

*FOUNDATION DEPTH BASED ON SOIL CONDITIONS PROVIDED ARE SUBJECT TO REVIEW AND MODIFICATION OF DEPTH ON SITE OR IF ADDITIONAL SOIL INFORMATION IS PROVIDED

- NOTE:**
1. TURBINES SHALL NOT BE CONSTRUCTED IN DEPRESSIONS OR NATURAL STORM RUNOFF CHANNELS.
 2. OFF TURBINE PAD STORM RUNOFF WATERS SHALL BE DIRECTED AWAY FROM THE TURBINE PAD.
 3. ELECTRICAL TRENCHES SHALL NOT CHANNEL OR PIPE STORM RUNOFF WATERS TO TRANSFORMER OR TURBINE FOUNDATIONS.
 4. IF ANCHOR BOLTS ARE MORE THAN 2 FEET SHORTER THAN THE DEPTH OF FOUNDATION, THE INSIDE OF THE INNER CMP SHALL BE FILLED WITH CONCRETE TO A MINIMUM 1 FOOT ABOVE THE BOTTOM OF THE ANCHOR BOLT.
 5. OUTER CMP IS OPTIONAL.

NOTE:
FINAL FOUNDATION SIZE SUBJECT TO VERIFICATION OF SOIL / ROCK CONDITIONS EXPOSED BY FOUNDATION EXCAVATION

CONFIDENTIALITY STATEMENT

The above drawings and calculations and ideas, designs, and arrangements represented thereby are and shall remain the property of Patrick & Henderson, Inc. and no part thereof shall be copied, discussed to others, or used in connection with any work or project other than the specific project for which they have been prepared and developed without the written consent of Patrick & Henderson, Inc. Visual contact with these drawings or specifications shall constitute conclusive evidence of acceptance of these restrictions.

RESPONSIBILITY STATEMENT

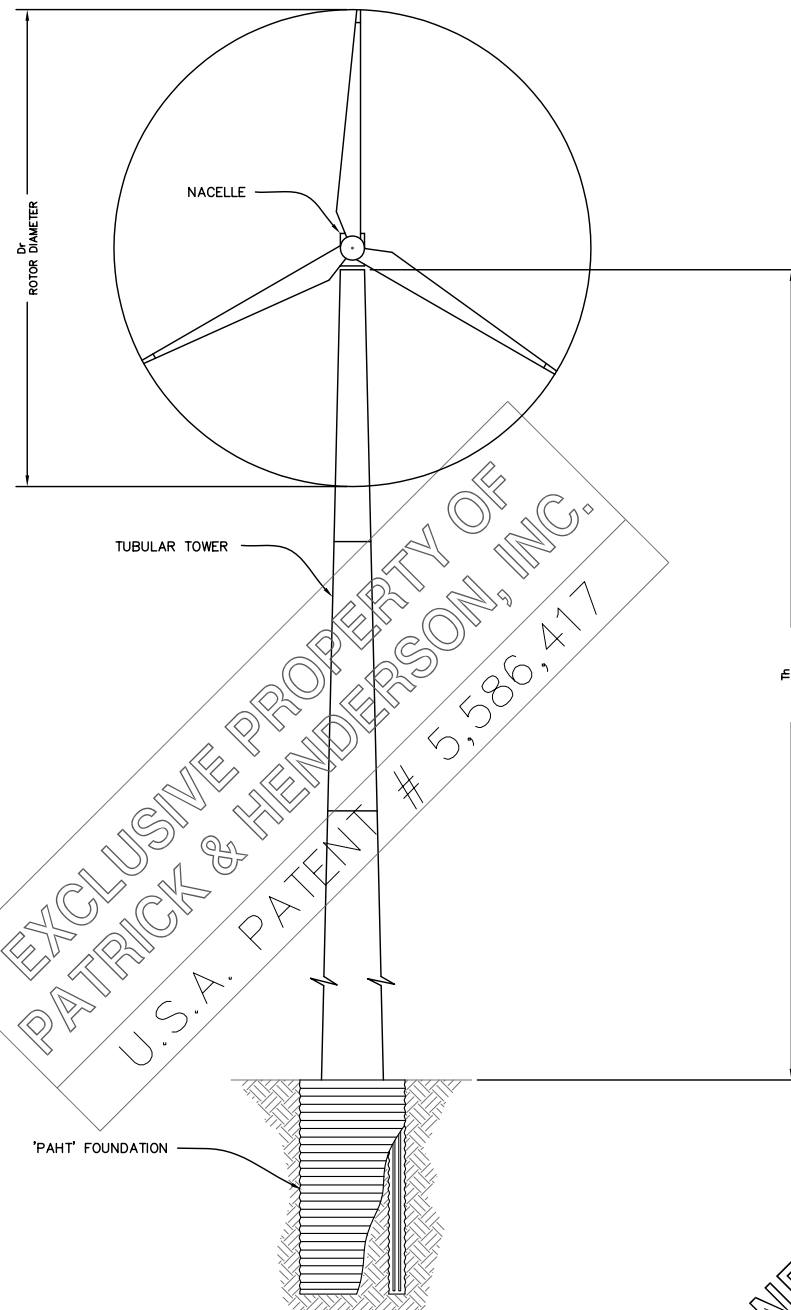
Contractors shall verify and be responsible for all dimensions and conditions on the job and this office must be notified of any variations from the dimensions and conditions shown by these drawings. Shop details must be submitted to this office for approval before proceeding with fabrication.

Construction contractor agrees that in accordance with generally accepted construction practices, construction contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety of all persons and property; that this requirement shall be made to apply continuously and not be limited to normal working hours, and construction contractor further agrees to defend, indemnify and hold design professional harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting liability arising from the sole negligence of design professional.

18 FT FOUNDATION CHART	
FOUNDATION REFERENCE NUMBER	
SCHOOL-1	
TOTAL OF 1	

NOMINAL DIMENSIONS			
MARK	VALUE (M)	VALUE (FT)	DESCRIPTION
Dr	15.0	49.2	DIAMETER OF ROTOR
Th	22.5	74.0	TOWER HEIGHT

DESIGN CRITERIA	
WIND	
EXTREME WIND LOADING PROVIDED BY TOWER AND TURBINE MANUFACTURE:	
F _z (VERTICAL LOAD) =	14,900 LBS
F _x (HORIZONTAL LOAD) =	18,078 LBS
M (MAXIMUM MOMENT) =	1,284,000
SEISMIC (DOES NOT GOVERN)	
2003 INTERNATIONAL BUILDING CODE	

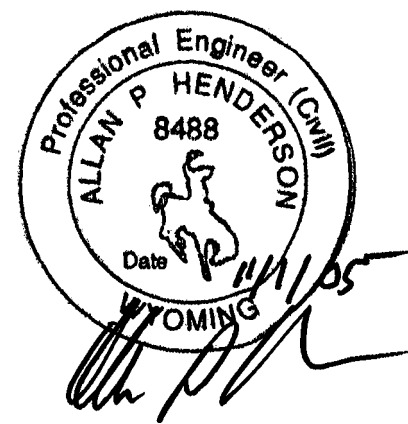


DRAWING INDEX		
FOUNDATION SIZE-SHEET NUMBER	DRAWING TITLE	REVISION #
18-S-1	TITLE SHEET & DRAWING INDEX	0
18-S-2	ASSEMBLY VIEW	0
18-S-3	FOUNDATION PLAN & SECTION	0
18-S-1	EMBEDMENT & TEMPLATE RING FABRICATION DETAILS	0

'PAHT' FOUNDATION FOR WIND TURBINE
 SCALE: NONE
 NORTANK 65 KW
 WIND TURBINE GENERATOR
 ON A
 74 FT TOWER

CONFIDENTIAL

APPROVED FOR CONSTRUCTION
 PATRICK AND HENDERSON, INC.
 ALLAN P. HENDERSON
 WYOMING #8488
 EXP. 12/31/05
 DATE 11/05



PROPRIETARY WARNING

SEE THE CONFIDENTIALITY STATEMENT. THIS DESIGN AND THESE DRAWINGS ARE CONFIDENTIAL AND PROPRIETARY. IF YOU DO NOT HAVE A SET ASSIGNED AND NUMBERED SPECIFICALLY TO YOU, RETURN THESE IMMEDIATELY TO PATRICK & HENDERSON, INC.

THIS SET NO. _____ ASSIGNED TO: _____

ALLAN P. HENDERSON
 WYOMING #8488
 EXP. 12/31/05
 DATE

ISSUED FOR CONSTRUCTION 11/01/02
18' FOUNDATION
SOIL / CLAYSTONE

APPROVED FOR CONSTRUCTION
TITLE SHEET & DRAWING INDEX

DESCRIPTION:
 18' P&H TENSIONLESS FOUNDATION USA PATENT #5,586,417
 1 - 65 KW ON A 74 FT TOWER FOUNDATION PLAN
 FOR
 LARAMIE COUNTY COMMUNITY COLLEGE
 LARAMIE, WYOMING

REV: 0
 COPYRIGHT © 2005.
 BY
 PATRICK & HENDERSON, INC.
 FOUNDATION SIZE-SHEET NO.:
18-S-1
 4 SHEETS
 JOB NO.: 05-066

CONFIDENTIAL

PATRICK AND HENDERSON, INC. PLOTTED ON 11/01/05 ISSUED

PATRICK & HENDERSON INC.
 CIVIL & GEOTECHNICAL ENGINEERING

1965 AIRPORT DRIVE
 BAKERSFIELD, CALIFORNIA 93308
 (661) 391-9854
 FAX: (661) 391-9926

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

DATE	REVISION DESCRIPTION	DATE	REV #	BY	PREPARED FOR
11/01/05	AS SHOWN			JK	LARAMIE COUNTY COMMUNITY COLLEGE 1400 EAST COLLEGE DRIVE CHEYENNE, WY 82007

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 318-95 (EXCEPT TREMMIE REQUIREMENTS SEE #26)
 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 SIX (6.0) SACK MIX WITH A WATER CEMENT RATIO OF 0.50 (APPROXIMATELY) PER CUBIC YARD. (7.8 SACKS/M³, 335 Kg/M³). WATER REDUCERS 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 SOIL BORNE SALTS PRESENTED BY THE SOILS REPORT.
- ALL CONCRETE SHALL BE PLACED IN ACCORDANCE WITH ACI 318-95 CHAPTER 5. ALL CONCRETE FORM 1" ABOVE EMBEDMENT RING TO TOP OF FOUNDATION SHALL BE VIBRATED WITH MINIMUM 2.5" (64 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. SPLICE 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.
- TRENCHES FOR GROUNDING AND SECONDARY ELECTRICAL CONDUIT SHALL BE 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.
- 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.
- ROCK CAVITIES UNDETECTED BY ON SITE GEOTECHNICAL / GEOPHYSICAL INVESTIGATION ARE NOT CONSIDERED BY THIS FOUNDATION DESIGN.
- ONLY APPROVED PLANS WET 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-SHRINK CEMENTIOUS OR EQUAL THAT MEETS THE CORPS OF ENGINEER'S SECTION CRD 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 (CRD C-621):	PLASTIC			FLOWABLE			FLUID					
	1 DAY	3 DAY	14 DAY	28 DAY	1 DAY	3 DAY	14 DAY	28 DAY	1 DAY	3 DAY	14 DAY	28 DAY
	4,500 (31 MPa)	4,600 (31.7 MPa)	7,100 (49.1 MPa)	8,900 (61.4 MPa)	4,100 (28.3 MPa)	4,300 (29.7 MPa)	6,300 (43.4 MPa)	8,100 (55.8 MPa)	2,700 (18.6 MPa)	4,000 (27.6 MPa)	6,600 (45.5 MPa)	7,200 (49.6 MPa)

HORN (NON-CORROSIVE, NON-SHRINK GROUT), DAYTON SUPERIOR (SURE-GRIP 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 DYMIDAG 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.
- 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.
- TREMMIE TUBE SHALL DIRECT CONCRETE BETWEEN CMP'S.
- MATERIAL QUANTITIES ARE FOR BID PURPOSES ONLY THE CONTRACTOR SHALL DETERMINE CONSTRUCTION QUANTITIES.

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

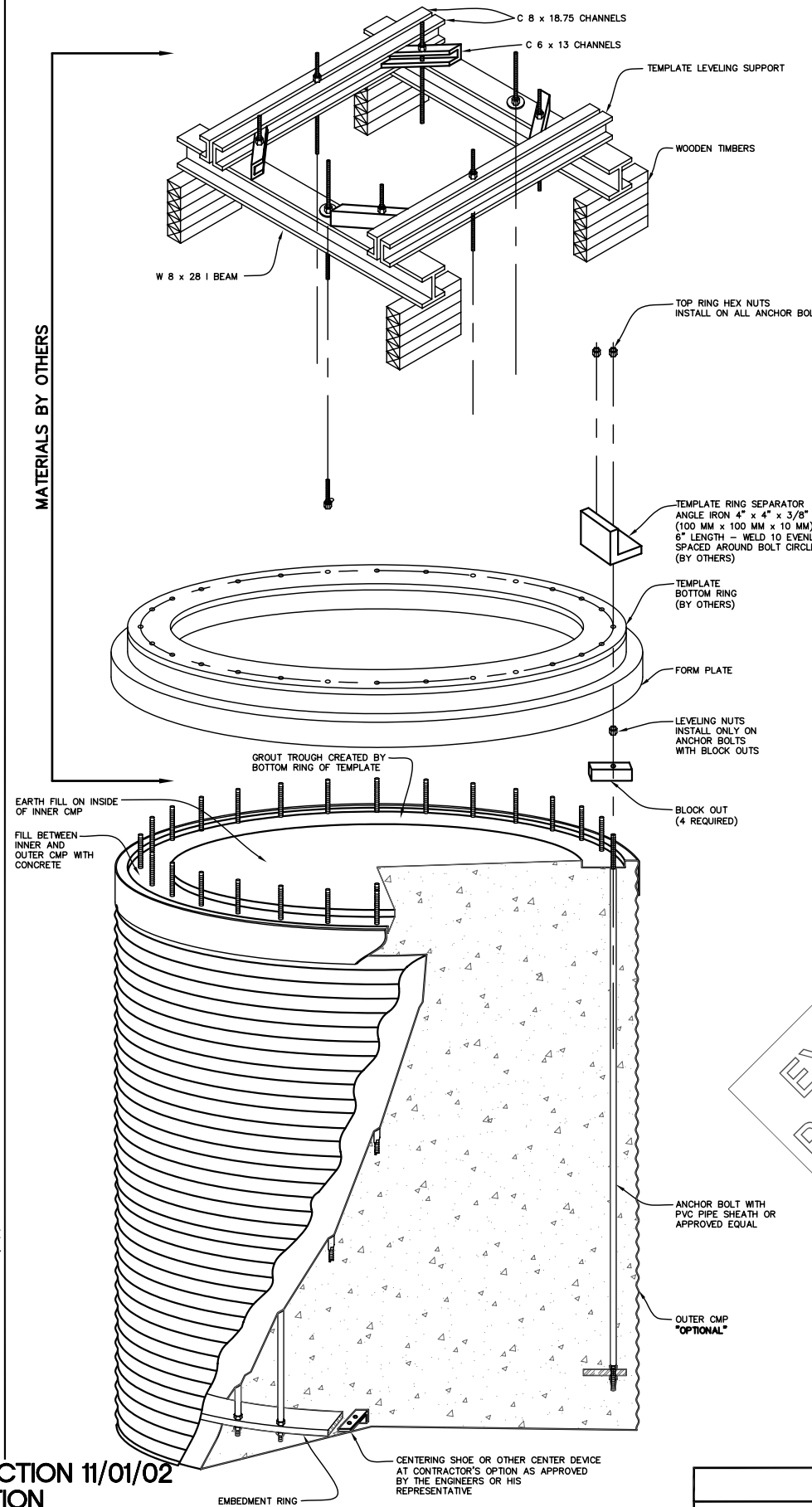
SPECIAL INSPECTION NOTES:

- 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 INSPECTORS 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.
- CERTIFICATION OF BOLT STRENGTHS AND REINFORCEMENT GRADE ALONG WITH MILL CERTIFICATIONS AND HEAT NUMBERS SHALL BE PROVIDED BY THE CONTRACTOR FOR THE ENGINEER 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.
 - THE PLANS SHALL BE REVIEWED AND AN ITEMIZED CHECK LIST KEPT ALONG WITH COMMENTS NOTED.
 - THE SPECIFICATIONS SHALL BE REVIEWED IN DETAIL.
 - THE CONTRACTOR SHALL PRESENT HIS CONSTRUCTION METHODS AND PROCEDURES ALONG WITH A CRITICAL PATH CONSTRUCTION SCHEDULE.
- SLURRY TEST RESULTS (BEFORE CONSTRUCTION BEGINS) FOR 1 AND 3-SACK SLURRY SHALL BE PROVIDED. RANDOM TEST FOR 3 SACK SLURRY 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) SPLICED 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.
 - BOLT HOLE DIAMETERS WITHIN 1/16 INCH (1.6 MM) MORE OR LESS. LENGTH WITHIN 1 INCH MORE OR LESS ACCUMULATIVE.
 - SPACING BETWEEN BOLT HOLES 1/32 INCH (0.8 MM) - MORE OR LESS - 1/16 INCH MORE OR LESS ACCUMULATIVE.
 - 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 MAY 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, DOBIES, OR EVEN ROCKS IF THE CONTRACTOR DEMONSTRATES TO THE SATISFACTION OF THE QA/QC INSPECTOR THE CONTRACTOR'S METHOD IS WORKABLE.

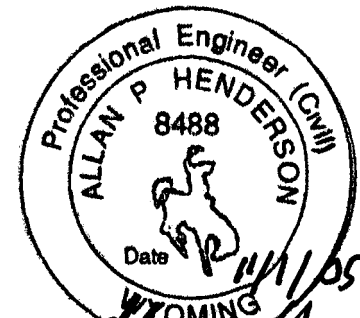
MATERIALS BY OTHERS



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.
- PLACE, PLUMB, AND SECURE BOLT/TEMPLATE ASSEMBLY INSIDE OUTER CMP.
- PLACE, PLUMB, AND SECURE INNER CMP INSIDE EMBEDMENT AND TEMPLATE RINGS. BACKFILL WITH EXCAVATED MATERIAL EXCLUDING ROCK IN EXCESS OF 2 FEET (0.6 M) IN DIAMETER TO WITHIN 4 TO 5 FEET (1.2 TO 1.5 M) FROM TOP OF INNER CMP.
- INSTALL ELECTRIC AND COMMUNICATION CONDUITS THROUGH CMP'S, PLACE GROUNDING WIRE FOR INNER CMP.
- BACKFILL AND COMPACT INNER CMP TO FLOOR DEPTH. PLACE NO. 4 REBAR OR WIRE MESH FOR CONCRETE FLOOR REINFORCEMENT. INSTALL STYROFOAM BLOCKOUTS. INSTALL 4" (100 MM) PVC DRAIN PIPE FOR CENTRAL DRAIN.
- CHECK LEVEL ON TEMPLATE AND PLACE CONCRETE. CONCRETE FLOOR TO BE POURED MONOLITHICALLY. FLOOR TO SLOPE A MINIMUM OF 1 INCH (25 MM) FROM SIDES TO CENTER DRAIN PIPE. FINISH FLOOR WITH TROWEL. APPLY CONCRETE CURING COMPOUND.
- REMOVE TEMPLATE ASSEMBLY AND FORM PLATE 8 HRS MINIMUM AFTER POUR. RESET TEMPLATE AND FORM PLATE AT SUBSEQUENT FOUNDATION. ALLOW CONCRETE TO CURE A MINIMUM OF 2 DAYS PRIOR TO BEGINNING TOWER ERECTION.
- PLACE CONCRETE DRAIN GRATE OR RODENT SCREEN PER FOUNDATION-DRAINAGE OPTIONS.

EXCLUSIVE PROPERTY OF
 PATRICK & HENDERSON, INC.
 U.S.A. PATENT # 5,586,417
 CONFIDENTIAL



PROPRIETARY WARNING

SEE THE CONFIDENTIALITY STATEMENT. THIS DESIGN AND THESE DRAWINGS ARE CONFIDENTIAL AND PROPRIETARY. IF YOU DO NOT HAVE A SET ASSIGNED AND NUMBERED SPECIFICALLY TO YOU, RETURN THESE IMMEDIATELY TO PATRICK & HENDERSON, INC.

ALLAN P. HENDERSON
 WYOMING #8488
 EXP. 12/31/05

THIS SET NO. _____ ASSIGNED TO: _____

APPROVED FOR CONSTRUCTION
 ASSEMBLY VIEW

DESCRIPTION:
 18' P&H TENSIONLESS FOUNDATION USA PATENT #5,586,417
 1 - 65 KW ON A 74 FT TOWER FOUNDATION PLAN
 FOR
 LARAMIE COUNTY COMMUNITY COLLEGE
 LARAMIE, WYOMING

REV: 0
 COPYRIGHT © 2005.
 BY
 PATRICK & HENDERSON, INC.
 FOUNDATION SIZE-SHEET NO.:
 18-S-2
 4 SHEETS
 JOB NO.: 05-066

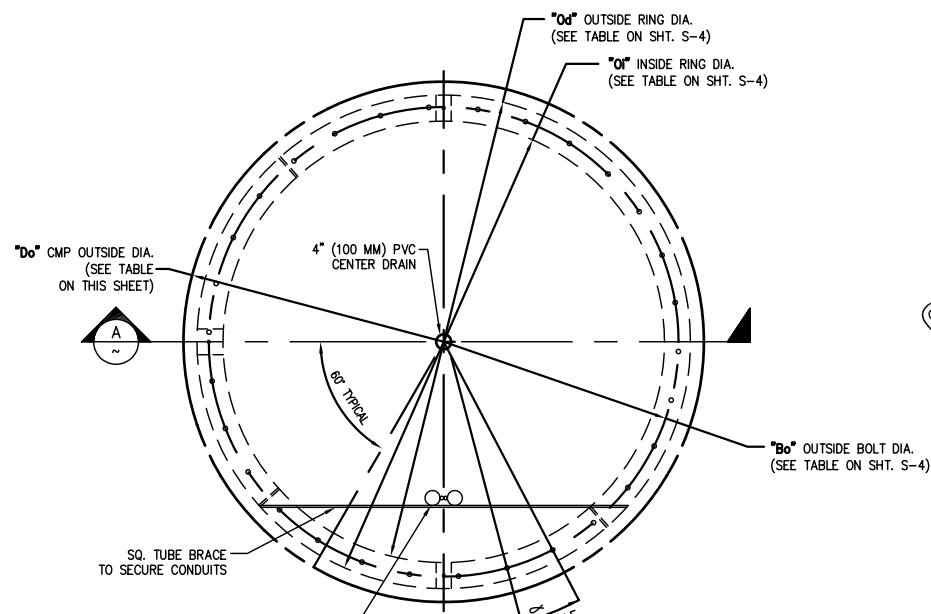
ISSUED FOR CONSTRUCTION 11/01/02
 18' FOUNDATION
 SOIL / CLAYSTONE

PATRICK & HENDERSON, INC. CIVIL & GEOTECHNICAL ENGINEERING
 1965 AIRPORT DRIVE, BAKERSFIELD, CALIFORNIA 93308
 (661) 391-9854 FAX: (661) 391-9926

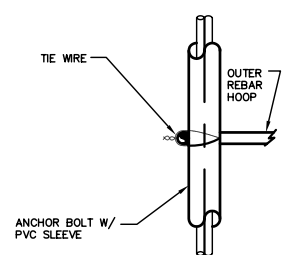
Consulting Engineers
 Foundation & Structural Engineering
 Land Planning
 Land Surveying
 Soils Testing

DATE:	11/01/05	DATE:	REV. #	REVISION DESCRIPTION	BY	PREPARED FOR:
SCALE:	AS SHOWN					LARAMIE COUNTY COMMUNITY COLLEGE 1400 EAST COLLEGE DRIVE CHEYENNE, WY 82007
DRAWN BY:	JK					
APPROVED:						

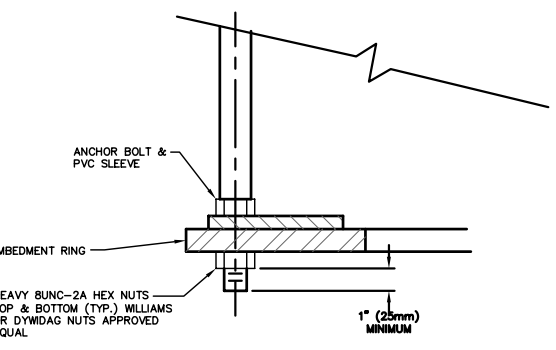
CONFIDENTIAL



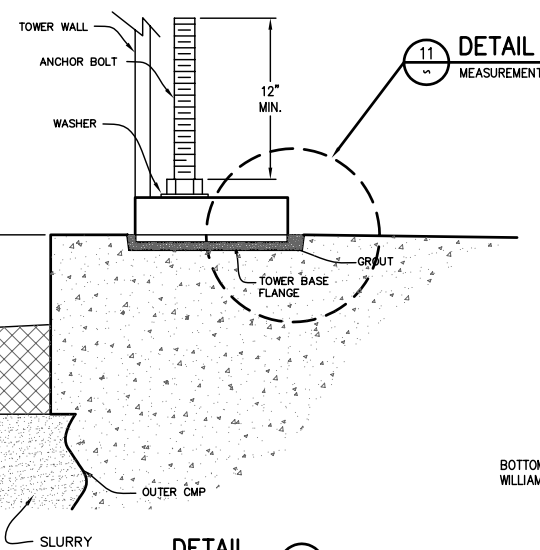
TOP VIEW OF FOUNDATION PLAN NOT TO SCALE



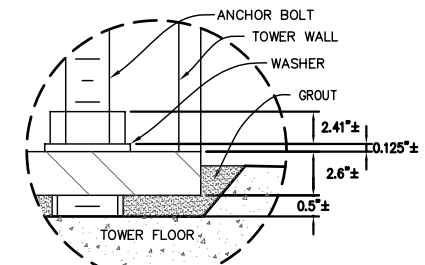
DETAIL 1 REBAR TIE NOT TO SCALE



DETAIL 2 BOLTING OF EMBEDMENT RING NOT TO SCALE



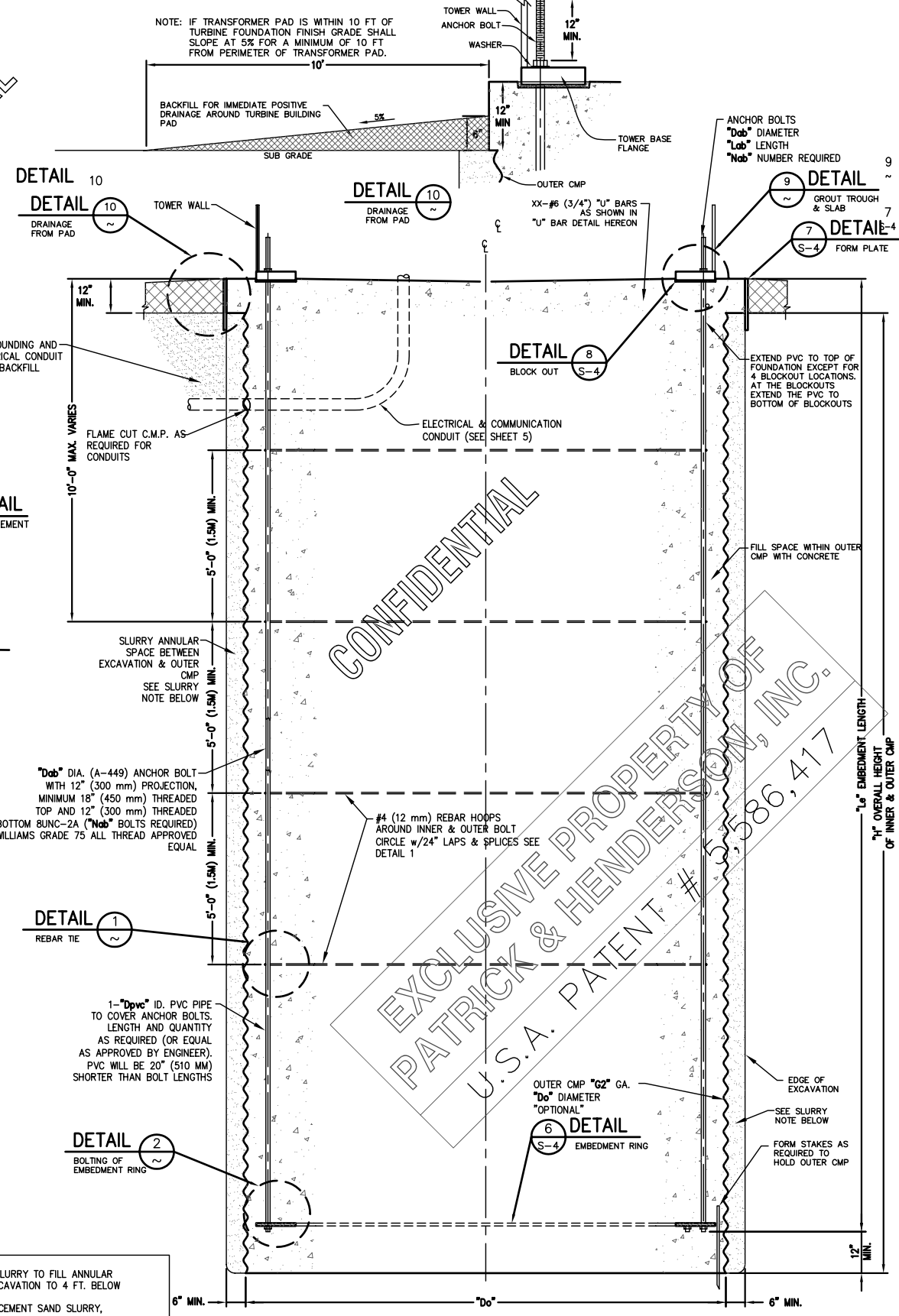
DETAIL 9 GROUT TROUGH & SLAB NOT TO SCALE



DETAIL 11 MEASUREMENT NOT TO SCALE

PROPRIETARY WARNING SEE THE CONFIDENTIALITY STATEMENT. THIS DESIGN AND THESE DRAWINGS ARE CONFIDENTIAL AND PROPRIETARY. IF YOU DO NOT HAVE A SET ASSIGNED AND NUMBERED SPECIFICALLY TO YOU, RETURN THESE IMMEDIATELY TO PATRICK & HENDERSON, INC.

SLURRY NOTE: USE 3-SACK CEMENT SAND SLURRY TO FILL ANNULAR SPACE FROM BOTTOM OF EXCAVATION TO 4 FT. BELOW FINISH GRADE. TOP 4 FT SHALL BE 1 SACK CEMENT SAND SLURRY, MINIMUM 30 PSI AT 28 DAYS. CONTACT ENGINEER FOR CLARIFICATION.



SECTION A FOUNDATION NOT TO SCALE

DETAIL 10 DRAINAGE FROM PAD

DETAIL 10 DRAINAGE FROM PAD

DETAIL 9 GROUT TROUGH & SLAB

DETAIL 7 FORM PLATE

DETAIL 8 BLOCK OUT

DETAIL 11 MEASUREMENT

DETAIL 1 REBAR TIE

DETAIL 2 BOLTING OF EMBEDMENT RING

DETAIL 6 EMBEDMENT RING

Lo EMBEDMENT LENGTH OF INNER & OUTER CMP

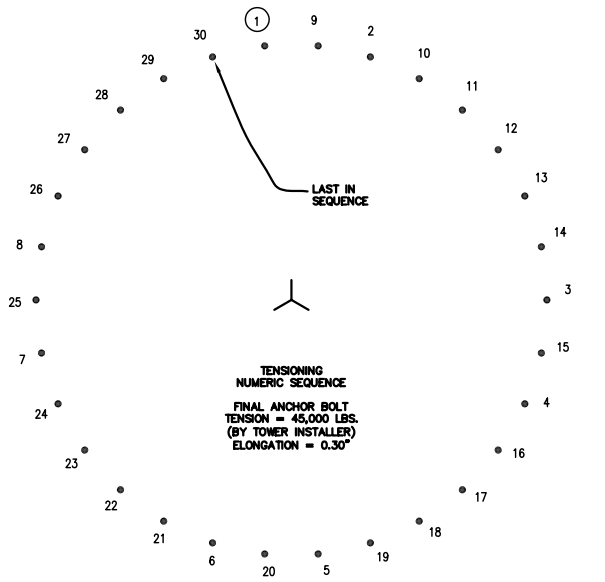
H OVERALL HEIGHT OF OUTER CMP

NOTE: TRENCHES FOR GROUNDING AND SECONDARY ELECTRICAL CONDUIT SHALL BE SLURRY BACKFILL.

NOTE: IF TRANSFORMER PAD IS WITHIN 10 FT OF TURBINE FOUNDATION FINISH GRADE SHALL SLOPE AT 5% FOR A MINIMUM OF 10 FT FROM PERIMETER OF TRANSFORMER PAD.

'Dob' DIA. (A-449) ANCHOR BOLT WITH 12\"/>

EXCLUSIVE PROPERTY OF PATRICK & HENDERSON, INC. U.S.A. PATENT # 5,586,417

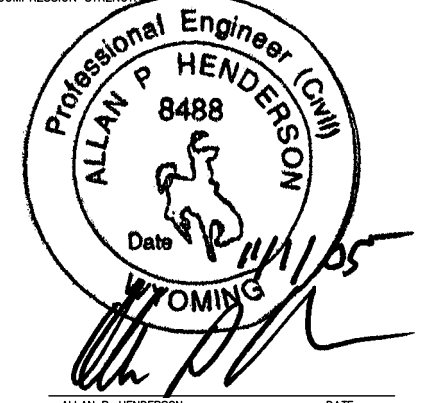


BOLT TENSIONING SEQUENCE

ANCHOR BOLT TIGHTENING NOT TO SCALE NOTE: BOLT TENSIONING PROCEDURES ARE UNDER SEPARATE DOCUMENT AND ARE AVAILABLE UPON REQUEST FROM PATRICK AND HENDERSON INC.

FOUNDATION DIMENSIONS			
MARK	VALUE	UNITS	DESCRIPTION
Dob	1.125	IN.	DIAMETER OF ANCHOR BOLTS (OUTSIDE DIAMETER)
Lab	18	FT	LENGTH OF ANCHOR BOLTS
Nab	30	EA	NUMBER OF ANCHOR BOLTS
Le	15	FT	BOLT EMBEDMENT LENGTH
Dpvc	1.0	IN	DIAMETER OF PVC PIPE SLEEVE
Do	8.0	FT	DIAMETER OF THE OUTER CORRUGATED METAL PIPE
H	18 *	FT	OVERALL HEIGHT OF OUTER CMP
G2	14	Ga	GAUGE OF OUTER CMP "OPTIONAL"

- * ANCHOR BOLTS SHALL BE .25 INCHES KESS IN DIAMETER THAN THEIR BOLT HOLE IN THE TOWER FLANGE. VARIATIONS SHALL BE REPORTED TO THE ENGINEER.
- NOTES:
- POUR SAND CEMENT SLURRY (MIX DESIGN BY ENGINEER) AROUND OUTER C.M.P. BETWEEN C.M.P. & EXCAVATION.
 - POUR MONOLITHICALLY A TWELVE (12) INCH (300 MM) CONCRETE SLAB W/ 6"x6"-10/10 WIRE MESH & A FOUR (4) INCH Ø PVC FLOOR DRAIN, IF FLOOR DRAINS TO CENTER, SHALL BE CONSTRUCTED INSIDE THE INNER CMP. NO. 4 REBAR MAT @ 12" (300 MM) O.C. BOTH WAYS MAY BE UTILIZED AS AN ALTERNATIVE TO WIRE MESH.
 - THREE (3) SACK SAND AND CEMENT SLURRY SHALL HAVE A 300 PSI COMPRESSION STRENGTH. ONE (1) SACK SAND AND CEMENT SLURRY SHALL HAVE A 30 PSI COMPRESSION STRENGTH.



ISSUED FOR CONSTRUCTION 11/01/02 18' FOUNDATION SOIL / CLAYSTONE

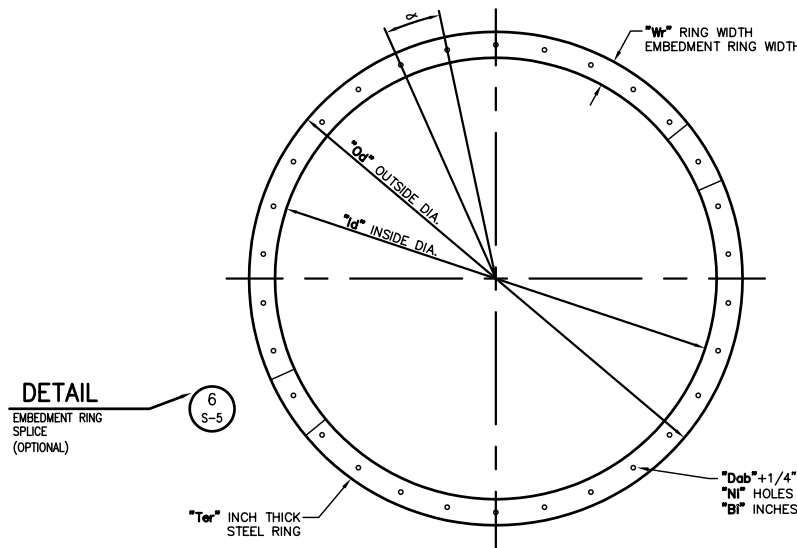
APPROVED FOR CONSTRUCTION FOUNDATION PLAN & SECTION 18' P&H TENSIONLESS FOUNDATION USA PATENT #5,586,417 1 - 65 KW ON A 74 FT TOWER FOUNDATION PLAN FOR LARAMIE COUNTY COMMUNITY COLLEGE LARAMIE, WYOMING

REV: 0 COPYRIGHT © 2005 BY PATRICK & HENDERSON, INC. FOUNDATION SIZE-SHEET NO.: 18-S-3 4 SHEETS JOB NO.: 05-066

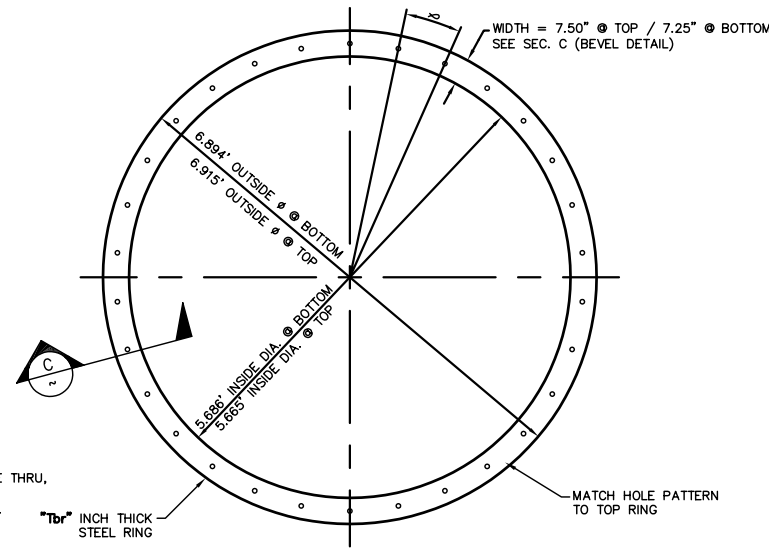
PATRICK & HENDERSON INC. CIVIL & GEOTECHNICAL ENGINEERING
 1965 AIRPORT DRIVE BAKERSFIELD, CALIFORNIA 93308
 (661) 391-9854 FAX: (661) 391-9926

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

DATE:	11/01/05	DATE:	REV #	REVISION DESCRIPTION	BY	PREPARED FOR:	LARAMIE COUNTY COMMUNITY COLLEGE 1400 EAST COLLEGE DRIVE CHEYENNE, WY 82007
SCALE:	AS SHOWN						
DRAWN BY:	JK						
APPROVED:							

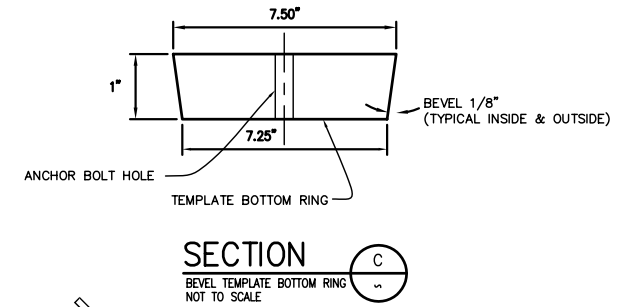


DETAIL 6
EMBEDMENT RING SPLICE (OPTIONAL)



DETAIL 4
TEMPLATE BOTTOM RING NOT TO SCALE (1 REQUIRED)

TEMPLATE TOP RING, TEMPLATE BOTTOM RING, & EMBEDMENT RING DIMENSIONS		
MARK	VALUE (UNITS)	DESCRIPTION
Dab	1.125"	ANCHOR BOLT OUTSIDE DIAMETER
No	30 EA.	NUMBER OF ANCHOR BOLT HOLES IN OUTSIDE BOLT CIRCLE
Bo	6.2927'	OUTSIDE DIA. OF ANCHOR BOLT CIRCLE
Od	6.69'	OUTSIDE DIA. OF TOP RING AND EMBEDMENT RING
Id	6.03'	INSIDE DIA. OF TOP RING AND EMBEDMENT RING
Wr	4.00"	WIDTH OF TOP & EMBEDMENT RING
Tbr	1.0"	THICKNESS OF BOTTOM RING
Ter	1/2"	THICKNESS OF EMBEDMENT RING
α	12.0°	ANGLE BETWEEN BOLT HOLES



SECTION C
BEVEL TEMPLATE BOTTOM RING NOT TO SCALE

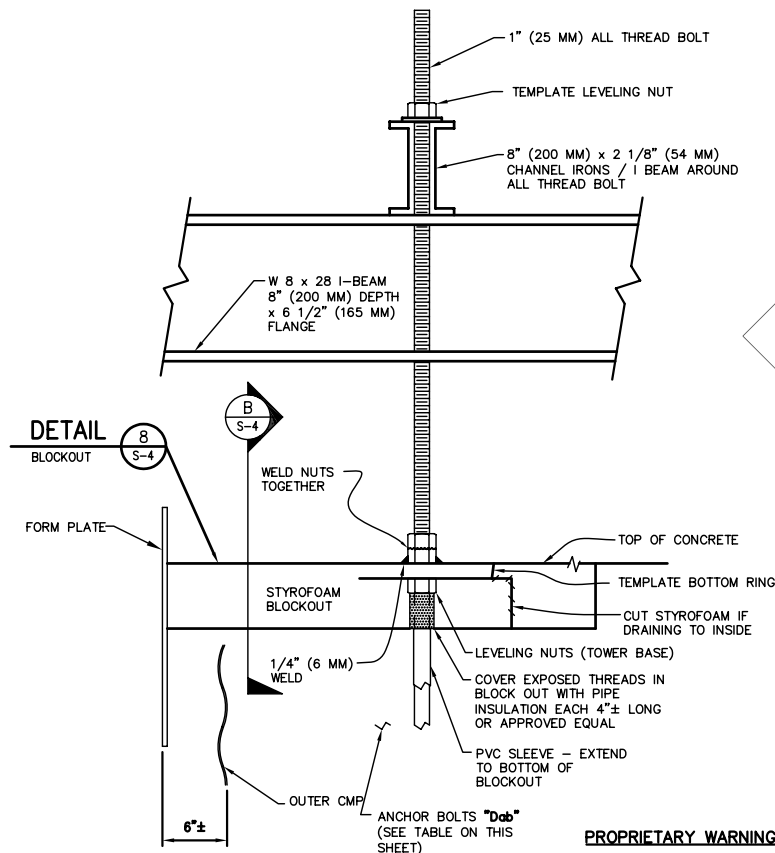
NOTE: FLAME CUT BOLT HOLES OK EMBEDMENT RING ONLY EMBEDMENT RING MAY BE MADE IN 4 EQUAL SEGMENTS AND SPLICED AT CONTRACTOR'S OPTION

DETAIL 3
EMBEDMENT RING NOT TO SCALE (1 REQUIRED)

NOTE: MATCH HOLE PATTERN TO TEMPLATE TOP RING.

EXCLUSIVE PROPERTY OF PATRICK & HENDERSON, INC. U.S.A. PATENT # 5,586,417

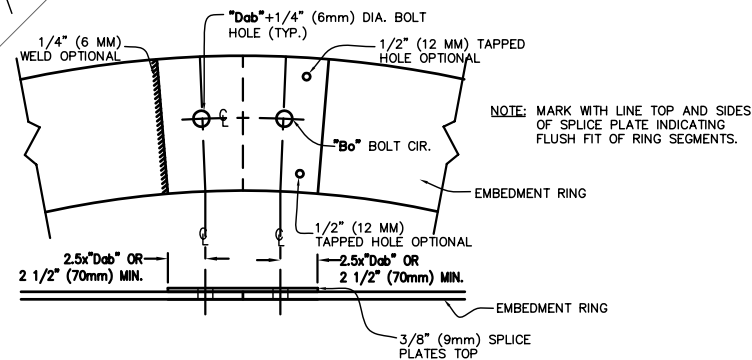
CONFIDENTIAL



DETAIL 7
TEMPLATE SPT. NOT TO SCALE

PROPRIETARY WARNING

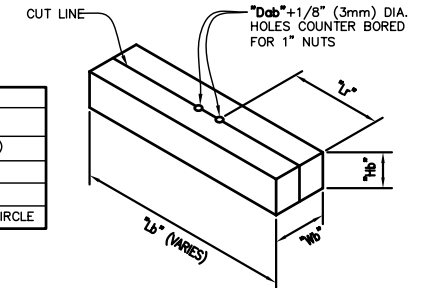
SEE THE CONFIDENTIALITY STATEMENT. THIS DESIGN AND THESE DRAWINGS ARE CONFIDENTIAL AND PROPRIETARY. IF YOU DO NOT HAVE A SET ASSIGNED AND NUMBERED SPECIFICALLY TO YOU, RETURN THESE IMMEDIATELY TO PATRICK & HENDERSON, INC.



DETAIL 6
EMBEDMENT RING SPLICE (OPTIONAL)

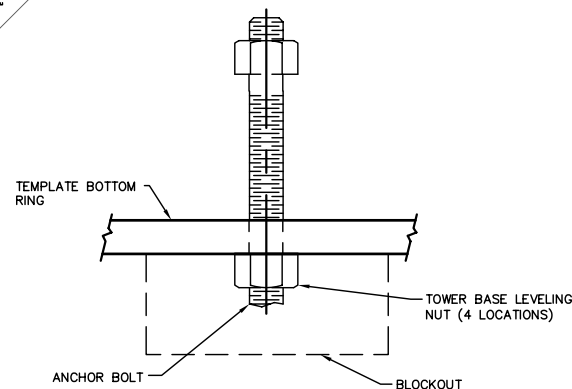
NOTE: MARK WITH LINE TOP AND SIDES OF SPLICE PLATE INDICATING FLUSH FIT OF RING SEGMENTS.

BLOCK OUT DIMENSIONS			
MARK	VALUE	UNITS	DESCRIPTION
Lb	24	IN	LENGTH (SEE NOTE)
Wb	8	IN	WIDTH
Hb	4	IN	HEIGHT
Lr	12	IN	TO OUTSIDE BOLT CIRCLE



DETAIL 8
BLOCK OUT NOT TO SCALE (4 REQ'D)

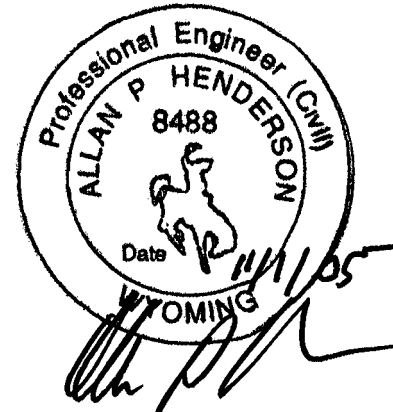
NOTE:
1. MATERIALS SUCH AS STYROFOAM OR WOOD FOR BLOCKOUTS ARE ACCEPTABLE. CUT LENGTH TO FIT AGAINST FORM PLATE IN FIELD.
2. BLOCKOUT SHALL BE CUT TO ACCOMMODATE TEMPLATE BOTTOM RING AS SHOWN IN DETAIL 7 SHOWN HEREON BY CONTRACTOR.



SECTION B
TEMPLATE BOLT SUPPORT NOT TO SCALE

MATERIALS BY SUPPLIER

- EMBEDMENT RINGS MAY BE IN ONE PIECE AND/OR PLATE SPLICED TO FACILITATE SHIPPING IN SEGMENTS AND RAPID FIELD ASSEMBLY INTO CONTINUOUS RINGS FOR PLACEMENT INSIDE OF OUTER CMP. A SHOP DRAWING, IF DIFFERENT THAN DETAIL 6 OF THESE PLANS, OF SPLICE PLATE SHALL BE PROVIDED THE ENGINEER FOR APPROVAL BY SUPPLIER.
- BOLT HOLE TOLERANCES FOR THE TEMPLATE AND EMBEDMENT RINGS FROM SPECIFIED DIMENSIONS SHOWN ON THESE PLANS:
 - (a) BOLT CIRCLE DIAMETERS WITHIN 1/16 INCH (1.6 MM) MORE OR LESS BOLT LENGTH TO BE WITHIN 1" (25 MM).
 - (b) SPACING BETWEEN BOLT HOLES 1/32 INCH (0.8 MM) - MORE OR LESS 1/16 INCH (1.6 MM) 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).



ALLAN P. HENDERSON
WYOMING #8488
EXP. 12/31/05

DATE

ISSUED FOR CONSTRUCTION 11/01/02
18' FOUNDATION
SOIL / CLAYSTONE

THIS SET NO. _____ ASSIGNED TO: _____

APPROVED FOR CONSTRUCTION

EMBEDMENT RING, TEMPLATE RING, & FABRICATION DETAILS

DESCRIPTION:
18' P&H TENSIONLESS FOUNDATION USA PATENT #5,586,417
1 - 65 KW ON A 74 FT TOWER FOUNDATION PLAN
FOR
LARAMIE COUNTY COMMUNITY COLLEGE
LARAMIE, WYOMING

REV: 0
COPYRIGHT © 2005.
BY
PATRICK & HENDERSON, INC.
FOUNDATION SIZE-SHEET NO.:
18-S-4
4 SHEETS
JOB NO.: 05-066

PATRICK & HENDERSON INC.
CIVIL & GEOTECHNICAL ENGINEERING
1965 AIRPORT DRIVE
BAKERSFIELD, CALIFORNIA 93308
(661) 391-9854
FAX: (661) 391-9926

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

DATE: 11/01/05
SCALE: AS SHOWN
DRAWN BY: JK
APPROVED:

REVISION	DESCRIPTION	DATE	REV. #	BY	PREPARED FOR:
					LARAMIE COUNTY COMMUNITY COLLEGE 1400 EAST COLLEGE DRIVE CHEYENNE, WY 82007