

GENERAL FOUNDATION NOTES:

- CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO STARTING WORK. DISCREPANCIES IN THE DIMENSIONS OR SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER BEFORE PROCEEDING WITH THE WORK.
- ALL CONSTRUCTION SHALL CONFORM TO THE FOLLOWING:
CONCRETE: ACI 318-2000 (EXCEPT TRENCH REQUIREMENTS SEE #27)
AGGREGATE: C-33
STRUCTURAL STEEL: AISC 9th EDITION
CEMENT: ASTM C-150
REINFORCING STEEL: ASTM A-615 (WITH MODIFICATIONS AS NOTED)
- CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4,000 psi (27.5 MPa) AT 28 DAYS. USE A MIN. SIX (6.0) SACK MIX WITH A MAX. WATER CEMENT RATIO OF 0.50 (APPROXIMATELY) PER CUBIC YARD (7.8 SACKS/M³, 335 kg/M³). WATER REDUCER, AIR ENTRAINMENT AND PLASTICIZERS ARE ACCEPTABLE. FLY ASH IS NOT ACCEPTABLE.
- CEMENT SHALL BE TYPE II PORTLAND CEMENT IN ACCORDANCE WITH ASTM C-150. CEMENT SELECTION SHALL BE DETERMINED BY CONCENTRATIONS OF SOL BORME SALTS PRESENTED BY THE SOILS REPORT.
- ALL CONCRETE SHALL BE PLACED IN ACCORDANCE WITH ACI 318-2000 CHAPTER 5. ALL CONCRETE FROM 1' ABOVE EMBEDMENT RING TO TOP OF FOUNDATION SHALL BE VIBRATED WITH MINIMUM 2" (50 MM) VIBRATORS IN GOOD WORKING ORDER.
- ALL CONCRETE SHALL BE PROTECTED FROM FREEZING FOR A MINIMUM OF 7 DAYS AFTER PLACEMENT.
- THE CONCRETE MIX DESIGN SHALL BE APPROVED BY THE ENGINEER.
- NO CONCRETE SHALL BE PLACED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER OR HIS REPRESENTATIVE. THE APPROVAL SHALL CONSIST OF A WRITTEN FORM INDICATING THAT ALL DIMENSIONS AND REINFORCING STEEL ARE IN SUBSTANTIAL CONFORMANCE WITH THE PLANS. THE ENGINEER'S REPRESENTATIVE SHALL BE PRESENT DURING PLACEMENT OF THE CONCRETE.
- REINFORCEMENT SHALL BE SUPPORTED TO OBTAIN BAR PLACEMENT AND SPACING AS INDICATED ON THE PLANS. SEE ACI MANUAL OF CONCRETE PRACTICE PART 3. SPICE REBAR ONLY AS SHOWN ON THE PLANS.
- THE LOCATION OF ANY CONSTRUCTION JOINTS SHALL BE APPROVED BY THE ENGINEER.
- MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE 3" (75 MM) FOR CONCRETE PLACED IN DIRECT CONTACT WITH EARTH, AND 2" (50 MM) FOR CONCRETE EXPOSED TO THE ELEMENTS AND 3" (75 MM) FROM INNER OR OUTER CMP.
- FOR CONDUIT AND GROUNDING SYSTEM LOCATION AND ORIENTATION SEE CONDUIT SCHEDULE SHEET 5 OF THESE PLANS IF AVAILABLE OR ELECTRICAL ENGINEERS PLANS. IF DIFFERENT ELECTRICAL ENGINEERS PLANS SHALL SUPERSEDE.
- TRENCHES FOR GROUNDING AND SECONDARY ELECTRICAL CONDUIT SHALL BE 1 SACK SAND CEMENT SLURRY BACKFILL.
- ALL MISCELLANEOUS METAL WORK SHALL BE A-36. FLAME CUT IS O.K. IF APPROVED BY THE ENGINEER.
- THIS PLAN NOT VALID WITHOUT AN ACCOMPANYING SOILS REPORT APPROVED BY THE ENGINEER.
- ALL EXTERIOR BACKFILL TO BE COMPACTED TO 90% RELATIVE COMPACTION OUTSIDE OF SLURRY AND SHALL CONSIST OF CLEAN GRANULAR MATERIAL. INTERIOR FOUNDATION BACKFILL TO BE UNCOMPACTED. REMOVE ROCKS IN EXCESS OF 2 FT. (0.6 M) IN DIAMETER FROM INTERIOR BACKFILL. COMPACTION TESTING AS APPROVED BY THE ENGINEER, SHALL BE PERFORMED BY AN ACCEPTABLE GEOTECHNICAL FIRM. THE COST OF COMPACTION TESTING SHALL BE PAID FOR BY THE CONTRACTOR/OWNER.
- POSITIVE DRAINAGE SHALL BE PROVIDED AWAY FROM FOUNDATIONS AT A MIN. 5% SLOPE IN ALL DIRECTIONS FOR AT LEAST 10 FEET. NO PONDING OF WATER ALLOWED ON TURBINE BUILDING PAD.
- NO WELDING OF REINFORCEMENT STEEL OR ANCHOR BOLTS, UNLESS APPROVED BY THE ENGINEER.
- EXCAVATION SHALL BE CLEAN AND FREE FROM LOOSE MATERIAL PRIOR TO PLACEMENT OF STEEL. LOOSE MATERIAL SHALL BE REMOVED AND/OR CONSOLIDATED FOR ENGINEER OR HIS REPRESENTATIVES APPROVAL.
- ROCK CAVITIES UNDETECTED BY ON SITE GEOTECHNICAL / GEOPHYSICAL INVESTIGATION ARE NOT CONSIDERED BY THIS FOUNDATION DESIGN.
- ONLY APPROVED PLANS MET STAMPED BY THE ENGINEER AND AGENCY APPROVALS SHALL BE USED FOR CONSTRUCTION. THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF THE MOST RECENT APPROVED PLANS, ADDENDA AND REVISIONS ON SITE FOR CONSTRUCTION.
- GROUT SHALL BE SILKAGROUT 212 NON-SHINK CEMENTIOUS OR EQUAL THAT MEETS THE CORPS OF ENGINEER'S SECTION ORD C-621. GROUT SHALL BE UTILIZED TO FILL AIR VOIDS IN CONCRETE AS MAY OCCUR IMMEDIATELY UNDER TEMPLATE. (GROUTING BY TOWER INSTALLER)
COMPRESSIVE STRENGTH psi (ORD C-621):

	PLASTIC	FLOWABLE	FLUID
1 DAY	4,500 (31 MPa)	4,100 (28.3 MPa)	2,700 (18.6 MPa)
3 DAY	4,600 (31.7 MPa)	4,300 (29.7 MPa)	4,000 (27.6 MPa)
14 DAY	7,100 (49.1 MPa)	6,300 (43.4 MPa)	6,600 (45.5 MPa)
28 DAY	8,900 (61.4 MPa)	8,100 (55.8 MPa)	7,200 (49.6 MPa)
- HORN (NON-CORROSIVE, NON-SHINK GROUT), DAYTON SUPERIOR (SURE-GRP HIGH PERFORMANCE GROUT), MASTER BUILDERS (MASTER FLOW 928 GROUT) ARE APPROVED EQUALS.
- ANCHOR BOLTS SHALL BE A-449 OR APPROVED EQUAL. REBAR SHALL BE GRADE 60 DEFORMED BARS OR APPROVED EQUAL. ALL THREAD BOLTS MANUFACTURED BY DYWIDAG SYSTEMS, INC. OR WILLIAMS FORM ENGINEERING ARE ACCEPTABLE ALTERNATIVE BOLTS WITH ENGINEERING APPROVAL. ONE PERCENT (1%) EXTRA BOLTS, NUTS, AND WASHERS SHALL BE SUPPLIED.
- CONCRETE SHALL BE PLACED PER ENGINEER'S DIRECTION OR HIS REPRESENTATIVE. IN ACCORDANCE WITH #5 ABOVE.
- ANCHOR BOLTS SHALL BE TENSIONED IN ACCORDANCE WITH THE BOLT TENSIONING SEQUENCE SHEET S-3 OR AS DIRECTED BY THE ENGINEER.
- CONCRETE CURING COMPOUND SHALL CONFORM TO ACI 308-4.2.3.1. THE CONCRETE CURING COMPOUND SHALL BE APPLIED IN TWO COATS. CONTRACTOR SHALL PROVIDE THE ENGINEER A COPY OF THE MANUFACTURER'S INSTRUCTIONS.
- TREMBLE TUBE SHALL DIRECT CONCRETE BETWEEN CMP'S.
- MATERIAL QUANTITIES ARE FOR BID PURPOSES ONLY. THE CONTRACTOR SHALL DETERMINE CONSTRUCTION QUANTITIES.

SPECIAL INSPECTION NOTES:

- THE ENGINEER OR HIS REPRESENTATIVE SHALL VERIFY THAT THE SOIL CONDITIONS MEET THE MINIMUM REQUIREMENT. ADJUSTMENTS FOR ROCK OR GROUNDWATER, IF ENCOUNTERED, MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.
- CONCRETE SHALL BE BROUGHT UP UNIFORMLY AND VIBRATED IN ACCORDANCE WITH NOTE 5 OF GENERAL FOUNDATION NOTES WITH EXCEPTION OF THE BOTTOM 5' OF THE FOUNDATION WHERE CONCRETE SLUMPS UP TO 7 INCHES ARE ALLOWED. CONCRETE SLUMP TESTS AND CONCRETE COMPRESSION TEST SAMPLES SHALL BE OCCASIONALLY TAKEN BY THE FOUNDATION QA/QC INSPECTOR FROM CONCRETE POURS IN THE BOTTOM FIVE (5) FEET OF THE FOUNDATION AT THE INSPECTOR'S OPTION FOR STRENGTH COMPARISON WITH LOWER SLUMP CONCRETE POURS. SLUMPS GREATER THAN SPECIFIED SHALL BE CAUSE FOR CONCRETE REJECTION. MAXIMUM TIME IN TRUCK IS 90 MINUTES OR 300 REVOLUTION. DRUM SHALL BE TURNED A MINIMUM OF 30 REVOLUTIONS AFTER ADDING WATER.
- A MINIMUM OF FOUR CONCRETE TEST CYLINDERS SHALL BE TAKEN BY THE ENGINEER'S REPRESENTATIVE FOR EACH COMPLETE FOUNDATION. ADDITIONAL CYLINDERS SHALL BE AT THE OWNERS EXPENSE.
- CERTIFICATION OF BOLT STRENGTHS AND REINFORCEMENT GRADE ALONG WITH MILL CERTIFICATIONS AND HEAT NUMBERS SHALL BE PROVIDED BY THE CONTRACTOR FOR ALL STEEL.
- SAMPLES FOR MATERIAL TESTS SHALL BE PROVIDED TO THE ENGINEER UPON REQUEST AT NO ADDITIONAL COST TO THE OWNER.
- ALL FRAMEWORK AND BOLT TEMPLATES SHALL BE DESIGNED TO HOLD THE FOUNDATION COMPONENTS RIGIDLY IN PLACE DURING PLACEMENT OF CONCRETE OR DURING TRANSPORTATION OF THE BOLT ASSEMBLY FROM FABRICATION YARD TO THE EXCAVATION.
- DEVIATIONS FROM THE PLAN REQUIRE WRITTEN APPROVAL BY THE ENGINEER. PROPOSED CHANGES SHALL BE SHOWN ON SHOP DRAWINGS PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
- A FINAL REPORT SHALL BE SUBMITTED BY THE ENGINEER PRESENTING ALL TEST RESULTS, FOUNDATION CHECKLISTS, FIELD REPORTS, AND ANY SUBSTANTIAL DEVIATIONS FROM THE PLAN. THE FOUNDATION CHECKLIST SHALL BE KEPT FOR EACH FOUNDATION BY THE ENGINEER'S REPRESENTATIVE.
- BOLTS SHALL HAVE SHAFT LIMITS (CLASS LC) OF 0.004 INCH (0.10 MM) AND HOLES SHALL HAVE LIMITS (CLASS LC) OF 0.005 INCH (0.125 MM) IN ACCORDANCE WITH AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
- THE CONTRACTOR, OWNER, AND ENGINEER OR HIS REPRESENTATIVE MAY MEET PRIOR TO CONSTRUCTION FOR A PRE CONSTRUCTION CONFERENCE.
(a) THE PLANS SHALL BE REVIEWED AND AN ITEMIZED CHECK LIST KEPT ALONG WITH COMMENTS NOTED.
(b) THE SPECIFICATIONS SHALL BE REVIEWED IN DETAIL.
(c) THE CONTRACTOR SHALL PRESENT HIS CONSTRUCTION METHODS AND PROCEDURES ALONG WITH A CRITICAL PATH CONSTRUCTION SCHEDULE.
- SLURRY TEST RESULTS (BEFORE CONSTRUCTION BEGINS) FOR FOR 3 SACK SLURRY SHALL BE PROVIDED. RANDOM TEST FOR 3 SACK SLURRY APPROXIMATELY EVERY FIFTH FOUNDATION.
- TURBINE PAD GRADING MEETS ALL SPECIFICATIONS.

MATERIALS BY SUPPLIERS:

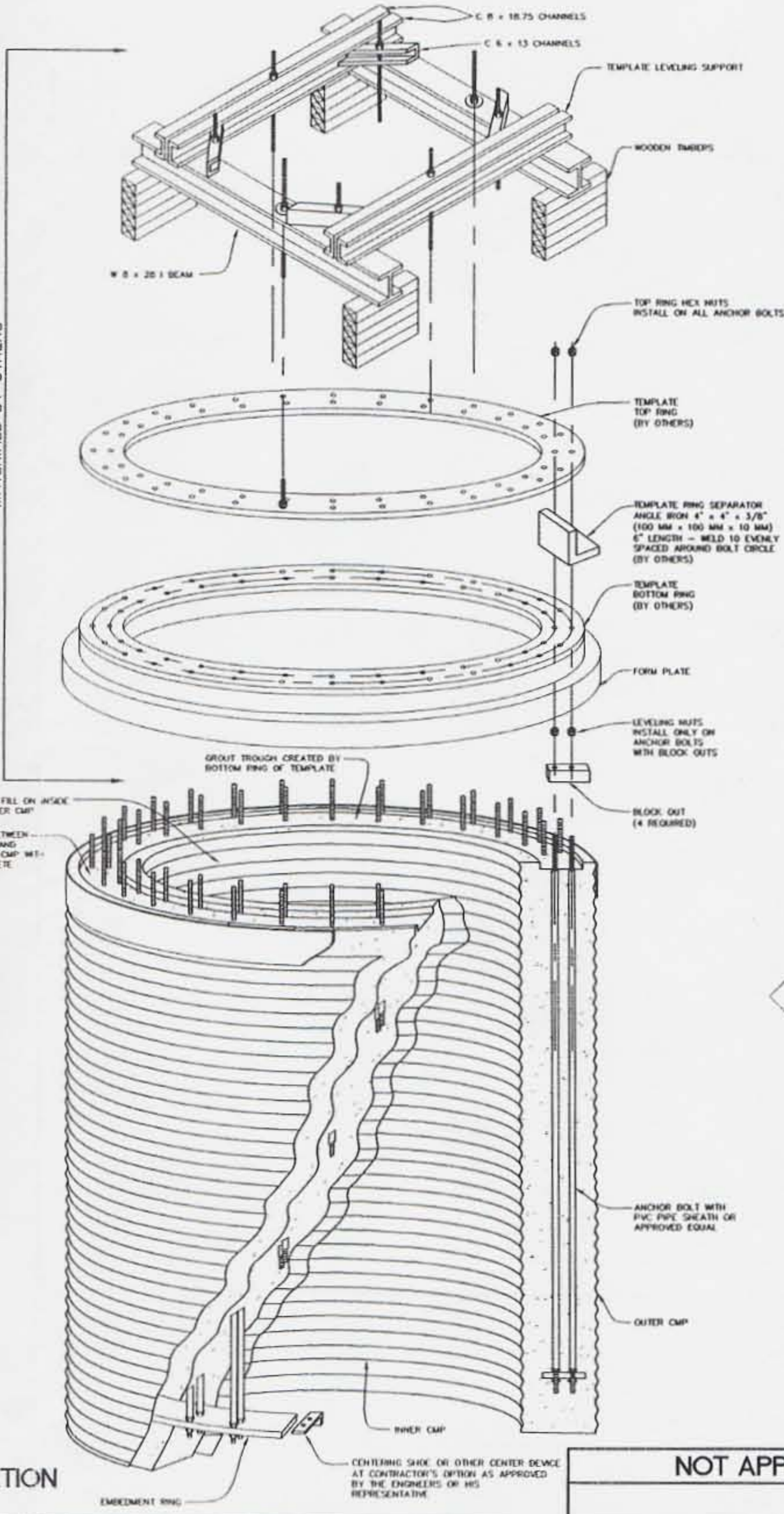
- ANCHOR BOLTS TO BE PACKAGED INTO GROUPS OF 30 OR AT CONTRACTOR'S OPTION.
- ANCHOR BOLTS TO BE FITTED WITH A PVC SLEEVES 20" SHORTER THAN THE BOLT LENGTH.
- EMBEDMENT RINGS (MAY BE) SPUNCE TO FACILITATE SHIPPING IN SEGMENTS AND RAPID FIELD ASSEMBLY INTO CONTINUOUS RING FOR PLACEMENT INSIDE OUTER CMP. FOUR CENTERING SHOES SHALL BE FABRICATED AND PACKAGED FOR EACH EMBEDMENT RING AT CONTRACTOR'S OPTION (THE FABRICATOR SHALL CONTACT THE CONTRACTOR TO VERIFY NEED FOR CENTERING SHOES). A SHOP DRAWING OF SPLICE PLATE SHALL BE PROVIDED TO THE ENGINEER BY SUPPLIER FOR APPROVAL IF THE SPLICE PLATE PROPOSED DOES NOT CONFORM TO DETAIL 6 SHEET S-4 OF THESE PLANS.
- THE OUTER & INNER CMP SHALL CONTAIN 4 - 2 INCH (50 MM) HOLES WITHIN 4 INCHES OF THE TOP TO FACILITATE PLUMB LIFTING. THESE HOLES SHALL FORM A LEVEL PLANE PERPENDICULAR TO THE SIDES OF THE CMP. THE TOP & BOTTOM OF THE CMP SHALL BE CUT TO FORM A PLANE NOT VARYING MORE THAN 2 INCHES (50 MM) MORE OR LESS FROM LEVEL. THE LENGTH OF THE CMP SHALL NOT VARY MORE THAN 3 INCHES (75 MM) MORE OR LESS FROM THE LENGTH SPECIFIED BY THESE PLANS.
- BOLT HOLE TOLERANCES FOR THE TEMPLATE AND EMBEDMENT RINGS FROM SPECIFIED DIMENSIONS SHOWN ON THESE PLANS.
(a) BOLT HOLE DIAMETERS WITHIN 1/16 INCH (1.6 MM) MORE OR LESS. LENGTH WITHIN 1 INCH
(b) SPACING BETWEEN BOLT HOLES 1/32 INCH (0.8 MM) - MORE OR LESS - 1/16 INCH MORE OR LESS ACCUMULATIVE.
(c) RINGS SHALL NOT VARY MORE THAN 1/4 INCH (6 MM) OUT OF LEVEL.
- RING THICKNESS SHALL NOT VARY MORE THAN 1/32 INCH (0.8 MM).
- STYROFOAM BLOCKOUTS TO BE PACKAGED INTO 4 PER TOWER AND CUT INTO HALVES ALONG LENGTH. REFER TO DETAIL 8 SHEET S-4 OF THESE PLANS.
- EXPOSED THREADS ABOVE BASE PLATE SHALL BE COVERED WITH A CAP OR EQUAL AS APPROVED BY THE ENGINEER. PLASTIC CAPS SHALL BE PACKED WITH GREASE. (BY TOWER INSTALLER)
- ONE NUT SHALL BE THREADED TO THE TOP OF THE BOTTOM THREADS OF THE ANCHOR BOLT 6 INCHES ABOVE THE BOTTOM OF THE BOLT. THE NUT FOR THE TOP OF THE BOLT SHALL BE THREADED TO EXPOSE APPROXIMATELY 1 INCH OF THREADS EXTENDING ABOVE NUT. NUTS TOP AND BOTTOM OF EACH BOLT WILL PREVENT THE PVC SLEEVE FROM SLIDING OFF OF BOLT. THE REMAINING NUT FOR EACH ANCHOR BOLT SHALL BE PACKAGED IN SEPARATE CONTAINERS (KEGS) LABELED "HEAVY HEX NUTS" AND THE NUMBER OF NUTS CONTAINED. ONE PERCENT (1%) EXTRA NUTS SHALL BE SUPPLIED.
- WASHERS SHALL BE HARDENED STEEL WASHERS. ONE PERCENT (1%) EXTRA WASHERS SHALL BE SUPPLIED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING IN PLACE THE EMBEDMENT RING TO PREVENT MOVEMENT DURING CONCRETE POUR. THE CONTRACTOR MAY USE THE CENTERING SHOES, DOBBIES, OR EVEN ROCKS IF THE CONTRACTOR DEMONSTRATES TO THE SATISFACTION OF THE QA/QC INSPECTOR THE CONTRACTOR'S METHOD IS WORKABLE.

NOTES FOR CORRUGATED METAL PIPE

CORRUGATED METAL PIPE (CMP) USED FOR CANS SHALL MEET ASTM A929 (YS=33 KSI) OR ASTM A444 (YS= 50 KSI) SPECIFICATION. CMP TO BE GALVANIZED FOR CORROSION PROTECTION.
CMP INNER CAN TO BE 10' DIAMETER AND 12 GAUGE MATERIAL WITH CORRUGATIONS A 3 X 1.
CMP OUTER CAN TO BE 14' DIAMETER AND 12 GAUGE MATERIAL WITH CORRUGATION AT 3 X 1.
CORRUGATED METAL PIPE SHALL BE HELICAL INTERLOCKING SEAM (AASHTO DESIGNATION: T 740-90)

CONVERSIONS	
ENGLISH TO METRIC	
1000 PSI	= 6.9 MPa
1" (INCH)	= 25.4 MM
1' (FOOT)	= 0.305 M

MATERIALS BY OTHERS



30' FOUNDATION

CONSTRUCTION SEQUENCE:

- EXCAVATE FOUNDATION HOLE BY TRACK EXCAVATOR OR DRILL RIG. EXCAVATED HOLE MUST BE A MINIMUM OF 12" LARGER IN DIAMETER THAN THE OUTER CMP DIAMETER. EXCAVATED HOLE SHALL BE COVERED OR CIRCLED BY FENCING TO PREVENT UNAUTHORIZED ENTRANCE.
- PLACE, PLUMB, AND SECURE OUTER CMP INTO FOUNDATION EXCAVATION.
- A) PLACE GROUNDING WIRE OUTSIDE CMP AS REQUIRED.
B) SLURRY ANNULAR SPACE BETWEEN FOUNDATION EXCAVATION HOLE AND EXTERIOR OUTER CMP.
C) CUT HOLES FOR CONDUITS AND PLACE CONDUIT AS REQUIRED TO CONFORM TO CONSTRUCTION METHODOLOGY EMPLOYED BY THE CONTRACTOR.
- SET TOP FORM PLATE.
- POSITION BOTTOM EMBEDMENT RING INSIDE OUTER CMP.
- LOWER AND STAND A PACKAGED GROUP OF ANCHOR BOLTS IN EACH QUADRANT INSIDE THE OUTER CMP.
- LOAD TEMPLATE AND EMBEDMENT RING WITH BOLTS. SECURE WITH NUTS, CENTER BOLTS AND RING. LIFT TEMPLATE, PLACE AND THE REBAR WRAP. THE FOUR (4) REBAR HOOP WRAPS AROUND EACH OUTER ANCHOR BOLT AT EQUALLY SPACED VERTICAL INTERVALS AS SHOWN ON SHEET S-3 AT MAXIMUM 6\"/>

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PATRICK & HENDERSON INC.
CIVIL & GEOTECHNICAL ENGINEERING
1965 AIRPORT DRIVE
BAKERSFIELD, CALIFORNIA 93308
(861) 391-9854
FAX: (861) 391-9926

Consulting Engineers
Foundation & Structural Engineering
Land Planning
Land Surveying
Soils Testing

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