



DESIGN DATA

DEAD LOAD
 WEIGHT OF EARTH = --- pcf
 WEIGHT OF CONCRETE = 150 pcf
 WEIGHT OF WATER = 62.4 pcf

SEISMIC INFORMATION
 PGA = ---g

SOIL INFORMATION

MODULUS OF SUBGRADE REACTION
 K = --- pci

LATERAL LOAD
 EARTH SIDE = -- psf (EFP)
 WATER SIDE = 40 psf (EFP)

ULTIMATE STRENGTH

$f'_c = 4,000$ ps
 $f_y = 60,000$ psi
 $\phi = 0.90$ (Flexural Reduction)
 $\phi = 0.85$ (Shear Reduction)
 $\beta = 0.85$ (Steel/Conc Reduction)
 REDUCTION FACTORS PER ACI 318, LATEST CODE

GOVERNING CODES

– USACE EM 1110-2-2104, STRENGTH DESIGN FOR RC HYDRAULIC STRUCTURES
 – AMERICAN CONCRETE INSTITUTE (ACI 318), LATEST EDITION.

STRUCTURAL NOTES

- DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO THE NEAREST EDGE OF BAR AND SHALL BE TWO/THREE INCHES UNLESS OTHERWISE SHOWN.
 - CONCRETE DIMENSIONS SHALL BE MEASURED HORIZONTALLY OR VERTICALLY ON THE PROFILE, AND PARALLEL TO OR AT RIGHT ANGLES (OR RADIALLY) TO CENTERLINE OF CONDUIT ON THE PLAN UNLESS OTHERWISE SHOWN.
 - ALL BAR BENDS AND HOOKS SHALL CONFORM TO THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE'S "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318).
 - PLACING OF REINFORCEMENT SHALL CONFORM TO THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE'S "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", (ACI 318).
 - TRANSVERSE STRAIGHT REINFORCING STEEL SHALL TERMINATE 1 1/2 INCHES FROM THE CONCRETE SURFACES UNLESS OTHERWISE SHOWN ON THE PLANS.
 - CONSTRUCTION JOINTS IN WALLS AND SLABS SHALL BE IN THE SAME PLANE. NO STAGGERING OF JOINTS WILL BE PERMITTED. TRANSVERSE CONSTRUCTION JOINTS SHALL BE NORMAL OR RADIAL TO THE CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE SHOWN.
 - TRANSVERSE CONSTRUCTION JOINTS SHALL NOT BE PLACED WITHIN 30 INCHES OF OPENINGS FOR MANHOLES, JUNCTION STRUCTURES, OR SIDE INLETS.
 - ALL LAP SPLICES SHALL CONFORM TO THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE'S "BUILDING CODE (ACI 318) REQUIREMENTS FOR REINFORCED CONCRETE". LONGITUDINAL STEEL SHALL BE LAPPED 24 BAR DIAMETER AT SPLICES. TRANSVERSE STEEL SHALL BE LAPPED USING THE FOLLOWING TABLE:
- | BAR SIZE | #4 | #5 | #6 | #7 | #8 | #9 | #10 | #11 | #14 | #18 |
|----------------------|-----|-----|-----|-----|-----|------|------|------|------------------------------------|-----|
| LENGTH OF LAP SPLICE | 25" | 31" | 37" | 62" | 81" | 103" | 130" | 160" | TENSION LAP SPLICING NOT PERMITTED | |
- NO SPLICES IN TRANSVERSE STEEL REINFORCEMENT WILL BE PERMITTED OTHER THAN SHOWN IN THE DRAWING WITHOUT APPROVAL OF THE ENGINEER. NO MORE THAN ONE SPLICE SHALL BE PERMITTED IN ANY LONGITUDINAL BAR BETWEEN TRANSVERSE JOINTS. SPLICES SHALL BE STAGGERED.
 - LONGITUDINAL STEEL SHALL TERMINATE 2-INCHES FROM THE TRANSVERSE CONSTRUCTION JOINT.
 - TRANSVERSE CONSTRUCTION JOINT KEYWAYS (IN BOTH SLABS AND WALLS) SHALL BE PLACED AT THE END OF EACH POUR, BUT THE SPACING THEREOF SHALL NOT EXCEED 50 FEET NOR BE LESS THAN 10 FEET, MEASURED ALONG THE CENTERLINE OF CONSTRUCTION.
 - TRANSVERSE BARS SHALL BE PLACED RADIALLY IN CURVED SECTIONS UNLESS SHOWN OTHERWISE ON THE DETAILS. STRAIGHT TRANSVERSE BARS IN THE SLAB SHALL BE PLACED AS SHOWN ON THE TYPICAL SECTION. SPACING SHALL BE AT THE CENTERLINE OF CONSTRUCTION. STRAIGHT BARS AND 'L' SHAPED BARS IN THE WALLS SHALL BE SPACED AS SHOWN ON THE TABLE AND MEASURED BETWEEN THE VERTICAL LEGS OF THE BARS.
 - AT THE BEGINNING AND END OF ALL POURS, A CURTAIN OF REINFORCEMENT COMPOSED OF B_1 , B_4 , AND B_7 BARS SHALL BE PLACED 3 INCHES FROM THE TRANSVERSE CONSTRUCTION JOINT.
 - B_1 AND B_4 BARS MAY BE SPLICED AT THE LONGITUDINAL CONSTRUCTION JOINTS. THE LAP SPLICE SHALL BE IN ACCORDANCE WITH THE TABLE UNDER NOTE 8.
 - THE B_1 , B_2 , AND B_3 BARS MAY BE LAP SPLICED AT THE CENTERLINE OF THE SLAB FOR THE CHANNEL WIDTHS OF 20 FEET AND GREATER IN ACCORDANCE WITH THE TABLE UNDER NOTE 8. FOR LESS THAN 20 FOOT WIDTHS, THE BAR SHALL BE 'U' SHAPED.
 - THE BAR LENGTHS TABULATED FOR TRANSITIONS ARE APPLICABLE TO THE LARGER SECTION ONLY. THE BARS REQUIRING ADJUSTMENT ARE THOSE TABULATED IN THE TABLE HERON AND SHALL BE ADJUSTED AS NECESSARY WITHIN THE TRANSITION.
 - THE LONGITUDINAL CONSTRUCTION JOINTS SHALL BE CONTINUOUS.
 - THE SPACING OF THE LONGITUDINAL BARS IN THE SLAB SHALL BE BASED ON THE DISTANCE BETWEEN THE LONGITUDINAL CORNER BARS NEAREST THE INSIDE FACE OF THE STRUCTURE AND THE NUMBER OF BARS SPECIFIED IN THE TABLE. THE SPACING IN THE WALLS SHALL BE BASED ON THE WALL HEIGHT AND THE NUMBER OF BARS IN THE TABLE.
 - THE NUMBER OF CARRIER BARS INDICATED IN THE TABLE SHALL BE PROVIDED AND INSTALLED TO FACILITATE PLACEMENT OF THE TRANSVERSE REINFORCING. ADDITIONAL CARRIER BARS PROVIDED AND INSTALLED FOR THE CONVENIENCE OF THE CONTRACTOR WILL BE AT HIS EXPENSE.
 - EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE CHAMFERED 3/4" X 3/4".

RC CHANNEL TABLE						
SECTION NUMBER	1	2	3	4	5	6
WIDTH	W	–				
HEIGHT	H	–				
THICKNESS (INCHES)	BASE OF WALL	T ₁	–			
	SLAB AT FACE OF WALL	T ₂	–			
	SLAB AT ϕ	T ₃	–			
	TOP OF WALL	T ₄	–			
INVERT DROP	V	–				
STEEL CLEARANCE INVERT	C	–				
B ₁ BAR	BAR # AND SPACING	–				
	HORIZONTAL LENGTH	–				
	VERTICAL LENGTH	–				
B ₂ BAR	BAR # AND SPACING	–				
	HORIZONTAL LENGTH	–				
	VERTICAL LENGTH	–				
B ₃ BAR	BAR # AND SPACING	–				
	HORIZONTAL LENGTH	–				
	VERTICAL LENGTH	–				
B ₄ BAR	BAR # AND SPACING	–				
	HORIZONTAL LENGTH	–				
	VERTICAL LENGTH	–				
B ₅ BAR	BAR # AND SPACING	–				
	HORIZONTAL LENGTH	–				
	VERTICAL LENGTH	–				
B ₆ BAR	BAR # AND SPACING	–				
	HORIZONTAL LENGTH	–				
	VERTICAL LENGTH	–				
B ₇ BAR	BAR # AND SPACING	–				
	HORIZONTAL LENGTH	–				
	VERTICAL LENGTH	–				
B ₈ BAR	BAR # AND SPACING	–				
	HORIZONTAL LENGTH	–				
	VERTICAL LENGTH	–				
B ₉ BAR	BAR # AND SPACING	–				
	HORIZONTAL LENGTH	–				
	VERTICAL LENGTH	–				
#4 LONGITUDINAL BAR	BOTTOM SLAB	–				
	SIDE WALLS	–				
TOTAL #4 LONGITUDINAL BARS	–					
#4 CARRIER BARS IN BOTTOM SLAB	–					
CONCRETE QUANTITY: CY/LINEAR FT	–					
STEEL QUANTITY: LBS/LINEAR FT	–					

RC CHANNEL LOCATION				
CHANNEL SECTION NUMBER	STATIONS		BARS TO BE ADJUSTED	
	FROM	TO	VERTICAL LEG	HORIZONTAL LEG
1	–	–		
2	–	–		
2	–	–		
3	–	–		
4	–	–		
5	–	–		
6	–	–		
7	–	–		
8	–	–		

PLOT DATE: 9/15/21

D					
C					
B					
A					
Δ	REVISION	DESCRIPTION	APP.	DATE	

DESIGNED	WATERSHED PROJECT MANAGER	DATE
DRAWN	WATERSHED DEPUTY DIRECTOR	DATE
CHECKED	WATERSHED DIRECTOR	DATE

**VENTURA COUNTY
PUBLIC WORKS AGENCY
WATERSHED PROTECTION**

SPEC. NO.		PROJECT NAME	SHEET _____ OF _____ DRAWING SET NO. WPD-?-???
PROJ. NO.			
		RC RECTANGULAR CHANNEL STRUCTURAL DETAILS	