

G E N E R A L S T R U C T U R A L N O T E S (GSN)

DESIGN

BRIDGE DESIGN SPECIFICATIONS:
(1983 AASHTO WITH INTERMS AND REVISIONS BY CALTRANS)

GENERAL

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION. USCD SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES. IN CASE OF CONFLICT, MORE COSTLY REQUIREMENTS GOVERN FOR BIDDING. SUBMIT CLARIFICATION REQUEST PRIOR TO PROCEEDING WITH WORK.
2. ALL DRAWINGS ARE CONSIDERED TO BE A PART OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS AND SPECIFICATIONS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES THAT OCCUR SHALL BE BROUGHT TO THE ATTENTION OF USCD PRIOR TO START OF CONSTRUCTION SO THAT A CLARIFICATION CAN BE ISSUED. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS OR ANY CODE REQUIREMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT HIS OWN EXPENSE.
3. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE GIVEN, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK, UNLESS NOTED OTHERWISE. DETAILS ON STRUCTURAL DRAWINGS ARE TYPICAL AS INDICATED BY CUTS, REFERENCES OR TITLES.
4. SEE MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR THE FOLLOWING:
 - ELECTRICAL CONDUIT RUNS, BOXES, OUTLETS IN WALLS AND SLABS.
 - ELECTRICAL CONDUIT RUNS, BOXES, OUTLETS IN WALLS AND SLABS.
 - CONCRETE INSERTS FOR ELECTRICAL, MECHANICAL, OR PLUMBING FIXTURES.
 - SIZE AND LOCATION OF MACHINE OR EQUIPMENT BASES, ANCHOR BOLTS FOR MOTOR MOUNTS.
5. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE BUT NOT BE LIMITED TO BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.
6. OPENINGS, POCKETS, ETC., LARGER THAN 6" SHALL NOT BE PLACED IN CONCRETE SLABS, DECKS, OR WALLS UNLESS SPECIALLY DETAILED ON THE STRUCTURAL DRAWINGS. NOTIFY THE STRUCTURAL ENGINEER WHEN DRAWINGS BY OTHERS SHOW OPENINGS, POCKETS, ETC., LARGER THAN 6" NOT SHOWN ON THE STRUCTURAL DRAWINGS, BUT WHICH ARE LOCATED IN STRUCTURAL MEMBERS. FOR ANY FURTHER RESTRICTIONS ON OPENINGS IN STRUCTURAL ELEMENTS, SEE APPLICABLE SECTIONS BELOW.
7. ASTM, ACI, & AWS SPECIFICATIONS ON THE DRAWINGS SHALL BE OF THE LATEST REVISION.
8. CONTRACTOR SHALL INVESTIGATE SITE DURING CLEARING AND EARTHWORK OPERATIONS FOR FILLED EXCAVATIONS OR BORED STRUCTURES, SUCH AS CESSPOOLS, CISTERNS, FOUNDATIONS, ETC. IF ANY SUCH STRUCTURES ARE FOUND, STRUCTURAL ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
9. CONSTRUCTION MATERIAL SHALL BE SPREAD OUT IF PLACED ON FRAMED ROOF OR FLOOR. LOAD SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT. PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE STRUCTURE HAS NOT ATTAINED DESIGN STRENGTH.

11. ANY ENGINEERING DESIGN PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BE BY A REGISTERED STRUCTURAL ENGINEER AND SUBMITTAL SHALL BE SEALED BY THE ENGINEER.
12. REVISIONS MADE DURING CONSTRUCTION MUST BE REVIEWED AND SIGNED BY THE ENGINEER AND FORWARDED TO THE USCD FACILITY DESIGN AND CONSTRUCTION DEPARTMENT.
13. OWNER SUPPLIED, CONTRACTOR INSTALLED REFERRED TO HEREIN AS 05-01.
14. PRE BID MEETING REQUIRED WITH USCD PRIOR TO FINAL BID.
15. PRE CONSTRUCTION MEETING REQUIRED WITH USCD PRIOR TO START OF CONSTRUCTION.

SHOP DRAWINGS

1. THE STRUCTURAL SHOP DRAWING REVIEW IS INTENDED TO HELP THE ENGINEER VERIFY HIS DESIGN CONCEPT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK HIS OWN SHOP DRAWINGS.
2. RESUBMITTAL IF A CASUALTY REVIEW SHOWS MAJOR ERRORS WHICH SHOULD HAVE BEEN FOUND BY THE CONTRACTOR'S CHECKING.
3. THE FOLLOWING SHOP DRAWINGS ARE NOT REQUIRED FOR SUBMITTAL FOR STRUCTURAL ENGINEER'S REVIEW:
 - A. BRACING.
 - B. PICK UP INSERT.
 - C. FORMWORK.
4. THE FOLLOWING SHOP DRAWINGS AND CALCULATIONS, WHEN APPLICABLE, ARE REQUIRED FOR SUBMITTAL FOR STRUCTURAL REVIEW:
 - A. CONCRETE MIX DESIGNS.
 - B. SPLICED REINFORCING.
 - C. CONSTRUCTION JOINT LOCATIONS.
 - D. MISCELLANEOUS STRUCTURAL STEEL SHOWN ON STRUCTURAL DRAWINGS.
 - E. P/T STRESSING SEQUENCE.
5. ANY SUBMITTAL OF A DETAIL SHEET WITH ADDED INFORMATION SHALL BE ACCOMPANIED BY LOCATION PLAN IDENTIFYING THE MEMBERS INVOLVED AND CLOUDING AROUND ADDED INFORMATION.
6. ANY ENGINEERING SUBMITTED FOR REVIEW SHALL BE APPROPRIATELY SEALED. FULL RESPONSIBILITY OF SUCH ENGINEERING RESTS WITH THE PERSON SEALING THE DESIGN.
7. REFERENCE THE DATE OF THE DESIGN DRAWINGS THAT WERE USED TO PRODUCE SHOP DRAWINGS.

CONCRETE

1. ALL CONCRETE CONSTRUCTION SHALL CONFORM WITH CHAPTER 19 OF THE CODE AND WITH THE PROVISIONS OF ACI 318, LATEST ADDITION.
2. CONCRETE MIXES SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY AND APPROVED BY THE STRUCTURAL ENGINEER. MIX DESIGN METHODS (TEST HISTORY OR TRIAL BATCH METHOD) PER CODE SECTION 1905.3 SHALL BE USED TO PROPORTION CONCRETE. CONCRETE STRENGTH =5000 PSI WITH 1" MAX. AGGREGATE AND MAX. W/C=0.48
3. ALL MEMBERS WITH VOLUMETRIC DIMENSIONS EXCEEDING 5'-5.5'-6" WILL BE CAST IN ACCORDANCE WITH CALTRANS SPECIFICATION FOR MASS CONCRETE.
4. PORTLAND CEMENT SHALL CONFORM TO ASTM C-150, TYPE I OR II SELF-COMPACTING.
5. AGGREGATE FOR HARD ROCK CONCRETE SHALL CONFORM TO ALL REQUIREMENTS AND TESTS OF ASTM C-33 AND PROJECT SPECIFICATIONS. EXCEPTIONS MAY BE USED ONLY WITH PERMISSION OF THE STRUCTURAL ENGINEER.
6. CONCRETE MIXING OPERATION, ETC. SHALL CONFORM TO ASTM C-94.
7. PLACEMENT OF CONCRETE SHALL CONFORM TO CODE SECTION 1905 AND PROJECT SPECIFICATIONS. CLEAN AND ROUGHEN TO 1/4" APPLITUDE. ALL CONCRETE SURFACES AGAINST WHICH NEW CONCRETE IS TO BE PLACED.
8. ALL REINFORCING BARS, ANCHOR BOLTS, AND OTHER CONCRETE INSERTS SHALL BE WELL SECURED IN POSITION PRIOR TO PLACING CONCRETE.
9. PROVIDE SLEEVES FOR PLUMBING AND ELECTRICAL OPENINGS IN CONCRETE BEFORE PLACING. DO NOT CUT ANY REINFORCING WHICH MAY CONFLICT. CORING IN CONCRETE IS NOT PERMITTED. NOTIFY THE STRUCTURAL ENGINEER IN ADVANCE OF CONDITIONS NOT SHOWN ON THE DRAWINGS. SEE THESE DRAWINGS FOR ADDITIONAL RESTRICTIONS ON THE PLACEMENT OF OPENINGS IN SLABS AND WALLS.
10. PRESS SHALL NOT DISPLACE OR INTERRUPT REINFORCING BARS. SPACE EMBEDDED PIPES AT A MINIMUM OF 3 DIAMETERS.
11. CAST SLABS ON GRADE IN ALTERNATE SECTIONS UNLESS PERMANENT FORMS ARE USED. WAIT 48 HOURS BETWEEN ALL ADJACENT CONCRETE CASTINGS. DO NOT PLACE CONCRETE IN LENGTHS EXCEEDING 100 FEET.
12. MINIMUM STRENGTH FOR REMOVAL OF BOTTOM FORMS AND SHORING SHALL BE 75% OF SPECIFIED STRENGTH AT 28 DAYS. COLUMN AND WALL FORMS MAY BE REMOVED IN 24 HOURS FOR MINIMUM 5500 PSI CONCRETE.
13. 7 DAY MOST CURE REQUIRED. APPLICATION OF CURING COMPOUNDS IN LIEU OF MOST CURE IS NOT ACCEPTABLE.

CONSTRUCTION JOINTS

1. ALL CONSTRUCTION JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CODE SECTION 1906.4 AND THE TYPICAL CONSTRUCTION JOINT DETAILS SHOWN ON THE STRUCTURAL DRAWINGS.
2. ALL SURFACES OF CONSTRUCTION JOINTS SHALL BE CLEANED TO REMOVE DUST, CHIPS, OR OTHER FOREIGN MATTER AND ROUGHENED TO 1/4" AMPLITUDE PRIOR TO PLACING THE ADJACENT CONCRETE.
3. THE CONTRACTOR SHALL SUBMIT THE PROPOSED LOCATIONS OF CONSTRUCTION JOINTS TO THE USCD FOR APPROVAL BY THE STRUCTURAL ENGINEER BEFORE STARTING CONSTRUCTION.

REINFORCING STEEL FOR CONCRETE

1. REINFORCING BARS SHALL CONFORM TO THE REQUIREMENTS OF CHAPTER 19 OF THE CODE, ASTM A615, GRADE 60 UNO. DEFORMATIONS SHALL BE IN ACCORDANCE WITH ASTM A-305.
2. WHERE WELDING OF REINFORCING IS APPROVED BY THE STRUCTURAL ENGINEER, IT SHALL BE DONE BY AWS CERTIFIED WELDERS USING E9018 OR APPROVED ELECTRODES. WELDING PROCEDURES SHALL CONFORM TO THE REQUIREMENTS OF STRUCTURAL WELDING CODE - REINFORCING STEEL, AWS-D1-4, LATEST REVISION. REINFORCING BARS TO BE WELDED SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-706.
3. BARS SHALL BE CLEAN OF RUST, GREASE, OR OTHER MATERIALS LIKELY TO IMPAIR BOND. ALL REINFORCING BAR BENDS SHALL BE MADE COLD.
4. THE DRAWINGS - MINIMUM SPLICE LENGTH FOR REINFORCING STEEL BARS IN CONCRETE SHALL BE PER THE CODE SECTION 1912. ALL BARS SHALL BE FULLY DEVELOPED AND WELDED TO ALL HORIZONTAL BARS AT CORNERS AND INTERSECTIONS. ALL DOWN ALL VERTICAL REBAR TO FOUNDATIONS. ALL SPLICE LOCATIONS ARE SUBJECT TO APPROVAL BY STRUCTURAL ENGINEER. USE 90 BAR DIA. UNO. PROVIDE REQUIRED SHOP DRAWINGS AND FABRICATE AFTER ENGINEER'S REVIEW.
5. ALL BARS SHALL BE MARKED SO THEIR IDENTIFICATION CAN BE MADE WHEN THE FINAL IN-PLACE INSPECTION IS MADE.
6. BARS IN SLABS SHALL BE SECURELY SUPPORTED ON WELL-CURED CONCRETE BLOCKS OR APPROVED METAL CHAIRS, PRIOR TO PLACING CONCRETE.
7. REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH THE "A.C.I. MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", LATEST EDITION.
8. COMPLETE AND DETAILED REINFORCING PLACEMENT DRAWINGS SHALL BE PREPARED AND SUBMITTED TO THE STRUCTURAL ENGINEER PRIOR TO FABRICATION IN ACCORDANCE WITH THE SPECIFICATIONS AND APPLICABLE CODES. THESE DRAWINGS SHALL BE AVAILABLE ON THE JOB SITE PRIOR TO PLACING OF CONCRETE.
9. REBAR SPACINGS GIVEN ARE MAXIMUM ON CENTER WHETHER STATED AS "C.C." OR NOT. REBAR IS CONTINUOUS UNLESS NOTED OTHERWISE.
10. WHERE REINFORCING IS SHOWN CONTINUOUS THROUGH CONSTRUCTION JOINTS, MECHANICAL SPLICE DEVICES MAY BE USED. SIZES AND TYPES SHALL BE SELECTED TO DEVELOP AT LEAST 125% OF THE SPECIFIED YIELD STRENGTH OF THE BAR PER ICR80 RESEARCH REPORT FOR TYPE II SPLICES.
11. WLT TEST REPORTS FOR GRADE 60 BARS SHALL BE SUBMITTED PRIOR TO PLACEMENT OF CONCRETE.
12. CONTINUOUS INSPECTION OF CONCRETE SHALL INCLUDE INSPECTION DURING INSTALLATION OF REINFORCING STEEL. INSPECTION SHALL BE SCHEDULED SO THAT PLACEMENT OF REINFORCING STEEL, CONDUIT, SLEEVES, AND EMBEDDED ITEMS MAY BE CORRECTED PRIOR TO PLACEMENT OF OVERLAPPING GRIDS OF REINFORCING STEEL.
13. CONCRETE PROTECTION FOR REINFORCEMENT

(I) UNLESS SPECIFIED, THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT:

	MINIMUM COVER, INCHES
A. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO WEATHER	3
B. CONCRETE EXPOSED TO EARTH OR WEATHER. NO. 6 THROUGH NO. 18 BAR.	2
C. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND: SLABS, WALLS, JOISTS: BEAMS, COLUMNS. PRIMARY REINFORCEMENT TIES, STIRRUPS, SPIRALS	2
D. MECHANICAL SPLICES	3/4

14. REINFORCING ALLOWANCE: THE CONTRACTOR SHALL PROVIDE 5% OF TOTAL REINF. AS EXTRA REINFORCING FOR THE ENGINEER TO USE AT HIS DISCRETION DURING UNUSED PORTION.
15. LENTION TERMINATORS BY ERCO MAY BE USED IN LIEU OF STANDARD HOOKS. THE USE OF HEADED BARS AND THEIR LOCATION ARE IDENTIFIED ON PLANS

POWELL LAB/CAMP ELLIOTT FIELD STATION ISOLATED BLAST SLAB

NO.	DATE	REVISIONS



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