DESIGN CRITERIA

1. APPLICABLE CODE: 2007 CALIFORNIA BUILDING CODE (CBC), AND UFC 3-310-04, SEISMIC DESIGN FOR BUILDINGS.
2. OCCUPANCY CATEGORY III (TABLE 1604.5)
3. ROOF LOADS:
   20 PSF LIVE (UNREDUCED)
   0 PSF SNOW
4. REFER TO THE INDIVIDUAL STRUCTURE DRAWINGS FOR SPECIFIC STRUCTURE LOADINGS, NOTES AND REQUIREMENTS.
   DEFLECTION CRITERIA FOR ROOF AND FLOOR FRAMING MEMBERS:
   TOTAL LOAD L / 240
   LIVE LOAD L / 360
   DEFLECTION CRITERIA FOR BEAMS, LINTELS OR SLABS SUPPORTING MASONRY:
   L / 720 OR 3/8" MAXIMUM FOR LINTELS OVER WINDOWS

   WHERE L IS THE MEMBERS SPAN LENGTH
5. WIND LOAD:
   CBC WIND PRESSURE
   90 MPH, 3 SEC GUST WIND SPEED
   EXPOSURE C
   IMPORTANCE FACTOR = 1.15
   $GCpi = \pm 0.18$
6. SEISMIC LOAD:
   SEISMIC PARAMETERS (MAPPED)
   $S_S = 1.50$ G
   $S_1 = 0.60$ G

   SOIL SITE CLASS D

   SEISMIC PARAMETERS (DESIGN)
   $S_{DS} = 1.00$ G
   $S_{D1} = 0.60$ G

   SEISMIC DESIGN CATEGORY D
   PER TABLES 1613.5.6 (1) AND (2)
   IMPORTANCE FACTOR = 1.25
   IMPORTANCE FACTOR(IP) = 1.50 (FOR SPRINKLERS AND MECHANICAL EQPT IN ADMIN/RO BLDG)
7. SEISMIC FORCE RESISTANCE SYSTEMS
   A. OPERATIONS BUILDING AND FWPS:
      SPECIAL REINFORCED MASONRY SHEAR WALLS R=5
      EQUIVALENT LATERAL FORCE METHOD.

   B. CONCENTRATE PUMP STATION AND CLEARWELL:
      REINFORCED CONCRETE BURIED, UNANCHORED TANKS
      Ri=2.0 Rc=1.0
      DYNAMIC LATERAL FORCE PER ACI 350.3
8. SOIL DESIGN PARAMETERS:
   A. NET ALLOWABLE SOIL BEARING PRESSURES:
      2500 PSF (WITH A 1/3 INCREASE ALLOWED USING WIND OR SEISMIC LOADS)

   B. EQUIVALENT DRAINED FLUID PRESSURES:
      ACTIVE: 40 PCF
      AT REST: 60 PCF
      PASSIVE: 230 PCF

   C. COEFFICIENT OF FRICTION AGAINST SLIDING = 0.30

   D. SOIL UNIT WEIGHT = 125 PCF

   E. GROUND WATER ELEVATION:
      APPROX. 37 FEET BELOW EXISTING GRADE.

   F. REFER TO FOUNDATIONS SECTION OF THESE NOTES FOR ADDITIONAL SOILS INFORMATION.

GENERAL INFORMATION

1. FOR ABBREVIATIONS NOT LISTED, SEE ASME Y14.38 "ABBREVIATIONS AND ACRONYMS" PUBLICATION AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
2. DESIGN DETAILS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO ALL SIMILAR SITUATIONS OCCURRING THROUGHOUT THE PROJECT, WHETHER OR NOT THEY ARE KEYED IN EACH LOCATION. CONSULT THE ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION.
3. VERIFY ALL OPENING DIMENSIONS IN WALLS, SLABS, AND DECKS WITH THE ARCHITECTURAL, MECHANICAL, HVAC AND ELECTRICAL DRAWINGS.
4. FOR NUMBER, TYPE, SIZE, ARRANGEMENT, AND/OR LOCATION OF EQUIPMENT PADS SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, HVAC AND PLUMBING DRAWINGS. COORDINATE WITH EQUIPMENT SUPPLIER PRIOR TO PLACING SLABS,WALLS AND FOUNDATIONS. COORDINATE ALL MECHANICAL, ELECTRICAL AND HVAC PIPING OPENINGS WITH MECHANICAL, ELECTRICAL AND HVAC DRAWINGS.
5. NO STRUCTURAL MEMBERS SHALL BE CUT FOR PIPES, DUCTS, ETC, UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE DISTRICT.
6. VISITS TO THE JOB SITE BY THE DISTRICT TO OBSERVE THE CONSTRUCTION DO NOT IN ANY WAY MEAN THAT DISTRICT IS GUARANTORS OF THE CONSTRUCTOR'S WORK, NOR RESPONSIBLE FOR THE COMPREHENSIVE OR SPECIAL INSPECTIONS, COORDINATION, SUPERVISION, FOR SAFETY AT THE JOB SITE.
7. SPECIAL INSPECTION (PROVIDED AND PAID FOR BY THE OWNER) IS REQUIRED IN ACCORDANCE WITH CBC SECTIONS 109 AND 1704 ON THE FOLLOWING PORTIONS OF THE WORK:

   CONCRETE PLACEMENT
   REINFORCING STEEL PLACEMENT
   STRUCTURAL WELDING
   ANCHORS, EMBEDS AND BOLTS INSTALLED IN CONCRETE
   HIGH STRENGTH BOLTS
   GRADING, EXCAVATION, AND FILLING
   MASONRY.
8. ALL SPECIFIED CONCRETE GROUT AND MASONRY TESTING DURING CONSTRUCTION WILL BE DISTRICT FURNISHED. ALL SPECIFIED LABORATORY TEST MIXES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

FOUNDATIONS

1. REFER TO PERRIS DESALTER GEOTECHNICAL INVESTIGATIONS BY CH2M HILL, DATED FEBRUARY 20, 2008 AND BY NINYO AND MOORE DATED OCTOBER 28, 2005.
2. ALL FOUNDATION BEARING SURFACES SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF REINFORCING STEEL.
3. NO BACKFILL SHALL BE PLACED BEHIND WALLS UNTIL THE WALL'S AND TOP SUPPORTING SLAB'S CONCRETE HAVE ATTAINED 80% OF THEIR SPECIFIED COMPRESSIVE STRENGTH, OR UNTIL TOP-OF-WALL FRAMING SYSTEMS,INCLUDING DIAPHRAGMS, HAVE BEEN COMPLETED.
4. NO BACKFILL SHALL BE PLACED BEHIND CANTILEVERED, FREE TOP WALLS UNTIL THE CONCRETE HAS ATTAINED 80% OF ITS SPECIFIED COMPRESSIVE STRENGTH.
5. REFER TO SPECIFICATIONS FOR ALL EXCAVATION AND FILL REQUIREMENTS.
6. EXCAVATIONS SHALL BE SHORED AS REQUIRED TO PREVENT DAMAGE TO ADJACENT STRUCTURES, UTILITIES, ETC.

FORMWORK, SHORING AND BRACING

1. THE STRUCTURES SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED FOR STABILITY UNDER FINAL CONDITIONS ONLY. THE DESIGN SHOWN DOES NOT INCLUDE THE NECESSARY COMPONENTS OR EQUIPMENT FOR THE STABILITY OF THE STRUCTURES DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK RELATING TO CONSTRUCTION ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS,SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN.
2. TEMPORARY SHORING SHALL REMAIN IN PLACE UNTIL ELEVATED CONCRETE FLOOR OR SLABS HAVE REACHED 28 DAY DESIGN STRENGTH AS DETERMINED BY CYLINDER BREAKS.

CONCRETE REINFORCING

1. CLEARANCE FOR REINFORCEMENT BARS, UNLESS SHOWN OTHERWISE, SHALL BE:
   WHEN PLACED ON GROUND: 3"
   ALL OTHER CONCRETE SURFACES:
   #5 BAR OR SMALLER 1 1/2"
   #6 BAR OR LARGER 2"
2. REFER TO WALL CORNER AND WALL INTERSECTION REINFORCING DETAIL (0330-003). WALL CORNER REINFORCING SIZES AND SPACING'S SHALL BE AS SHOWN ON THE DRAWINGS. TYPICAL HORIZONTAL WALL REINFORCING SHALL LAP WITH THE CORNER HORIZONTAL REINFORCING.
3. ALL BENDS, UNLESS OTHERWISE SHOWN, SHALL BE 90 DEGREE ACI 318 STANDARD HOOKS.
4. ADDITIONAL REINFORCEMENT SHALL BE PROVIDED AT PIPE PENETRATIONS AND OPENINGS AS SHOWN IN THE DRAWINGS. ALL REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED.
5. LAP SPLICES SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENTS:

CONCRETE DESIGN STRENGTH = 4,000 PSI GRADE 60 REINFORCING STEEL								
BAR SIZE		#3	#4	#5	#6	#7	#8	#9
LAP SPLICE LENGTH								
SPACING < 6"	TOP BAR*	1'-4"	2'-0"	3'-0"	4'-0"	5'-10"	6'-8"	7'-7"
	OTHER BAR	1'-4"	1'-7"	2'-4"	3'-1"	4'-6"	5'-2"	5'-10"
SPACING ≥ 6"	TOP BAR*	1'-4"	1'-8"	2'-0"	2'-5"	3'-6"	4'-0"	5'-0"
	OTHER BAR	1'-4"	1'-4"	1'-7"	1'-10"	2'-9"	3'-1"	3'-10"
EMBEDMENT LENGTH								
SPACING < 6"	TOP BAR*	1'-0"	1'-7"	2'-4"	3'-1"	4'-6"	5'-2"	5'-10"
	OTHER BAR	1'-0"	1'-3"	1'-9"	2'-5"	3'-6"	4'-0"	4'-6"
SPACING ≥ 6"	TOP BAR*	1'-0"	1'-3"	1'-7"	1'-10"	2'-9"	3'-1"	3'-10"
	OTHER BAR	1'-0"	1'-0"	1'-3"	1'-5"	2'-1"	2'-5"	3'-0"

* TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

**WHERE 3000 PSI CONCRETE IS USED, INCREASE ABOVE LENGTHS BY 16%.

6. 100% TIED CONTACT SPLICES ARE REQUIRED.

CONCRETE

1. 28-DAY CAST-IN-PLACE CONCRETE STRENGTHS:
   TYPICAL: 4000 PSI
   CONCRETE FILL: 2500 PSI
   CURBS AND SIDEWALKS: 3000 PSI
   CONDUIT ENCASEMENTS: 3000 PSI
   PIPE ENCASEMENTS NOT INTEGRAL WITH FOUNDATIONS: 3000 PSI
2. REINFORCING STEEL:
   TYPICAL: ASTM A615, GRADE 60
   WELDED: ASTM A706, GRADE 60
3. FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI MSP-1 "MANUAL OF STANDARD PRACTICE" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL, CONCRETE FOR BUILDING".
4. CONSTRUCTION JOINTS INDICATED ARE SUGGESTED LOCATIONS. CONTRACTOR MAY REVISE LOCATION OF JOINTS, SUBJECT TO SPECIFIED REQUIREMENTS, AND SHALL SUBMIT ALL JOINT LOCATIONS FOR REVIEW BY THE ENGINEER. ADDITIONAL CONSTRUCTION JOINT LOCATIONS, AS REQUIRED FOR CONSTRUCTION, SHALL BE SUBMITTED FOR REVIEW.
5. ROUGHEN AND CLEAN ALL CONSTRUCTION JOINTS IN WALLS AND SLABS AS SPECIFIED PRIOR TO PLACING ADJACENT CONCRETE. SANDBLASTING OR OTHER PREPARATION OF HORIZONTAL AND VERTICAL JOINTS IS REQUIRED.
6. THE CONTRACTOR SHALL COORDINATE PLACEMENT OF ALL OPENINGS, CURBS, DOWELS, SLEEVES, CONDUITS, BOLTS AND INSERTS PRIOR TO PLACEMENT OF CONCRETE.
7. NO ALUMINUM CONDUIT OR PRODUCTS CONTAINING ALUMINUM OR ANY OTHER MATERIAL INJURIOUS TO THE CONCRETE SHALL BE EMBEDDED IN THE CONCRETE.
8. CONDUIT SHALL NOT BE PLACED PARALLEL WITH BEAM OR COLUMN REINFORCEMENT UNLESS SPECIFICALLY INDICATED IN DRAWINGS.
9. CONCRETE MIX FOR WALL SECTION OR LINER DIMENSIONS OF 8" OR LESS SHALL USE 1" MAXIMUM AGGREGATE.

MASONRY

1. MORTAR: ASTM C270, TYPE S, HYDRATED. MASONRY CEMENT SHALL NOT BE USED.
2. GROUT: ASTM C476 COURSE GROUT. 2000 PSI MINIMUM 28 DAY COMPRESSIVE STRENGTH.
3. CONCRETE MASONRY UNITS: ASTM C90, GRADE N, LINEAR SHRINKAGE SHALL NOT EXCEED .065%, MEDIUM WEIGHT, 1900 PSI UNIT COMPRESSIVE MASONRY STRENGTH.
4. THE DESIGN f'm OF THE FINISHED ASSEMBLY SHALL BE 1500 PSI.
5. PLACE COURSES IN RUNNING BOND PATTERN, UNLESS SPECIFICALLY INDICATED OTHERWISE.
6. AT BUILDING WALLS, LAP VERTICAL REINFORCING 48 BAR DIAMETER WITH DOWELS. ALL OTHER VERTICAL BAR LAPS SHALL BE 72 BAR DIAMETERS. ALL VERTICAL LAPS IN CANTILEVER WALLS SHALL BE 72 BAR DIAMETERS. STAGGER ALL ADJACENT LAP SPLICES, SEPARATED BY 3 INCHES OR LESS, BY 24 INCHES.
7. MASONRY UNIT AND GROUT TESTING SHALL BE IN CONFORMANCE WITH 2007 CBC, "UNIT STRENGTH METHOD". TESTING WILL BE OWNER FURNISHED. OTHER CBC TEST METHODS MAY BE SUBMITTED AS AN ALTERNATIVE.
8. CONDUIT SHALL NOT BE PLACED IN CELLS CONTAINING REINFORCEMENT.

WELDING

1. ALL WELDS SHALL CONFORM TO AWS D1.1 LATEST EDITION AS SPECIFIED.
2. ALL WELDS FOUND DEFECTIVE SHALL BE REPAIRED IN ACCORDANCE WITH AWS D1.1, 5.26
3. INTERMITTENT WELDS SHALL BE UTILIZED AT ALL FIELD WELDS AND EMBED PLATES AND ANGLES TO AVOID SPALLING OR CRACKING OF THE EXISTING CONCRETE.
4. ALL BUTT JOINT WELDS SHALL BE COMPLETE JOINT PENETRATION (CJP) UNLESS INDICATED OTHERWISE.

STRUCTURAL STEEL AND METAL FABRICATIONS

1. ALL STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING:
   W-SHAPES
   (UNLESS SHOWN OTHERWISE): A992 (50 KSI)
   ROLLED PLATES, ANGLES AND BARS,
   ALL SHAPES, EXCEPT W-SHAPES
   (INCLUDING CHANNELS): A36 (36 KSI)
   SQUARE OR RECTANGULAR STEEL
   TUBING: A500, GRADE B (46 KSI)
   STEEL PIPE: A501 OR A53, GRADE B
   ALUMINUM: ALLOY 6061-T6
   STAINLESS STEEL: TYPE 316 (25 KSI)
2. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION, CURRENT EDITION, AND CURRENT OSHA STANDARDS.
3. ALL BOLTS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO THE FOLLOWING EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE:
   UNLESS SHOWN OTHERWISE A325-N
   MACHINE BOLTS (MB) AND ANCHOR BOLTS (AB)
   CARBON STEEL A307
   STAINLESS STEEL A193
   GALVANIZED STEEL A153
4. ALL ITEMS TO BE EMBEDDED IN CONCRETE SHALL BE CLEAN AND FREE OF OIL, DIRT AND PAINT.
5. NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS. NO CUTTING OR BURNING OF STRUCTURAL STEEL WILL BE PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER.

STRUCTURAL OBSERVATION

1. ALL STRUCTURAL OBSERVATION SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2007 CALIFORNIA BUILDING CODE SECTION 1709.
2. OBSERVATION INDICATED SHALL BE CONDUCTED BY THE STRUCTURAL OBSERVER (ENGINEER OF RECORD OR HIS DESIGNATED REPRESENTATIVE). PROVIDE MINIMUM 2 WORKING DAYS NOTICE TO THE STRUCTURAL OBSERVER PRIOR TO THE DATE OF THE REQUIRED OBSERVATION.
3. THE STRUCTURAL OBSERVER SHALL SUBMIT TO THE LOCAL BUILDING DEPARTMENT A WRITTEN REPORT DETAILING ALL PORTIONS OF WORK OBSERVED AND SHALL IDENTIFY ANY DEFICIENT PORTIONS OF WORK, THAT TO THE BEST OF THE STRUCTURAL OBSERVERS KNOWLEDGE, HAVE NOT BEEN RESOLVED. THE REPORT REQUIRED TO DOCUMENT STRUCTURAL OBSERVATION SHALL REFERENCE ALL PERTINENT DRAWING NUMBERS, BUILDING GRIDS, DETAIL NUMBERS, AND SPECIFICATION SECTIONS.

PREFABRICATED OPEN WEB METAL JOISTS

1. JOISTS SHALL BE DESIGNED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE AISC AND THE STEEL JOISTS INSTITUTE. DESIGN OPEN WEB STEEL JOISTS FOR THE LOADS AS INDICATED ON THE PLANS.
2. CONTRACTOR TO VERIFY AND COORDINATE EQUIPMENT WEIGHTS, LOCATIONS, AND ATTACHMENT REQUIREMENTS AND PROVIDE TO JOISTS MANUFACTURER. EQUIPMENT SUPPLIER SHALL BE RESPONSIBLE FOR THE DESIGN OF THE VERTICAL AND LATERAL SUPPORT OF THEIR EQUIPMENT. JOIST MANUFACTURER SHALL PROVIDE ADDITIONAL DIAGONAL WEB MEMBERS AT CONCENTRATED LOAD LOCATIONS.
3. WIND ANALYSIS FOR THE JOISTS SHALL USE THE PROVISIONS OF THE 2007 CALIFORNIA BUILDING CODE FOR ELEMENTS AND COMPONENTS.
4. JOIST SIZES AND CHORD SIZES INDICATED ON THE PLANS ARE MINIMUM ONLY. DESIGN BY THE JOIST MANUFACTURER MAY RESULT IN A LARGER SIZE. JOISTS SHALL HAVE DOUBLE ANGLE CHORDS.
5. PROVIDE CALCULATIONS, PRODUCT DATA, MATERIAL PROPERTIES, CONNECTION DETAILS, ECT FOR ALL TYPES OF JOISTS. CALCULATIONS SHALL BE STAMPED AND DESIGNED BY LICENSED CIVIL OR STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA.
6. JOIST BRIDGING, BOTTOM CHORD BRACING, AND OTHER ACCESSORIES SHALL BE PER THE MANUFACTURER'S STANDARDS AND AS INDICATED ON THE SHOP DRAWINGS.
7. JOIST SHALL BE CAMBERED FOR DEAD LOAD. PROVIDE STANDARD S.J.I. CAMBER. JOIST CAMBER SHALL BE SHOWN ON SHOP DRAWINGS.

STEEL DECK

1. FOR DECK SIZE AND GAUGE SEE ROOF FRAMING PLANS.
2. WELDING SHALL BE IN ACCORDANCE WITH AWS S1.3 "STRUCTURAL WELDING CODE - SHEET STEEL".
3. DECKING SHALL HAVE A MINIMUM 1 1/2 INCHES BEARING ON ALL SUPPORTS.
4. DECKING SHALL BE CONTINUOUS OVER THREE SPANS MINIMUM.

REGISTERED PROFESSIONAL ENGINEER THOMAS E. PETTYJOHN No. C65724 Exp. 09-30-11 CIVIL STATE OF CALIFORNIA

DATE: 10/05/09

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

EASTERN MUNICIPAL WATER DISTRICT
PERRIS II DESALINATION FACILITY
PERRIS, CALIFORNIA

STRUCTURAL NOTES

DESIGNED BY: T PAGE
DRAWN BY: A VARGAS
CHECKED BY: M GOODSON

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

CADD FILE NAME: PDFg010d.dgn

CH2MHILL

SUBMITTED BY: ART JUNG, P.E. CHIEF, DESIGN BRANCH

SPEC. NO.: NOT APPLICABLE

L.A. DISTRICT FILE NO. XXX-XXXX

G-10

SHEET 10 OF 226 SHEETS

NDM-SCO:EMWD USACE PERRIS II/ PDFg010d.dgn PLOT DATE: 2/19/2010 PLOT TIME:10:52:42 AM