETS **20**
CITY FILE NUMBER

CONSTRUCTION NOTES

- ① REMOVE AND DISPOSE ITEMS FROM CITY OF PALM DESERT, CHANNEL IMPROVEMENTS PROJECT NUMBER 500B-97, SHEET 1 OF 4. (INFILTRATOR EQUILIZER 36 LEACHING SYSTEM W/ ROCK BED)
- ② INSTALL 12" PVC - C-900
- ③ INSTALL 24"X24" GRATE INLETS PER BROOKS 2424 CB
- ④ REMOVE INTERFERING PORTION OF EXISTING 8" PIPE AND CONNECT TO PROPOSED 12" PVC WITH 90° BEND.
- ⑤ INSTALL 48" DIA. UNDERGROUND INFILTRATION SYSTEM PER DETAILS, SHEETS 13-20
- ⑥ REMOVE AND REPLACE DAMAGED IRRIGATION SYSTEM

HYDROLOGY DATA

STATION RANGE	Q100
60+05-52+00	322 CFS
52+00-47+50	348 CFS
47+50-38+50	543 CFS
38+50-34+50	595 CFS
34+50-15+50	600 CFS
15+50-10+50	826 CFS
10+50-10+00	930 CFS



DIG ALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-422-4133
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.
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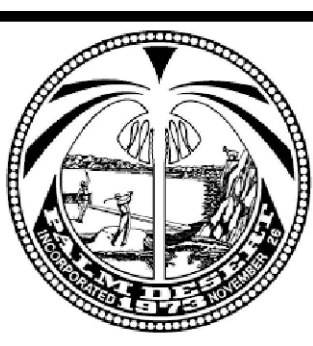
ENGINEER	MARK	BY	DATE	REVISIONS	CITY	APPR.	DATE
	△						

ENGINEERS SEAL
No. 41836
CIVIL
STATE OF CALIFORNIA

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CITY OF PALM DESERT
DEPARTMENT OF DEVELOPMENT SERVICES
APPROVED BY:
MARIA FRASERI, P.E.
RCE #56005
CITY ENGINEER
DATE: _____
REVIEWED AND RECOMMENDED BY: _____
DATE: _____

PLAN CHECKED BY:
CIVIL
TRAFFIC
LANDSCAPE

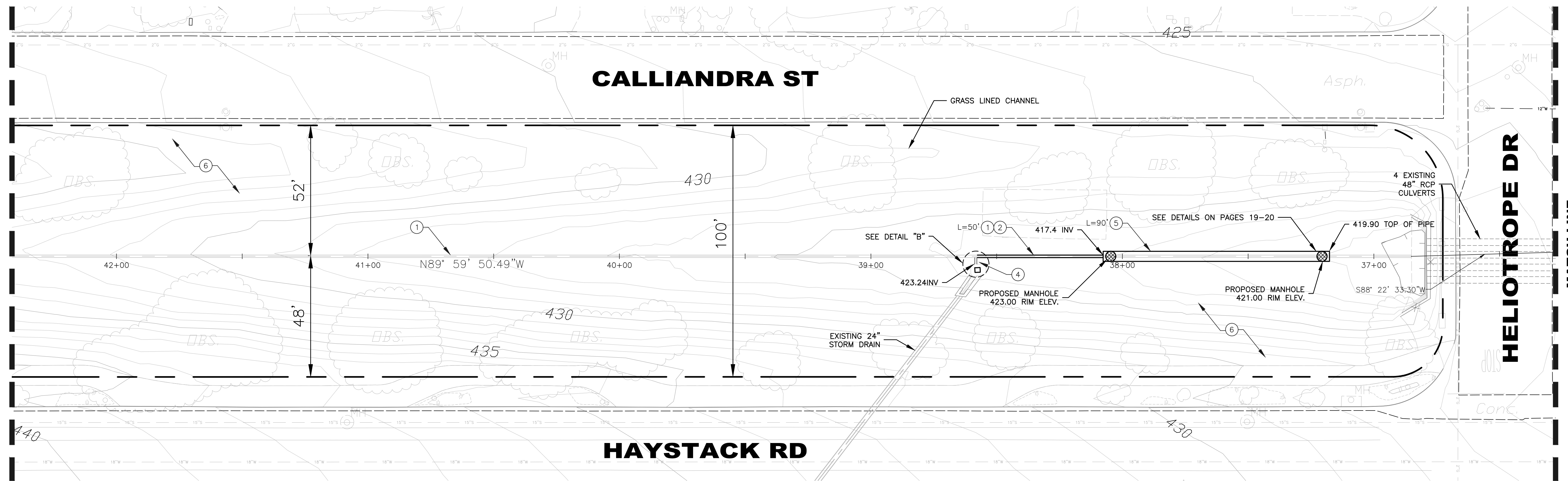


CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
STATION 52+50 TO 42+50

SHEET 3
OF SHEETS 20
CITY FILE NUMBER

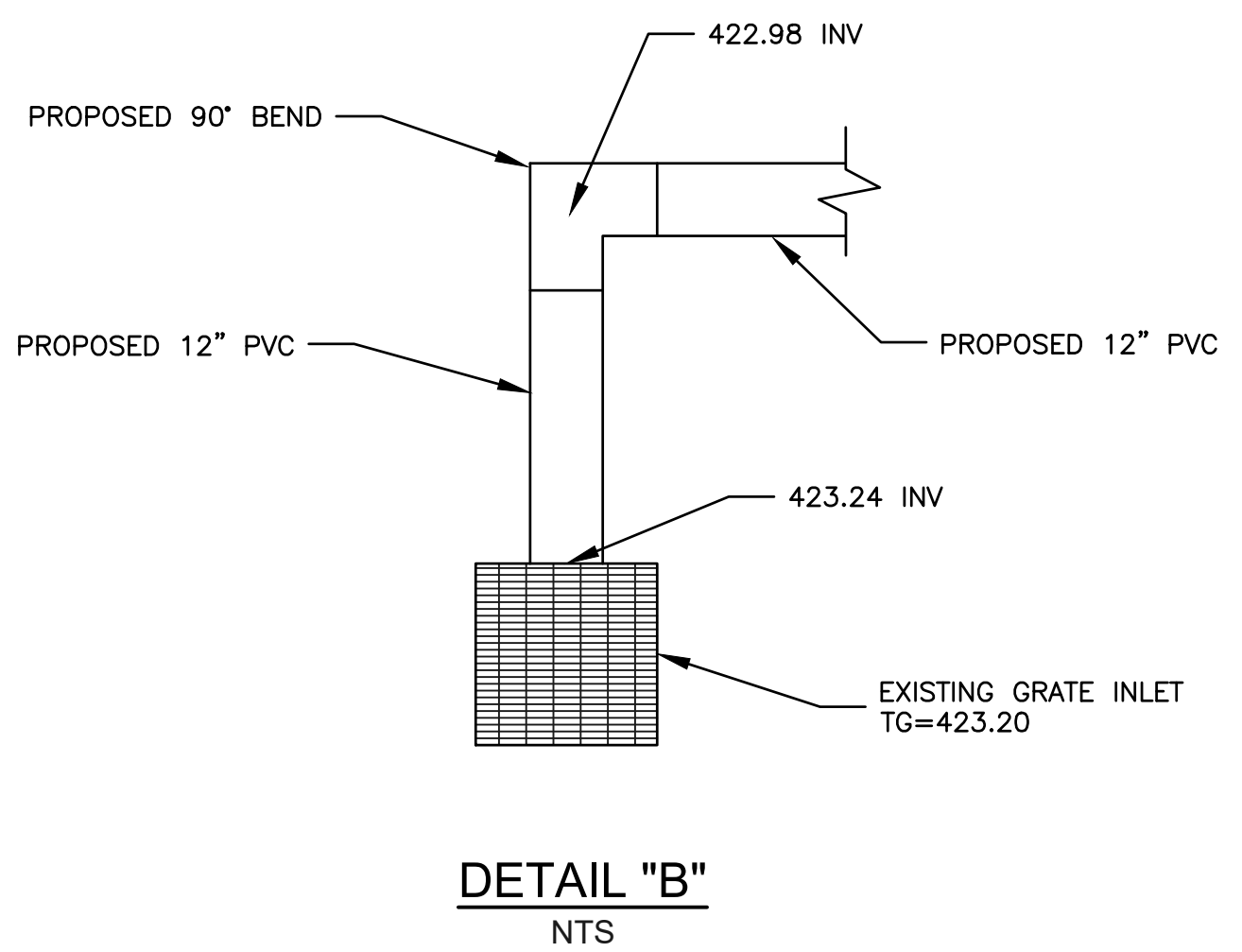
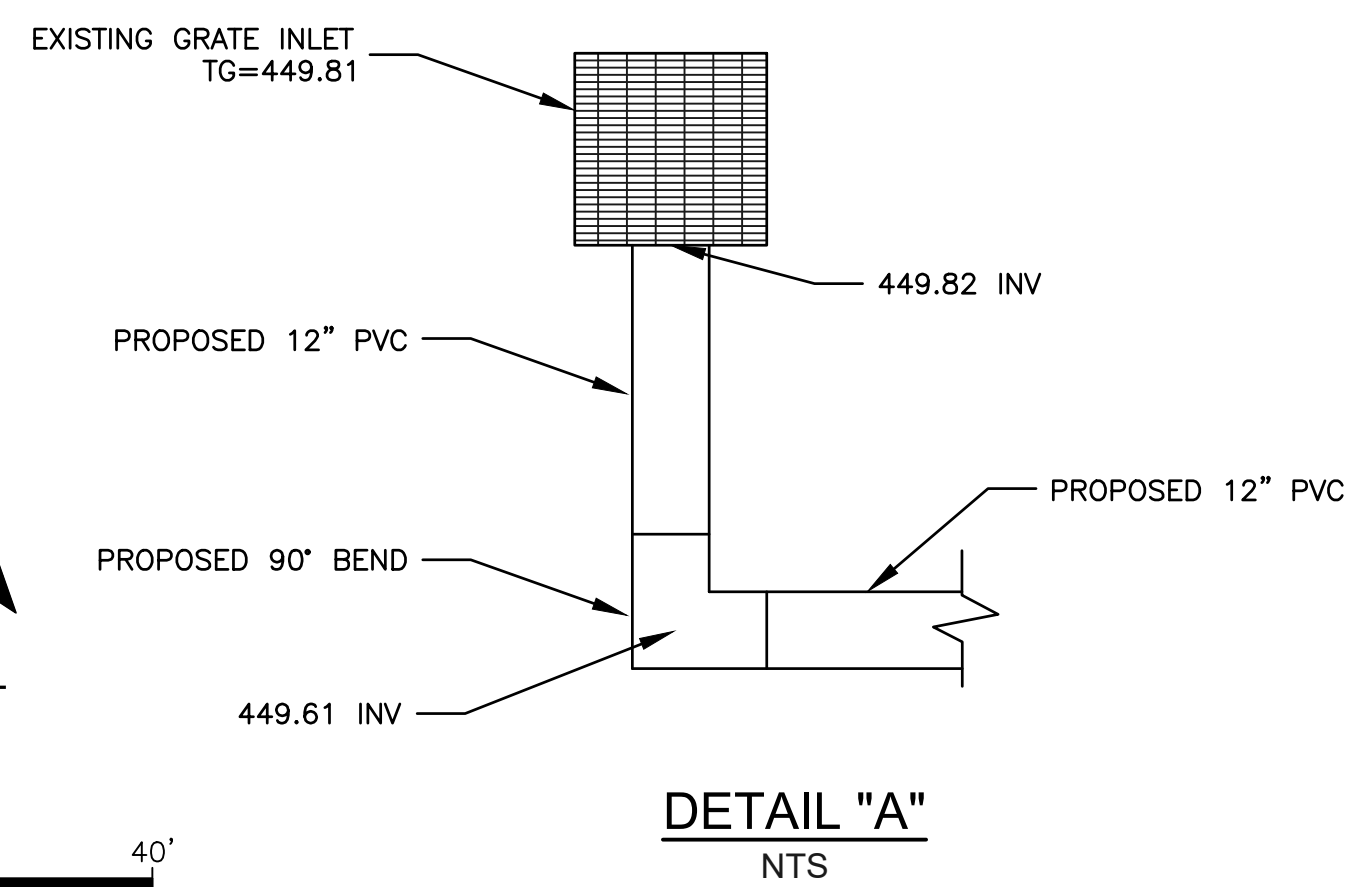
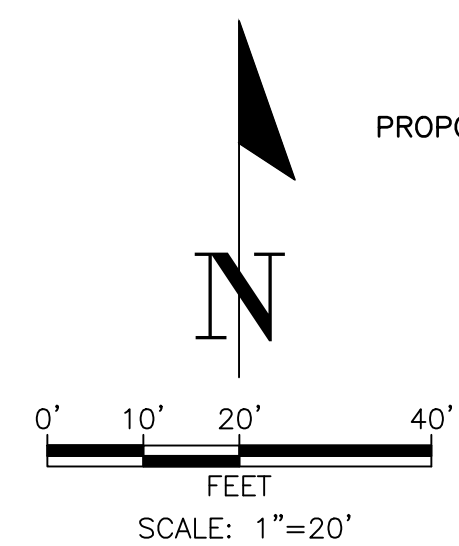
MATCH LINE
SEE SHEET 3
STA 42+50

MATCH LINE
SEE SHEET 5
STA 36+50



HYDROLOGY DATA

STATION RANGE	Q100
60+05-52+00	322 CFS
52+00-47+50	348 CFS
47+50-38+50	543 CFS
38+50-34+50	595 CFS
34+50-15+50	600 CFS
15+50-10+50	826 CFS
10+50-10+00	930 CFS



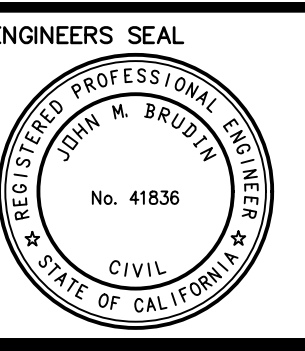
- CONSTRUCTION NOTES**
- REMOVE AND DISPOSE ITEMS FROM CITY OF PALM DESERT, CHANNEL IMPROVEMENTS PROJECT NUMBER 500B-97, SHEET 1 OF 4. (INFILTRATOR EQUALIZER 36 LEACHING SYSTEM W/ ROCK BED)
 - INSTALL 12" PVC - C-900
 - REMOVE INTERFERING PORTION OF EXISTING 8" PIPE AND CONNECT TO PROPOSED 12" PVC WITH 90° BEND.
 - INSTALL 48" DIA. UNDERGROUND INFILTRATION SYSTEM PER DETAILS, SHEETS 13-20
 - REMOVE AND REPLACE DAMAGED IRRIGATION SYSTEM



BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.
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 THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

ENGINEER	MARK	BY	DATE	REVISIONS
	△			

CITY	APPR.	DATE



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 Engineering Resources of Southern California
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 Redlands, CA 92373
 P: 909.890.1255
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PREPARED UNDER THE DIRECT SUPERVISION OF:
 JOHN M. BRUDIN, R.C.E. 41836
 DATE: EXP. 03/31/24

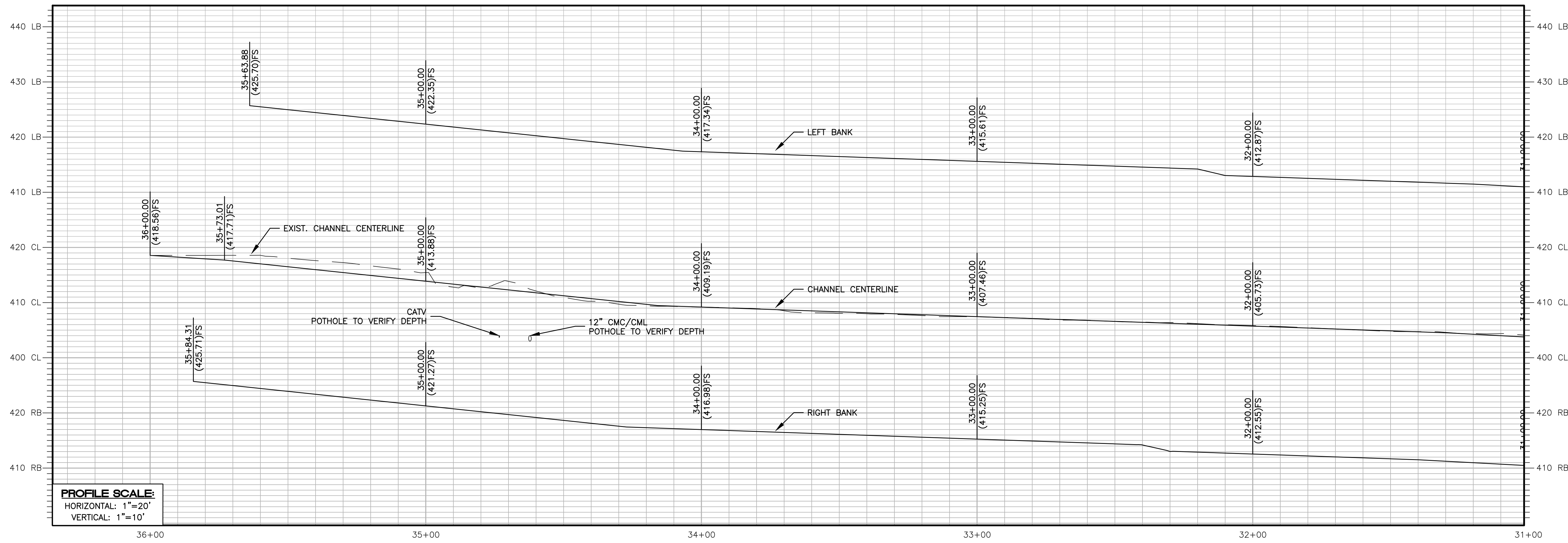
CITY OF PALM DESERT
 DEPARTMENT OF DEVELOPMENT SERVICES
 APPROVED BY:
 MARIA FRASERI, P.E.
 RCE #56005
 CITY ENGINEER
 DATE: _____
 REVIEWED AND RECOMMENDED BY: _____
 DATE: _____

PLAN CHECKED BY:
CIVIL
TRAFFIC
LANDSCAPE



CITY OF PALM DESERT
 HAYSTACK CHANNEL REHABILITATION
 CHANNEL IMPROVEMENT PLAN
 STATION 42+50 TO 36+50

SHEET 4
 OF SHEETS 20
 CITY FILE NUMBER



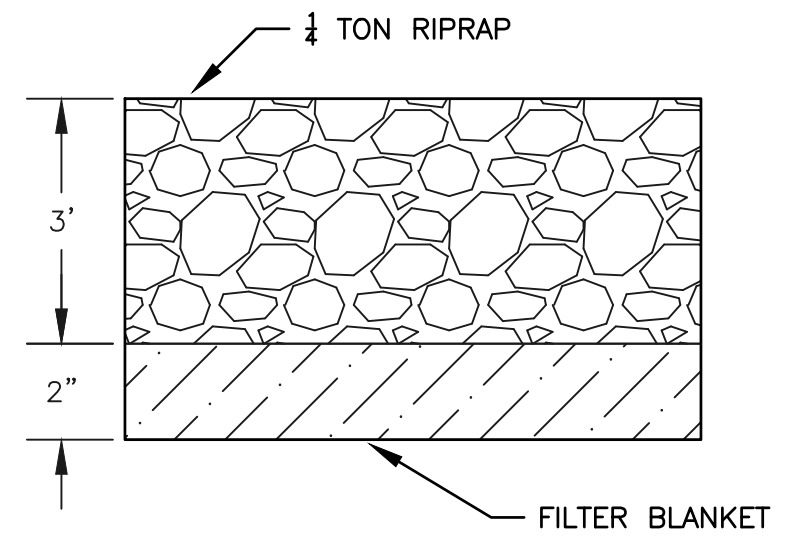
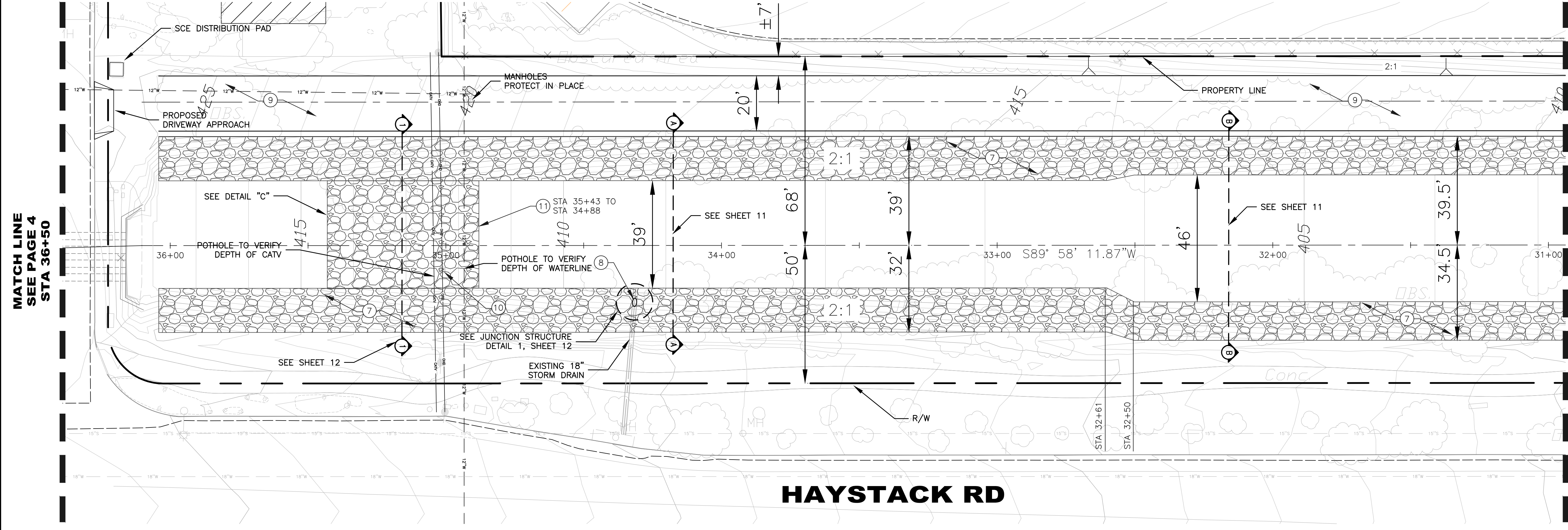
PROFILE SCALE:
 HORIZONTAL: 1"=20'
 VERTICAL: 1"=10'

- CONSTRUCTION NOTES**
- ⑦ INSTALL UNGROUTED 12" ROCK RIP-RAP LEVEE PER LA COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL
 - ⑧ CONSTRUCT JUNCTION STRUCTURE NO. 6 PER RFCFD STD. NO. JS231
 - ⑨ CONSTRUCT 20' WIDE ACCESS ROAD ALONG NORTH SIDE OF CHANNEL PER RFCFD STD. CH323
 - ⑩ RELOCATE EXISTING POWERPOLES (SCE)
 - ⑪ INSTALL 1/2 TON RIP-RAP PER DETAIL C

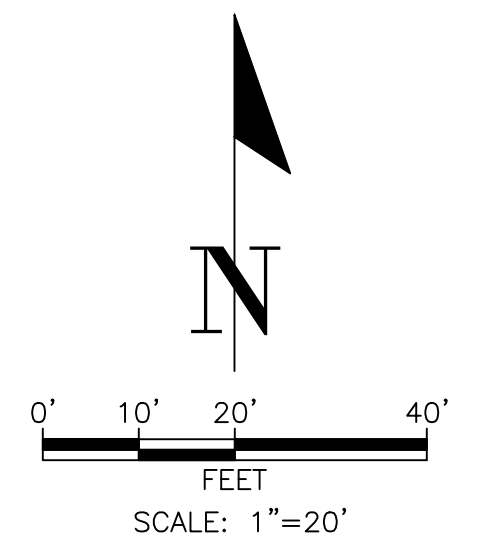
MATCH LINE
SEE SHEET 6
STA 31+00

HYDROLOGY DATA

STATION RANGE	Q100
60+05-52+00	322 CFS
52+00-47+50	348 CFS
47+50-38+50	543 CFS
38+50-34+50	595 CFS
34+50-15+50	600 CFS
15+50-10+50	826 CFS
10+50-10+00	930 CFS



DETAIL "C"
 NTS



MATCH LINE
SEE PAGE 4
STA 36+50

MATCH LINE
SEE SHEET 6
STA 31+00

DIG ALERT
 DIAL BEFORE YOU DIG
 TWO WORKING DAYS BEFORE YOU DIG
 TOLL FREE 1-800-422-4133
 A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHWEST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.
BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS SURVEY IS THE STATE PLANE COORDINATE SYSTEM NAD83 ZONE 8, AS DETERMINED LOCALLY BY THE LINE BETWEEN USC&GS STATIONS AC5161 AND DX0739.
 THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

ENGINEER	MARK	BY	DATE	REVISIONS
	▲			

CITY	APPR.	DATE

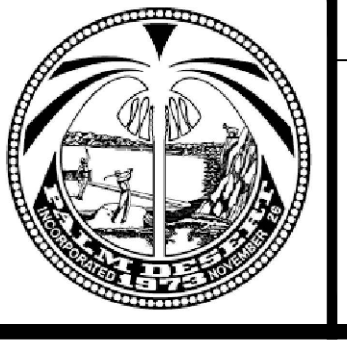
ENGINEERS SEAL
 JOHN M. BRUDIN, P.E.
 No. 41836
 CIVIL
 STATE OF CALIFORNIA

ERSC
 Engineering Resources of Southern California
 1861 West Redlands Blvd.
 Redlands, CA 92373
 P: 909.890.1255
 F: 909.890.0995
 PREPARED UNDER THE DIRECT SUPERVISION OF:
 JOHN M. BRUDIN, R.C.E. 41836
 DATE: EXP. 03/31/24

CITY OF PALM DESERT
 DEPARTMENT OF DEVELOPMENT SERVICES
 APPROVED BY:
 MARIA FRASERI, P.E.
 RCE #56005
 CITY ENGINEER
 DATE: _____
 REVIEWED AND RECOMMENDED BY: _____ DATE: _____

PLAN CHECKED BY:

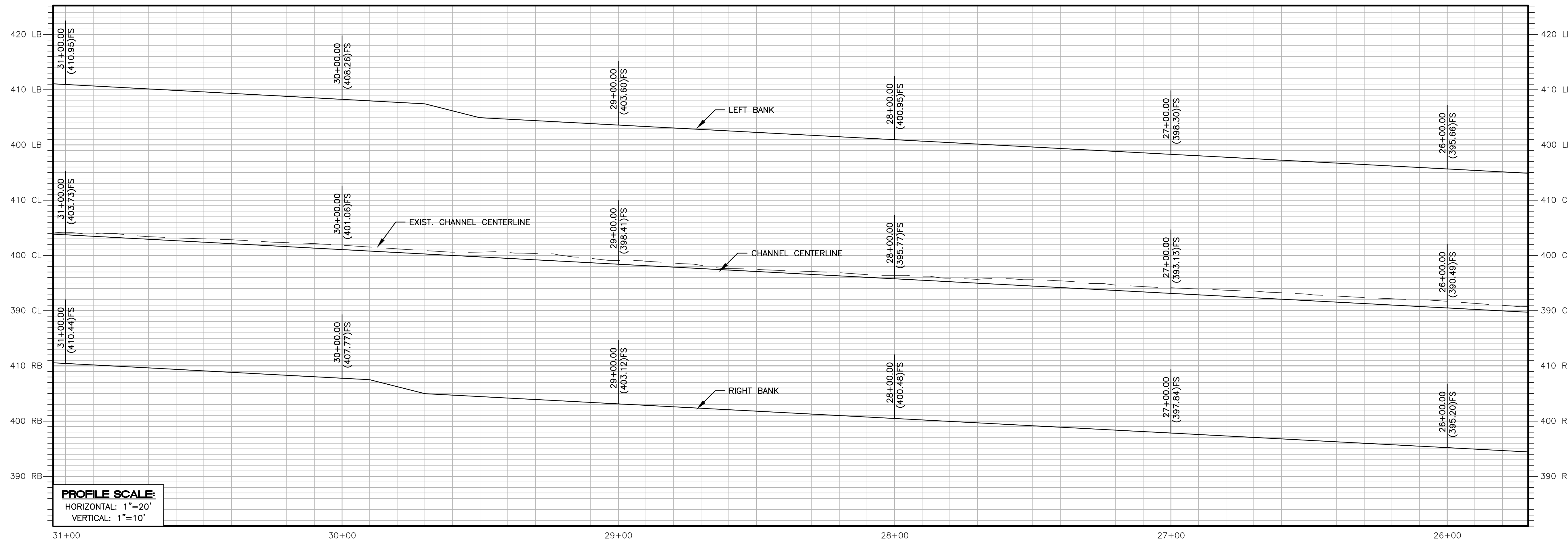
CIVIL	
TRAFFIC	
LANDSCAPE	



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
 STATION 36+50 TO 31+00

SHEET 5
OF SHEETS 20
 CITY FILE NUMBER

MATCH LINE
SEE SHEET 5
STA 31+00



- CONSTRUCTION NOTES**
- 7) INSTALL UNGROUTED 12" ROCK RIP-RAP LEVEE PER LA COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL
 - 9) CONSTRUCT 20' WIDE ACCESS ROAD ALONG NORTH SIDE OF CHANNEL PER RCFCF STD. CH323

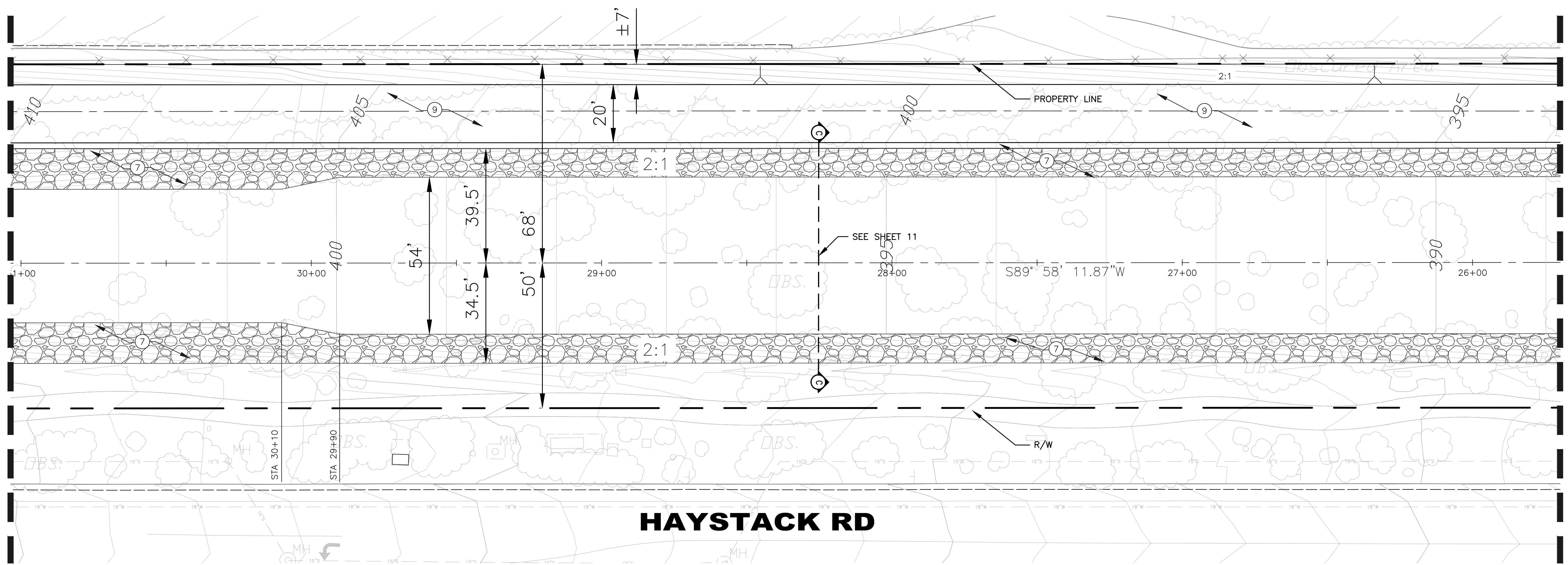
MATCH LINE
SEE SHEET 7
STA 25+50

HYDROLOGY DATA

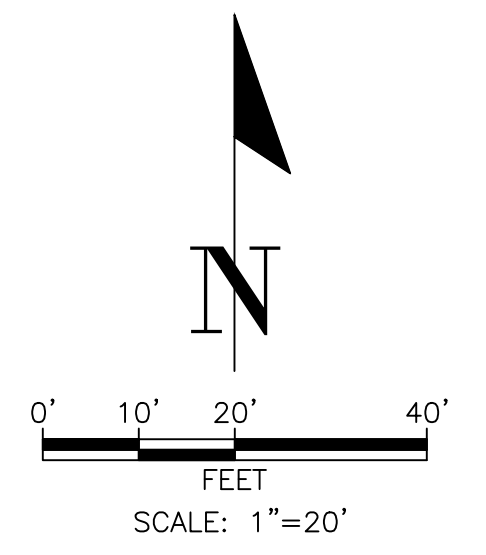
STATION RANGE	Q100
60+05-52+00	322 CFS
52+00-47+50	348 CFS
47+50-38+50	543 CFS
38+50-34+50	595 CFS
34+50-15+50	600 CFS
15+50-10+50	826 CFS
10+50-10+00	930 CFS

PROFILE SCALE:
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

MATCH LINE
SEE SHEET 5
STA 31+00



MATCH LINE
SEE SHEET 7
STA 25+50



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MARK	BY	DATE	REVISIONS

CITY	APPR.	DATE

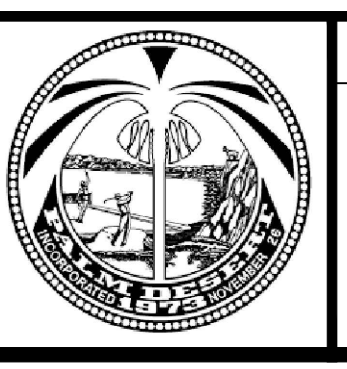
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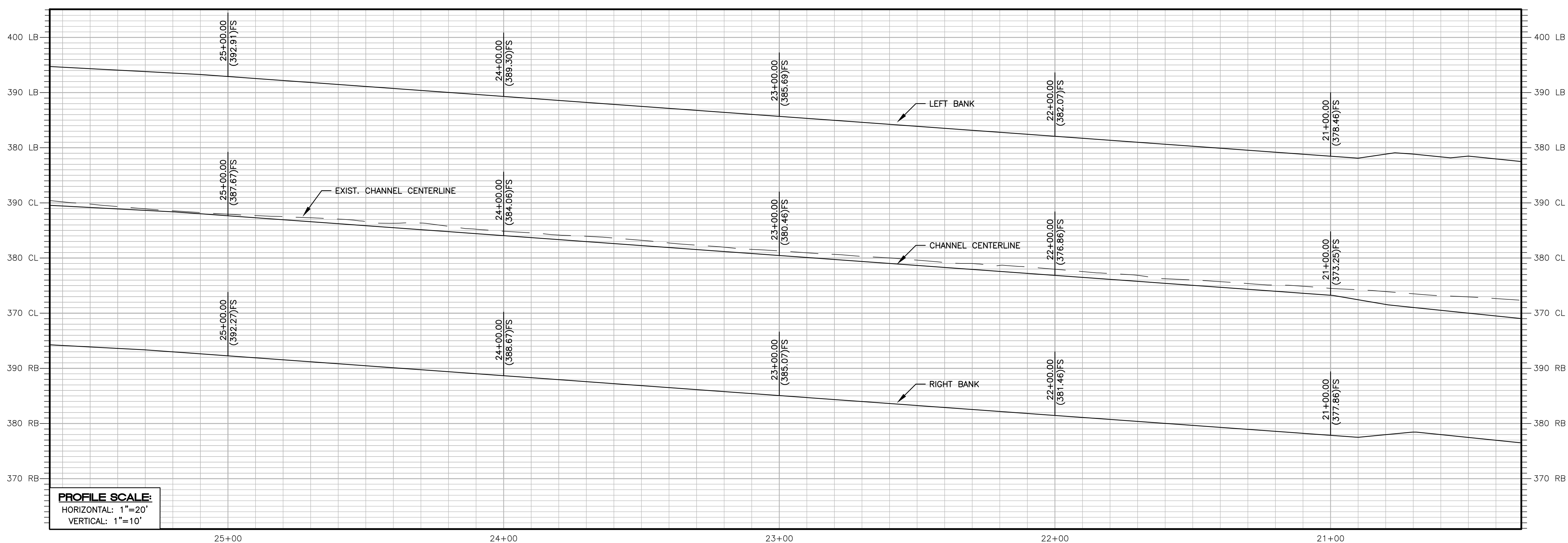
CIVIL	
TRAFFIC	
LANDSCAPE	



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
STATION 31+00 TO 25+50

SHEET 6
OF SHEETS 20
CITY FILE NUMBER

MATCH LINE
SEE SHEET 6
STA 25+50



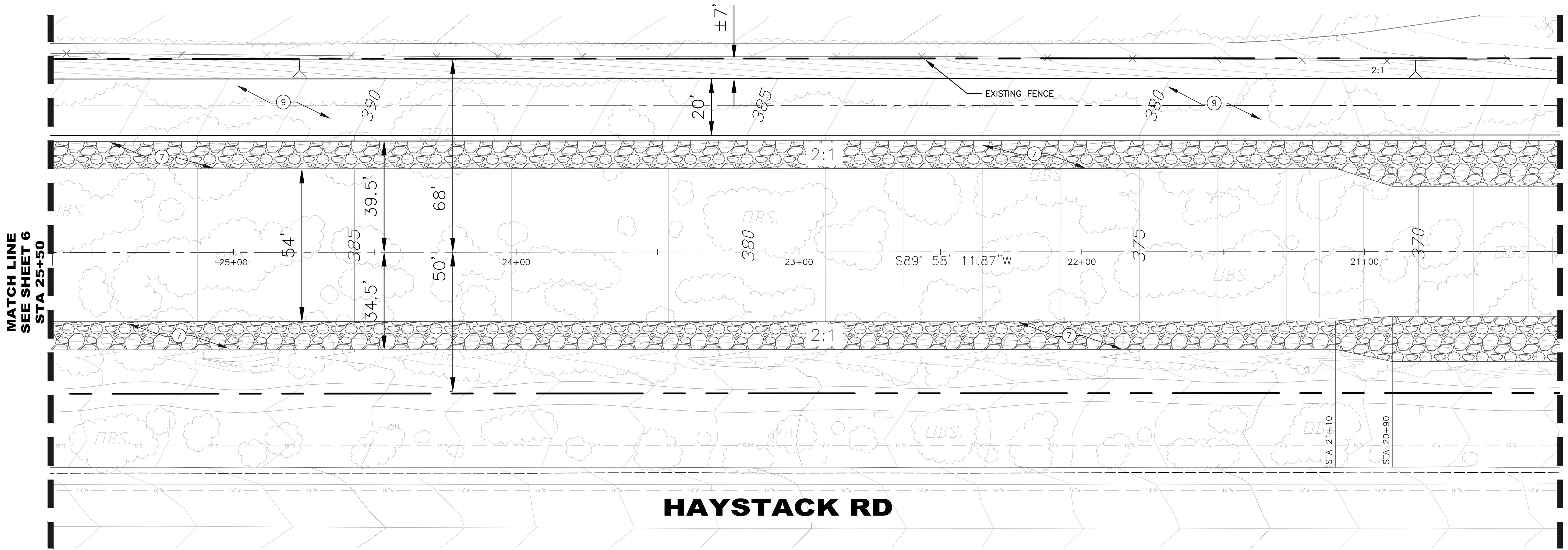
PROFILE SCALE:
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

- CONSTRUCTION NOTES**
- 7 INSTALL UNGROUTED 12" ROCK RIP-RAP LEVEE PER LA COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL
 - 9 CONSTRUCT 20' WIDE ACCESS ROAD ALONG NORTH SIDE OF CHANNEL PER RCFCF STD. CH323

MATCH LINE
SEE SHEET 8
STA 20+50

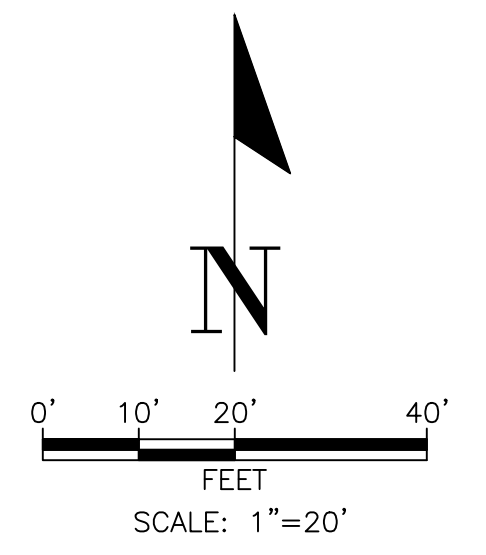
HYDROLOGY DATA

STATION RANGE	Q100
60+05-52+00	322 CFS
52+00-47+50	348 CFS
47+50-38+50	543 CFS
38+50-34+50	595 CFS
34+50-15+50	600 CFS
15+50-10+50	826 CFS
10+50-10+00	930 CFS



HAYSTACK RD

MATCH LINE
SEE SHEET 8
STA 20+50



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ENGINEER	MARK	BY	DATE	REVISIONS	CITY	APPR.	DATE

ENGINEERS SEAL
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PLAN CHECKED BY:

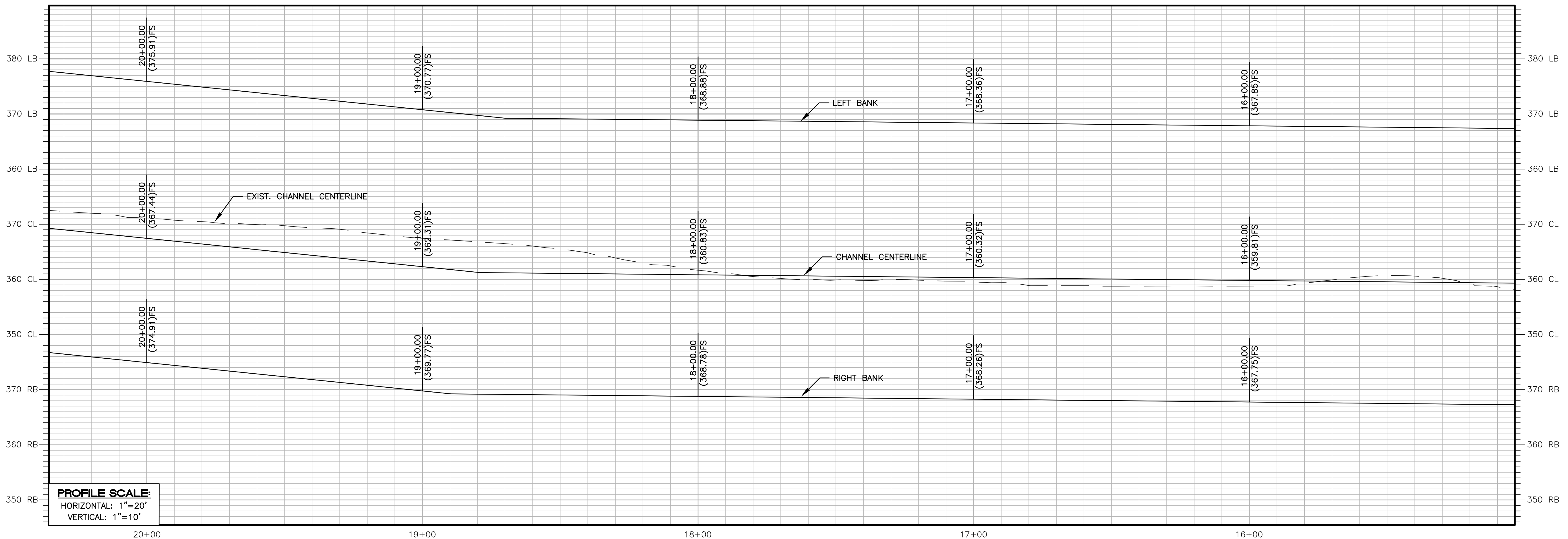
CIVIL	
TRAFFIC	
LANDSCAPE	



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
STATION 25+50 TO 20+50

SHEET 7
OF SHEETS 20
CITY FILE NUMBER

MATCH LINE
SEE SHEET 7
STA 20+50



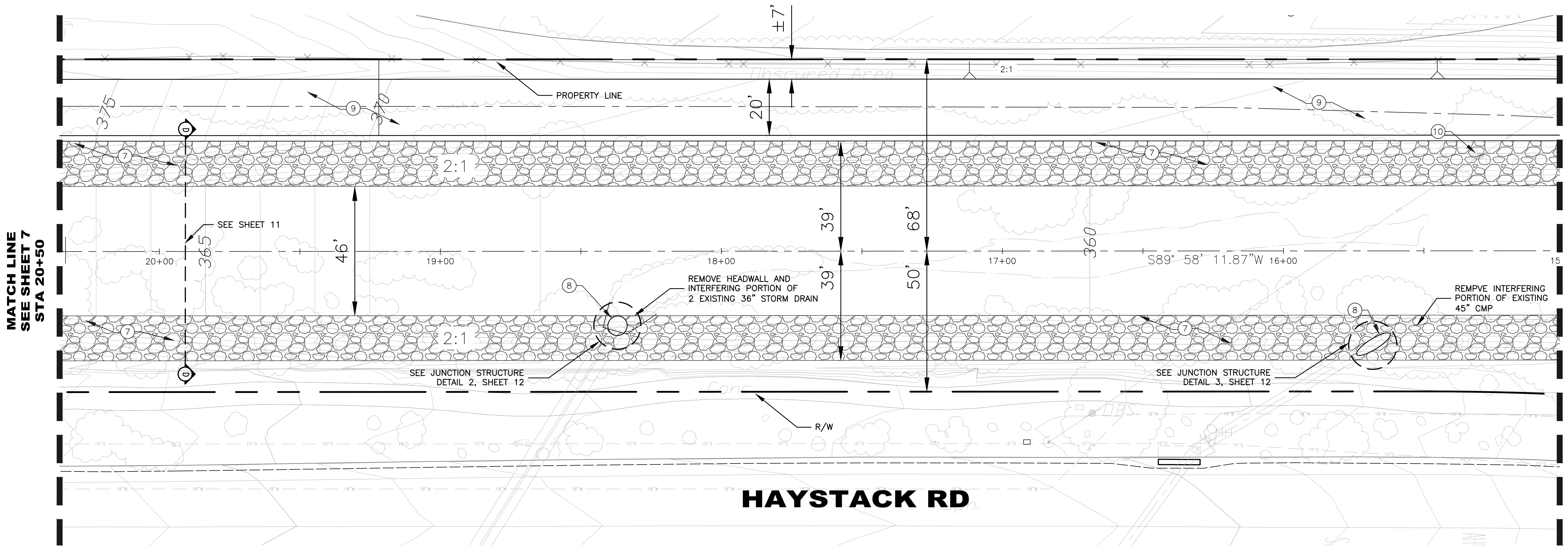
PROFILE SCALE:
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

- CONSTRUCTION NOTES**
- 7) INSTALL UNGROUTED 12" ROCK RIP-RAP LEVEE PER LA COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL
 - 8) CONSTRUCT JUNCTION STRUCTURE NO. 6 PER RFCDD STD. NO. JS231
 - 9) CONSTRUCT 20' WIDE ACCESS ROAD ALONG NORTH SIDE OF CHANNEL PER RFCDD STD. CH323
 - 10) RELOCATE EXISTING POWERPOLES (SCE)

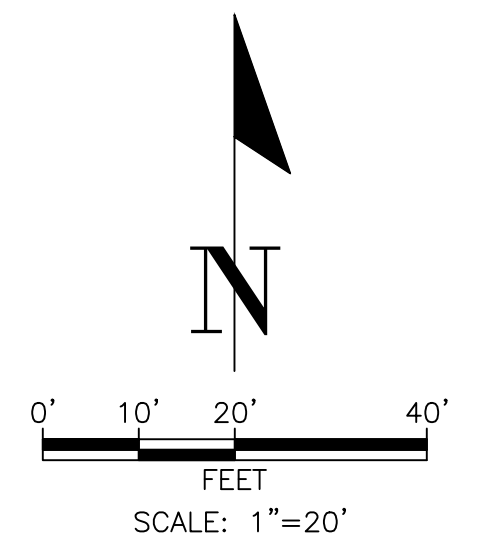
MATCH LINE
SEE SHEET 9
STA 15+00

HYDROLOGY DATA

STATION RANGE	Q100
60+05-52+00	322 CFS
52+00-47+50	348 CFS
47+50-38+50	543 CFS
38+50-34+50	595 CFS
34+50-15+50	600 CFS
15+50-10+50	826 CFS
10+50-10+00	930 CFS



HAYSTACK RD



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MARK	BY	DATE	REVISIONS

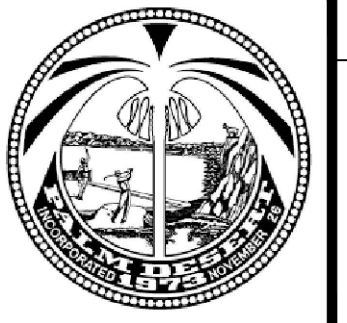
CITY	APPR.	DATE

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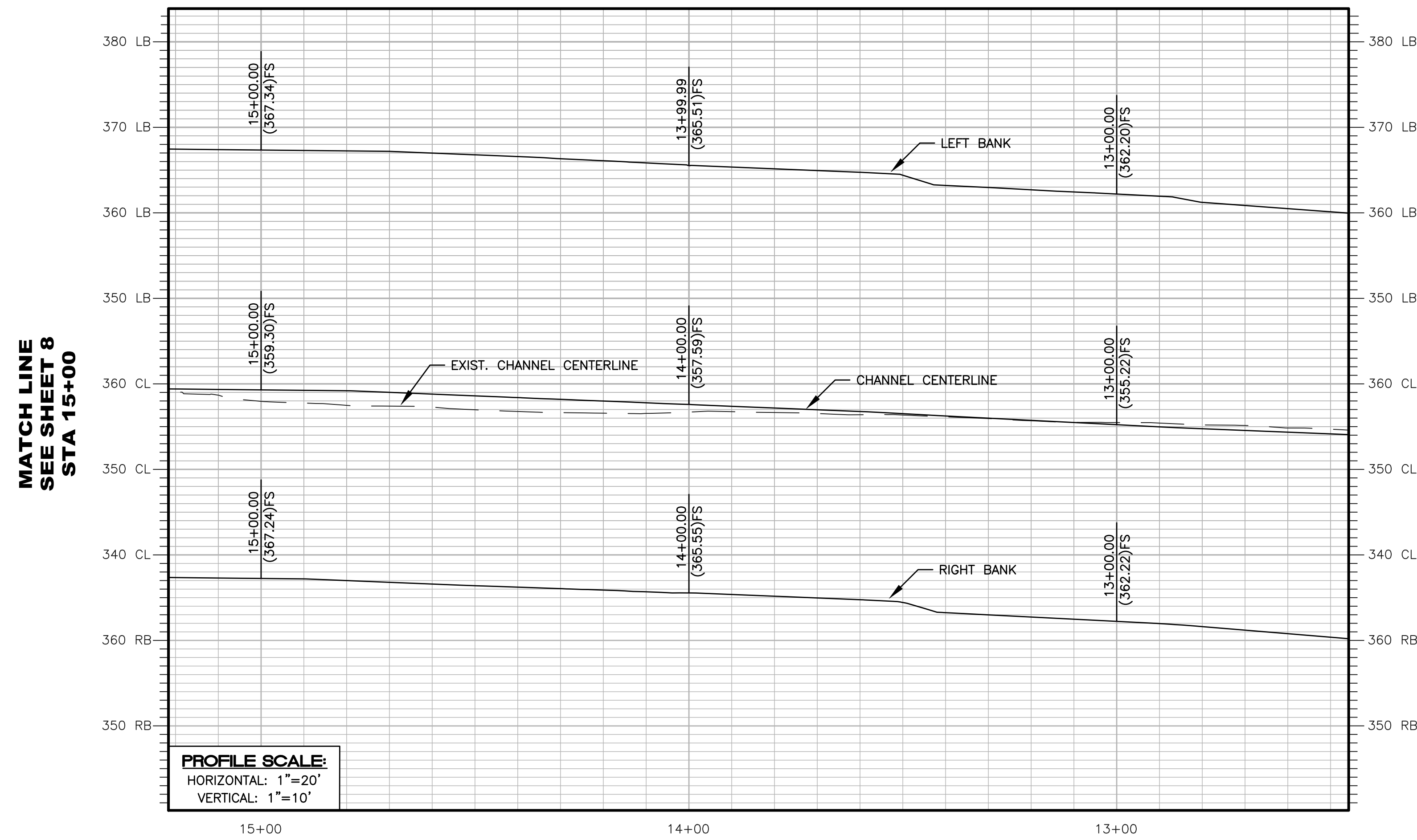
PLAN CHECKED BY:
CIVIL
TRAFFIC
LANDSCAPE



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
STATION 20+50 TO 15+00

CONSTRUCTION NOTES

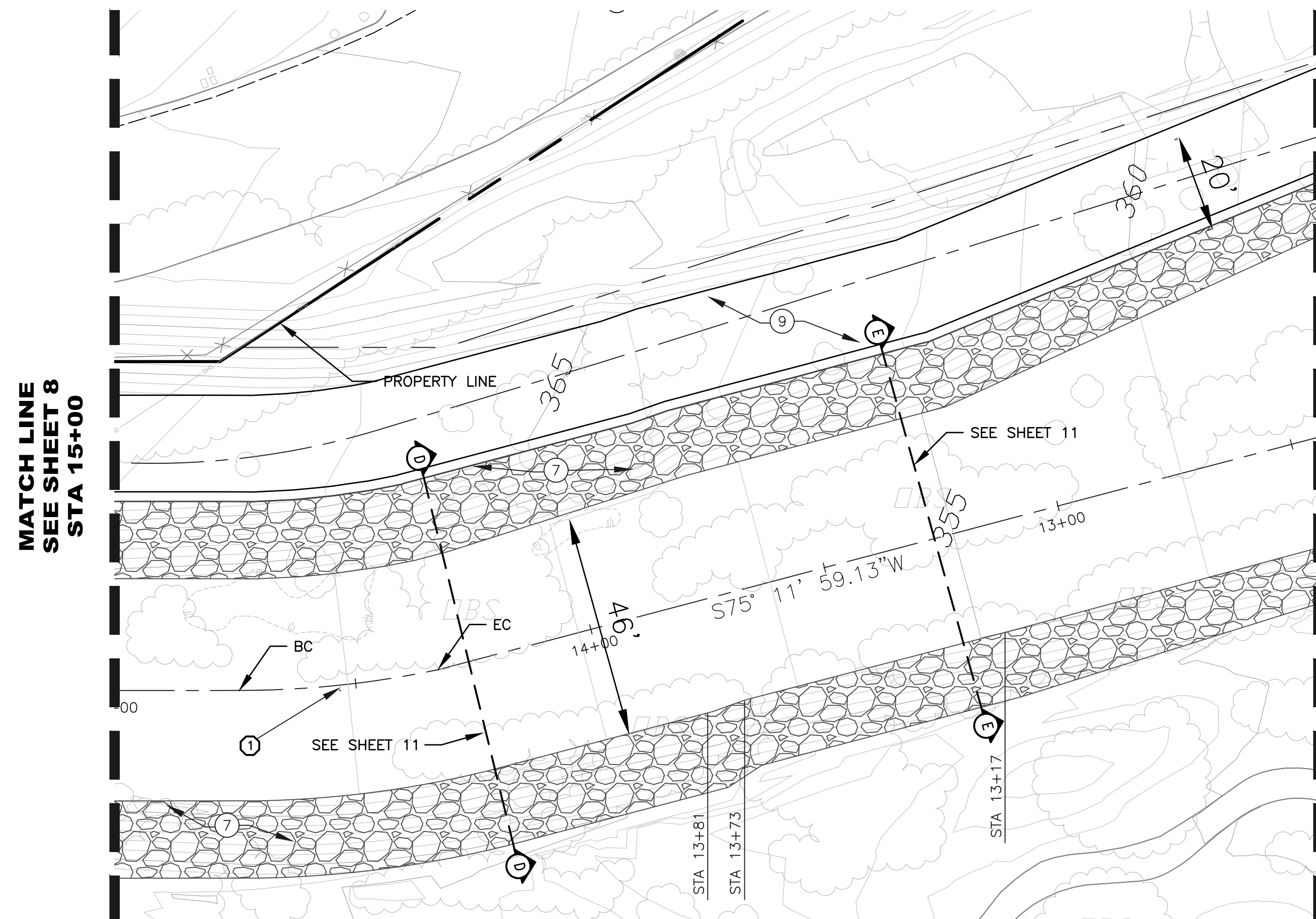
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- ⑨ CONSTRUCT 20' WIDE ACCESS ROAD ALONG NORTH SIDE OF CHANNEL PER RFCFD STD. CH323



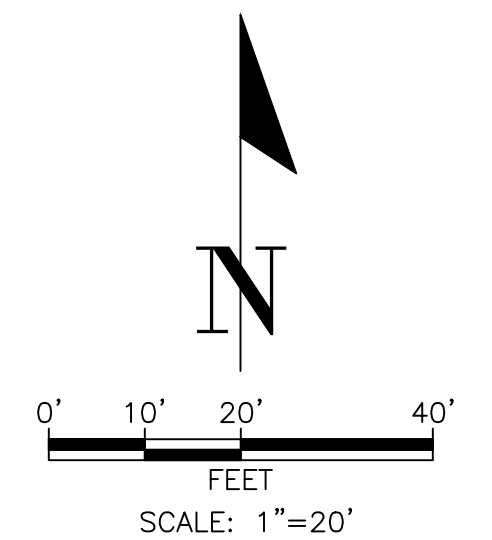
MATCH LINE
SEE SHEET 10
STA 12+50

HYDROLOGY DATA

STATION RANGE	Q100
60+05-52+00	322 CFS
52+00-47+50	348 CFS
47+50-38+50	543 CFS
38+50-34+50	595 CFS
34+50-15+50	600 CFS
15+50-10+50	826 CFS
10+50-10+00	930 CFS



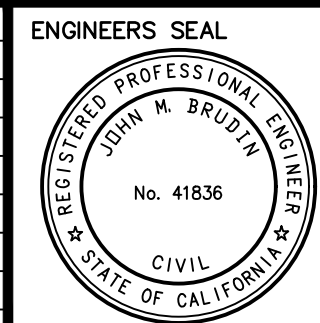
MATCH LINE
SEE SHEET 10
STA 12+50



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 RCE #56005
 CITY ENGINEER
 DATE: _____
 REVIEWED AND RECOMMENDED BY: _____
 DATE: _____

PLAN CHECKED BY:
 CIVIL
 TRAFFIC
 LANDSCAPE



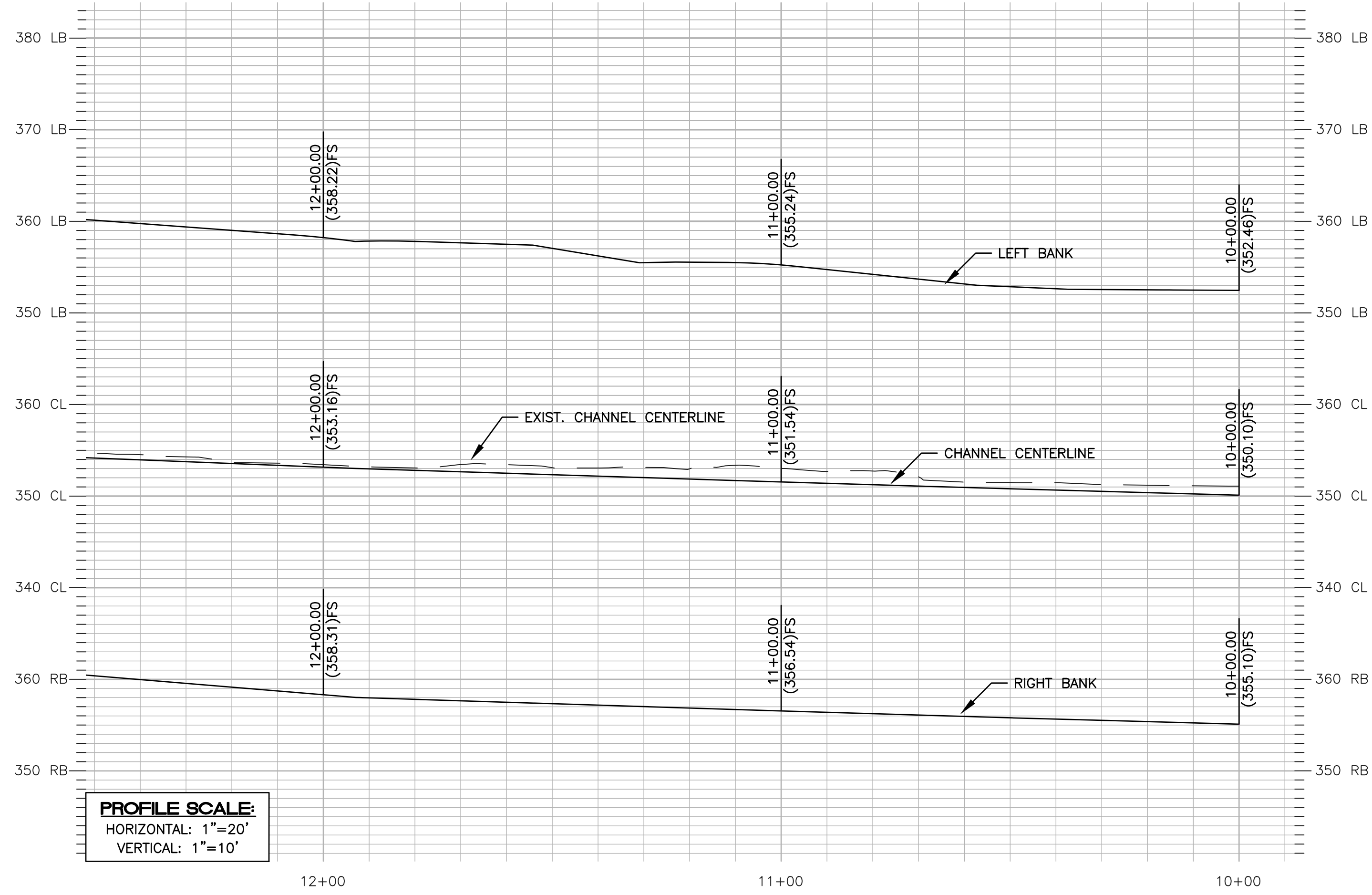
CITY OF PALM DESERT
 HAYSTACK CHANNEL REHABILITATION
 CHANNEL IMPROVEMENT PLAN
 STATION 15+00 TO 12+50

SHEET 9
 OF SHEETS 20
 CITY FILE NUMBER

CONSTRUCTION NOTES

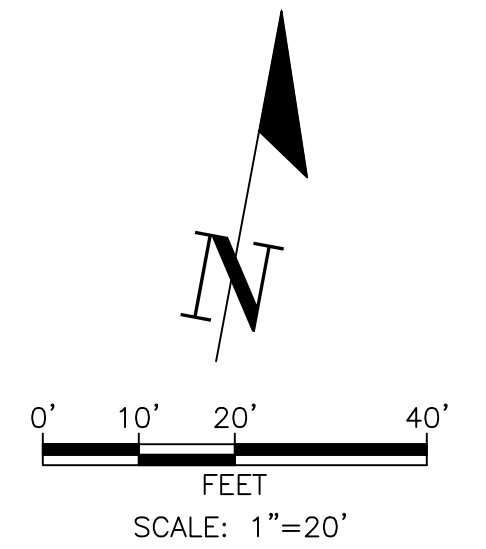
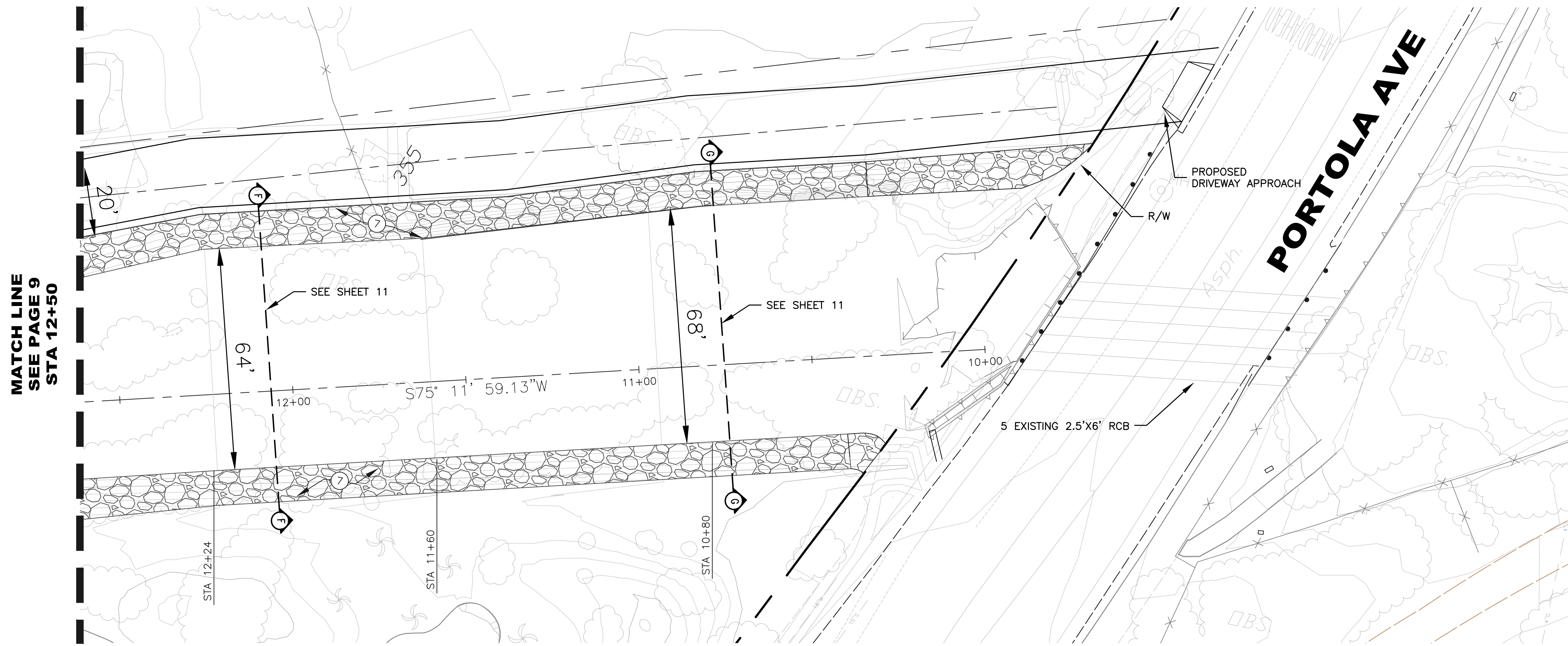
- ⑦ INSTALL UNGROUTED 12" ROCK RIP-RAP LEVEE PER LA COUNTY FLOOD CONTROL DISTRICT DESIGN MANUAL
- ⑨ CONSTRUCT 20' WIDE ACCESS ROAD ALONG NORTH SIDE OF CHANNEL PER RFCSD STD. CH323

MATCH LINE
SEE PAGE 9
STA 12+50



HYDROLOGY DATA

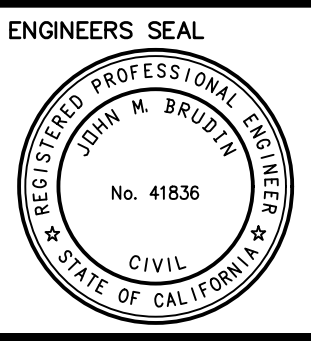
STATION RANGE	Q100
60+05-52+00	322 CFS
52+00-47+50	348 CFS
47+50-38+50	543 CFS
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15+50-10+50	826 CFS
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ENGINEER	REVISIONS	CITY	ENGINEERS SEAL
MARK BY DATE		APPR. DATE	



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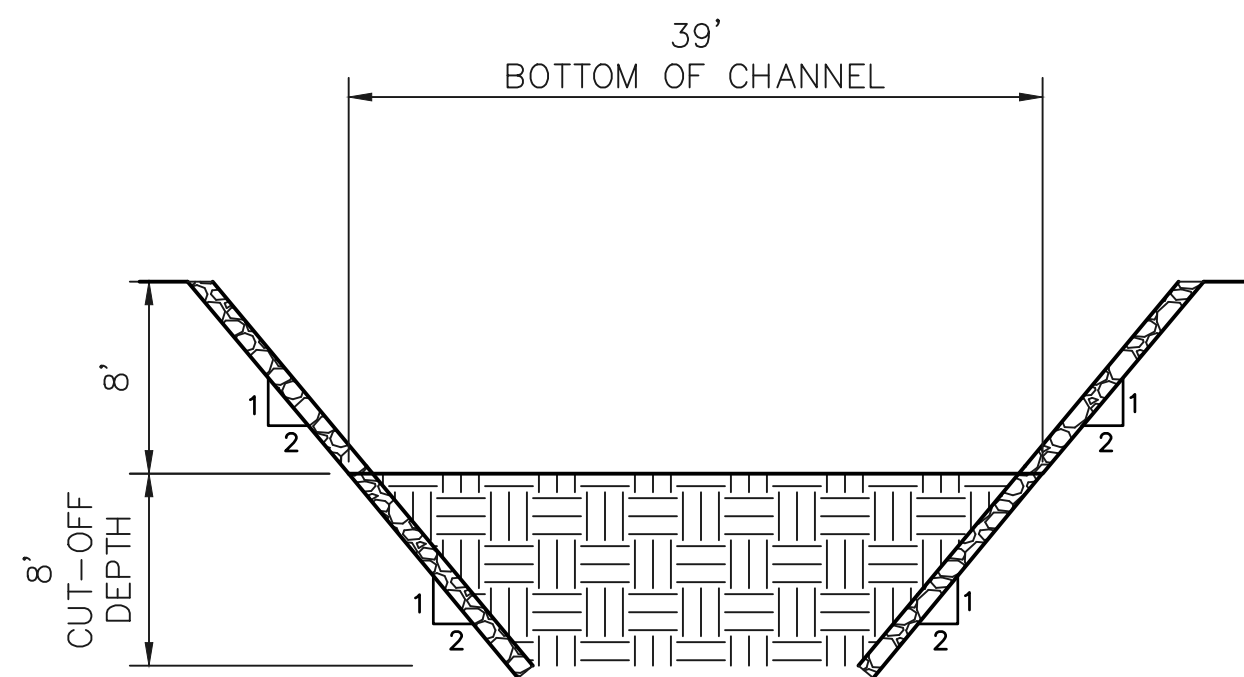
CITY OF PALM DESERT
DEPARTMENT OF DEVELOPMENT SERVICES
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RCE #56005
CITY ENGINEER
DATE

PLAN CHECKED BY:
CIVIL
TRAFFIC
LANDSCAPE

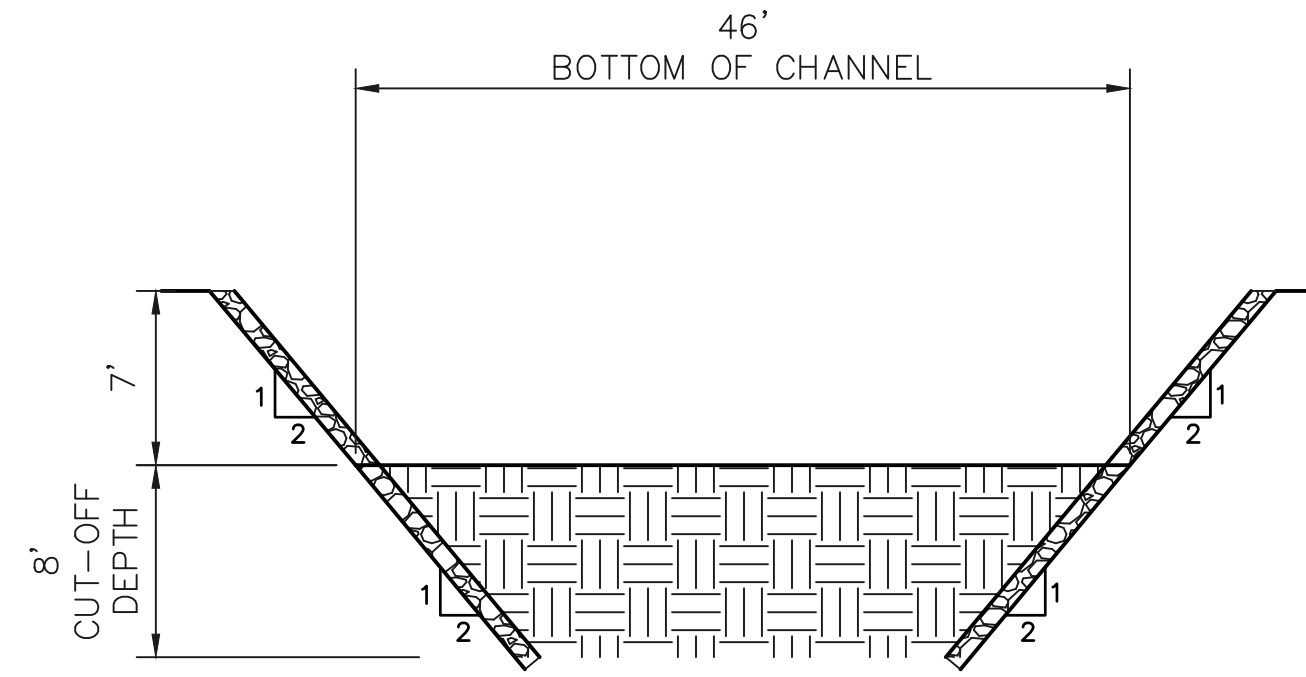


CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
STATION 12+50 TO 10+00

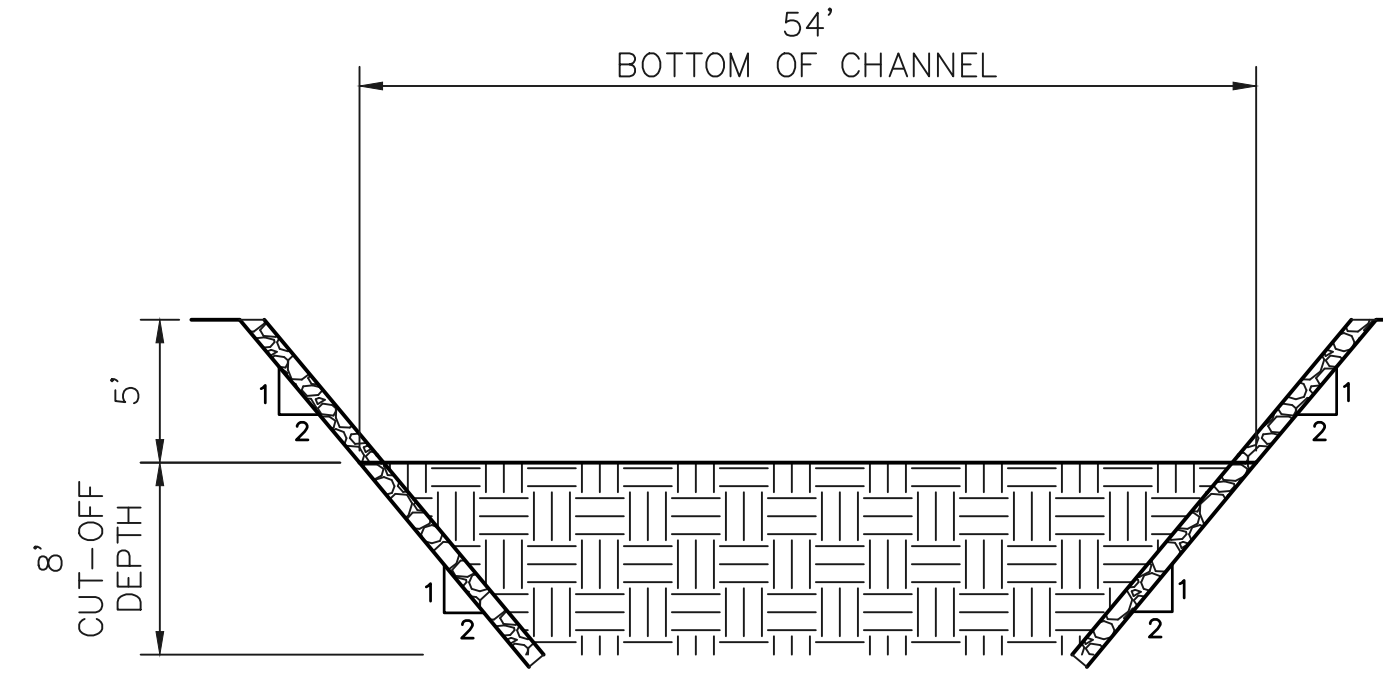
SHEET 10
OF SHEETS 20
CITY FILE NUMBER



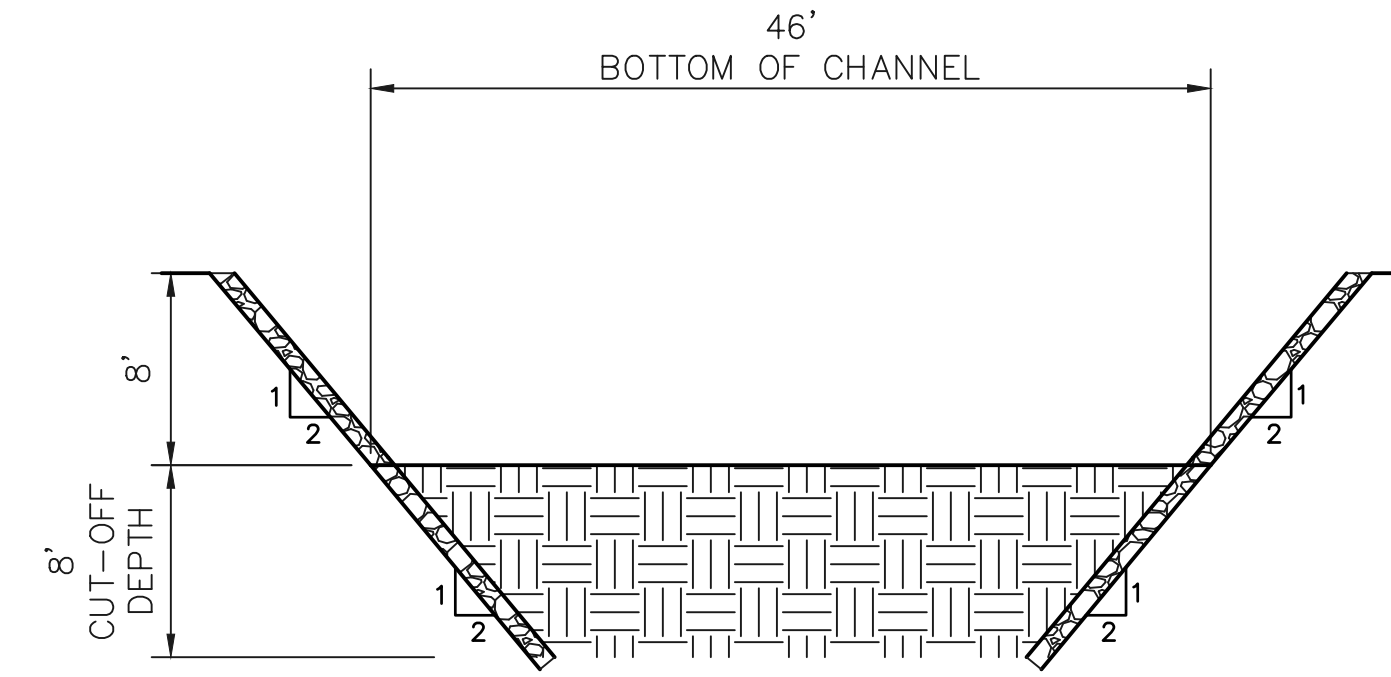
TYPICAL CROSS SECTION A-A
STATION 36+04-32+60
 N.T.S.



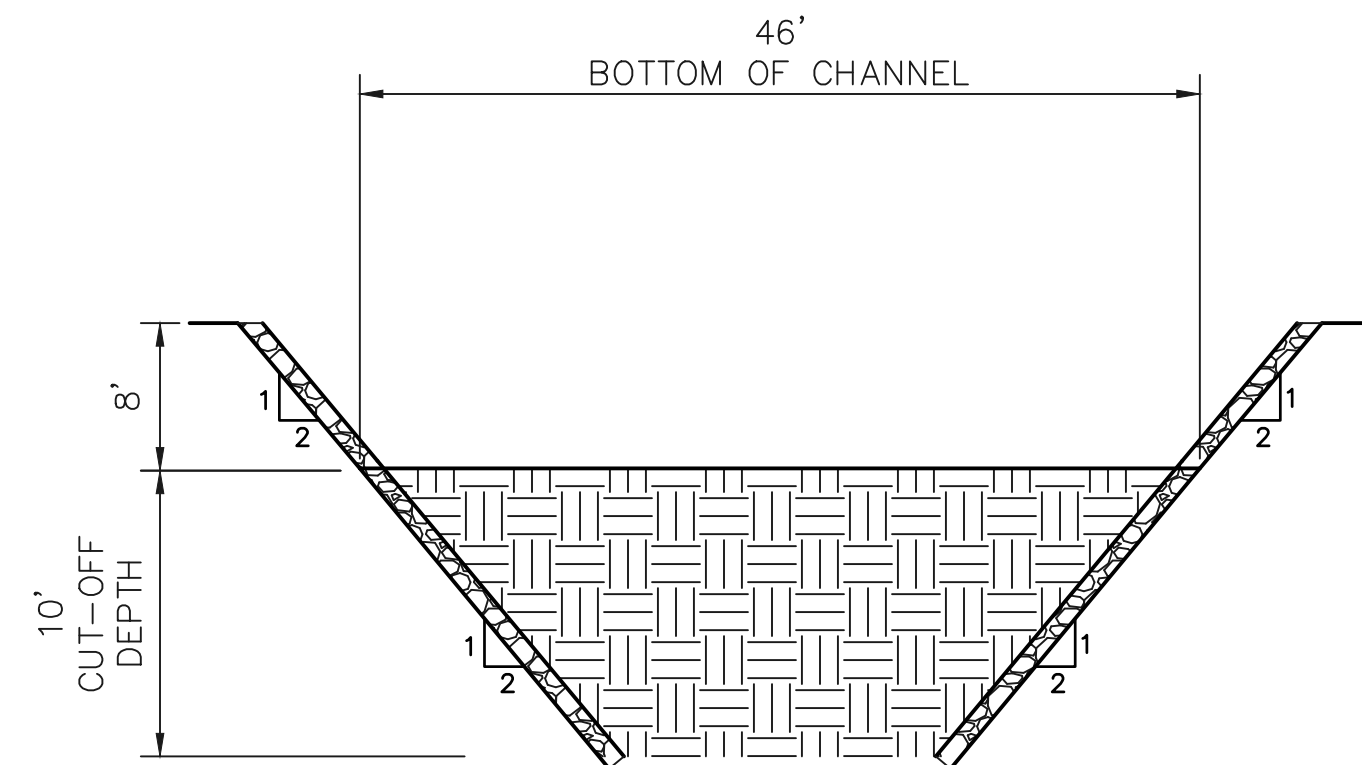
TYPICAL CROSS SECTION B-B
STATION 32+50-30+10
 N.T.S.



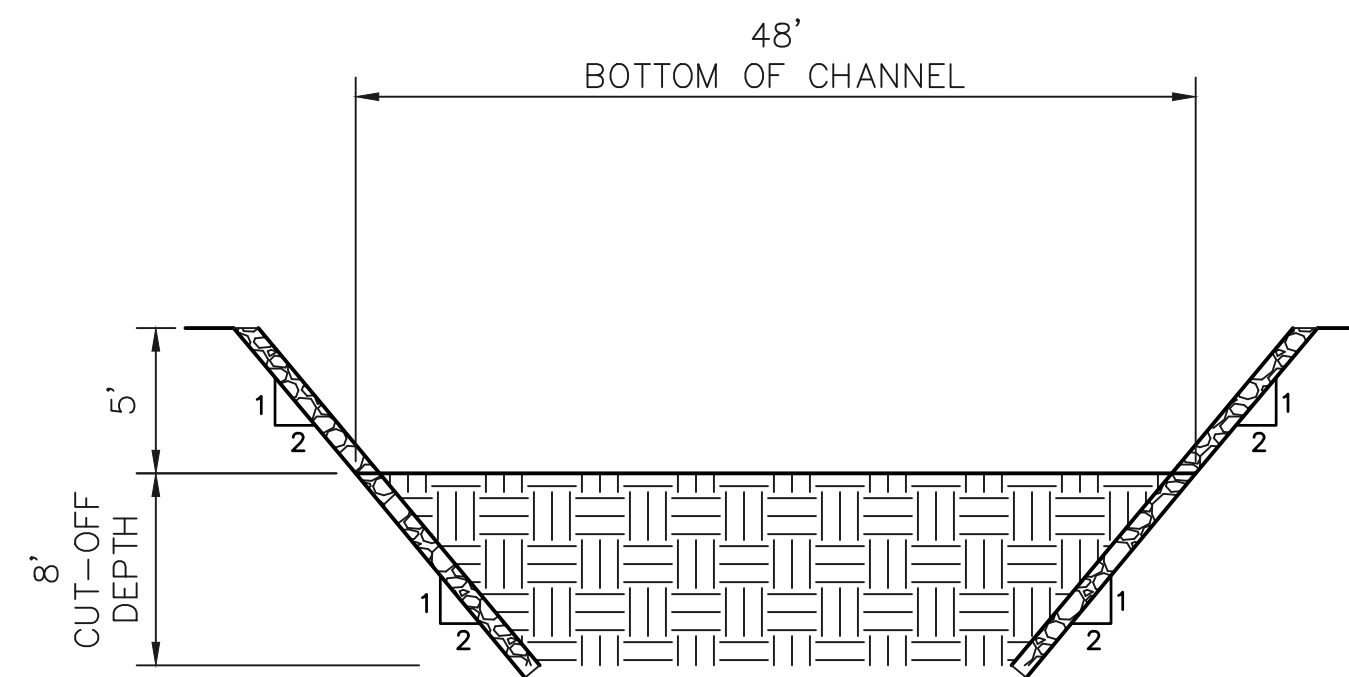
TYPICAL CROSS SECTION C-C
STATION 29+90-21+10
 N.T.S.



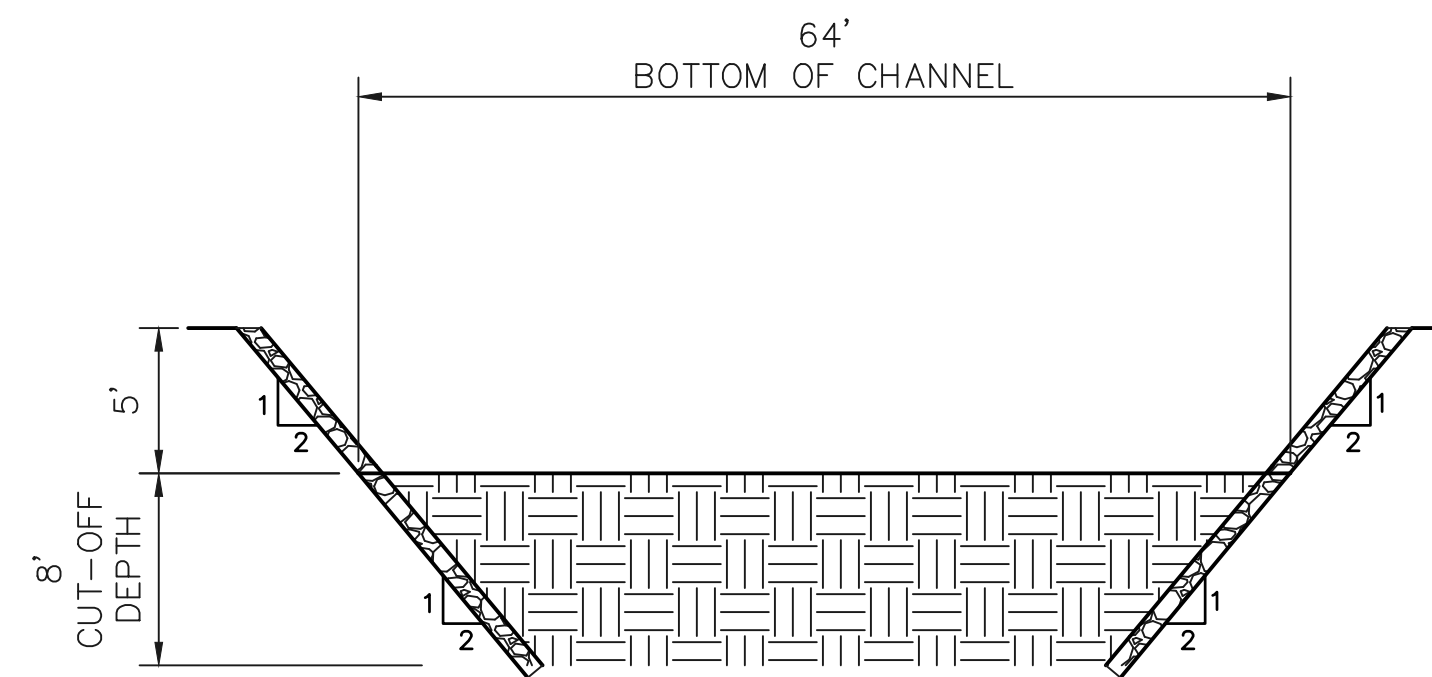
TYPICAL CROSS SECTION D-D
STATION 20+90-13+81
 N.T.S.



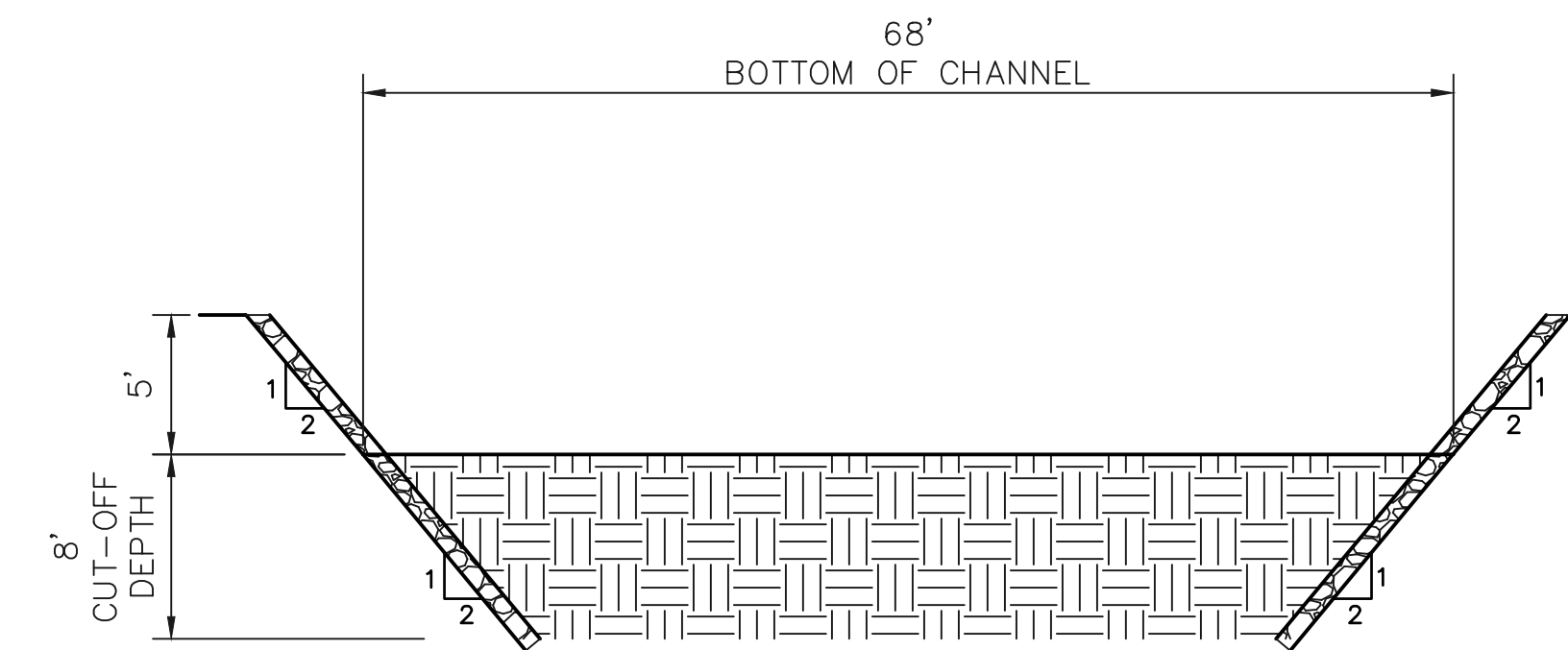
TYPICAL CROSS SECTION D-D
(CURVED REACH)
STATION 14+74-14+33 ONLY
 N.T.S.



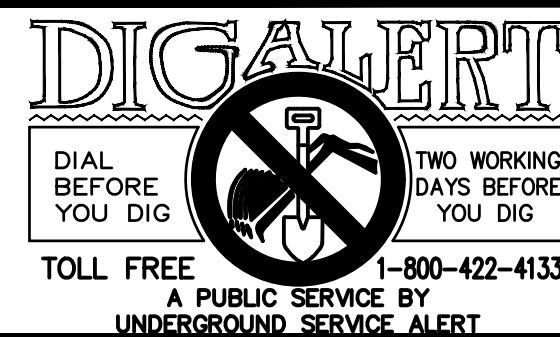
TYPICAL CROSS SECTION E-E
STATION 13+73-13+17
 N.T.S.



TYPICAL CROSS SECTION F-F
STATION 12+24-11+60
 N.T.S.

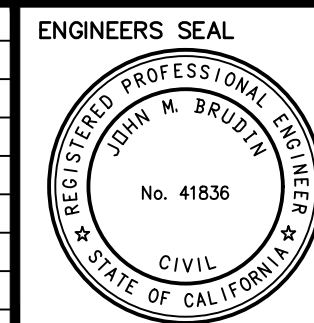


TYPICAL CROSS SECTION G-G
STATION 11+02-10+00
 N.T.S.



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ENGINEER		REVISIONS		CITY	
MARK	BY	DATE		APPR.	DATE
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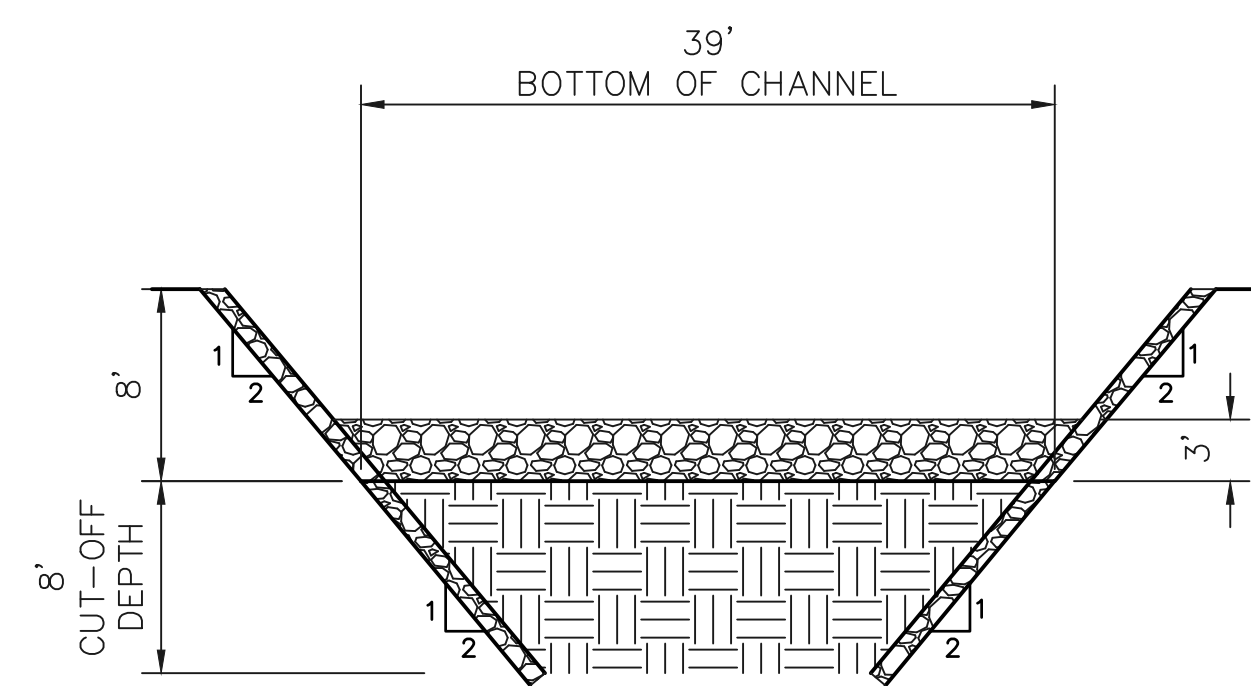
DATE: _____
 DATE: _____

PLAN CHECKED BY:
 CIVIL
 TRAFFIC
 LANDSCAPE

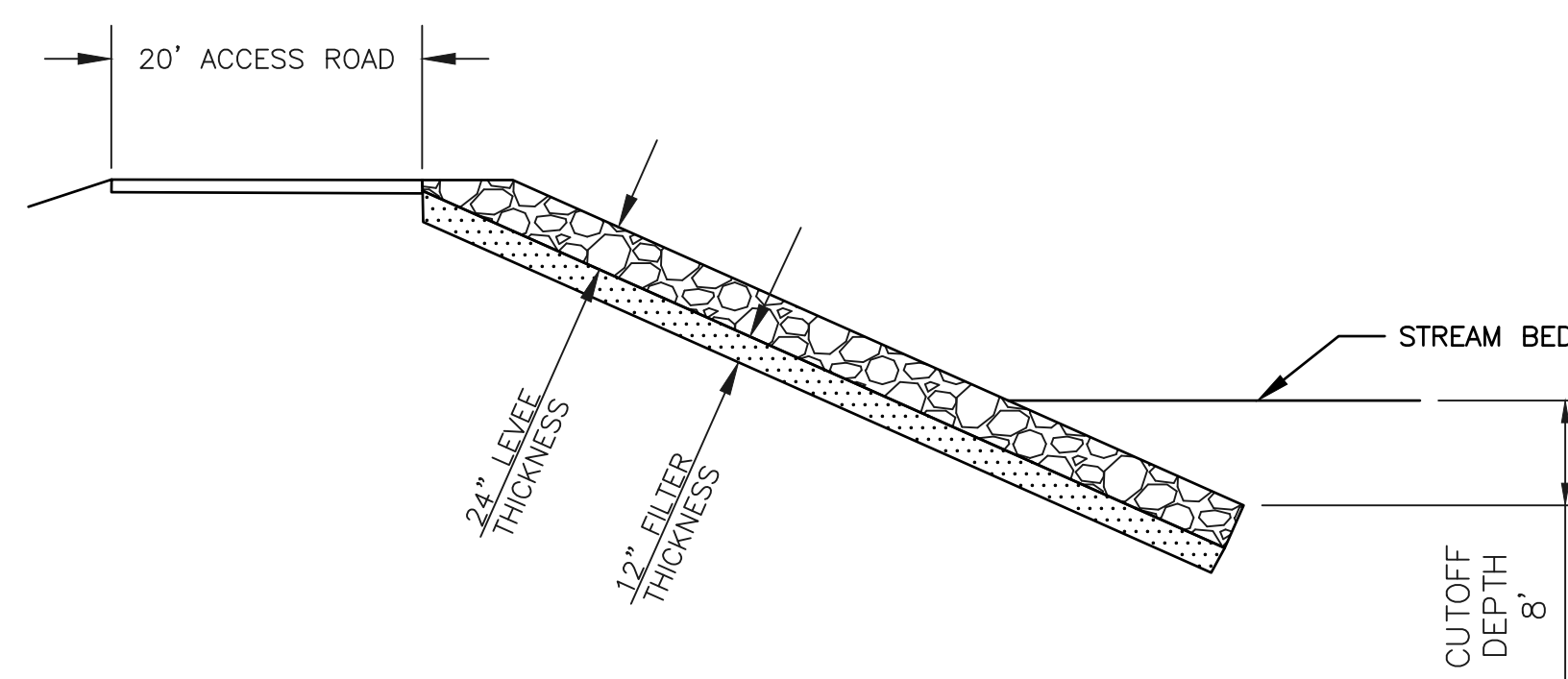


CITY OF PALM DESERT
 HAYSTACK CHANNEL REHABILITATION
 CHANNEL IMPROVEMENT PLAN
 CHANNEL CROSS SECTIONS

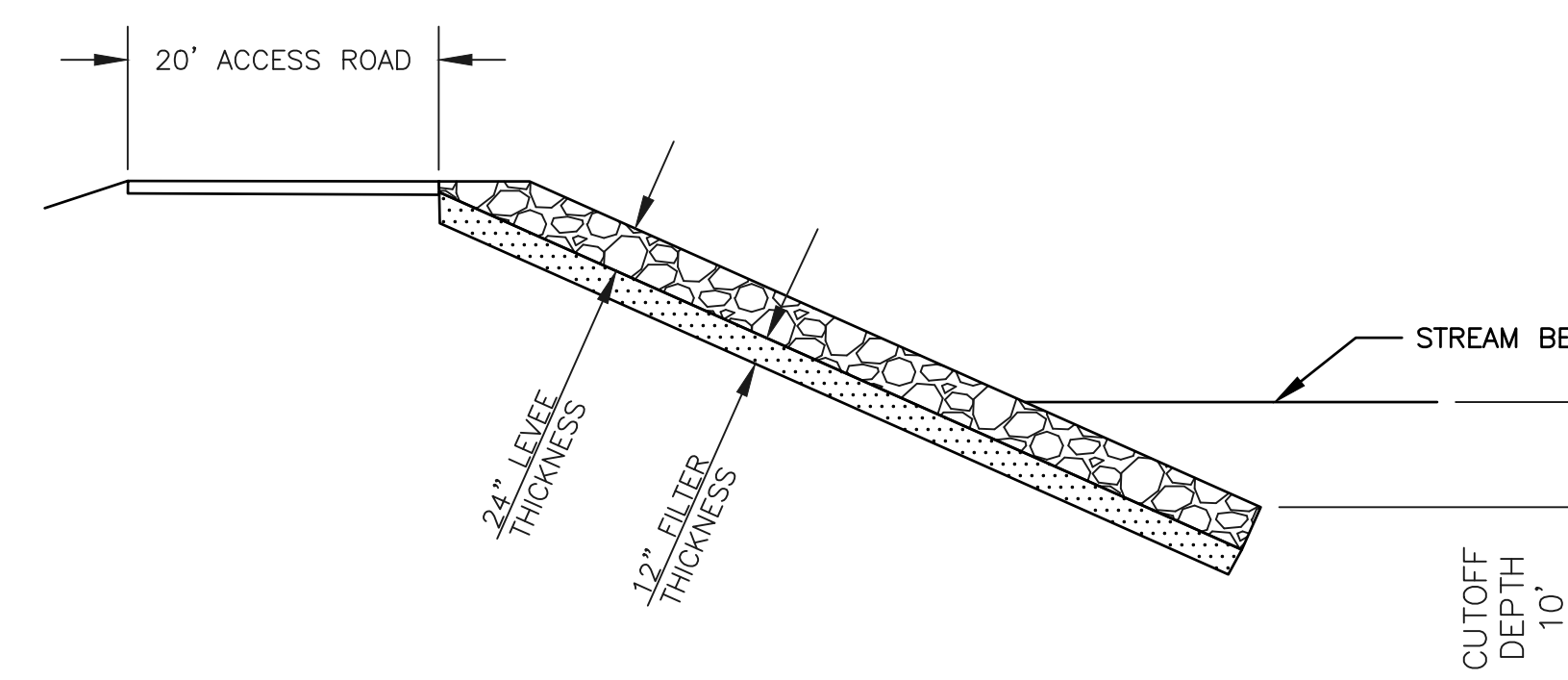
SHEET 11
 OF SHEETS 20
 CITY FILE NUMBER



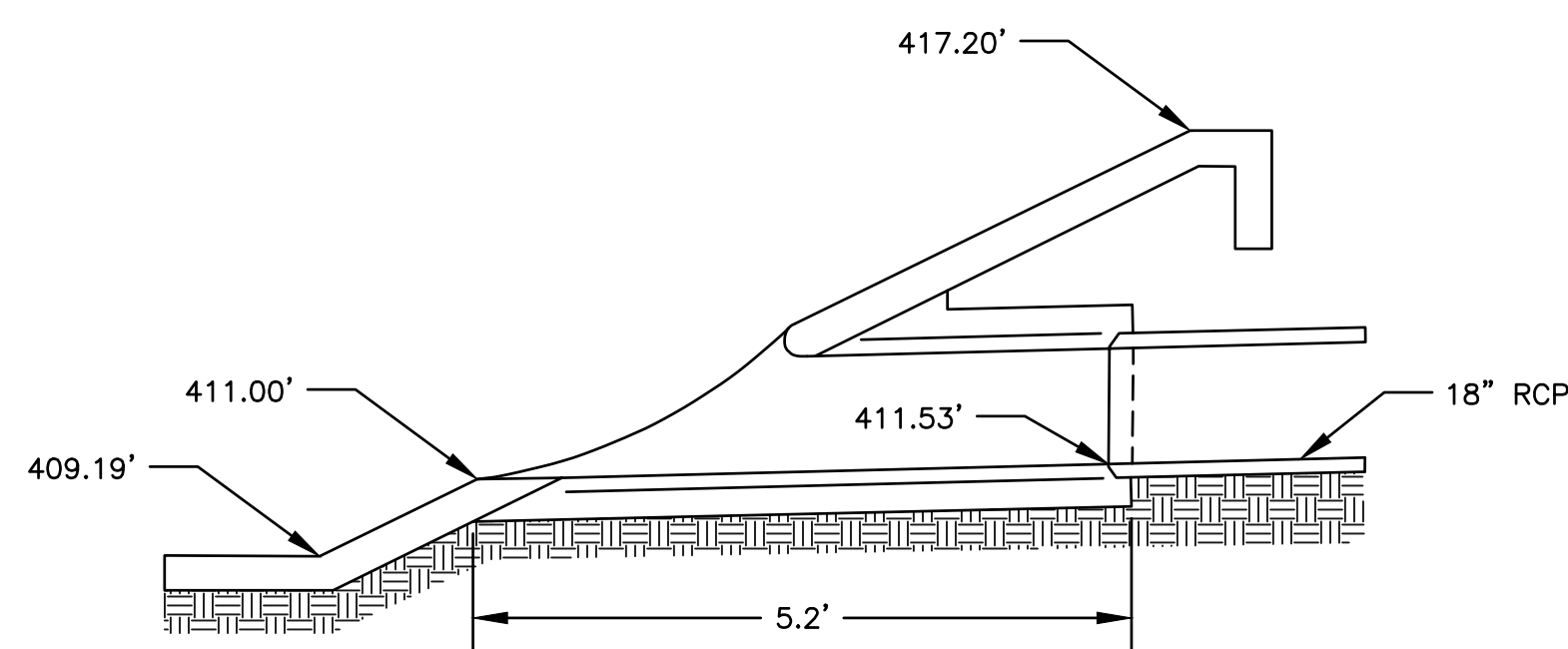
CROSS SECTION 1
 STA 35+43 TO 34+88
 SEE SHEET 5
 NTS



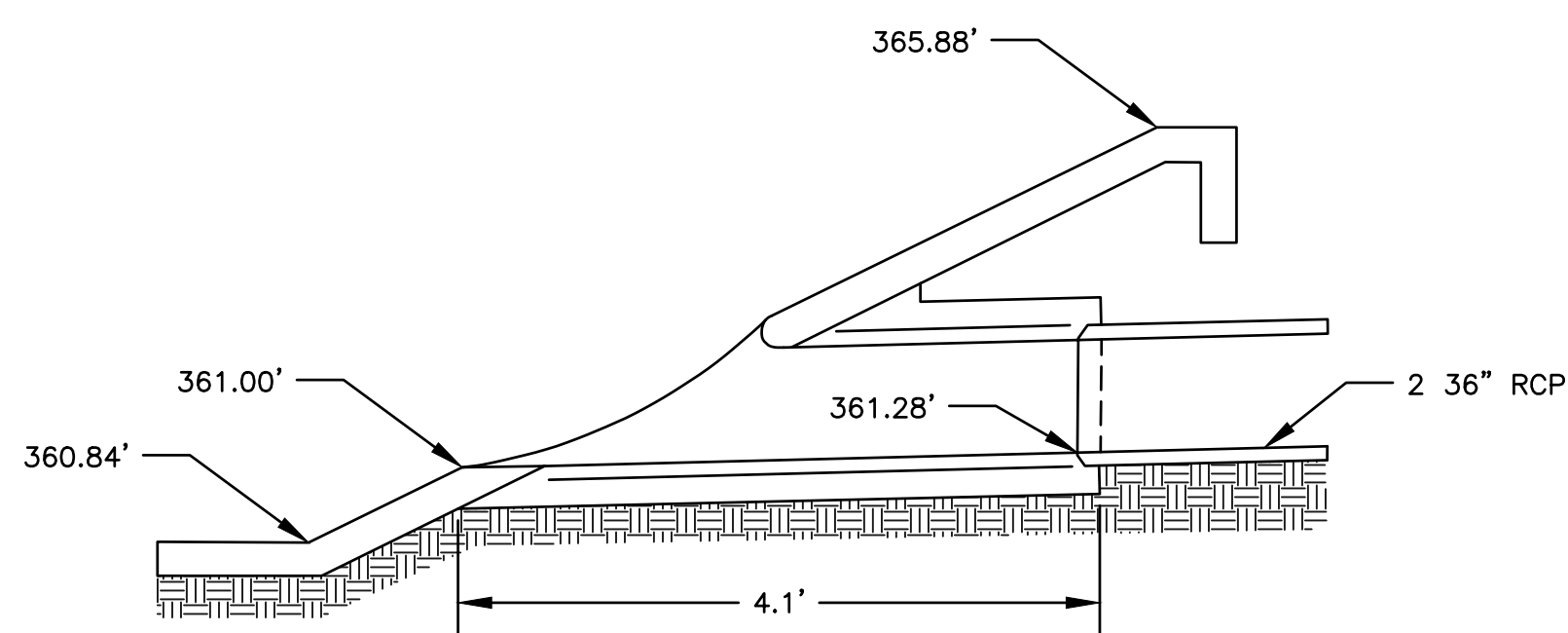
LA COUNTY DESIGN MANUAL
 TYPICAL ROCK RIP-RAP LEVEE SECTION
 STRAIGHT REACH
 NTS



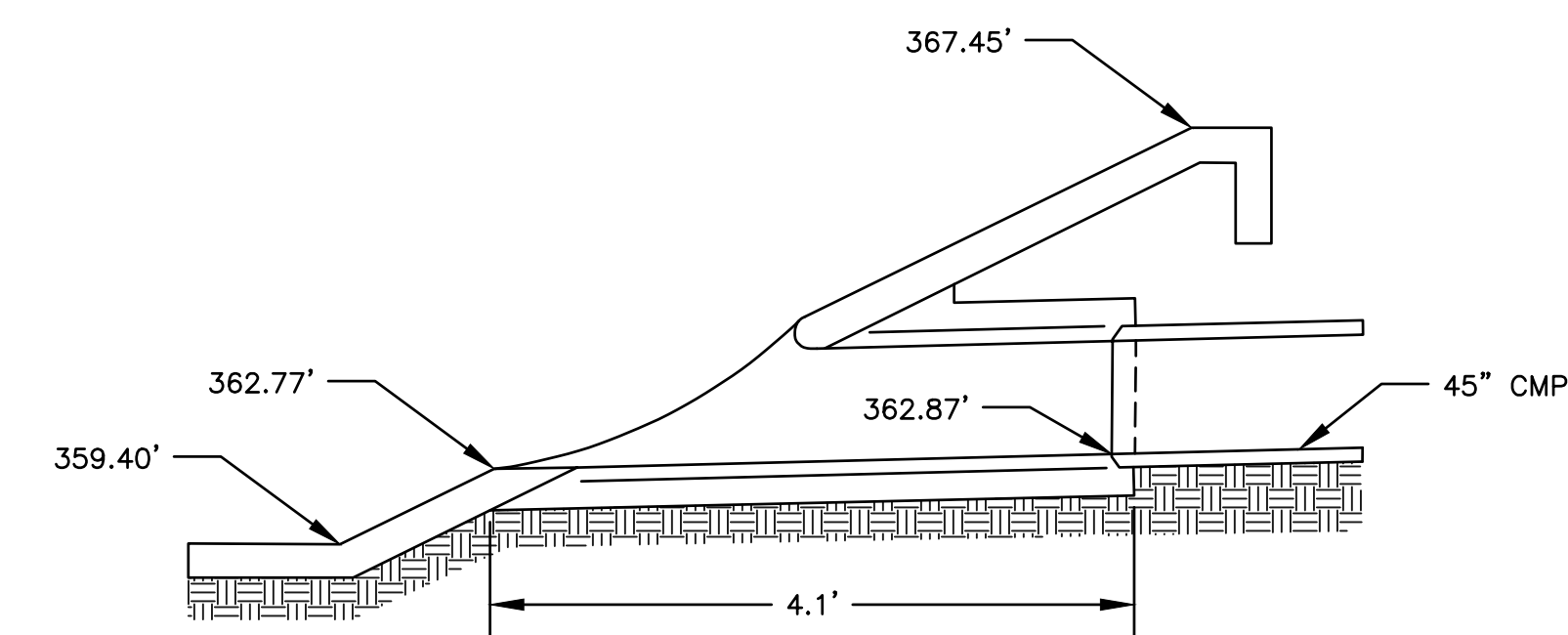
LA COUNTY DESIGN MANUAL
 TYPICAL ROCK RIP-RAP LEVEE SECTION
 CURVED REACH
 NTS



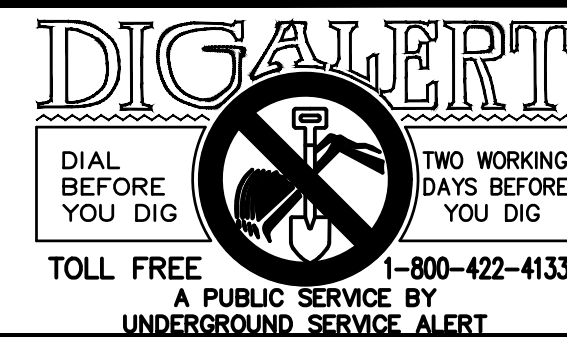
DETAIL 1
 JUNCTION STRUCTURE DETAIL
 STA 11+79
 NTS



DETAIL 2
 JUNCTION STRUCTURE DETAIL
 STA 27+73
 NTS

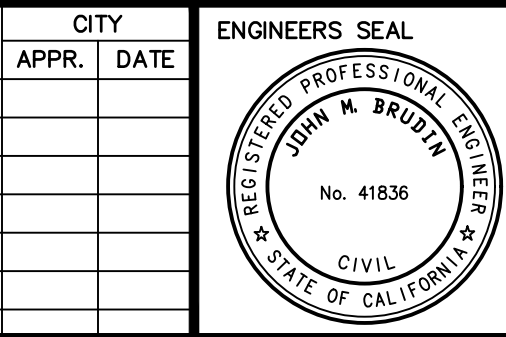


DETAIL 3
 JUNCTION STRUCTURE DETAIL
 STA 30+42
 NTS



BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.
 BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS SURVEY IS THE STATE PLANE COORDINATE SYSTEM NAD83 ZONE 6, AS DETERMINED LOCALLY BY THE LINE BETWEEN USC&GS STATIONS AC5161 AND DX0739.
 THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

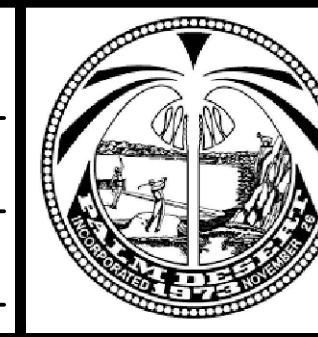
ENGINEER			REVISIONS		CITY	
MARK	BY	DATE		APPR.	DATE	



ERSC
 Engineering Resources of Southern California
 1861 West Redlands Blvd.
 Redlands, CA 92373
 P: 909.890.1255
 F: 909.890.0995
 PREPARED UNDER THE DIRECT SUPERVISION OF:
 JOHN M. BRUDIN, R.C.E. 41836 DATE: EXP. 03/31/24

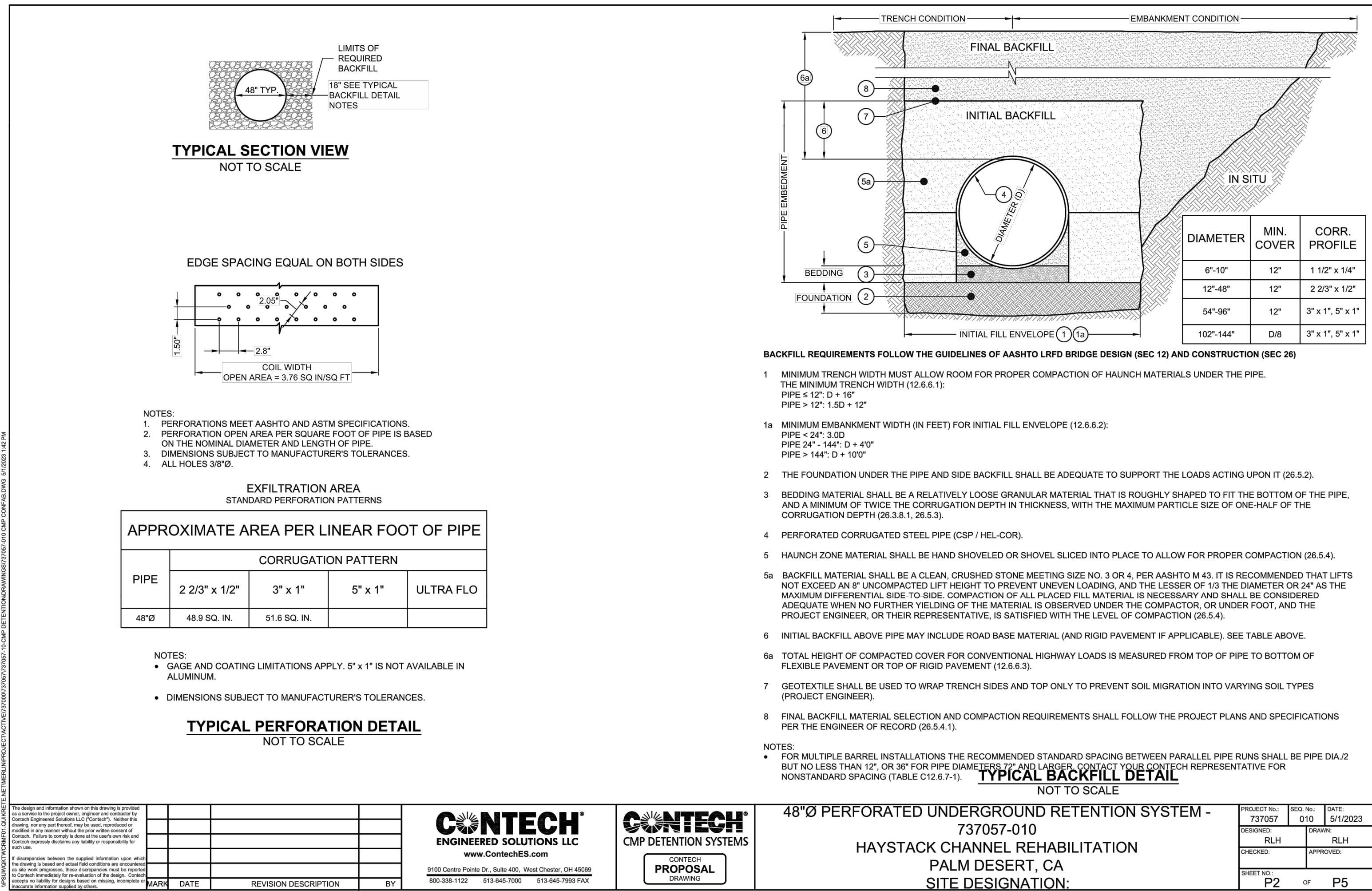
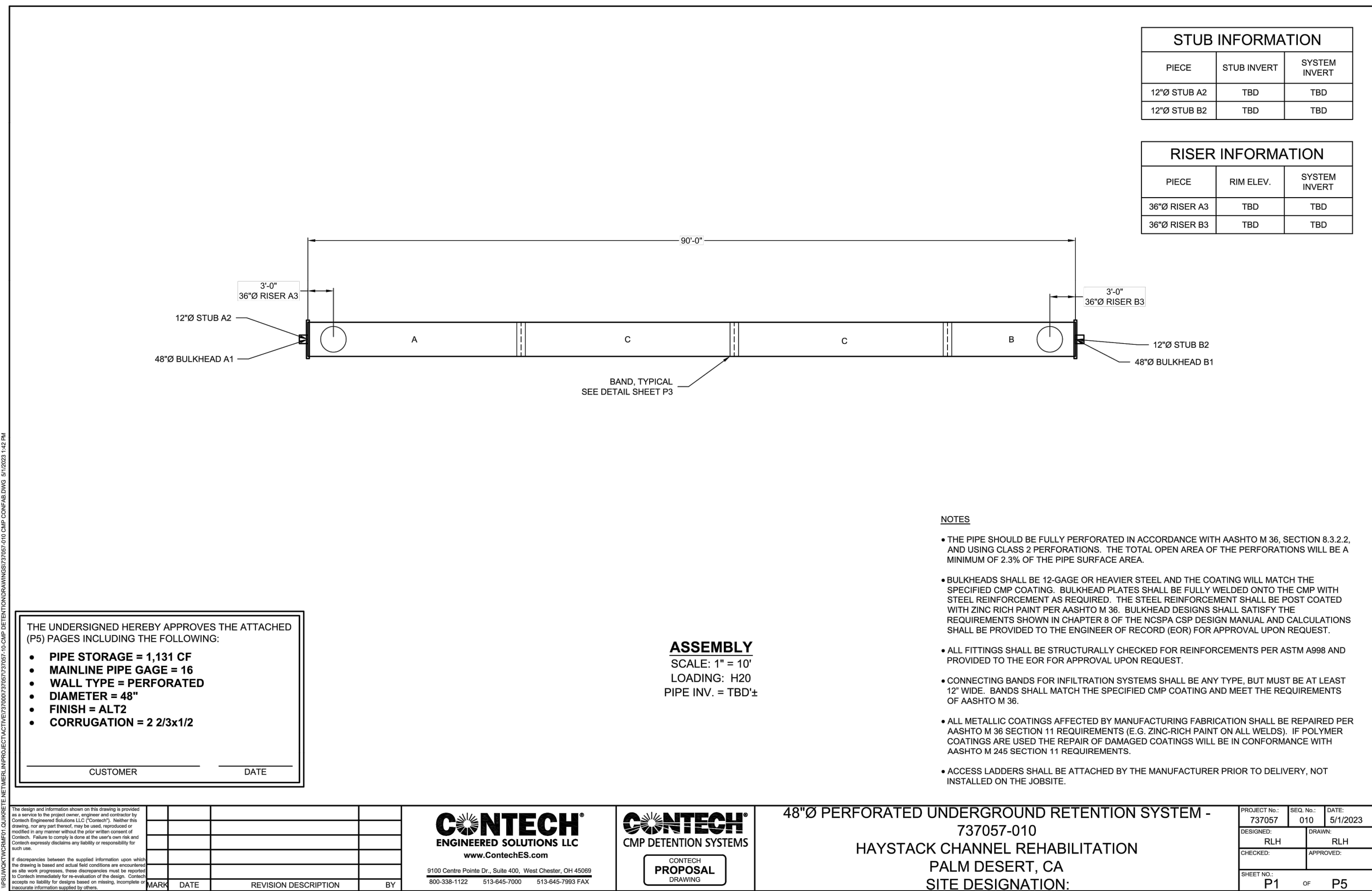
CITY OF PALM DESERT
 DEPARTMENT OF DEVELOPMENT SERVICES
 APPROVED BY:
 MARIA FRASERI, P.E.
 RCE #56005
 CITY ENGINEER
 REVIEWED AND RECOMMENDED BY: DATE

PLAN CHECKED BY:
 CIVIL
 TRAFFIC
 LANDSCAPE



CITY OF PALM DESERT
 HAYSTACK CHANNEL REHABILITATION
 CHANNEL IMPROVEMENT PLAN
 DETAILS

SHEET 12
 OF SHEETS 20
 CITY FILE NUMBER



DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-422-4133
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.

BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS SURVEY IS THE STATE PLANE COORDINATE SYSTEM NAD83 ZONE 6, AS DETERMINED LOCALLY BY THE LINE BETWEEN USC&GS STATIONS AC5161 AND DX0739.

THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

MARK	DATE	REVISION DESCRIPTION	BY

ENGINEERS SEAL
JOHN M. BRUDIN, R.C.E.
No. 41836
CIVIL
STATE OF CALIFORNIA

ERSC
Engineering Resources of Southern California
1861 West Redlands Blvd.
Redlands, CA 92373
P: 909.890.1255
F: 909.890.0995

PREPARED UNDER THE DIRECT SUPERVISION OF:
JOHN M. BRUDIN, R.C.E. 41836
DATE: EXP. 03/31/24

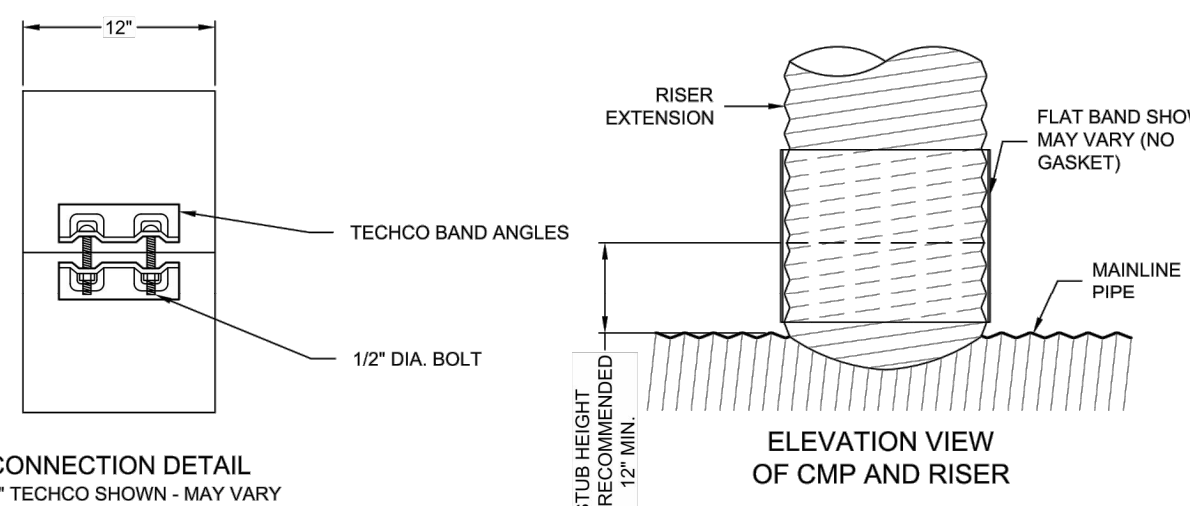
CITY OF PALM DESERT
DEPARTMENT OF DEVELOPMENT SERVICES
APPROVED BY:
MARIA FRASERI, P.E.
RCE #56005
CITY ENGINEER
DATE
REVIEWED AND RECOMMENDED BY: DATE

PLAN CHECKED BY:

CIVIL	
TRAFFIC	
LANDSCAPE	



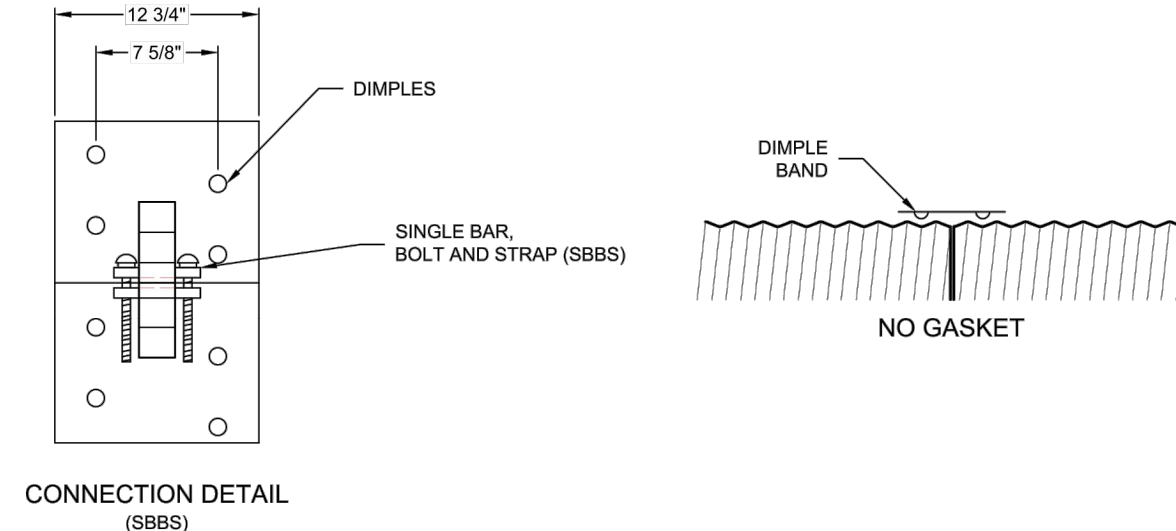
CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
INFILTRATION SYSTEM 1



PLAIN END CMP RISER PIPE

- GENERAL NOTES:
- DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.
 - JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
 - BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
 - IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.
 - BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" 2-PIECES
 - ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
 - MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
 - DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

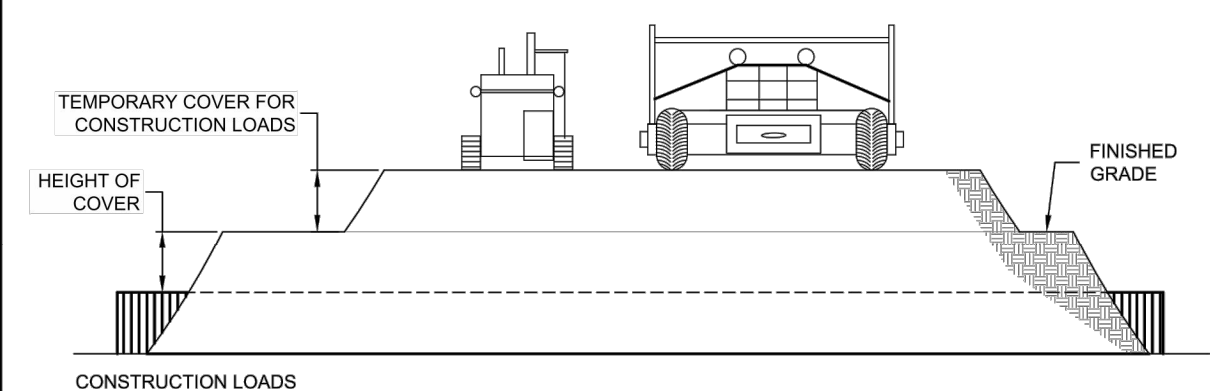
12" RISER BAND DETAIL
NOT TO SCALE



PLAIN END CMP PIPE

- GENERAL NOTES:
- JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
 - BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION, CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
 - BANDS ARE SHAPED TO MATCH THE PIPE-ARCH WHEN APPLICABLE.
 - BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" THRU 96" 2-PIECES
 - 102" THRU 144" 3-PIECES
 - BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
 - DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
 - ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

D-12 DIMPLE BAND DETAIL
NOT TO SCALE



PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-60	60-75	75-110	110-150
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM
NOT TO SCALE

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL
THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A923.

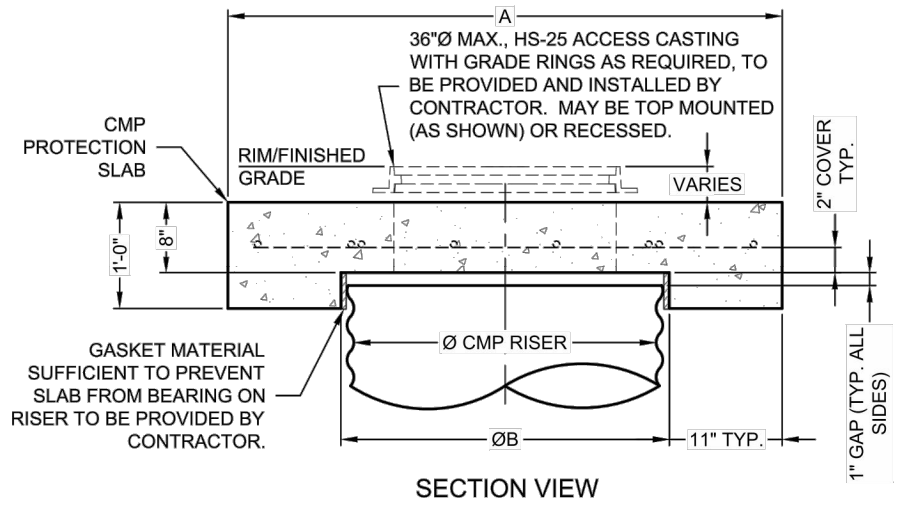
PIPE
THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A790. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA).

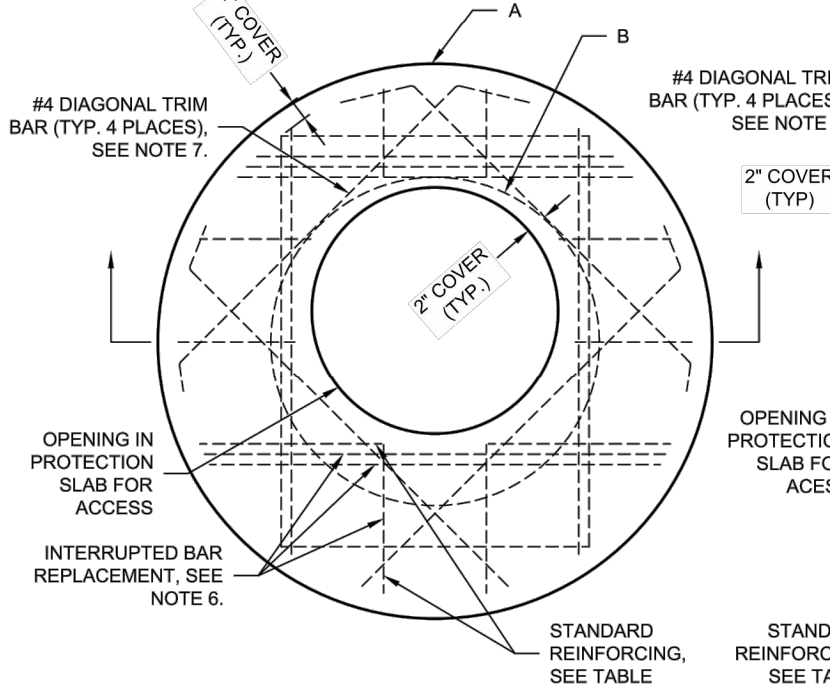
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

ANTI-FLOTATION PROVISIONS
DUE TO HIGH GROUNDWATER OR OTHER FLOTATION CONCERNS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.

MATERIAL SPECIFICATION
NOT TO SCALE



ACCESS CASTING NOT SUPPLIED BY CONTECH

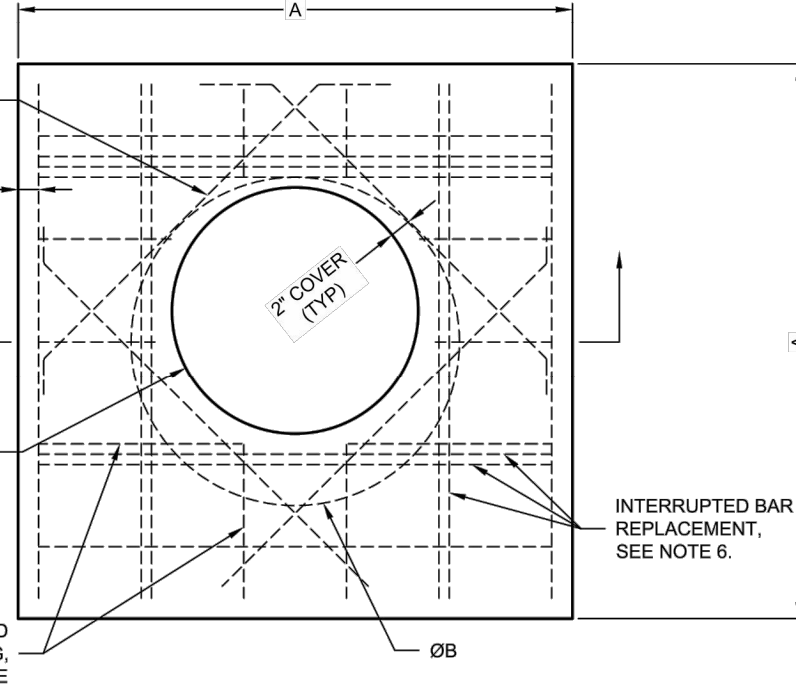


ROUND OPTION PLAN VIEW

- NOTES:
- DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND ACI 350.
 - DESIGN LOAD HS25.
 - EARTH COVER = 1' MAX.
 - CONCRETE STRENGTH = 4,000 psi
 - REINFORCING STEEL = ASTM A615, GRADE 60.
 - PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.

REINFORCING TABLE				
Ø CMP RISER	A	B Ø	REINFORCING	**BEARING PRESSURE (PSF)
24"	4'0"	26"	#5 @ 10" OCEW #5 @ 10" OCEW	2,540 1,800
30"	4'-6"	32"	#5 @ 10" OCEW #5 @ 9" OCEW	2,280 1,570
36"	5'0"	38"	#5 @ 9" OCEW #5 @ 8" OCEW	2,060 1,500
42"	5'-6"	44"	#5 @ 8" OCEW #5 @ 8" OCEW	1,490 1,370
48"	6'0"	50"	#5 @ 7" OCEW #5 @ 7" OCEW	1,210 1,270

** ASSUMED SOIL BEARING CAPACITY



SQUARE OPTION PLAN VIEW

- TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
- PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
- DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDWELL, NY.

MANHOLE CAP DETAIL
NOT TO SCALE

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH
ENGINEERED SOLUTIONS LLC
www.conteches.com

9100 Centre Pointe Dr., Suite 400, West Chester, OH 45399
800-338-1122 513-945-7000 513-945-7993 FAX

CONTECH
CMP DETENTION SYSTEMS
CONTECH
PROPOSAL DRAWING

PROJECT NO.	REQ. NO.	DATE
737057	010	5/1/2023

DESIGNED: RLH DRAWN: RLH
CHECKED: APPROVED:

SHEET NO. P4 OF P5

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MARK	DATE	REVISION DESCRIPTION	BY

CONTECH
ENGINEERED SOLUTIONS LLC
www.conteches.com

9100 Centre Pointe Dr., Suite 400, West Chester, OH 45399
800-338-1122 513-945-7000 513-945-7993 FAX

CONTECH
CMP DETENTION SYSTEMS
CONTECH
PROPOSAL DRAWING

48"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 737057-010

HAYSTACK CHANNEL REHABILITATION
PALM DESERT, CA
SITE DESIGNATION:

PROJECT NO. 737057 REQ. NO. 010 DATE 5/1/2023
DESIGNED: RLH DRAWN: RLH
CHECKED: APPROVED:
SHEET NO. P3 OF P5

DIG ALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-422-4133
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.

BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS SURVEY IS THE STATE PLANE COORDINATE SYSTEM NAD83 ZONE 6, AS DETERMINED LOCALLY BY THE LINE BETWEEN USC&GS STATIONS AC5161 AND DX0739.

THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

ENGINEER	MARK	BY	DATE

REVISIONS

CITY	APPR.	DATE

ENGINEERS SEAL
JOHN M. BRUDIN, R.C.E.
No. 41836
CIVIL
STATE OF CALIFORNIA

ERSC
Engineering Resources of Southern California

1861 West Redlands Blvd.
Redlands, CA 92373
P: 909.890.1255
F: 909.890.0995

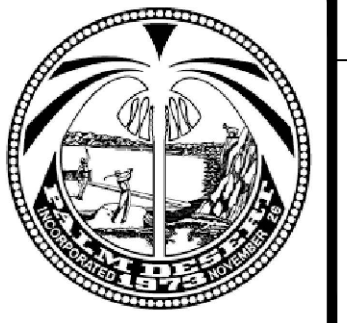
PREPARED UNDER THE DIRECT SUPERVISION OF:
JOHN M. BRUDIN, R.C.E. 41836 DATE: EXP. 03/31/24

CITY OF PALM DESERT
DEPARTMENT OF DEVELOPMENT SERVICES
APPROVED BY:
MARIA FRASERI, P.E.
RCE #56005
CITY ENGINEER

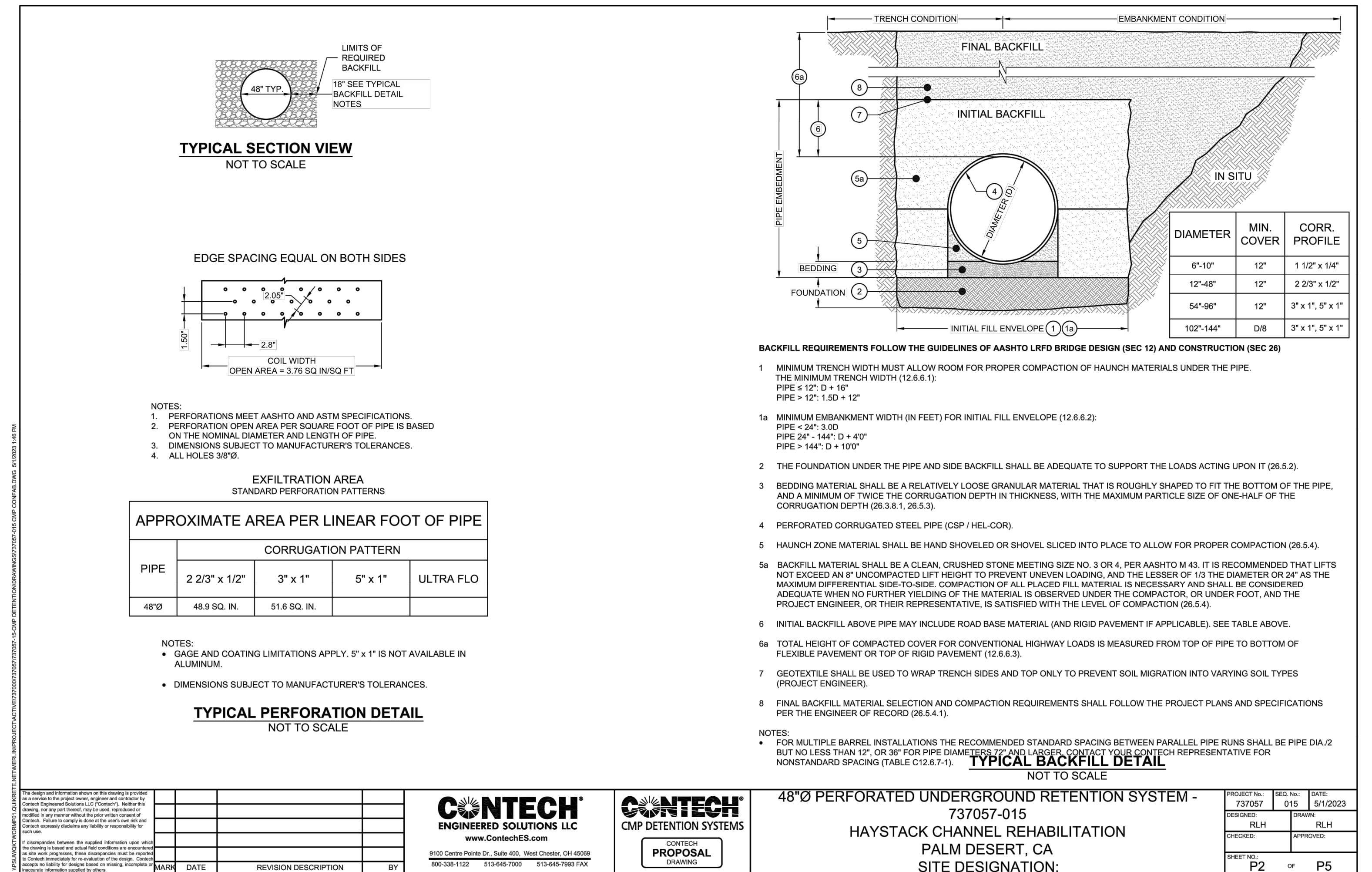
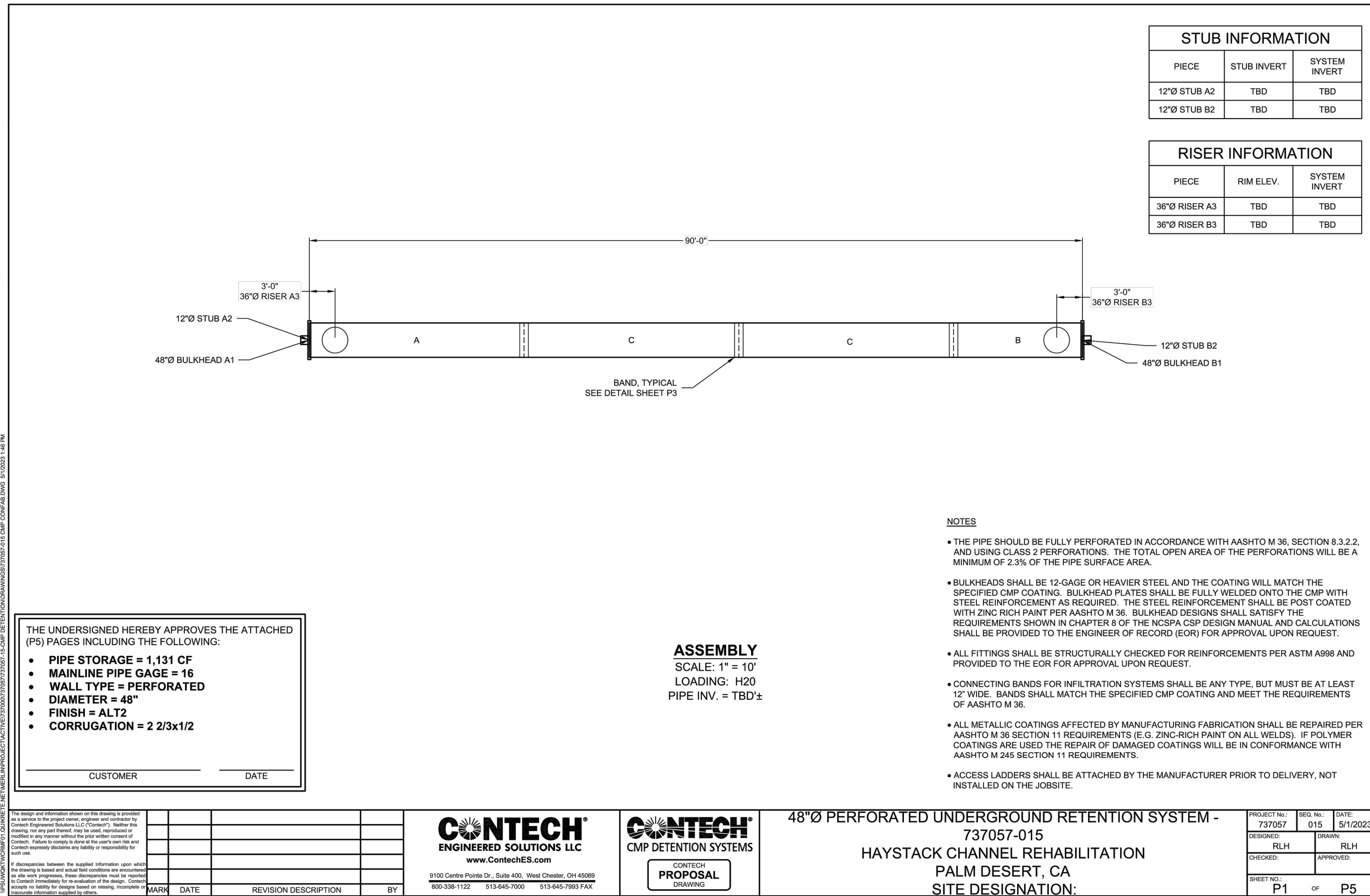
DATE: _____
REVIEWED AND RECOMMENDED BY: DATE: _____

PLAN CHECKED BY:

CIVIL	
TRAFFIC	
LANDSCAPE	



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
INFILTRATION SYSTEM 1



 3180 Central Express Dr., Suite 400, West Chester, OH 45380 800-338-1122 513-645-7900 513-645-7989 FAX	 CONTECH PROPOSAL DRAWING	48" PERFORATED UNDERGROUND RETENTION SYSTEM - 737057-015 HAYSTACK CHANNEL REHABILITATION PALM DESERT, CA SITE DESIGNATION:	PROJECT NO. 737057 SEQ. NO. 015 DATE 5/1/2023 DESIGNED: RLH DRAWN: RLH CHECKED: APPROVED: SHEET NO. P1 OF P5
		 3180 Central Express Dr., Suite 400, West Chester, OH 45380 800-338-1122 513-645-7900 513-645-7989 FAX	 CONTECH PROPOSAL DRAWING

DIAL BEFORE YOU DIG

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TOLL FREE 1-800-422-4133

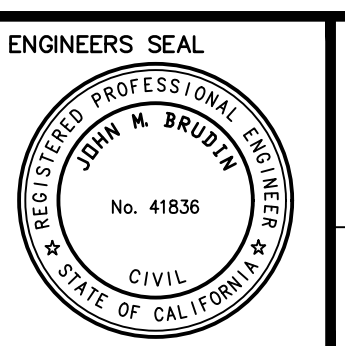
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.

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THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

MARK	ENGINEER	REVISIONS	CITY	ENGINEERS SEAL
BY	DATE		APPR.	DATE



1861 West Redlands Blvd., Redlands, CA 92373
 P: 909.890.1255
 F: 909.890.0995

DEPARTMENT OF DEVELOPMENT SERVICES
 APPROVED BY:

MARIA FRASERI, P.E.
 RCE #56005
 CITY ENGINEER

DATE _____

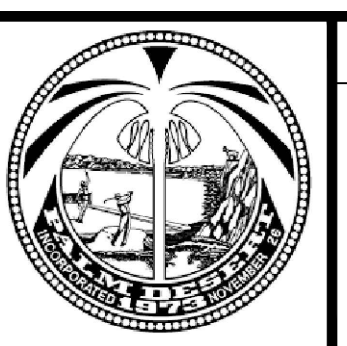
PREPARED UNDER THE DIRECT SUPERVISION OF:
 JOHN M. BRUDIN, R.C.E. 41836
 DATE: EXP. 03/31/24

PLAN CHECKED BY:

CIVIL _____

TRAFFIC _____

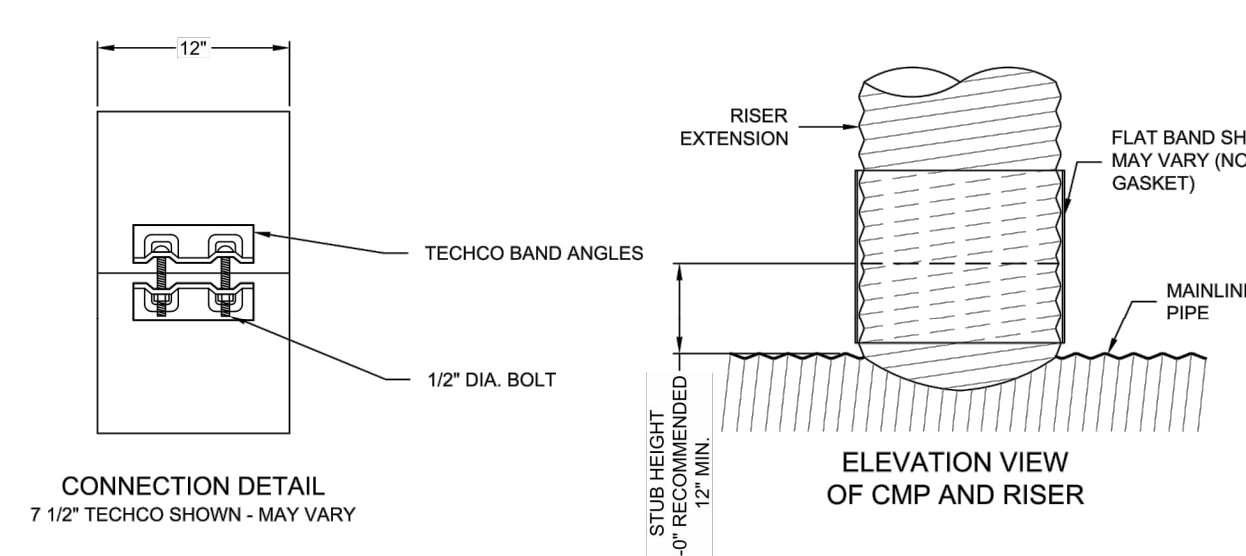
LANDSCAPE _____



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
INFILTRATION SYSTEM 2

SHEET 15 OF SHEETS 20

CITY FILE NUMBER _____

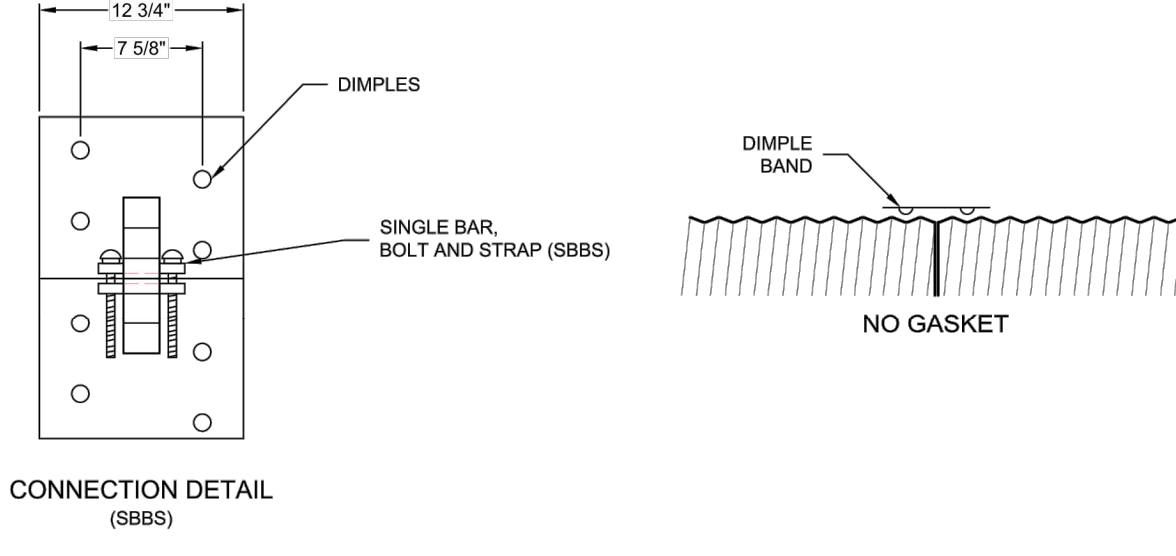


CONNECTION DETAIL
7 1/2" TECHCO SHOWN - MAY VARY

PLAIN END CMP RISER PIPE

- GENERAL NOTES:
- DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.
 - JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
 - BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
 - IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.
 - BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" 2-PIECES
 - ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
 - MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
 - DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

12" RISER BAND DETAIL
NOT TO SCALE

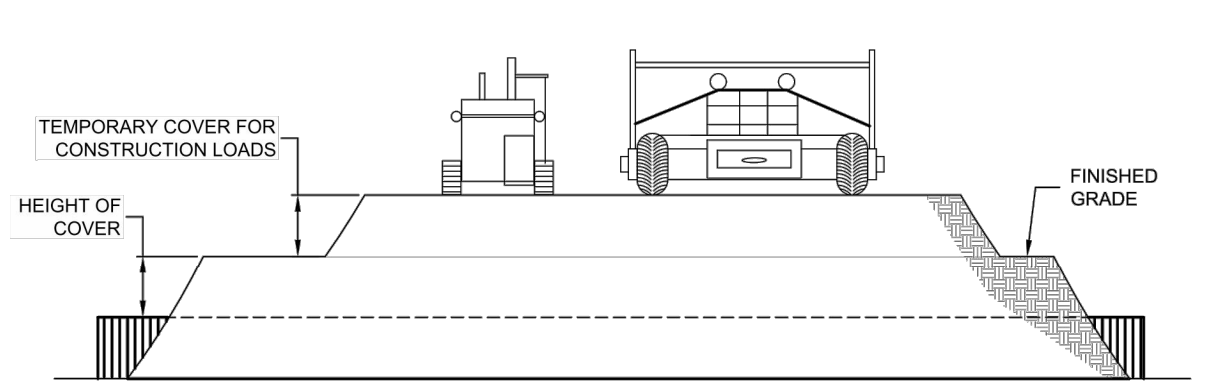


CONNECTION DETAIL
(SBS)

PLAIN END CMP PIPE

- GENERAL NOTES:
- JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
 - BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION. CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
 - BANDS ARE SHAPED TO MATCH THE PIPE-ARCH WHEN APPLICABLE.
 - BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" THRU 96" 2-PIECES
 - 102" THRU 144" 3-PIECES
 - BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
 - DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
 - ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

D-12 DIMPLE BAND DETAIL
NOT TO SCALE



CONSTRUCTION LOADING DIAGRAM
NOT TO SCALE

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	19-50	50-75	75-110	110-150
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
75-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE: THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL: THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A629.

PIPE: THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

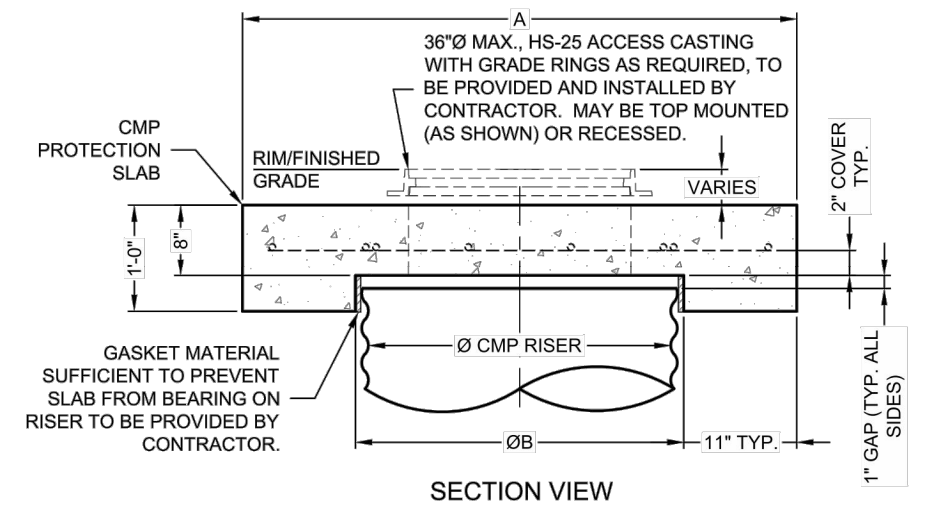
HANDLING AND ASSEMBLY: SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA).

INSTALLATION: SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

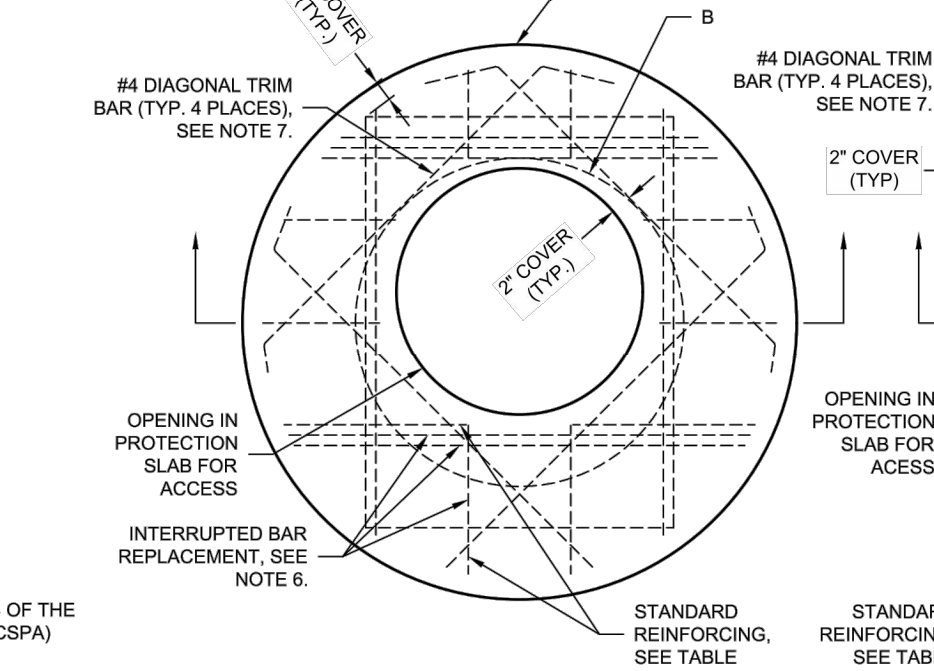
ANTI-FLOTATION PROVISIONS DUE TO HIGH GROUNDWATER OR OTHER FLOTATION CONCERNS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.

MATERIAL SPECIFICATION
NOT TO SCALE



SECTION VIEW

ACCESS CASTING NOT SUPPLIED BY CONTECH

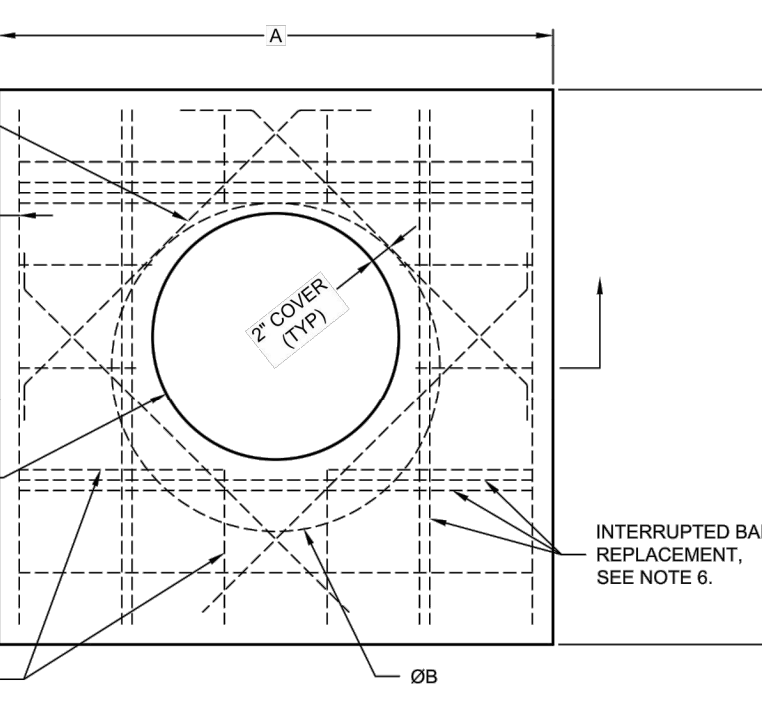


ROUND OPTION PLAN VIEW

- NOTES:
- DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND ACI 308.
 - DESIGN LOAD HS25.
 - EARTH COVER = 1' MAX.
 - CONCRETE STRENGTH = 4,000 psi
 - REINFORCING STEEL = ASTM A615, GRADE 60.
 - PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.

REINFORCING TABLE				
Ø CMP RISER	A	B Ø	REINFORCING	**BEARING PRESSURE (PSF)
24"	4'0"	26"	#5 @ 10" OCEW #5 @ 10" OCEW	2,540 1,900
30"	4'-6"	32"	#5 @ 10" OCEW #5 @ 9" OCEW	2,260 1,670
36"	5'0"	38"	#5 @ 8" OCEW #5 @ 8" OCEW	2,060 1,500
42"	5'-6"	44"	#5 @ 8" OCEW #5 @ 8" OCEW	1,490 1,370
48"	6'0"	50"	#5 @ 7" OCEW #5 @ 7" OCEW	1,210 1,270

** ASSUMED SOIL BEARING CAPACITY



SQUARE OPTION PLAN VIEW

- TRIM OPENING WITH DIAGONAL #4 BARS. EXTEND BARS A MINIMUM OF 12" BEYOND OPENING. BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
- PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
- DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDWELL, NY.

MANHOLE CAP DETAIL
NOT TO SCALE

CONTECH ENGINEERED SOLUTIONS LLC
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CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

48"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 737057-015
HAYSTACK CHANNEL REHABILITATION
PALM DESERT, CA
SITE DESIGNATION:

PROJECT NO. 737057 SEQ. NO. 015 DATE: 5/1/2023
DESIGNED BY: RLH DRAWN BY: RLH
CHECKED BY: APPROVED BY:
SHEET NO. P3 OF P5

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DESIGNED BY: RLH DRAWN BY: RLH
CHECKED BY: APPROVED BY:
SHEET NO. P4 OF P5

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BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.
BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS SURVEY IS THE STATE PLANE COORDINATE SYSTEM NAD83 ZONE 6, AS DETERMINED LOCALLY BY THE LINE BETWEEN USC&GS STATIONS AC5161 AND DX0739.
THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

ENGINEER	MARK	BY	DATE

REVISIONS	CITY	
NO.	APPR.	DATE

ENGINEERS SEAL
JOHN M. BRUDIN
No. 41836
CIVIL
STATE OF CALIFORNIA

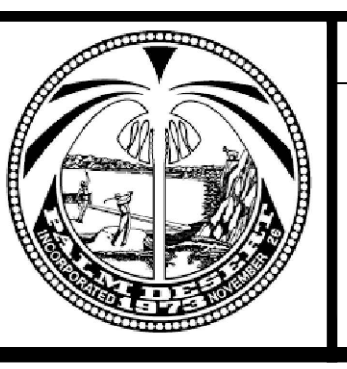
ERSC
1861 West Redlands Blvd.
Redlands, CA 92373
P: 909.890.1255
F: 909.890.0995

PREPARED UNDER THE DIRECT SUPERVISION OF:
JOHN M. BRUDIN, R.C.E. 41836
DATE: EXP. 03/31/24

CITY OF PALM DESERT
DEPARTMENT OF DEVELOPMENT SERVICES
APPROVED BY:
MARIA FRASERI, P.E.
RCE #56005
CITY ENGINEER
DATE
REVIEWED AND RECOMMENDED BY: DATE

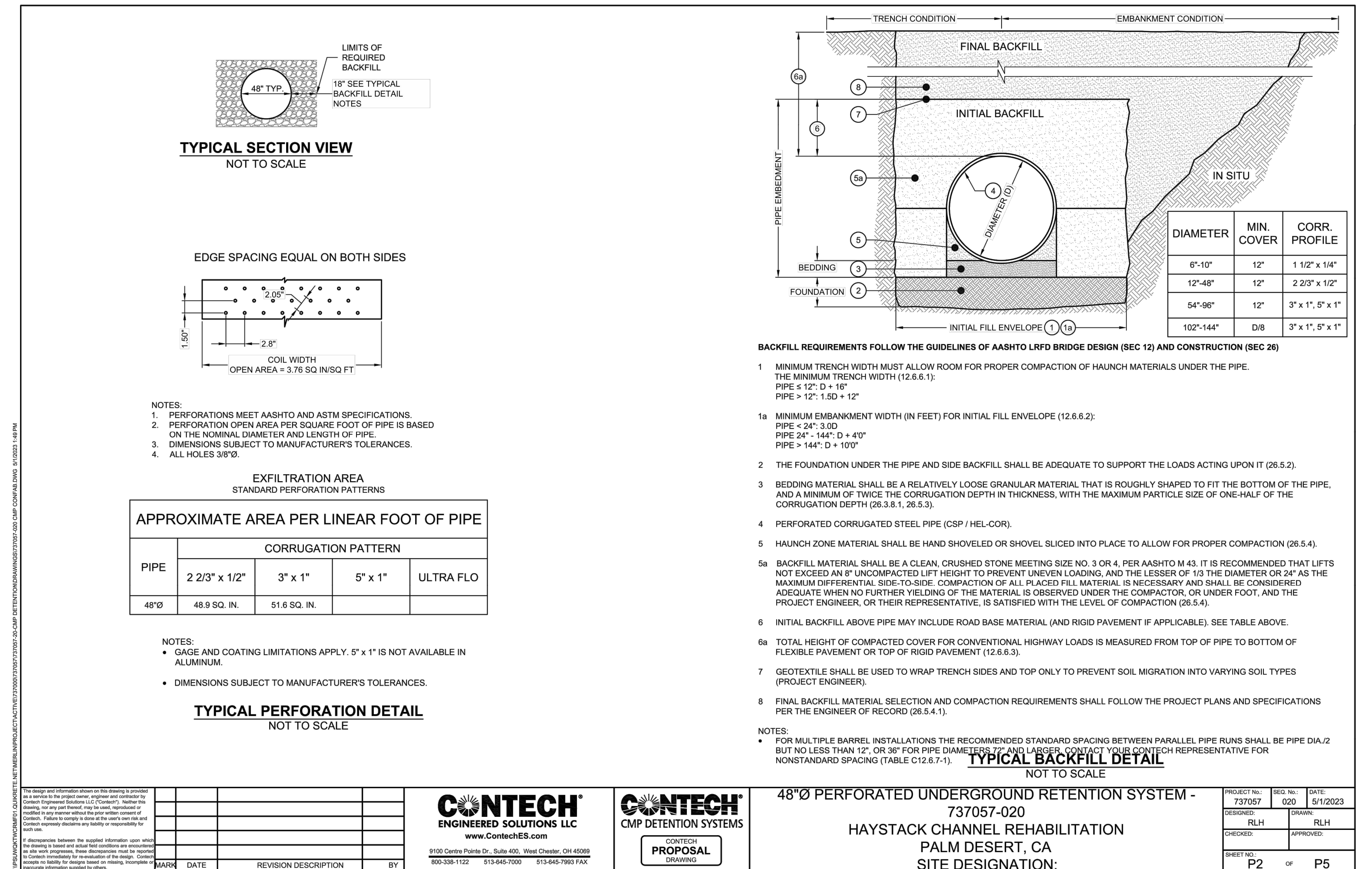
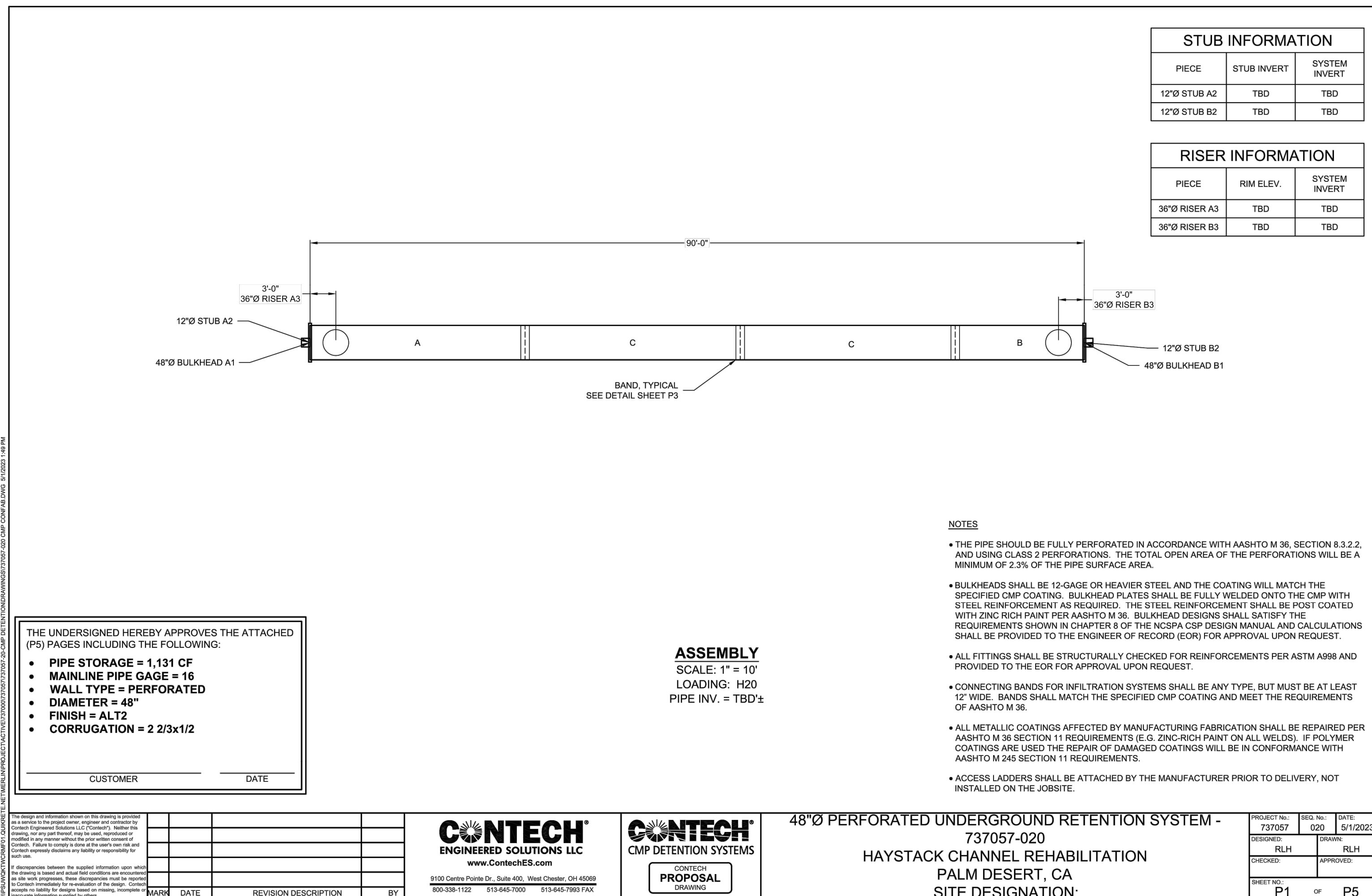
PLAN CHECKED BY:

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TRAFFIC	
LANDSCAPE	



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
INFILTRATION SYSTEM 2

SHEET 16
OF SHEETS 20
CITY FILE NUMBER



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BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.
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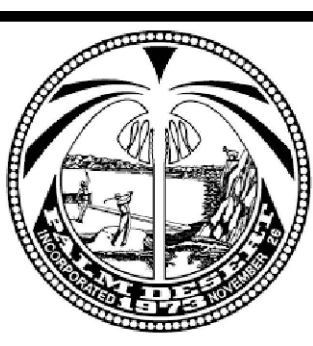
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JOHN M. BRUDIN, R.C.E.
No. 41836
CIVIL
STATE OF CALIFORNIA

ERSC
Engineering Resources of Southern California
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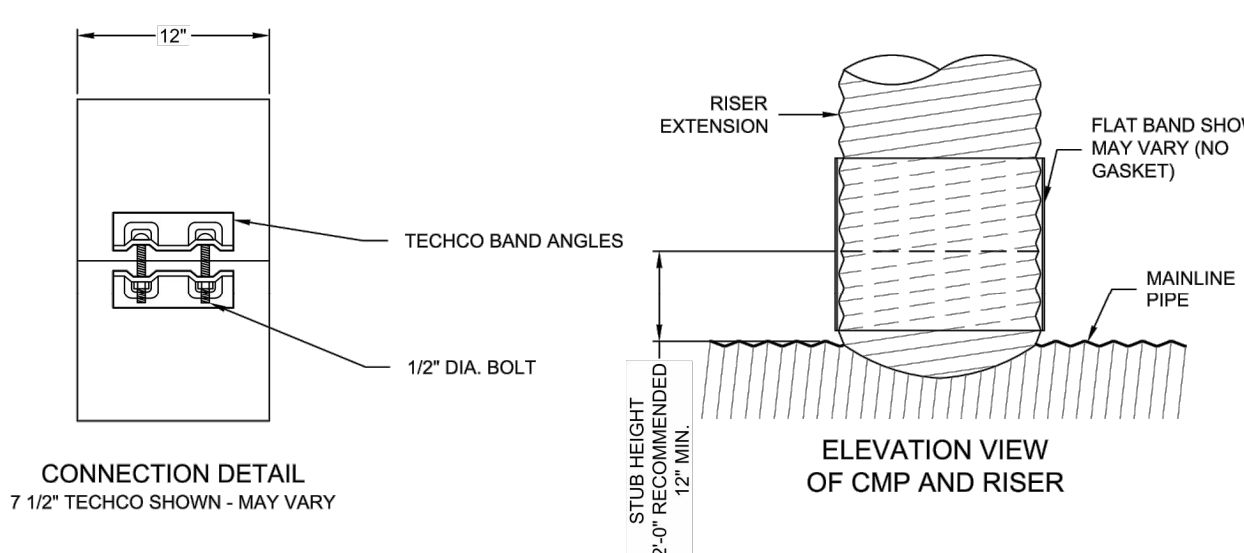
CITY OF PALM DESERT
DEPARTMENT OF DEVELOPMENT SERVICES
APPROVED BY:
MARIA FRASER, P.E.
RCE #56005
CITY ENGINEER
DATE
REVIEWED AND RECOMMENDED BY: DATE

PLAN CHECKED BY:
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LANDSCAPE



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
INFILTRATION SYSTEM 3

SHEET 17
OF SHEETS 20
CITY FILE NUMBER

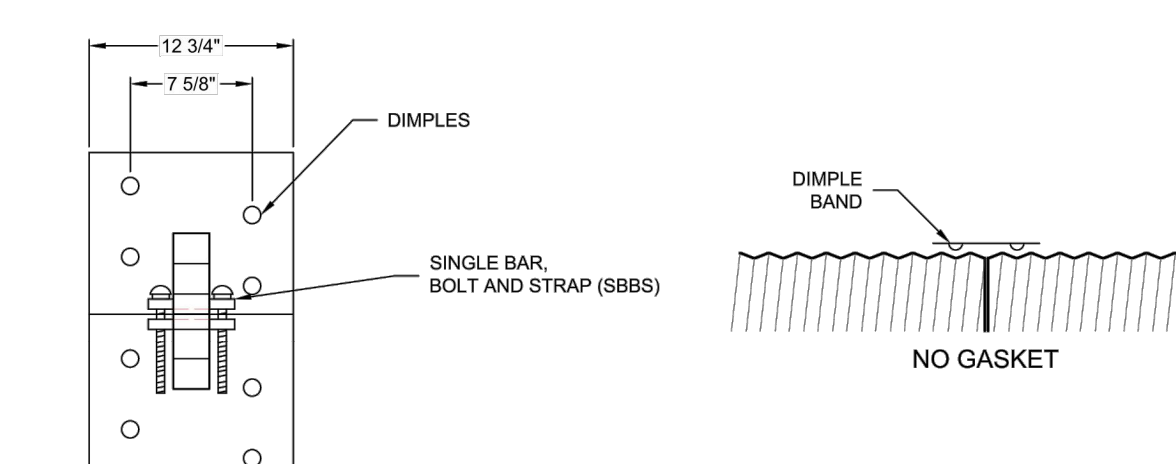


CONNECTION DETAIL
7 1/2" TECHCO SHOWN - MAY VARY

ELEVATION VIEW OF CMP AND RISER

STUB HEIGHT: 2'-0" RECOMMENDED
1/2" DIA. BOLT

TECHCO BAND ANGLES
RISER EXTENSION
FLAT BAND SHOW MAY VARY (NO GASKET)
MAINLINE PIPE



CONNECTION DETAIL (SBS)

12 3/4"
7 5/8"
DIMPLES
SINGLE BAR BOLT AND STRAP (SBS)
NO GASKET
DIMPLE BAND

PLAIN END CMP RISER PIPE

GENERAL NOTES:

- DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.
- JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
- BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
- IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.
- BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" 2-PIECES
- ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
- MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
- DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

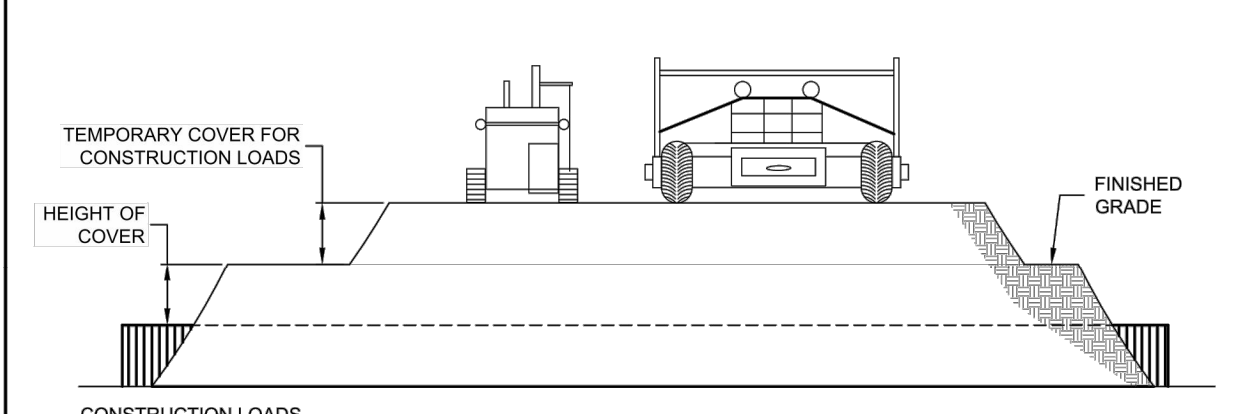
12" RISER BAND DETAIL
NOT TO SCALE

PLAIN END CMP PIPE

GENERAL NOTES:

- JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
- BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION, CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
- BANDS ARE SHAPED TO MATCH THE PIPE-ARCH WHEN APPLICABLE.
- BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" THRU 96" 2-PIECES
 - 102" THRU 144" 3-PIECES
- BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
- DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
- ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

D-12 DIMPLE BAND DETAIL
NOT TO SCALE



CONSTRUCTION LOADING DIAGRAM
NOT TO SCALE

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (Kips)			
	18-50	50-75	75-110	110-150
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM
NOT TO SCALE

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL
THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE
THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A790. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSIPA).

INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

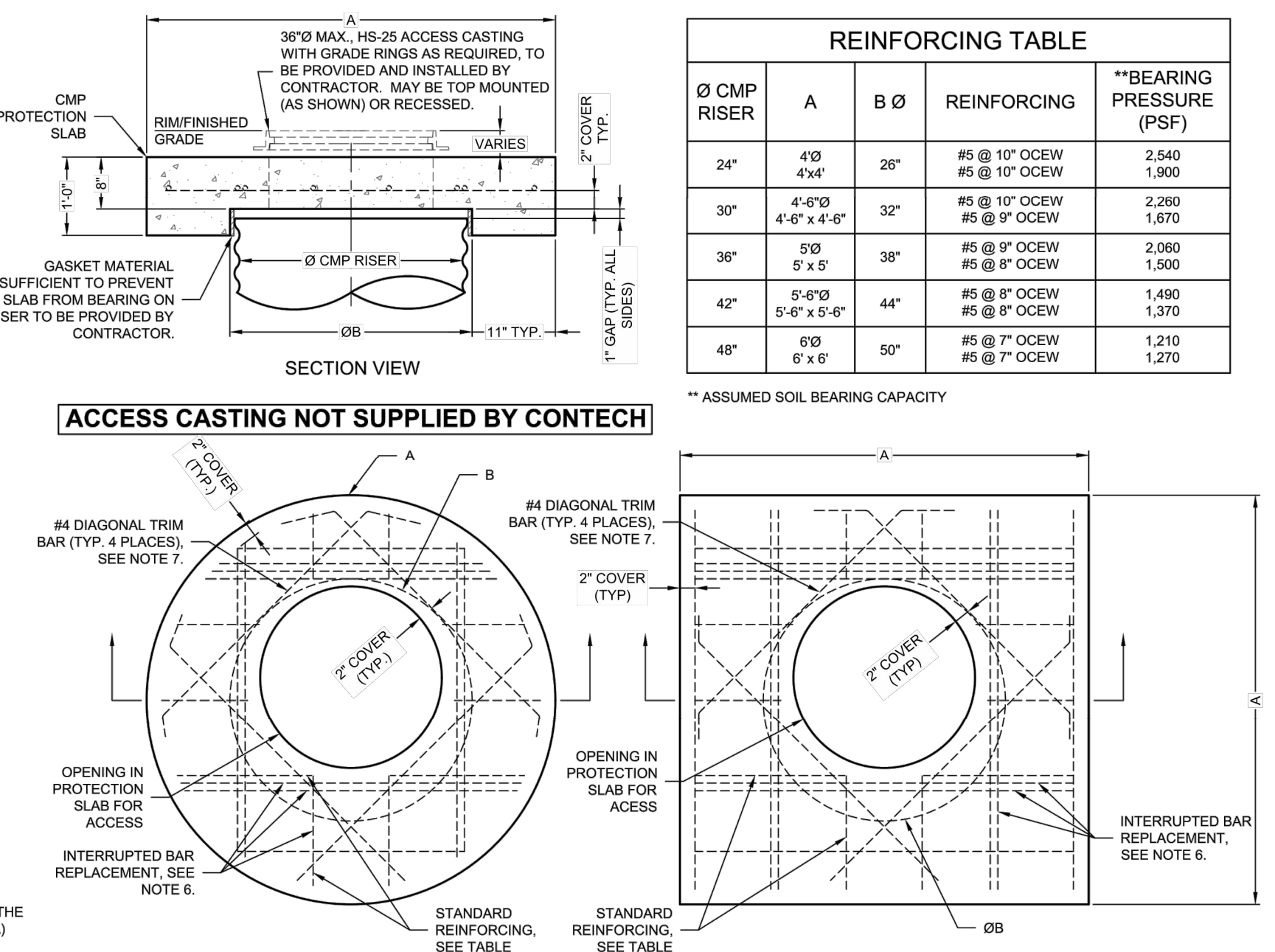
IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

ANTI-FLOTATION PROVISIONS DUE TO HIGH GROUNDWATER OR OTHER FLOTATION CONCERNS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.

MATERIAL SPECIFICATION
NOT TO SCALE

Ø CMP RISER	A	B Ø	REINFORCING	**BEARING PRESSURE (PSF)
24"	4'0"	26"	#5 @ 10" OCEW #5 @ 10" OCEW	2,540 1,900
30"	4'-6"Ø 4'-6" x 4'-6"	32"	#5 @ 10" OCEW #5 @ 9" OCEW	2,260 1,670
36"	5'0"	38"	#5 @ 8" OCEW #5 @ 8" OCEW	2,060 1,500
42"	5'-6"Ø 5'-6" x 5'-6"	44"	#5 @ 8" OCEW #5 @ 8" OCEW	1,490 1,370
48"	6'0"	50"	#5 @ 7" OCEW #5 @ 7" OCEW	1,210 1,270

** ASSUMED SOIL BEARING CAPACITY



ACCESS CASTING NOT SUPPLIED BY CONTECH

ROUND OPTION PLAN VIEW

SQUARE OPTION PLAN VIEW

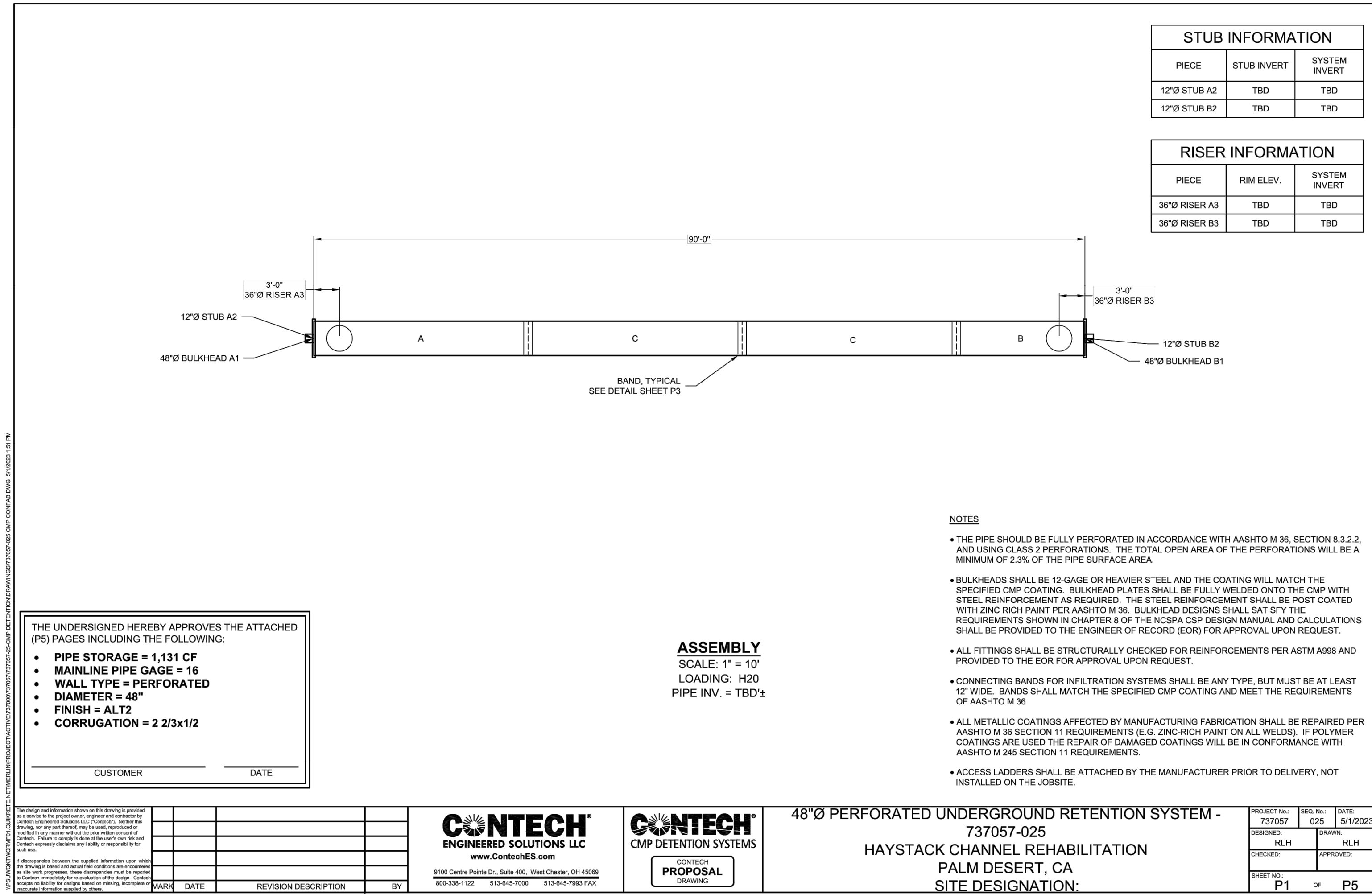
MANHOLE CAP DETAIL
NOT TO SCALE

NOTES:

- DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND ACI 350.
- DESIGN LOAD HS25.
- EARTH COVER = 1' MAX.
- CONCRETE STRENGTH = 4,000 psi
- REINFORCING STEEL = ASTM A615, GRADE 60.
- PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
- TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
- PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
- DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDWELL, NY.

CONTECH ENGINEERED SOLUTIONS LLC www.conteches.com	CONTECH CMP DETENTION SYSTEMS	48"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 737057-020 HAYSTACK CHANNEL REHABILITATION PALM DESERT, CA SITE DESIGNATION:	PROJECT NO: 737057 DESIGNED: RLM CHECKED: RLM SHEET NO: P3 OF P5	REV. NO: 020 DATE: 5/1/2023	CONTECH ENGINEERED SOLUTIONS LLC www.conteches.com	CONTECH CMP DETENTION SYSTEMS	48"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 737057-020 HAYSTACK CHANNEL REHABILITATION PALM DESERT, CA SITE DESIGNATION:
1930 Canby Pointe Dr., Suite 403, West Chester, OH 45390 800-338-1122 513-646-7000 513-646-7993 FAX	CONTECH PROPOSAL DRAWING				1930 Canby Pointe Dr., Suite 403, West Chester, OH 45390 800-338-1122 513-646-7000 513-646-7993 FAX	CONTECH PROPOSAL DRAWING	PROJECT NO: 737057 DESIGNED: RLM CHECKED: RLM SHEET NO: P4 OF P5

DIG ALERT DIAL BEFORE YOU DIG TWO WORKING DAYS BEFORE YOU DIG TOLL FREE 1-800-422-4133 A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT	BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL. BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS SURVEY IS THE STATE PLANE COORDINATE SYSTEM NAD83 ZONE 6, AS DETERMINED LOCALLY BY THE LINE BETWEEN USC&GS STATIONS AC5161 AND DX0739. THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.	ENGINEER BY: [] DATE: []	REVISIONS	CITY APPR. DATE	ENGINEERS SEAL No. 41836 CIVIL	ERSC Engineering Resources of Southern California 1861 West Redlands Blvd. Redlands, CA 92373 P: 909.890.1255 F: 909.890.0995	CITY OF PALM DESERT DEPARTMENT OF DEVELOPMENT SERVICES APPROVED BY: MARIA FRASERI, P.E. RCE #56005 CITY ENGINEER DATE: []	PLAN CHECKED BY: CIVIL TRAFFIC LANDSCAPE	CITY OF PALM DESERT HAYSTACK CHANNEL REHABILITATION CHANNEL IMPROVEMENT PLAN INFILTRATION SYSTEM 3	SHEET 18 OF SHEETS 20 CITY FILE NUMBER
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THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (P5) PAGES INCLUDING THE FOLLOWING:

- PIPE STORAGE = 1,131 CF
- MAINLINE PIPE GAGE = 16
- WALL TYPE = PERFORATED
- DIAMETER = 48"
- FINISH = ALT2
- CORRUGATION = 2 2/3 x 1/2

CUSTOMER _____ DATE _____

- NOTES**
- THE PIPE SHOULD BE FULLY PERFORATED IN ACCORDANCE WITH AASHTO M 36, SECTION 8.3.2.2 AND USING CLASS 2 PERFORATIONS. THE TOTAL OPEN AREA OF THE PERFORATIONS WILL BE A MINIMUM OF 2.3% OF THE PIPE SURFACE AREA.
 - BULKHEADS SHALL BE 12-GAUGE OR HEAVIER STEEL AND THE COATING WILL MATCH THE SPECIFIED CMP COATING. BULKHEAD PLATES SHALL BE FULLY WELDED ONTO THE CMP WITH STEEL REINFORCEMENT AS REQUIRED. THE STEEL REINFORCEMENT SHALL BE POST COATED WITH ZINC RICH PAINT PER AASHTO M 36. BULKHEAD DESIGNS SHALL SATISFY THE REQUIREMENTS SHOWN IN CHAPTER 9 OF THE NCSIPA CSP DESIGN MANUAL AND CALCULATIONS SHALL BE PROVIDED TO THE ENGINEER OF RECORD (EOR) FOR APPROVAL UPON REQUEST.
 - ALL FITTINGS SHALL BE STRUCTURALLY CHECKED FOR REINFORCEMENTS PER ASTM A998 AND PROVIDED TO THE EOR FOR APPROVAL UPON REQUEST.
 - CONNECTING BANDS FOR INFILTRATION SYSTEMS SHALL BE ANY TYPE, BUT MUST BE AT LEAST 12" WIDE. BANDS SHALL MATCH THE SPECIFIED CMP COATING AND MEET THE REQUIREMENTS OF AASHTO M 36.
 - ALL METALLIC COATINGS AFFECTED BY MANUFACTURING FABRICATION SHALL BE REPAIRED PER AASHTO M 36 SECTION 11 REQUIREMENTS (E.G. ZINC-RICH PAINT ON ALL WELDS). IF POLYMER COATINGS ARE USED THE REPAIR OF DAMAGED COATINGS WILL BE IN CONFORMANCE WITH AASHTO M 245 SECTION 11 REQUIREMENTS.
 - ACCESS LADDERS SHALL BE ATTACHED BY THE MANUFACTURER PRIOR TO DELIVERY, NOT INSTALLED ON THE JOBSITE.

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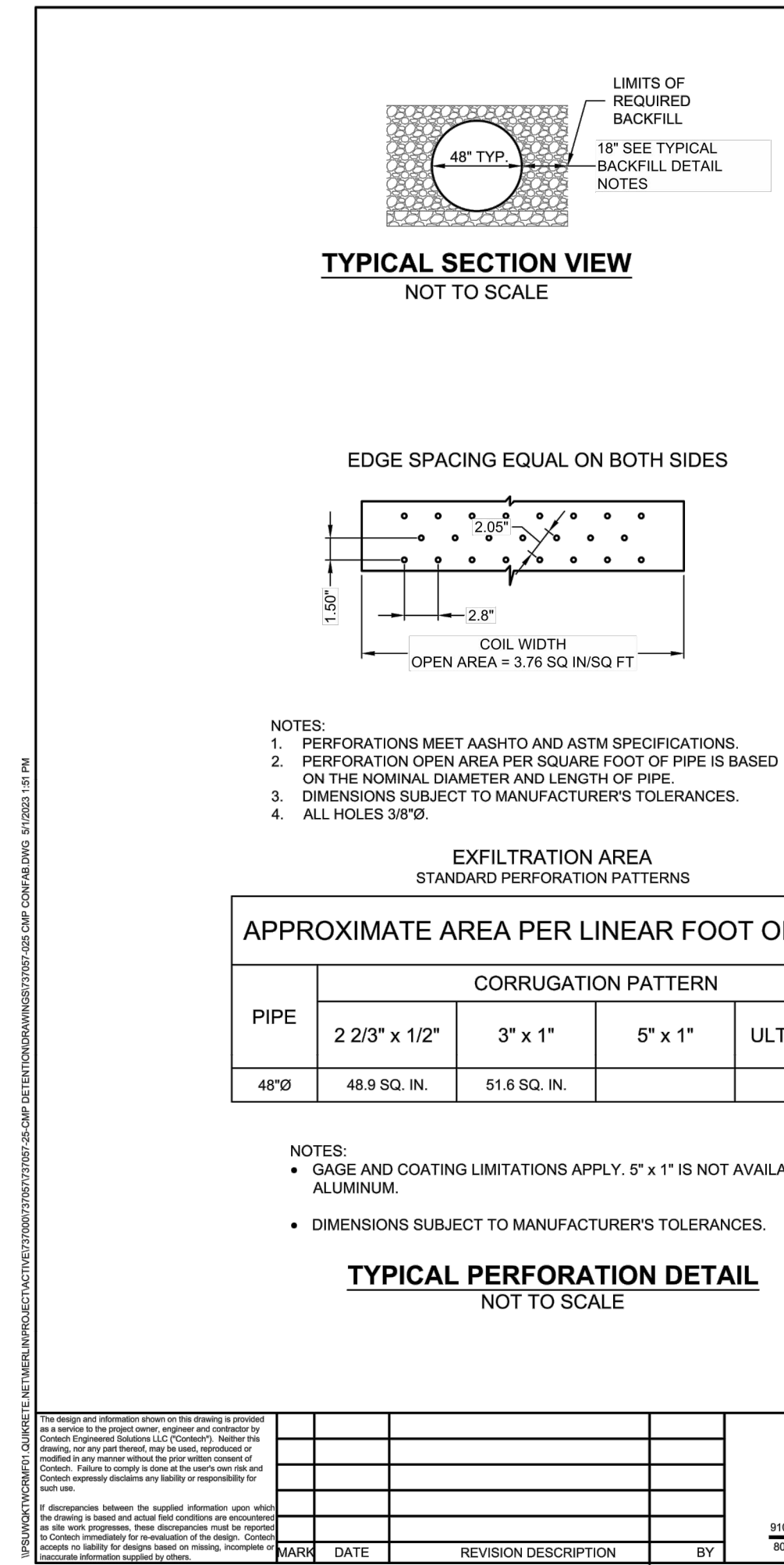
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48"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 737057-025
HAYSTACK CHANNEL REHABILITATION
PALM DESERT, CA
SITE DESIGNATION:

PROJECT No. 737057, SEQ No. 025, DATE 5/1/2023
DESIGNED: RLH, DRAWN: RLH
CHECKED: APPROVED:
SHEET No. P1 OF P5



- NOTES**
- PERFORATIONS MEET AASHTO AND ASTM SPECIFICATIONS.
 - PERFORATION OPEN AREA PER SQUARE FOOT OF PIPE IS BASED ON THE NOMINAL DIAMETER AND LENGTH OF PIPE.
 - DIMENSIONS SUBJECT TO MANUFACTURER'S TOLERANCES.
 - ALL HOLES 3/8"Ø.
- EXFILTRATION AREA STANDARD PERFORATION PATTERNS**
- NOTES:**
- GAGE AND COATING LIMITATIONS APPLY. 5" x 1" IS NOT AVAILABLE IN ALUMINUM.
 - DIMENSIONS SUBJECT TO MANUFACTURER'S TOLERANCES.

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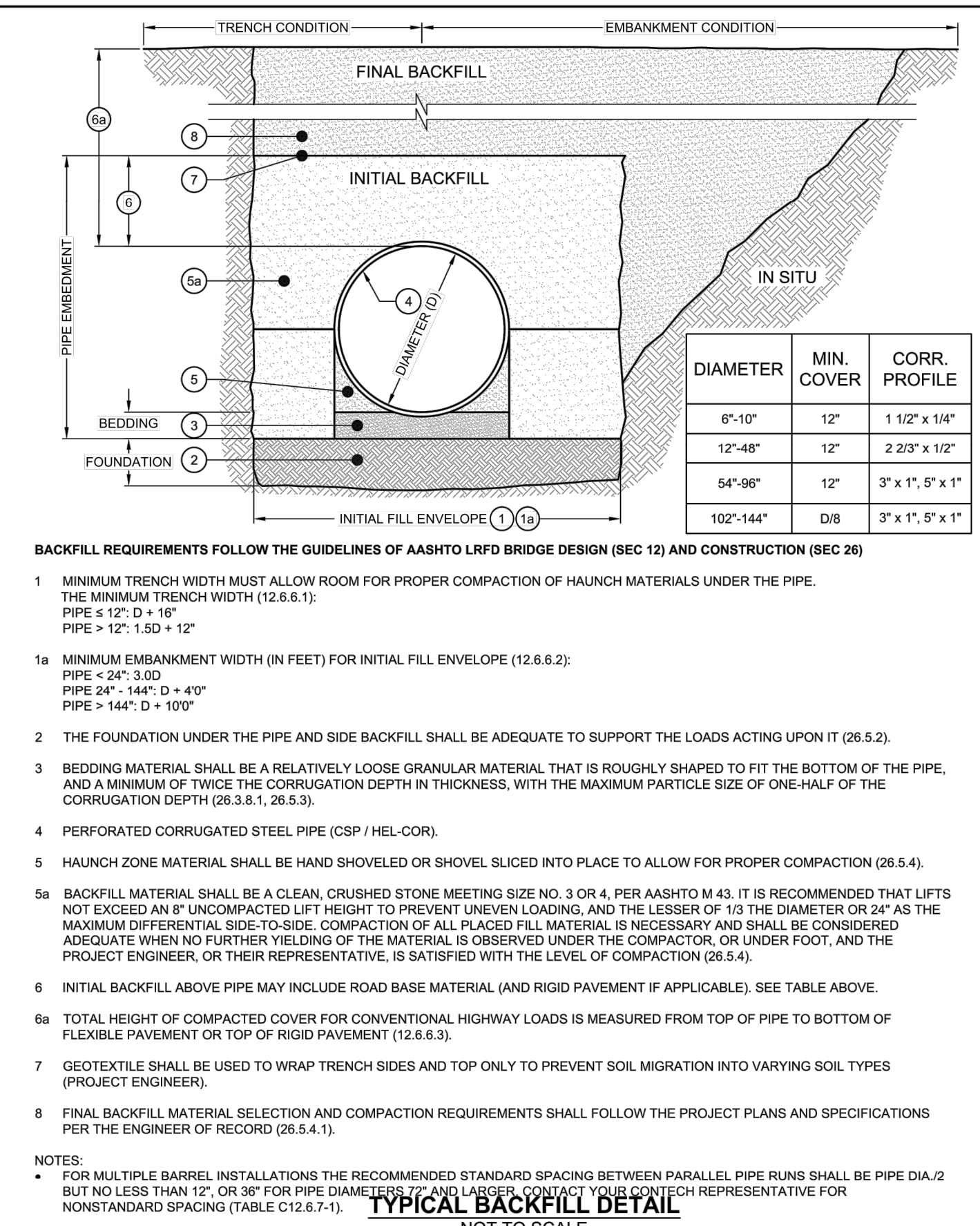
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PALM DESERT, CA
SITE DESIGNATION:

PROJECT No. 737057, SEQ No. 025, DATE 5/1/2023
DESIGNED: RLH, DRAWN: RLH
CHECKED: APPROVED:
SHEET No. P2 OF P5



- BACKFILL REQUIREMENTS FOLLOW THE GUIDELINES OF AASHTO LRFD BRIDGE DESIGN (SEC 12) AND CONSTRUCTION (SEC 26)**
- MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE MINIMUM TRENCH WIDTH (12.6.6.1):
PIPE ≤ 12" : D + 16"
PIPE > 12" : 1.5D + 12"
 - MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE (12.6.6.2):
PIPE < 24" : 3.0D
PIPE 24" - 144" : D + 40"
PIPE > 144" : D + 100"
 - THE FOUNDATION UNDER THE PIPE AND SIDE BACKFILL SHALL BE ADEQUATE TO SUPPORT THE LOADS ACTING UPON IT (26.5.2).
 - BEDDING MATERIAL SHALL BE A RELATIVELY LOOSE GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, AND A MINIMUM OF TWICE THE CORRUGATION DEPTH IN THICKNESS, WITH THE MAXIMUM PARTICLE SIZE OF ONE-HALF OF THE CORRUGATION DEPTH (26.5.8.1, 26.5.3).
 - PERFORATED CORRUGATED STEEL PIPE (CSP / HEL-COR).
 - HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION (26.5.4).
 - BACKFILL MATERIAL SHALL BE A CLEAN, CRUSHED STONE MEETING SIZE NO. 3 OR 4, PER AASHTO M 43. IT IS RECOMMENDED THAT LIFTS NOT EXCEED AN 8" UNCOMPACTED LIFT HEIGHT TO PREVENT UNIFORM LOADING, AND THE LESSER OF 1/3 THE DIAMETER OR 24" AS THE MAXIMUM DIFFERENTIAL SIDE-TO-SIDE. COMPACTION OF ALL PLACED FILL MATERIAL IS NECESSARY AND SHALL BE CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE PROJECT ENGINEER, OR THEIR REPRESENTATIVE, IS SATISFIED WITH THE LEVEL OF COMPACTION (26.5.4).
 - INITIAL BACKFILL ABOVE PIPE MAY INCLUDE ROAD BASE MATERIAL (AND RIGID PAVEMENT IF APPLICABLE). SEE TABLE ABOVE.
 - TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT (12.6.6.3).
 - GEOTEXTILE SHALL BE USED TO WRAP TRENCH SIDES AND TOP ONLY TO PREVENT SOIL MIGRATION INTO VARYING SOIL TYPES (PROJECT ENGINEER).
 - FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD (26.5.4.1).
- NOTES:**
- FOR MULTIPLE BARREL INSTALLATIONS THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE PIPE DIA./2 BUT NO LESS THAN 12", OR 36" FOR PIPE DIAMETERS 12" AND LARGER. CONSULT THE PROJECT ENGINEER REPRESENTATIVE FOR NONSTANDARD SPACING (TABLE C12.6.7-1).

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THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

ENGINEER	BY	DATE	REVISIONS	CITY	APPR.	DATE

ENGINEERS SEAL
JOHN M. BRUDIN, R.C.E.
No. 41836
CIVIL
STATE OF CALIFORNIA

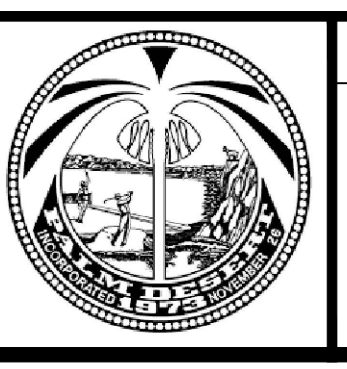
ERSC
Engineering Resources of Southern California

1861 West Redlands Blvd.
Redlands, CA 92373
P: 909.890.1255
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PREPARED UNDER THE DIRECT SUPERVISION OF:
JOHN M. BRUDIN, R.C.E. 41836 DATE: EXP. 03/31/24

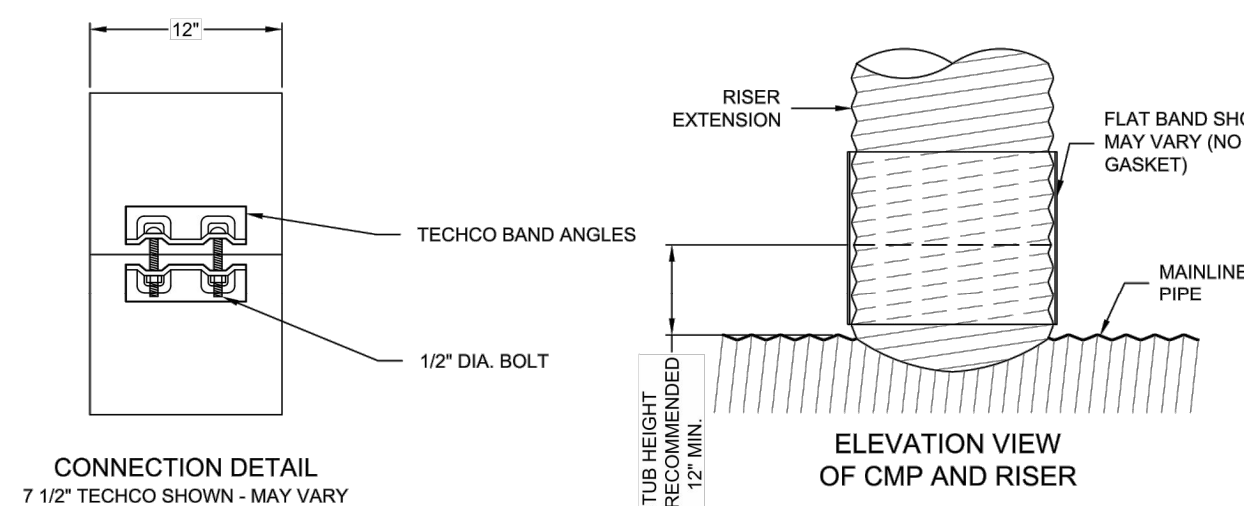
CITY OF PALM DESERT
DEPARTMENT OF DEVELOPMENT SERVICES
APPROVED BY:
MARIA FRASERI, P.E.
RCE #56005
CITY ENGINEER
DATE: _____
REVIEWED AND RECOMMENDED BY: DATE: _____

PLAN CHECKED BY:
CIVIL
TRAFFIC
LANDSCAPE



CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
INFILTRATION SYSTEM 4

SHEET 19 OF SHEETS 20
CITY FILE NUMBER

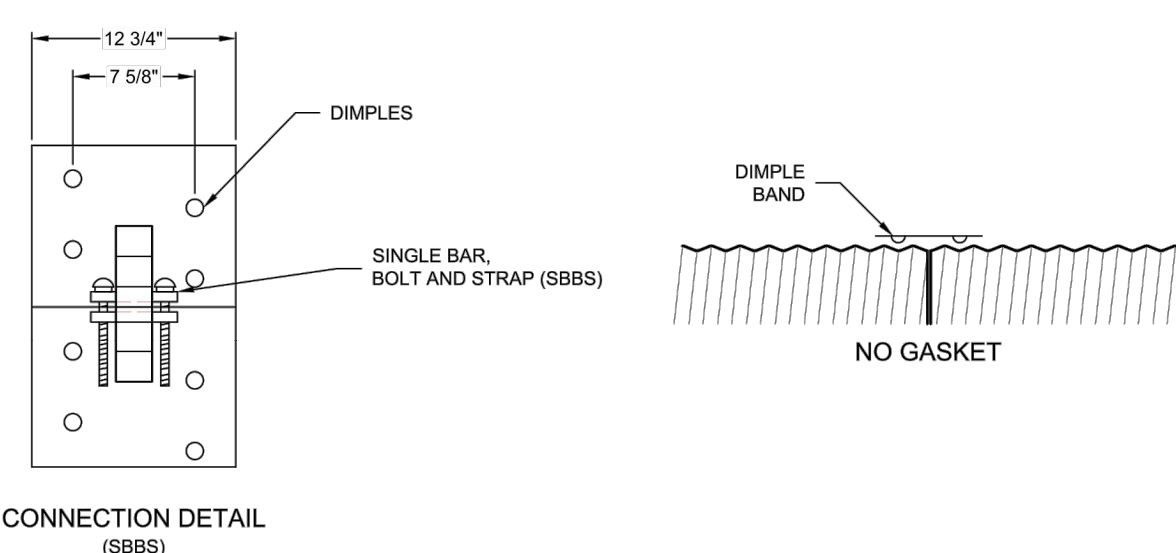


CONNECTION DETAIL
7 1/2" TECHCO SHOWN - MAY VARY

PLAIN END CMP RISER PIPE

- GENERAL NOTES:
- DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.
 - JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 28.4.2.4.
 - BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
 - IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.
 - BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" 2-PIECES
 - ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
 - MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
 - DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

12" RISER BAND DETAIL
NOT TO SCALE

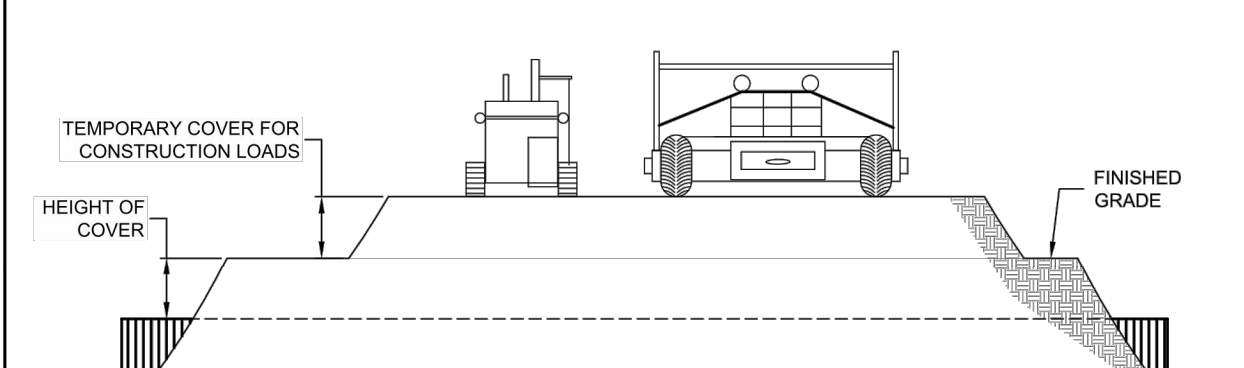


CONNECTION DETAIL
(SBSBS)

PLAIN END CMP PIPE

- GENERAL NOTES:
- JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 28.4.2.4.
 - BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION. CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
 - BANDS ARE SHAPED TO MATCH THE PIPE ARCH WHEN APPLICABLE.
 - BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 - 12" THRU 48" 1-PIECE
 - 54" THRU 96" 2-PIECES
 - 102" THRU 144" 3-PIECES
 - BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
 - DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
 - ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

D-12 DIMPLE BAND DETAIL
NOT TO SCALE



CONSTRUCTION LOADS
FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (Kips)			
	18-50	50-75	75-110	110-150
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

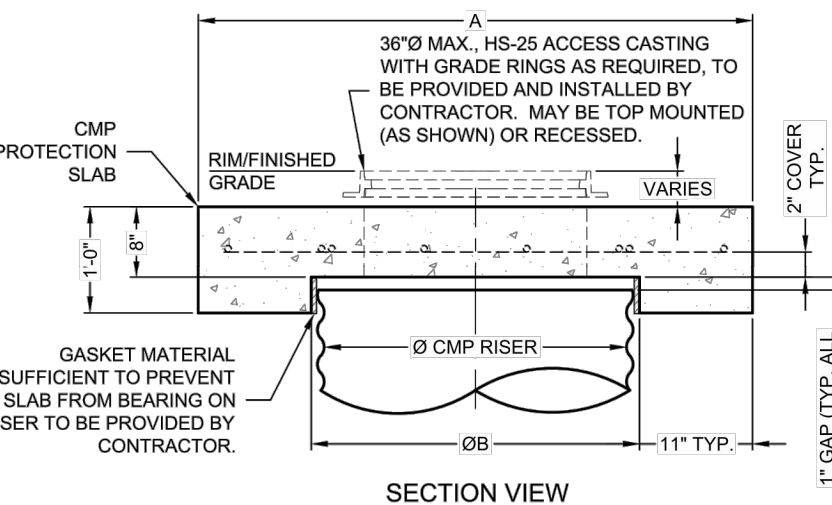
*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM
NOT TO SCALE

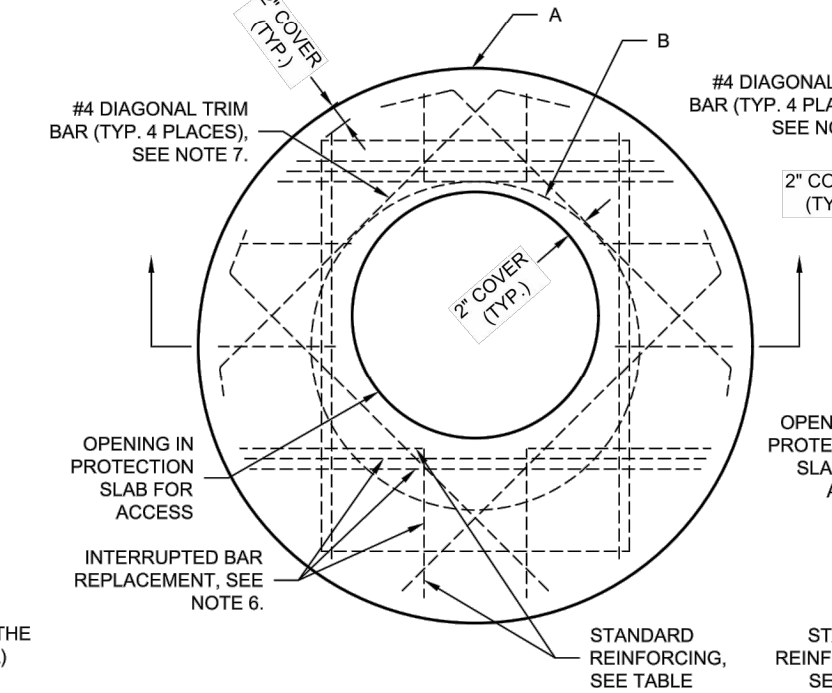
SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

- SCOPE: THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.
- MATERIAL: THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A829.
- PIPE: THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.
- ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.
- HANDLING AND ASSEMBLY: SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSIPA).
- INSTALLATION: SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 28, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.
- IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.
- ANTI-FLOTATION PROVISIONS DUE TO HIGH GROUNDWATER OR OTHER FLOTATION CONCERNS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.

MATERIAL SPECIFICATION
NOT TO SCALE



ACCESS CASTING NOT SUPPLIED BY CONTECH

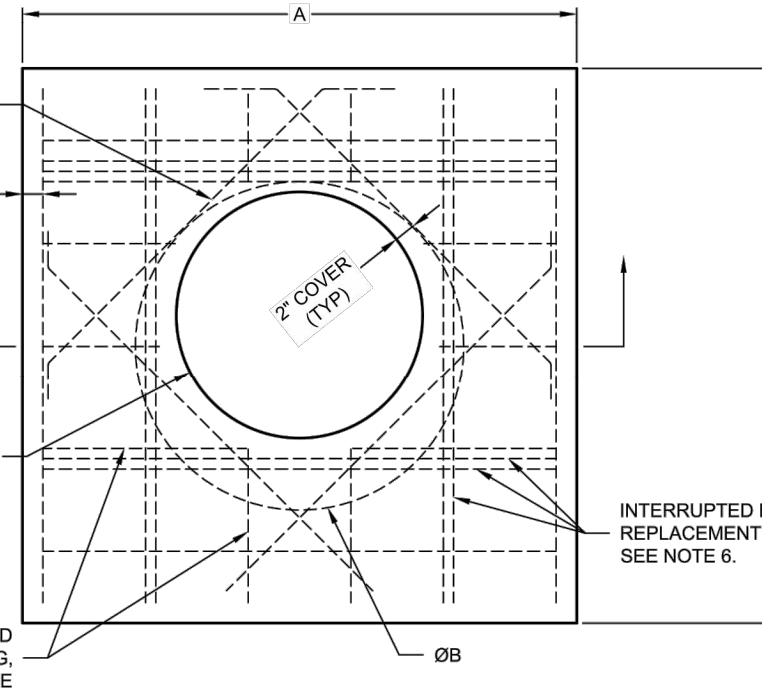


ROUND OPTION PLAN VIEW

- NOTES:
- DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND ACI 350.
 - DESIGN LOAD HS25.
 - EARTH COVER = 1' MAX.
 - CONCRETE STRENGTH = 4,000 psi
 - REINFORCING STEEL = ASTM A615, GRADE 60.
 - PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.

REINFORCING TABLE				
Ø CMP RISER	A	B Ø	REINFORCING	**BEARING PRESSURE (PSF)
24"	4'0"	26"	#5 @ 10" OCEW #5 @ 10" OCEW	2,540 1,900
30"	4'-6" Ø 4'-6" x 4'-6"	32"	#5 @ 10" OCEW #5 @ 9" OCEW #5 @ 8" OCEW	2,280 1,670 1,500
36"	5'0"	38"	#5 @ 8" OCEW #5 @ 8" OCEW	2,000 1,500
42"	5'-6" Ø 5'-6" x 5'-6"	44"	#5 @ 8" OCEW #5 @ 8" OCEW	1,490 1,370
48"	6'0"	50"	#5 @ 7" OCEW #5 @ 7" OCEW	1,210 1,270

** ASSUMED SOIL BEARING CAPACITY



SQUARE OPTION PLAN VIEW

- TRIM OPENING WITH DIAGONAL #4 BARS. EXTEND BARS A MINIMUM OF 12" BEYOND OPENING. BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
- PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
- DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDWELL, NY.

MANHOLE CAP DETAIL
NOT TO SCALE

CONTECH
ENGINEERED SOLUTIONS LLC
www.contechES.com

8100 Centre Pointe Dr., Suite 400, West Chester, OH 45399
800-398-1122 513-645-7000 513-645-7993 FAX

CONTECH
CMP DETENTION SYSTEMS
PROPOSAL DRAWING

48"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 737057-025
HAYSTACK CHANNEL REHABILITATION
PALM DESERT, CA
SITE DESIGNATION:

PROJECT NO. 737057, DESIGNED BY RLH, DRAWN BY RLH, CHECKED BY APPROVED BY, SHEET NO. P3 OF P5

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ENGINEERED SOLUTIONS LLC
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PROPOSAL DRAWING

48"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 737057-025
HAYSTACK CHANNEL REHABILITATION
PALM DESERT, CA
SITE DESIGNATION:

PROJECT NO. 737057, DESIGNED BY RLH, DRAWN BY RLH, CHECKED BY APPROVED BY, SHEET NO. P4 OF P5

DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-422-4133
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

BENCHMARK: CITY OF PALM DESERT BM118, A 2" BRASS DICK STAMPED "CITY OF P.D. BM 118" LOCATED ON THE SOUTHEAST CORNER OF CONCRETE BRIDGE ON HWY 111 OVER PALM VALLEY STORMWATER CHANNEL AT THE EAST END OF CONC. STEM WALL, FLUSH WITH TOP OF WALL.
BASIS OF BEARINGS: THE BASIS OF BEARING FOR THIS SURVEY IS THE STATE PLANE COORDINATE SYSTEM NAD83 ZONE 6, AS DETERMINED LOCALLY BY THE LINE BETWEEN USC&GS STATIONS AC5161 AND DX0739.
THE LINE BETWEEN SAID POINTS BEARS: NORTH 18°54'09" EAST, 2010.00 EPOCH.

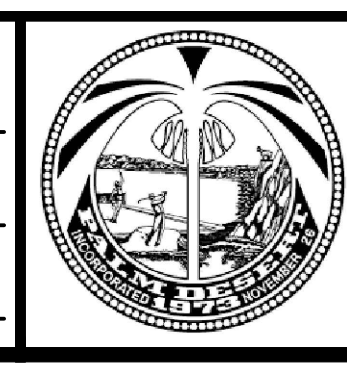
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CITY OF PALM DESERT
HAYSTACK CHANNEL REHABILITATION
CHANNEL IMPROVEMENT PLAN
INFILTRATION SYSTEM 4

SHEET 20
OF SHEETS 20
CITY FILE NUMBER