

GENERAL STRUCTURAL NOTES

A. GENERAL REQUIREMENTS

- THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE STRUCTURAL ENGINEERS IN THIS OR SIMILAR LOCALITIES. THEY ASSUME THAT THE WORK DESCRIBED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKMEN WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
- THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, LAGGING, SHORING, BRACING, FORM-WORK, ETC. AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. CONSTRUCTION MATERIALS SHALL BE UNIFORMLY SPREAD OUT SUCH THAT DESIGN LIVE LOAD PER SQUARE FOOT AS NOTED HEREIN IS NOT EXCEEDED.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, CONDITIONS AND ELEVATIONS WITH ARCHITECTURAL / CIVIL DRAWINGS PRIOR TO START OF CONSTRUCTION AND NOTIFY STRUCTURAL ENGINEER OF RECORD OF ANY DISCREPANCIES.
- TYPICAL DETAILS AND NOTES SHALL APPLY, THOUGH NOT NECESSARILY INDICATED AT A SPECIFIC LOCATION ON PLANS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT. DETAILS MAY SHOW ONLY ONE SIDE OF CONNECTION OR MAY OMIT INFORMATION FOR CLARITY.
- NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS.
- STANDARDS AND CODE REFERENCES NOTED IN THESE CONSTRUCTION DOCUMENTS REFER TO THE EDITIONS ADOPTED BY THE BUILDING CODE SPECIFIED IN THE BASIS FOR DESIGN. REFERENCES NOT SPECIFICALLY ADOPTED BY SAID BUILDING CODE REFER TO THE LATEST EDITION.
- GLOBAL STABILITY OF ALL STACKED RETAINING WALL CONFIGURATIONS SHALL BE VERIFIED BY A GEOTECHNICAL ENGINEER.
- BACKFILL MATERIAL AND PLACEMENT SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT (INCLUDING REQUIREMENTS FOR GEOTEXTILE, IF ANY). IN THE ABSENCE OF A GEOTECHNICAL REPORT, BACKFILL MATERIAL SHALL BE GRANULAR AND FREE-DRAINING.
- ALL INSPECTIONS REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR BY THESE PLANS SHALL BE PROVIDED BY AN INDEPENDENT INSPECTION COMPANY OR THE BUILDING DEPARTMENT. SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN INSPECTION.
- IF A FLOOD IS TO OCCUR AT A FENCE WALL IT SHALL BE CONSIDERED A FLOOD WALL. IF THE FLOOD OCCURS AT THE HIGH SIDE OF A RETAINER OR A RETAINING PILASTER IT SHALL BE CONSIDERED A FLOOD WALL.
- RETAINING WALLS AND PILASTERS DESIGNED TO RETAIN SOIL SHALL BE CONSIDERED SURCHARGED IF A BUILDING, PARKING LOT, OR ROAD IS CONSTRUCTED WITHIN 15 TIMES THE RETAINED HEIGHT OF SOIL, ON THE HIGH SIDE.
- RETAINING WALLS SHALL BE CONSIDERED STACKED, AND SURCHARGED, IF THERE IS A WALL WITHIN 7 TIMES THE RETAINED HEIGHT OF THE SOIL, ON THE HIGH SIDE.
- CONTACT URIGHT ENGINEERS IF UNCLEAR ON WHETHER A WALL IS A FLOOD, STACKED OR SURCHARGED WALL.

B. BASIS FOR DESIGN

- BUILDING CODE: INTERNATIONAL BUILDING CODE 2018
- LIVE LOADS: HL-93 TRUCK LOADING
- WIND LOADS: 105 MPH ULTIMATE WIND SPEED WIND PRESSURE PER ASCE7-10, EXPOSURE C
- SEISMIC LOADS: SITE CLASS D SEISMIC DESIGN CATEGORY B R = 3.0 S_s = 0.155 S₁ = 0.128 IMPORTANCE FACTOR = 1.0 SEISMIC USE GROUP I SYSTEM: REINFORCED CONCRETE MOMENT FRAMES ANALYSIS: EQUIVALENT LATERAL FORCE PROCEDURE

C. BACKFILL

- FILL SHALL CONSIST OF WELL-GRADED 3" MINUS MATERIAL AROUND THE CULVERT AND STEM WALLS OF THE CULVERT. CLEAN ON-SITE OR IMPORTED MATERIALS MAY BE USED AS BACKFILL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GEOTECHNICAL REPORT SPECIFIED IN SECTION D.
- PLACEMENT OF THE FILL AT THE WALLS AND OVER THE CULVERT MAY BEGIN WHEN THE CONCRETE STRENGTH HAS REACHED 2500 PSI COMPRESSIVE STRENGTH.
- FILL AT CULVERT SHALL BE PLACED IN 1'-0" MAXIMUM VERTICAL LIFTS AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY AND WITHIN THE RANGE OF +/- 2% OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698. LIFTS SHALL BE PLACED SYMMETRICALLY EACH SIDE ALONG THE FULL LENGTH OF CULVERT SECTION WITH A MAXIMUM BACKFILL LIFT HEIGHT DIFFERENTIAL OF 8" WHEN COMPACTED WITH HEAVY EQUIPMENT.

D. FOUNDATION

- FOUNDATIONS DESIGNED PER RECOMMENDATIONS BY ALFHA GEOTECHNICAL & MATERIALS, INC. REPORT NO. 20-G-11044, DATED JULY 13, 2021. SITE PREPARATION, GRADING, TESTS, INSPECTIONS, FIELD OBSERVATIONS, OR APPROVAL FROM THE GEOTECHNICAL ENGINEER RECOMMENDED BY THE GEOTECHNICAL REPORT AND ANY ADDENDA SHALL BE COMPLETED PRIOR TO CONSTRUCTION OF FOUNDATIONS.
- ALLOWABLE DEAD PLUS LIVE LOAD SOIL PRESSURE = 2000 PSF.
- CANTILEVER RETAINING WALLS DESIGNED USING ACTIVE SOIL PRESSURE (EQUIVALENT FLUID WEIGHT) OF 40 PSF/FT. BRACED FOUNDATION WALLS DESIGNED WITH SOIL PRESSURE DISTRIBUTION PER GEOTECHNICAL REPORT.
- TRENCHES AND EXCAVATIONS UNDER OR ADJACENT TO FOUNDATIONS SHALL BE PROPERLY BACKFILLED AND COMPACTED.
- REFER TO GEOTECHNICAL REPORT FOR ON-SITE SOIL CORROSION POTENTIAL ON METAL CONSTRUCTION MATERIALS. CONSULT A QUALIFIED CORROSION ENGINEER FOR RECOMMENDATIONS FOR MITIGATING CORROSION EFFECTS, IF NECESSARY.
- WATER PROOFING AS MAY BE REQUIRED AT SOIL FACE OF WALLS BELOW GRADE SHALL BE BY OTHERS.

E. CONCRETE

- ALL CONCRETE CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ACI 318 AND ACI 301 (LATEST EDITIONS) EXCEPT AS MODIFIED BY THE CONSTRUCTION DOCUMENTS.

E. CONCRETE (CONT'D.)

- MIN. 28 DAY COMPRESSIVE STRENGTH, f_c , SHALL BE 3000 PSF FOR ALL CONCRETE IN CONTACT WITH SOIL.
- CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY, STAMPED BY AN APPROPRIATELY LICENSED SPECIALTY ENGINEER, AND APPROVED BY THE ENGINEER OF RECORD. MIX DESIGNS SHALL INCLUDE THE PROJECT NAME AND INDICATE THEIR USE WITHIN THE STRUCTURE. MIX DESIGNS SHALL BE PROPORTIONED TO MINIMIZE SHRINKAGE.
- IF USED, EARLY STRENGTH CONCRETE SHALL BE PROPORTIONED TO DEVELOP THE 28 DAY COMPRESSIVE STRENGTH AT THE AGE REQUIRED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT TEST DATA FOR REVIEW BY THE STRUCTURAL ENGINEER TO SUBSTANTIATE THE CONCRETE STRENGTH AT THE REQUIRED AGE.
- ALL CONCRETE SHALL BE NORMAL WEIGHT OF 145 POUNDS PER CUBIC FOOT USING HARD ROCK AGGREGATES CONFORMING TO ASTM C33 UNO. WHERE LIGHTWEIGHT CONCRETE IS SPECIFIED, CONCRETE SHALL BE 110 POUNDS PER CUBIC FOOT USING AGGREGATES CONFORMING TO ASTM C330. MAXIMUM NOMINAL AGGREGATE SIZE FOR ALL CONCRETE SHALL BE 3/4" OR GREATER UNO.
- MAX. SLUMP SHALL BE 5 INCHES (EXCEPTION: WHERE ADMIXTURES/PLASTICIZERS HAVE BEEN INCLUDED IN MIX DESIGN TO IMPROVE WORKABILITY, SLUMP LIMIT SHALL BE BASED ON ADMIXTURE MFR'S RECOMMENDATIONS). MIX WATER SHALL BE CLEAN AND POTABLE.
- PORTLAND CEMENT SHALL CONFORM TO ASTM C150. TYPE II OR TYPE V CEMENT SHALL BE USED.
- FLY ASH MAY BE USED IN CONCRETE, PROVIDED THE FOLLOWING CONDITIONS ARE MET:
 - FLY ASH SHALL COMPLY WITH ASTM C618.
 - CEMENT CONTENT SHALL BE REDUCED A MINIMUM OF 15 PERCENT UP TO A MAXIMUM OF 25 PERCENT WHEN COMPARED TO AN EQUIVALENT CEMENT MIX DESIGN WITHOUT FLY ASH. FLY ASH CONTENT SHALL NOT COMPRISE MORE THAN 35 PERCENT OF THE TOTAL CEMENTITIOUS CONTENT. THE WATER-CEMENT RATIO SHALL BE CALCULATED BASED ON THE TOTAL CEMENTITIOUS MATERIAL IN THE MIX.
 - CLASS F FLY ASH SHALL BE USED IN SULFATE RESISTANT CONCRETE WITH f_c EQUAL TO OR GREATER THAN 4000 PSF. CLASS C FLY ASH MAY BE USED ELSEWHERE.
- WATER SOLUBLE CHLORIDE ION CONCENTRATIONS IN CONCRETE SHALL BE LIMITED PER ACI 318, SECTION 4.4.
- THE BETWEEN CONCRETE BATCHING AND PLACEMENT SHALL BE IN ACCORDANCE WITH ASTM C94.
- CONCRETE MIXING, PLACEMENT AND QUALITY SHALL BE PER IBC SECTION 1905. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED. SLABS ON GRADE NEED BE VIBRATED ONLY AROUND AND UNDER FLOOR DUCTS OR SIMILAR ELEMENTS. REMOVE ALL DEBRIS FROM FORMS BEFORE PLACING CONCRETE. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL SO AS TO CAUSE SEGREGATION OF AGGREGATES. UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED 5 FEET.
- PROTECT CONCRETE FROM DAMAGE OR REDUCED STRENGTH DUE TO COLD OR HOT WEATHER IN ACCORDANCE WITH ACI 305 AND 306. CONTRACTOR SHALL TAKE SPECIAL CURING PRECAUTIONS TO MINIMIZE SHRINKAGE CRACKING OF CONCRETE SLABS.
- ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCEMENT, DOUELS, BOLTS, ANCHORS, SLEEVES, ETC. SHALL BE SECURELY POSITIONED IN THE FORMS.

F. REINFORCING STEEL

- REINFORCING STEEL SHALL CONFORM TO REQUIREMENTS OF ASTM A615 OR ASTM A106. REINFORCING SHALL BE GRADE 60 ($f_y = 60$ KSI) DEFORMED BARS UNO. ON PLANS OR DETAILS. ALL REINFORCING TO BE WELDED SHALL BE ASTM A106, GRADE 60 LOW ALLOY WELDABLE STEEL.
- ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS 'CLEAR' OR 'CLR' ARE TO CENTER OF STEEL. MIN. COVER FOR NON-PRESTRESSED CONCRETE REINFORCING SHALL BE AS FOLLOWS, UNO. ON PLANS OR DETAILS.

EXPOSURE CONDITION:	MINIMUM COVER:	TOLERANCES (+/-)
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH:	3"	3/8"
EXPOSED TO EARTH OR WEATHER:		
NO. 5 AND SMALLER:	1 1/2"	3/8"
NO. 6 AND LARGER:	2"	3/8"
SLABS ON GRADE:	1 1/2"	1/4"

- LAP SPLICES OF REINFORCING STEEL IN CONCRETE BEAMS, SLABS AND FOOTINGS SHALL BE ACCORDING TO ACI 318, SECTION 12, OR LAP SCHEDULE WHERE PRESENT, UNO. STAGGER SPLICES A MIN. OF ONE LAP LENGTH. NO TACK WELDING OF REINFORCING BARS ALLOWED. LATEST ACI CODE AND DETAILING MANUAL APPLY. PROVIDE BENT CORNER BARS TO MATCH AND LAP WITH HORIZ. BARS AT ALL CORNERS AND INTERSECTIONS PER TYPICAL DETAILS. VERT. WALL BARS SHALL BE SPLICED AT OR NEAR FLOOR LINES. SPLICE TOP BARS AT CENTER LINE OF SPAN AND BOTTOM BARS AT THE SUPPORT IN SPANDRELS, BEAMS, GRADE BEAMS, ETC. UNO.
- MECHANICAL SPLICE COUPLERS SHALL HAVE CURRENT ICC APPROVAL AND SHALL BE CAPABLE OF DEVELOPING 125% OF THE STRENGTH OF THE BAR.
- ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UN-BENT AND RE-BENT. FIELD BENDING OF REBAR SHALL NOT BE ALLOWED UNLESS SPECIFICALLY NOTED.
- REINFORCING BAR SPACING SHOWN ON PLANS ARE MAX. ON CENTERS. ALL BARS SHALL BE DETAILED AND PLACED PER CRSI SPEC'S AND HANDBOOK. DOUCEL ALL VERT. REINFORCING TO FOUNDATION. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE. MIN. CLEAR SPACING BETWEEN PARALLEL REINFORCEMENT SHALL BE THE LARGER OF 1-1/2 TIMES NOMINAL BAR DIA. OR 1-1/2 TIMES MAX. AGGREGATE SIZE OR 1-1/2".

G. SPECIAL INSPECTION

- IN ADDITION TO STANDARD INSPECTIONS BY THE BUILDING OFFICIAL REQUIRED PER IBC SECTION 110, THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS WHO SHALL PROVIDE INSPECTIONS DURING CONSTRUCTION.
- THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.
- THE SPECIAL INSPECTOR SHALL INSPECT THE WORK ASSIGNED FOR CONFORMANCE WITH THE APPROVED CONTRACT DRAWINGS AND SPEC'S. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, THE ENGINEER OF RECORD, AND OTHER DESIGNATED PERSONS. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN, IF UNCORRECTED, TO THE ENGINEER AND THE BUILDING OFFICIAL. THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL SIGNED REPORT STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS TO THE BEST OF THE INSPECTOR'S KNOWLEDGE, IN CONFORMANCE WITH THE APPROVED PLANS AND SPEC'S AND THE APPLICABLE CODE PROVISIONS.

G. SPECIAL INSPECTION (CONT'D.)

- INSPECTORS SHALL INSPECT FROM AN APPROVED SET OF CONTRACT DRAWINGS. SHOP DRAWINGS SHALL NOT BE USED IN LIEU OF THE APPROVED CONTRACT DRAWINGS FOR INSPECTION PURPOSES.
- TYPES OF WORK TO BE INSPECTED BY THE SPECIAL INSPECTOR ARE AS FOLLOWS:
 - DURING ALL EPOXY ANCHORING OPERATIONS FOR BOLTS, REBAR, THREADED ROD, ETC., INCLUDING VERIFICATION OF BOLT OR BAR MATERIALS, HOLE DEPTH AND DIA., HOLE CLEANOUT, EPOXY MIXING AND PLACEMENT PROCEDURES, AND EMBEDMENT DEPTH IN ACCORDANCE WITH THE CONTRACT DRAWINGS AND MFR'S SPEC'S AND RECOMMENDATIONS.
 - CONCRETE CONSTRUCTION PER IBC SECTION 1105.3 AND TABLE 1105.3.
 - CERTIFICATE OF APPROVAL REGARDING MATERIALS AND INSPECTION OF PREFABRICATED ITEMS SHALL BE PROVIDED IN ACCORDANCE WITH IBC SECTION 1104.

H. SUBMITTALS

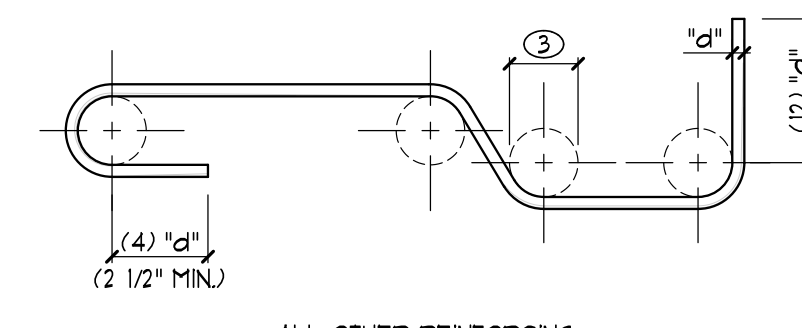
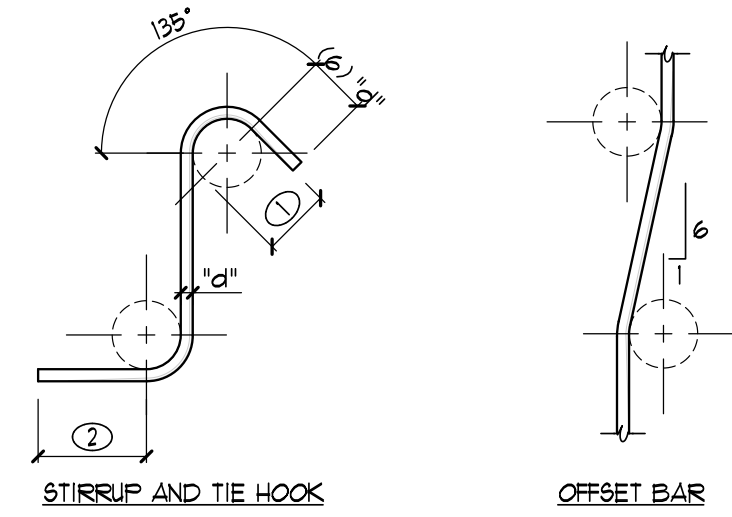
- PREFABRICATED COMPONENTS, SPECIALTY ITEMS, OR DESIGN-BUILD ELEMENTS NOTED ON THE STRUCTURAL DRAWINGS BUT WHICH REQUIRE THE MFR. OR SUPPLIER TO PROVIDE THE DESIGN MAY BE SUBMITTED TO THE ARCHITECT AND/OR ENGINEER FOR REVIEW AS A DEFERRED SUBMITTAL. DEFERRED SUBMITTALS REQ'D. BY THE STRUCTURAL ENGINEER OF RECORD SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
 - CONCRETE MIX DESIGNS
- DEFERRED SUBMITTALS SHALL INCLUDE CALCULATIONS AND DRAWINGS PREPARED AND STAMPED BY AN APPROPRIATELY LICENSED ENGINEER (SPECIALTY ENGINEER) SHOWING LOCATION AND MAGNITUDE OF LOADS, CONFIGURATION AND SIZE OF MEMBERS, AND COMPATIBILITY OF SUBMITTAL ITEM WITH THE PRIMARY STRUCTURAL SYSTEM.
- THE PURPOSE OF THE STRUCTURAL ENGINEER'S REVIEW OF DEFERRED SUBMITTALS SHALL BE LIMITED TO DETERMINING THAT THE DRAWINGS AND CALCULATIONS HAVE BEEN PROPERLY SEALED, THAT THE LOAD CRITERIA IS IN GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS AND WITH THE REFERENCED BUILDING CODE, THAT CONNECTIONS TO THE PRIMARY STRUCTURE ARE COMPATIBLE WITH THE PRIMARY DESIGN, AND THAT THE PRIMARY STRUCTURE IS CAPABLE OF SUPPORTING THE IMPOSED LOADS.
- THE STRUCTURAL ENGINEER WILL RELY UPON THE SPECIALTY ENGINEER'S SEAL AS CERTIFICATION THAT THE ITEMS DESIGNED BY THE SPECIALTY ENGINEER COMPLY WITH THE CRITERIA SET FORTH IN THE CONSTRUCTION DOCUMENTS AND APPLICABLE CODES AND STANDARDS. THE STRUCTURAL ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ADEQUACY OF DESIGNS PROVIDED BY OTHERS.
- FOR ALL SUBMITTALS, ANY CORRECTIONS NOTED WILL BE MARKED ON ONE (1) COPY SET ONLY AND RETURNED. ADDITIONAL COPIES OF ANY SUBMITTAL WILL BE RETURNED UNMARKED. CONTRACTOR SHALL BE RESPONSIBLE FOR REPRODUCING ENGINEER'S CORRECTIONS ON ADDITIONAL COPIES REQ'D. ONE COPY SET MAY BE RETAINED FOR THE ENGINEER'S RECORDS. ALLOW FIVE (5) TO TEN (10) WORKING DAYS FOR THE ENGINEER'S REVIEW.
- REFER TO APPLICABLE G.S.N. SECTIONS FOR FURTHER REQUIREMENTS SPECIFIC TO INDIVIDUAL SUBMITTALS.

BAR SIZE	CONCRETE ($f_c = 2500$ PSI w/ 1 1/2" MIN. CLR.)			
	MIN. SPACING	TOP BARS	OTHER BARS	STANDARD HOOK LENGTH
#3	2	18	14	4 1/2
#4	2 1/2	24	19	6
#5	3 1/4	30	23	7 1/2
#6	3 3/4	31	28	9
#7	4	60	46	10 1/2
#8	4	76	59	12
#9	4 1/4	94	72	13 1/2

01 TYPICAL REBAR LAP SCHEDULE

01-21655

NO SCALE

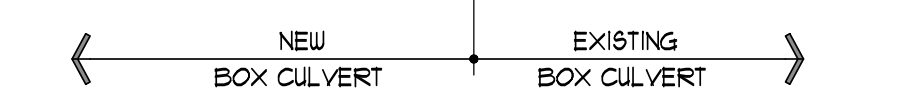


02 STANDARD REBAR BEND DETAILS

C01-01 09104

NO SCALE

- "d" = BAR DIA.
- ALL REINFORCEMENT SHALL BE BENT COLD UNLESS NOTED OTHERWISE ON PLANS OR DETAILS.
- REINFORCING PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT UNLESS SPECIFICALLY NOTED ON PLANS OR DETAILS.
- DRILL 1" DIA. HOLE 3" DEEP FOR #6 DOUCEL. EPOXY DOUCEL IN HOLE USING SHIPSON SET-XP OR EQUIVALENT.
- REFER TO BOX CULVERT LID THICKNESS REQUIREMENTS.
- 3/8" x 1'-9" AT 18" O.C. DOUCEL.
- REINFORCING PER BOX CULVERT REQUIREMENTS.
- EXISTING HEADWALL TO BE REMOVED AT CONTRACTOR'S OPTION.
- (3) #1 AT 3" O.C. CONT. HORIZONTAL REBAR PARALLEL TO EXISTING CULVERT, TOP AND BOTTOM.



03 TIE-IN NEW CULVERT TO EXISTING

03-221655

NO SCALE

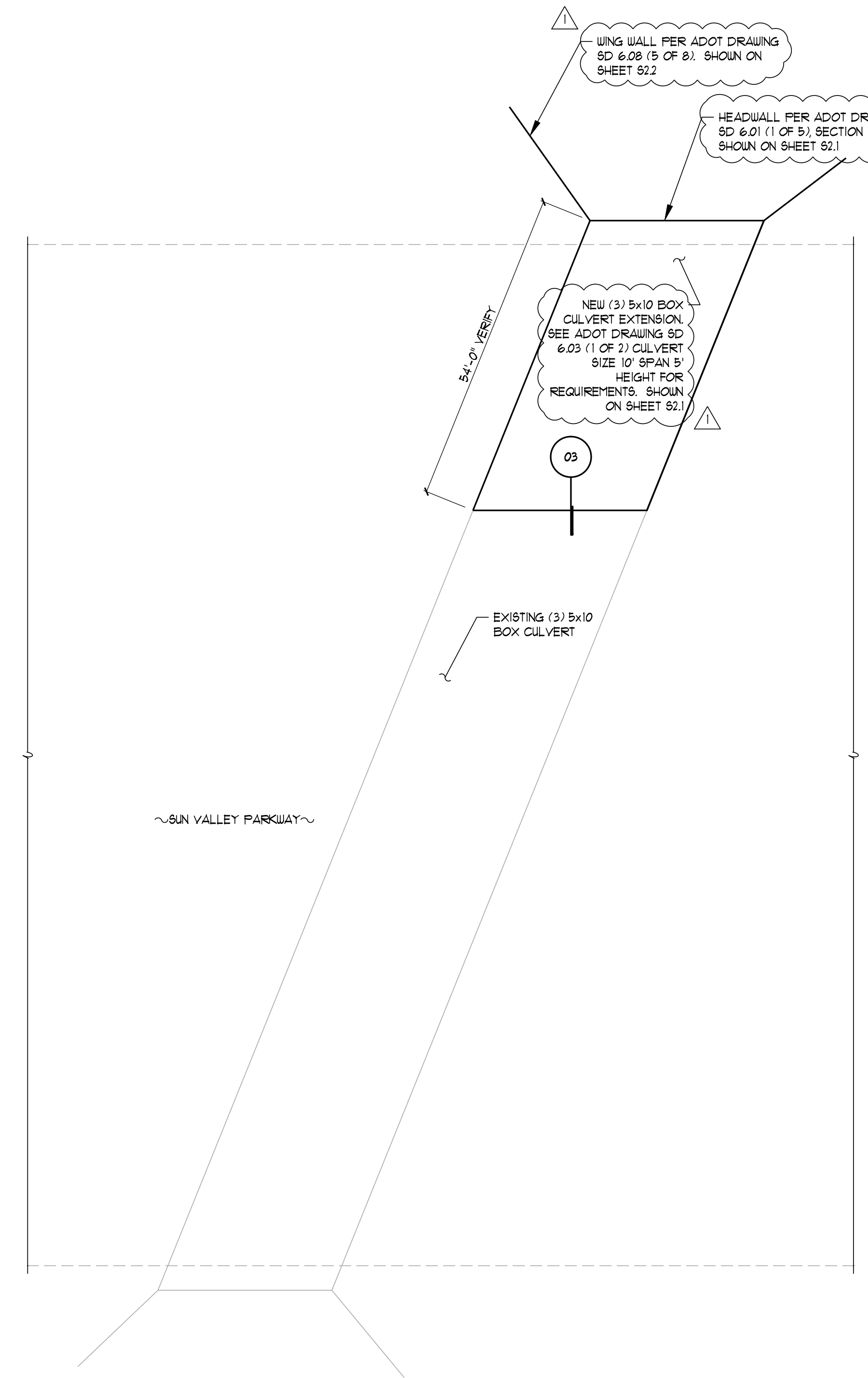
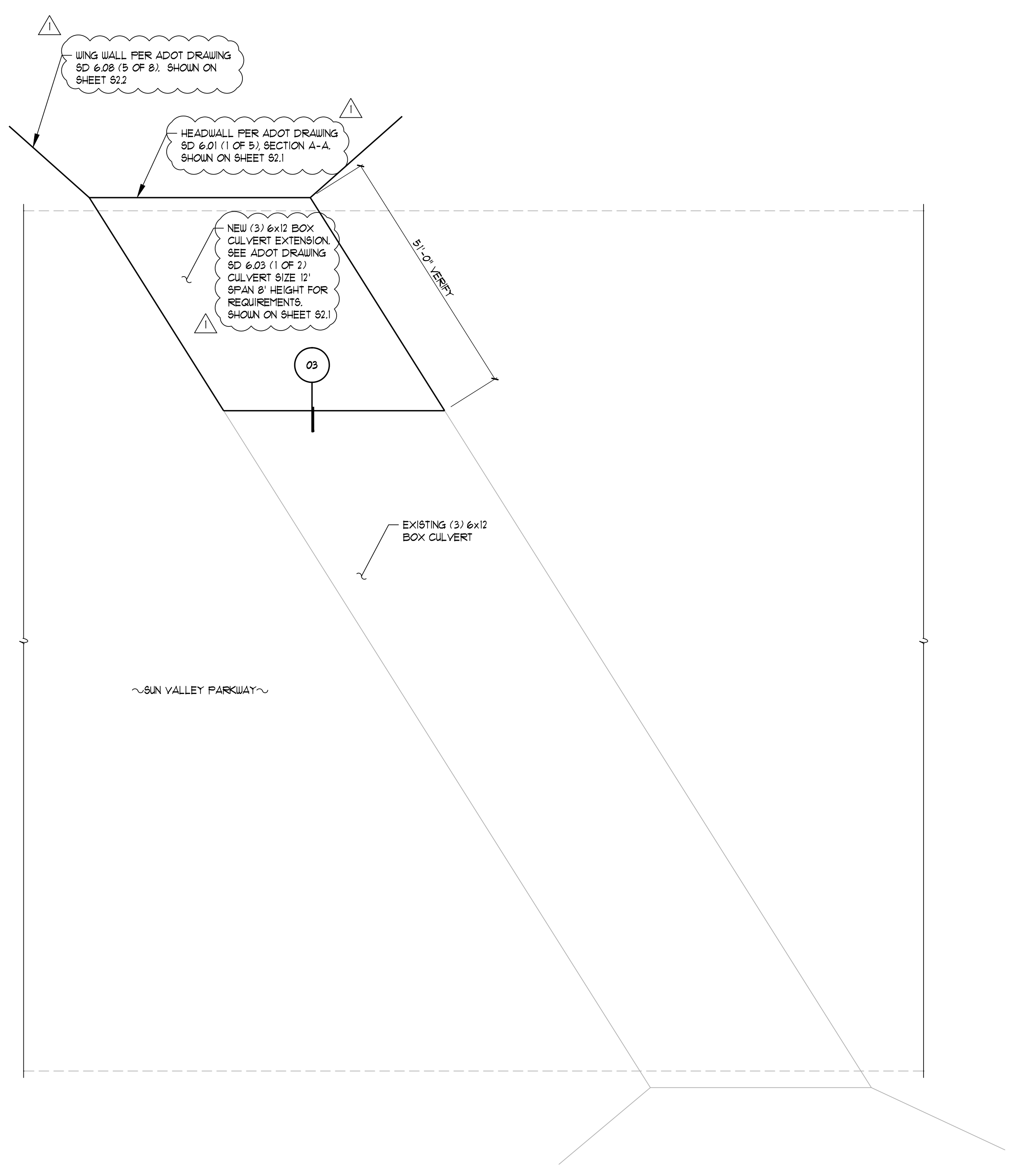


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MANAGING ENGINEER / SURVEYOR HILGARTWILSON	PROJECT COORDINATOR SANDRA HAYDEN	CHECKED	TH	CHECKED	DRAWING SCALES AS SHOWN
		DRAFTED	MBM	DRAFTED	
DESIGN LAYOUT	MEMO	FIELD SURVEY	DRAWING SCALES		
		AS SHOWN			
PLAN TYPE SUN VALLEY PARKWAY SUN VALLEY BOX CULVERT		ENGINEER INFORMATION HILGARTWILSON ENGINEER PLAN SURVEY MANAGE 2441 E. HIGHLAND AVE., STE. 250 P: 602.490.0535 / F: 602.368.2436 PHOENIX, AZ 85016 WWW.HILGARTWILSON.COM			
PROJECT: FLOREO AT TERAVALIS SUN VALLEY PARKWAY NORTHEAST CORNER OF WINTERSBURG PARKWAY & SUN VALLEY PARKWAY BUCKEYE, ARIZONA		COB PROJECT PLAN STOKER			
REVISIONS: 1 9/19/2023, CONTRACTOR CLARIFICATION					
COB PERMITTING APPROVED SEAL	COB ENGINEERING APPROVED SEAL	SUBMITTAL: CONTRACTOR CLARIFICATION			
AS-BUILT SEAL	DESIGN SEAL 45716 TYE HAYDEN SEP 19 2023 ARIZONA, U.S.A.	COB PLAN TRACKING #	COB PERMIT #	ENG-21-0285	
ORIGINAL PLAN DATE July 21	LATEST REVISION DATE September 23				
PROJECT NUMBER 221655	SHEET NUMBER S0.1	SHT. OF			

PLAN NOTES

- A. VERIFY ALL DIMENSIONS, ELEVATIONS, SLOPES, ETC. w/ CIVIL ENGINEER PRIOR TO CONSTRUCTION. RESOLVE DISCREPANCIES w/ CIVIL ENGINEER.
- B. HIGH LEVELS OF CHLORIDE WERE DETECTED DURING THE GEOTECHNICAL INVESTIGATION. THE CONTRACTOR SHALL DO ONE OF THE FOLLOWING TO MITIGATE THE HIGH CHLORIDES: SURROUND THE NEW SECTION OF BOX CULVERT w/ MAG ABC PER GEOTECHNICAL ENGINEER'S RECOMMENDATION, TEST THE SOIL FOR CHLORIDES WHILE BACKFILLING THE CULVERT TO VERIFY ACCEPTABLE LEVELS OF CHLORIDE ARE PRESENT, OR INCREASE THE CULVERT CONCRETE THICKNESS THAT WILL BE PLACED AGAINST THE SOIL TO PROVIDE A MIN. OF 3" CLEARANCE BETWEEN THE SOIL AND REBAR.
- C. ALL CULVERT REQUIREMENTS NOT SPECIFICALLY NOTED SHALL BE CONSTRUCTED PER ADOT SD 6.01-6.11 SERIES DRAWINGS.
- D. ALL HANDRAILS INSTALLED OVER THE CULVERT AND WING WALLS SHALL BE PER MAG DETAIL NO. 145. DETAIL SHOWN ON SHEET S2.



TC202200170

3 BARREL 6x12 BOX CULVERT EXTENSION
SCALE: 1/16" = 1'-0"
PLAN VIEW

3 BARREL 5x10 BOX CULVERT EXTENSION
SCALE: 1/16" = 1'-0"
PLAN VIEW

Call at least two full working days before you begin excavation.

ARIZONA 811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (752-3348)
In Maricopa County: (602) 263-1100

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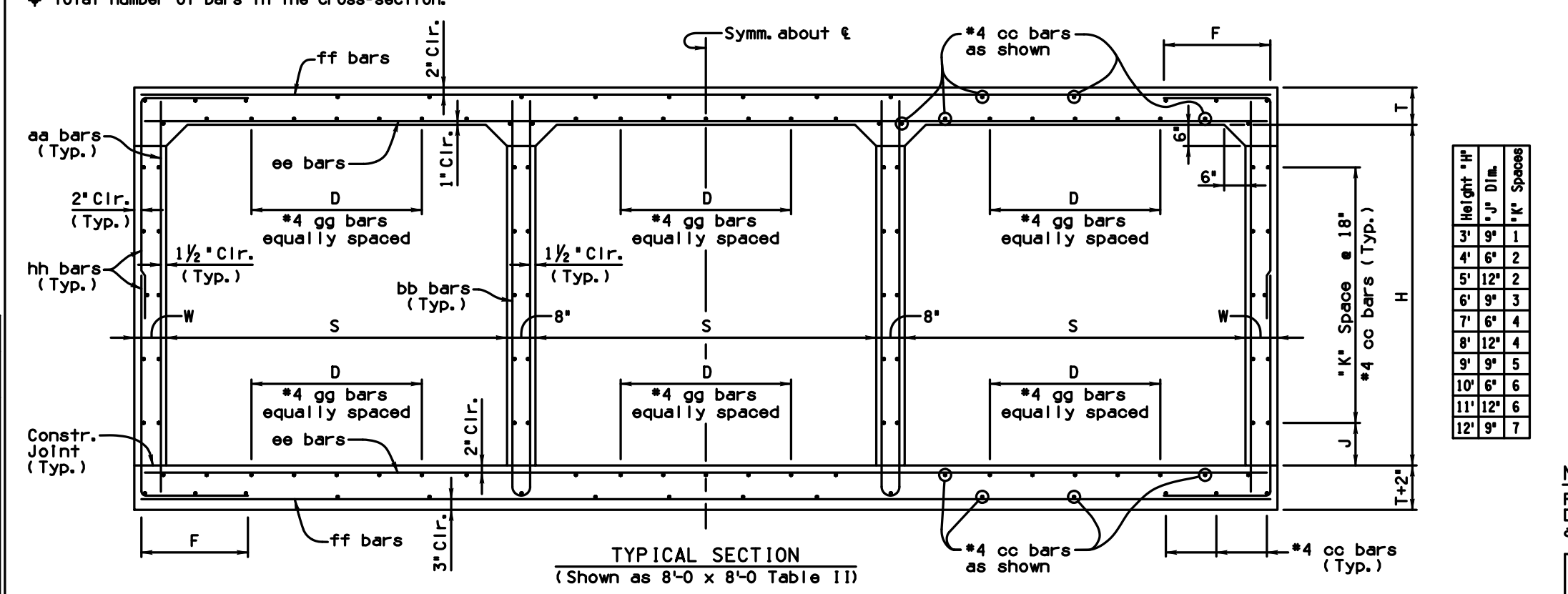
PLAN NAME FLOREO AT TERAVALIS SUN VALLEY PKWY BOX CULVERT		SUBMITTAL: CONTRACTOR CERTIFICATION
ENGINEER INFORMATION HILGARTWILSON		
COB PERMITTING APPROVED SEAL	COB ENGINEERING APPROVED SEAL	SUBMITTAL: CONTRACTOR CERTIFICATION ENG-21-0285
AS-BUILT SEAL	DESIGN SEAL 	
ORIGINAL PLAN DATE July 21	LATEST REVISION DATE September 23	COB PLAN TRACKING # COB PERMIT #
PROJECT NUMBER 221655	SHEET NUMBER S1.1 OF	

(3) 5x10 BOX CULVERT

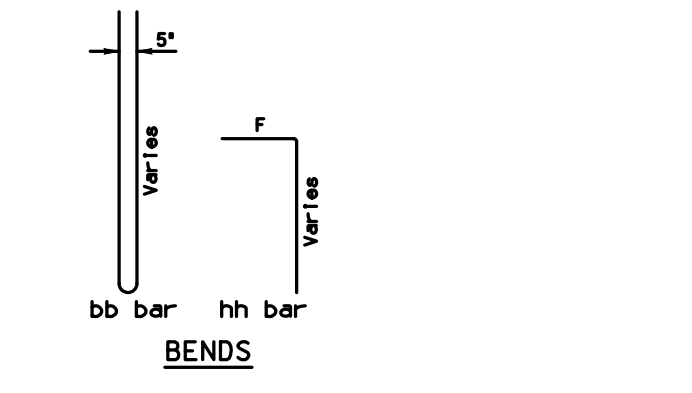
(3) 6x12 BOX CULVERT

TABLE NO. I 0'-10" FILL. Table with columns for span, height, and various reinforcement dimensions (aa, bb, cc, ee, ff, gg, hh).

TABLE NO. II 10'-15" FILL. Table with columns for span, height, and various reinforcement dimensions (aa, bb, cc, ee, ff, gg, hh).



NOTE: Reinforcing shown for 8'-0 x 8'-0 Table II box. Use the appropriate table to determine the reinforcing requirements of selected box.

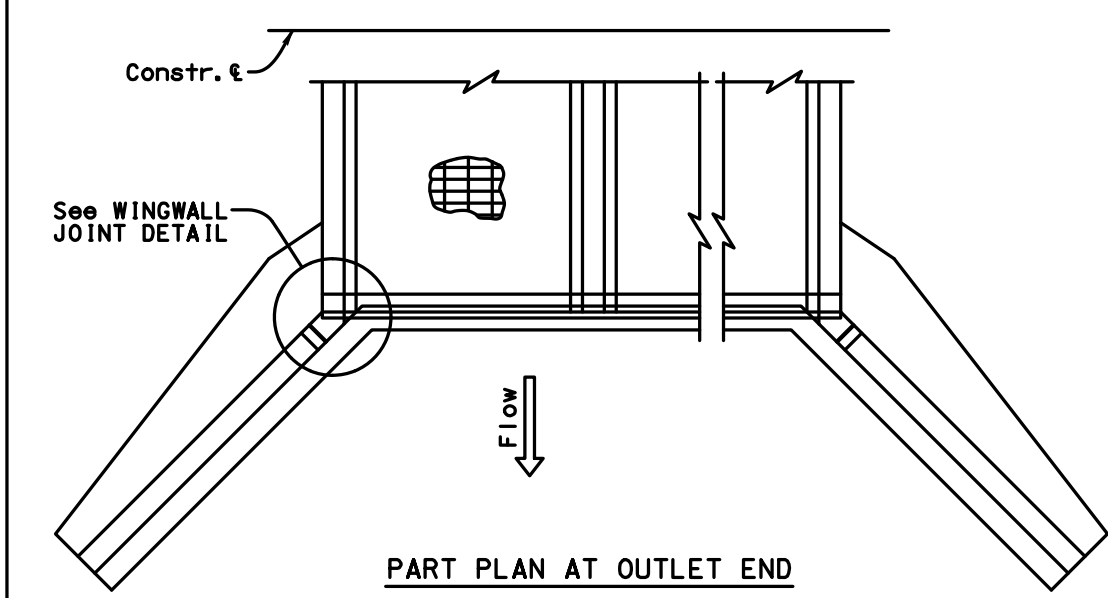


NOTE: For General Notes, Dimensions, and additional Details, see SD 6.01 (1 to 4). For Quantities and Tables III thru V see SD 6.03 (2 of 2).

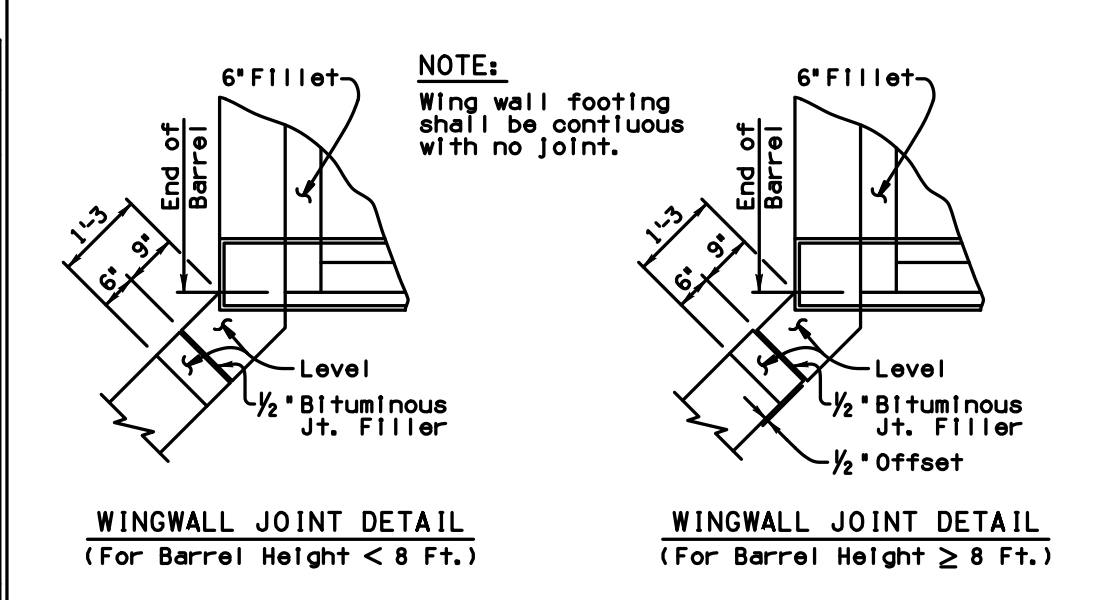
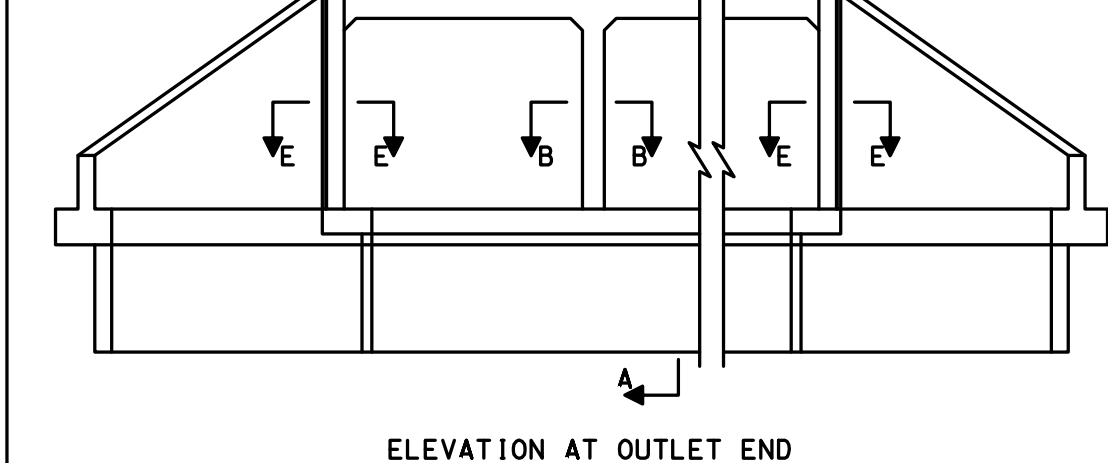
Table with project information: Project No., Date, and other details.

New box culverts shall not be constructed using 3' or 4' heights without special approval from ADOT Bridge Group. Tables referencing these sizes are provided for extension of existing box culverts only.

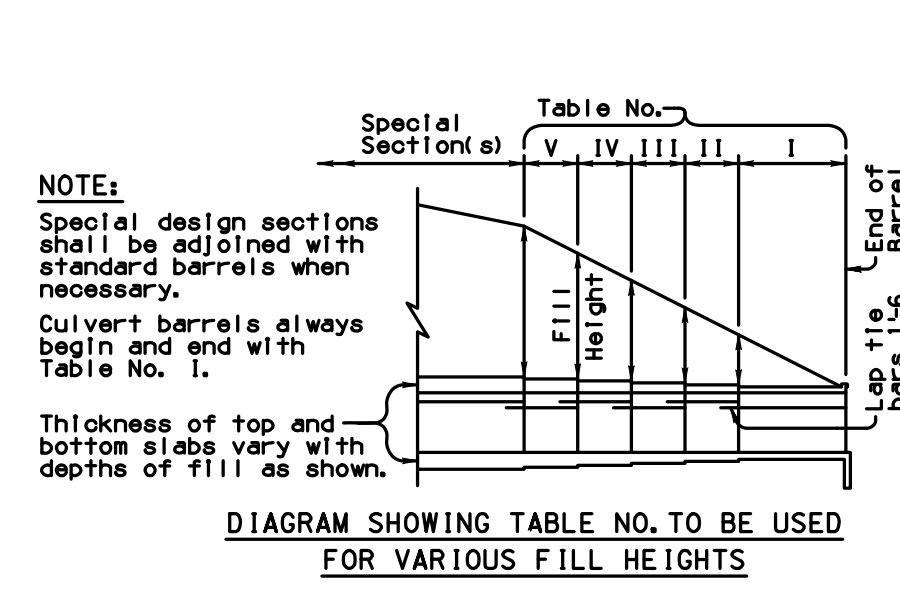
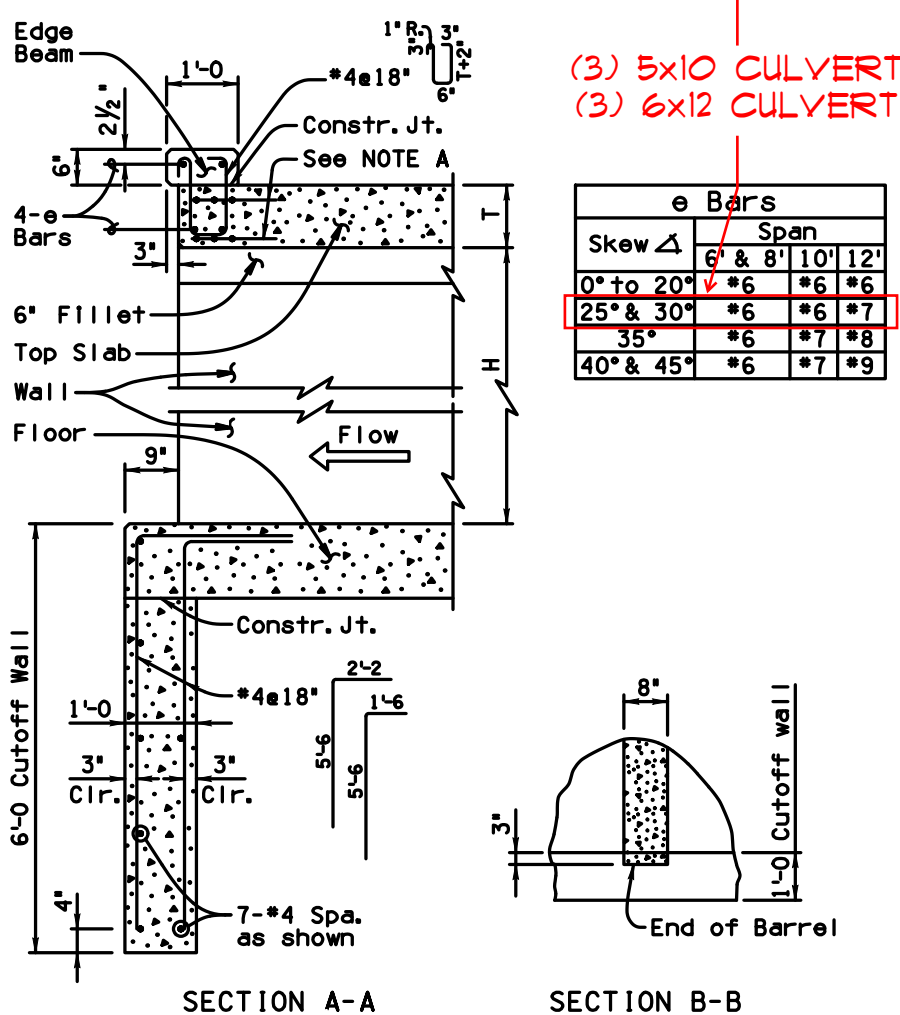
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NOTE: For SECTION E-E see Dwg. (2 of 5)



NOTE A: Use 3-#7 #3' spa. top and bott bars for culverts skewed 6° to 30°. Use 3-#8 #3' spa. top and bott bars for culverts skewed 31° to 45°. Culverts skewed over 45° require a special edge beam design. Edge beam reinforcing quantity shall be added to table quantities.



GENERAL NOTES: Construction Specification - Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition. Design Specifications - AASHTO LRFD Bridge Design Specifications, 7th Edition 2014. Loading Class - HL-93. Design: Soil weight = 120 p.c.f. All Concrete shall be Class 'S' (f'c = 3000 psi). Reinforcing steel shall conform to ASTM Specification A615. All reinforcing shall be furnished as Grade 60.

All bends and hooks shall meet the requirements of AASHTO LRFD Article 5.10. All bend dimensions for reinforcing steel shall be out-to-out of bars. All placement dimensions for reinforcing steel shall be to center of bars unless noted otherwise.

All reinforcing steel shall have 2' clear cover unless noted otherwise. Chamfer all exposed corners 1/4" unless noted otherwise. Compact backfill for footing and wing base minimum 100 percent of ASTM D698 maximum dry density.

All structures shall have formed construction joints in the top slab and walls (optional in floor slab) and spaced not more than 38'-0" apart or as shown in Project Plans. Joints shall be perpendicular to the centerline of the box. Reinforcing steel shall project 1-6 thru the joint. The joint shall be made with a 1/4" plywood bulkhead which shall be left in place or the alternate joint detail shown on Dwg. (2 of 5) may be used.

See Project Plans for culvert layout, invert elevations, finished grade elevations, headwall, apron, and other site specific details. Dimensions shall not be scaled from drawings.

Pay item quantities of concrete and reinforcing steel include all labor and materials for box culvert, footing, headwalls, and aprons. Total Quantities include Barrel and Headwall Quantities shown in Tables (plus added quantity for apron when used). Barrel Quantities Table is per linear foot of box (multiply by length of box to obtain barrel total). Headwall Quantities Table includes wings, edge beam, and cutoff wall.

Culverts measuring 20 ft and greater to the inside faces of exterior walls, along the roadway centerline, shall be assigned a structure number. The structure number shall be referenced in the culvert summary sheet and drainage details.

NOTE: For Dimensions, Quantities and additional Details, see SD 6.01 (2 to 5).

Table with project information: Project No., Date, and other details.

TC202200170

PLAN NAME FLOREO AT TERAVALIS SUN VALLEY PKWY BOX CULVERT

ENGINEER INFORMATION HILGARTWILSON

COB PERMITTING APPROVED SEAL COB ENGINEERING APPROVED SEAL

AS-BUILT SEAL DESIGN SEAL

ARIZONA 811 logo

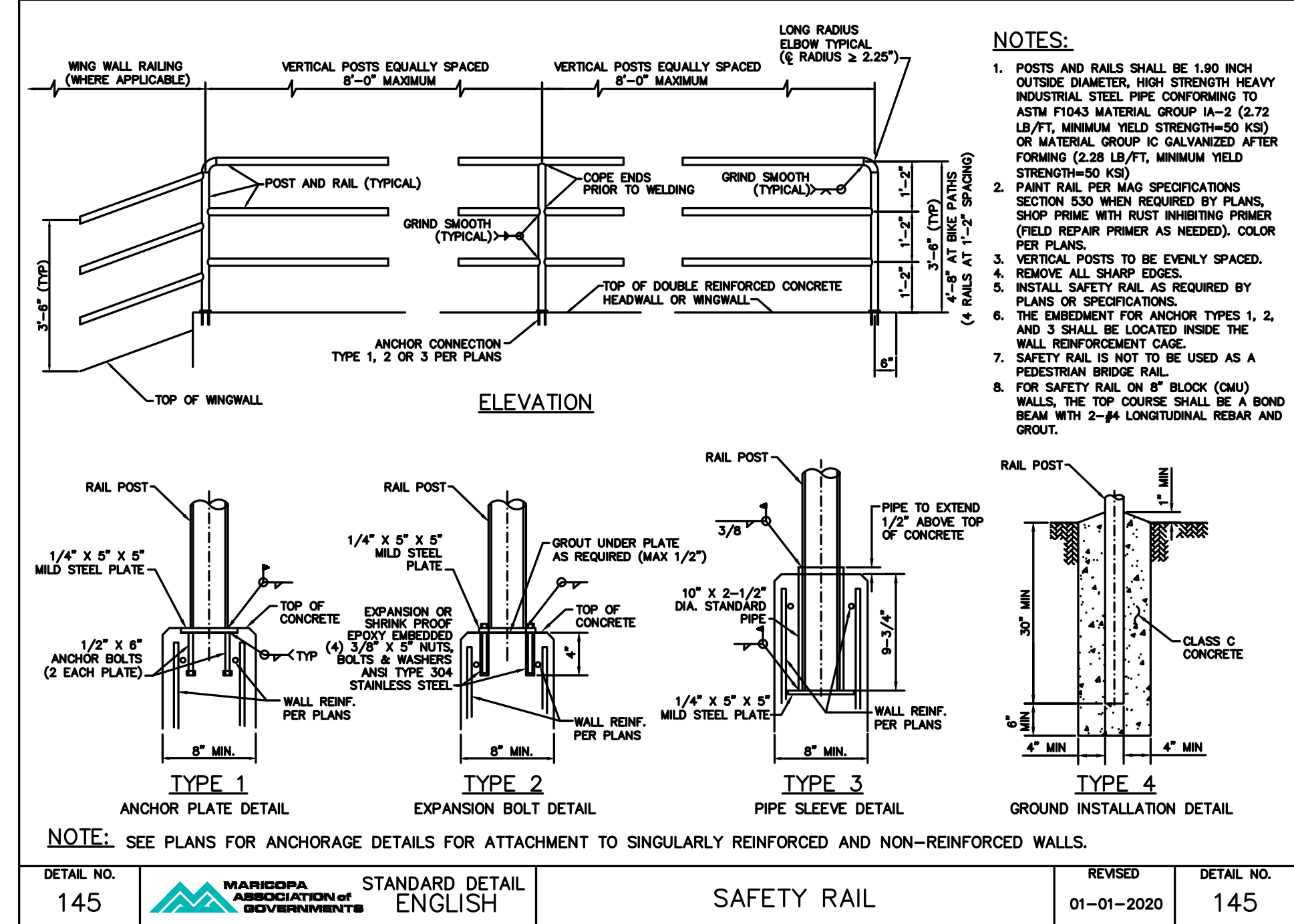
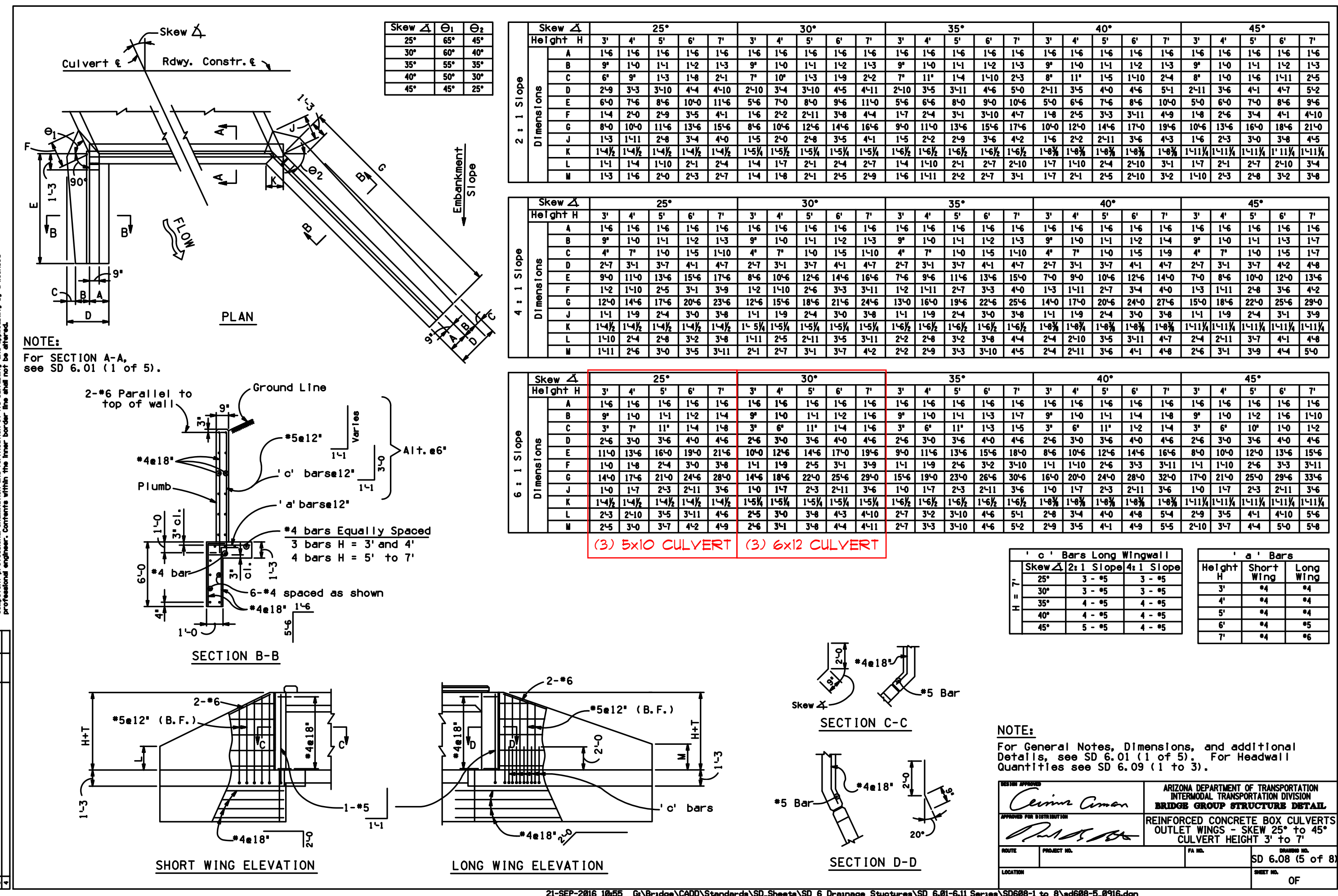
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ORIGINAL PLAN DATE July 21 LATEST REVISION DATE September 23 PROJECT NUMBER 221655 SHEET NUMBER S2.1 SHT. OF

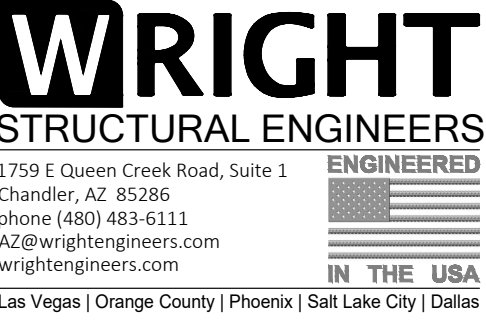
CONTRACTOR CLARIFICATION

ENG-21-0265

COB PLAN TRACKING # COB PERMIT #



TC202200170



PLAN NAME
**FLOREO AT TERAVALIS
SUN VALLEY PKWY BOX CULVERT**

ENGINEER INFORMATION
HILGARTWILSON

COB PERMITTING APPROVED SEAL
COB ENGINEERING APPROVED SEAL

AS-BUILT SEAL
DESIGN SEAL
THE HAYE

ORIGINAL PLAN DATE: July 21
LATEST REVISION DATE: September 23

PROJECT NUMBER: 221655
SHEET NUMBER: S2.2 OF 5

CONTRACTOR CLARIFICATION
SUBMITTAL: CONTRACTOR CLARIFICATION
ENG-21-0285
COB PLAN TRACKING #
COB PERMIT #