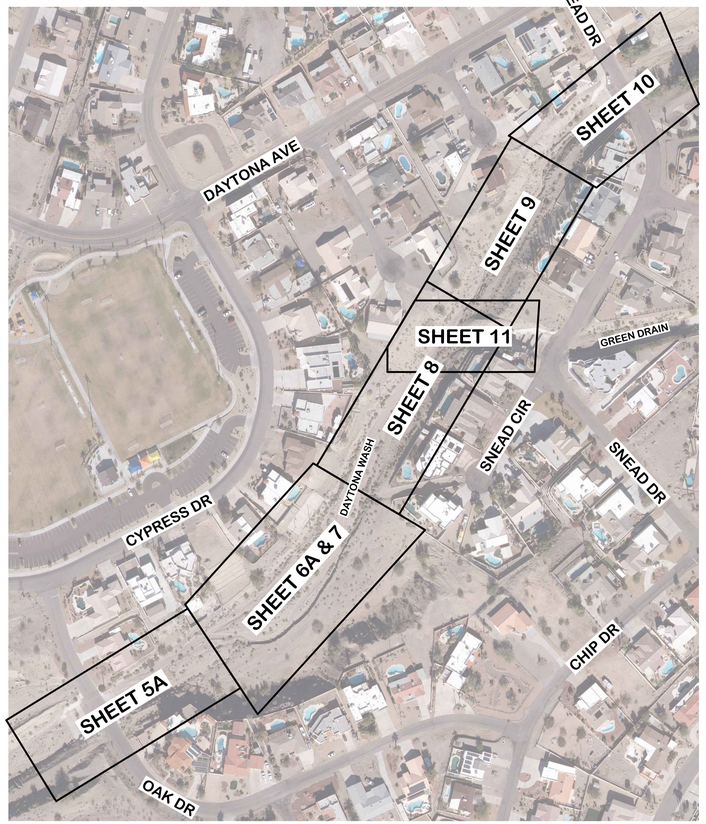
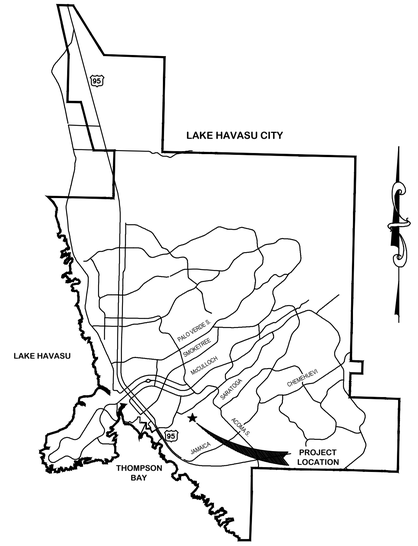
LAKE HAVASU CITY, AZ

DAYTONA WASH REACH 4
PROJECT NUMBER 105004
IMPROVEMENT PLANS

A PORTION OF SECTION 14, TOWNSHIP 13N, RANGE 20W
GILA AND SALT RIVER BASE AND MERIDIAN, MOHAVE COUNTY, ARIZONA



INDEX MAP
1"=150'



VICINITY MAP
NOT TO SCALE

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CITY COUNCIL

CAL SHEEHY	MAYOR
JIM DOLAN	VICE MAYOR
DAVID LANE	COUNCIL MEMBER
NANCY CAMPBELL	COUNCIL MEMBER
MICHELE LIN	COUNCIL MEMBER
CAMERON MOSES	COUNCIL MEMBER
JENI COKE	COUNCIL MEMBER

OWNER

LAKE HAVASU CITY
ENGINEERING DIVISION
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LAKE HAVASU CITY, AZ 86404
MIKE WOLFE, PE
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SURVEYOR

CIVILTEC ENGINEERING, INC
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P: 623.582.0970
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BEN TILMAN, R.L.S.
BTILMAN@CIVILTEC.COM

BENCHMARK

POINT 708
MAG NAIL AND SHINER
265' SOUTHEAST OF INTERSECTION OF
SWANSON AVE AND UNIVERSITY WAY
N: 1,264,161.67, E: 527,769.13
ELEV = 681.38 NAVD88

ENGINEER

WILSON & COMPANY, INC
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ASHROADS@CIVILTEC.COM

FLOOD ZONE NOTE

ACCORDING TO THE NATIONAL FLOOD INSURANCE PROGRAM, FLOOD INSURANCE RATE MAP (FIRM) NUMBER 04015C6180G REVISED 11/18/2009, THIS PROPERTY IS LOCATED IN UNSHADED ZONE X. UNSHADED ZONE X IS DESCRIBED AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

FLOOD ZONE CERTIFICATION

COMMUNITY NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM	BASE FLOOD ELEVATION
040116	6180	G	11/18/2009	N/A

UTILITY CONTACTS

LAKE HAVASU CITY (WASTEWATER)	THILAK FERNANDO	928.854.4308	FERNANDOT@LHCAZ.GOV
LAKE HAVASU CITY (WATER)	BILL GANE	928.854.4305	GANEB@LHCAZ.GOV
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UNISOURCE ENERGY SERVICES (ELECTRIC)	PETER SKUSE	928.505.7034	PSKUSE@UESAZ.COM

LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978 •

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

Designed by: ARS
Drawn by: RAM
Checked by: CJD
Date: 7/5/2023
Dwg scale: SEE PLAN

COVER

WILSON & COMPANY
HIGHER RELATIONSHIPS

CIVILTEC engineering inc.
Civil, Water, Wastewater, Drainage, and Transportation Engineering Construction Management • Surveying
California • Arizona

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CERTIFIED PROFESSIONAL ENGINEER (CIVIL) — CERTIFICATE NO. 41014 — BRIAN NICHOLAS SCHALK — REGISTERED ARIZONA U.S.A. — EXPIRES 9/30/2025

CERTIFIED PROFESSIONAL ENGINEER (CIVIL) — CERTIFICATE NO. 55518 — ANDREW R. SHROADS — REGISTERED ARIZONA U.S.A. — EXPIRES 9/30/2023

CALL AT LEAST TWO FULL WORKING DAYS BEFORE YOU BEGIN EXCAVATION
ARIZONA 811
DIAL 8-1-1 OR 1-800-STAKE-IT (782-5348)
MARICOPA COUNTY: (602) 659-7500

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ABBREVIATIONS

%	PERCENT		
ABAND	ABANDON OR ABANDONED	PC	POINT OF CURVATURE
ABC	AGGREGATE BASE COURSE	PCC	PORTLAND CEMENT CONCRETE
AC	ASPHALTIC CONCRETE	PI	POINT OF TANGENT INTERSECTION
ACP	ASBESTOS CEMENT PIPE	PKWY	PARKWAY
ALT	ALTERNATE	POC	POINT ON CURVE
APPROX	APPROXIMATE	POI	POINT OF INTERSECTION
ARV	AIR RELEASE VALVE	PP	POWER POLE
APN	ASSESSOR'S PARCEL NUMBER	PRC	POINT OF REVERSE CURVE
AVE	AVENUE	PREFAB	PREFABRICATED
		PROP	PROPOSED
		PSI	POUNDS PER SQUARE INCH
BC	BRASS CAP	PT	POINT OF TANGENCY
BLDG	BUILDING	PUE	PUBLIC UTILITY EASEMENT
BLVD	BOULEVARD	PVC	POLYVINYL CHLORIDE
BM	BENCH MARK	PVI	POINT OF VERTICAL INTERSECTION
BNDY	BOUNDARY		
BOT	BOTTOM	Q	DISCHARGE
BVC	BEGIN VERTICAL CURVE	QTY	QUANTITY
BW	BACK OF WALK		
		R	RADIUS
CAB	CRUSHED AGGREGATE BASE	RAD	RADIAL
CB	CATCH BASIN	RCBC	REINFORCED CONCRETE BOX CULVERT
CC	CENTER TO CENTER	RCP	REINFORCED CONCRETE PIPE
CF	CURB FACE	RD	ROAD
CF	CUBIC FEET	REQD	REQUIRED
CFS	CUBIC FEET PER SECOND	REV	REVISION
CIP	CAST IRON PIPE	ROW	RIGHT-OF-WAY
CL	CENTERLINE	RR	RAILROAD
CLR	CLEAR	RT	RIGHT
CMP	CORRUGATED METAL PIPE		
CONC	CONCRETE	S	SOUTH
CONT	CONTINUOUS	SD	STORM DRAIN
CY	CUBIC YARD	SECT	SECTION
		SF	SQUARE FEET
DE	DRAINAGE EASEMENT	SHT	SHEET
DIA	DIAMETER	SS	SANITARY SEWER
DIM	DIMENSION	SSMH	SEWER MANHOLE
DIP	DUCTILE IRON PIPE	ST	STREET
DR	DRIVE	STA	STATION
DWG	DRAWING	STD	STANDARD
		SW	SIDEWALK
E	EAST OR EASTING	SY	SQUARE YARD
EA	EACH		
EG	EXISTING GRADE OR EXISTING GROUND	T	TELEPHONE
EL	ELEVATION	TAN	TANGENT
ESMT	EASEMENT	TBC	TOP BACK OF CURB
EVC	END VERTICAL CURVE	TC	TOP OF CURB
EX	EXISTING	TCE	TEMPORARY CONSTRUCTION EASEMENT
		TF	TOP OF FOOTING
FF	FINISHED FLOOR	TG	TOP OF GRATE
FG	FINISHED GRADE	TH	THICKNESS
FH	FIRE HYDRANT	TV	CABLE TELEVISION
FL	FLOW LINE	TW	TOP OF WALL
FO	FIBER OPTIC	TYP	TYPICAL
FS	FINISHED SURFACE		
FT	FEET OR FOOT	UNK	UNKNOWN
GA	GAUGE	VAR	VARIES
GALV	GALVANIZED	VC	VERTICAL CURVE
GB	GRADE BREAK	VCP	VITRIFIED CLAY PIPE
GM	GAS METER	VERT	VERTICAL
GR	GRADE		
GV	GAS VALVE	W	WEST
GW	GUY WIRE	WM	WATER METER
		WSE	WATER SURFACE ELEVATION
HDPE	HIGH-DENSITY POLYETHYLENE	WV	WATER VALVE
HDWL	HEADWALL		
HORIZ	HORIZONTAL		
HP	HIGH POINT		
HT	HEIGHT		
HWY	HIGHWAY		
ICV	IRRIGATION CONTROL VALVE		
ID	INSIDE DIAMETER		
IN.	INCHES		
INV	INVERT		
LAT	LATITUDE		
LBS	POUNDS		
LF	LINEAR FEET		
LONG	LONGITUDE		
LS	LUMP SUM		
LT	LEFT		
MAX	MAXIMUM		
MH	MANHOLE		
MIN	MINIMUM		
MISC	MISCELLANEOUS		
MON	MONUMENT		
N	NORTH OR NORTHING		
NO.	NUMBER		
NPI	NON-PAYMENT ITEM		
NTS	NOT TO SCALE		
O.A.E.	OR APPROVED EQUAL		
OC	ON CENTER		
OCEW	ON CENTER EACH WAY		
OD	OUTSIDE DIAMETER		

SYMBOLS

EXISTING		PROPOSED
	ARV	
	BENCHMARK	
	BRASS CAP	
	BUSH	
	BACKFLOW PREVENTOR	
C	COMM MANHOLE	C
C	COMM PED	C
	CONCRETE	
	DOUBLE CONTROL CHECK VALVE	
	SIGN	
E	ELECTRIC MANHOLE	E
EM	ELECTRIC METER	EM
E	ELECTRIC PED	E
	FIRE HYDRANT	
GM	GAS METER	GM
	GAS VALVE	
	GUY WIRE	
	LIGHT POST	
MB	MAIL BOX	MB
	POWER POLE	
	RIPRAP	
	SEWER CLEANOUT	
SD	STORM DRAIN MANHOLE	SD
SS	SANITARY SEWER MANHOLE	SS
T	TELEPHONE MANHOLE	T
T	TELEPHONE PED	T
TV	TELEVISION MANHOLE	TV
TV	TELEVISION PED	TV
TR	TRAFFIC BOX	TR
	TREES	
W	WATER MANHOLE	W
WM	WATER METER	WM
	WATER VALVE	
W	WELL	W

LINETYPES

EXISTING		PROPOSED
	BUILDING	
	CENTERLINE	
— COMM —	COMMUNICATION	COMM
(5515)	CONTOUR	5515
	EASEMENT	
— OHE —	ELECTRIC (OVERHEAD)	OHE
— E —	ELECTRIC (UNDERGROUND)	E
— X —	FENCING	X
— FOT —	FIBER OPTIC TELEPHONE	FOT
— FOTV —	FIBER OPTIC TELEVISION	FOTV
	FLOW LINE	
— G —	GAS	G
	GRADING LIMITS	
	HEADWALL	
	PAVED ROAD	
	PIPE	
	PROPERTY LINE	
	RIGHT-OF-WAY	
	SECTION LINE	
— SS —	SEWER	SS
— T —	TELEPHONE	T
— TV —	TELEVISION	TV
	UNPAVED ROAD	
— W —	WATER	W

LAKE HAVASU CITY, ARIZONA • 1978 • INCORPORATED

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HIGHER RELATIONSHIPS

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41014 BRIAN NICHOLAS SCHALK U.S.A. ARIZONA EXPIRES 6/30/2025

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 58518 ANDREW R. SHROADS U.S.A. ARIZONA EXPIRES 9/30/2023

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LAKE HAVASU CITY GENERAL NOTES

1. ALL STRUCTURES ARE DESIGNED TO ACT AS A STRUCTURAL UNIT UPON COMPLETION. CONTRACTOR SHALL DESIGN AND PROVIDE NECESSARY BRACING, TEMPORARY SUPPORTS, AND SHORING TO RESIST FORCES ON THE STRUCTURE DURING CONSTRUCTION.

2. VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO STARTING WORK. NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

3. VERIFY LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO STARTING WORK.

4. CONTRACTOR SHALL EXERCISE EXTREME CARE DURING THE EXCAVATION AND CONSTRUCTION FOR NEW STRUCTURE TO AVOID DAMAGE TO EXISTING STRUCTURES AND EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL MEANS AND METHODS REQUIRED TO FACILITATE CONSTRUCTION OF THE WORK AND ENSURING THE SAFETY, STABILITY AND INTEGRITY OF ADJACENT STRUCTURES AND FACILITIES.

5. THE ENGINEER SHALL BE NOTIFIED A MINIMUM OF 24 HOURS PRIOR TO BEGINNING ANY CONSTRUCTION.

6. ANY WORK PERFORMED WITHOUT THE KNOWLEDGE AND APPROVAL BY THE ENGINEER AND/OR ALL WORK MATERIAL NOT IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

7. NO JOB WILL BE CONSIDERED COMPLETE UNTIL ALL CURBS, PAVEMENT AND SIDEWALKS (NEW AND EXISTING) HAVE BEEN SWEPT CLEAN OF ALL DIRT AND DEBRIS.

8. ALL QUANTITIES SHOWN ON PLANS ARE APPROXIMATE, ARE NOT VERIFIED BY THE ENGINEER, AND ARE FURNISHED SOLELY FOR THE CONTRACTOR'S CONVENIENCE. THEY DO NOT NECESSARILY CORRESPOND TO BID SCHEDULE ITEMS. PAYMENT WILL BE BASED ON BID SCHEDULE ITEMS. THE CONTRACTOR SHALL NOT BE RELIEVED OF HIS RESPONSIBILITY FOR INDEPENDENTLY ESTIMATING WORK QUANTITIES PRIOR TO BIDDING.

9. BACKFILL COMPACTION SHALL BE PER MAG 301, UNLESS OTHERWISE NOTED.

10. REMOVAL OF STRUCTURES AND OBSTRUCTIONS AS NECESSARY TO COMPLETE THE WORK, OTHER THAN SPECIALLY SCHEDULED IN THE BID, IS INCIDENTAL TO THE CONTRACT. NO SEPARATE MEASUREMENT OF PAYMENT FOR UNSCHEDULED REMOVAL ITEMS WILL BE MADE.

11. CONSTRUCTION STAKING SHALL BE BY THE CONTRACTOR'S SURVEYOR WITH CONTROL PROVIDED BY THE DESIGN ENGINEER WHO STAMPED THE PLANS.

12. THE LAKE HAVASU CITY MAY ORDER ANY OR ALL WORKMANSHIP AND MATERIALS TO BE TESTED ACCORDING TO APPLICABLE STANDARDS.

13. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL REWORK AND/OR REMOVAL AND REPLACEMENT OF ALL MATERIALS AND/OR WORKMANSHIP REPRESENTED BY A FAILING TEST.

14. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS OF TESTING AND QUALITY ASSURANCE/QUALITY CONTROL AS DELINEATED IN THE CITY'S PROJECT SPECIFICATIONS. THE COST OF TESTING IS INCIDENTAL TO EACH ITEM OF WORK. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE COST OF ANY CITY INSPECTION AND CITY INSPECTION TIME IF THE CONTRACTOR'S WORK IS BEING PERFORMED IN OVERTIME, AT NIGHT, OR ON WEEKENDS.
15. APPROVAL OF A PORTION OF THE WORK IN PROGRESS DOES NOT GUARANTEE ITS FINAL ACCEPTANCE. TESTING AND EVALUATION MAY CONTINUE UNTIL WRITTEN FINAL ACCEPTANCE OF A COMPLETE AND WORKABLE UNIT.

16. THE LAKE HAVASU CITY MAY SUSPEND THE WORK BY WRITTEN NOTICE WHEN, IN ITS JUDGEMENT, PROGRESS IS UNSATISFACTORY, WORK BEING DONE IS UNAUTHORIZED OR DEFECTIVE, WEATHER CONDITIONS ARE UNSUITABLE, OR THERE IS A DANGER TO THE PUBLIC HEALTH OR SAFETY.

17. CLEARING AND GRUBBING IS CONSIDERED INCIDENTAL TO THE WORK UNLESS SEPARATELY IDENTIFIED IN THE BID SCHEDULE. NO SEPARATE MEASUREMENT OF OR PAYMENT FOR CLEARING, GRUBBING, AND TREE REMOVAL WILL BE MADE. THE SITE OF ALL EXCAVATION, EMBANKMENTS, AND FILLS SHALL FIRST BE CLEARED OF STUMPS, TRASH, WEEDS, RUBBISH, AND LOOSE BOULDERS WHICH SHALL BE REMOVED AND DISPOSED OF. THE CONTRACTOR MUST SATISFY HIMSELF REGARDING THE CHARACTER AND AMOUNT OF LOAM, CLAY, SAND, QUICKSAND, HARDPAN, GRAVEL, ROCK, WATER, AND ALL OTHER MATERIAL TO BE ENCOUNTERED AND WORK TO BE PERFORMED.

18. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ARE APPROXIMATE AND ARE BASED ON FIELD DATA AND MAP RECORDS. THE CONTRACTOR SHALL CONTACT 1-800-STAKE-IT PRIOR TO ANY CONSTRUCTION ACTIVITY TO VERIFY THE ACTUAL LOCATION OF ALL UTILITIES. THE CONTRACTOR SHALL DETERMINE WHICH UTILITIES DO NOT PARTICIPATE IN 1-800-STAKE-IT AND CONTACT THEM DIRECTLY TO VERIFY THE LOCATION OF THOSE UTILITIES. ANY DAMAGE TO EXISTING UTILITIES CAUSED BY CONTRACTOR'S OPERATION SHALL BE REPORTED TO THE UTILITY OWNER IMMEDIATELY AND REPAIRED OR REPLACED AT NO COST TO THE CITY. IN CASES WHEN THE EXISTING UTILITIES ARE NOT AS DEPICTED ON THE PLANS SOME MINOR DEVIATION TO THE PROPOSED ALIGNMENT MAY BE ALLOWED TO MAINTAIN MINIMUM SEPARATION DISTANCES BETWEEN UTILITIES. ANY PROPOSED TO MAINTAIN MINIMUM SEPARATION DISTANCES BETWEEN UTILITIES. ANY PROPOSED TO CHANGES TO THE ALIGNMENT MUST BE SUBMITTED TO THE CITY'S REPRESENTATIVE FOR REVIEW. NO CHANGES WILL BE ALLOWED WITHOUT PRIOR APPROVAL.

19. THE CONTRACTOR SHALL LIMIT THE WORK AREA TO PUBLIC RIGHT-OF-WAY AND PERMANENT EASEMENTS AS SHOWN FOR CONSTRUCTION OF THE PROJECT. TEMPORARY CONSTRUCTION EASEMENTS EXIST AS SHOWN AND INDICATED IN THE PLANS.

20. CONTRACTOR SHALL OBTAIN ANY ADDITIONAL TEMPORARY EASEMENTS OR USE AGREEMENTS THAT ARE DEEMED NECESSARY FOR CONSTRUCTION AT NO ADDITIONAL COST TO THE CITY. COPIES OF ALL CONTRACTOR OBTAINED EASEMENTS AND USE AGREEMENTS SHALL BE PROVIDED TO THE CITY'S REPRESENTATIVE PRIOR TO THE UTILIZATION OF THE SITE.

21. THE CONTRACTOR SHALL GRADE AND RESURFACE ALL AREAS DISTURBED BY CONSTRUCTION, INCLUDING LANDSCAPE ROCK, IN ACCORDANCE WITH THE SPECIFICATIONS AND TO A CONDITION EQUAL TO, OR BETTER THAN, THE PRE-CONSTRUCTION CONDITION.

22. THE CONTRACTOR SHALL PROTECT ALL CONCRETE STRUCTURES TO REMAIN. ALL CONCRETE REPLACEMENT SHALL BE FROM JOINT TO JOINT (WALLS, SIDEWALK) AND SHALL BE REPLACED WITH 4000 PSI CONCRETE. ALL DAMAGED CONCRETE PANELS MUST BE REPLACED AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

23. THE CONTRACTOR SHALL PROVIDE PROTECTION TO PREVENT UNDERMINING OR DAMAGING THE STRUCTURAL INTEGRITY OF ALL FENCES, RETAINING WALLS, STREET SIGNS, OTHER UTILITY POLES, OR OTHER PRIVATE OR PUBLIC IMPROVEMENTS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE OWNING UTILITY AS NECESSARY TO PROVIDE TEMPORARY SUPPORT, OR PROTECTION DURING CONSTRUCTION WORK, AND SHALL NEATLY REMOVE AND PROMPTLY REPLACE NON UTILITY IMPROVEMENTS WITHOUT UNDUE DISRUPTION. THE COST OF ALL SUCH PROTECTION, REMOVAL, AND REPLACEMENT REQUIRED TO COMPLETE THE PROJECT SHALL BE SUBSIDIARY TO OTHER BID ITEMS.

24. THE CONTRACTOR SHALL REMOVE ALL FENCING, ASPHALT AND CONCRETE ROADS AND DRIVEWAYS, CURB AND GUTTER, RIP-RAP, DRAINAGE CULVERTS AND ASSOCIATED APPURTENANCES AS REQUIRED FOR CONSTRUCTION PURPOSES. ALL ITEMS DAMAGED OR REMOVED SHALL BE RESTORED IN ACCORDANCE WITH THE SPECIFICATION TO A CONDITION EQUAL TO, OR BETTER THAN, THEIR CONDITION PRIOR TO THE START OF THE PROJECT. ITEMS OF WORK NOT SPECIFICALLY INCLUDED IN THE MEASUREMENTS AND PAYMENT SECTION OF THE SPECIFICATIONS SHALL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS AND SHALL NOT BE PAID FOR SEPARATELY.

25. IT IS NOT THE INTENTION OF THE SPECIFICATIONS TO SUPERSEDE ANY FEDERAL, STATE OR LOCAL LAWS, REGULATIONS AND/OR ORDINANCES; THEY SHALL GOVERN IN ALL INSTANCES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SHOW A GOOD FAITH EFFORT AND TO PROTECT ALL EXISTING UTILITY TIES AND STRUCTURES AND TO ABIDE BY ALL FEDERAL, STATE AND LOCAL LAWS AND ORDINANCES IN THIS RESPECT.

26. THE CONTRACTOR SHALL PROTECT ALL EXISTING IMPROVEMENTS ON PRIVATE PROPERTY. ALL ITEMS DAMAGED OR REMOVED SHALL BE RESTORED IN ACCORDANCE WITH THE SPECIFICATION TO A CONDITION EQUAL TO, OR BETTER THAN, THEIR CONDITION PRIOR TO THE START OF THE PROJECT.

27. PROPERTY LINES SHOWN ON DRAWINGS ARE APPROXIMATE.

28. ALL CONSTRUCTION SHALL CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS, UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION (MAG). OTHER CITY'S, AND ADOT DETAILS (AS CITED IN PROJECT PLANS AND SPECIFICATIONS), LAKE HAVASU CITY STANDARD DETAILS WILL CONTINUE TO APPLY WHERE SUCH DETAILS WERE NOT ADOPTED OR INCLUDED BY MAG. ALTERNATE DETAILS AND SPECIFICATIONS MAY BE SUBMITTED FOR REVIEW AND ACCEPTANCE BY THE ENGINEERING DIVISION. IF ACCEPTED, ALTERNATE DETAILS WILL BE SHOWN AS PART OF THE APPROVED PLANS/DETAIL SHEETS.

29. THIS SET OF PLANS HAS BEEN REVIEWED FOR COMPLIANCE WITH CITY REQUIREMENTS PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS. HOWEVER, SUCH REVIEW SHALL NOT PREVENT THE CITY ENGINEER FROM REQUIRING CORRECTION OF ERRORS OR OMISSIONS IN PLANS FOUND TO BE IN VIOLATION OF ANY LAW OR ORDINANCE.

30. APPROVAL BY THE CITY ENGINEER MEANS FOR GENERAL LAYOUT IN RIGHT--OF--WAY ONLY. CONSTRUCTION PERMITS SHALL BE OBTAINED WITHIN THIS PERIOD OR THE PLANS SHALL BE RESUBMITTED FOR APPROVAL. WORK SHALL ALSO BE CONTINUOUSLY PURSUED IN ORDER TO MAINTAIN A VALID PLAN APPROVAL AND PERMIT. APPROVAL IS ONLY FOR WORK WITHIN THE JURISDICTION OF LAKE HAVASU CITY.

31. AN APPROVED SET OF PLANS MUST BE AVAILABLE ON THE JOB SITE AT ALL TIMES. THE CONTRACTOR'S REPRESENTATIVE (CAPABLE OF COMMUNICATING WITH THE CITY'S REPRESENTATIVES) SHALL BE ON THE JOB AT ALL TIMES THE WORK IS BEING PURSUED.

32. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE EMERGENCY TELEPHONE NUMBERS TO LAKE HAVASU CITY AT TIME OF LSSUANCE OF OFF--SLTE/ON--SITE PERMITS AND HAVE PERSONNEL AVAILABLE 24--HOURS A DAY TO RESPOND TO EMERGENCIES. IF THE CITY IS REQUIRED TO RESPOND AND MAKE EMERGENCY REPAIRS ON BEHALF OF THE CONTRACTOR, THE CONTRACTOR IS RESPONSIBLE TO REIMBURSE THE CITY FOR ALL COSTS INCURRED.

33. THE CONTRACTOR SHALL TAKE APPROPRIATE STEPS TO PREVENT EROSION AND DEPOSITION OF SEDIMENTS INTO WATER COURSES. THE CONTRACTOR SHALL SUBMIT AN EROSION CONTROL PLAN FOR APPROVAL, PRIOR TO THE START OF ANY EXCAVATION. ALL DRAINAGE PROTECTIVE DEVICES SUCH AS SWALES, INTERCEPTION DITCHES, PIPES, PROTECTIVE BERMS, CONCRETE CHANNELS OR OTHER MEASURES DESIGNED TO PROTECT IMPROVEMENTS, WHETHER EXISTING OR PROPOSED, FROM RUNOFF OR DAMAGE FROM STORM WATER, MUST BE CONSTRUCTED PRIOR TO THE CONSTRUCTION OF ANY IMPROVEMENTS. ALL EROSION AND SEDIMENT CONTROL WORK SHALL BE INCIDENTAL TO OTHER PAY ITEMS.

34. TRAFFIC CONTROL SHALL CONFORM WITH THE TRAFFIC BARRICADE MANUAL AND MUTCD GUIDELINES. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN PER THE TRAFFIC BARRICADE MANUAL. BARRICADES MUST BE CONTINUALLY MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. A TRAFFIC CONTROL PLAN (TCP) SHALL BE SUBMITTED TO THE ENGINEERING DIVISION AND ACCEPTED A MINIMUM OF 24--HOURS PRIOR TO CONSTRUCTION. AN ACCEPTED TCP WILL BE STAMPED AND A COPY RETURNED TO THE CONTRACTOR. A COPY OF THE ACCEPTED PLAN MUST REMAIN ON THE JOB SITE AT ALL TIMES.

35. ALL CONTRACTORS ARE RESPONSIBLE TO OBTAIN AN ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES) PERMIT IN ACCORDANCE WITH FEDERAL AND STATE REGULATIONS, INCLUDING NOTICE OF INTENT (NOI),NOTICE OF TERMINATION, AND STORM WATER POLLUTION PREVENTION PLAN (SWPPP). A COPY OF THE NOI AND SWPPP SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.

36. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY AND ALL OTHER PERMITS AND MEET ANY REQUIREMENTS SET FORTH BY OTHER AGENCIES OR UTILITIES, WHICH HAVE JURISDICTION, AT THE CONTRACTORS EXPENSE, INCLUDING OSHA. CONTRACTOR SHALL MEET OSHA STANDARDS FOR TRENCH SAFETY.

37. FIRE ACCESS TO BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION AS REQUIRED BY LAKE HAVASU CITY FIRE DEPARTMENT.

38. THE CONTRACTOR SHALL KEEP SUITABLE EQUIPMENT ON HAND AT THE JOBSITE FOR MAINTENANCE DUST CONTROL, AND SHALL CONTROL DUST AS DIRECTED BY THE APPROPRIATE AGENCIES.

39. ALL EXISTING FLOW LINES SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY CONTRACTOR.

40. PROPERTY LINES SHOWN ON DRAWINGS ARE APPROXIMATE.

41. THE CONTRACTOR SHALL GRADE AND RESURFACE ALL AREAS DISTURBED BY CONSTRUCTION, INCLUDING LANDSCAPE ROCK, IN ACCORDANCE WITH THE SPECIFICATIONS AND TO A CONDITION EQUAL TO, OR BETTER THAN, THE PRE-CONSTRUCTION CONDITION.

42. ANY ROCK ENCOUNTERED DURING EXCAVATION SHALL BE REMOVED AT NO ADDITIONAL COST TO THE CITY. ROCK EXCAVATION COST SHALL BE INCIDENTAL TO OTHER ITEMS OF WORK.

43. ANY SHORING REQUIRED SHALL BE CONSIDERED INCIDENTAL TO OTHER ITEMS OF WORK.

44. COORDINATE SHUTDOWN AND SEQUENCING REQUIREMENTS WITH OWNER 48--HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR MUST HAVE AN APPROVED SEQUENCING PLAN PRIOR TO ANY CONSTRUCTION.

45. CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING STAGING AREAS FOR THEIR WORK.

46. CONTRACTOR SHALL FIELD VERIFY AND REPLACE ALL PROPERTY DRAIN PIPES (6" OR SMALLER, IN KIND) TO BE LAID OVER THE FINISHED GRADE SLOPE & EXTENDED 12" BEYOND TOP OF BANK PROTECTION AS SPECIFIED ON THE TECHNICAL SPECIFICATIONS (ALLOWANCE).

GEOTECHNICAL GENERAL NOTES

1. A GEOTECHNICAL REPORT HAS BEEN PREPARED FOR THIS PROJECT AND IS INCLUDED IN THE CONTRACT DOCUMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FULLY READ AND COMPLY WITH THE CONTENTS OF THE REPORT. EXCERPTS FROM THE REPORT ARE PROVIDED BELOW.

2. SUBGRADE IMPROVEMENT

2.1. BASED ON OUR TESTING, THE NEAR SURFACE ALLUVIAL SOILS ARE NOT CONSIDERED SUITABLE TO PROVIDE SUPPORT TO THE NEW IMPROVEMENTS IN THEIR IN-SITU CONDITION. WE RECOMMEND THAT NEAR SURFACE FOUNDATIONS ASSOCIATED WITH THE CONCRETE LINED CHANNEL AND RETAINING WALLS BE SUPPORTED ON 1 FOOT OF MOISTURE-CONDITIONED AND COMPACTED ENGINEERED FILL MEASURED FROM THE BOTTOM OF THE FOOTING OR MAT. THIS OVER EXCAVATION ZONE SHOULD EXTEND 1 FOOT HORIZONTALLY BEYOND THE EDGES OF THE FOUNDATIONS AND SHOULD BE MOISTURE CONDITIONED AND COMPACTED IN ACCORDANCE WITH THIS REPORT.

2.2. ONCE THE ABOVE-MENTIONED OVEREXCAVATION IS ACHIEVED, AND THE UNDERLYING SOILS ARE EXPOSED, FURTHER EVALUATION SHOULD BE MADE BY THE ON-SITE GEOTECHNICAL REPRESENTATIVE FOR THE PRESENCE OF LOOSE, SOFT, YIELDING, OR UNACCEPTABLE SOILS. BASED ON THIS EVALUATION, ADDITIONAL REMEDIATION MAY BE NEEDED. THIS COULD INCLUDE FURTHER IMPROVEMENT OF THE EXPOSED SURFACE. THIS ADDITIONAL REMEDIATION, IF NEEDED, SHOULD BE ADDRESSED BY THE GEOTECHNICAL CONSULTANT DURING EARTHWORK OPERATIONS.

3. EXCAVATIONS

3.1. OUR EVALUATION OF THE EXCAVATION CHARACTERISTICS OF THE ON-SITE MATERIALS IS BASE ON THE RESULTS OF OUR EXPLORATORY TEST PITS, SITE OBSERVATIONS, AND EXPERIENCE WITH SIMILAR MATERIALS. EXCAVATION OF THE MATERIALS CAN GENERALLY BE ACCOMPLISHED WITH HEAVY-DUTY EARTHMOVING EQUIPMENT. HOWEVER; VERY DENSE, CEMENTED SOIL, WITH VARYING AMOUNTS OF GRAVEL, COBBLES, AND OCCASIONAL BOULDERS WERE ENCOUNTER IN OUR TEST PITS AND MAY BE MORE DIFFICULT TO EXCAVATE AND/OR SLOW THE RATE OF EXCAVATION DEPENDING ON THE DEGREE OF CEMENTATION ENCOUNTERED DURING CONSTRUCTION.

3.2. SIDEWALKS FOR TEMPORARY EXCAVATIONS SHOULD NOT BE ANTICIPATED TO STAND NEAR-VERTICAL WITHOUT SLOUGHING. THEREFORE, THE SIDES OF EXCAVATIONS AND TRENCHES FOR THIS PROJECT SHOULD BE STABILIZED IN ORDER TO REDUCE DAMAGE TO ADJACENT FACILITIES RESULTING FROM VERTICAL OR LATERAL MOVEMENT OF THE SOIL. THE SIDES OF THE EXCAVATION MAY BE STABILIZED BY SLOPING BACK THE SIDES AND/OR BY USING BRACING. HOWEVER, THE TRENCH SIDEWALLS MAY BE DIFFICULT TO STABILIZE DUE TO THE PRESENCE OF LOW COHESION SOILS, WHICH COULD HAVE A POTENTIAL TO CAVING AND SLOUGHING DURING EXCAVATION, ESPECIALLY IF THE SOILS ARE WET OR SATURATED. ADDITIONALLY, VIBRATIONS CAUSED BY NEARBY TRAFFIC OR CONSTRUCTION EQUIPMENT COULD ACCELERATE SLOUGHING.

4. TEMPORARY SLOPES

4.1. THE CONTRACTOR SHOULD PROVIDE SAFELY SLOPED EXCAVATIONS OR AN ADEQUATELY CONSTRUCTED AND BRACED SHORING SYSTEM IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS FOR EMPLOYEES WORKING IN AN EXCAVATION THAT MAY EXPOSE THEM TO THE DANGER OF MOVING GROUND. BASED ON THE SOIL CONDITIONS AT THE SITE, WE RECOMMEND THAT OSHA SOIL "TYPE C" CLASSIFICATION BE USED FOR EXCAVATIONS AT THE SITE. THIS CORRESPONDS TO TEMPORARY SLOPES OF 1.5:1 (HORIZONTAL: VERTICAL). THIS SIDE SLOPE IS FOR EXCAVATIONS THAT ARE LESS THAN 20 FEET DEEP. IF MATERIAL IS STORED OR EQUIPMENT IS OPERATED NEAR AN EXCAVATION, STRONGER SHORING SHOULD BE USED TO RESIST THE EXTRA PRESSURE DUE TO SUPERIMPOSED LOADS. EXCAVATIONS OVER 20 FEET SHOULD BE DESIGNED BY THE CONTRACTOR'S ENGINEER BASED ON ALIGNMENT-SPECIFIC GEOTECHNICAL ANALYSIS.

4.2. UPON MAKING THE EXCAVATIONS, SOIL AND/OR ROCK CLASSIFICATIONS AND EXCAVATION PERFORMANCE SHOULD BE EVALUATED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT IN ACCORDANCE WITH OSHA STANDARDS.

5. PERMANENT SLOPES

5.1. PERMANENT CUT SLOPES AND CONSTRUCTED EMBANKMENT FILL SLOPES SHOULD BE NO STEEPER THAN 2:1 (HORIZONTAL TO VERTICAL). NEW EMBANKMENT FILLS SHOULD BE BENCHED INTO EXISTING EMBANKMENTS, WHERE APPROPRIATE. BENCHES SHOULD BE LEVEL AND WIDE ENOUGH TO ALLOW OPERATION OF AND COMPACTION BY, CONSTRUCTION EQUIPMENT. FILL SLOPES SHOULD BE CONSTRUCTED IN A MANNER (E.G., OVERFILLING AND CUTTING TO GRADE) SUCH THAT THE RECOMMENDED DEGREE OF COMPACTION IS ACHIEVED TO THE FINISHED SLOPES FACE. CUT AND FILL SLOPES SHOULD BE PROTECTED FROM EROSION. THIS SHOULD PROMOTE RE-VEGETATION AND A STABLE SLOPE. PERIODIC MAINTENANCE OF EXPOSED SLOPES SHOULD BE ANTICIPATED.

5.2. UNPROTECTED SLOPES MAY RILL AND ERODE IF EXPOSED TO RUNNING WATER. SILTY SOILS AND SOILS CONTAINING FINE SAND ARE MORE SUSCEPTIBLE IN THIS REGARD. WHILE 2:1 (HORIZONTAL TO VERTICAL) SLOPES ARE ACCEPTABLE FROM A STABILITY STANDPOINT, LAYING SLOPES BACK TO 3:1 (HORIZONTAL TO VERTICAL) WILL DECREASE RUNOFF VELOCITY AND DECREASE THE LIKELIHOOD OF SERIOUS EROSION. STEEPER SLOPES WILL NEED ADDITIONAL MAINTENANCE. ADEQUATE DRAINAGE AND TEMPORARY EROSION PROTECTION COVERING COULD MINIMIZE EROSION PROBLEMS AND PROMOTE POST-CONSTRUCTION VEGETATION. PLATING THE SLOPES WITH GRAVELLY MATERIAL OR RIPRAP WILL REDUCE THE IMPACTS OF PRECIPITATION AND SLOW THE RATE OF EROSION. IF RIPRAP IS PLACED IN THE CHANNEL IT SHOULD BE ADEQUATELY SIZED TO PREVENT EROSION OF THE EMBANKMENT. ALONG LONGER SLOPES, BROW DITCHES SHOULD BE CONSIDERED TO REDUCE THE AMOUNT OF SURFACE FLOW ON THE SLOPE FACE. WHERE FEASIBLE, THE EXISTING VEGETATION SHOULD BE SALVAGED AND REPLACED.

6. FILL PLACEMENT AND COMPACTION

6.1. SPECIAL CARE SHOULD BE EXERCISED TO AVOID DAMAGING PIPES OR OTHER STRUCTURES DURING THE COMPACTION OF THE BACKFILL. COMPACTION SHOULD BE ACCOMPLISHED IN A MANNER THAT INHIBITS SURFACE WATER INFILTRATION AS WELL AS CONVEYANCE OF SUBSURFACE MOISTURE DUE TO THE INTERSECTION OF NATURAL DRAINAGES ALONG THE ALIGNMENT.

6.2. FILL MATERIAL SHOULD BE PLACED IN HORIZONTAL LIFTS APPROXIMATELY 8 INCHES IN LOOSE THICKNESS WHEN COMPACTED BY MECHANICAL METHODS. IF NON-CONVENTIONAL, HAND OPERATED, COMPACTION EQUIPMENT IS EMPLOYED HORIZONTAL LIFTS SHALL NO EXCEED 4 INCHES IN LOOSE THICKNESS. IT IS RECOMMENDED THAT SOIL BE COMPACTED BY APPROPRIATE MECHANICAL METHODS AT MOISTURE CONTENT AS OUTLINED IN TABLE 1.

TABLE 1 - COMPACTION RECOMMENDATIONS

ENGINEERED FILL DESCRIPTION	PERCENT COMPACTION PER ASTM D698	MOISTURE CONTENT
BELOW FOUNDATIONS	95 PERCENT	±2 PERCENT OF OPTIMUM
WALL BACKFILL OR EMBANKMENT FILL	95 PERCENT	±3 PERCENT OF OPTIMUM

6.3. AN EARTHWORK (SHRINKAGE) FACTOR OF 10 TO 20 PERCENT IS ESTIMATED. THIS SHRINKAGE FACTOR RANGE REPRESENTS AN AVERAGE OF THE MATERIAL TESTED AND ASSUMES THAT MATERIALS EXCAVATED FROM THE SITE WILL BE PLACED AS FILL. POTENTIAL BIDDERS SHOULD CONSIDER THIS IN PREPARING ESTIMATES AND SHOULD REVIEW THE AVAILABLE DATA TO MAKE THEIR OWN CONCLUSIONS REGARDING EXCAVATION CONDITIONS.

7. PRE-CONSTRUCTION CONFERENCE

7.1. WE RECOMMEND THAT A PRE-CONSTRUCTION CONFERENCE BE HELD. REPRESENTATIVES OF THE OWNER, CIVIL ENGINEER, THE GOETECHNICAL CONSULTANT, AND THE CONTRACTOR SHOULD BE IN ATTENDANCE TO DISCUSS THE PROJECT PLANS AND SCHEDULE. OUR OFFICE SHOULD BE NOTIFIED IF THE PROJECT DESCRIPTION INCLUDED HEREIN IS INCORRECT, OR IF THE PROJECT CHARACTERISTICS ARE SIGNIFICANTLY CHANGED.

GEOMETRIC QUANTITIES*

TOTAL:
CUT = 7,979 CY
FILL = 6,035 CY

BASE BID:
CUT = 4,196 CY
FILL = 3,989 CY

ADDITIVE ALTERNATE:
CUT = 3,783 CY
FILL = 2,046 CY

*NO SHRINK OR SWELL ASSUMED

GENERAL STRUCTURAL NOTES

DESIGN SPECIFICATION
2018 INTERNATIONAL BUILDING CODE (2018 IBC) WITH LAKE HAVASU CITY AMENDMENTS

CONSTRUCTION SPECIFICATIONS
LAKE HAVASU CITY ENGINEERING SPECIFICATIONS (https://www.lhcaz.gov/public-works/engineering/engineering-specifications)

DESIGN CRITERIA
ALLOWABLE SOIL BEARING PRESSURE: 2,000 PSF
SOIL DENSITY - 120 PCF
COEFFICIENT OF FRICTION = 0.40
ACTIVE EARTH PRESSURE = 40 PCF
PASSIVE EARTH PRESSURE = 400 PCF

SEISMIC DESIGN CRITERIA:
SITE CLASS = D
SITE COEFFICIENT
F_a = 1.6
Fv = 2.347
MAPPED SPECTRAL RESPONSE ACCELERATION PARAMETERS:
S_S = 0.216
S_1 = 0.113
ADJUSTED SPECTRAL RESPONSE ACCELERATION PARAMETERS:
S_{MS} = 0.346
S_{M1} = 0.266
DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETERS:
S_{DS} = 0.231
S_{D1} = 0.177

HANDRAIL (IBC 2018, 1607.8.1): 50 PLF LATERAL LOAD OR 200 LB CONCENTRATED LOAD

FOUNDATIONS
FOUNDATION DATA BASED ON THE GEOTECHNICAL ENGINEERING REPORT DAYTONA WASH REACH 4 IMPROVEMENTS PREPARED BY NINYO & MOORE, PROJECT NO. 607315001, DATED DECEMBER 1, 2022.

ALL FOUNDATIONS, EARTHWORK EXCAVATION, BACKFILL, AND SUBGRADE SHALL BE SUBJECT TO OBSERVATION BY GEOTECHNICAL ENGINEER OR GEOTECHNICAL ENGINEER REPRESENTATIVE.

FOOTINGS SHALL BE SUPPORTED ON AT LEAST 12 INCHES OF MOISTURE CONDITIONED AND COMPACTED ENGINEERED FILL.

WALL BACKFILL SHALL BE FREE DRAINING AND PROVISIONS SHOULD BE MADE TO COLLECT AND DISPOSE OF EXCESS WATER THAT MAY ACCUMULATE BEHIND WALLS.

CONCRETE AND REINFORCEMENT
ALL CONCRETE SHALL BE PER LHC 03300, f'_C = 4,000 PSI.

ALL REINFORCEMENT SHALL BE PER LHC 03200.

ALL BEND DIMENSIONS FOR REINFORCING STEEL SHALL BE OUT-TO-OUT OF BARS. ALL PLACEMENT DIMENSION FOR REINFORCING STEEL SHALL BE TO CENTER OF BARS UNLESS NOTED OTHERWISE.

ALL REINFORCING SHALL HAVE 2" CLEAR COVER UNLESS NOTED OTHERWISE.

ALL EXPOSED CONCRETE CORERS SHALL BE CHAMFERED 3/4".

JOINTS
CONCRETE FOOTINGS
FOOTINGS MAY BE CONTINUOUS WITH NO JOINT.

CONCRETE WALL
WALLS SHALL HAVE CONTRACTION JOINTS SPACED AT NO MORE THAN 30'-0" APART OR AS SHOWN.

CONCRETE CHANNEL BOTTOM
CHANNEL BOTTOM SHALL BE CONTINUOUS WITH NO JOINTS. CONSTRUCTION JOINTS ARE ALLOWED, BUT THE NUMBER SHOULD BE MINIMIZED. ADDITIONAL REINFORCING AT CONSTRUCTION JOINTS PER THE DETAIL ON THE PLANS.

SHOTCRETE CHANNEL
SHOTCRETE CHANNEL SHALL HAVE CONTRACTION JOINTS SPACED AT NO MORE THAN 30'-0" APART OR AS SHOWN.

GEOMETRY
REFERENCE CHANNEL PLAN AND PROFILE SHEETS FOR LAYOUT.

TOP OF DROP STRUCTURE AND TOP OF FOOTING SHALL BE AS SHOWN ON THE TYPICAL SECTION. HEIGHT OF WALL MAY VARY ±2 INCHES.

COORDINATION
CONTRACTOR SHALL COORDINATE ALL EXISTING CONDITIONS DURING CONSTRUCTION OF PROJECT, UTILITY INFORMATION SHOWN ON THE PLANS MAY NOT BE COMPLETE OR ACCURATELY DEPICT THE LOCATION OF THE UTILITIES SHOWN. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL EXISTING, NEW, RELOCATED, AND ABANDONED UTILITIES WITH THE PROJECT PLANS AND NOTIFY RESPECTIVE OWNERS BEFORE COMMENCING THE WORK OF EXCAVATION, INCLUDING ANY DRILLING OR PILING REQUIRED FOR TEMPORARY SHORING. CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND RESOLVED PRIOR TO PROCEEDING WITH THE WORK.

VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO STARING WORK. NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

CONCRETE FINISH
FINISH PER LHC 03300.

SPECIAL INSPECTIONS
1. SPECIAL INSPECTION IS REQUIRED OF MATERIALS, INSTALLATION, FABRICATION, ERECTION, OR PLACEMENT OF COMPONENTS AND CONNECTIONS REQUIRING SPECIAL EXPERTISE TO ENSURE COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS.
2. THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION:
2.1. INSPECTION OF CONCRETE CONSTRUCTION (2018 IBC TABLE 1705.3).
2.2. INSPECTION OF SOILS (2018 IBC TABLE 1705.6).

WILSON & COMPANY
HIGHER RELATIONSHIPS

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REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41014 BRIAN NICHOLAS SCHALK ARIZONA U.S.A. DATE SIGNED 07-05-23 EXPIRES 6/30/2025

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 58518 ANDREW R. SHROADS ARIZONA U.S.A. DATE SIGNED 07-05-23 EXPIRES 9/30/2023

LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978

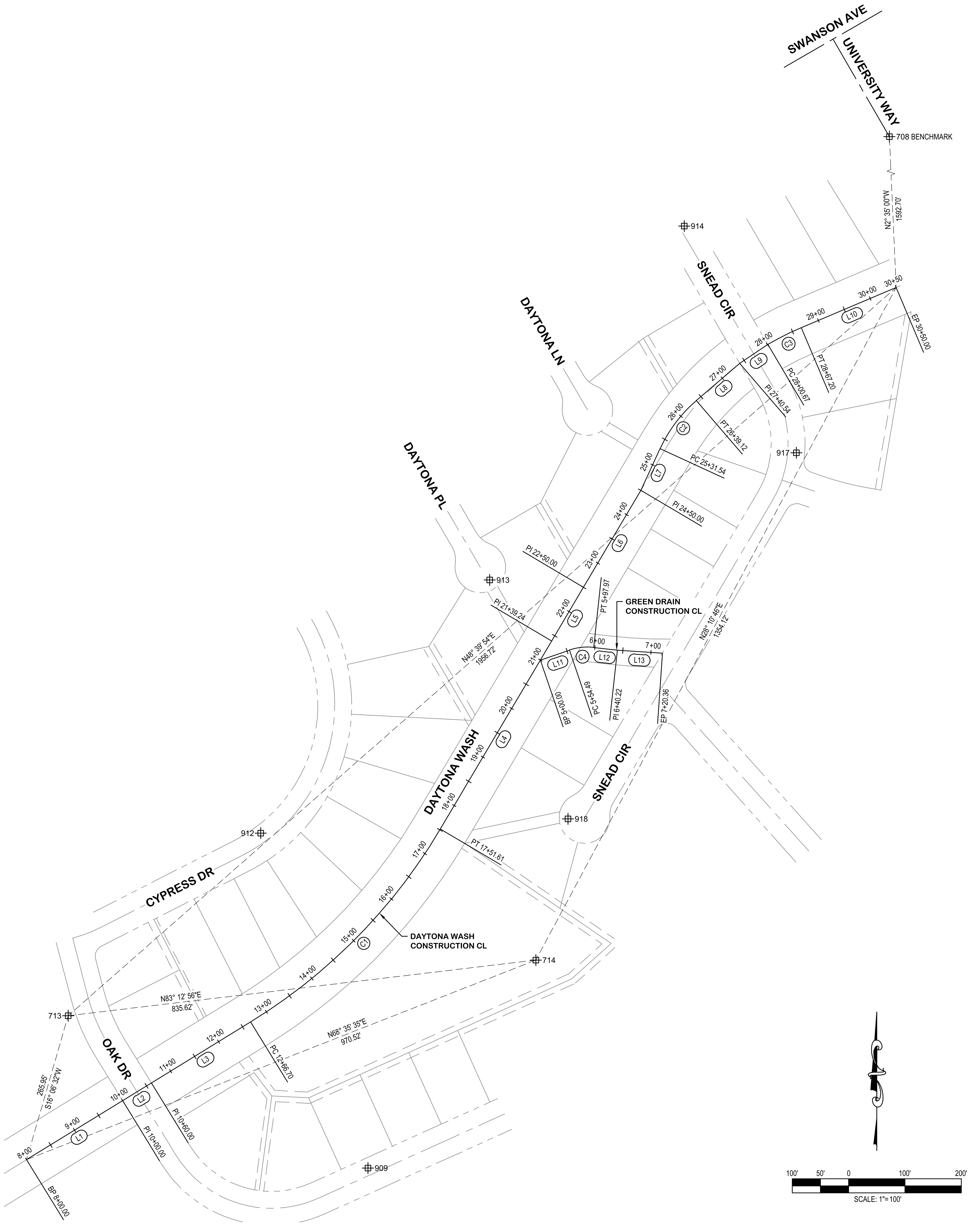
NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

Designed by: ARS
Drawn by: RAM
Checked by: CJD
Date: 7/5/2023
Dwg scale: SEE PLAN

GENERAL NOTES

Sheet Number:
G-03



LINE TABLE				
LINE #	BEARING	DISTANCE	START	END
L1	N58°24'48"E	200.00'	N 1261022.74 E 526297.90	N 1261127.50 E 526468.27
L2	N58°24'48"E	60.00'	N 1261127.50 E 526468.27	N 1261158.93 E 526519.38
L3	N58°24'48"E	206.70'	N 1261158.93 E 526519.38	N 1261267.19 E 526695.46
L4	N30°37'48"E	387.63'	N 1261609.55 E 527032.15	N 1261943.10 E 527229.64
L5	N30°37'48"E	110.76'	N 1261943.10 E 527229.64	N 1262038.40 E 527286.07
L6	N30°37'48"E	200.00'	N 1262038.40 E 527286.07	N 1262210.50 E 527387.97
L7	N24°43'13"E	81.54'	N 1262210.50 E 527387.97	N 1262284.57 E 527422.07
L8	N49°22'36"E	101.42'	N 1262369.77 E 527486.39	N 1262435.80 E 527563.37
L9	N55°59'34"E	60.12'	N 1262435.80 E 527563.37	N 1262469.43 E 527613.21
L10	N67°03'48"E	182.80'	N 1262499.35 E 527672.57	N 1262570.59 E 527840.92
L11	N71°15'58"E	54.49'	N 1261909.33 E 527209.65	N 1261926.83 E 527261.25
L12	S83°49'30"E	42.26'	N 1261931.55 E 527304.13	N 1261927.00 E 527346.14
L13	S86°07'40"E	80.14'	N 1261927.00 E 527346.14	N 1261921.59 E 527426.09

CURVE TABLE							
CURVE #	R	Δ	LENGTH	CHORD DIRECTION	CHORD LENGTH	START	END
C1	1000.00'	27°47'00"	484.91'	N44° 31' 18"E	480.17'	N 1261267.19 E 526695.46	N 1261609.55 E 527032.15
C2	250.00'	24°39'22"	107.58'	N37° 02' 55"E	106.75'	N 1262284.57 E 527422.07	N 1262369.77 E 527486.39
C3	500.00'	7°37'25"	66.53'	N63° 15' 05"E	66.48'	N 1262469.43 E 527613.21	N 1262499.35 E 527672.57
C4	100.00'	24°54'32"	43.47'	N83° 43' 14"E	43.13'	N 1261926.83 E 527261.25	N 1261931.55 E 527304.13

	POINT DATA				
	#	N.	E.	ELEV.	DESC.
BENCHMARK	708	1264161.67	527769.13	681.38	3MIN ON 14 MAG NL AND SHINER
	713	1261278.26	526371.69	579.37	RB SET SE COR MT LOT AT SW COR INTX CYPRESS AND OAK
	714	1261376.97	527201.46	603.23	RB SET BACK OF LOT
	909	1261007.81	526903.76	588.77	MAG NL SET PANEL
	910	1260791.72	526398.80	578.53	60D NL SET PANEL
	911	1261232.93	526146.19	579.32	60D NL SET PANEL
	912	1261602.13	526713.53	591.82	MAG NL SET PANEL
	913	1262051.48	527119.62	606.13	MAG NL SET PANEL
	914	1262679.53	527464.81	632.59	MAG NL SET PANEL
	915	1262831.27	527759.69	643.75	MAG NL SET PANEL
	916	1262404.57	528083.48	640.89	MAG NL SET PANEL
	917	1262277.25	527663.86	623.76	MAG NL SET PANEL
	918	1261627.40	527258.68	583.07	MAG NL SET PANEL

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LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

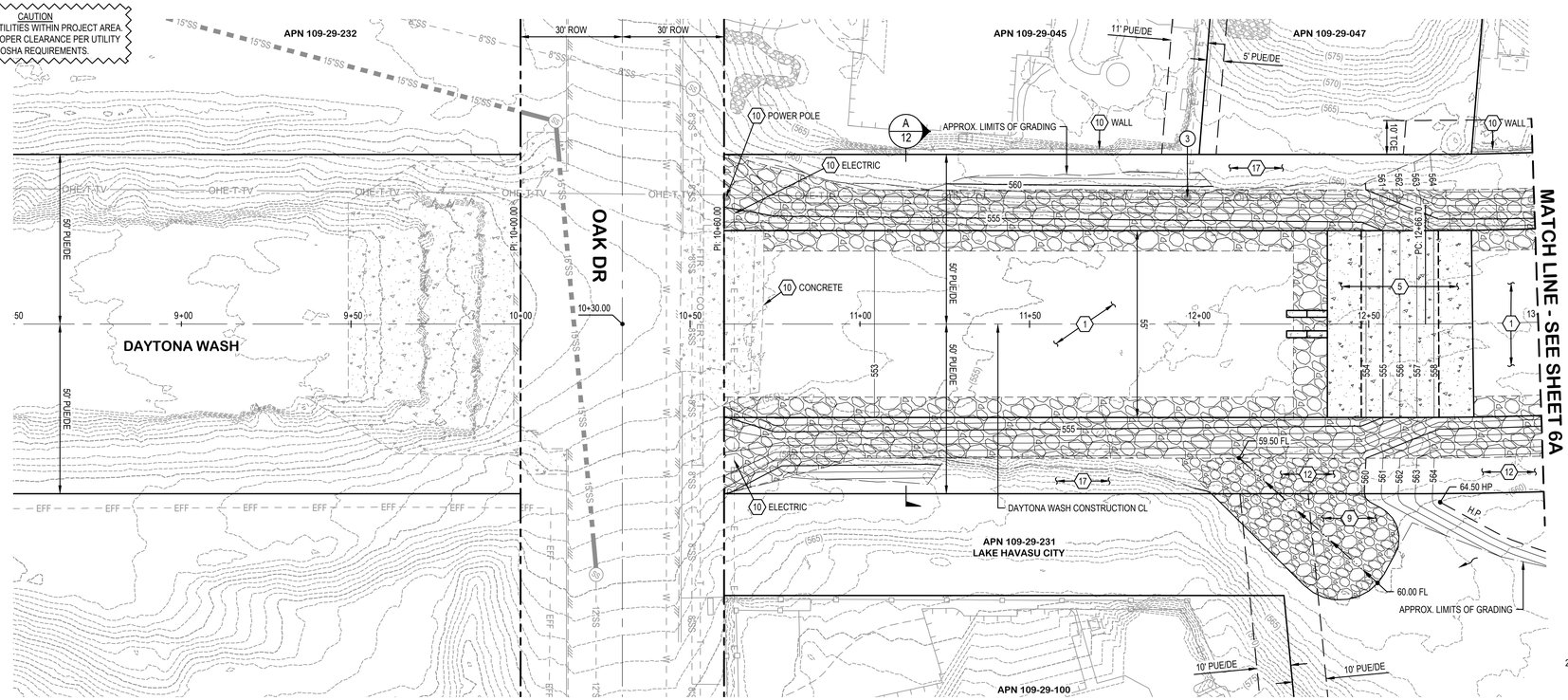
LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

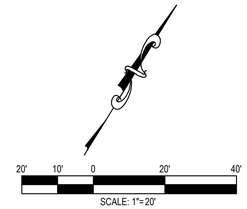
Designed by: ARS
Drawn by: RAM
Checked by: CJD
Date: 7/5/2023
Dwg scale: SEE PLAN

GEOMETRIC DATA

Sheet Number:
G-04

CAUTION
OVERHEAD UTILITIES WITHIN PROJECT AREA.
MAINTAIN PROPER CLEARANCE PER UTILITY AND OSHA REQUIREMENTS.





NOTES

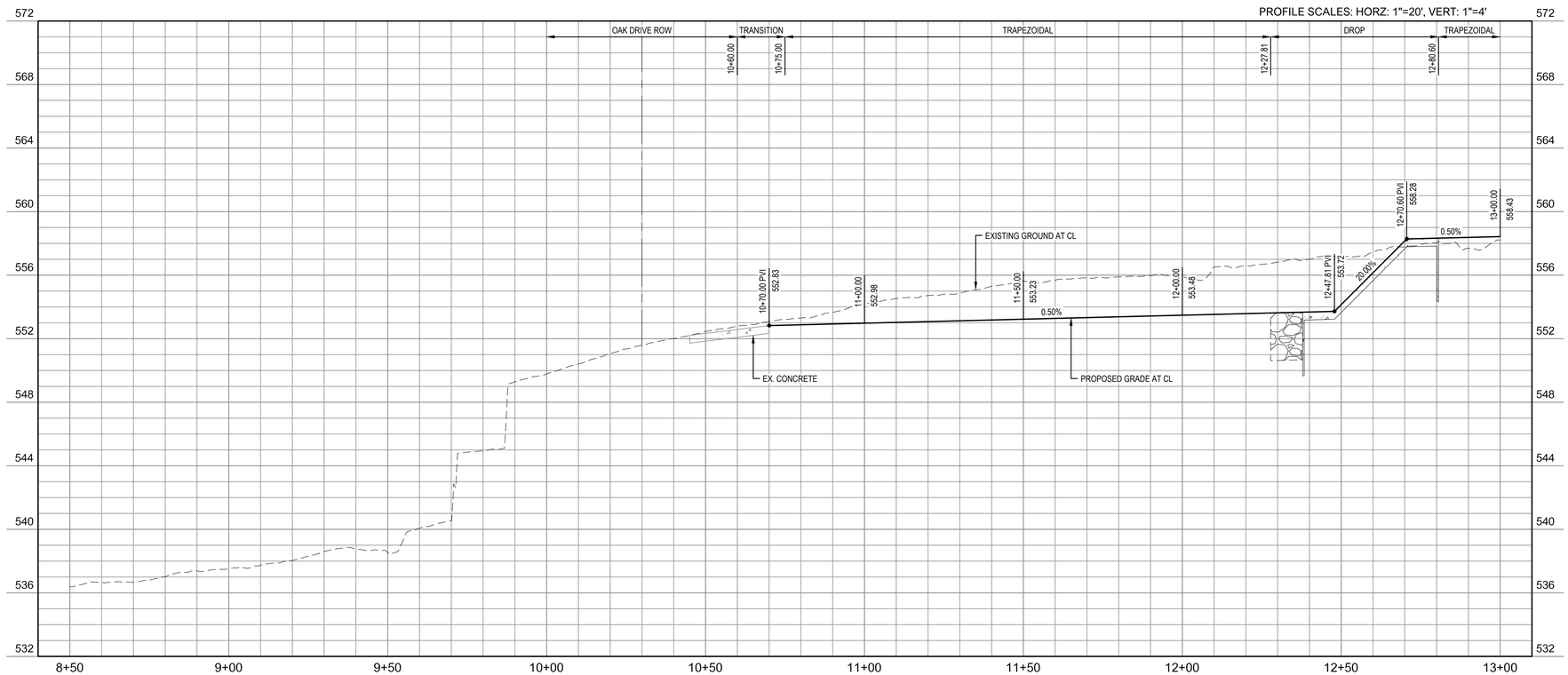
	CONSTRUCTION	EST. QUANTITY THIS SHEET	
1	CONSTRUCT TRAPEZOIDAL CHANNEL. SEE TYPICAL SECTIONS ON SHEETS 12 AND 13.	188	LF
5	CONSTRUCT DROP STRUCTURE. SEE DETAIL ON SHEET 14.	1	EA
9	FURNISH & INSTALL RIPRAP WITH GEOSYNTHETIC FABRIC. D50=8", THICKNESS=12" PER DETAIL ON SHEET 13.	61	CY
10	PROTECT IN PLACE.		NPI
12	GRADE OVERBANK AREA AS SHOWN.	SHEET 3	CY
17	TRIM OR MODIFY DRAIN PIPES LESS THAN 12" Ø TO BE COMPATIBLE WITH IMPROVED CHANNEL.		NPI

	REMOVALS	EST. QUANTITY THIS SHEET

	UTILITIES	EST. QUANTITY THIS SHEET
3	EX. POWER POLE. TO BE RELOCATED BY UTILITY COMPANY. PROTECT IN PLACE.	NPI

	EASEMENTS	

PROFILE SCALES: HORZ: 1"=20', VERT: 1"=4'



DAYTONA WASH CENTERLINE

ADDITIVE ALTERNATE SHEET

NO.	REVISIONS / SUBMISSIONS	DATE
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LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

Designed by: ARS
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CHANNEL PLAN & PROFILE

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REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 55518 ANDREW R. SHROADS VIRGINIA U.S.A. EXPIRES 9/30/2023

Sheet Number:
C-01
Sheet 5A of 16

CAUTION
OVERHEAD UTILITIES WITHIN PROJECT AREA.
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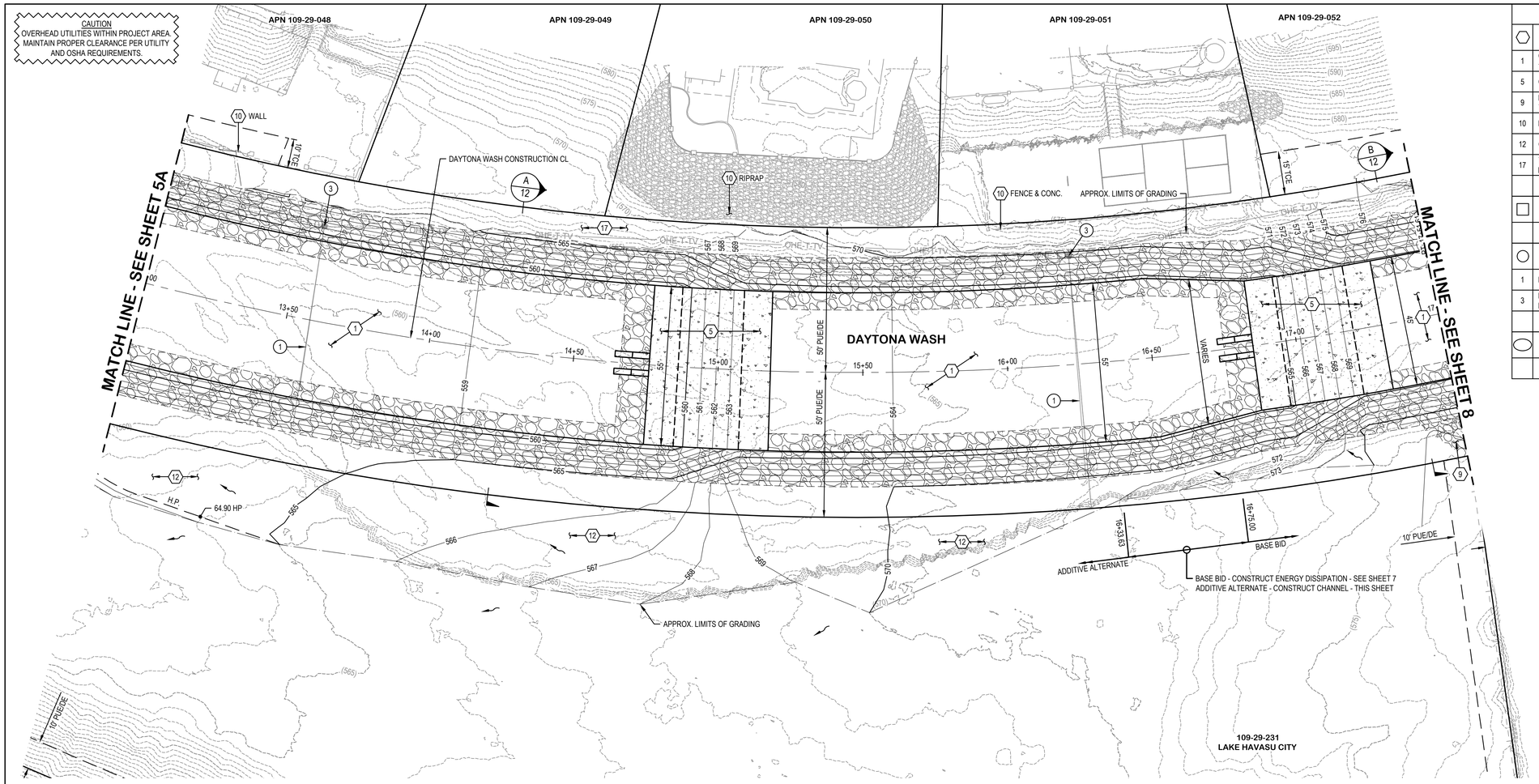

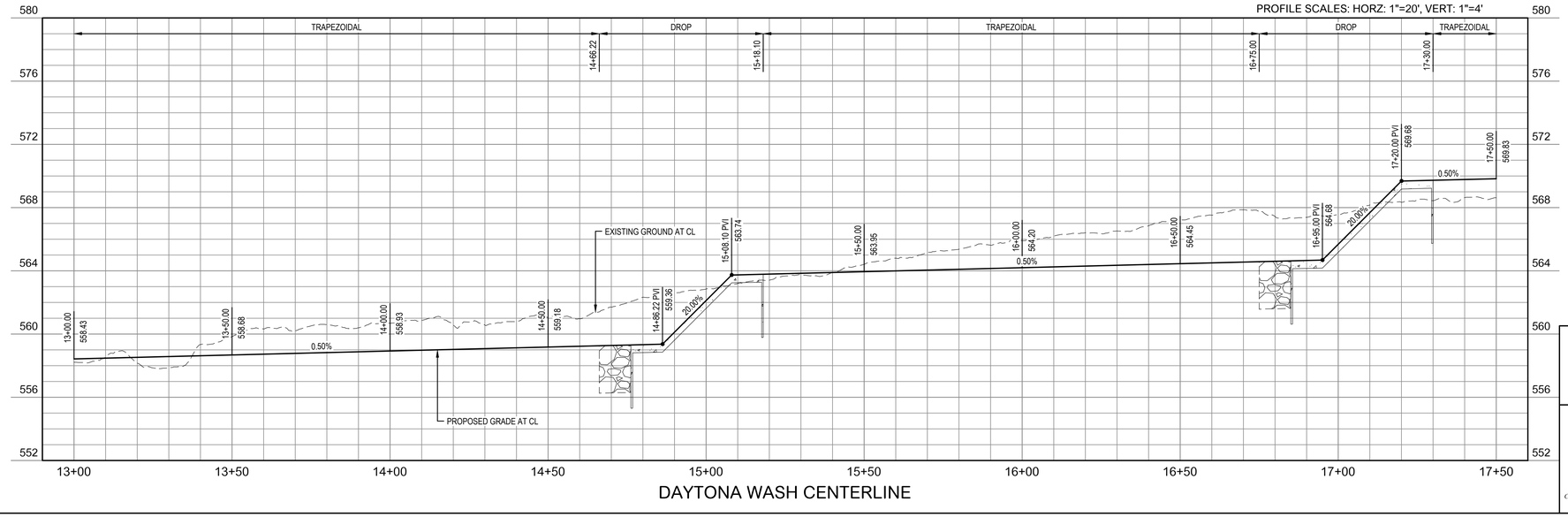

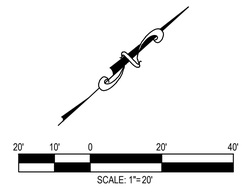

NOTES

	CONSTRUCTION	EST. QUANTITY THIS SHEET	
1	CONSTRUCT TRAPEZOIDAL CHANNEL. SEE TYPICAL SECTIONS ON SHEETS 12 AND 13.	343	LF
5	CONSTRUCT DROP STRUCTURE. SEE DETAIL ON SHEET 14.	2	EA
9	FURNISH & INSTALL RIPRAP WITH GEOSYNTHETIC FABRIC. D50=8", THICKNESS=12" PER DETAIL ON SHEET 13.	6	CY
10	PROTECT IN PLACE.		NPI
12	GRADE OVERBANK AREA AS SHOWN.	SHEET 3	CY
17	TRIM OR MODIFY DRAIN PIPES LESS THAN 12" Ø TO BE COMPATIBLE WITH IMPROVED CHANNEL.		NPI

	REMOVALS	EST. QUANTITY THIS SHEET

	UTILITIES	EST. QUANTITY THIS SHEET
1	EX. GUY WIRES. TO BE RELOCATED BY UTILITY COMPANY.	NPI
3	EX. POWER POLE. TO BE RELOCATED BY UTILITY COMPANY. PROTECT IN PLACE.	NPI

	EASEMENTS

LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978 •

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

ADDITIVE ALTERNATE SHEET

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

Designed by: ARS
Drawn by: RAM
Checked by: CJD
Date: 7/5/2023
Dwg scale: SEE PLAN

CHANNEL PLAN & PROFILE

PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41014 BRIAN NICHOLAS SCHALK STATE OF ARIZONA U.S.A. EXPIRES 9/30/2025

PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 58518 ANDREW R. SHROADS STATE OF ARIZONA U.S.A. EXPIRES 9/30/2023

Sheet Number:

C-02

Sheet 6A of 16

WILSON & COMPANY
HIGHER RELATIONSHIPS

CIVILTEC engineering inc.
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Phone: 623.582.0970
Fax: 623.582.1973
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ARIZONA 811
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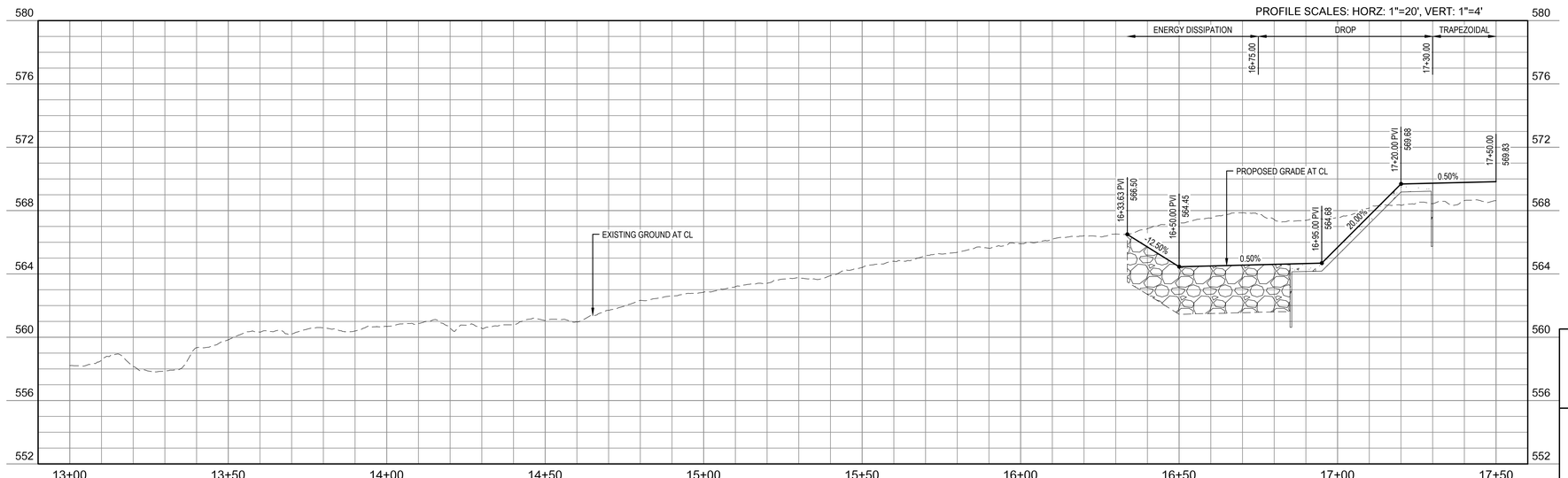
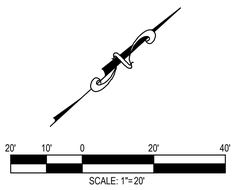
MARICOPA COUNTY: (602) 659-7500

CAUTION
OVERHEAD UTILITIES WITHIN PROJECT AREA.
MAINTAIN PROPER CLEARANCE PER UTILITY AND OSHA REQUIREMENTS.





NOTES

	CONSTRUCTION	EST. QUANTITY THIS SHEET	
1	CONSTRUCT TRAPEZOIDAL CHANNEL. SEE TYPICAL SECTIONS ON SHEETS 12 AND 13.	20	LF
5	CONSTRUCT DROP STRUCTURE. SEE DETAIL ON SHEET 14.	1	EA
9	FURNISH & INSTALL RIPRAP WITH GEOSYNTHETIC FABRIC. D50=8", THICKNESS=12" PER DETAIL ON SHEET 13.	6	CY
10	PROTECT IN PLACE.		NPI
12	GRADE OVERBANK AREA AS SHOWN.	SHEET 3	CY
15	FURNISH & INSTALL RIPRAP ENERGY DISSIPATOR WITH GEOSYNTHETIC FABRIC. D50=18", THICKNESS=36".	400	CY
17	TRIM OR MODIFY DRAIN PIPES LESS THAN 12" Ø TO BE COMPATIBLE WITH IMPROVED CHANNEL.		NPI

	REMOVALS	EST. QUANTITY THIS SHEET

	UTILITIES	EST. QUANTITY THIS SHEET

	EASEMENTS

LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

BASE BID SHEET

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

Designed by: ARS
Drawn by: RAM
Checked by: CJD
Date: 7/5/2023
Dwg scale: SEE PLAN

CHANNEL PLAN & PROFILE

WILSON & COMPANY
HIGHER RELATIONSHIPS

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REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41014 BRIAN NICHOLAS SCHALK STATE OF ARIZONA EXPIRES 9/30/2025

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 56518 ANDREW R. SHROADS STATE OF ARIZONA EXPIRES 9/30/2023

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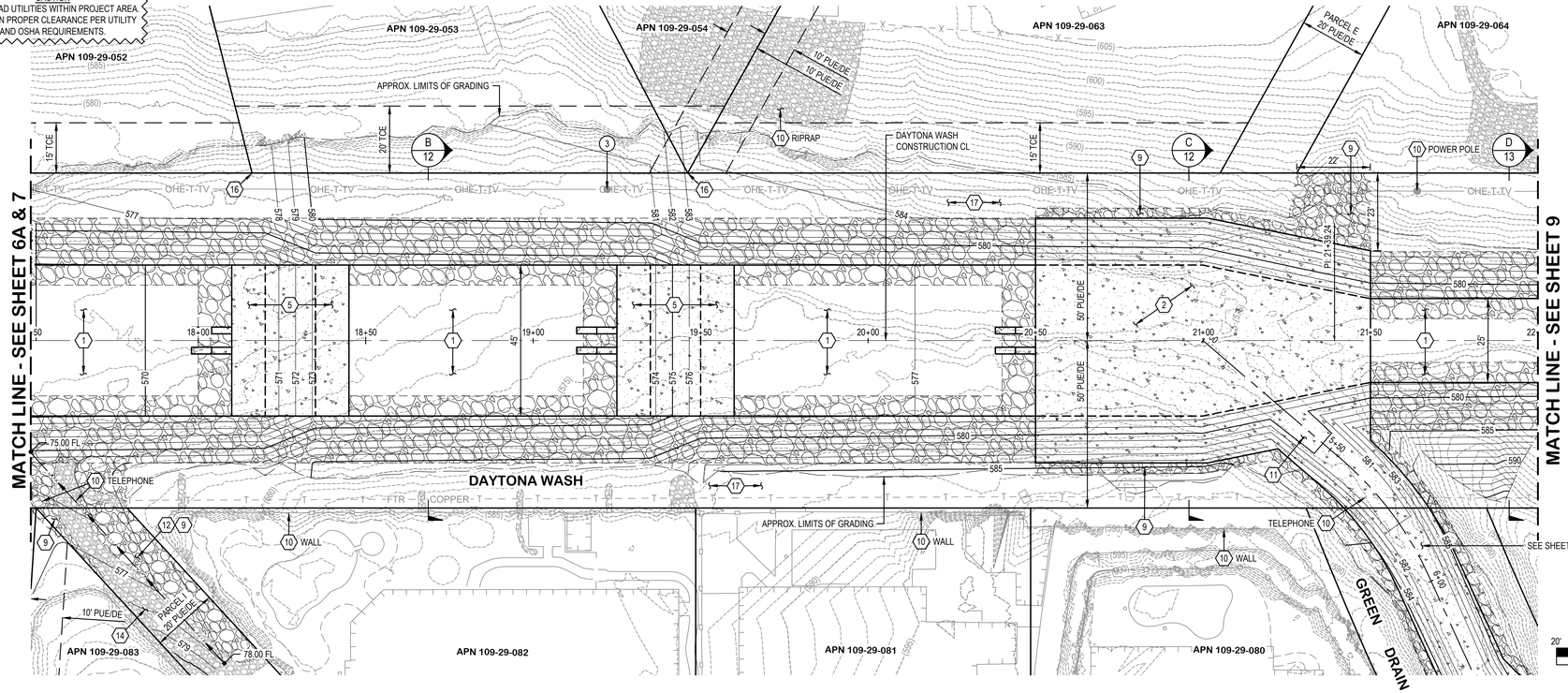
Sheet Number:
C-03
Sheet 7 of 16

CAUTION
OVERHEAD UTILITIES WITHIN PROJECT AREA
MAINTAIN PROPER CLEARANCE PER UTILITY
AND OSHA REQUIREMENTS.



20' 10' 0 20' 40'
SCALE: 1"= 20'

NOTES

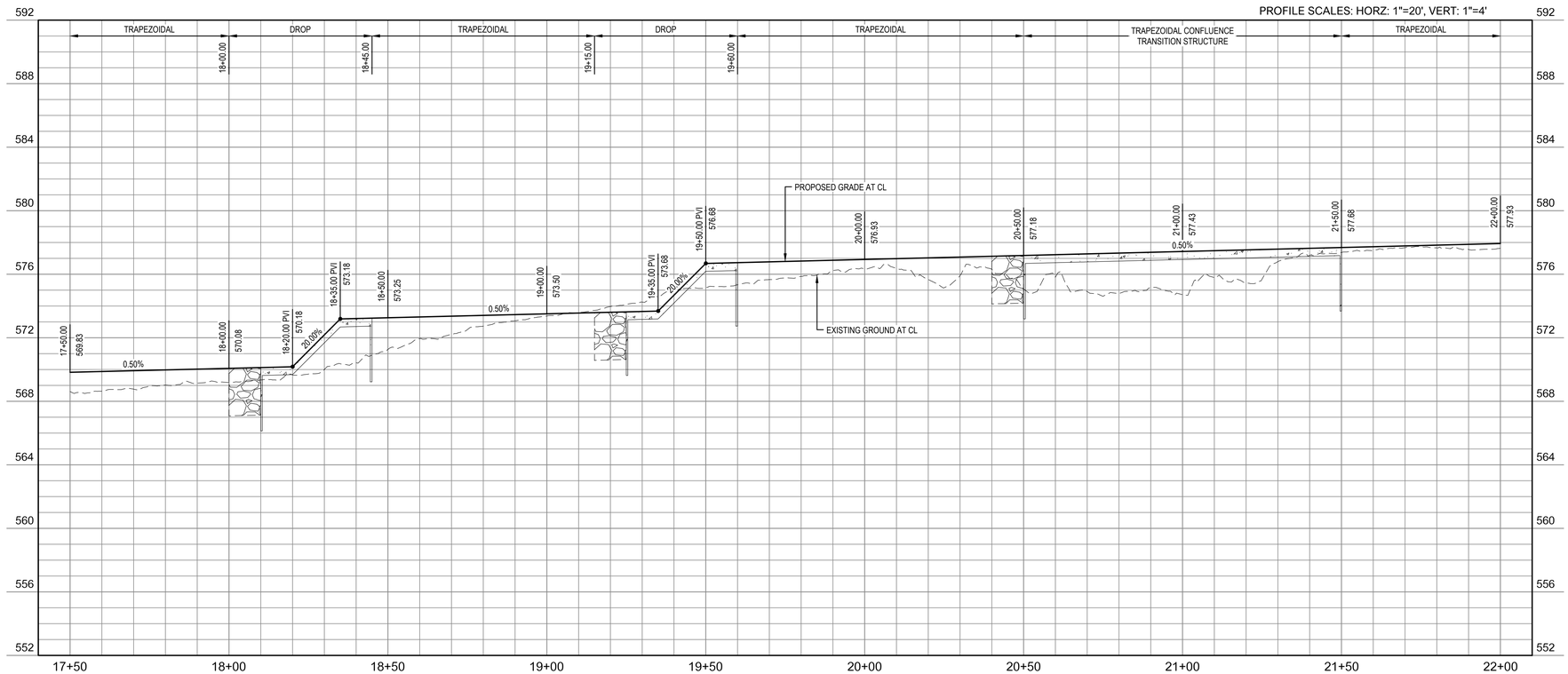
	CONSTRUCTION	EST. QUANTITY THIS SHEET	
1	CONSTRUCT TRAPEZOIDAL CHANNEL. SEE TYPICAL SECTIONS ON SHEETS 12 AND 13.	260	LF
2	CONSTRUCT TRAPEZOIDAL SHOTCRETE CONFLUENCE TRANSITION STRUCTURE. SEE TYPICAL SECTIONS ON SHEET 12 & 15.	1	LS
5	CONSTRUCT DROP STRUCTURE. SEE DETAIL ON SHEET 14.	2	EA
9	FURNISH & INSTALL RIPRAP WITH GEOSYNTHETIC FABRIC. D50=8", THICKNESS=12" PER DETAIL ON SHEET 13.	70	CY
10	PROTECT IN PLACE.		NPI
11	CONSTRUCT SHOTCRETE CONFLUENCE DROP. SEE PROFILE ON SHEET 11.		NPI
12	GRADE OVERBANK AREA AS SHOWN.	SHEET 3	CY
14	REMOVE, SALVAGE, AND REPLACE EX. RIPRAP.		NPI
16	RESET PROPERTY CORNER MONUMENT.		NPI
17	TRIM OR MODIFY DRAIN PIPES LESS THAN 12" Ø TO BE COMPATIBLE WITH IMPROVED CHANNEL.		NPI

	REMOVALS	EST. QUANTITY THIS SHEET

	UTILITIES	EST. QUANTITY THIS SHEET	
3	EX. POWER POLE. TO BE RELOCATED BY UTILITY COMPANY. PROTECT IN PLACE.		NPI

	EASEMENTS

PROFILE SCALES: HORZ: 1"=20', VERT: 1"=4'



DAYTONA WASH CENTERLINE

BASE BID SHEET

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

Designed by: ARS
Drawn by: RAM
Checked by: CJD
Date: 7/5/2023
Dwg scale: SEE PLAN

CHANNEL PLAN & PROFILE

Sheet Number:
C-04
Sheet 8 of 16

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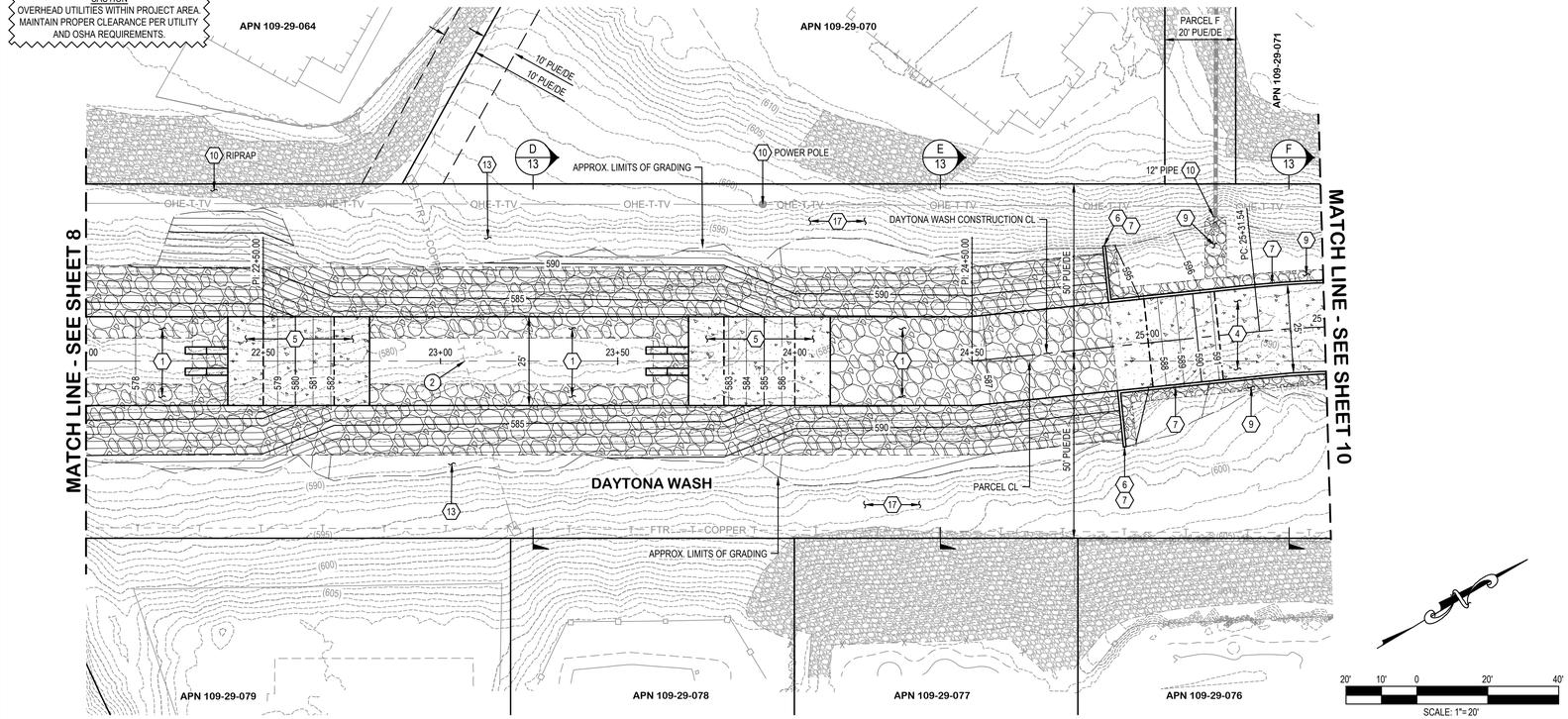

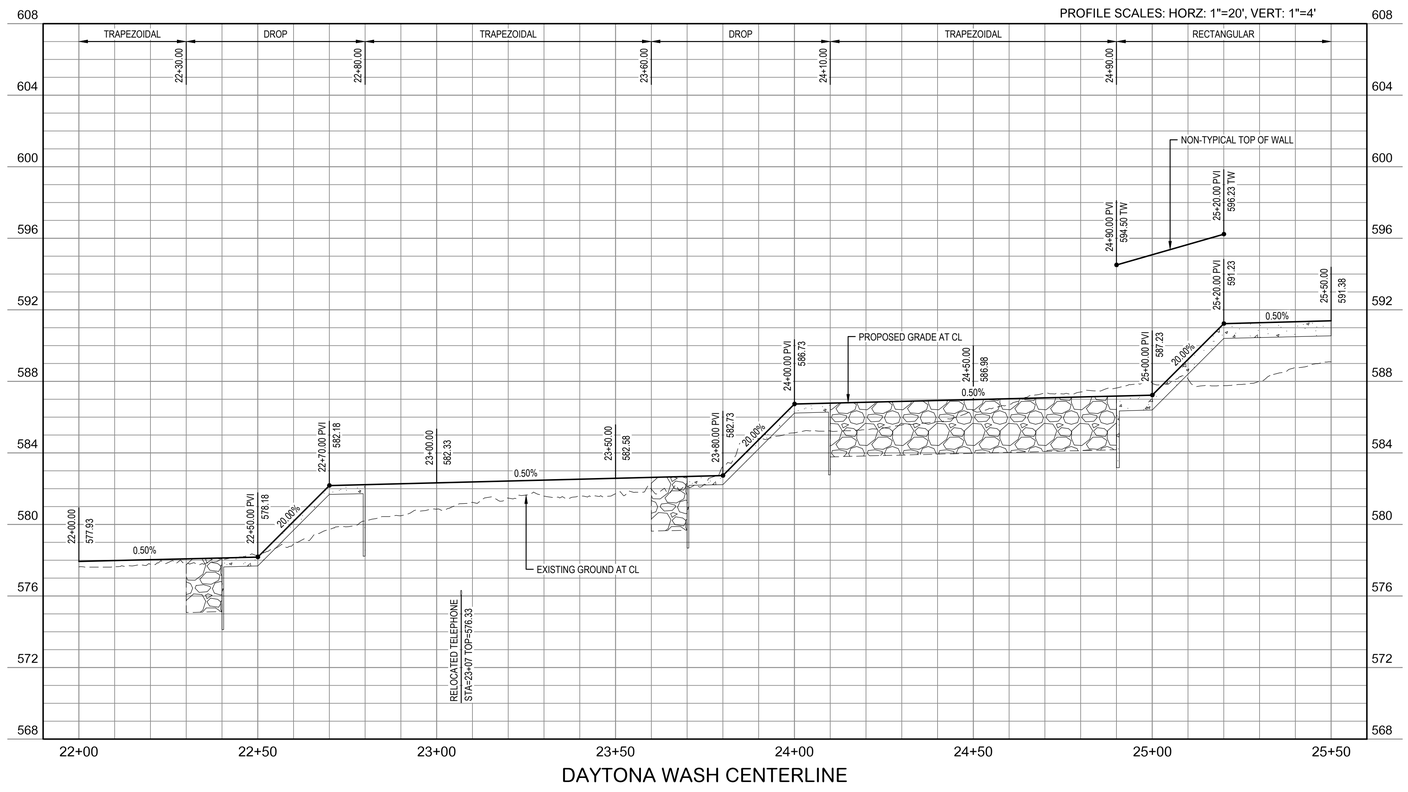

NOTES

	CONSTRUCTION	EST. QUANTITY THIS SHEET	
1	CONSTRUCT TRAPEZOIDAL CHANNEL. SEE TYPICAL SECTIONS ON SHEETS 12 AND 13.	190	LF
4	CONSTRUCT RECTANGULAR CHANNEL. SEE TYPICAL SECTION ON SHEET 13.	60	LF
5	CONSTRUCT DROP STRUCTURE. SEE DETAIL ON SHEET 14.	2	EA
6	CONSTRUCT CONCRETE WINGWALLS PER ADOT SD 6.10. SEE DETAIL ON SHEETS 15 & 16.	2	EA
7	FURNISH & INSTALL SAFETY RAIL PER MAG 145 'TYPE 2'. SEE DETAIL ON SHEET 16.	150	LF
9	FURNISH & INSTALL RIPRAP WITH GEOSYNTHETIC FABRIC. D50=8", THICKNESS=12" PER DETAIL ON SHEET 13.	22	CY
10	PROTECT IN PLACE.		NPI
13	CAUTION. USE EXTREME CARE NEAR STEEP ROCKED SLOPES DURING CONSTRUCTION ACTIVITIES.		NPI
17	TRIM OR MODIFY DRAIN PIPES LESS THAN 12" Ø TO BE COMPATIBLE WITH IMPROVED CHANNEL.		NPI
	REMOVALS	**EST. QUANTITY THIS SHEET**	
	UTILITIES	**EST. QUANTITY THIS SHEET**	
2	EX. TELEPHONE. TO BE RELOCATED BY UTILITY COMPANY.		NPI
	EASEMENTS		

LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

BASE BID SHEET

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

Designed by:	ARS
Drawn by:	RAM
Checked by:	CJD
Date:	7/5/2023
Dwg scale:	SEE PLAN

CHANNEL PLAN & PROFILE

PROFESSIONAL ENGINEER (CIVIL) U.S. CERTIFICATE NO. 41014 BRIAN NICHOLAS SCHALK STATE OF ARIZONA REGISTERED EXPIRES 6/30/2025

PROFESSIONAL ENGINEER (CIVIL) U.S. CERTIFICATE NO. 58518 ANDREW R. SHROADS STATE OF ARIZONA REGISTERED EXPIRES 9/30/2023

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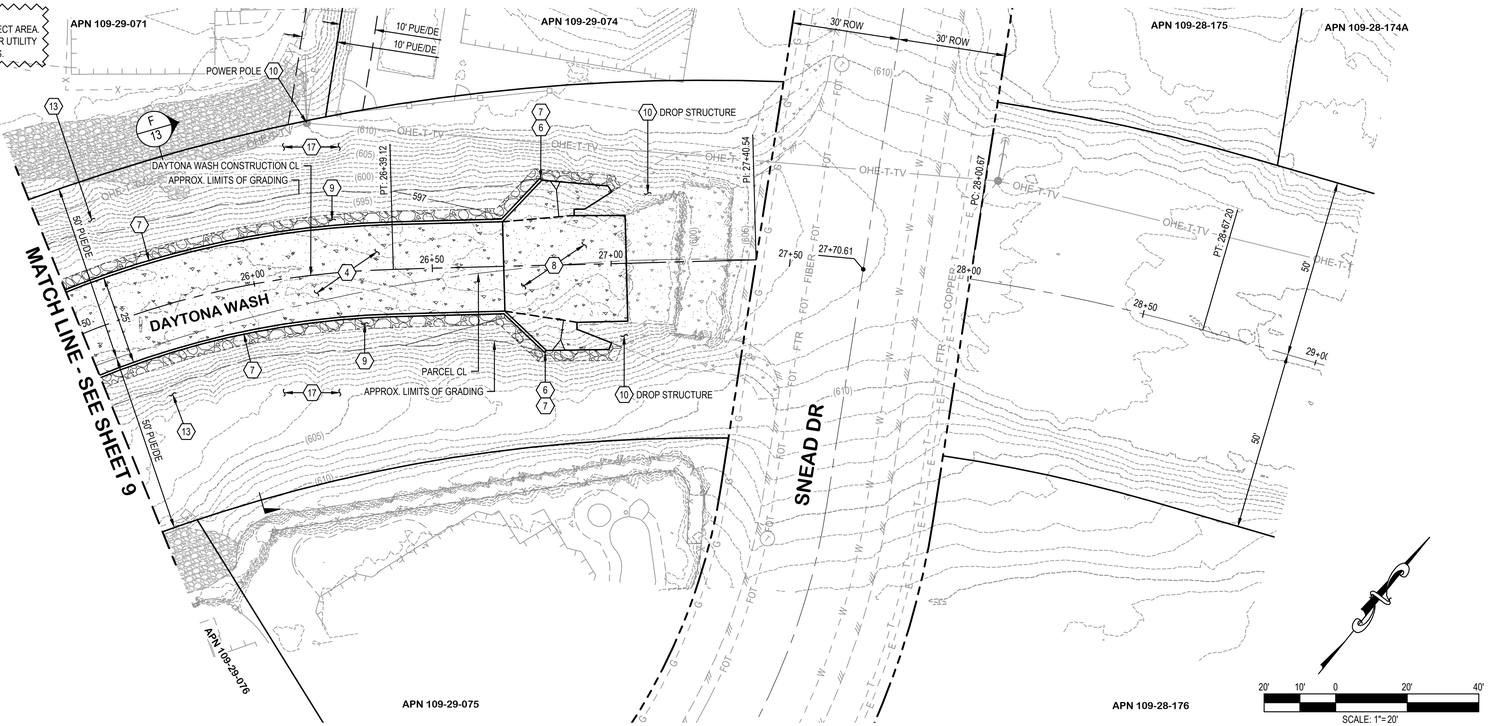
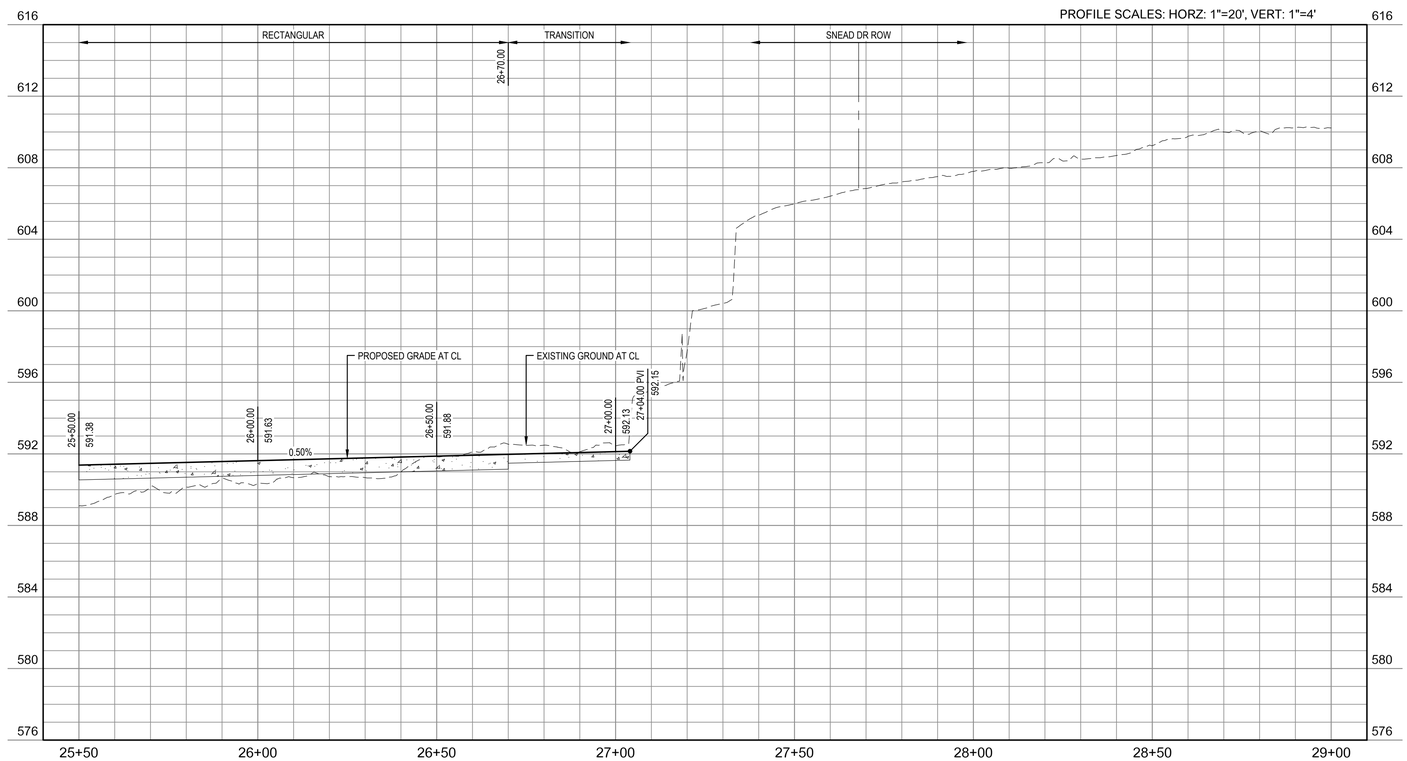
Sheet Number:
C-05
Sheet 9 of 16

CAUTION
OVERHEAD UTILITIES WITHIN PROJECT AREA. MAINTAIN PROPER CLEARANCE PER UTILITY AND OSHA REQUIREMENTS.





NOTES

	CONSTRUCTION	EST. QUANTITY THIS SHEET	
4	CONSTRUCT RECTANGULAR CHANNEL. SEE TYPICAL SECTION ON SHEET 13.	120	LF
6	CONSTRUCT CONCRETE WINGWALLS PER ADOT SD 6.10. SEE DETAIL ON SHEETS 15 & 16.	2	EA
7	FURNISH & INSTALL SAFETY RAIL PER MAG 145 'TYPE 2'. SEE DETAIL ON SHEET 16.	272	LF
8	CONSTRUCT INLET SHOTCRETE TRANSITION. SEE DETAIL ON SHEET 15.	155	SY
9	FURNISH & INSTALL RIPRAP WITH GEOSYNTHETIC FABRIC. D50=8", THICKNESS=12" PER DETAIL ON SHEET 13.	35	CY
10	PROTECT IN PLACE.		NPI
13	CAUTION. USE EXTREME CARE NEAR STEEP ROCKED SLOPES DURING CONSTRUCTION ACTIVITIES.		NPI
17	TRIM OR MODIFY DRAIN PIPES LESS THAN 12" Ø TO BE COMPATIBLE WITH IMPROVED CHANNEL.		NPI
	REMOVALS	**EST. QUANTITY THIS SHEET**	
	UTILITIES	**EST. QUANTITY THIS SHEET**	
	EASEMENTS		

LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

BASE BID SHEET

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

Designed by: ARS
Drawn by: RAM
Checked by: CJD
Date: 7/5/2023
Dwg scale: SEE PLAN

CHANNEL PLAN & PROFILE

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41014 BRIAN NICHOLAS SCHALK U.S.A. ARIZONA EXPIRES 6/30/2025

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 58518 ANDREW R. SHROADS U.S.A. ARIZONA EXPIRES 9/30/2023

Sheet Number:
C-06
Sheet 10 of 16

WILSON & COMPANY
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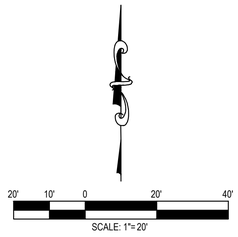
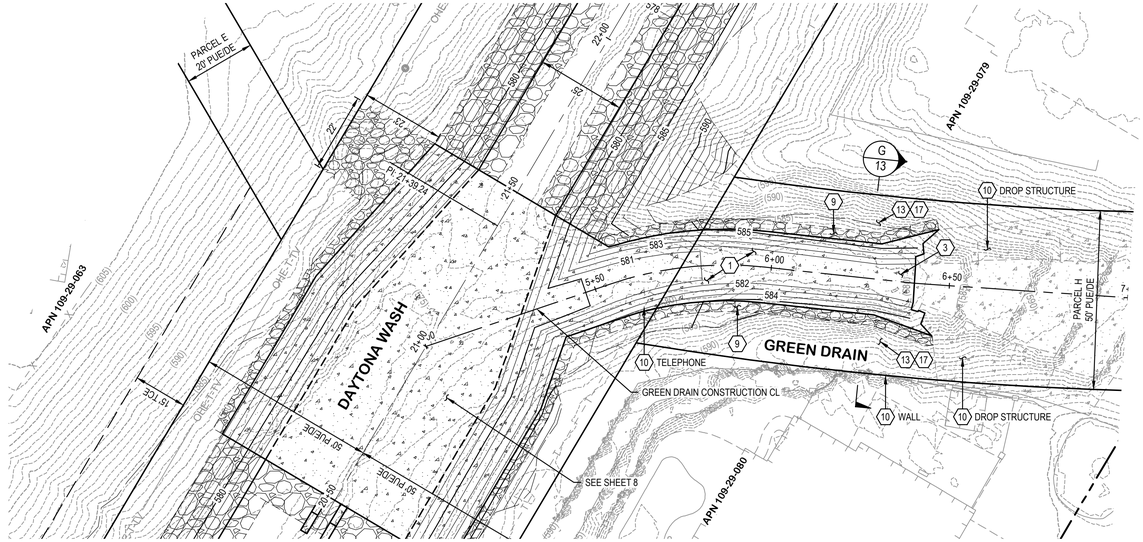
MARICOPA COUNTY: (602) 659-7500

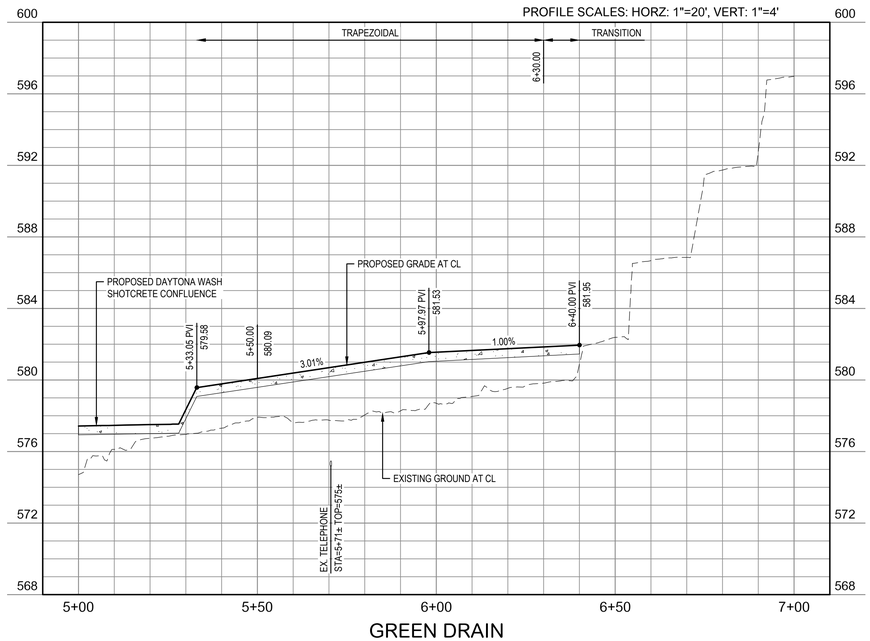
CAUTION
OVERHEAD UTILITIES WITHIN PROJECT AREA.
MAINTAIN PROPER CLEARANCE PER UTILITY
AND OSHA REQUIREMENTS.





NOTES

	CONSTRUCTION	EST. QUANTITY THIS SHEET	
1	CONSTRUCT TRAPEZOIDAL CHANNEL. SEE TYPICAL SECTIONS ON SHEETS 12 AND 13.	97	LF
3	CONSTRUCT GREEN DRAIN SHOTCRETE INLET TRANSITION. SEE DETAIL ON SHEET 15.	33	SY
9	FURNISH & INSTALL RIPRAP WITH GEOSYNTHETIC FABRIC. D50=8", THICKNESS=12" PER DETAIL ON SHEET 13.	22	CY
10	PROTECT IN PLACE.		NPI
13	CAUTION. USE EXTREME CARE NEAR STEEP ROCKED SLOPES DURING CONSTRUCTION ACTIVITIES.		NPI
17	TRIM OR MODIFY DRAIN PIPES LESS THAN 12" Ø TO BE COMPATIBLE WITH IMPROVED CHANNEL.		NPI
	REMOVALS	**EST. QUANTITY THIS SHEET**	
	UTILITIES	**EST. QUANTITY THIS SHEET**	
	EASEMENTS		



BASE BID SHEET

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

Designed by:	ARS
Drawn by:	RAM
Checked by:	CJD
Date:	7/5/2023
Dwg scale:	SEE PLAN

CHANNEL PLAN & PROFILE

Sheet Number:
C-07
Sheet 11 of 16

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REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41014 BRIAN NICHOLAS SCHALK ARIZONA U.S.A. EXPIRES 6/30/2025

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 58518 ANDREW R. SHROADS ARIZONA U.S.A. EXPIRES 9/30/2023

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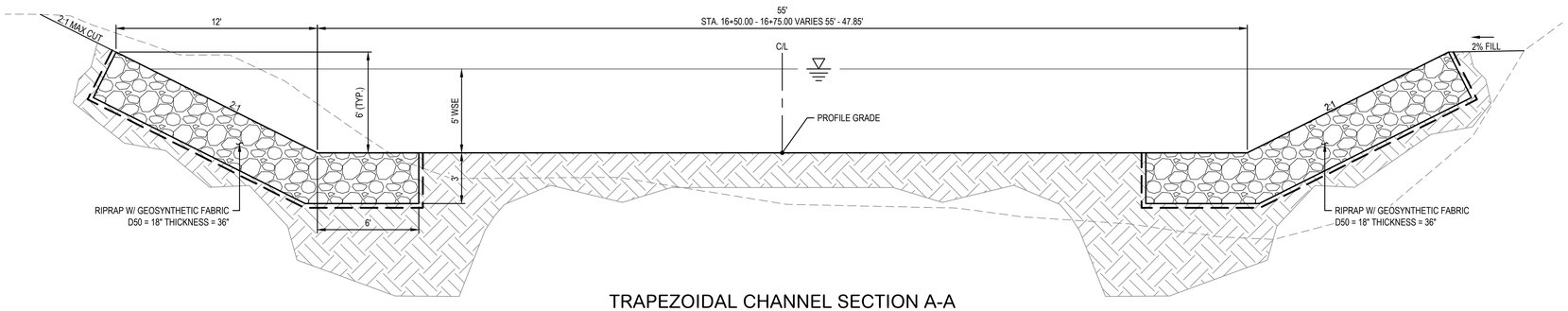
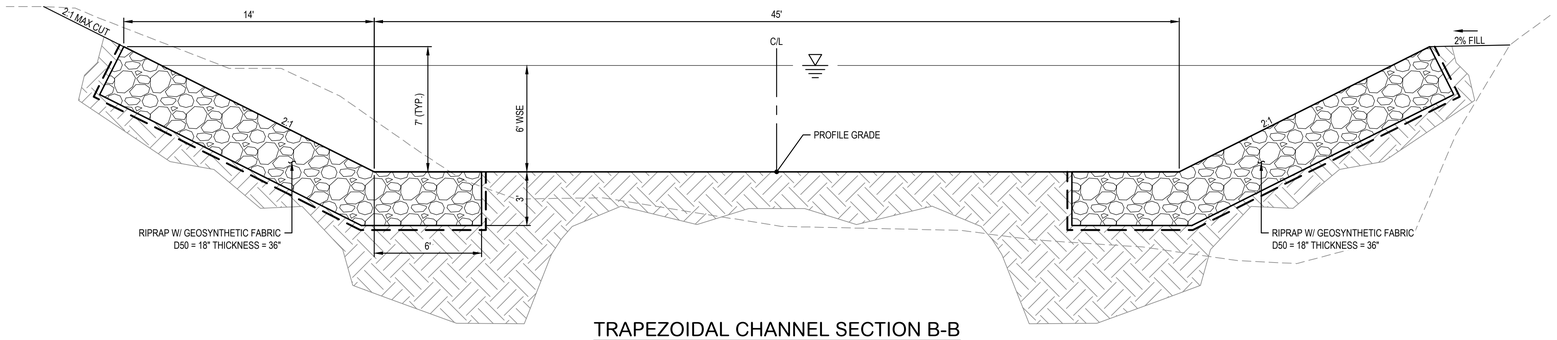


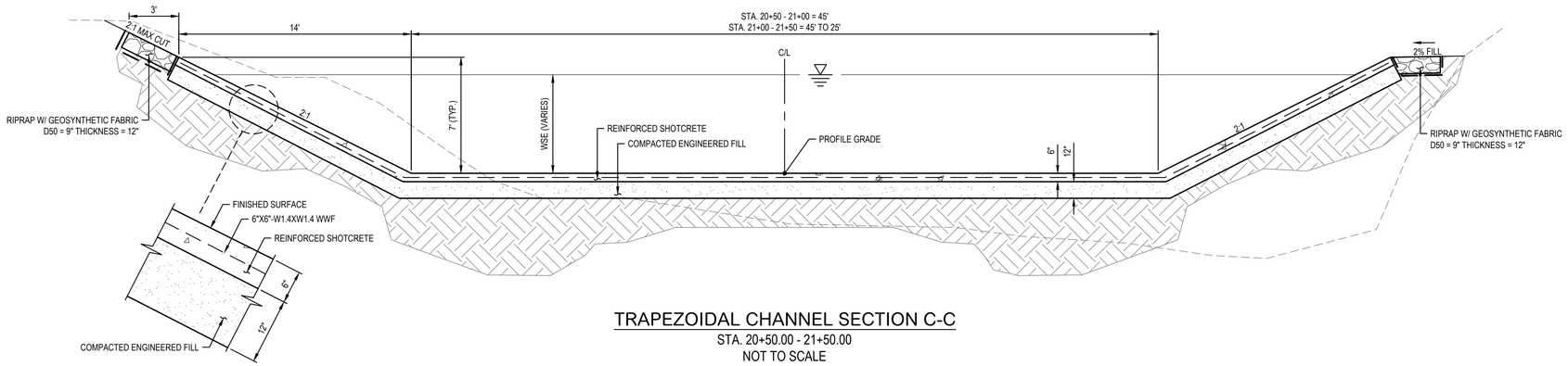
TRAPEZOIDAL CHANNEL SECTION A-A

STA. 10+60 - 12+27.81
STA. 12+80.60 - 14+66.22
STA 15+18.10 - 16+75.00
NOT TO SCALE



TRAPEZOIDAL CHANNEL SECTION B-B

STA. 17+30.00 - 18+00.00
STA. 18+45.00 - 19+15.00
STA. 19+60.00 - 20+50.00
NOT TO SCALE



TRAPEZOIDAL CHANNEL SECTION C-C

STA. 20+50.00 - 21+50.00
NOT TO SCALE

LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

DETAILS

Designed by: ARS
Drawn by: RAM
Checked by: CJD
Date: 7/5/2023
Dwg scale: SEE PLAN

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41014 BRIAN NICHOLAS SCHALK ARIZONA U.S.A. Date Signed EXPIRES 6/30/2025

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 58518 ANDREW R. SHROADS ARIZONA U.S.A. EXPIRES 9/30/2023

WILSON & COMPANY
HIGHER RELATIONSHIPS

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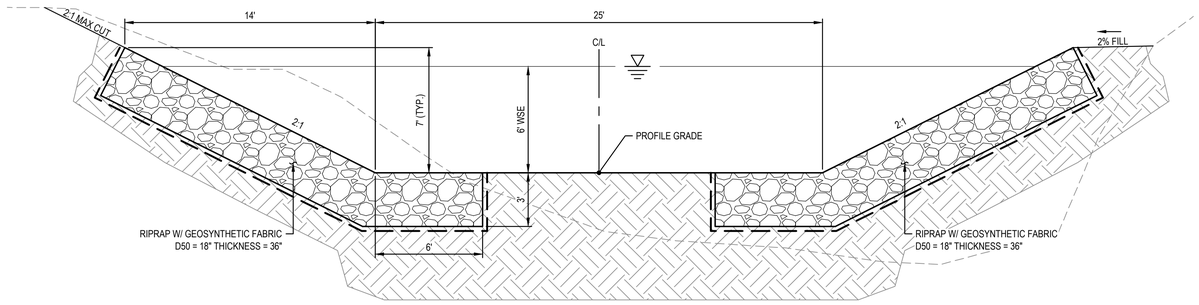
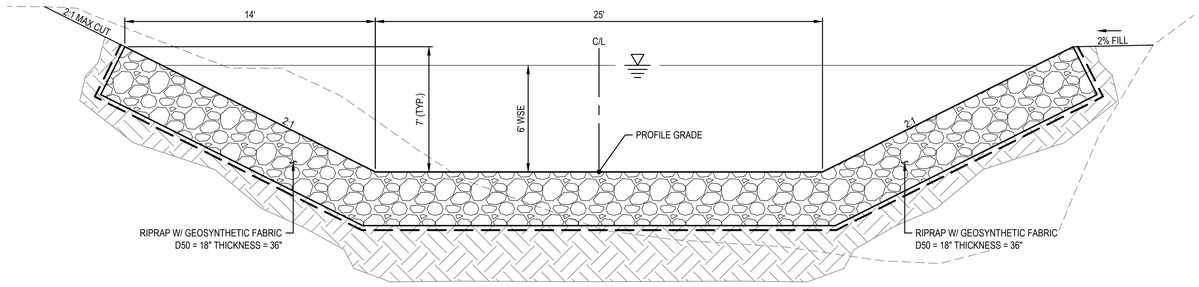
Sheet Number:
D-01
Sheet 12 of 16



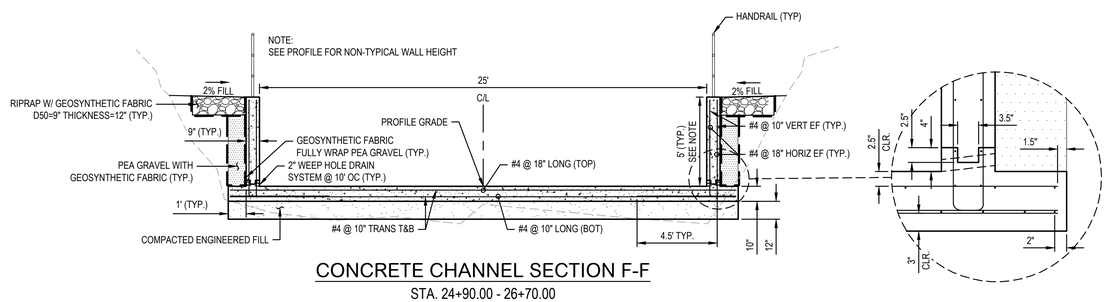
TRAPEZOIDAL CHANNEL SECTION D-D

STA. 21+50.00 - 22+30.00
STA. 22+80.00 - 23+60.00
NOT TO SCALE



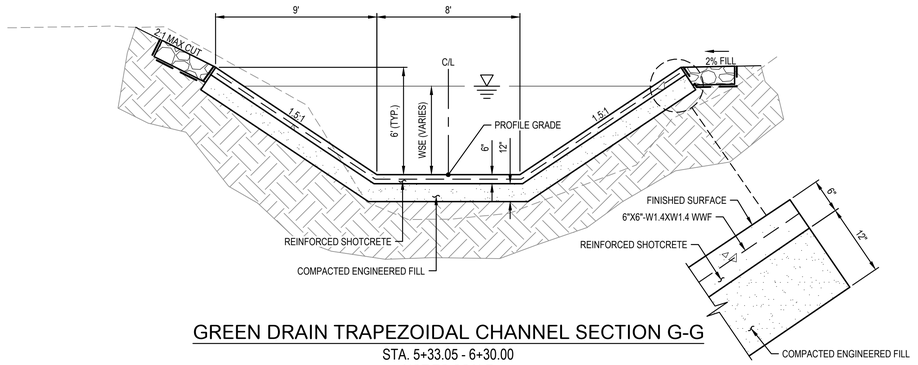
TRAPEZOIDAL CHANNEL SECTION E-E

STA. 24+10.00 - 24+90.00
NOT TO SCALE



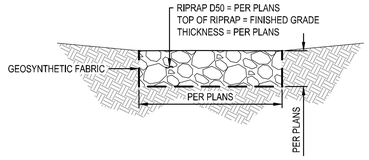
CONCRETE CHANNEL SECTION F-F

STA. 24+90.00 - 26+70.00
NOT TO SCALE



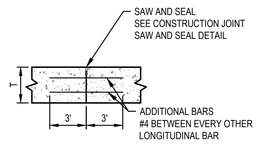
GREEN DRAIN TRAPEZOIDAL CHANNEL SECTION G-G

STA. 5+33.05 - 6+30.00
NOT TO SCALE



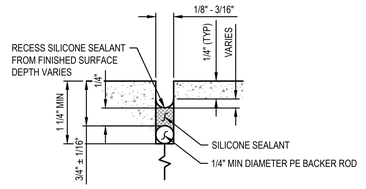
RIPRAP DETAIL

NOT TO SCALE



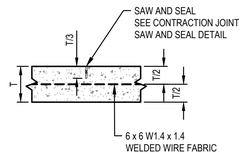
CONCRETE CHANNEL CONSTRUCTION JOINT

NOT TO SCALE



CONSTRUCTION JOINT SAW AND SEAL DETAIL

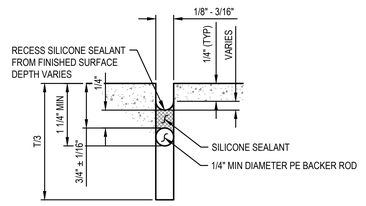
NOT TO SCALE



SHOTCRETE CHANNEL CONTRACTION JOINT

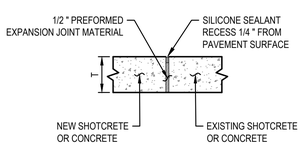
NOT TO SCALE

CONTRACTION JOINTS TO BE LOCATED ACROSS SHOTCRETE CHANNEL AT A MAXIMUM 30 FOOT INTERVAL



CONTRACTION JOINT SAW AND SEAL DETAIL

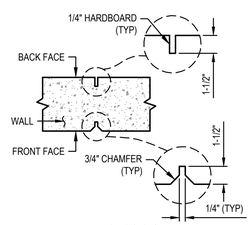
NOT TO SCALE



EXPANSION JOINT

NOT TO SCALE

EXPANSION JOINTS TO BE LOCATED BETWEEN ALL NEW & EXISTING SHOTCRETE OR CONCRETE STRUCTURES.



WALL CONTRACTION JOINT

NOT TO SCALE

CONTRACTION JOINTS TO BE LOCATED ALONG WALL AT A MAXIMUM 30 FOOT INTERVAL

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REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 58518 ANDREW R. SHROADS U.S.A. ARIZONA EXPIRES 9/30/2023

CITY OF LAKE HAVASU CITY, ARIZONA • INCORPORATED 1978

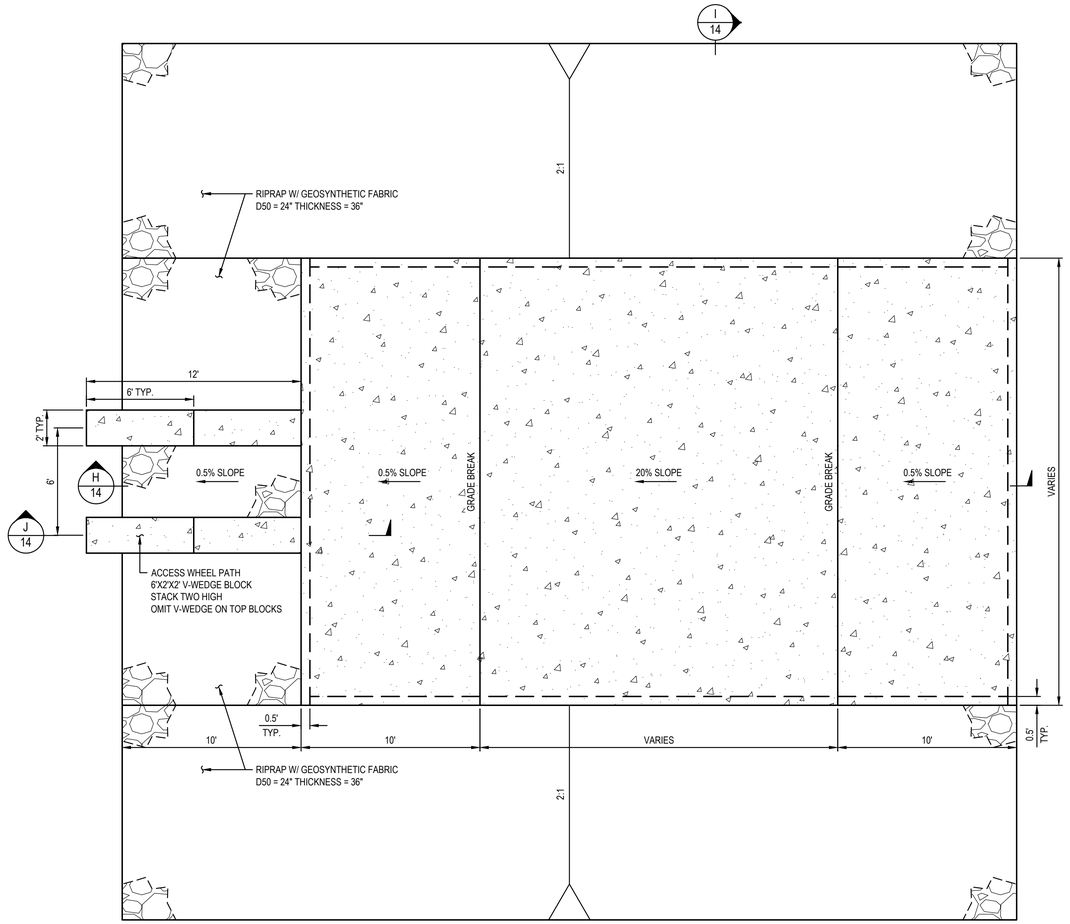
NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

Designed by: ARS
Drawn by: RAM
Checked by: CJD
Date: 7/5/2023
Dwg scale: SEE PLAN

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

DETAILS

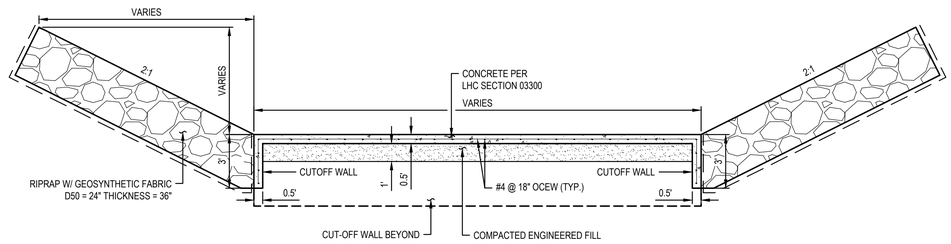
Sheet Number:
D-02
Sheet 13 of 16



NOTE:
RIPRAP APRON WIDTH VARIES FROM 47.85' - 45.00'
BETWEEN STA. 16+75.00 - 16+85.00

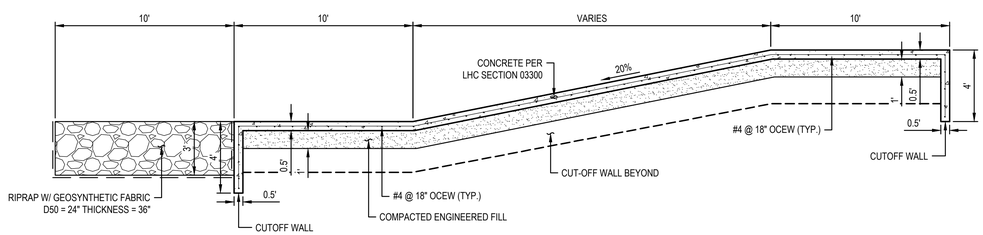
DROP STRUCTURE DETAIL

NOT TO SCALE



SECTION I-I

NOT TO SCALE



SECTION H-H

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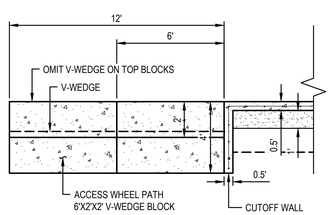

SECTION J-J

NOT TO SCALE

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

Designed by:	ARS
Drawn by:	RAM
Checked by:	CJD
Date:	7/5/2023
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DROP STRUCTURE DETAIL

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 41014 BRIAN NICHOLAS SCHALK STATE OF ARIZONA U.S.A. EXPIRES 6/30/2025

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 59518 ANDREW R. SHROADS STATE OF ARIZONA U.S.A. EXPIRES 9/30/2023

Sheet Number:

D-03

Sheet 14 of 16

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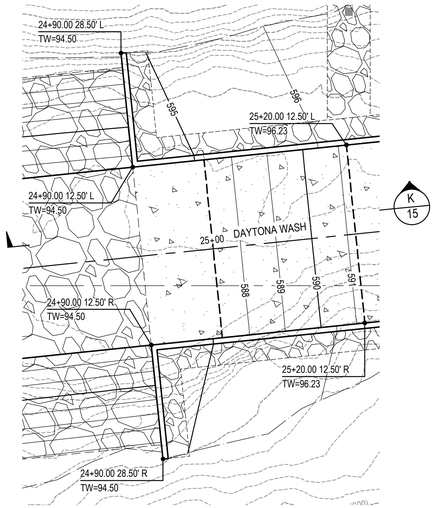
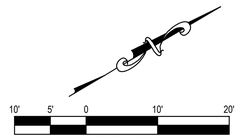
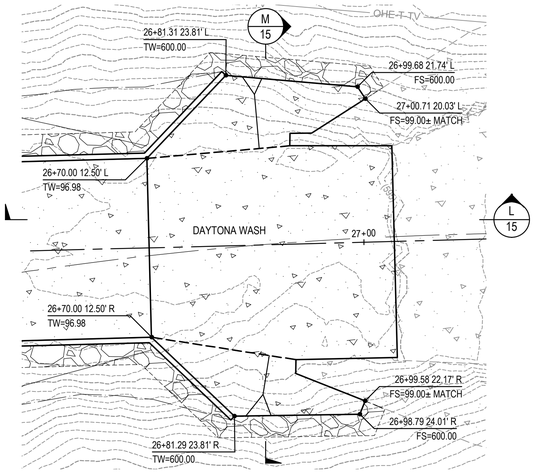
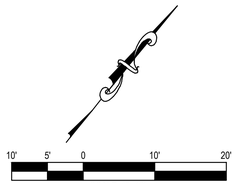


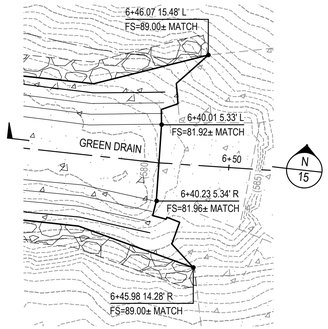


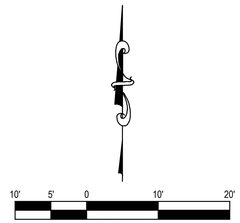
OUTLET CONCRETE CHANNEL DETAIL



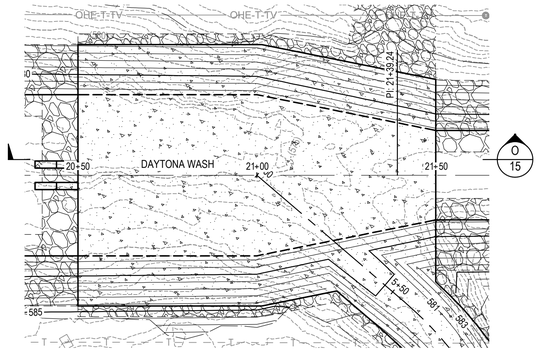


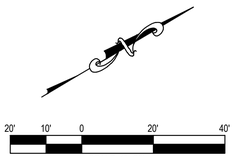
INLET SHOTCRETE TRANSITION DETAIL



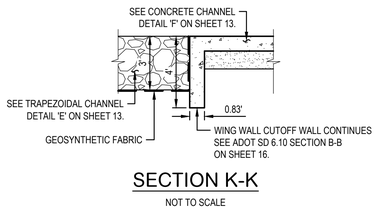


GREEN DRAIN INLET SHOTCRETE TRANSITION DETAIL



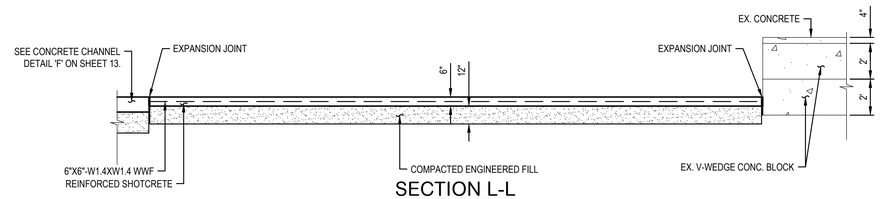


SHOTCRETE CONFLUENCE DETAIL



SECTION K-K

NOT TO SCALE



SECTION L-L

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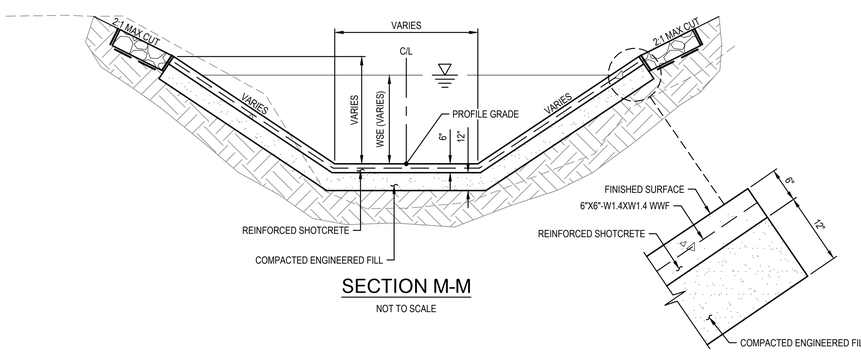

SECTION M-M

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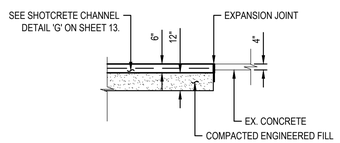
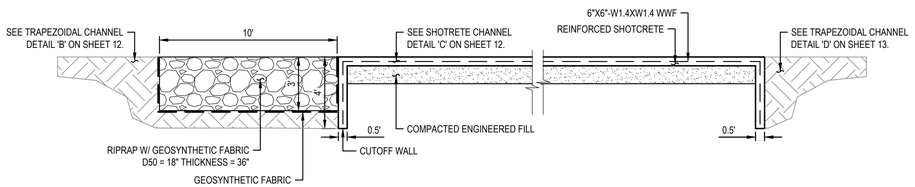


SECTION N-N

NOT TO SCALE



SECTION O-O

NOT TO SCALE

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LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

DETAILS

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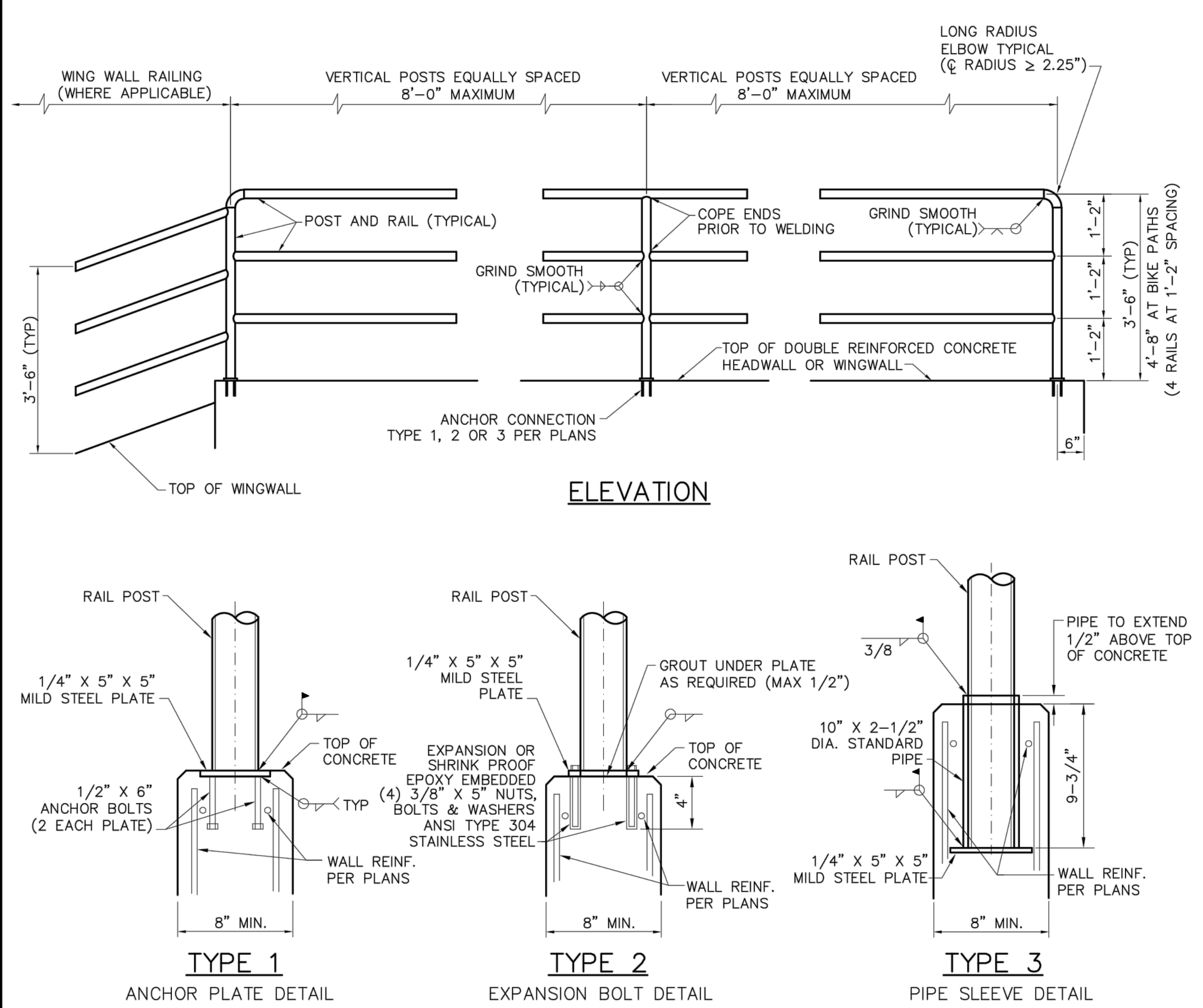
Drown by:	RAM
Checked by:	CJD
Date:	7/5/2023
Dwg scale:	SEE PLAN

Sheet Number:

D-04

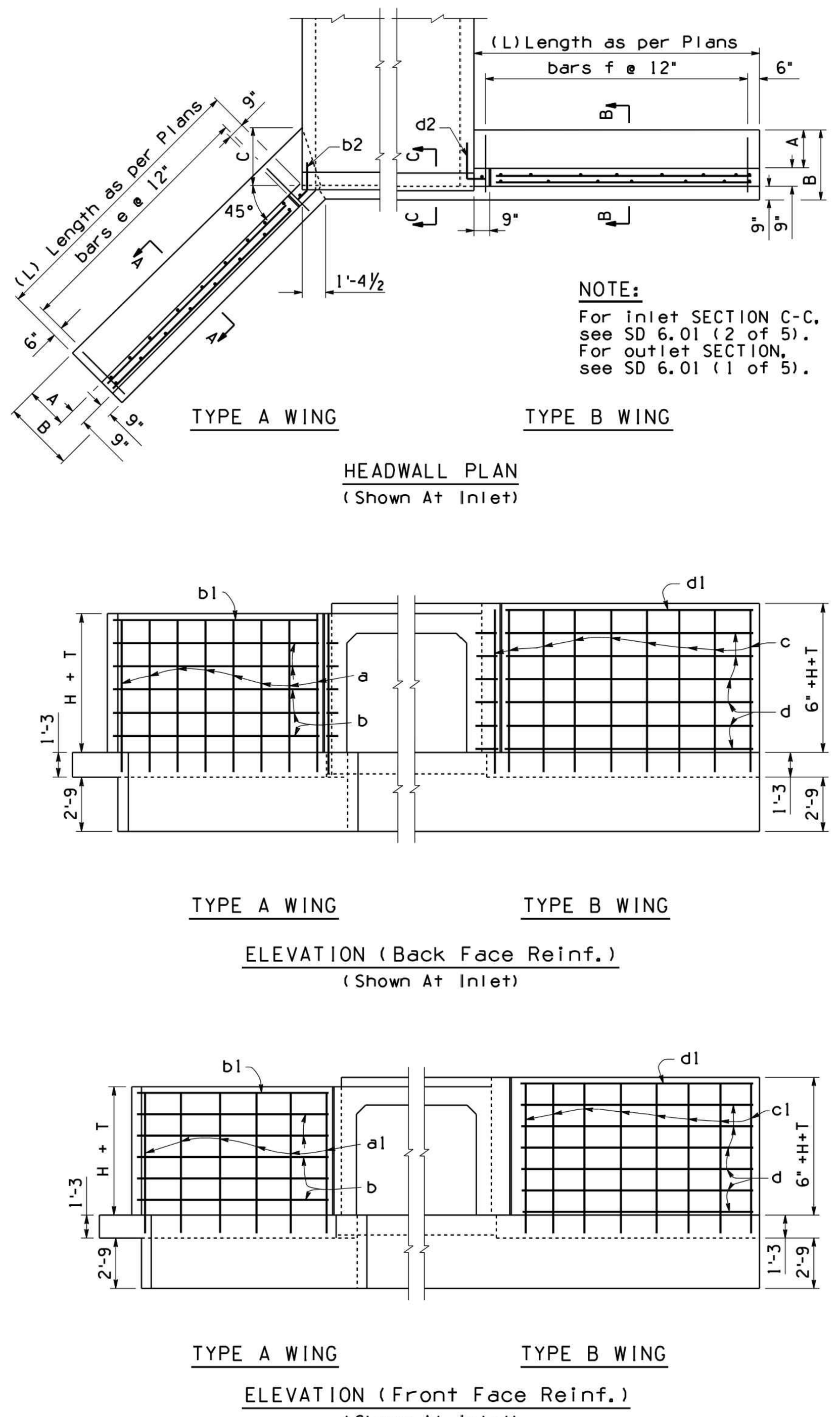


NOTES:

1. POSTS AND RAILS SHALL BE 1.90 INCH OUTSIDE DIAMETER, HIGH STRENGTH HEAVY INDUSTRIAL STEEL PIPE CONFORMING TO ASTM F1043 MATERIAL GROUP IA-2 (2.72 LB/FT, MINIMUM YIELD STRENGTH=50 KSI) OR MATERIAL GROUP IC GALVANIZED AFTER FORMING (2.28 LB/FT, MINIMUM YIELD STRENGTH=50 KSI)
2. PAINT RAIL PER MAG SPECIFICATIONS SECTION 530 WHEN REQUIRED BY PLANS, SHOP PRIME WITH RUST INHIBITING PRIMER (FIELD REPAIR PRIMER AS NEEDED). COLOR PER PLANS.
3. VERTICAL POSTS TO BE EVENLY SPACED.
4. REMOVE ALL SHARP EDGES.
5. INSTALL SAFETY RAIL AS REQUIRED BY PLANS OR SPECIFICATIONS.
6. THE EMBEDMENT FOR ANCHOR TYPES 1, 2, AND 3 SHALL BE LOCATED INSIDE THE WALL REINFORCEMENT CAGE.
7. SAFETY RAIL IS NOT TO BE USED AS A PEDESTRIAN BRIDGE RAIL.
8. FOR SAFETY RAIL ON 8" BLOCK (CMU) WALLS, THE TOP COURSE SHALL BE A BOND BEAM WITH 2-#4 LONGITUDINAL REBAR AND GROUT.

NOTE: SEE PLANS FOR ANCHORAGE DETAILS FOR ATTACHMENT TO SINGULARLY REINFORCED AND NON-REINFORCED WALLS.

DETAIL NO. 145 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | SAFETY RAIL | REVISED 01-01-2020 | DETAIL NO. 145



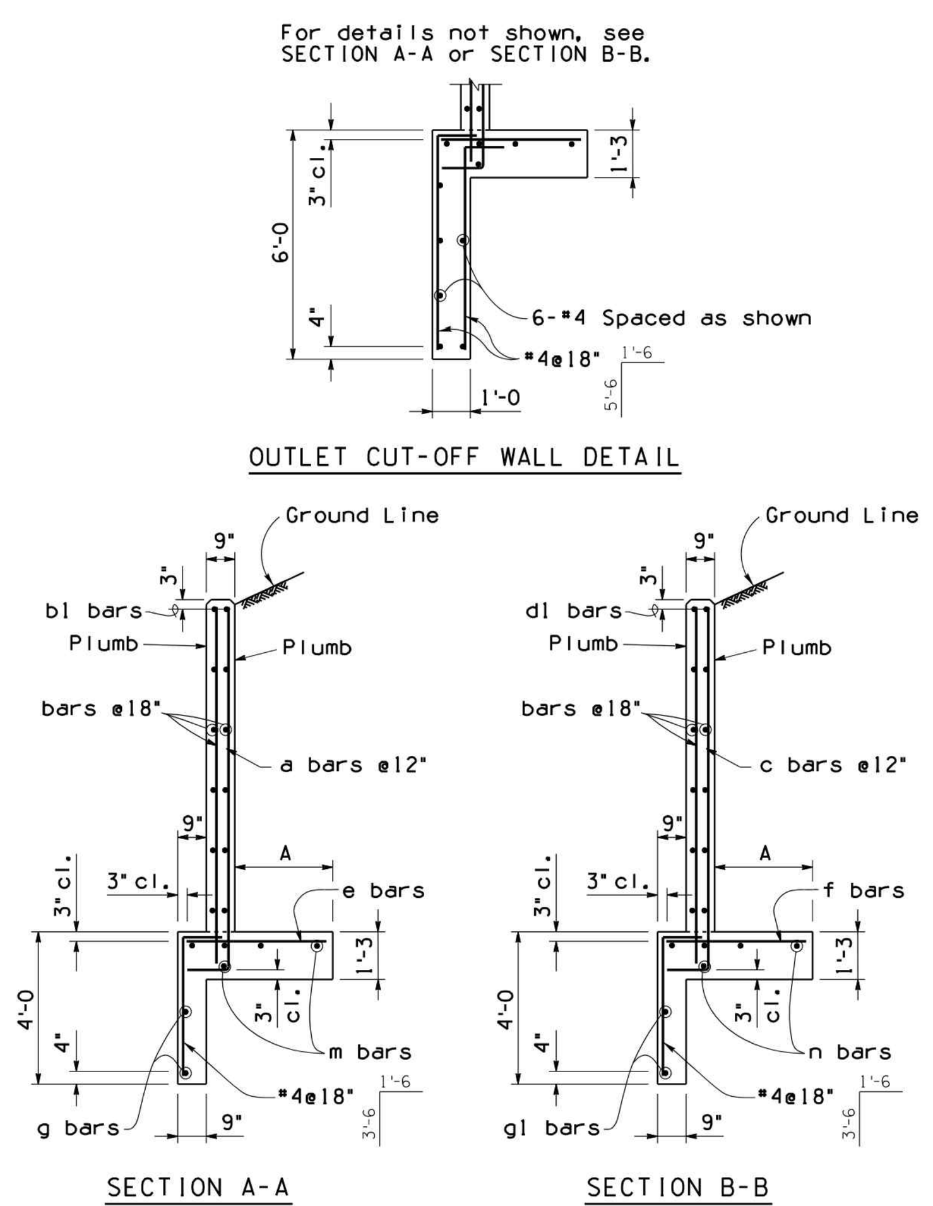
NOTE:
For Inlet SECTION C-C, see SD 6.01 (2 of 5).
For outlet SECTION, see SD 6.01 (1 of 5).

DIMENSIONS			
HEIGHT of OPENING	A	B	C
3'	1'-6	3'-0	1'-9
4'	2'-0	3'-6	2'-6
5'	2'-6	4'-0	3'-6
6'	3'-0	4'-6	4'-3
7'	3'-3	4'-9	4'-7

CURB & CUT-OFF QUANTITIES PER EACH ADDITIONAL BARREL

6' Spans		8' Spans		10' Spans	
Conc.	Steel	Conc.	Steel	Conc.	Steel
.859	76	1.114	103	1.370	130

For details not shown, see SECTION A-A or SECTION B-B.



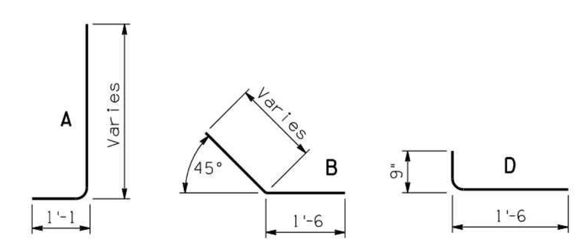
WINGS STEEL LIST (L=H+2)

Mark	Bend	3' Height			4' Height			5' Height			6' Height			7' Height		
		No.	Size	Length	No.	Size	Length	No.	Size	Length	No.	Size	Length	No.	Size	Length
TYPE A WING																
a	A	12	#5	5'-6	14	#5	6'-6	16	#5	7'-6	18	#6	8'-6	20	#7	9'-6
a1	str.	8	#4	4'-6	8	#4	5'-6	8	#4	6'-6	10	#4	7'-6	10	#4	8'-6
b	str.	8	#4	4'-0	12	#4	5'-0	12	#4	6'-0	16	#4	7'-0	20	#4	8'-0
b1	str.	4	#6	4'-0	4	#6	5'-0	4	#6	6'-0	4	#6	7'-0	4	#6	8'-0
b2	B	6	#4	2'-3	8	#4	2'-3	8	#4	2'-3	10	#4	2'-3	12	#4	2'-3
e	str.	12	#5	2'-6	14	#5	3'-0	16	#5	3'-6	18	#5	4'-0	20	#5	4'-3
g	B	2	#4	6'-9	2	#4	7'-9	4	#4	8'-9	4	#4	9'-9	4	#4	10'-9
m	str.	8	#4	5'-0	8	#4	6'-0	10	#4	7'-0	10	#4	8'-0	10	#4	9'-0
TYPE B WING																
c	A	12	#5	6'-0	14	#5	7'-0	16	#5	8'-0	18	#6	9'-0	20	#7	10'-0
c1	str.	8	#4	5'-0	8	#4	6'-0	8	#4	7'-0	10	#4	8'-0	10	#4	9'-0
d	str.	8	#4	4'-0	12	#4	5'-0	12	#4	6'-0	16	#4	7'-0	20	#4	8'-0
d1	str.	4	#6	4'-0	4	#6	5'-0	4	#6	6'-0	4	#6	7'-0	4	#6	8'-0
d2	D	6	#4	2'-3	8	#4	2'-3	8	#4	2'-3	10	#4	2'-3	12	#4	2'-3
f	str.	10	#5	2'-6	12	#5	3'-0	14	#5	3'-6	16	#5	4'-0	18	#5	4'-3
g1	str.	2	#4	6'-3	2	#4	7'-3	4	#4	8'-3	4	#4	9'-3	4	#4	10'-3
n	str.	8	#4	5'-0	8	#4	6'-0	10	#4	7'-0	10	#4	8'-0	10	#4	9'-0

APPROXIMATE HEADWALL QUANTITIES*

Span	Height	Hdwl. Type A Wings				Hdwl. Type B Wings			
		For L=H+2'		Per each Add Ft		For L=H+2'		Per each Add Ft	
		Conc.	Steel	Conc.	Steel	Conc.	Steel	Conc.	Steel
6'	3'	4.18	297	0.3146	19	4.32	308	0.3310	20
	4'	5.52	375	0.3655	23	5.60	3.82	0.3819	23
	5'	7.07	456	0.4164	25	7.07	467	0.4329	26
	6'	8.86	636	0.4673	33	8.75	652	0.4838	34
	7'	10.58	864	0.5067	41	10.43	886	0.5231	43
8'	3'	4.47	319	0.3157	19	4.61	336	0.3322	20
	4'	5.80	397	0.3666	23	5.88	409	0.3831	23
	5'	7.35	477	0.4176	25	7.37	494	0.4340	26
	6'	9.14	658	0.4685	33	9.04	679	0.4849	34
	7'	10.88	886	0.5090	41	10.75	913	0.5255	43
10'	3'	4.81	344	0.3180	19	4.94	368	0.3345	20
	4'	6.13	423	0.3640	23	6.21	441	0.3854	23
	5'	7.66	503	0.4210	25	7.69	527	0.4375	26
	6'	9.46	683	0.4731	33	9.39	712	0.4896	34
	7'	11.19	911	0.5125	41	11.09	946	0.5290	43

* Inculdes curb and cut-off wall quantities for a single barrel.



NOTE:
For General Notes, Dimensions, and additional Details, see SD 6.01 (1 & 2 of 5).

ARIZONA DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION
BRIDGE GROUP STRUCTURE DETAIL
REINFORCED CONCRETE BOX CULVERTS
INLET OR OUTLET - LEVEL WINGS
CULVERT HEIGHT 3' to 7'
SD 6.10 (1 of 2)

22-JAN-2016 10:45 G:\Bridge\CADD\Standards\SD_Sheets\SD 6 Drainage Stuctures\SD 6.01-6.11 Series\SD610-1 to 2\sd610-1.B11.dgn

LAKE HAVASU CITY, AZ
DAYTONA WASH REACH 4
IMPROVEMENT PLANS

STANDARD DETAILS

NO.	REVISIONS / SUBMISSIONS	DATE
	FINAL SUBMITTAL	

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Date: 7/5/2023
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Sheet Number: D-05