WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3 – BIOSOLIDS DRYER SYSTEM ADDITION

JULY 2010

BOWLING GREEN MUNICIPAL UTILITIES

WARREN COUNTY
BOWLING GREEN, KENTUCKY

GRESHAM, SMITH AND PARTNERS
Design Services For The Built Environment
Nashville, Tennessee

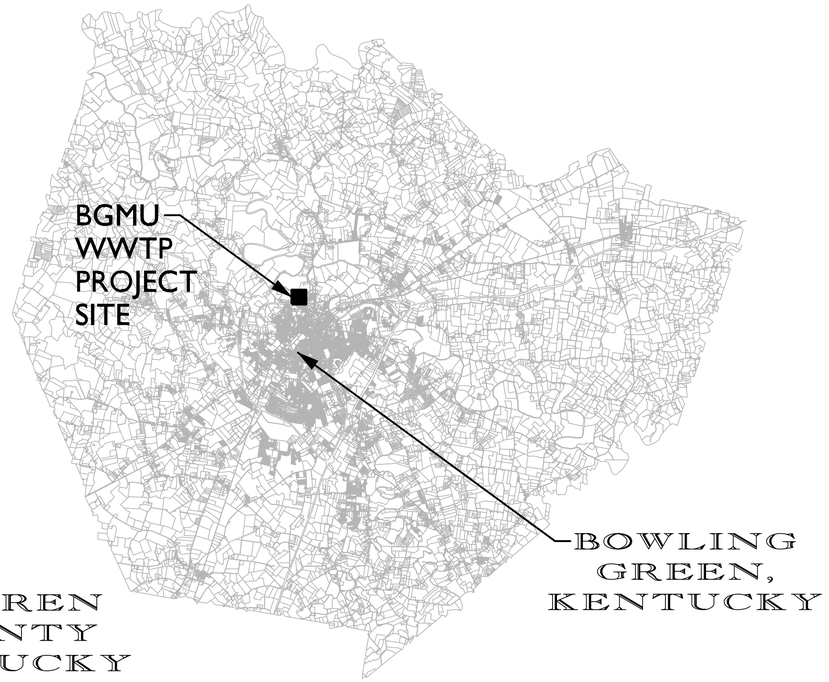
BGMU PROJECT NO. S07–653
GS&P PROJECT NO. 26064.00

APPROVED:

_____
SCOTT NEIGHBORS, PROJECT MANAGER
BOWLING GREEN MUNICIPAL UTILITIES

SET NUMBER : ____

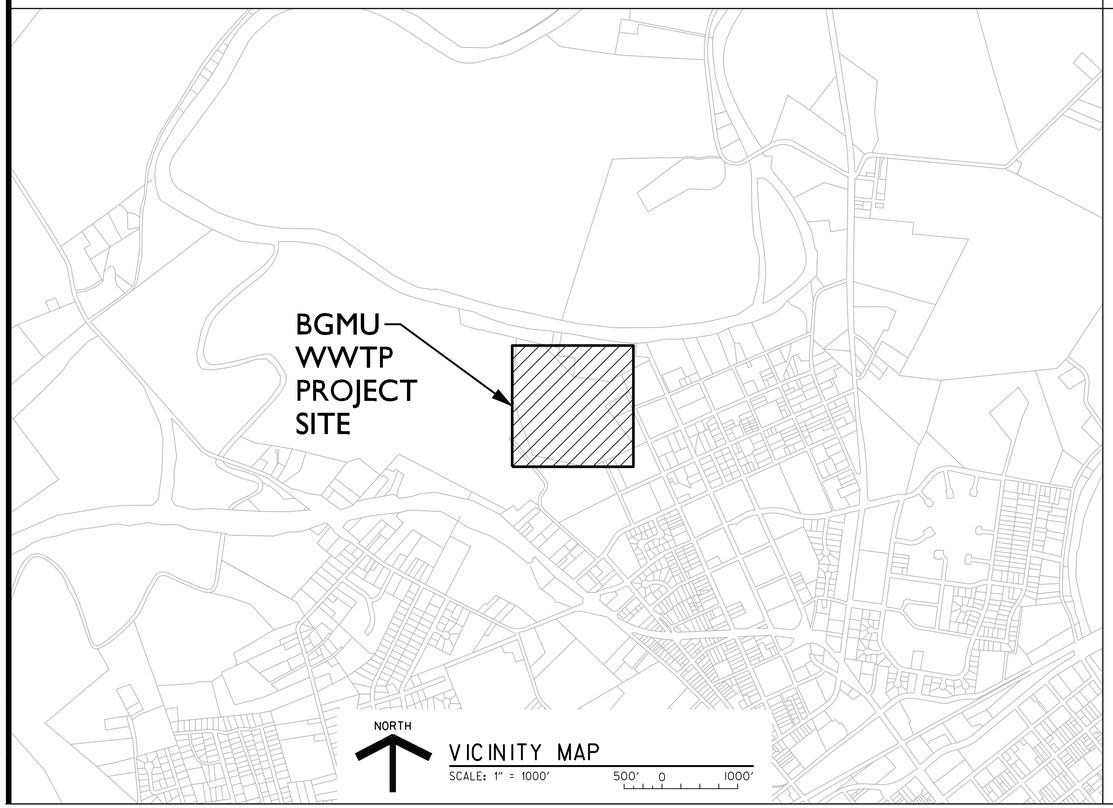
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NORTH

LOCATION MAP

NOT TO SCALE



NORTH

VICINITY MAP

SCALE: 1" = 1000' 500' 0 1000'

SHEET INDEX

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17	S7.2.0	DRYER BUILDING LOWER PLAN - STRUCTURAL
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35	MP7.3.1	MECHANICAL PROCESS DRYER BUILDING SECTIONS B AND C
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GENERAL NOTES

1. THIS PROJECT IS CONTRACT #3 FOR THE IMPROVEMENTS AT THE BOWLING GREEN WASTEWATER TREATMENT PLANT. CONTRACT #2 IS CURRENTLY UNDER CONSTRUCTION BY JUDY CONSTRUCTION COMPANY (JCC). THE CONTRACTOR FOR CONTRACT #3 SHALL BE RESPONSIBLE FOR COORDINATION OF ALL CONSTRUCTION ACTIVITIES AROUND JCC'S CONSTRUCTION ACTIVITIES. A COPY OF JCC'S CONSTRUCTION SCHEDULE WILL BE PROVIDED AS A SNAP SHOT OF THE ANTICIPATED PROGRESS SCHEDULE FOR CONTRACT #2. THIS SCHEDULE WILL BE UPDATED DURING CONSTRUCTION AND WILL BE PROVIDED TO THE CONTRACT #3 CONTRACTOR FOR HIS USE IN SCHEDULING WORK.

2. CONTRACTOR IS TO MAKE EVERY EFFORT TO PRESERVE PROPERTY CORNERS BENCH MARKS, ORIGINAL AND DESIGN SURVEY MONUMENTS, WHICH EXIST ON THE PROJECT AT THE TIME OF CONTRACT AWARD. THE CONTRACTOR SHALL FURNISH PERSONNEL FULLY QUALIFIED AND CAPABLE OF STAKING CENTERLINE SHOWN ON THE PLANS. ANY PROPERTY CORNERS OR R/W MONUMENTS DAMAGED DURING CONSTRUCTION SHALL BE RESTORED BY A REGISTERED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.

3. EXISITING UTILITIES SHOWN ON THESE DRAWINGS WERE TAKEN FROM BEST AVAILABLE INFORMATION. NO CLAIM IS MADE THAT ALL UTILITIES ARE SHOWN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE LOCATION AND SIZES OF ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR MUST CONTACT THE UTILITIES PROTECTION CENTER AT 1-800-752-6007 AT LEAST 72 HOURS PRIOR TO BEGINNING EXCAVATION ON THE PROJECT.

4. DRAINAGE SYSTEMS WILL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION OF THIS PROJECT. WHERE A DRAINAGE STRUCTURE IS DAMAGED OR IS TO BE REMOVED AND REPLACED, THE CONTRACTOR WILL NOT BE COMPENSATED FOR ANY OF THESE ITEMS UNLESS SPECIFICALLY SHOWN TO BE PAID FOR OTHERWISE.

5. TRAFFIC WILL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION BY PERMITTING AT LEAST ONE LANE OF TRAFFIC TO MOVE THROUGH THE CONSTRUCTION SITE. ALL FLAGMEN, WARNING SIGNS, BARRICADES, & LIGHTS NECESSARY TO CONTROL THE TRAFFIC AND PROTECT THE PUBLIC SHALL BE FURNISHED BY THE CONTRACTOR WITHOUT COST TO THE OWNER. TRAFFIC CONTROL DEVICES WILL BE IN ACCORDANCE WITH "THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS & HIGHWAYS".

6. INSTALLATION OF EROSION CONTROL MEASURES AND PRACTICES SHALL TAKE PLACE PRIOR TO OR CONCURRENT WITH LAND DISTURBING ACTIVITITES.

7. EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IF DEEMED NECESSARY BY ON-SITE INSPECTION.

8. PIPE BEDDING SHALL BE BASED ON PIPE DIAMETER AND DEPTH PER SPECIFICATIONS. ANY OVER-EXCAVATION BEYOND THE LIMITS SHOWN ON THE BEDDING DETAILS WILL BE REPLACED WITH THE APPLICABLE REQUIRED BEDDING MATERIAL AT THE CONTRACTOR'S EXPENSE. BEDDING WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

9. ALL EXCESS MATERIALS WILL BE HAULED OFF BY THE CONTRACTOR, SPREADING EXCESS MATERIALS IN A FLOOD PLAIN OR ELSEWHERE ON SITE IS NOT PERMITTED.

LEGEND

- MANHOLE
- VALVE
- FIRE HYDRANT
- CATCH BASIN
- CULVERT PIPE
- —8"W— WATER LINE
- WATER VALVE
- BENCH MARK
- BUSINESS MAIL BOX
- RESIDENTIAL MAIL BOX
- DROP BOX INLET
- POWER POLE
- GUIDE WIRE
- CENTER LINE OF STREET
- — DITCH — DITCH
- —E.O.P.— EDGE OF PAVEMENT
- PROPERTY LINE
- —OHE— OVERHEAD ELECTRIC
- —R.O.W.— RIGHT-OF-WAY
- —W— WATER LINE
- —SA— SANITARY SEWER
- —G— GAS LINE
- —BST— BELLSOUTH TELEPHONE
- CITY LIMITS
- STORM PIPE
- GUARD RAIL
- —TELE— TELEPHONE
- CATCH BASIN
- BUILDING

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

REVISION

No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

VICINITY MAP, LOCATION MAP, GENERAL NOTES, LEGEND AND SHEET INDEX

G0.1.0

PROJECT: 26064.01
DATE: JULY, 2010

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(0-20, 40-133, 199-234)
[I:\bgmu\main\ch_ces60 ...]
[CONTRACT_ONE\MISCFONT_SPEC_FILE.FNT]
[CONTRACT_ONE\MISCFONT_SPEC_FILE.SHX]
[CONTRACT_ONE\MISCFONT_SPEC_FILE.TTF

NORTH

10' 0 10' 20'

GRAPHIC SCALE

811 Know what's below. Call before you dig. 800-752-6007 OR 502-266-5123

NOTE:

EL.DI. = EPOXY LINED DUCTILE IRON

PVC = POLYVINYL CHLORIDE

1. 6" SA EL.DI. 23 LF @ 2%, REFER TO P7.2.0
2. 4" DI, 6 LF @ 2%, CONNECT TO HUB DRAIN, REFER TO P7.2.0
3. 6" EL.DI. 17LF @ 1%, REFER TO P7.2.0
4. 10" EL.DI., 25 LF, REFER TO MP7.2.0
5. 6" SA EL.DI., 15 LF @ 16.7%
6. 6" DI PLANT WATER

YARD HYDRANT W/HOSE REEL, DET. 1-2, SHT. C0.2.0

CONNECT TO EXISTING 2" GATE VALVE, INSTALL 5LF OF 2" TYPE K COPPER.

10.5'x8' NITROGEN STORAGE TANK CONC. PAD, 8'x8' MINERAL OIL STORAGE TANK CONC. PAD

EX MH 1-8D, CONTRACT 2
TC. 447.00
IE. 444.50 IN, 6" SA
IE. 438.60 IN, 10" DRYER DR.
IE. 439.10 IN, 6" SUMP DR.
IE. 444.50 IN, 4" ODOR SYS. DR.
IE. 438.50 OUT, 10" EL.DI.

EX. 6" EL.DI. PLANT WATER

EX MH 1-8C, CONTRACT 2
TC. 446.50
IE. 442.54 IN, 6"
IE. 438.23 IN, 10"
IE. 438.13 OUT, 10"

CONCRETE RAMP-C2, DET. 9, SHT. C0.2.0

CLEAN OUT IE.447.00

CONCRETE SIDEWALK-C1, DET. 7-8, SHT. C0.2.0

REFER TO P7.2.0

10" 45° DI BEND, IE.444.36, ROTATE FITTING TO TIE PIPE INTO MANHOLE

ODOR CONTROL EQUIPMENT PAD FFE=447.50

EX. 10"SA EL.DI

FFE=447.50

SLUDGE DRYING BUILDING - CONTRACT 3

CLEAN OUT, DET. 4, SHT.C0.2.0

7.7% SLOPE

REFER TO P7.3.0

CONNECT TO EX. 4" GAS LINE

EX. 4"GAS, HDPE

EX. 1 1/4" DOM. WATER

CONNECT TO EX. 1 1/4" DOM. WATER

REFER TO P7.2.0
REFER TO MP7.2.0

IE.445.76

IE.439.28

IE.443.00

CONCRETE RAMP, DET. 9, SHT. C0.2.0

CONCRETE SIDEWALK-C1, DET. 7-8, SHT. C0.2.0

CONCRETE PAVEMENT-C2, DET. 6, SHT. C0.2.0

T.O.C. 449.76

SLUDGE PROCESSING BUILDING - CONTRACT 2 -

EX. 10"SA EL.DI.

EX. 6" DI, PLANT WATER

15" CMP

ASPHALT

CONCRETE

GRAVEL

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SITE PLAN, UTILITY PLAN, YARD PIPING

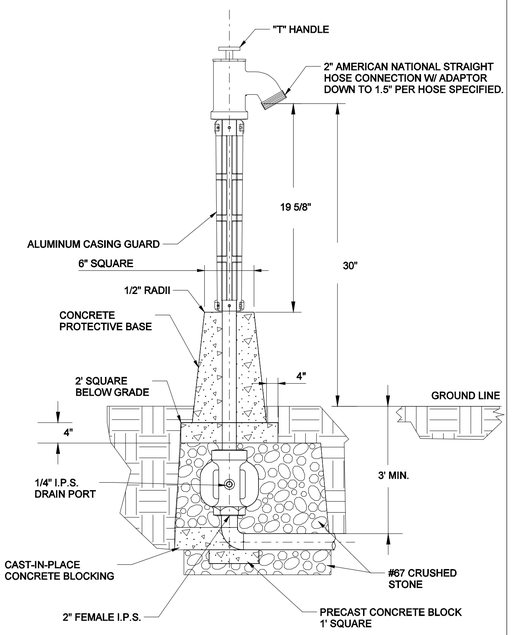
C0.1.0

PROJECT: 26064.01
DATE: JULY, 2010

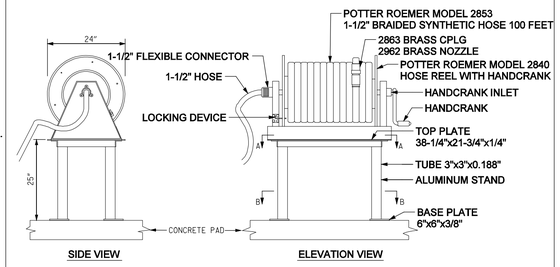
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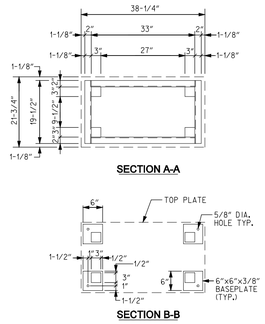
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DIMENSIONAL AREA FILL LEVEL (SHEETS, PATTERN, POINTS, TIES, WEIGHT, FILE)
EXTERNAL FILES USED: P:\26064.01\W\6064WC01.DGN, P:\26064.01\W\PANELS.DGN, P:\26064.01\W\6064WC02.DGN, M8TN1A3U.I14331945432, 888115A533

NOTE:
1. ZURN Z1390 WITH ALUMINUM CASING GUARD, "T" HANDLE, & PARTS KIT, OR APPROVED EQUIVALENT.

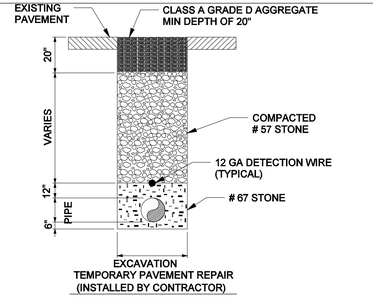


1 NON-FREEZE POST HYDRANT
NOT TO SCALE



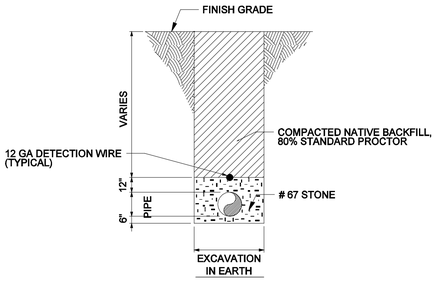


2 HOSE REEL W/STAND
NOT TO SCALE

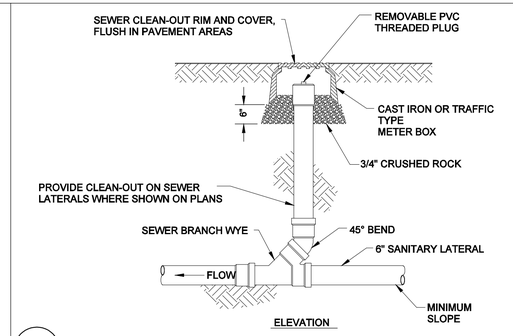


TEMPORARY PAVEMENT REPAIR (INSTALLED BY CONTRACTOR):

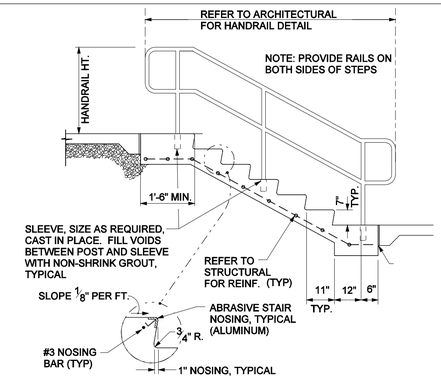
1. NO. 7 STONE SHALL BE USED FOR PIPE BEDDING. PIPE BEDDING SHALL BE PLACED FROM 6" BELOW THE PIPE TO 12" ABOVE THE PIPE CROWN.
2. NO. 57 STONE SHALL BE COMPACTED IN MAXIMUM 12" LIFTS (WITH A MINIMUM OF 2 LIFTS) USING A VIBRATORY SLED UP TO 20" BELOW THE PAVEMENT SURFACE.
3. CLASS A GRADE D AGGREGATE SHALL BE COMPACTED IN 6" LIFTS UP TO THE PAVEMENT SURFACE.
4. THE PAVEMENT REPAIR (INSTALLED BY CONTRACTOR) SHALL BE PLACED WITHIN 14 DAYS (OR 28 DAYS IF APPROVED BY THE OWNER OR PROGRAM MANAGER).



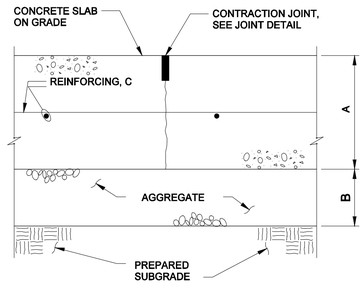
3 TRENCH DETAIL
NOT TO SCALE



4 SEWER CLEAN-OUT FOR PAVED AREAS
NOT TO SCALE



5 EXTERIOR CONCRETE STAIR
NOT TO SCALE

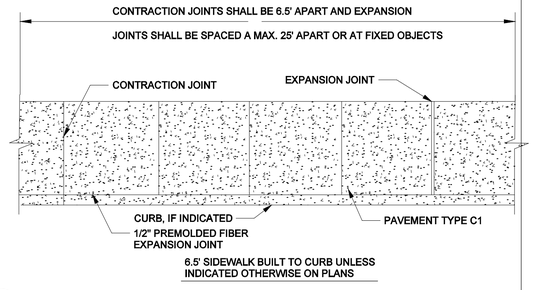


PAVEMENT TYPE(S) SEE NOTE 4	DIMENSION (INCHES)		REINFORCING
	A	B	C
C1	4"	4"	6" x 6"-W2.9" WIRE MESH
C2	8"	6"	4" x 4"-W4" WIRE MESH ***
C3	-	-	-

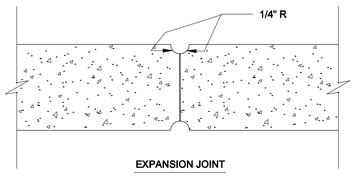
*** ALTERNATIVE: #5 @ 12" EW 2 1/2" COVER

NOTES:
1. CONTRACTION JOINT SHALL BE MADE, CLEANED WITH COMPRESSED AIR, AND FILLED WITH SEALANT AS SPECIFIED.
2. CONCRETE JOINT SPACING: 'W x 'L OR AS SHOWN.
3. INSTALL 3/4" PREMOLDED JOINT FILLER FULL DEPTH WHERE CONCRETE PAVEMENT ABUTS CONCRETE CURB, BUILDING OR ANY RIGID STRUCTURE.
4. PROVIDE PORTLAND CEMENT CONCRETE PAVEMENT TYPE AS SHOWN ON PLANS.

6 CONCRETE SURFACE DETAIL
NOT TO SCALE

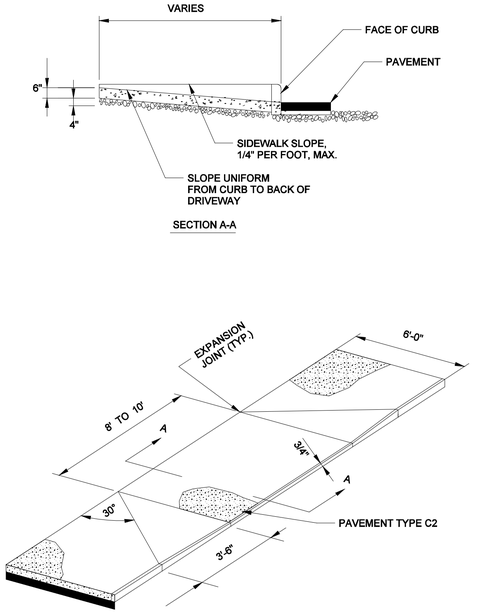


7 CONCRETE SIDEWALK
NOT TO SCALE

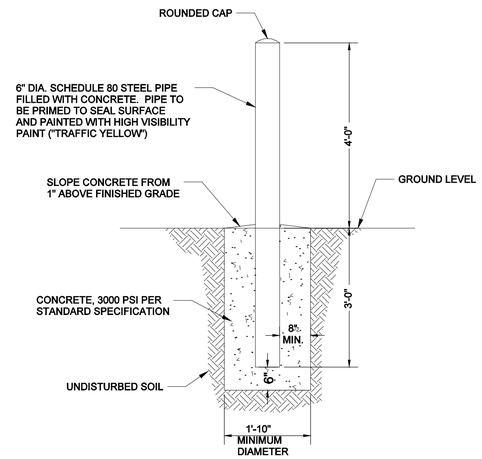


NOTES:
1. CONCRETE JOINT SPACING: 'W x 'L OR AS SHOWN.
2. INSTALL 3/4" PREMOLDED JOINT FILLER FULL DEPTH WHERE CONCRETE PAVEMENT ABUTS CONCRETE CURB, BUILDING OR ANY RIGID STRUCTURE.
3. PROVIDE PORTLAND CEMENT CONCRETE PAVEMENT TYPE AS SHOWN ON PLANS.

8 CONCRETE EXPANSION JOINT
NOT TO SCALE



9 CONCRETE RAMP
NOT TO SCALE



10 VEHICULAR GUARD POST (BOLLARD)
NOT TO SCALE

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DETAILS
WATER
SEWER
SITE

C0.2.0

PROJECT: 26064.01
DATE: JULY, 2010

FILE: P:\26064\01\w\6064w02.dgn

PLAN REVIEW DATA

BUILDING CLASSIFICATION:

OCCUPANCY TYPE:
PER 2007 EDITION OF THE KENTUCKY BUILDING CODE:
FACTORY GROUP F-1

CONSTRUCTION TYPE:
PER 2007 EDITION OF THE KENTUCKY BUILDING CODE, SECTION 602:
TYPE II-B

BUILDING FIRE PROTECTION:

AREA SPRINKLERED: NON - SPRINKLERED

REQUIRED ASSEMBLY RATINGS:

BEARING WALLS - EXTERIOR	0 HOUR
BEARING WALLS - INTERIOR	0 HOUR
NONBEARING WALLS - EXTERIOR	0 HOUR
RIGID FRAMES	0 HOUR
COLUMNS SUPPORTING ONLY ONE ROOF	0 HOUR
BEAMS SUPPORTING ONLY ONE ROOF	0 HOUR
FLOORS	0 HOUR
FLOOR/CEILINGS	0 HOUR
ROOFS	0 HOUR
ROOF/CEILINGS	0 HOUR

BUILDING INFORMATION:

HEIGHTS AND AREA:
ALLOWED: 55' HEIGHT OR 2 STORIES, 15,500 SQUARE FEET
ACTUAL: 2 STORIES, 38'-0" IN HEIGHT, 5,426 SQUARE FEET ADDITION

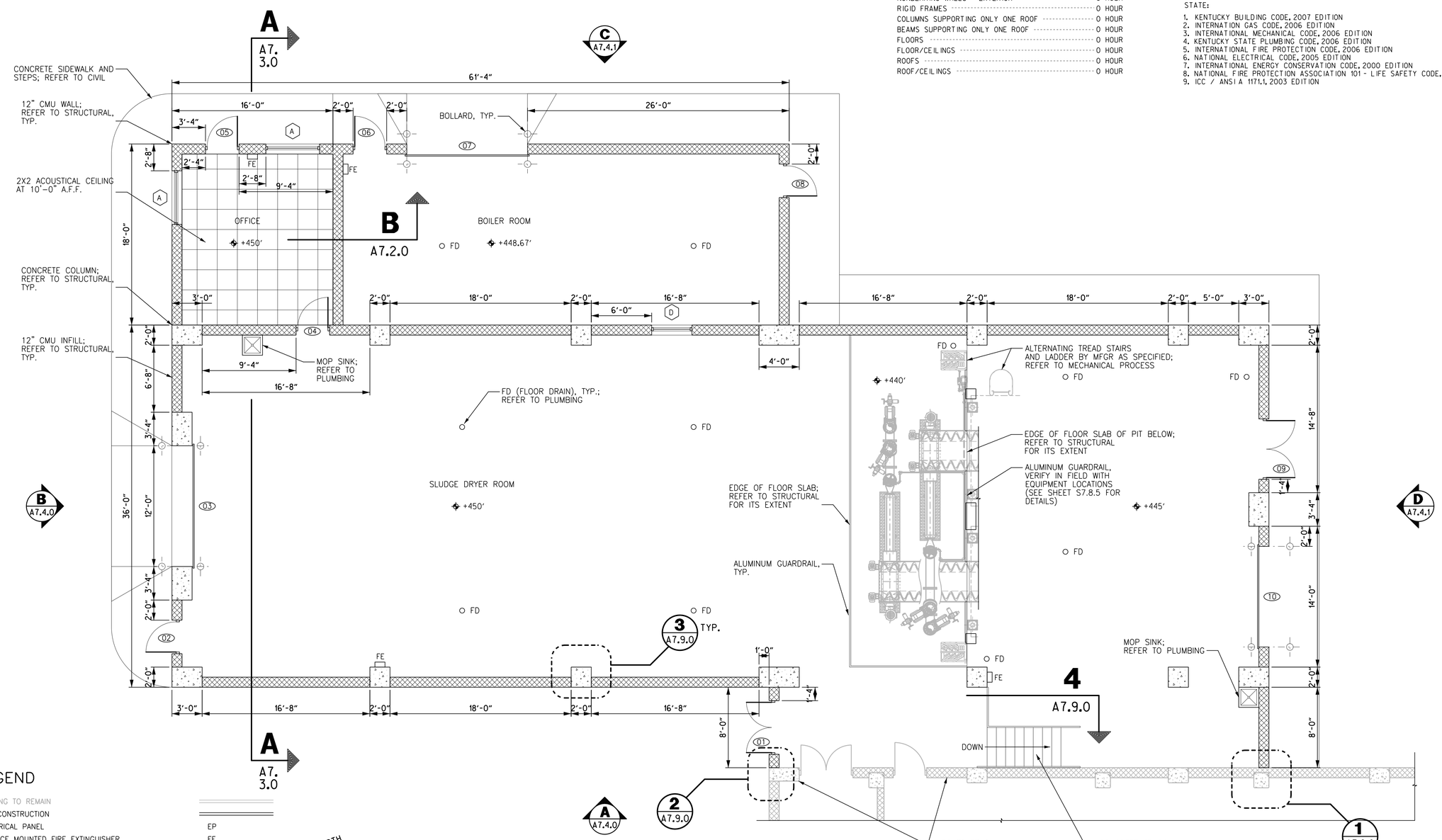
MEANS OF EGRESS:

TRAVEL DISTANCES:
PER 2007 EDITION OF THE KENTUCKY BUILDING CODE,
SECTION 421.5.1.2: 150 FEET

GOVERNING CODES AND REGULATIONS:

FEDERAL:
1. THE AMERICANS WITH DISABILITIES (ADA), ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES - 1991

STATE:
1. KENTUCKY BUILDING CODE, 2007 EDITION
2. INTERNATION GAS CODE, 2006 EDITION
3. INTERNATIONAL MECHANICAL CODE, 2006 EDITION
4. KENTUCKY STATE PLUMBING CODE, 2006 EDITION
5. INTERNATIONAL FIRE PROTECTION CODE, 2006 EDITION
6. NATIONAL ELECTRICAL CODE, 2005 EDITION
7. INTERNATIONAL ENERGY CONSERVATION CODE, 2000 EDITION
8. NATIONAL FIRE PROTECTION ASSOCIATION 101 - LIFE SAFETY CODE, 2000 EDITION
9. ICC / ANSI A 117.1, 2003 EDITION



LEGEND

EXISTING TO REMAIN	
NEW CONSTRUCTION	
ELECTRICAL PANEL	EP
SURFACE MOUNTED FIRE EXTINGUISHER	FE
OWNER FURNISHED EQUIPMENT	
DOOR DESIGNATION (SEE SHEET A7.9.2 AND PROJECT MANUAL FOR DOOR, FRAME AND HARDWARE SCHEDULE)	00
WINDOW DESIGNATION (SEE SHEET A7.9.2 AND PROJECT MANUAL FOR WINDOW SCHEDULE)	2

NORTH

A LOWER LEVEL FLOOR PLAN
SCALE: 3/16" = 1'-0" 3' 0 5'

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION

No. -	Date -	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

NEW CONSTRUCTION LOWER LEVEL FLOOR PLAN

A7.2.0

PROJECT: 26064.01
DATE: JULY, 2010

luckett
B.O.
luckett
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GENERAL NOTES FOR ROOF PLAN

1. REFER TO MECHANICAL, PLUMBING, FIRE PROTECTION, AND ELECTRICAL DRAWINGS FOR LOCATIONS OF ADDITIONAL ITEMS WHICH HAVE NOT BEEN SHOWN ON THIS ROOF PLAN (INCLUDING PIPING, CURBS, VENTS, DUCTS, FANS, LIGHTNING PROTECTION, ETC.).

2. PAINT EXPOSED ROOF MOUNTED EQUIPMENT, PIPING, ETC. IN A COLOR AS SELECTED BY ARCHITECT, EXCEPT THAT ITEMS WHICH ARE ALUMINUM OR STAINLESS STEEL SHALL NOT BE PAINTED.

3. THE GENERAL CONTRACTOR SHALL VERIFY THAT THERE IS PROPER COORDINATION BETWEEN THE ROOFING CONTRACTOR AND THE PLUMBING CONTRACTOR SO THAT ALL ROOF SCUPPERS ARE SET AT A "LOW POINT", AND SO THAT ALL AREAS OF ALL ROOFS SLOPE TO A SCUPPER DRAIN AT A MINIMUM SLOPE OF 1/4 INCH (VERTICAL) IN 1'-0" (HORIZONTAL). THE ROOF SLOPE MUST BE CONTINUOUS WITH A CONSTANT GRADIENT/DEGREE OF SLOPE FROM "HIGH POINT" TO "LOW POINT". CHANGE IN GRADIENT/DEGREE OF ROOF SLOPE IS NOT ALLOWED IN ANY SINGLE "RUN" OF THE ROOF. THE ABSOLUTE MINIMUM ROOF SLOPE SHALL BE 1/4 INCH (VERTICAL) IN 1'-0" (HORIZONTAL); HOWEVER, THE ROOF SLOPE IN MANY AREAS MAY BE MUCH STEEPER THAN 1/4 INCH (VERTICAL) IN 1'-0" (HORIZONTAL) IN ORDER TO PROVIDE THE REQUIRED CONSTANT GRADIENT/DEGREE OF SLOPE.
   A. IN REGARDS TO ROOF DRAINAGE COMPLY WITH OF THE KENTUCKY BUILDING CODE.

4. THE "LIMITS OF CONSTRUCTION" LINES SHOWN ON THE ARCHITECT'S ROOF PLAN APPLY ONLY TO THE LIMITS OF THE ARCHITECTURAL NEW CONSTRUCTION AND RENOVATION ON THE ROOF. SEE THE OTHER DISCIPLINES' DRAWINGS FOR THE LIMITS OF THE NEW CONSTRUCTION AND RENOVATION ON THE ROOF FOR THEIR DISCIPLINE.

LEGEND FOR ROOF PLAN

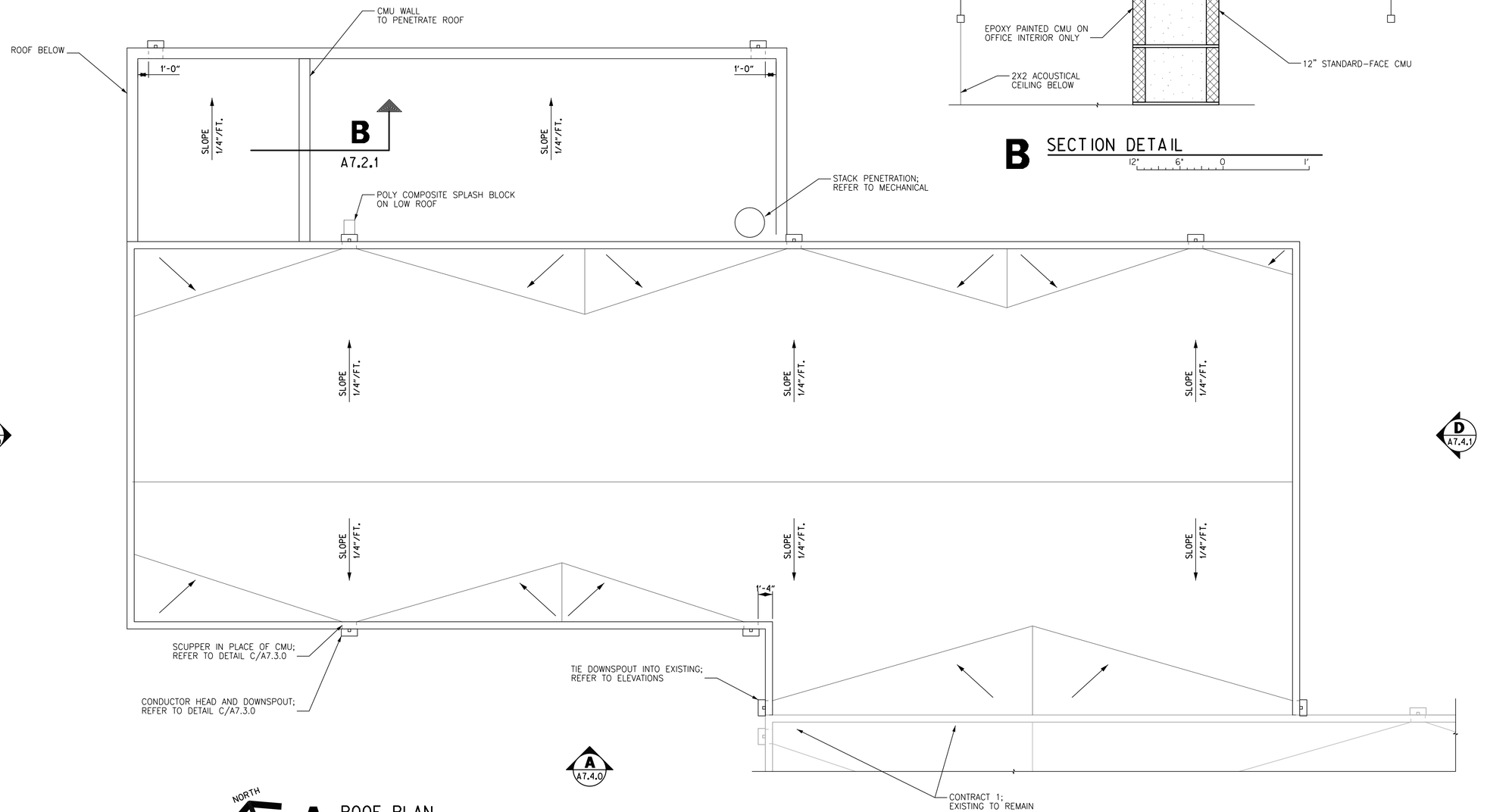
EXISTING TO REMAIN

NEW CONSTRUCTION

DOWNWARD DIRECTION OF ROOF SLOPE (COMPLY WITH NOTE 3)

PARAPET

EXTERIOR ELEVATION DESIGNATION (2 / A3.1)

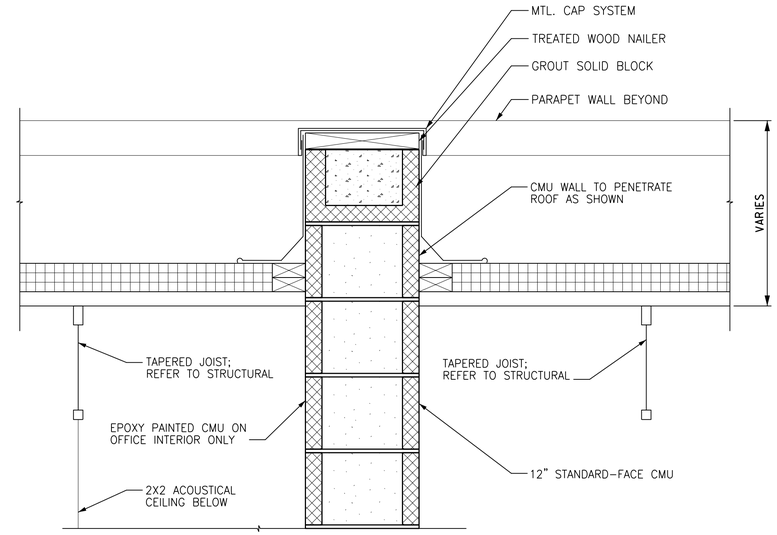


A ROOF PLAN

SCALE: 3/16" = 1'-0"

3' 0 5'

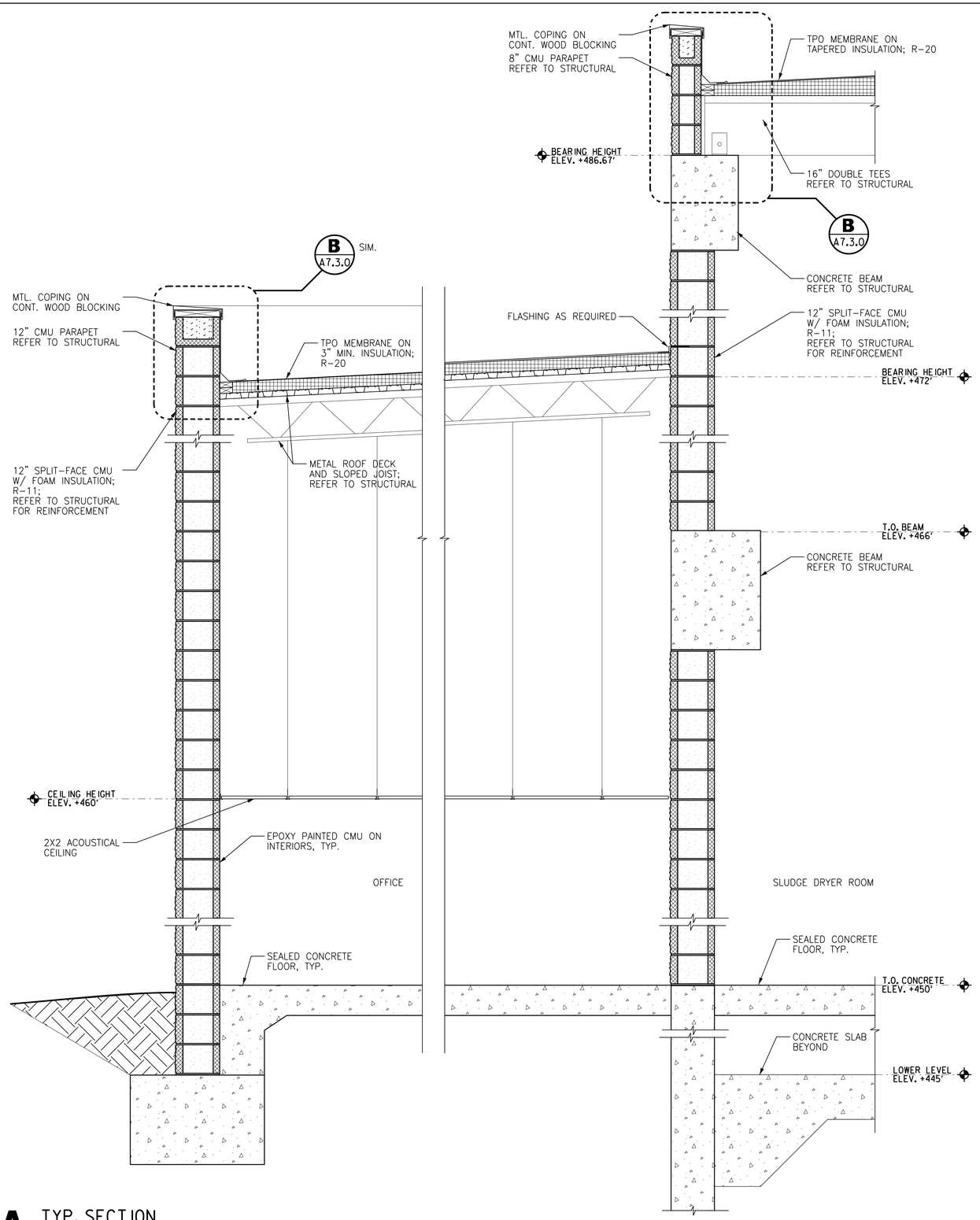
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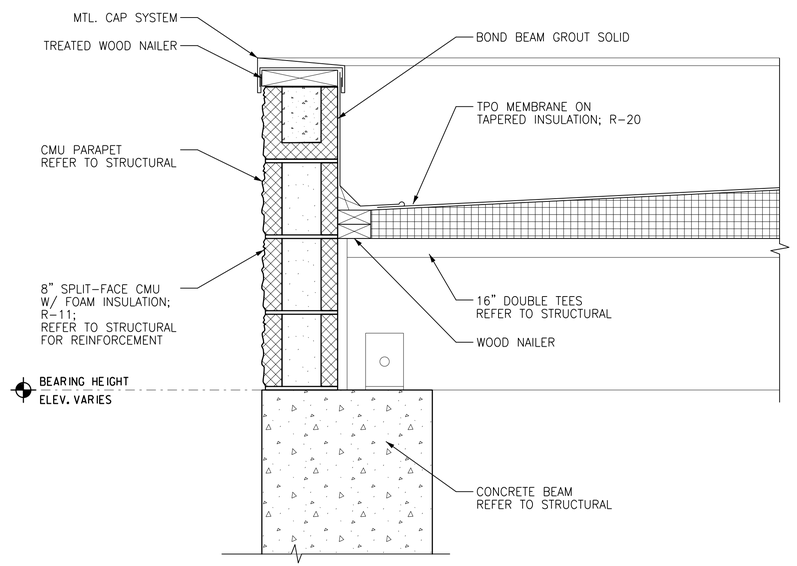
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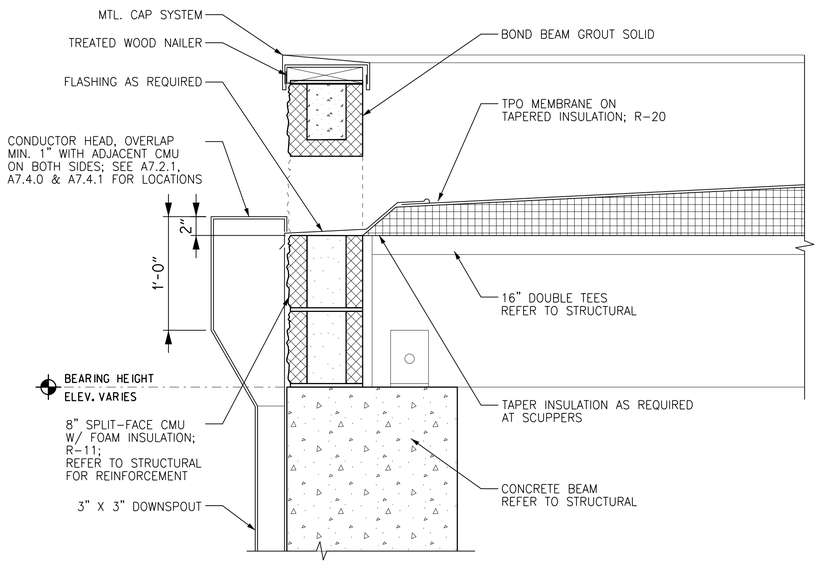
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[CONSTRUCT ON DIMENSION, MESH FILL LINE STYLES, PATTERN, POINTS, FACE, MESH FILES
ELEVATIONS, SECTIONS, DETAILS, SCHEDULES, MATERIALS, FINISHES, & PATTERNS AS NOTED ON DRAWINGS]
Project Data
Project Number 26064.01
Project Name BGMU WWTP EXPANSION
Project Status 100% CONSTRUCTION DOCUMENTS
Project Address BOWLING GREEN, KENTUCKY
Author BJM/TS
Drawn By BJM/TS
Checked By BJM/TS
Date/Time Stamp 7/14/2010 1:48:28 PM
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A TYP. SECTION
SCALE: 3/4" = 1'-0"



B SECTION DETAIL
SCALE: 1 1/2" = 1'-0"



C SECTION DETAIL
SCALE: 1 1/2" = 1'-0"

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CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES
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Bowling Green, Kentucky
BGMU Project No. S07-653

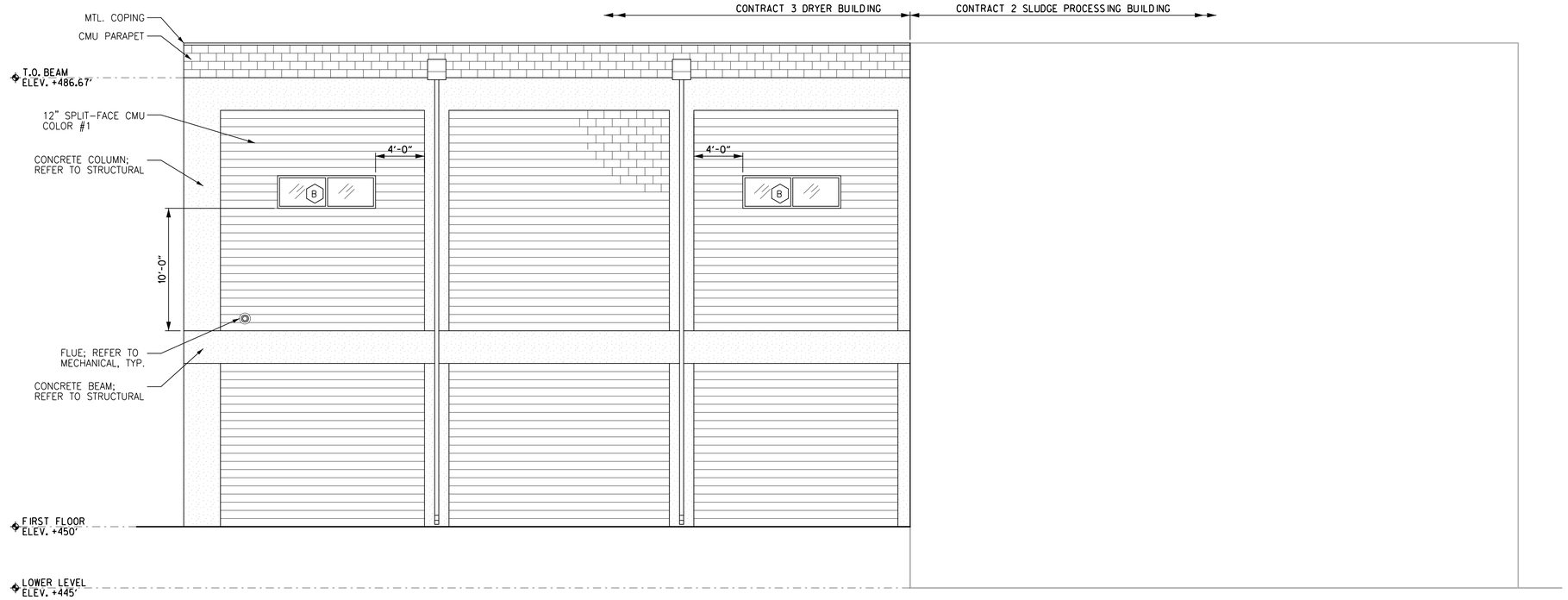
REVISION		
No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

EXTERIOR WALL SECTIONS

A7.3.0

PROJECT: 26064.01
DATE: JULY, 2010

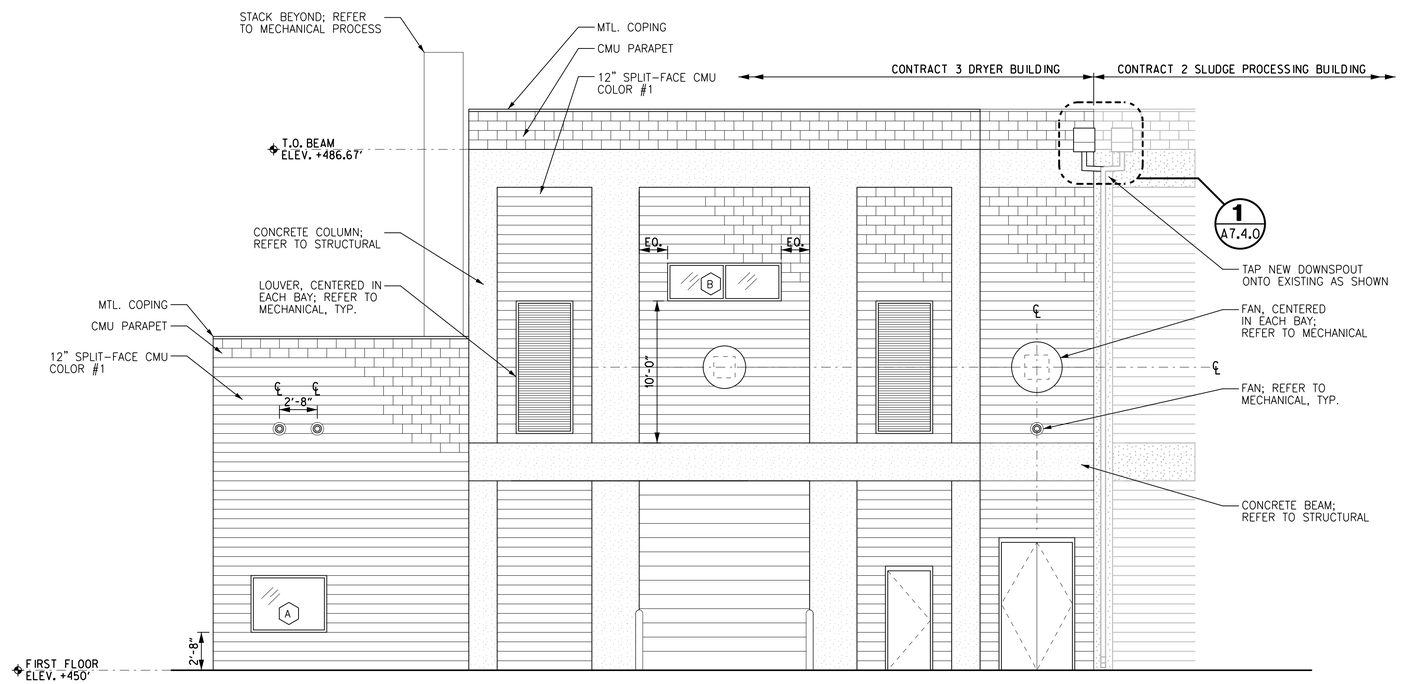
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A SOUTH ELEVATION

SCALE: 3/16" = 1'-0"

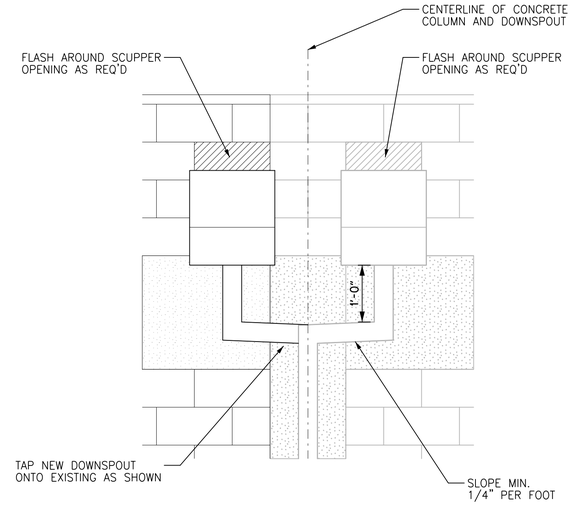
3' 0 5'



B WEST ELEVATION

SCALE: 3/16" = 1'-0"

3' 0 5'



1 DETAIL

12" 0 1'

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BOWLING GREEN MUNICIPAL UTILITIES

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Bowling Green, Kentucky

BGMU Project No. S07-653

REVISION

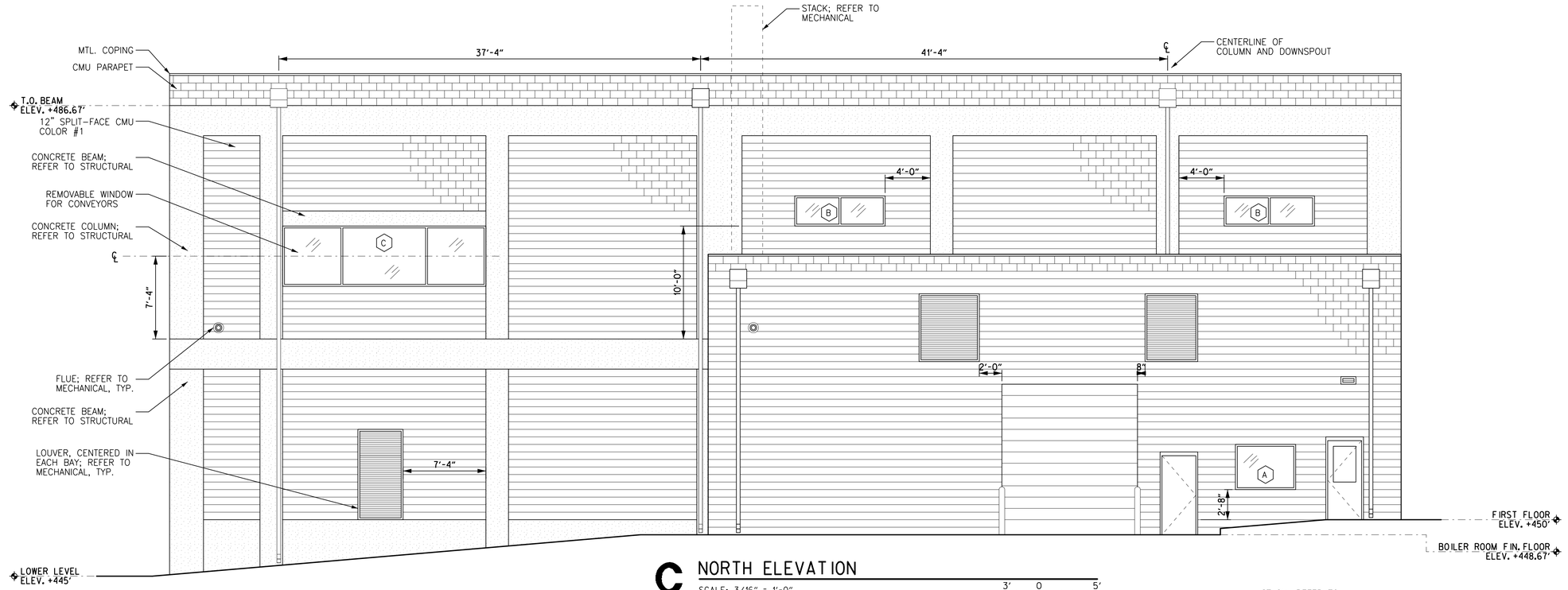
No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

EXTERIOR ELEVATIONS

A7.4.0

PROJECT: 26064.01
DATE: JULY, 2010

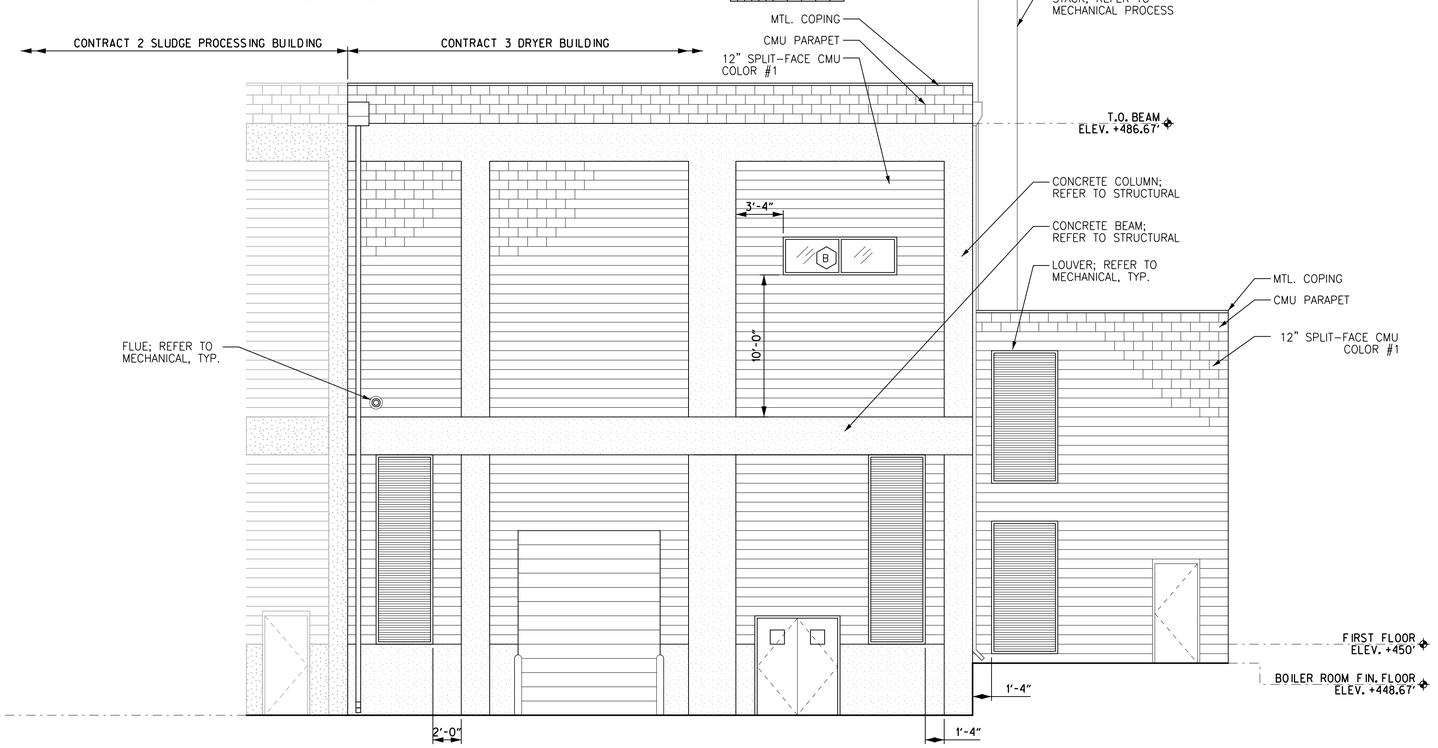
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C NORTH ELEVATION

SCALE: 3/16" = 1'-0"

3' 0 5'

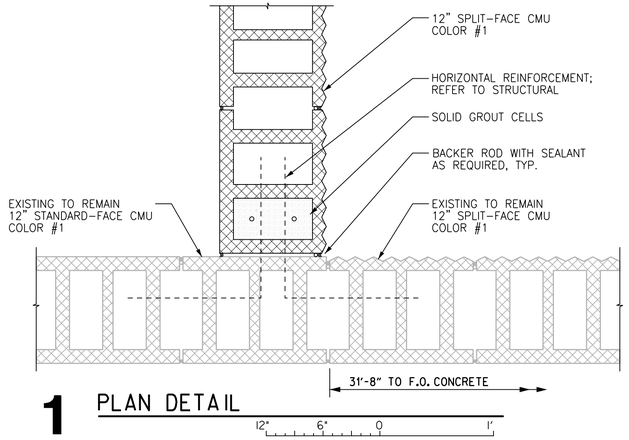


D EAST ELEVATION

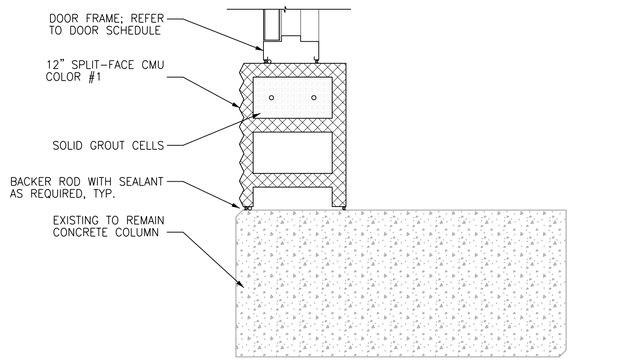
SCALE: 3/16" = 1'-0"

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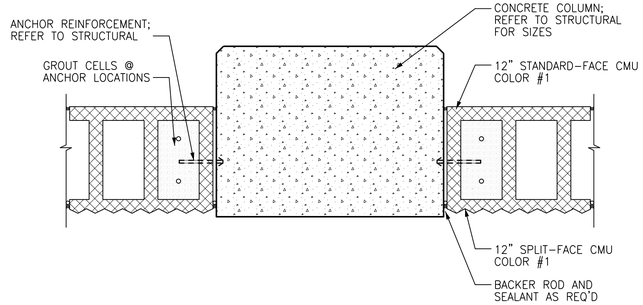
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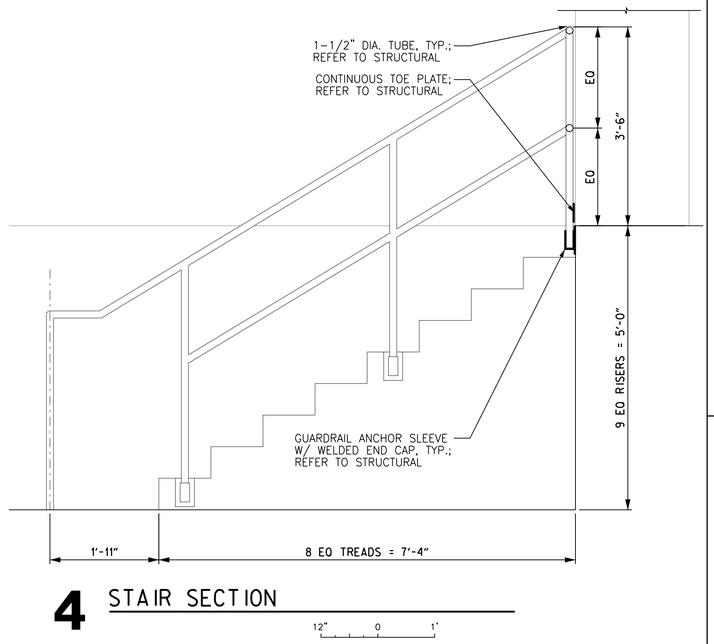
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2 PLAN DETAIL



3 PLAN DETAIL

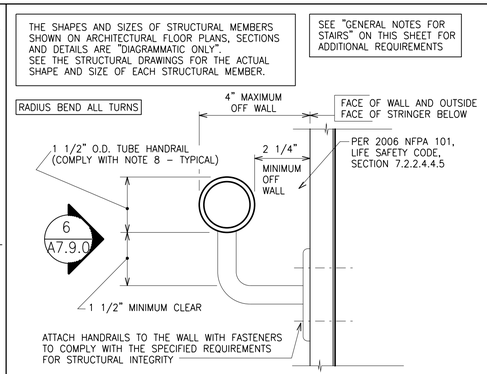


4 STAIR SECTION

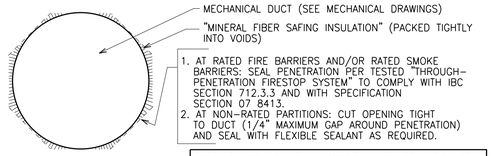
12" 0 1'

THE SHAPES AND SIZES OF STRUCTURAL MEMBERS SHOWN ON ARCHITECTURAL FLOOR PLANS, SECTIONS AND DETAILS ARE "DIAGRAMMATIC ONLY". SEE THE STRUCTURAL DRAWINGS FOR THE ACTUAL SHAPE AND SIZE OF EACH STRUCTURAL MEMBER.

SEE "GENERAL NOTES FOR STAIRS" ON THIS SHEET FOR ADDITIONAL REQUIREMENTS

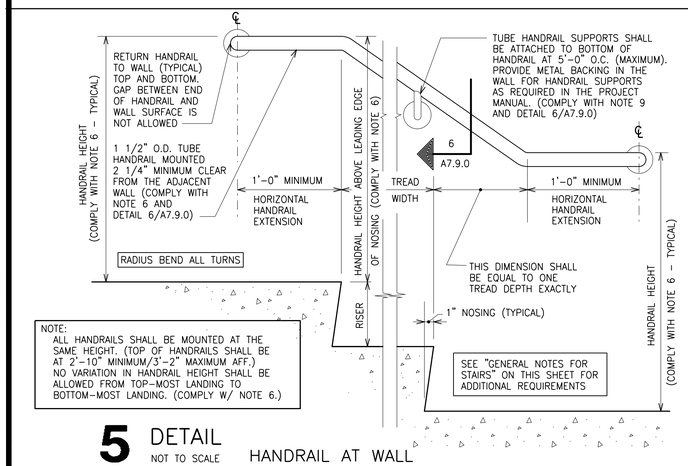


6 DETAIL
NOT TO SCALE
HANDRAIL CONFIGURATION AND ATTACHMENT TO WALL (SIMILAR AT SIDE OF GUARDRAIL TUBE SUPPORT)



NOTE: IF DUCT IS TO BE INSULATED, DO NOT RUN DUCT INSULATION THROUGH THE WALL. FLARE DUCT INSULATION ONTO FACE OF WALL AROUND DUCT ON BOTH SIDES OF WALL, AND SEAL DUCT INSULATION TO FACE OF WALL WITH INSULATION MASTIC.

7 DETAIL
NOT TO SCALE
DUCT PENETRATION IN NON-RATED PARTITIONS (OR IN RATED FIRE BARRIERS & SMOKE BARRIERS ONLY IF DAMPER IS NOT REQUIRED BY CODE)



5 DETAIL
NOT TO SCALE
HANDRAIL AT WALL

GENERAL NOTES FOR STAIRS

1. STAIRWAYS INCLUDING HANDRAILS AND GUARDRAILS SHALL COMPLY WITH THE MOST STRINGENT REQUIREMENTS OF THE FOLLOWING CODES AND WITH ANY ADDITIONAL REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION:
   A. 2007 KENTUCKY BUILDING CODE SECTIONS 403.13, 905.4.1, 909.20, 1003, 1004, 1005, 1007.3, 1008, 1009, 1012, 1020.1.4, 1020.1.7, 3310, ETC. AND TABLES 1005.1, ETC.
   B. ICC/ANSI A117.1-2003 SECTIONS 307.4, 402.2, 504, 505, ETC. AND FIGURES 307.4, ETC.
   C. 1991 AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES [ADAAG] SECTIONS 4.3.11.3, 4.1.3(9), 4.9, ETC.
2. STAIRWAY WIDTH:
   A. MINIMUM WIDTH OF STAIRWAYS SHALL BE DETERMINED USING THE APPLICABLE CODE REFERENCES ABOVE, BUT IN NO CASE SHALL THE WIDTH BE LESS THAN 36 INCHES CLEAR BETWEEN FACE OF GUARDRAILS AND/OR WALLS, OR LESS THAN WHAT IS SHOWN ON THE DRAWINGS, WHICHEVER IS WIDER.
   B. STAIRS SHALL BE CLEAR OF ALL OBSTRUCTIONS EXCEPT FOR PROJECTIONS NOT EXCEEDING 4 INCHES AT OR BELOW HANDRAIL HEIGHT ON EACH SIDE.
   C. WIDTH OF STAIRS SHALL NOT DECREASE IN THE DIRECTION OF EXIT TRAVEL.
3. HEADROOM: STAIRWAYS SHALL HAVE A MINIMUM HEADROOM CLEARANCE OF 6'-8" MEASURED VERTICALLY FROM A LINE CONNECTING THE EDGE OF THE NOSINGS. THE MINIMUM CLEARANCE SHALL BE MAINTAINED FOR THE FULL WIDTH OF THE STAIRWAY AND LANDING. COMPLY WITH KENTUCKY BUILDING CODE SECTION 1009.2.
4. STAIR TREADS AND RISERS:
   A. STAIR RISER HEIGHTS SHALL BE 7 INCHES MAXIMUM / 4 INCHES MINIMUM. STAIR TREAD DEPTHS SHALL BE 11 INCHES MINIMUM. THE RISER HEIGHT SHALL BE MEASURED VERTICALLY BETWEEN THE LEADING EDGES OF ADJACENT TREADS. THE TREAD DEPTH SHALL BE MEASURED HORIZONTALLY BETWEEN THE VERTICAL PLANES OF THE FOREMOST PROJECTION OF ADJACENT TREADS AND AT A RIGHT ANGLE TO THE TREAD'S LEADING EDGE.
   B. STAIR TREADS SHALL BE OF UNIFORM DEPTH & SHAPE AND RISERS SHALL BE OF UNIFORM HEIGHT & SHAPE IN ANY STAIRWAY BETWEEN TWO FLOORS. THERE SHALL BE NO VARIATION EXCEEDING 3/16 INCH IN THE DEPTH OF ADJACENT TREADS OR IN THE HEIGHT OF ADJACENT RISERS; AND THE TOLERANCE BETWEEN THE LARGEST AND SMALLEST RISER OR BETWEEN THE LARGEST AND SMALLEST TREAD SHALL NOT EXCEED 3/8 INCH IN ANY FLIGHT OF STAIRS. COMPLY WITH NOTE 5.
5. STAIRWAY WALKING SURFACES: THE WALKING SURFACE OF TREADS AND LANDINGS OF A STAIRWAY SHALL NOT BE SLOPED STEEPER THAN ONE UNIT VERTICAL IN 50 UNITS HORIZONTAL [2 PERCENT MAXIMUM SLOPE] IN ANY DIRECTION. FINISH FLOOR SURFACES SHALL HAVE A SLIP-RESISTANT SURFACE AND THE FINISH FLOORING SHALL BE SECURELY ATTACHED.
6. HANDRAILS:
   A. STAIRWAYS SHALL HAVE HANDRAILS ON EACH SIDE. HANDRAILS SHALL BE ADEQUATE IN STRENGTH AND ATTACHMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE GOVERNING CODES AND THE SPECIFICATIONS.
   B. THE HEIGHT TO THE TOP OF THE HANDRAILS FOR THIS PROJECT SHALL BE 34 INCHES HIGH UNLESS OTHERWISE APPROVED IN WRITING BY THE ARCHITECT. ALL HANDRAILS SHALL BE INSTALLED AT THE SAME HEIGHT. VARIANCE IN HANDRAIL MOUNTING HEIGHT IS NOT ALLOWED. (NOTE: IN ACCORDANCE WITH THE CODES, HANDRAIL HEIGHT (AS MEASURED ABOVE THE LEADING EDGE OF THE STAIR NOSING) SHALL BE UNIFORM, NOT LESS THAN 34 INCHES [2'-10"] HIGH AND NOT GREATER THAN 38 INCHES [3'-2"] HIGH.)
   C. HANDRAILS SHALL RETURN TO A WALL, GUARD OR THE WALKING SURFACE. WHERE HANDRAILS ARE NOT CONTINUOUS BETWEEN FLIGHTS, THE HANDRAILS SHALL: EXTEND HORIZONTALLY AT LEAST 12 INCHES BEYOND THE TOP RISER; CONTINUE TO SLOPE FOR THE DEPTH OF ONE TREAD BEYOND THE BOTTOM RISER; AND THEN EXTEND HORIZONTALLY AT LEAST 12 INCHES.
   D. HANDRAIL-GRIPPING SURFACES SHALL BE CONTINUOUS, WITHOUT INTERRUPTION BY OBSTRUCTIONS. COMPLY WITH DETAIL 6/A7.9.0 FOR ATTACHMENT TO THE WALL.
   E. THE CLEARANCE BETWEEN A NEW HANDRAIL AND THE WALL TO WHICH IT IS FASTENED SHALL BE A MINIMUM OF 2 1/4 INCHES. THE HANDRAIL, WALL OR OTHER SURFACE ADJACENT TO THE HANDRAIL SHALL BE FREE OF ANY SHARP OR ABRASIVE ELEMENTS. COMPLY WITH DETAIL 6/A7.9.0.
   F. THE MAXIMUM PROJECTION OF A HANDRAIL INTO THE STAIR SHALL NOT EXCEED 4 INCHES.
7. GUARDRAILS [GUARDS]:
   A. GUARDRAILS SHALL BE LOCATED ALONG ALL OPEN-SIDED WALKING SURFACES, STAIRWAYS AND LANDINGS WHICH ARE LOCATED MORE THAN 30 INCHES ABOVE THE FLOOR OR GRADE BELOW. GUARDRAILS SHALL BE ADEQUATE IN STRENGTH AND ATTACHMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE GOVERNING CODES AND THE SPECIFICATIONS.
   B. GUARDRAILS SHALL BE A MINIMUM OF 42 INCHES [3'-6"] ABOVE THE FINISH FLOOR, LANDING AND STAIR NOSING.
8. SEE STRUCTURAL DRAWINGS FOR ATTACHMENT OF STEEL STAIRS TO THE STRUCTURE, AND CONCRETE STAIRS, LANDINGS AND BEAMS.
9. WOOD BLOCKING IS NOT ALLOWED FOR IN-WALL SUPPORTS. COMPLY WITH DETAIL 6/A7.9.0. ALSO, SEE SPECIFICATIONS AND DETAILS FOR FURTHER SPECIFIC REQUIREMENTS.

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

REVISION

No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

MISCELLANEOUS DETAILS

A7.9.0

PROJECT: 26064.01
DATE: JULY, 2010

luckett
FILE: P:\26064.01\a\26064A790.dgn
B.O.

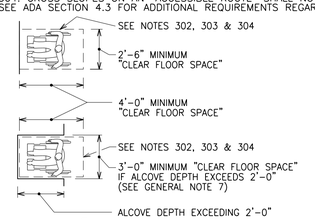
Notes for "Accessible Route" and "Clear Floor Space":

301. SEE ADA SECTIONS 4.2.5 & 4.2.6, ADA FIGURES 4, 5 & 6, AND ANSI SECTIONS 305, 308 & 309 FOR ADDITIONAL REQUIREMENTS REGARDING "FORWARD REACH" AND "SIDE REACH".

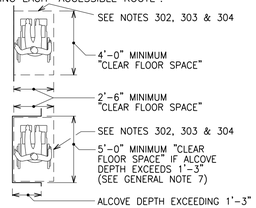
302. ONE FULL UNOBSTRUCTED SIDE OF THE "CLEAR FLOOR SPACE" SHALL ADJOIN OR OVERLAP AN "ACCESSIBLE ROUTE" OR ADJOIN ANOTHER "CLEAR FLOOR SPACE" PER ADA SECTION 4.2.4.2 AND ANSI SECTION 305.6.

303. FLOOR SURFACES OF BOTH "CLEAR FLOOR SPACE" AND "WHEELCHAIR TURNING SPACE" SHALL HAVE A SLOPE NOT GREATER THAN 1:50 [ONE VERTICAL IN 50 HORIZONTAL]. SEE NOTE 304.

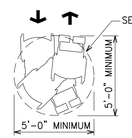
304. CROSS SLOPES ON AN "ACCESSIBLE ROUTE" SHALL NOT EXCEED 1:50 [ONE VERTICAL IN 50 HORIZONTAL]. SEE ADA SECTION 4.3 FOR ADDITIONAL REQUIREMENTS REGARDING EACH "ACCESSIBLE ROUTE".



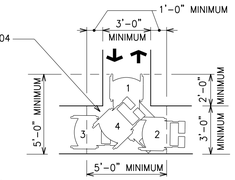
A "Clear Floor Space" for Forward Reach
Forward Approach



B "Clear Floor Space" for Side Reach
Side Approach



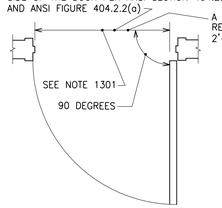
C 5'-0" Diameter "Wheelchair Turning Space"



D T-Shaped "Wheelchair Turning Space" for 180 Degree Turns

3 "CLEAR FLOOR SPACE", "ACCESSIBLE ROUTE" AND "WHEELCHAIR TURNING SPACE"
NOT TO SCALE

MINIMUM REQUIRED CLEAR WIDTH OF DOORWAY MUST BE MEASURED BETWEEN FACE OF DOOR (IN 90 DEGREE OPEN POSITION) AND THE FACE OF THE PROTRUDING STOP ON THE OPPOSITE SIDE OF THE DOOR PER ANSI SECTION 404.2.2 AND ANSI FIGURE 404.2.2(a)



A Method for Measuring Minimum Door Width at Swinging Door

Notes for Door Widths:

1301. FOR ALL SWINGING DOORS THROUGH WHICH A PERSON WOULD ENTER A SPACE, A 3'-0" MINIMUM WIDTH DOOR SHALL BE PROVIDED (AS THIS WOULD ALLOW FOR THE 2'-8" MINIMUM REQUIRED CLEAR WIDTH OF THE DOORWAY AS REQUIRED BY ADA SECTION 4.13.5 AND ANSI SECTION 404.2.2).

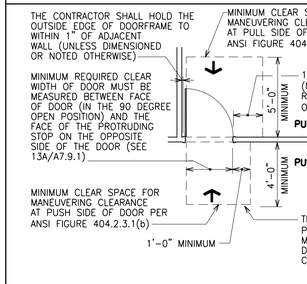
1302. A MAXIMUM WIDTH OF 4'-0" IS ALLOWED BY CODE FOR ANY SINGLE SWINGING DOOR LEAF.

1303. PER ANSI SECTION 404.2.2, THERE SHALL BE NO PROJECTIONS INTO THE CLEAR OPENING WIDTH OF A DOOR LOWER THAN 2'-10" AFF. PROJECTIONS INTO THE CLEAR OPENING WIDTH BETWEEN 2'-10" AFF AND 6'-8" AFF ARE PERMITTED, BUT SHALL NOT EXCEED 4".

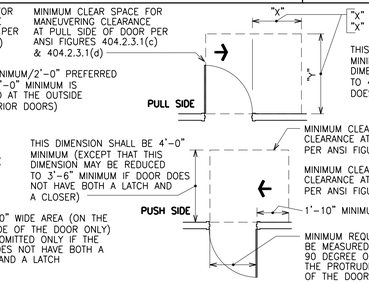
13 DOORWAY WIDTHS

GENERAL NOTES FOR 1991 ADA & ICC/ANSI A117.1-2003 ACCESSIBILITY REQUIREMENTS:

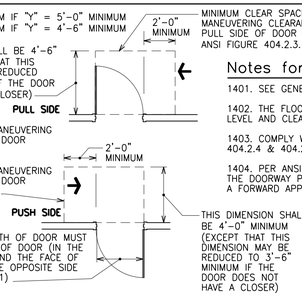
1. " ↑ " INDICATES DIRECTION OF APPROACH.
2. "AFF" INDICATES "ABOVE FINISH FLOOR"
   "MIN." INDICATES "MINIMUM"
   "MAX" INDICATES "MAXIMUM"
3. MANEUVERING CLEARANCES SHALL BE PROVIDED AT ALL DOORS THAT ARE NOT "AUTOMATIC" OR "POWER-ASSISTED". SEE ADA SECTION 4.13 AND ANSI SECTION 1002.5. SEE DETAIL 14/A7.9.1.



A Front Approaches at Swinging Doors



B Hinge Side Approaches at Swinging Doors



C Latch Side Approaches at Swinging Doors

Notes for Maneuvering Clearances at Doors:

1401. SEE GENERAL NOTE 3 ON THIS SHEET.

1402. THE FLOOR OR GROUND AREA WITHIN THE REQUIRED MANEUVERING CLEARANCES AT DOORS SHALL BE LEVEL AND CLEAR.

1403. COMPLY WITH THE MOST STRINGENT OF THE FOLLOWING: ADA SECTION 4.13.6, ANSI SECTIONS 404.2.3, 404.2.4 & 404.2.5, AND ANSI FIGURES 404.2.3.1, 404.2.3.2, 404.2.3.4 & 404.2.5.

1404. PER ANSI SECTION 404.2.3.4, WHERE ANY OBSTRUCTION WITHIN 18 INCHES OF THE LATCH SIDE OF THE DOORWAY PROJECTS MORE THAN 8" BEYOND THE FACE OF THE DOOR, MANEUVERING CLEARANCES FOR A FORWARD APPROACH SHALL BE PROVIDED.

14 MANEUVERING CLEARANCES AT DOORS & DOORWAYS

Notes for Limits of Protruding Objects into Circulation Paths:

1701. OBJECTS WHICH PROTRUDE INTO CIRCULATION PATHS (WALKS, SIDEWALKS, HALLS, CORRIDORS, PASSAGEWAYS OR AISLES) SHALL COMPLY WITH ANSI SECTION 307, ANSI FIGURES 307.2, 307.3 & 307.4, ADA SECTION 4.4, AND ADA FIGURE 8(a-e). THESE OBJECTS INCLUDE, BUT ARE NOT LIMITED TO: WALL MOUNTED OBJECTS [TELEPHONES, CORRIDOR HANDRAILS, SINKS, SIGNS, TIME CLOCKS, FIRE EXTINGUISHERS, LIGHT FIXTURES, ETC.]; CEILING MOUNTED OBJECTS [EXIT SIGNS, LIGHT FIXTURES, SMOKE DETECTORS, EQUIPMENT, ETC.]; POST-MOUNTED OBJECTS [TELEPHONES, SIGNS, LIGHT FIXTURES, ETC.]; STRUCTURAL ELEMENTS; COUNTERTOPS; LEDGES; PARKED CARS; ETC.

1702. PROTRUDING OBJECTS SHALL NOT PROTRUDE INTO THE REQUIRED CLEAR WIDTH OF AN ACCESSIBLE ROUTE OR MANEUVERING SPACE AS IDENTIFIED AND REQUIRED BY ADA SECTION 4.4.1 AND ANSI SECTION 307.5. ALSO SEE DETAILS 3 & 14/A7.9.1.

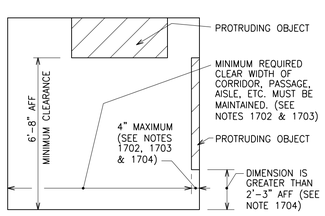
1703. PROTRUDING OBJECTS SHALL NOT REDUCE THE REQUIRED MINIMUM CLEAR WIDTH OF A CORRIDOR, PASSAGEWAY OR AISLE AS IDENTIFIED AND REQUIRED BY THE APPLICABLE BUILDING CODES, LIFE SAFETY CODE OR STATE HEALTH CODES THAT ARE ENFORCED BY THE AUTHORITIES HAVING JURISDICTION FOR THIS PARTICULAR PROJECT.

1704. PER ANSI SECTION 307.2 AND ANSI FIGURE 307.2, OBJECTS PROTRUDING FROM WALLS WITH THEIR LEADING EDGES BETWEEN 2'-3" AFF AND 6'-8" AFF SHALL PROTRUDE NO MORE THAN 4" INTO A CIRCULATION PATH. SEE NOTES 1702 & 1703 FOR ADDITIONAL REQUIREMENTS.

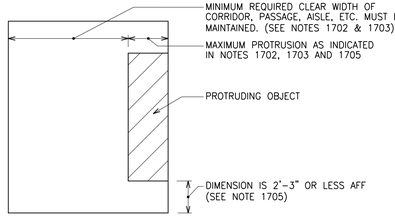
1705. PER ANSI SECTION 307.2, OBJECTS THAT ARE MOUNTED WITH THEIR LEADING EDGES AT OR BELOW 2'-3" AFF MAY PROJECT OR PROTRUDE ANY AMOUNT, AS LONG AS THEY ALSO COMPLY WITH NOTES 1702 & 1703.

1706. PER ANSI SECTION 307.3, FREESTANDING OBJECTS THAT ARE MOUNTED ON POSTS OR PYLONS MAY OVERHANG HORIZONTALLY 4" MAXIMUM IF THE LEADING EDGE OF THE OVERHANGING OBJECT IS BETWEEN 2'-3" AFF AND 6'-8" AFF, AS LONG AS THEY ALSO COMPLY WITH NOTES 1702 & 1703. IF THERE ARE MULTIPLE POSTS OF PYLONS, THE CLEAR DISTANCE BETWEEN THE POSTS OR PYLONS SHALL BE A MAXIMUM OF 1'-0".

1707. WALKS, SIDEWALKS, HALLS, CORRIDORS, PASSAGEWAYS, AISLES AND OTHER CIRCULATION PATHS SHALL HAVE 6'-8" MINIMUM CLEAR HEADROOM. IF THE VERTICAL CLEARANCE OF AN AREA THAT IS ADJOINING AN ACCESSIBLE ROUTE IS REDUCED TO LESS THAN 6'-8", A BARRIER TO WARN BLIND OR VISUALLY-IMPAIRED PERSONS SHALL BE PROVIDED TO COMPLY WITH ANSI SECTION 307.4, ANSI FIGURE 307.4, ADA SECTION 4.4.2, AND ADA FIGURE 8(c-1).



A Leading Edge of Object Greater than 2'-3" AFF



B Leading Edge of Object 2'-3" or Less AFF

17 LIMITS OF PROTRUDING OBJECTS INTO CIRCULATION PATHS

G S & P
Design Services For The Built Environment
Atlanta
Birmingham
Charlotte
Cincinnati
Columbus
Dallas
Fort Lauderdale
Jacksonville
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BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION

No.	Date	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

ADA & 2003 ANSI ACCESSIBILITY DETAILS AND NOTES

A7.9.1

PROJECT: 26064.01
DATE: JULY, 2010

PLOTTED: 7/26/2010 10:40:44 AM BY: lucketk
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XREFS: ...\CONTRACT 3\BGMU_A_ARCH_FILL_INC_STYLES_PATTERN_POINTS_1605_TRANSPARENCY_REV2011.FLT

DOOR SCHEDULE

DOOR NO.	SPACE NAME	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR SIZE THICKNESS	DOOR DESCRIPTION MAT.	DOOR DESCRIPTION TYPE	DOOR DESCRIPTION GLASS	FRAME DESCRIPTION MAT.	FRAME DESCRIPTION TYPE	FRAME DETAILS HEAD	FRAME DETAILS JAMB	HARDWR. SET NO.	REMARKS
01	SLUDGE DRYER ROOM	PR 2'-6"	9'-0"	1 3/4"	FRP	SG	1" INSULATED	FRP	D-1	1/A7.9.2	2/A7.9.2	5	
02	SLUDGE DRYER ROOM	3'-0"	7'-0"	1 3/4"	FRP	SG	1" INSULATED	FRP	S	1/A7.9.2	2/A7.9.2	3	CARD READER W/ KEYPAD
03	SLUDGE DRYER ROOM	12'-0"	13'-4"	-	STL	COILING	-	STL	-	3/A7.9.2	4/A7.9.2	1	
04	OFFICE	3'-0"	7'-0"	1 3/4"	FRP	HG	1/4" TEMP	FRP	S	1/A7.9.2	2/A7.9.2	6	
05	OFFICE	3'-0"	7'-0"	1 3/4"	FRP	HG	1" INSULATED	FRP	S	1/A7.9.2	2/A7.9.2	2	
06	BOILER ROOM	3'-0"	7'-0"	1 3/4"	FRP	F	-	FRP	S	1/A7.9.2	2/A7.9.2	3	CARD READER
07	BOILER ROOM	12'-0"	13'-4"	-	STL	COILING	-	STL	-	5/A7.9.2	6/A7.9.2	1	
08	BOILER ROOM	3'-0"	7'-0"	1 3/4"	FRP	F	-	FRP	S	1/A7.9.2	2/A7.9.2	3	CARD READER
09	SLUDGE DRYER ROOM	PR 2'-10"	6'-10"	1 3/4"	FRP	SG	1" INSULATED	FRP	D-2	1/A7.9.2	2/A7.9.2	4	
10	SLUDGE DRYER ROOM	10'-0"	13'-0"	-	STL	COILING	-	STL	-	5/A7.9.2	6/A7.9.2	1	

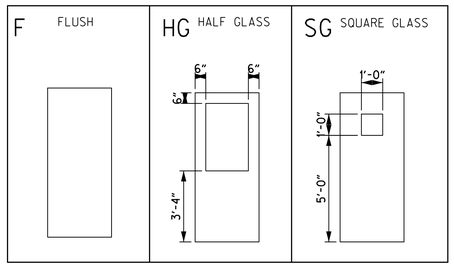
NOTES

1. THE CONTRACTOR SHALL CAREFULLY STUDY AND COMPARE THE CONTRACT DOCUMENTS AND THIS SHEET; AND HE SHALL IMMEDIATELY REPORT TO THE ARCHITECT ANY ERROR, INCONSISTENCY OR OMISSION THAT HE MAY DISCOVER.
2. REFER TO THE PROJECT MANUAL FOR HARDWARE SETS.
3. ALL FRAMES SHALL BE CAULKED CONTINUOUSLY TO THE WALL (EVEN WHERE JOINT IS NOT READILY VISIBLE.
4. WHEREVER THERE IS A CRACK LEFT BETWEEN THE BOTTOM OF THE DOOR FRAME AND THE FINISH FLOOR, THE CONTRACTOR SHALL PROVIDE A "PENCIL LINE CAULK" BETWEEN THE FRAME AND THE FINISH FLOOR TO SEAL THIS CRACK.
5. ALL THRESHOLDS SHALL CONFORM TO THE MOST STRINGENT REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND ALL OTHER ACCESSIBILITY CODES AS ENFORCED BY AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT.
6. THE CONTRACTOR SHALL VERIFY THE REQUIRED THROAT THICKNESS FOR EACH INDIVIDUAL DOOR FRAME IN EACH INDIVIDUAL WALL BASED UPON: THE SIZE OF CMU.

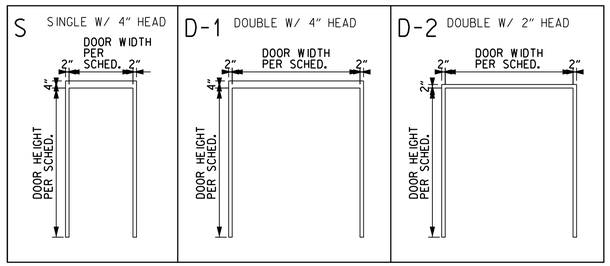
LEGEND

FRP	FIBERGLASS REINFORCED
HM	HOLLOW METAL
INSUL	INSULATED
OH	OPPOSITE HAND
PR	PAIR
SIM	SIMILAR
STL	STEEL
TEMP	TEMPERED

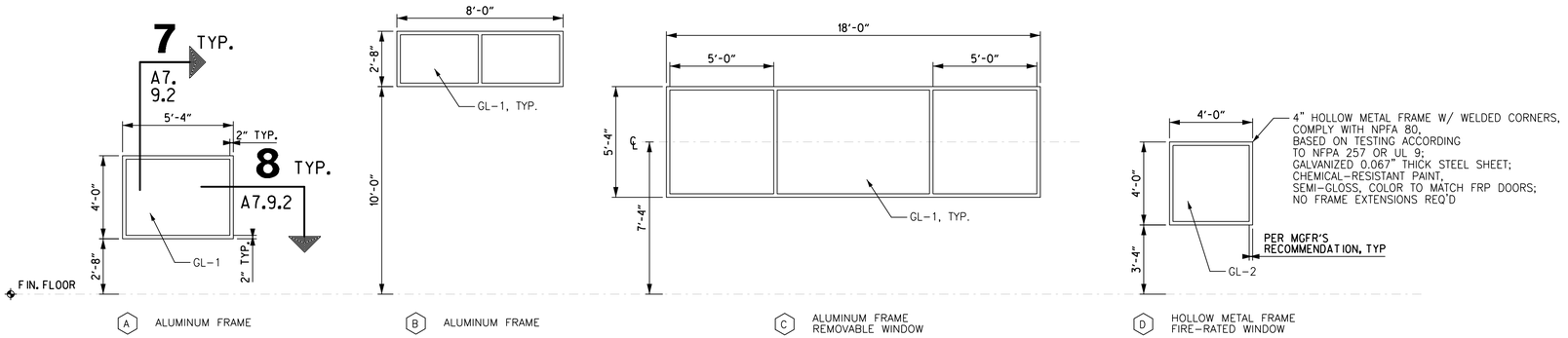
DOOR TYPES



DOOR FRAMES

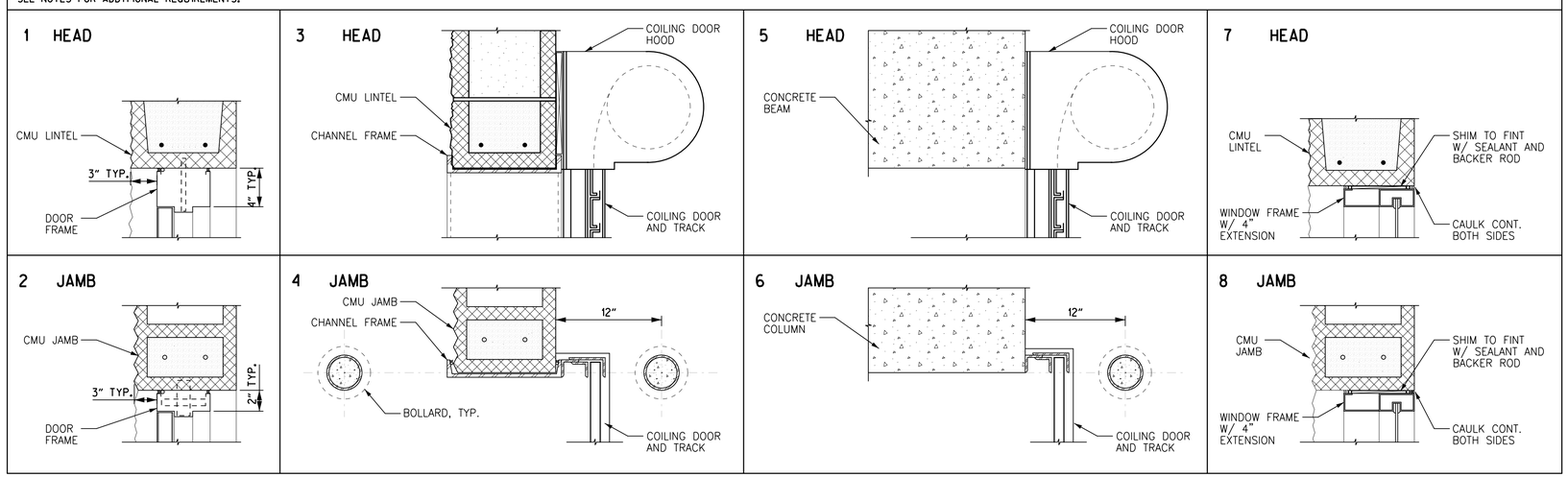


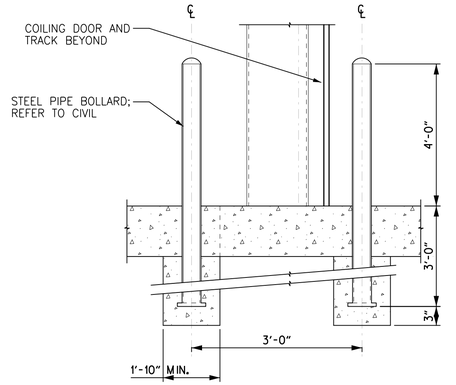
WINDOW SCHEDULE



FRAME DETAILS

SEE NOTES FOR ADDITIONAL REQUIREMENTS.





9 BOLLARD DETAIL
NOT TO SCALE

G S & P
Design Services For The Built Environment
Atlanta
Birmingham
Charlotte
Cincinnati
Columbus
Dallas
Fort Lauderdale
Jacksonville
Louisville
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Nashville
Richmond
Tampa
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No. -	Date -	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

DOOR AND WINDOW SCHEDULES AND DETAILS

A7.9.2

PROJECT: 26064.01
DATE: JULY, 2010

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CODES AND STANDARDS

THE FOLLOWING CODES AND STANDARDS SHALL BE UTILIZED BY THE CONTRACTOR TO ESTABLISH MINIMUM LEVELS OF QUALITY AND CONSTRUCTION TECHNIQUES.

1. GENERAL
   A. INTERNATIONAL BUILDING CODE, (IBC) 2006 EDITION AND THE KENTUCKY BUILDING CODE 2007 AMENDMENTS.
   B. AMERICAN SOCIETY OF CIVIL ENGINEERS, "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES" (ASCE 7-05).
2. CONCRETE
   A. AMERICAN CONCRETE INSTITUTE, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318). LATEST ADOPTED EDITION.
   B. AMERICAN CONCRETE INSTITUTE, "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS", (ACI 301). LATEST ADOPTED EDITION.
   C. AMERICAN CONCRETE INSTITUTE, "RECOMMENDED PRACTICE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION" (ACI 302). LATEST ADOPTED EDITION.
   D. AMERICAN CONCRETE INSTITUTE, "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES", (ACI 350). LATEST ADOPTED EDITION.
3. MASONRY
   A. AMERICAN CONCRETE INSTITUTE, "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES" (ACI 530).
   B. AMERICAN CONCRETE INSTITUTE, "SPECIFICATIONS FOR MASONRY STRUCTURES" (ACI 530.1).
4. STRUCTURAL STEEL
   A. AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "MANUAL OF STEEL CONSTRUCTION - THIRTEENTH EDITION."
   B. AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "MANUAL OF STEEL CONSTRUCTION, VOLUME II, CONNECTIONS," (AISC).
   C. AMERICAN WELDING SOCIETY, "STRUCTURAL WELDING CODE AWS D 1.1."
   D. CRANE MANUFACTURERS ASSOCIATION OF AMERICA, (CMAA) SPECIFICATION #70, LATEST EDITION

DESIGN CRITERIA

1. DRYER BUILDING
   A. ROOF LIVE LOAD= 20 PSF
   B. ROOF DEAD LOAD= 54 PSF(DRYER BLDG); 10 PSF (BOILER ROOM AND SALES OFFICE)
   C. COLLATERAL ROOF LOAD= 5 PSF
   D. ROOF SNOW LOAD
      1. FLAT ROOF SNOW LOAD, Pf=15 PSF
      2. SNOW EXPOSURE FACTOR, Ce= 1.0
      3. SNOW LOAD IMPORTANCE FACTOR, I=1.0
      4. THERMAL FACTOR, Ct=1.0
   E. WIND LOAD
      1. BASIC WIND SPEED= 90 MPH
      2. WIND IMPORTANCE FACTOR, I=1.25
      3. WIND EXPOSURE- B
   F. EARTHQUAKE DESIGN
      1. SEISMIC USE GROUP- I
      2. SPECTRAL RESPONSE COEFFICIENTS, Sds=0.26, Sd1=0.10
      3. SITE CLASS- B
      4. BASIC SEISMIC-FORCE-RESISTING SYSTEM- ORDINARY REINFORCED CONCRETE MOMENT FRAMES (DRYER BLDG); ORDINARY REINFORCED MASONRY SHEAR WALLS (BOILER ROOM & SALES OFFICE)
      5. DESIGN BASE SHEAR- 0.11W (DRYER BLDG); 0.16W (BOILER ROOM AND SALES OFFICE)
      6. ANALYSIS PROCEDURE- ELFP
   G. CRANE RUNWAY DESIGN CRITERIA
      1. CRANE RUNWAY: THE CRANE RUNWAY IS DESIGNED BASED ON THE FOLLOWING ASSUMPTIONS. CONTRACTOR SHALL CONFIRM PRIOR TO STEEL FABRICATION. NOTIFY ENGINEER FOR RESOLUTION FOR ANY DISCREPANCY.
         A. CRANE CLASSIFICATION- B (LIGHT SERVICE)
         B. CRANE CAPACITY- 5 TONS
         C. CRANE TYPE- TOP RUNNING
         D. MAXIMUM WHEEL LOAD- 6,600 LBS (DOES NOT INCLUDE IMPACT)
         E. VERTICAL IMPACT- 10% OF MAXIMUM WHEEL LOAD OR 660 LBS PER WHEEL.
         F. LATERAL THRUST- 20% OF TROLLEY WEIGHT PLUS LIFTED LOAD OR 2,156 LBS.
         G. LONGITUDINAL- 10% OF MAXIMUM WHEEL LOAD OR 660 LBS EACH RUNWAY.
   H. EQUIPMENT LOADS
      1. WET CAKE HOPPER
         A. END LEGS = 61.25K/LEG
         B. MIDDLE LEGS = 122.5K/LEG
      2. THERMAL FLUID HEATER = 36,200 LBS
      3. EXPANSION TANK W/ PUMPS = 19,100 LBS
      4. Thermo-Flite IC10,000 DRYER = 16K/LEG

CRANE CRITERIA

A. CRANE RUNWAY FABRICATION TOLERANCES
   1. SWEEP- NOT TO EXCEED 1/4 INCH IN 50 FOOT BEAM.
   2. CAMBER- 0 INCH NEGATIVE CAMBER AND 1/4 INCH POSITIVE CAMBER.
   3. SQUARENESS- WITHIN 18 INCHES OF EACH GIRDER END, THE FLANGE SHALL BE FREE OF CURVATURE AND NORMAL TO THE GIRDER WEB.

B. CRANE RUNWAY ERECTION TOLERANCES
   1. CRANE RAILS SHALL BE CENTERED ON THE CENTERLINE OF THE RUNWAY GIRDERS. THE MAXIMUM ECCENTRICITY OF CENTER OF RAIL TO CENTERLINE OF GIRDER SHALL BE THREE-QUARTERS OF THE GIRDER WEB THICKNESS.
   2. THE HORIZONTAL DISTANCE BETWEEN CRANE RAILS SHALL NOT EXCEED THE SPECIFIED DIMENSION BY PLUS OR MINUS 1/4 INCH MEASURED AT 68 DEGREES F.
   3. THE LONGITUDINAL HORIZONTAL MISALIGNMENT OF CRANE RAILS FROM STRAIGHT SHALL NOT EXCEED PLUS OR MINUS 1/2 INCH TOTAL DEVIATION IN THE LENGTH OF OF THE RUNWAY.
   4. THE VERTICAL LONGITUDINAL MISALIGNMENT OF CRANE RAILS FROM STRAIGHT SHALL NOT EXCEED PLUS OR MINUS ¼ INCH IN 50 FEET MEASURED AT COLUMN CENTERLINES WITH A MAXIMUM OF ½ INCH IN TOTAL DEVIATION IN THE LENGTH OF THE RUNWAY.
   5. CRANE RAIL SHALL BE JOINED WITH A WELDED BUTT JOINT SPLICE.
   6. RAIL JOINTS SHALL BE STAGGERED SO THAT JOINTS DO NOT LINE UP ON OPPOSITE SIDES OF THE RUNWAY.

REINFORCED CONCRETE

1. MINIMUM 28 DAY CONCRETE COMPRESSIVE STRENGTH SHALL BE 5,000 PSI (EXCEPT AT BUILDING FOUNDATIONS AND SLABS-ON-GRADE, WHICH SHALL USE 4000 PSI.)
2. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60 (DEFORMED)
3. WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185
4. ALL CONCRETE EXPOSED TO WEATHER SHALL BE AIR ENTRAINED.
5. MISCELLANOUS MATERIALS:
   A. CURING COMPOUND - MASTERSEAL BY MASTERBUILDERS
   B. MID-RANGE SUPERPLASTICIZER - POLYHEED 997 BY MASTERBUILDERS
   C. EPOXY ADHESIVE- EUCO #452 EPOXY SYSTEM, (OR APPROVED EQUAL)
6. CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS", (ACI 301).
7. CONCRETE SHALL BE PROPORTIONED, BATCHED, MIXED, PLACED, CONSOLIDATED, AND CURED IN ACCORDANCE WITH ACI 301, 304, 308, 309 AND 318.
8. CONTRACTOR SHALL EMPLOY A TESTING AGENCY ACCEPTABLE TO THE A/E TO PERFORM CONCRETE EVALUATION TESTS.
9. ALL CONCRETE SHALL BE MECHANICALLY VIBRATED IN ACCORDANCE WITH ACI 304 AND ACI 309.
10. REINFORCING STEEL SHALL HAVE DEVELOPMENT LENGTHS AND SPLICE LENGTHS IN ACCORDANCE WITH THE FOLLOWING TABLE UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

BAR SPLICES	
BAR SIZE	LAP LENGTH
#4	24"
#5	30"
#6	36"
#7	49"
#8	55"
#9	62"
#10	69"
#11	76"

11. HOOK TOP REINFORCING OF BARS AT DISCONTINUOUS EDGES OF SUPPORTED SLABS.

SLAB ON GRADE

1. AGGREGATE SUBBASE SHALL BE A DENSE GRADED AGGREGATE (DGA) BASE MATERIAL CONFORMING TO SECTION 303 OF THE KENTUCKY DEPARTMENT OF HIGHWAYS "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION."
2. CONCRETE MODULUS OF RUPTURE SHALL BE 550 PSI MINIMUM AND VERIFIED BY TESTING IN ACCORDANCE WITH ASTM C78.
3. WELDED WIRE FABRIC WHERE SPECIFIED, SHALL BE PROVIDED IN FLAT SHEETS ONLY, NOT ROLLS. FABRIC SHALL LAP TWO FULL MESHES AND BE SECURELY FASTENED AT EACH SIDE AND END.
4. SAWED CONTROL JOINTS SHALL BE CUT AS SOON AS SLAB CAN BE WALKED ON, BUT STARTED NO LATER THAN 8 HOURS AFTER POURING. CONTROL JOINTS SHALL BE COMPLETED NO LATER THAN 16 HOURS AFTER POURING. THESE TIME LIMITS SHALL APPLY REGARDLESS OF THE TIME OF DAY. AN EARLY ENTRY DRY CUT SAW SHALL BE USED (I.E., SOFF-CUT).
5. RIGID JOINT MATERIAL AT ALL CONSTRUCTION AND CONTROL JOINTS SHALL BE WM80 MANUFACTURED BY METZGER AND MCGUIRE. INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
6. PROVIDE 2 - #4 X 3'-0" LONG DIAGONAL BARS, SPACED AT 6-INCHES AND 2-INCHES BELOW FINISHED FLOOR AT ALL RE-ENTRANT CORNERS IN SLABS. EXTEND REINFORCING BARS PAST REENTRANT CORNERS A MINIMUM OF 12".
7. CURE ALL SLABS ON GRADE USING EITHER A MEMBRANE CURING COMPOUND OR WET CURING METHODS IMMEDIATELY AFTER FINAL TROWEL. FOR WET CURING, CONTINUOUSLY CURE WITHOUT INTERRUPTION FOR A PERIOD OF 10 DAYS. FOR MEMBRANE CURING, APPLY A SECOND COAT AT 7 DAYS.
8. ALL TROWELED FINISHED SLABS SHALL HAVE AN OVERALL TOLERANCE OF FF 30/FL25. FLOOR TOLERANCE SHALL BE CHECKED WITHIN 24 HOURS OF PLACEMENT, IN ACCORDANCE WITH ASTM E-1155.
9. SLAB ON GRADE CONSTRUCTION AND CONTROL JOINTS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. USE OF PREMANUFACTURED KEYED METAL BULKHEADS WILL NOT BE PERMITTED.
10. PREFORMED EXPANSION JOINT MATERIAL SHALL CONFORM TO ASTM D1751 (BITUMINOUS TYPE) TOPPED WITH FLEXIBLE JOINT SEALANT (SONOLASTIC SL-1 BY SONNEBORN).
11. VAPOR RETARDER SHALL BE 10 MILS THICK. OVERLAP SEAMS 6-INCHES AND TAPE.
12. ADEQUATE MEASURES TO PREVENT PLASTIC SHRINKAGE OF SLAB SHALL BE TAKEN BY THE CONTRACTOR AS OUTLINED IN ACI 302.1R (SECTION 11.2.2.1).
13. CONCRETE FOR SLABS SHALL NOT INCLUDE ANY ENTRAINED AIR OR FLY ASH.

PRECAST DOUBLE TEES

1. THE DESIGN OF THE PRESTRESSED DOUBLE TEES SHALL BE BASED ON THE PCI DESIGN HANDBOOK, (LATEST EDITION).
2. A REGISTERED STRUCTURAL ENGINEER IN THE STATE OF KENTUCKY SHALL AFFIX THEIR SEAL TO ALL SHOP DRAWINGS AND CALCULATIONS PRIOR TO SUBMITTAL. SUBMIT DOUBLE TEE SHOP DRAWINGS TO INCLUDE THE FOLLOWING:
   A. CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS AND AT RELEASE, PLANK DIMENSIONS, CAMBER, SPAN LENGTHS AND CONCRETE WEIGHT.
   B. BEARING REACTIONS, IN TERMS OF SELF WEIGHT, DEAD LOAD, LIVE LOAD, WIND LOAD AND ANY OTHER APPLICABLE LOAD.
   C. GRADE, LOCATION AND QUANTITY OF PRESTRESING STEEL AND REINFORCING STEEL.
3. MINIMUM 28 DAY CONCRETE COMPRESSIVE STRENGTH SHALL BE 5,000 PSI AT 28 DAYS AND 3,500 PSI @ RELEASE.
4. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60 (DEFORMED)
5. THE PRESTRESSING STEEL SHALL CONFORM TO ASTM A416, GRADE 270, (LOW RELAXATION)
6. THE PRECAST CONCRETE SHALL BE NORMAL WEIGHT (145 PCF) CONCRETE.
7. CONCRETE COVER FOR PRESTRESSED STRANDS AND REBAR SHALL BE 1-1/2".
8. DOUBLE TEES SHALL BE DESIGNED FOR ERECTION AND HANDLING/TRANSPORTATION STRESSES. CONTRACTOR SHALL BE RESPONSIBLE FOR LIFTING DEVICES OR INSERTS.
9. BEARING PADS SHALL BE A MINIMUM ⅛" THICK X 3" WIDE FOR THE ENTIRE LENGTH OF WALL. PAD MATERIAL SHALL BE EITHER NEOPRENE OR A MULTI-MONOMER PLASTIC.
10. CONCRETE SHALL BE PROPORTIONED, BATCHED, MIXED, PLACED, CONSOLIDATED AND CURED IN ACCORDANCE WITH ACI 301, 304, 308, 309 AND 318.

FOUNDATIONS

1. GEOTECHNICAL REPORT: FOUNDATION DESIGN BASED ON THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT BY AMERICAN GEOTECHNICAL AND ENVIRONMENTAL, INC (AG&E) PREPARED FOR GRESHAM, SMITH & PARTNERS DATED OCTOBER 15, 2008. THE GENERAL CONTRACTOR SHALL OBTAIN A COPY OF THE GEOTECHNICAL REPORT AND STRICTLY ADHERE TO THE RECOMMENDATIONS CONTAINED IN THE REPORT.
2. ASSUMED SAFE BEARING CAPACITIES USED IN THE FOUNDATION DESIGN AS BASED ON THE GEOTECHNICAL REPORT ARE AS FOLLOWS:
   A. CONTINUOUS WALL FOOTING, Fp = 3,000 PSF
   B. ISOLATED SPREAD FOOTING, Fp = 3,000 PSF
3. ALLOWABLE BEARING PRESSURES ARE BASED ON BEARING AGAINST FIRM, UNDISTURBED SOIL AND/OR ROCK. NOTIFY ENGINEER OF DISCREPANCIES. WHERE UNACCEPTABLE MATERIAL OCCURS, EXCAVATE AND REPLACE WITH ENGINEERED FILL AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
4. ALL FOUNDATION BEARING SURFACES SHALL BE REVIEWED BY A GEOTECHNICAL ENGINEER PRIOR TO STEEL OR CONCRETE PLACEMENT TO ENSURE THE BEARING SURFACES ARE CONSISTENT WITH THE ALLOWABLE BEARING PRESSURES NOTED.
5. FOUNDATION CONCRETE SHOULD BE PLACED DURING THE SAME DAY EXCAVATION IS MADE. IN THE EVENT FOOTING EXCAVATIONS ARE LEFT OPEN FOR MORE THAN ONE DAY, THEY SHALL BE PROTECTED TO REDUCE EVAPORATION OR ENTRY OF MOISTURE.
6. CONTRACTOR SHALL KEEP ALL FREE STANDING WATER OUT OF EXCAVATION. CONTRACTOR SHALL PROVIDE DEWATERING MEASURES AS NECESSARY PRIOR TO PLACING CONCRETE.
7. REINFORCEMENT PLACEMENT SHALL BE APPROVED BY THE TESTING AGENCY PRIOR TO CONCRETE PLACEMENT.
8. FOUNDATION OR RETAINING WALLS WITHOUT CANTILEVERED FOOTING SHALL NOT BE BACKFILLED UNTIL SHORED OR PERMANENTLY SUPPORTED AT TOP OF WALL.
9. BACKFILL SHALL BE CLEAN, CRUSHED STONE (#57 STONE CONFORMING TO ASTM D448 OR EQUAL) OR SOIL APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER. ALL BACKFILL SHALL BE PLACED IN MAXIMUM 6" LIFTS. COMPACT SOIL TO 98% MAXIMUM DRY DENSITY, STANDARD PROCTOR.
10. EXCAVATED/STRIPPED AREAS SHALL BE PROOF-ROLLED WITH APPROPRIATE EQUIPMENT AS APPROVED BY GEOTECHNICAL ENGINEER. SOFT AREAS SHALL BE REMOVED AND REPLACED WITH APPROVED BACKFILL AS DIRECTED BY THE GEOTECHNICAL ENGINEER.

MASONRY

1. MATERIAL
   A. CONCRETE MASONRY UNITS (CMU)- ASTM C90, TYPE 1, GRADE N, HOLLOW LOAD BEARING BLOCK UNITS- MOISTURE CONTROLLED, NORMAL WEIGHT.
   B. MORTAR (TYPE S- EXTERIOR, BEARING OR SHEAR WALLS)- ASTM C270
   C. MORTAR (TYPE N- NON-BEARING, NON-SHEAR, INTERIOR WALLS)- ASTM C270
   D. REINFORCING STEEL BARS AND RODS- ASTM A615, GRADE 60.
   E. JOINT REINFORCING (STEEL WIRE)- ASTM A82.
   F. GROUT- ASTM C476
2. ALL MASONRY CONSTRUCTION TO BE IN CONFORMANCE WITH ACI-530 "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES" AND ACI-530.1 "SPECIFICATIONS FOR MASONRY STRUCTURES."
3. COMPRESSIVE STRENGTH OF CONCRETE MASONRY AS DEFINED IN THE ACI 530.1 SPECIFICATION SHALL BE f'm=1,500 PSI MINIMUM AT 28 DAYS. CONTRACTOR SHALL SUBMIT CERTIFICATION TO STRUCTURAL ENGINEER INDICATING CONFORMANCE.
4. HORIZONTAL JOINT REINFORCING SHALL BE MEDIUM WEIGHT, GALVANIZED, LADDER TYPE AT 16" O.C., PROVIDE MIN. 8" LAP AT ALL SPLICE LOCATIONS.
5. REINFORCING BARS TO BE PLACED IN THE CENTER OF THE WALL FOR SINGLE BARS AND AT INSIDE EDGE OF MASONRY UNIT FOR DOUBLE BARS. PROVIDE MINIMUM ½" CLEAR.
6. VERTICAL CORE REINFORCEMENT SHALL BE CONTINUOUS FOR FULL HEIGHT OF WALL AND DOWELED FROM FOOTING.
7. ALL REINFORCED CORES SHALL BE GROUTED SOLID.
8. ALL CORES BELOW FINISH FLOOR SHALL BE GROUTED SOLID.
9. ALL MASONRY CONSTRUCTION TO BE RUNNING BOND.
10. MASONRY SHALL BE FULLY INSPECTED. CONTRACTOR TO PROVIDE MASONRY INSPECTOR TO REVIEW ALL PHASES OF MASONRY CONSTRUCTION. SUBMIT REPORTS TO STRUCTURAL ENGINEER FOR REVIEW.
11. ALL GROUT SHALL HAVE 2,500 PSI MINIMUM COMPRESSIVE STRENGTH. GROUT SHALL HAVE A SLUMP OF 8" TO 10".
12. PROVIDE FLEXIBLE COLUMN ANCHORS AT 16" O.C. HORIZONTALLY.
13. MASONRY REINFORCEMENT SPLICES SHALL BE LAPPED 48 BAR DIAMETERS.
14. WET STICKING REINFORCING STEEL IS STRICTLY PROHIBITED.
15. PROVIDE TWO GROUTED CORES ON EACH SIDE OF ALL CORNERS AND AT EACH END CORE. SIZE AND NUMBER OF BARS IN THE CORNER AND END CORES SHALL MATCH THE SIZE AND NUMBER OF BARS IN THE REMAINDER OF THE WALL.

STRUCTURAL STEEL

1. MATERIALS
   A. STRUCTURAL STEEL (W-SHAPES) -ASTM A992
   B. STRUCTURAL STEEL (NON W-SHAPES) AND PLATE- ASTM A36
   C. WELDING ELECTRODES- E70XX
   D. ANCHOR BOLTS- ASTM F1554
   E. NONSHRINK GROUT (NONMETALLIC)- MASTERFLOW 928 BY MASTER BUILDERS (FOR BASEPLATE APPLICATIONS ONLY)
2. STRUCTURAL STEEL DESIGN, DETAILING, FABRICATION AND ERECTION SHALL CONFORM TO:
   A. AISC, "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
   B. AISC, "CODE OF STANDARD PRACTICE", INCLUDING COMMENTARY.
   C. AISC, "MANUAL OF STEEL CONSTRUCTION, VOLUME II, CONNECTIONS".
3. WELDING SHALL CONFORM TO AWS D1.1 "STRUCTURAL WELDING CODE" AND BE PERFORMED BY CERTIFIED WELDERS. WELDS SHOWN ON STRUCTURAL DRAWINGS ARE MINIMUM DESIGN REQUIREMENTS. SHOP DRAWINGS SHALL REFLECT WELDS IN ACCORDANCE WITH AWS REQUIREMENTS. MINIMUM FILLET WELD SIZE SHALL BE ⅜" OR AISC TABLE J2.4, WHICHEVER IS GREATER.
4. REMOVE RUST, DIRT, PAINT AND GALVANIZING FROM STEEL PRIOR TO WELDING.
5. GROUT PADS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI IN 7 DAYS.
6. NO OPENINGS SHALL BE CUT IN STRUCTURAL MEMBERS.

BAR JOISTS

1. BAR JOISTS INCLUDING BRIDGING SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS OF THE STEEL JOIST INSTITUTE (SJI).
2. BRIDGING SHOWN ON THE PLANS IS FOR ILLUSTRATIVE PURPOSES ONLY. JOIST MANUFACTURER SHALL DETERMINE QUANTITY AND SIZE OF BRIDGING TAKING INTO ACCOUNT THE ROOF TYPE (E.G., STANDING SEAM) AND UPLIFT REQUIREMENTS.
3. PROVIDE STANDARD CAMBER UNLESS NOTED OTHERWISE ON THE PLANS.

MISCELLANEOUS

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND JOB SITE CONDITIONS PRIOR TO BEGINNING WORK. ARCHITECT/STRUCTURAL ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY.
2. COORDINATE THE STRUCTURAL DOCUMENTS WITH THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DOCUMENTS. ARCHITECT/STRUCTURAL ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY.
3. CONTRACTOR SHALL HAVE SOLE RESPONSIBILITY FOR THE DESIGN, ADEQUACY, AND SAFETY OF ERECTION BRACING, SHORING, AND TEMPORARY SUPPORTS OF THE STRUCTURE SO THAT IT WILL BE STABLE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE IS DESIGNED FOR A COMPLETED CONDITION ONLY AND THEREFORE MAY REQUIRE ADDITIONAL SUPPORT TO MAINTAIN STABILITY BEFORE COMPLETION.
4. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS. FOR DIMENSIONS TO BE CONFIRMED AT THE JOB SITE, FOR FABRICATION PROCESSES, FOR SAFE CONDITIONS AT THE JOB SITE AND FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION.
5. FOR LOCATION OF MISCELLANEOUS ITEMS (SUCH AS OPENINGS, INSERTS, ETC.) AFFECTING STRUCTURAL WORK, SEE ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS.
6. NO SUBSTITUTIONS OF MATERIAL WILL BE ALLOWED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER.
7. EXISTING UTILITIES SUCH AS CONDUIT, PIPING AND DUCTWORK WHICH INTERFERE WITH THE INSTALLATION OF THE NEW FRAMING SHALL BE RELOCATED BY THE OWNER PRIOR TO THE START OF CONSTRUCTION.
8. DO NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE CONTINUING WITH CONSTRUCTION.
9. CONTRACTOR SHALL EMPLOY A TESTING AGENCY ACCEPTABLE TO THE A/E TO PERFORM MATERIAL EVALUATION TESTS.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING UNDERGROUND UTILITIES SUCH AS CONDUIT AND PIPING WHICH INTERFERE WITH THE INSTALLATION OF THE NEW FOUNDATIONS. ALL INTERFERENCES SHALL BE REPORTED TO THE OWNER PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT ANY DAMAGE DURING EXCAVATION.
11. CONTRACTOR SHALL COMPLY WITH LOCAL, STATE, FEDERAL AND OWNERS SAFETY REGULATIONS WHILE WORKING. A/E DOES NOT ASSUME ANY RESPONSIBILITY FOR CONSTRUCTION SITE SAFETY.
12. CONTRACTOR SHALL ADHERE TO THE STRUCTURAL QUALITY ASSURANCE PLAN AS PER SECTION 17 OF THE IBC 2006. THIS INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:
   A. STRUCTURAL STEEL - IBC TABLE 1704.3
   B. CONCRETE - IBC TABLE 1704.4 & IBC SECTION 1704.4
   C. MASONRY - IBC TABLE 1704.5
   D. SOILS - IBC TABLE 1704.7

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3
BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

TSG
TEASLEY SERVICES GROUP, L.L.C.
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TSG Job No. 08179

REVISION

No. - Date - Revision		
	7-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING STRUCTURAL GENERAL NOTES

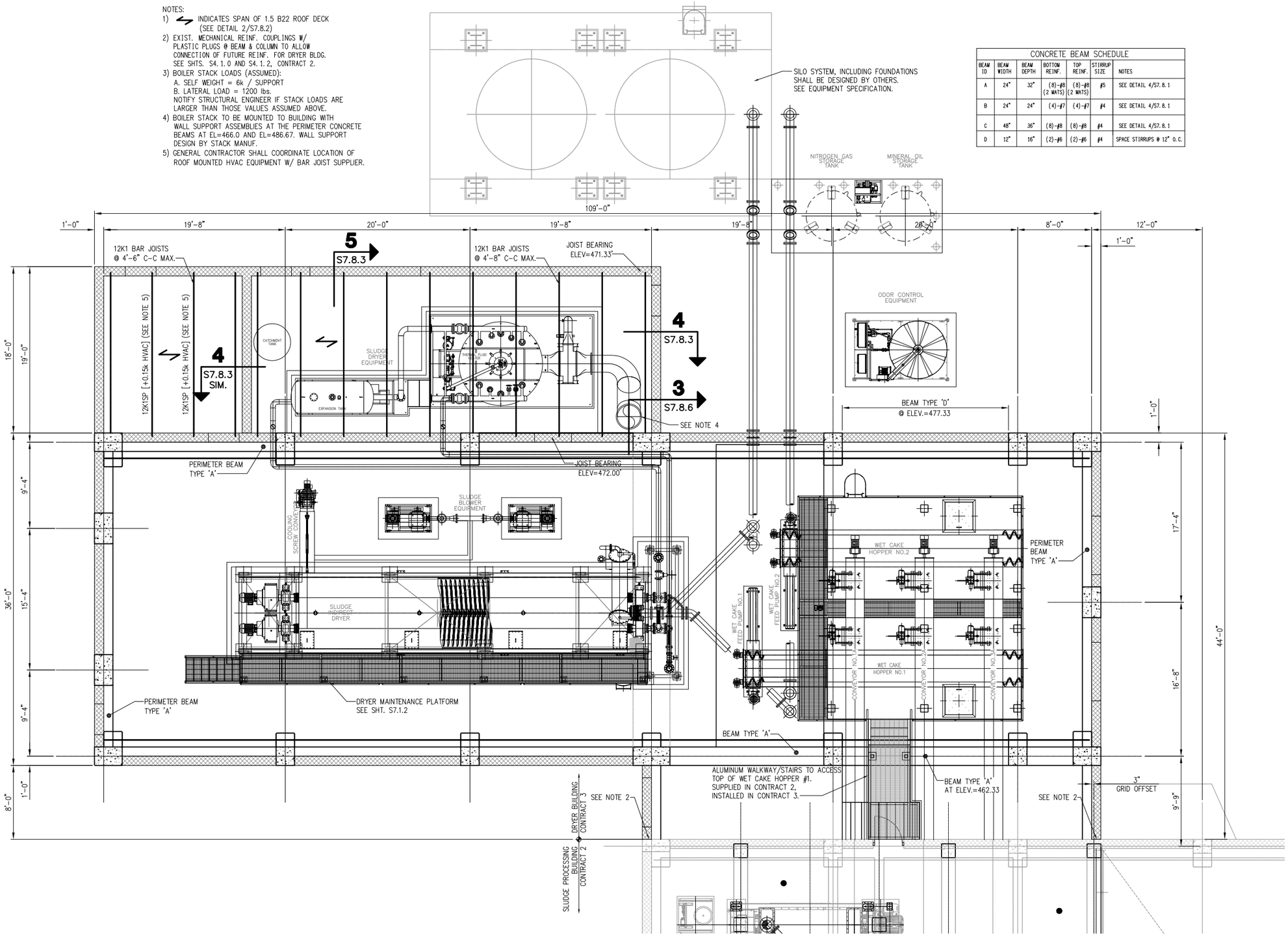
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PROJECT: 26064.01
DATE: JULY, 2010

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NOTES:
1) ⇆ INDICATES SPAN OF 1.5 B22 ROOF DECK (SEE DETAIL 2/S7.8.2)
2) EXIST. MECHANICAL REINF. COUPLINGS W/ PLASTIC PLUGS @ BEAM & COLUMN TO ALLOW CONNECTION OF FUTURE REINF. FOR DRYER BLDG. SEE SHTS. S4.1.0 AND S4.1.2, CONTRACT 2.
3) BOILER STACK LOADS (ASSUMED):
   A. SELF WEIGHT = 6k / SUPPORT
   B. LATERAL LOAD = 1200 lbs.
   NOTIFY STRUCTURAL ENGINEER IF STACK LOADS ARE LARGER THAN THOSE VALUES ASSUMED ABOVE.
4) BOILER STACK TO BE MOUNTED TO BUILDING WITH WALL SUPPORT ASSEMBLIES AT THE PERIMETER CONCRETE BEAMS AT EL=466.0 AND EL=486.67. WALL SUPPORT DESIGN BY STACK MANUF.
5) GENERAL CONTRACTOR SHALL COORDINATE LOCATION OF ROOF MOUNTED HVAC EQUIPMENT W/ BAR JOIST SUPPLIER.

CONCRETE BEAM SCHEDULE						
BEAM ID	BEAM WIDTH	BEAM DEPTH	BOTTOM REINF.	TOP REINF.	STIRRUP SIZE	NOTES
A	24"	32"	(8)-#8 (2 MATS)	(8)-#8 (2 MATS)	#5	SEE DETAIL 4/S7.8.1
B	24"	24"	(4)-#7	(4)-#7	#4	SEE DETAIL 4/S7.8.1
C	48"	36"	(8)-#8	(8)-#8	#4	SEE DETAIL 4/S7.8.1
D	12"	16"	(2)-#6	(2)-#6	#4	SPACE STIRRUPS @ 12" O.C.



NORTH

DRYER BUILDING FRAMING PLAN AT ELEV.=466.00

SCALE: 3/16" = 1'-0" 3' 0 5' 10'

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES
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Bowling Green, Kentucky
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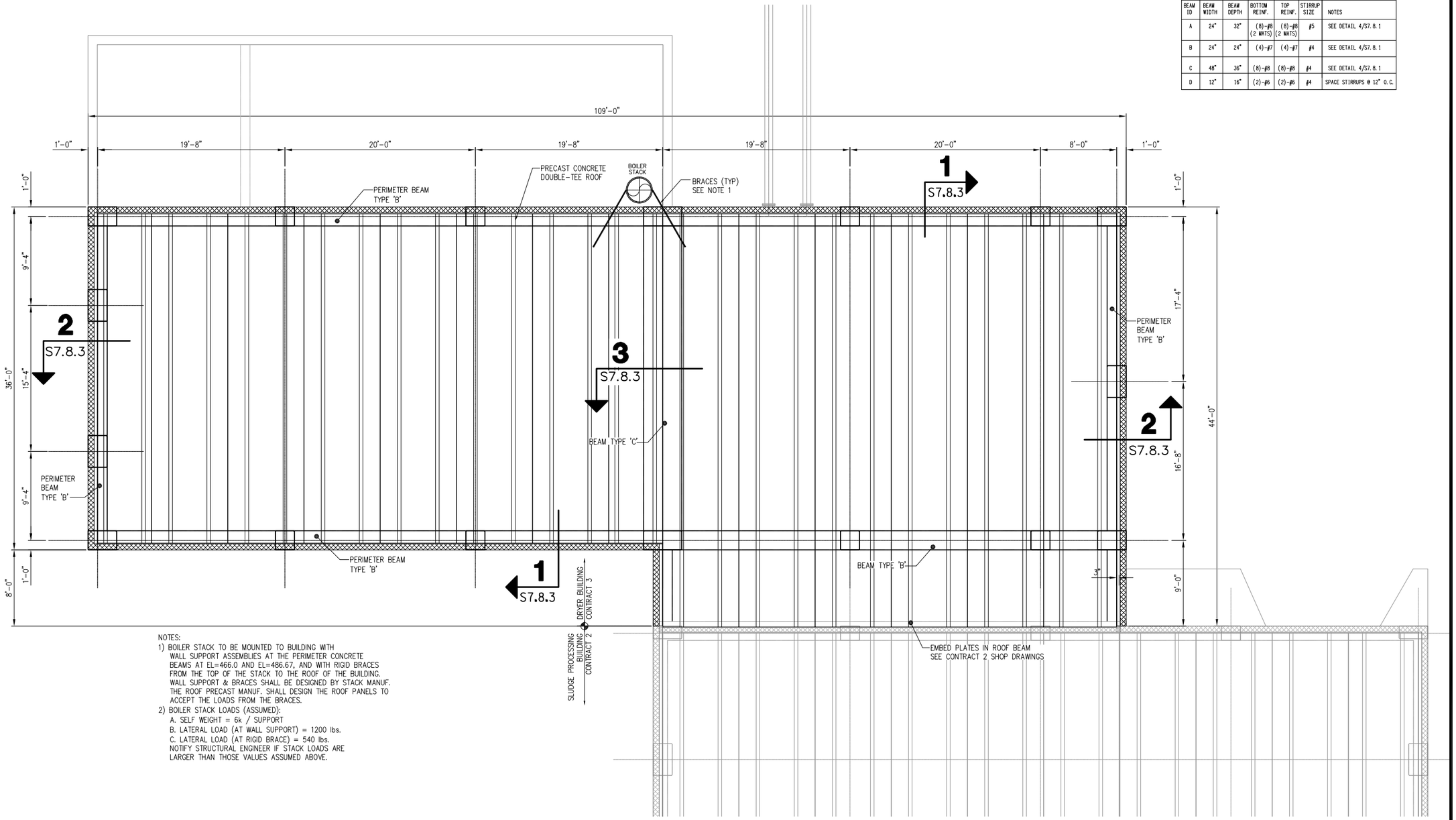
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PROJECT: 26064.01
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CONCRETE BEAM SCHEDULE						
BEAM ID	BEAM WIDTH	BEAM DEPTH	BOTTOM REINF.	TOP REINF.	STIRRUP SIZE	NOTES
A	24"	32"	(8)-#8 (2 MATS)	(8)-#8 (2 MATS)	#5	SEE DETAIL 4/S7.8.1
B	24"	24"	(4)-#7	(4)-#7	#4	SEE DETAIL 4/S7.8.1
C	48"	36"	(8)-#8	(8)-#8	#4	SEE DETAIL 4/S7.8.1
D	12"	16"	(2)-#6	(2)-#6	#4	SPACE STIRRUPS @ 12" O.C.



NOTES:
1) BOILER STACK TO BE MOUNTED TO BUILDING WITH WALL SUPPORT ASSEMBLIES AT THE PERIMETER CONCRETE BEAMS AT EL=466.0 AND EL=486.67, AND WITH RIGID BRACES FROM THE TOP OF THE STACK TO THE ROOF OF THE BUILDING. WALL SUPPORT & BRACES SHALL BE DESIGNED BY STACK MANUF. THE ROOF PRECAST MANUF. SHALL DESIGN THE ROOF PANELS TO ACCEPT THE LOADS FROM THE BRACES.
2) BOILER STACK LOADS (ASSUMED):
   A. SELF WEIGHT = 6k / SUPPORT
   B. LATERAL LOAD (AT WALL SUPPORT) = 1200 lbs.
   C. LATERAL LOAD (AT RIGID BRACE) = 540 lbs.
   NOTIFY STRUCTURAL ENGINEER IF STACK LOADS ARE LARGER THAN THOSE VALUES ASSUMED ABOVE.

NORTH

DRYER BUILDING ROOF PLAN & FRAMING @ ELEV.=486.67

SCALE: 3/16" = 1'-0" 3' 0 5' 10'

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

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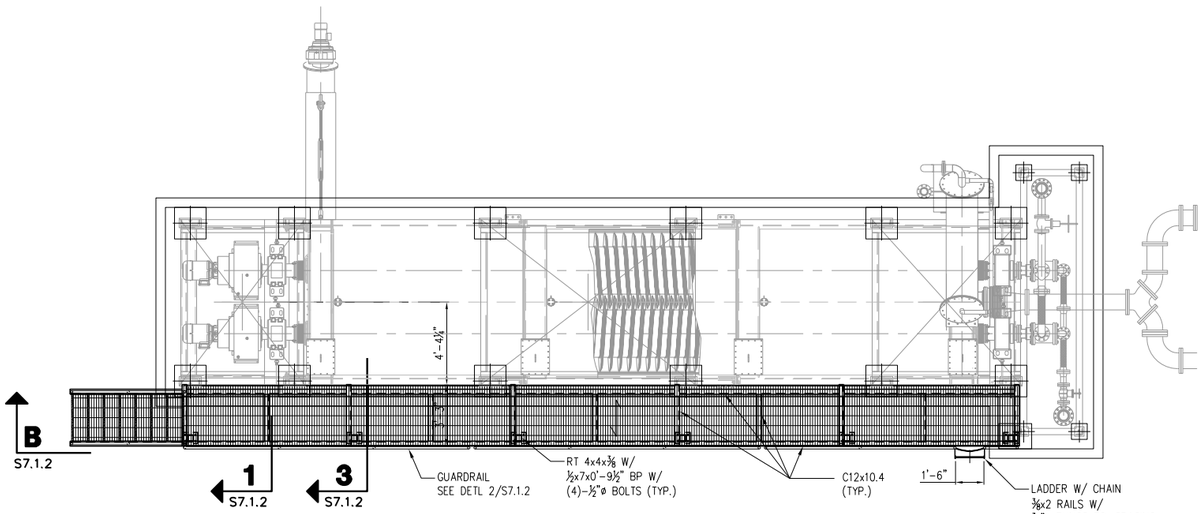
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DRYER BUILDING
ROOF PLAN
STRUCTURAL

S7.1.1

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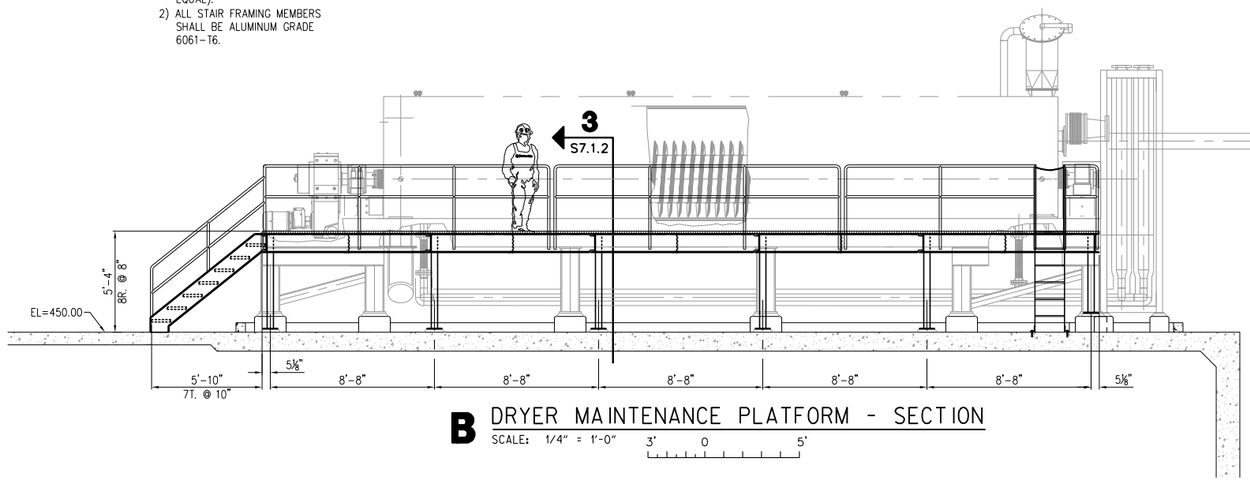
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NOTES:
1) ⟷ INDICATES SPAN OF I-6000 1-1/2" FRP GRATING BY DURADEK (OR APPROVED EQUAL).
2) ALL STAIR FRAMING MEMBERS SHALL BE ALUMINUM GRADE 6061-T6.

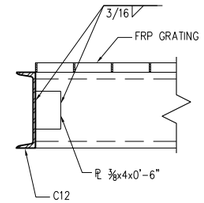
A DRYER MAINTENANCE PLATFORM - PLAN

SCALE: 1/4" = 1'-0" 3' 0 5'



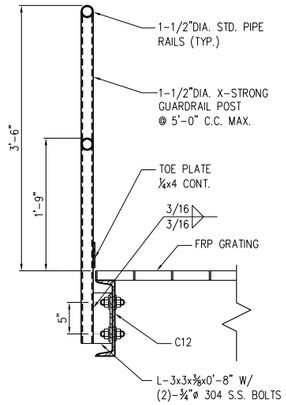
B DRYER MAINTENANCE PLATFORM - SECTION

SCALE: 1/4" = 1'-0" 3' 0 5'



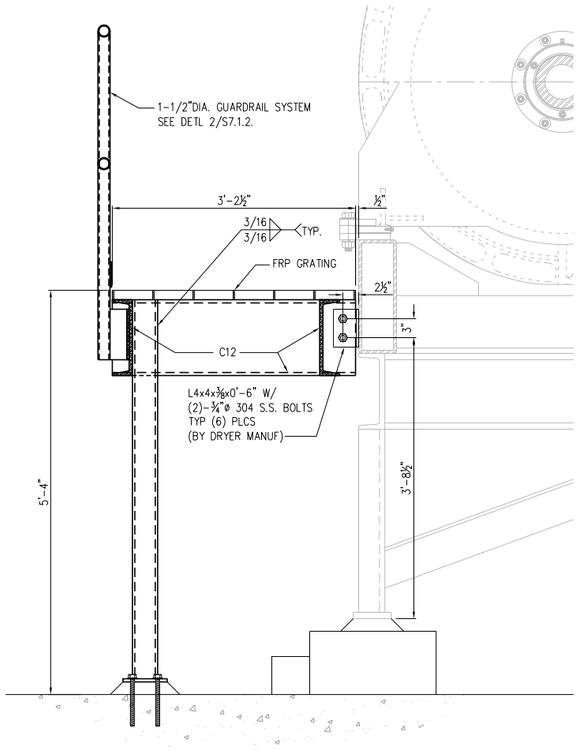
1 WELDED CONNECTION DETAIL

SCALE: NONE



2 BOLTED GUARDRAIL DETAIL

SCALE: NONE



3 MAINTENANCE PLATFORM AT DRYER

SCALE: NONE

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BIOSOLIDS DRYER SYSTEM ADDITION

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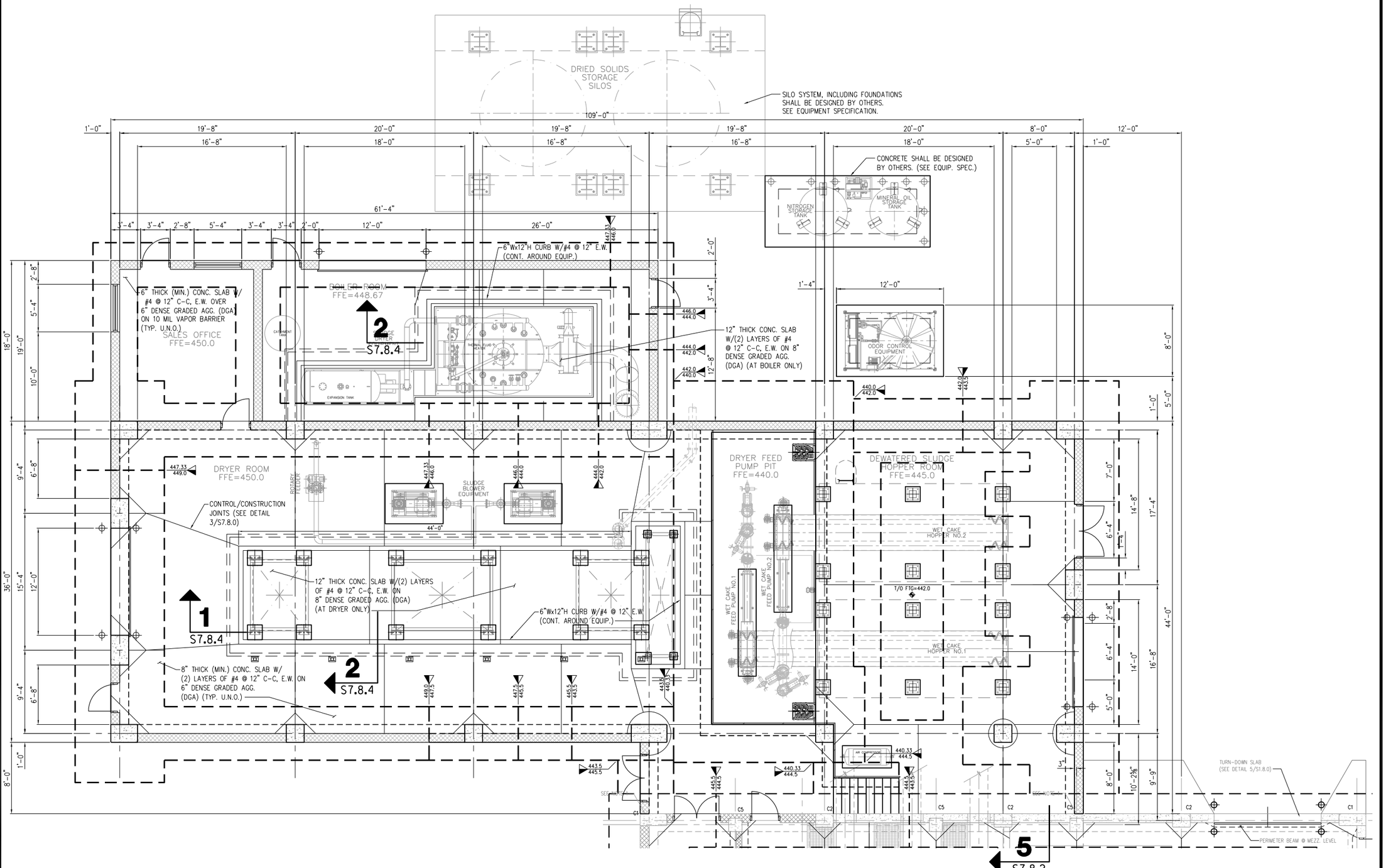
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No. -	Date -	Revision
	7-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING
WALKWAY @ DRYER
PLAN, ELEV. & DETAILS

S7.1.2

PROJECT: 26064.01
DATE: JULY, 2010

prints: S712 - Jul. 15, 2010 3:05pm
FILE: W:\26064.01 BGMU WWTP\DRYER BLDG_20100211817\S712.dwg - S712



NORTH

LOWER LEVEL PLAN (MAIN FLOOR)

SCALE: 3/16" = 1'-0" 3' 0 5' 10'

rpotts - S720 - Jul, 15, 2010 3:52pm
FILE: W:2008\08179 GSP - BGMU WWTP\DRYER BLDG_20100211\8179S720.dwg - S720

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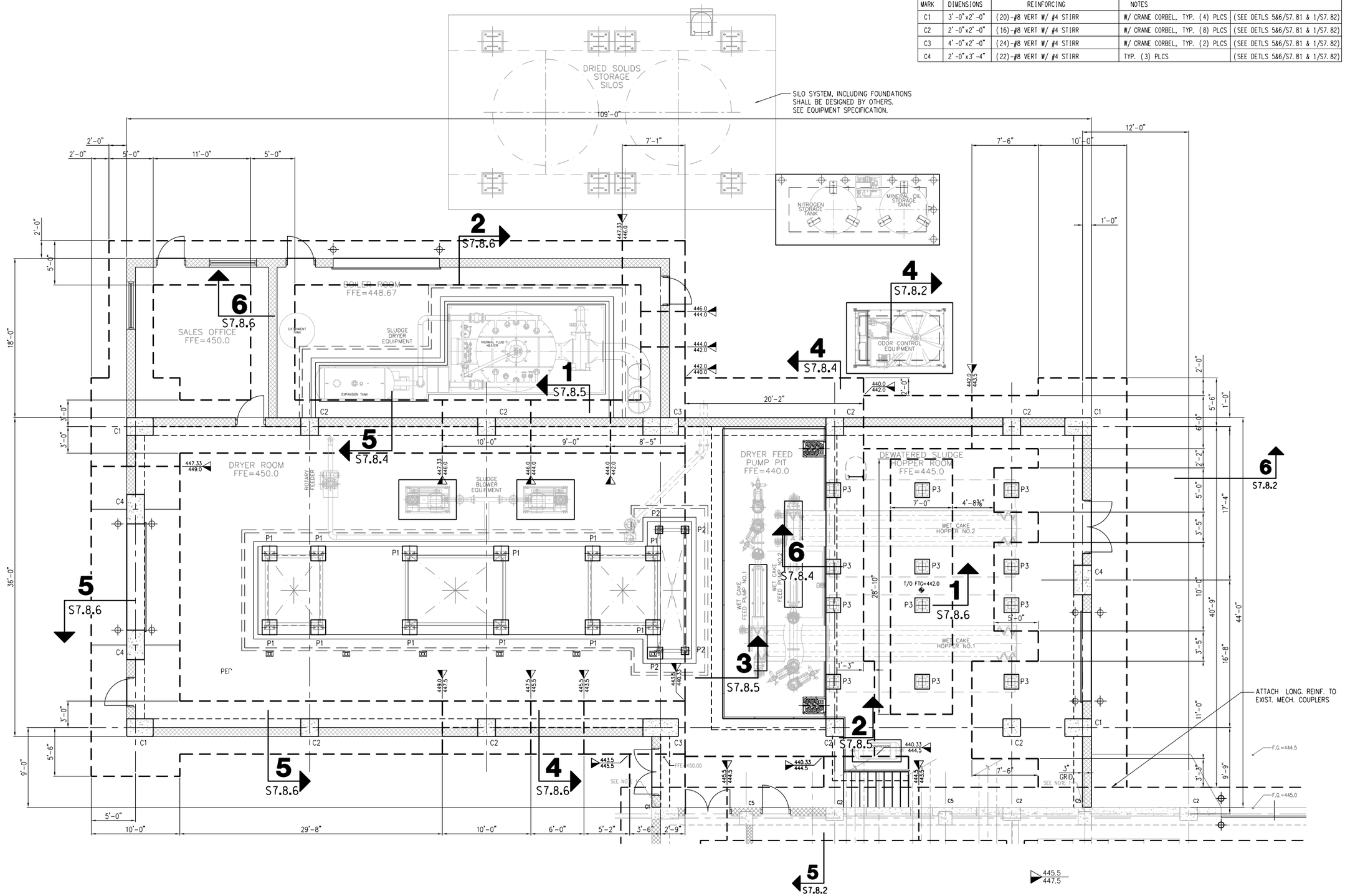
REVISION		
No. -	Date -	Revision
	7-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING LOWER PLAN STRUCTURAL

S7.2.0

PROJECT: 26064.01
DATE: JULY, 2010

COLUMN SCHEDULE				
MARK	DIMENSIONS	REINFORCING	NOTES	
C1	3'-0"x2'-0"	(20)-#8 VERT W/ #4 STIRR	W/ CRANE CORBEL, TYP. (4) PLCS	(SEE DETLS 5&6/S7.81 & 1/S7.82)
C2	2'-0"x2'-0"	(16)-#8 VERT W/ #4 STIRR	W/ CRANE CORBEL, TYP. (8) PLCS	(SEE DETLS 5&6/S7.81 & 1/S7.82)
C3	4'-0"x2'-0"	(24)-#8 VERT W/ #4 STIRR	W/ CRANE CORBEL, TYP. (2) PLCS	(SEE DETLS 5&6/S7.81 & 1/S7.82)
C4	2'-0"x3'-4"	(22)-#8 VERT W/ #4 STIRR	TYP. (3) PLCS	(SEE DETLS 5&6/S7.81 & 1/S7.82)



NORTH

DRYER BUILDING FOUNDATION PLAN

SCALE: 3/16" = 1'-0" 3' 0 5' 10'

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

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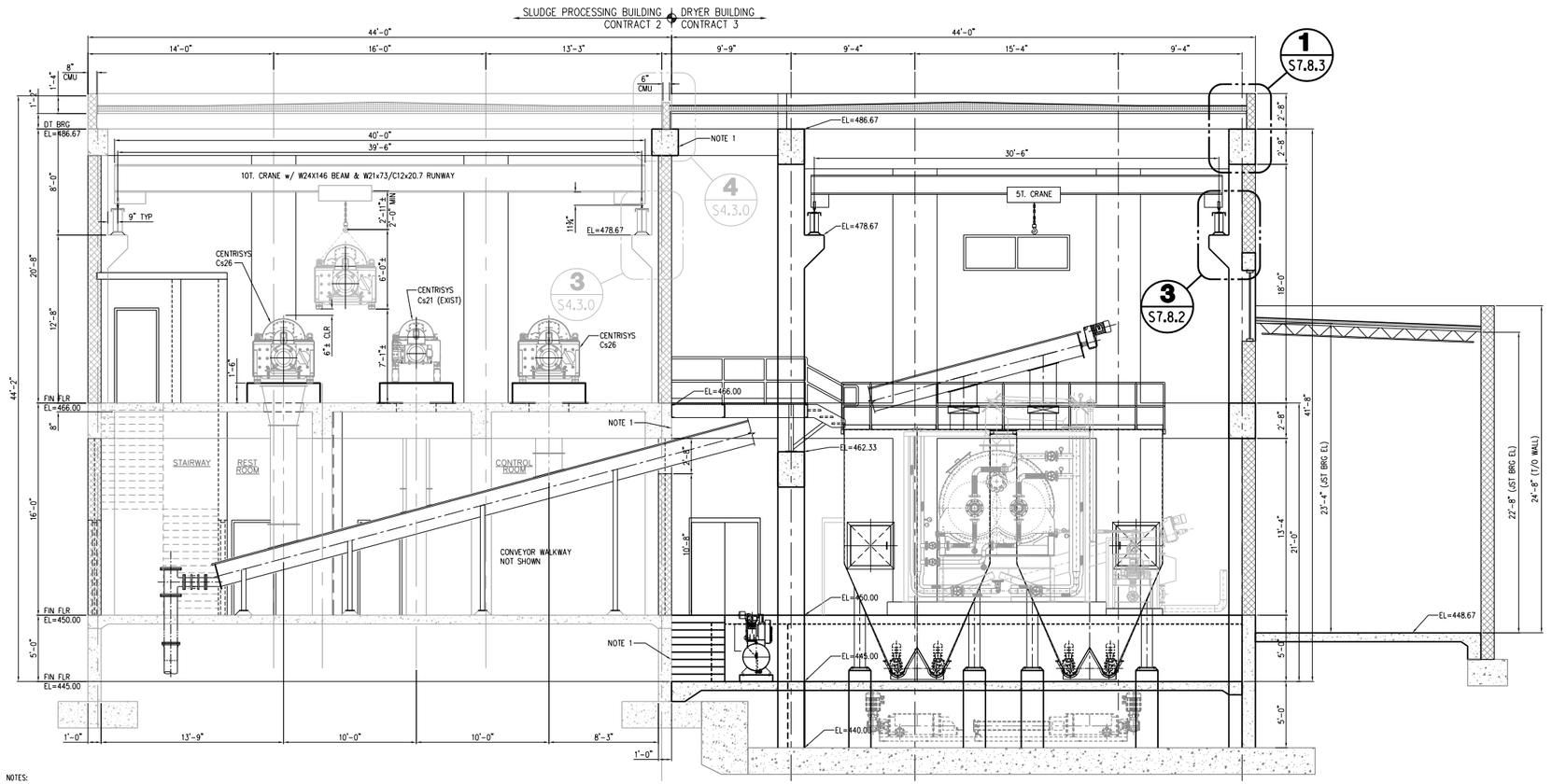
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	7-12-10	ISSUED FOR CONSTRUCTION

BIOSOLIDS DRYER BUILDING FOUNDATION PLAN

S7.2.1

PROJECT: 26064.01
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rpotts - S721 - Jul, 15, 2010 3:53pm
FILE: W:2008\08179 GSP - BGMU WWTP\DRYER BLDG_20100211\8179S720.dwg - S721



NOTES:
1) EXIST. MECHANICAL REINF. COUPLINGS W/ PLASTIC PLUGS @ BEAM & COLUMN TO ALLOW CONNECTION OF REINF. FOR DRYER BLDG.

SECTION A-A

SCALE: 3/16" = 1'-0" 3' 0 5'

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BIOSOLIDS DRYER SYSTEM ADDITION

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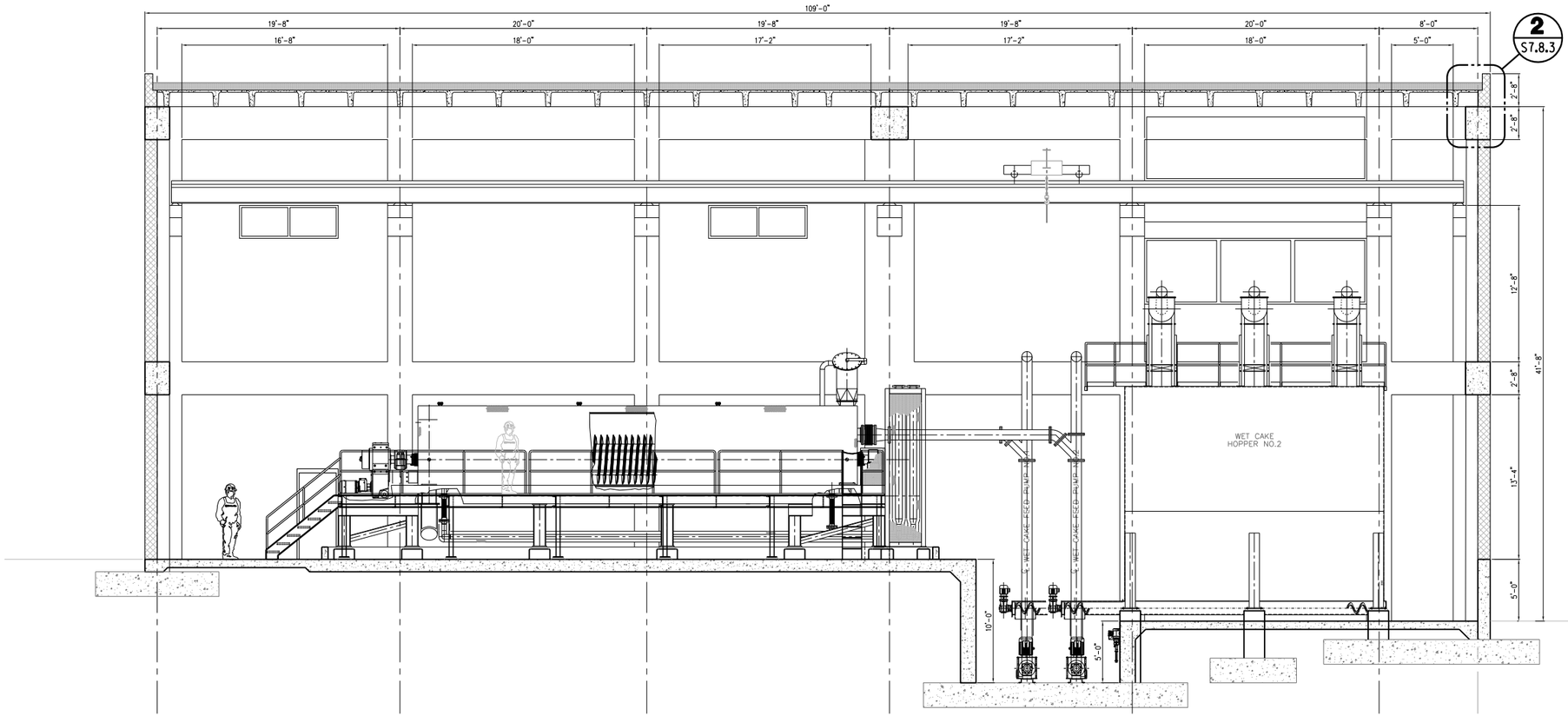
REVISION		
No. -	Date -	Revision
	7-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING
STRUCTURAL
SECTION A

S7.3.0

PROJECT: 26064.01
DATE: JULY, 2010

roots - S730 - Jul. 15, 2010 3:09pm
FILE: W:\2008\08179 GSP - BGMU WWTP\DRYER BLDG_20100211\81795730.dwg - S730



SECTION B-B

SCALE: 3/16" = 1'-0" 3' 0 5'

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

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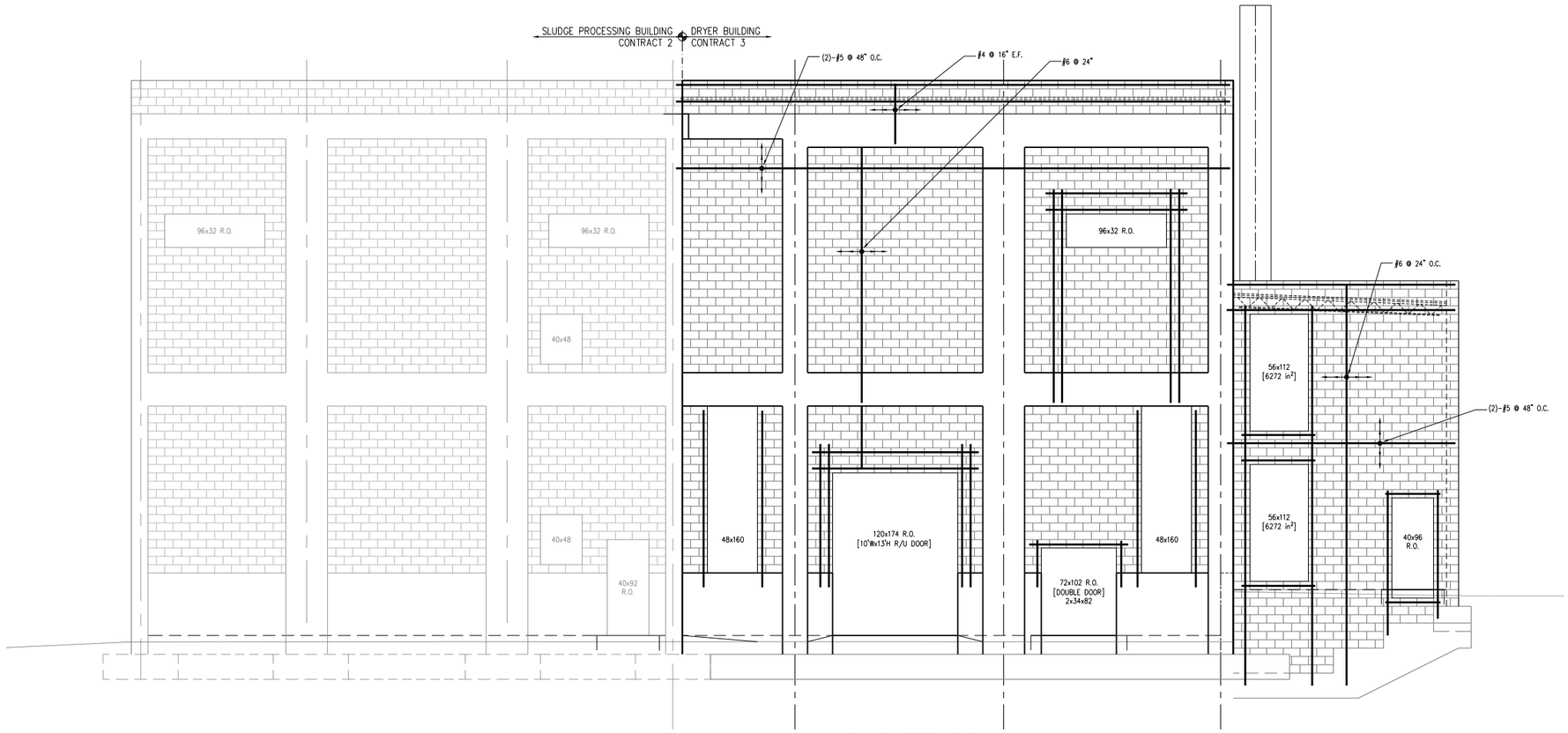
No. -	Date -	Revision
	7-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING STRUCTURAL SECTION B

S7.3.1

PROJECT: 26064.01
DATE: JULY, 2010

rpotts - S731 - Jul. 15, 2010 3:29pm
FILE: W:\2008\08179 GSP - BGMU WWTP\DRYER BLDG_20100211\8179S730.dwg - S731



NOTES:
1) REFER TO DETAIL 2/S7.8.1 FOR LINTEL REINFORCEMENT AND REINFORCEMENT AROUND OPENINGS.

2) REFER TO GENERAL NOTES FOR REINFORCEMENT AT CORNERS AND WALL INTERSECTIONS.

3) REFER TO DETAIL 1/S7.8.1 FOR WALL JOINT INFORMATION. NO WALL JOINTS SHALL BE PLACED IN THE AREAS DESIGNATED AS SHEAR WALLS OR THROUGH ANY LINTELS.

4) UNIT HEATER FLUE OPENINGS SHALL BE INSTALLED IN THE NON-REINFORCED CELLS IN THE CMU WALL.

DRYER BUILDING
CMU ELEVATION - EAST WALLS

SCALE: 3/16" = 1'-0" 0 5' 10'

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3
BIOSOLIDS DRYER SYSTEM ADDITION

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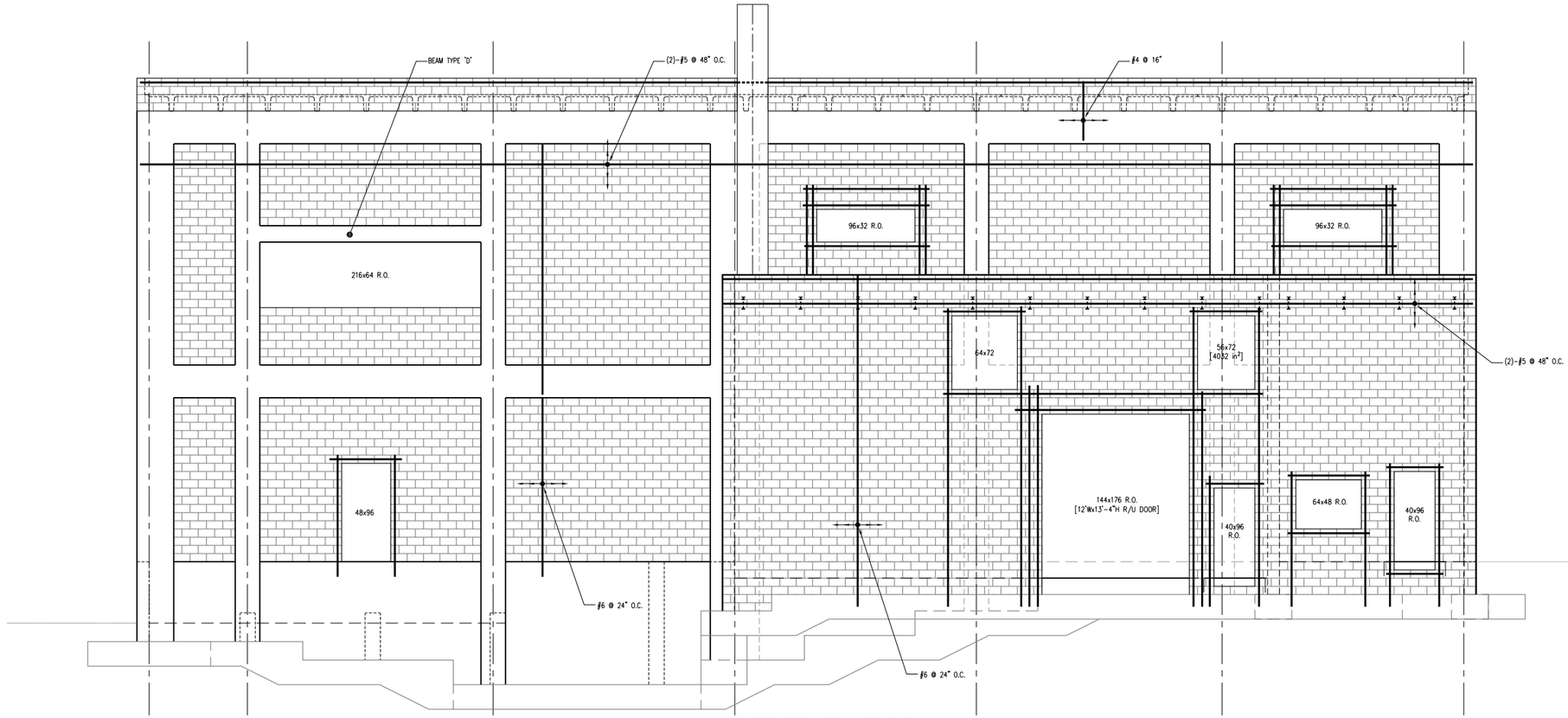
REVISION		
No. -	Date -	Revision
	7-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING
CMU WALL ELEVATION
STRUCTURAL

S7.4.0

PROJECT: 26064.01
DATE: JULY, 2010

rpotts - S740 - Jul. 15, 2010 3:09pm
FILE: W:\2008\08179 GSP - BGMU WWTP\DRYER BLDG_20100211\8179S730.dwg - S740



NOTES:
1) REFER TO DETAIL 2/S7.8.1 FOR LINTEL REINFORCEMENT AND REINFORCEMENT AROUND OPENINGS.

2) REFER TO GENERAL NOTES FOR REINFORCEMENT AT CORNERS AND WALL INTERSECTIONS.

3) REFER TO DETAIL 1/S7.8.1 FOR WALL JOINT INFORMATION. NO WALL JOINTS SHALL BE PLACED IN THE AREAS DESIGNATED AS SHEAR WALLS OR THROUGH ANY LINTELS.

4) UNIT HEATER FLUE OPENINGS SHALL BE INSTALLED IN THE NON-REINFORCED CELLS IN THE CMU WALL.

DRYER BUILDING
CMU ELEVATION - NORTH WALLS

SCALE: 3/16" = 1'-0" 0 5' 10'

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CONTRACT 3
BIOSOLIDS DRYER SYSTEM ADDITION

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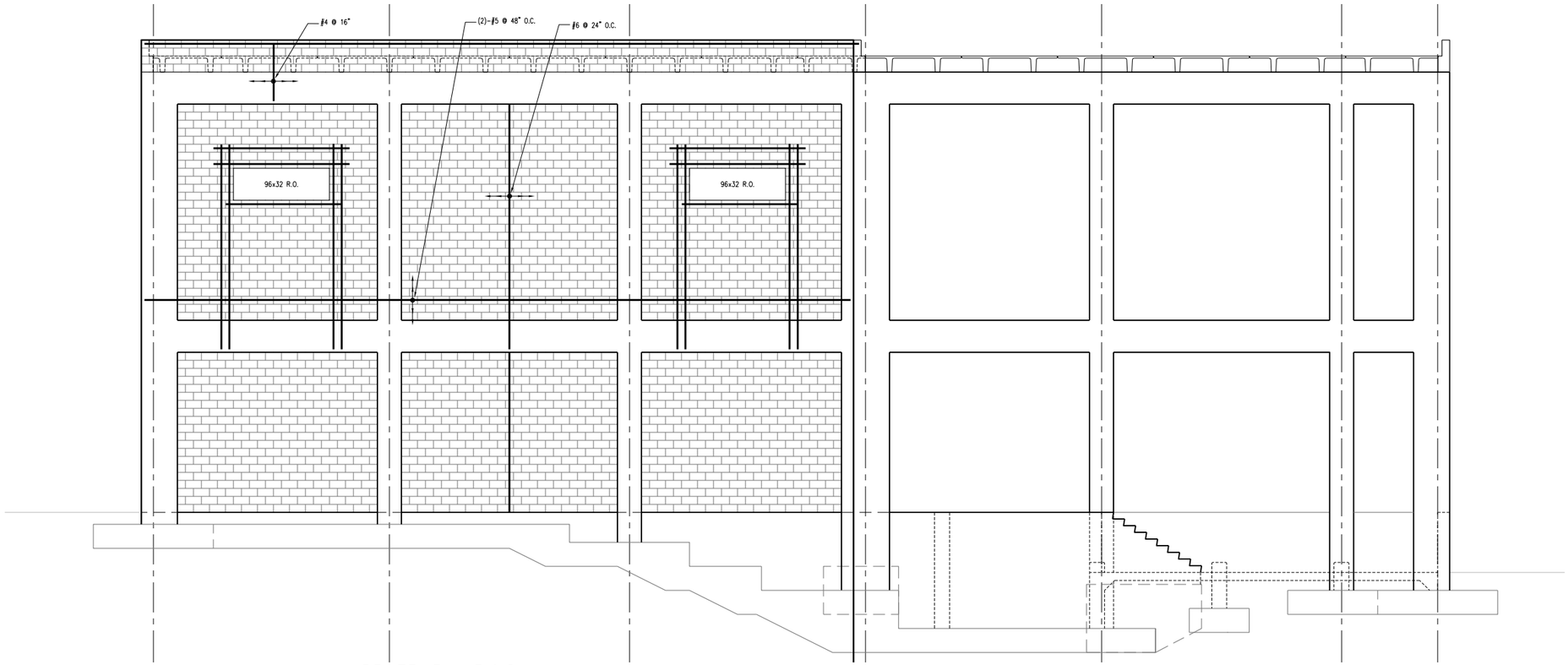
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DRYER BUILDING
CMU WALL ELEVATION
STRUCTURAL

S7.4.1

PROJECT: 26064.01
DATE: JULY, 2010

rpotts - S7.41 - Jul. 15, 2010 3:10pm
FILE: W:\2008\08179 GSP - BGMU WWTP\DRYER BLDG_20100211\8179S730.dwg - S7.41



NOTES:
1) REFER TO DETAIL 2/S7.8.1 FOR LINTEL REINFORCEMENT AND REINFORCEMENT AROUND OPENINGS.

2) REFER TO GENERAL NOTES FOR REINFORCEMENT AT CORNERS AND WALL INTERSECTIONS.

3) REFER TO DETAIL 1/S7.8.1 FOR WALL JOINT INFORMATION. NO WALL JOINTS SHALL BE PLACED IN THE AREAS DESIGNATED AS SHEAR WALLS OR THROUGH ANY LINTELS.

4) UNIT HEATER FLUE OPENINGS SHALL BE INSTALLED IN THE NON-REINFORCED CELLS IN THE CMU WALL.

DRYER BUILDING
CMU ELEVATION - SOUTH WALL

SCALE: 3/16" = 1'-0" 0 5' 10'

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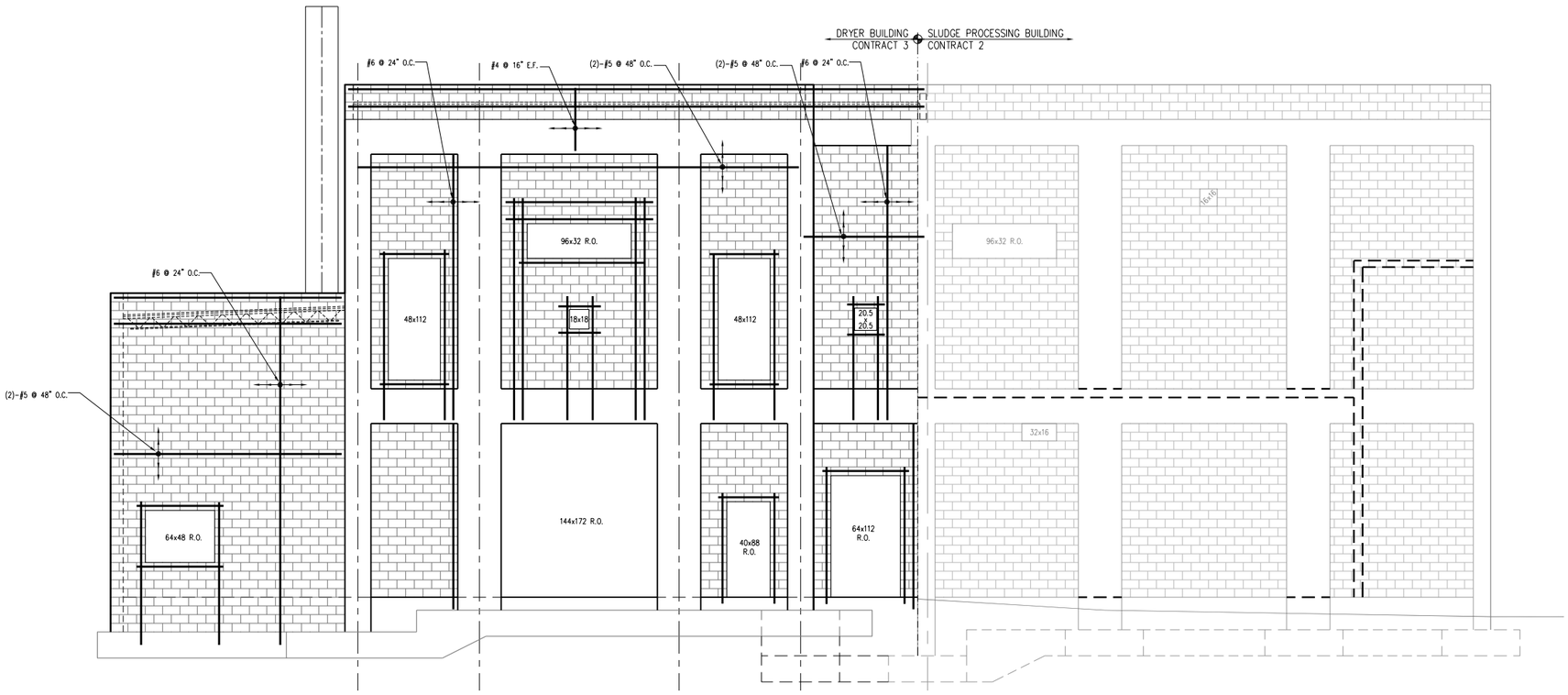
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DRYER BUILDING
CMU WALL ELEVATION
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S7.4.2

PROJECT: 26064.01
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rpotts - S742 - Jul. 15, 2010 3:10pm
FILE: W:\2008\08179 GSP - BGMU WWTP\DRYER BLDG_20100211\8179S730.dwg - S742



NOTES:
1) REFER TO DETAIL 2/S7.8.1 FOR LINTEL REINFORCEMENT AND REINFORCEMENT AROUND OPENINGS.

2) REFER TO GENERAL NOTES FOR REINFORCEMENT AT CORNERS AND WALL INTERSECTIONS.

3) REFER TO DETAIL 1/S7.8.1 FOR WALL JOINT INFORMATION. NO WALL JOINTS SHALL BE PLACED IN THE AREAS DESIGNATED AS SHEAR WALLS OR THROUGH ANY LINTELS.

4) UNIT HEATER FLUE OPENINGS SHALL BE INSTALLED IN THE NON-REINFORCED CELLS IN THE CMU WALL.

DRYER BUILDING
CMU ELEVATION - WEST WALLS

SCALE: 3/16" = 1'-0" 0 5' 10'

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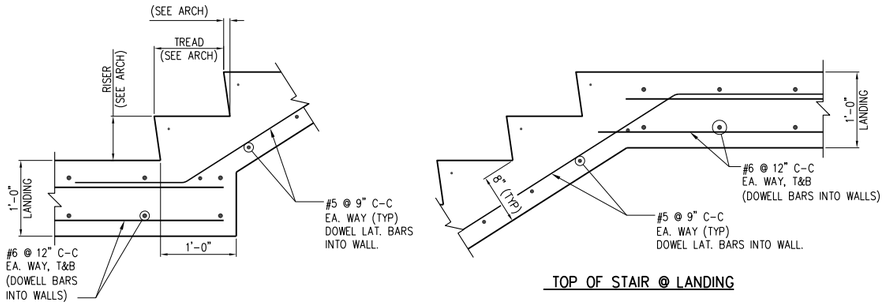
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DRYER BUILDING
CMU WALL ELEVATION
STRUCTURAL

S7.4.3

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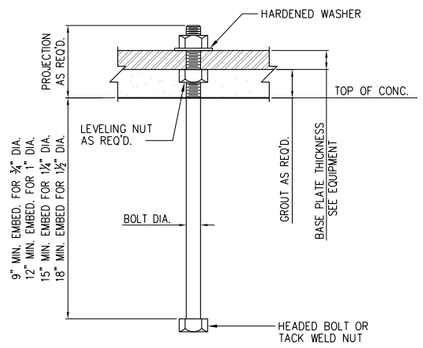
rootls - S743 - Jul. 15, 2010 3:11pm
FILE: W:\2008\08179 GSP - BGMU WWTP\DRYER BLDG_20100211\81795730.dwg - S743



1 TYPICAL CONCRETE STAIR REINF.

12" 6" 0 1' 2'

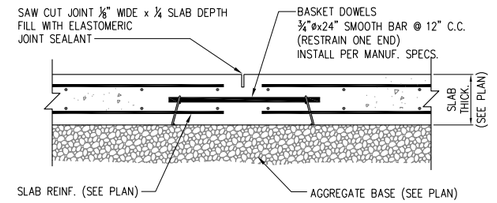
NOTES:
1. ALL ANCHOR BOLTS TO BE PER MANUF. SPECS.
2. USE HEADED BOLT OR TACK WELD NUT, OR EQUIVALENT EPOXY EMBED. USE OF "J" BOLTS IS NOT ACCEPTABLE.



2 TYPICAL ANCHOR BOLT DETAIL

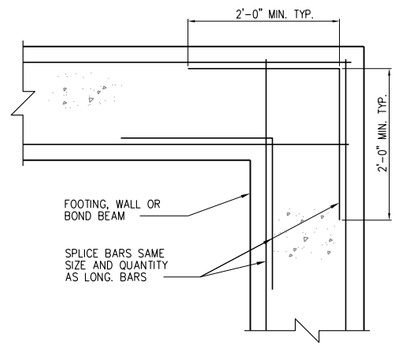
NO SCALE

NOTES:
1. SAW CUT CONTROL JOINTS IMMEDIATELY AFTER SLAB HAS CURED SUFFICIENTLY TO SUPPORT WORKER AND SAW.
2. SPACE CONTROL JOINTS AS SHOWN ON PLAN.
3. SEE STRUCTURAL GENERAL NOTES FOR SLAB LOADING CRITERIA.



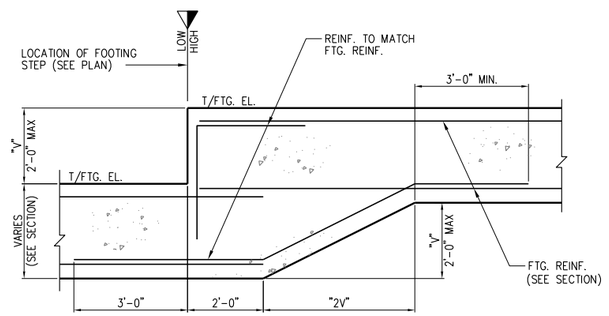
3 TYPICAL SLAB ON GRADE JOINTS (NON-CONTAINMENT)

NO SCALE



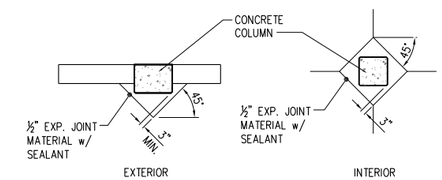
4 TYP. REINF. CORNERS NON-CONTAINMENT

NO SCALE



5 TYPICAL STEP FOOTING

NO SCALE



6 COLUMN ISOLATION JOINT

NO SCALE

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3
BIOSOLIDS DRYER SYSTEM ADDITION

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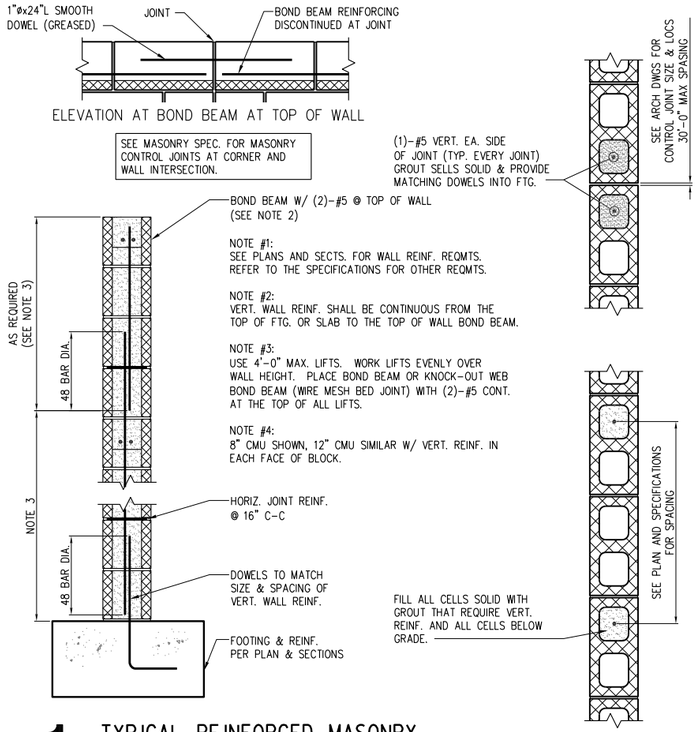
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DRYER BUILDING STRUCTURAL STANDARD DETAILS

S7.8.0

PROJECT: 26064.01
DATE: JULY, 2010

mmts - S780 - Jul, 15, 2010, 3:12pm
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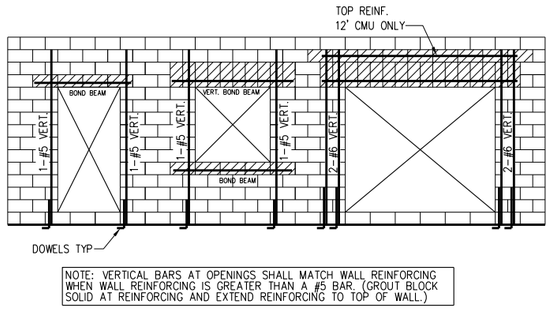


1 TYPICAL REINFORCED MASONRY

NO SCALE

BOND BEAM SCHEDULE				
WALL	OPENINGS	BOND BEAM	REINF. BARS	REMARKS
8"	TO 4'-0"	8"	2-#4	8" BEARING EACH END (MIN).
	4'-1" TO 7'-0"	16"	2-#5	8" BEARING EACH END (MIN).
	UP TO 10'-0"	16" + 8"	2-#6	16" BEARING EACH END (MIN). GROUT COURSE ABOVE LINTEL
12"	TO 3'-6"	8"	2-#5	8" BEARING EACH END (MIN).
	3'-6" TO 7'-0"	16"	2-#5	8" BEARING EACH END (MIN).
	UP TO 12'-0"	24"	2-#6 T&B	16" BEARING EACH END (MIN).

NOTES:
1. GROUT SOLID WITH 3000 PSI CONCRETE.
2. KEEP SHORED UNTIL LINTEL HAS ACHIEVED DESIGN STRENGTH.
3. VERT. REINF. IN 12" CMU IS EA. FACE.



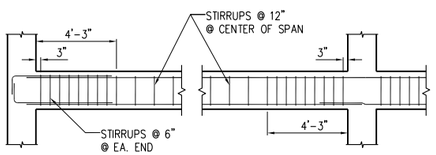
NOTE: VERTICAL BARS AT OPENINGS SHALL MATCH WALL REINFORCING WHEN WALL REINFORCING IS GREATER THAN A #5 BAR. (GROUT BLOCK SOLID AT REINFORCING AND EXTEND REINFORCING TO TOP OF WALL.)

2 TYPICAL REINFORCING AT CMU OPENINGS

NO SCALE

3

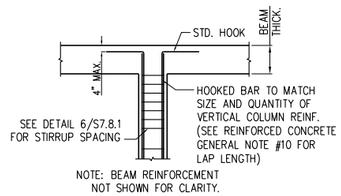
NO SCALE



1. COLUMN REINFORCING NOT SHOWN FOR CLARITY.
2. PLACE TOP BAR LAP SPLICES AT CENTER OF SPAN. PLACE BOTTOM BAR LAP SPLICES OVER COLUMNS.

4 BEAM REINFORCEMENT DIAGRAM

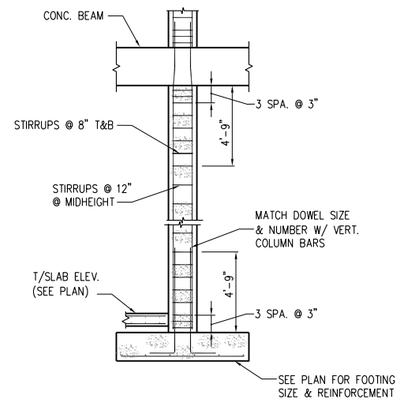
12" 6" 0 1' 2'



NOTE: BEAM REINFORCEMENT NOT SHOWN FOR CLARITY.

5 TYPICAL TOP OF COLUMN

SCALE: 1/4" = 1'-0" 3' 0 4'



NOTE: BEAM REINFORCEMENT NOT SHOWN FOR CLARITY.

6 COLUMN REINFORCEMENT DIAGRAM

SCALE: 1/4" = 1'-0" 3' 0 5'

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CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

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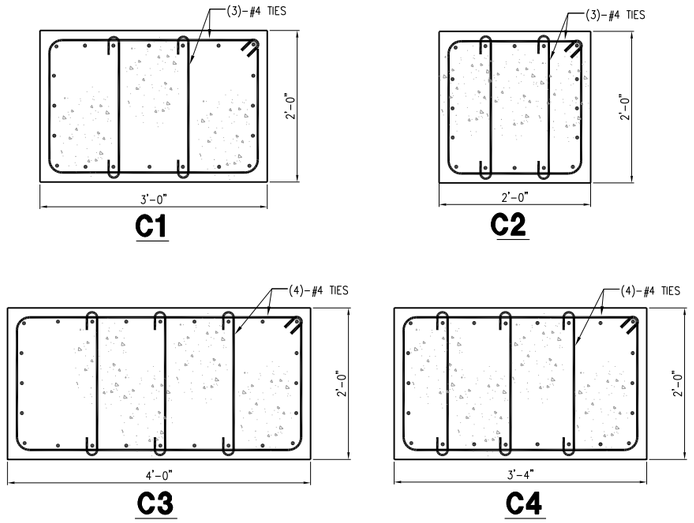
REVISION		
No. -	Date -	Revision
	7-12-10	ISSUED FOR CONSTRUCTION
1	03-20-09	ADDENDUM #1

DRYER BUILDING STRUCTURAL STANDARD DETAILS

S7.8.1

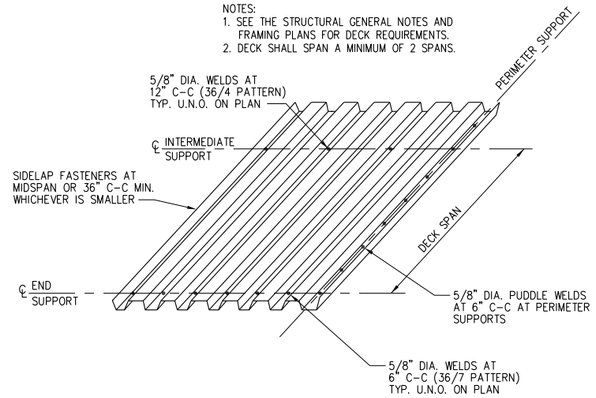
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DATE: JULY, 2010

plotts - 47361 - Jul 15, 2010 2:13pm
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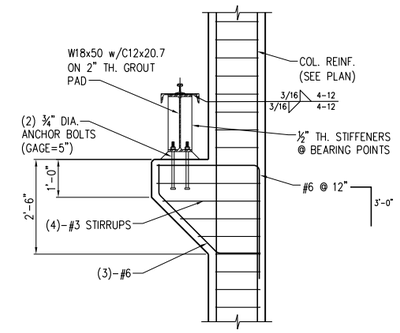
1 COLUMN DETAILS

12" 6" 0 1' 2'



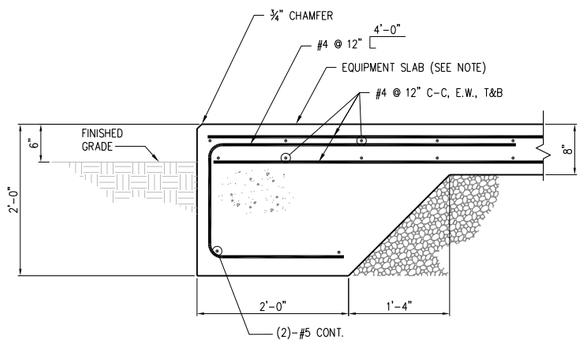
2 TYPICAL ROOF DECK ATTACHMENT

NO SCALE



3 CORBEL DETAIL

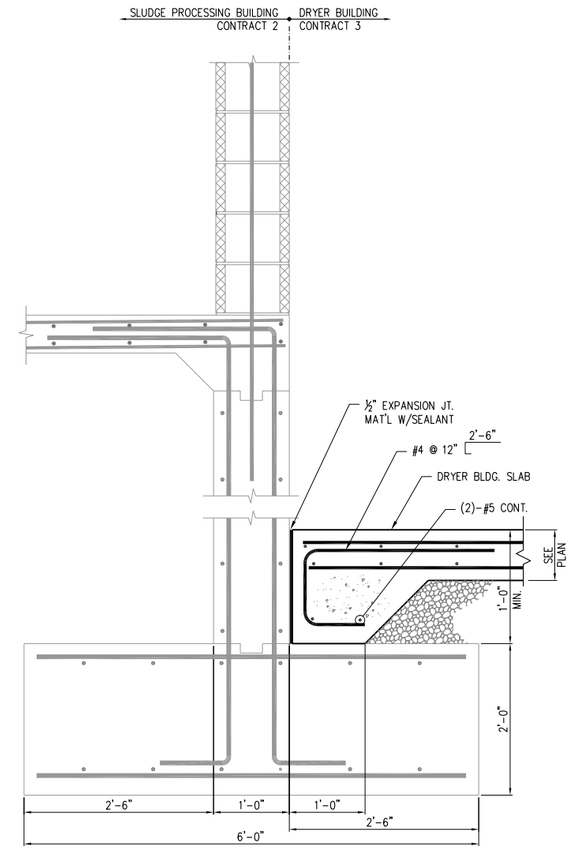
NO SCALE



NOTE
ODOR CONTROL EQUIPMENT IS ASSUMED TO BE MOUNTED ON 4"X4" BASE PLATES W/ A MAX. POINT LOAD OF 11K. NOTIFY E.O.R. IF LOADING IS GREATER THAN ASSUMED VALUE.

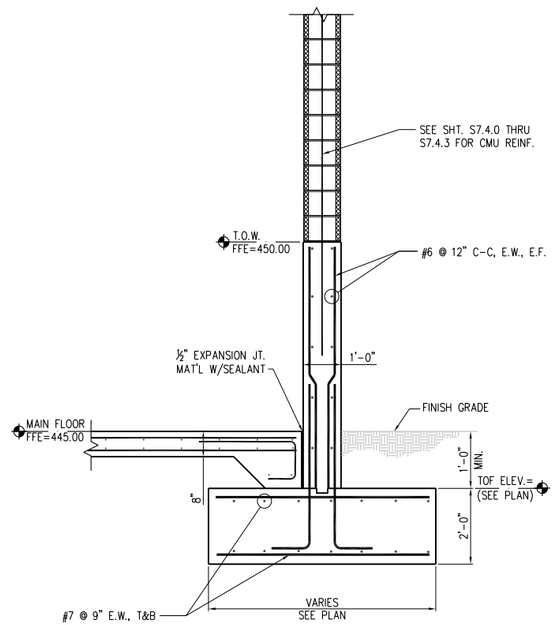
4 TYPICAL EQUIPMENT PAD

12" 6" 0 1' 2'



5 DRYER BLDG. SECTION

12" 6" 0 1' 2'



6 DRYER BLDG. SECTION

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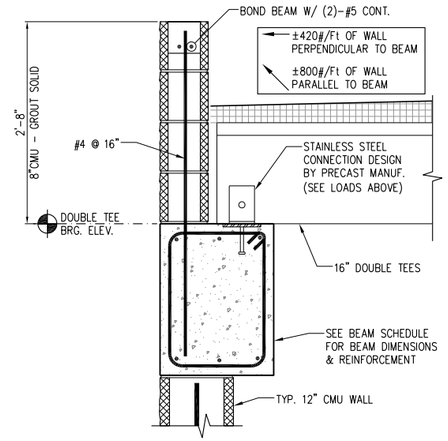
No. -	Date -	Revision
	7-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING STRUCTURAL DETAILS

S7.8.2

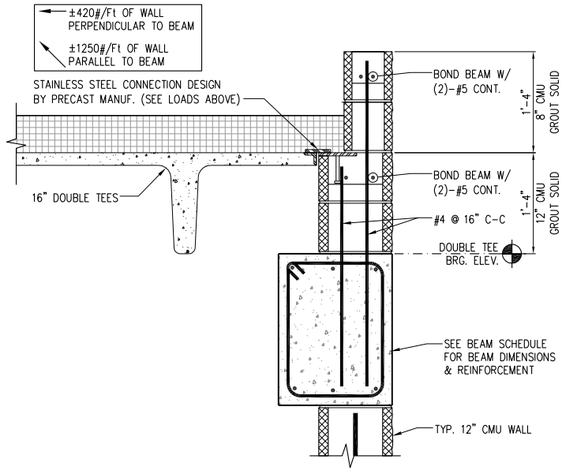
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DATE: JULY, 2010

mattw - S7821 - Jul 15, 2010 2:41pm
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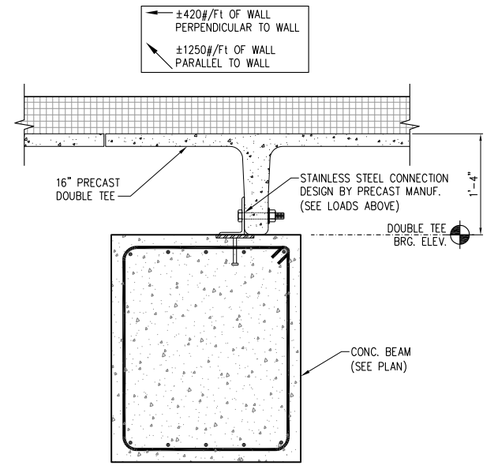
1 TYPICAL BEARING END CMU WALL @ ROOF

12" 6" 0 1' 2'



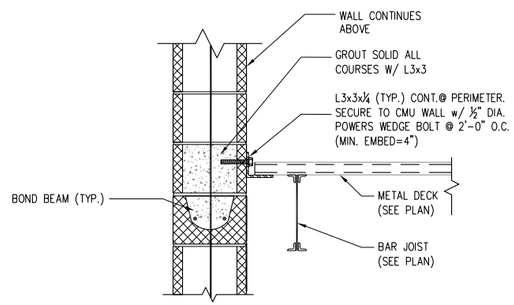
2 TYPICAL NON-BEARING END CMU WALL @ ROOF

12" 6" 0 1' 2'



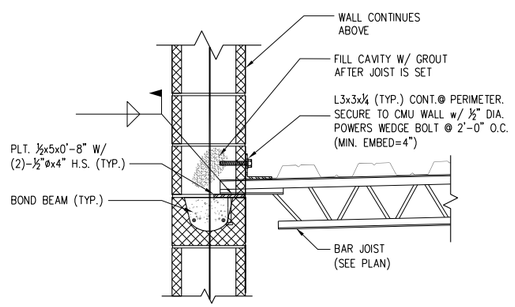
3 TYPICAL NON-BEARING END CONC. BEAM @ ROOF

12" 6" 0 1' 2'



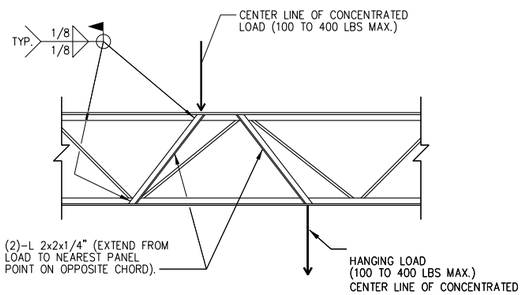
4 TYPICAL DECK AT CMU WALL

NO SCALE



5 TYPICAL BAR JOIST IN CMU WALL

NO SCALE



NOTES:

1. MAXIMUM OF 2 CONCENTRATED LOADS PER JOIST.
2. DESIGN SPECIAL JOISTS (CS JOISTS) REQUIRING SUPPORT FOR CONCENTRATED LOADS TOTALING OVER 400 LBS FOR ONE JOIST.

6 TYP. JOIST REINFORCEMENT FOR CONCENTRATED LOADS

NO SCALE

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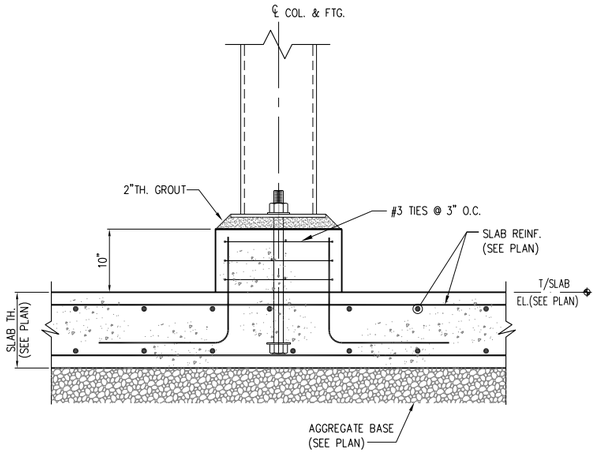
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No. - Date - Revision		
	7-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING STRUCTURAL DETAILS

S7.8.3

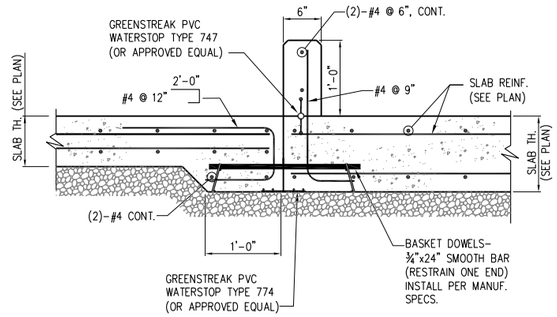
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DATE: JULY, 2010

plotts - S7820 - Jul. 15, 2010 2:41pm
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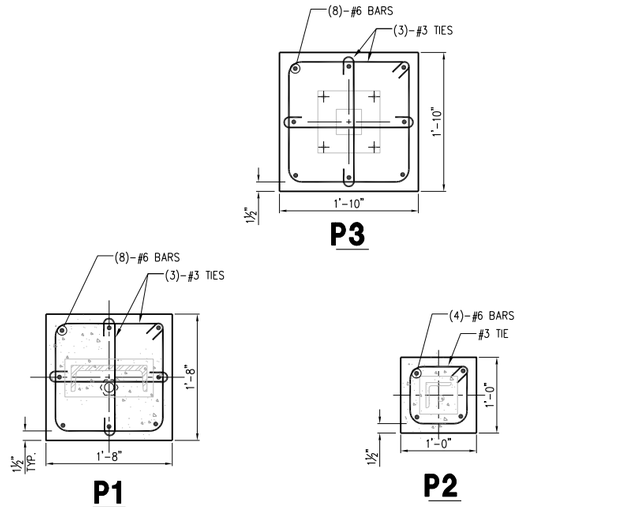
1 MAIN PIER AT DRYER

NO SCALE



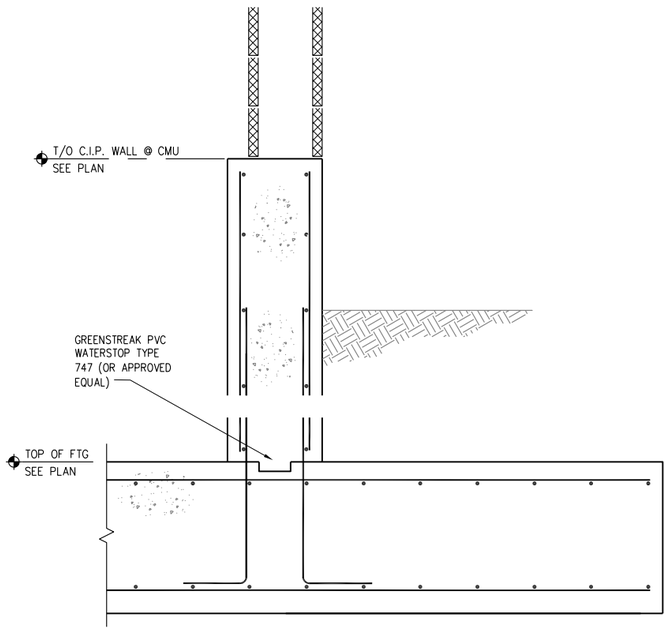
2 THICKENED SLAB AT DRYER

NO SCALE



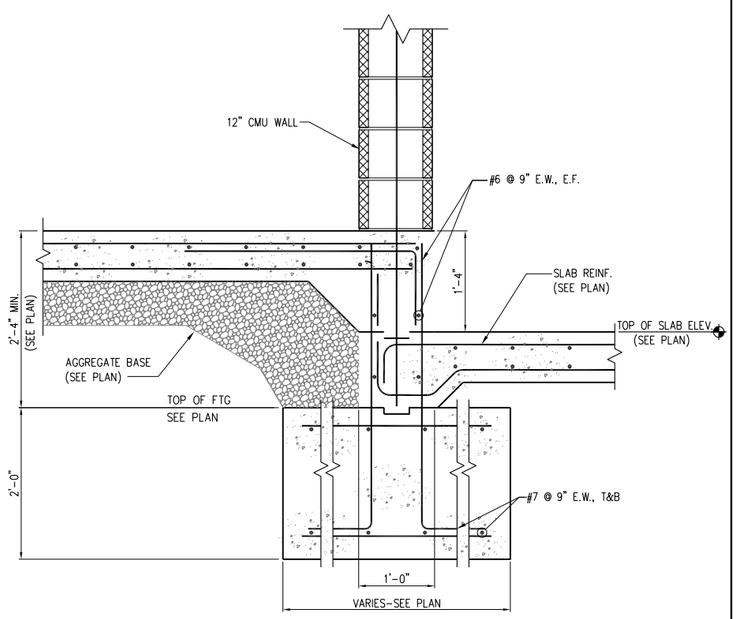
3 PEDESTAL DETAILS

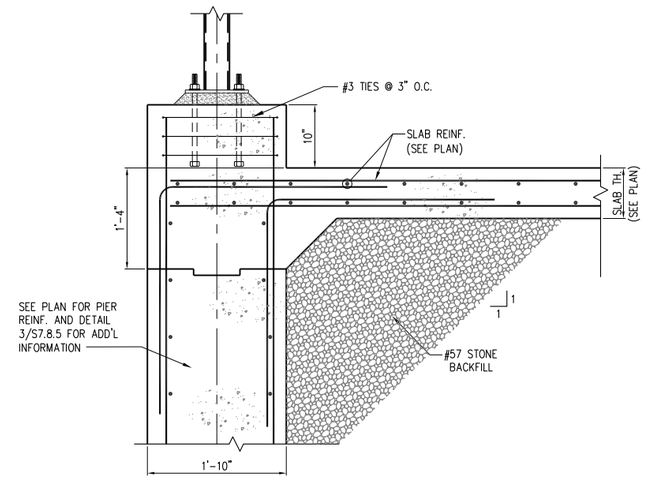
NO SCALE



4 TYPICAL CMU WALL BEARING ON C.I.P. CONC. WALL

NO SCALE





6 TYPICAL WET CAKE HOPPER PIER AT PUMP PIT WALL

NO SCALE

plotts: S7.8.4 - Jul. 15, 2010, 3:45pm
FILE: W:\2006\06179.GSP - BGMU WWTP\DRYER BLDG_20100211817957B0.dwg - S7.8.4

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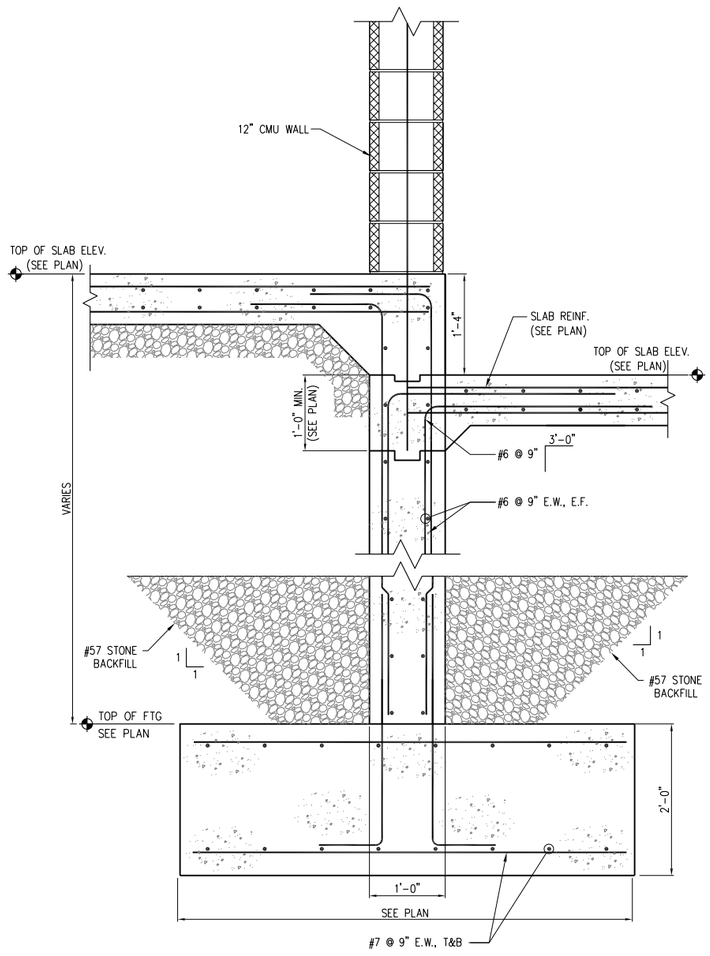
TSG Job No. 08179

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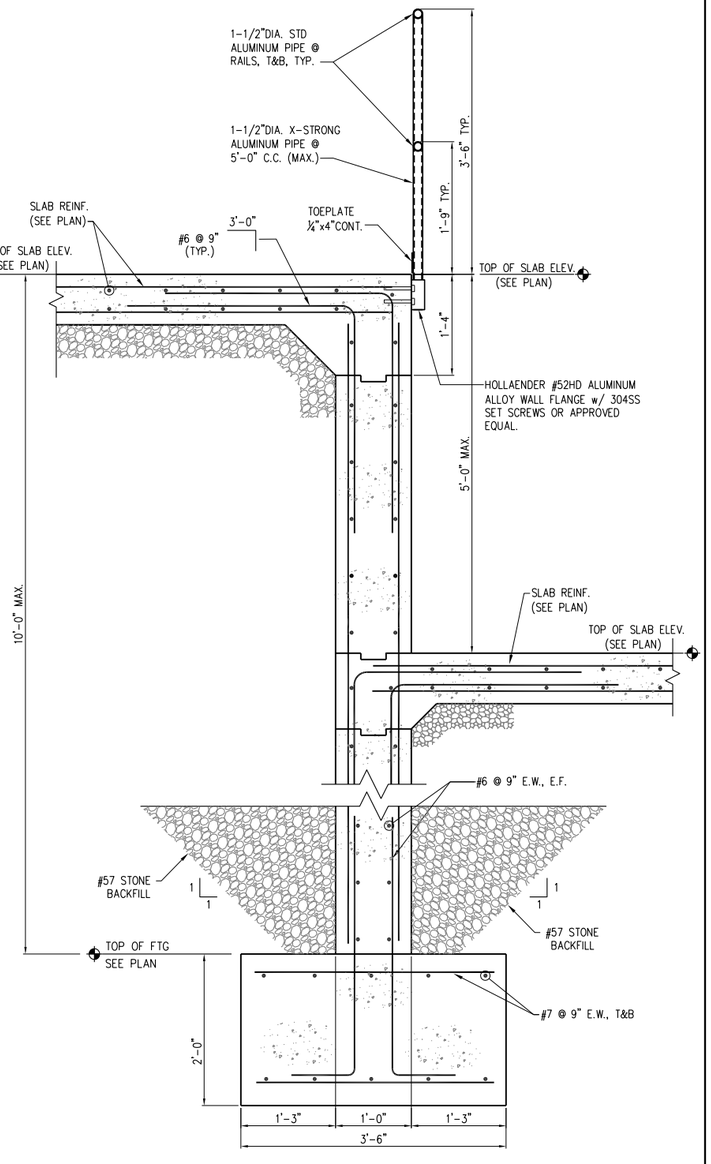
DRYER BUILDING STRUCTURAL DETAILS

S7.8.4

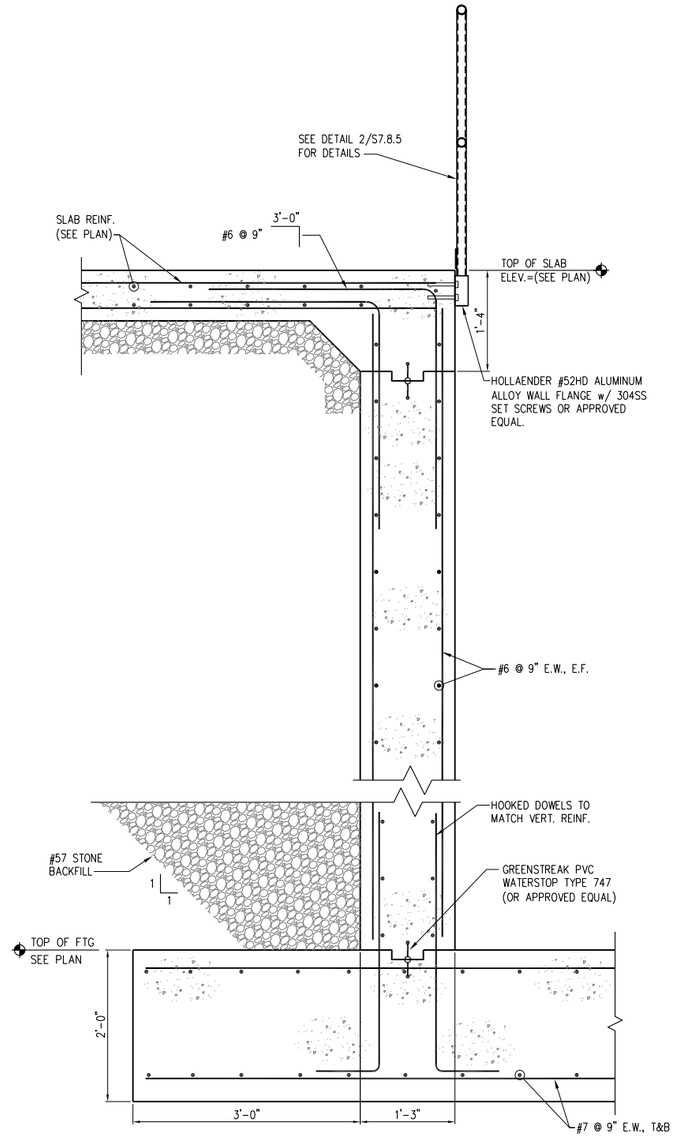
PROJECT: 26064.01
DATE: JULY, 2010



1 TYPICAL CMU WALL
BEARING ON C.I.P. CONC. WALL
NO SCALE



2 TYPICAL SLABS AND WALL
BEARING ON FOUNDATION
NO SCALE



3 TYPICAL SLAB AND WALL
AT DRYER FEED PUMP PIT
NO SCALE

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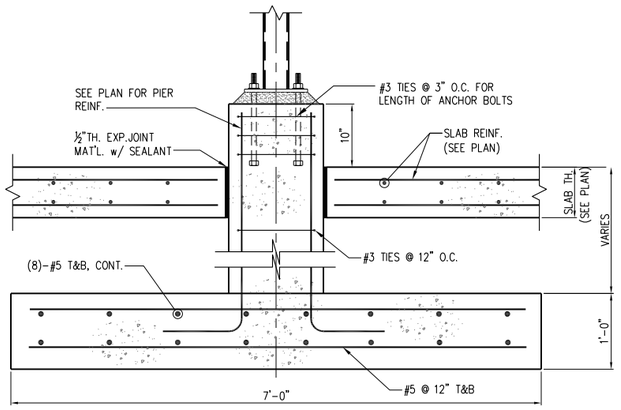
No.	Date	Revision
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DRYER BUILDING
STRUCTURAL
DETAILS

S7.8.5

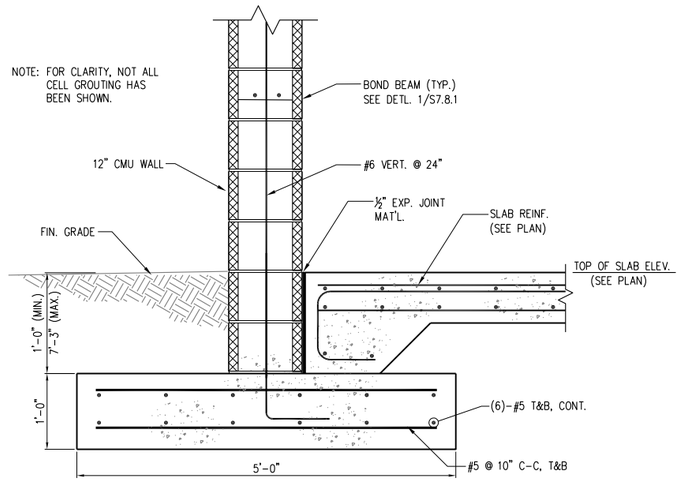
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DATE: JULY, 2010

plotts - 67365 - Jul 15, 2010 2:19pm
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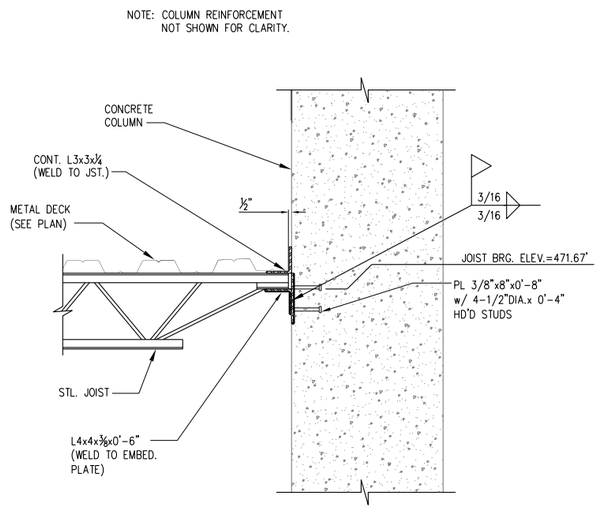
1 TYPICAL WET CAKE HOPPER PIER THROUGH FLOOR

NO SCALE



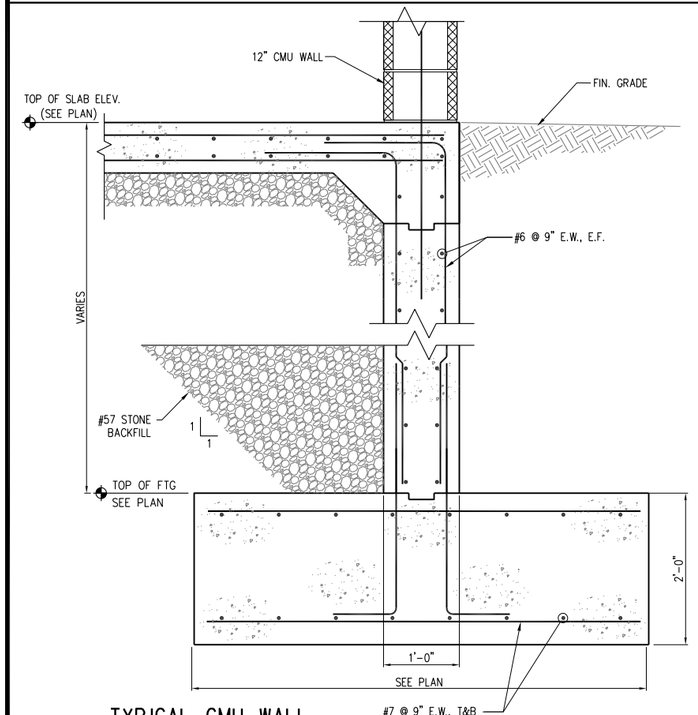
2 TYPICAL CMU WALL BEARING ON FOUNDATION

NO SCALE



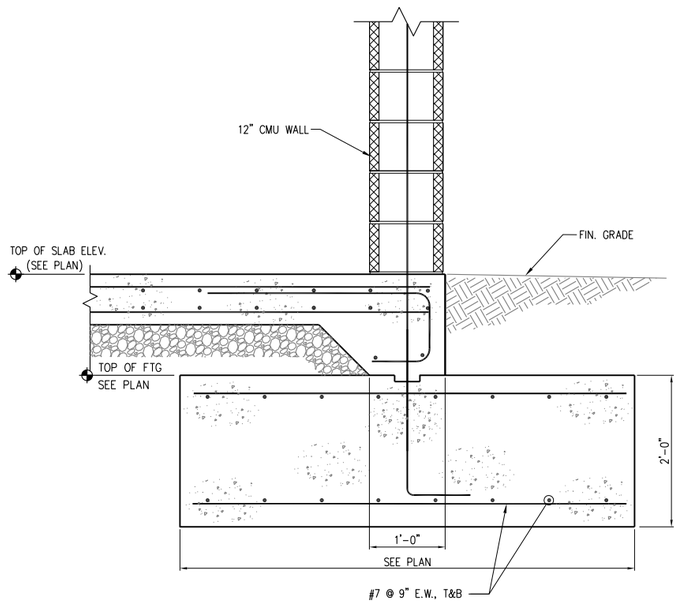
3 BAR JOIST DETAILS

NO SCALE



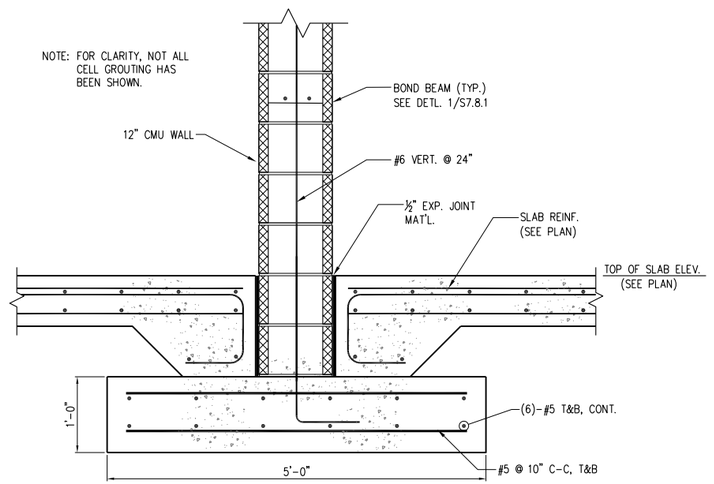
4 TYPICAL CMU WALL BEARING ON SLAB ON WALL

NO SCALE



5 TYPICAL CMU WALL BEARING ON TURNED DOWN SLAB

NO SCALE



6 TYPICAL CMU WALL BEARING ON FOUNDATION

NO SCALE

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DRYER BUILDING STRUCTURAL DETAILS

S7.8.6

PROJECT: 26064.01
DATE: JULY, 2010

plotts - 57786 - Jul 15, 2010 8:17pm
FILE: W:\2006\06179.GSP - BGMU WWTP\DRYER BLDG_20100211817957786.dwg - S7786

NOTES:

1. REFERENCE SPECIFICATIONS FOR OWNER FURNISHED EQUIPMENT. ALL ADDITIONAL EQUIPMENT EITHER SHOWN OR NOT SHOWN WHICH IS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
2. CENTRIFUGE CONVEYORS ARE PROVIDED AND INSTALLED AS PART OF CONTRACT 2.
3. CONTRACTOR SHALL FIELD ROUTE ALL NITROGEN PIPING PER DRAWING'S I7.1.1 & I7.1.2 AND SHALL SUPPORT PER SPECIFICATIONS.

BIOSOLIDS STORAGE SILO NO.2 (SIZE: 150 CUBIC YARDS) BSS-7600

BIOSOLIDS STORAGE SILO NO.1 (SIZE: 150 CUBIC YARDS) BSS-7500

BIOSOLIDS STORAGE SYSTEM: INCLUDING ALL STORAGE TANKS, SILO PIPING, VALVES, LADDERS, STAIRS, PLATFORMS, HANDRAILS, FOUNDATIONS & STRUCTURAL SUPPORTS, SHALL BE DESIGNED AND FURNISHED AS PART OF THE STORAGE SYSTEM (SEE EQUIPMENT SPECIFICATION)

PIPE SUPPORT BY BIOSOLIDS STORAGE SYSTEM MANUFACTURER

NITROGEN GAS STORAGE TANK (SIZE: 1,500 GALLONS) BSN-7460

METERING PUMP BSMO-7681

MINERAL OIL STORAGE TANK (SIZE: 1,200 GALLONS) BSMO-7680

DIVERTER VALVE BSS-7505A3

6"-BS

1"-N

1" NITROGEN PIPING, SEE NOTE NO.3

6" PNEUMATIC CONVEYING PIPELINE TO SILO'S NO.1 & NO.2

SALES OFFICE FFE=450.0

BOILER ROOM FFE=448.67

THERMAL FLUID HEATER BSD-7440

COMBUSTION FAN BSD-7443

CATCHMENT TANK BSD-7442

THERMAL FLUID HEATER EQUIPMENT (SKID MOUNTED HEATER W/ EXOTHERMIC TUBULAR EXCHANGER)

OIL RECIRCULATION PUMP BSD-7441

CONTROL PANEL BSD-7446

BOILER TANK

EXPANSION TANK BSD-7445

EXOTHERMIC TUBULAR HEAT EXCHANGER BSD-7444

6"-TO, HOT OIL RETURN IE=464.97

℄ ELEV.=470.67

6"-TO, HOT OIL SUPPLY IE=459.48

BOILER, EXHAUST STACK (SEE MECHANICAL-HVAC DRAWINGS)

6"-TO

6" DIA. THERMAL FLUID PIPING

BIOSOLIDS TRANSFER BLOWERS (SKID MOUNTED TABLE TOP UNIT W/SOUND ENCLOSURE) BSTB-7420 BSTB-7421

℄ ELEV.=465.22

DRYER ROOM FFE=450.0

14'-7 3/4 "

44'-4"

7'-4 1/4"

18'-6"

15'-6"

ROTARY FEEDER BSRF-7416

SURGE BIN BSTB-7422

COOLING SCREW CONVEYOR BSD-7410

BSCV-7425

BSBF2-7423

6"-AIR

INDIRECT DRYER, COOLING SCREW AND EXHAUST SCRUBBER ARE PART OF OWNER FURNISHED EQUIPMENT (SEE SHOP DRAWINGS FOR DETAILS

DRYER DRIVE UNIT NO.2 BSD-7402

DRYER DRIVE UNIT NO.1 BSD-7401

INDIRECT DRYER (12,000-12,500 LB/HR) BSD-7400

DRYER EXHAUST SCRUBBER BSD-7450

3"-DR

PLATFORM ACCESS STAIRS (SEE STRUCTURAL DRAWINGS)

DRYER MAINTENANCE PLATFORM (SEE STRUCTURAL DRAWINGS)

LADDER WITH SAFETY CHAIN (SEE STRUCTURAL DRAWINGS)

ODOR CONTROL EQUIPMENT BSOC-7700

BSOC-7720 RECIRCULATION PUMP

BSOCSV1-7710 WATER SUPPLY VALVE

BSOC-7715 CONTROL PANEL

BSOC-7730 EXHAUST FAN

SEE MECHANICAL-HVAC DRAWINGS FOR ROUTING OF ODOR CONTROL PIPING

3 MP7.4.0

4'-0" 4'-0" 3'-8"

10'-6" 6'-6"

HOPPER AIR EXHAUST PORT, SEE MECHANICAL-HVAC DRAWINGS (TYPICAL 2 PLACES)

ALUMINUM LADDER WITH SAFETY CAGE, PROVIDED BY EQUIP. MANUFACTURER

MANWAY ACCESS DOOR, PROVIDED BY EQUIPMENT MANUFACTURER (TYPICAL 2 LOCATIONS)

DRYER BUILDING (SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS)

DRYER FEED PUMP PIT FFE=440.0

DEWATERED SLUDGE HOPPER ROOM FFE=445.0

1 MP7.4.0

WET CAKE HOPPER NO.2 (SIZE: 100 CUBIC YARDS) HOPPER W/ LIVE BOTTOM CONVEYOR & DISCHARGE BSCH-7210

BSBF-7222

BSKV-7226A1

BSKV-7225A1

LIVE BOTTOM CONVEYORS

SPSC-4602

SPSC-4601

WET CAKE HOPPER NO.1 (SIZE: 100 CUBIC YARDS) HOPPER W/ LIVE BOTTOM CONVEYOR & DISCHARGE BSCH-7110

BSBF-7121

BSKV-7124A1

BSKV-7123A1

BSKV-7252A2

BSKV-7251A2

HOPPER AIR INTAKE PORT, SEE MECHANICAL-HVAC DRAWINGS (TYPICAL 2 PLACES)

EQUIPMENT ACCESS PLATFORM 3'-0" WIDE WALKWAY WITH ALUMINUM GRATING, HANDRAILS, TOE-BOARDS, LADDER AND ALL SUPPORTS, PROVIDED BY EQUIPMENT MANUFACTURER

MANWAY ACCESS DOOR, PROVIDED BY EQUIPMENT MANUFACTURER (TYPICAL 2 LOCATIONS)

11'-0" 5'-6" 2'-0" 5'-6" 11'-0" 5'-6"

3'-0" 2'-6" 7'-6" 7'-6" 3'-0" 7'-7 3/8"

MANWAY ACCESS DOOR, PROVIDED BY EQUIPMENT MANUFACTURER (TYPICAL 2 LOCATIONS)

CONVEYOR NO.1A SPTC-4400

CONVEYOR NO.2A SPTC-4500

CONVEYOR NO.3A SPTC-4600

HANDRAILS (SEE STRUCTURAL DRAWINGS)

EDGE OF FLOOR SLAB (SEE STRUCTURAL DRAWINGS)

CENTRIFUGE CONVEYORS, LEAVING SLUDGE PROCESSING BUILDING, DISCHARGING INTO WET CAKE HOPPERS 1 & 2. SEE NOTE NO.2 (TYPICAL 3 LOCATIONS)

ALUMINUM STAIRWAY & PLATFORM WITH HANDRAILS, TOE-BOARDS AND ALL REQUIRED SUPPORTS (PROVIDED UNDER CONTRACT NO.2. CONTRACTOR TO INSTALL UNIT AS PART OF CONTRACT NO.3)

SLUDGE PROCESSING BUILDING (SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS)

CONTRACT NO.3

CONTRACT NO.2

EXISTING/UNDER CONSTRUCTION SLUDGE PROCESSING BUILDING

CENTRIFUGE ROOM

CONVEYOR ROOM

CENTRIFUGE NO.1 SPC-4001

NORTH

DRYER BUILDING - UPPER LEVEL FLOOR PLAN

SCALE: 3/16" = 1'-0" 3' 0 5'

A MP 7.3.0 | B MP7.3.1 | C MP7.3.1 | D MP7.3.2 | E MP 7.3.2 | F MP 7.3.3 | G MP 7.3.3

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION		
No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

MECHANICAL PROCESS SLUDGE PROCESSING & DRYER BUILDING UPPER LEVEL PLAN

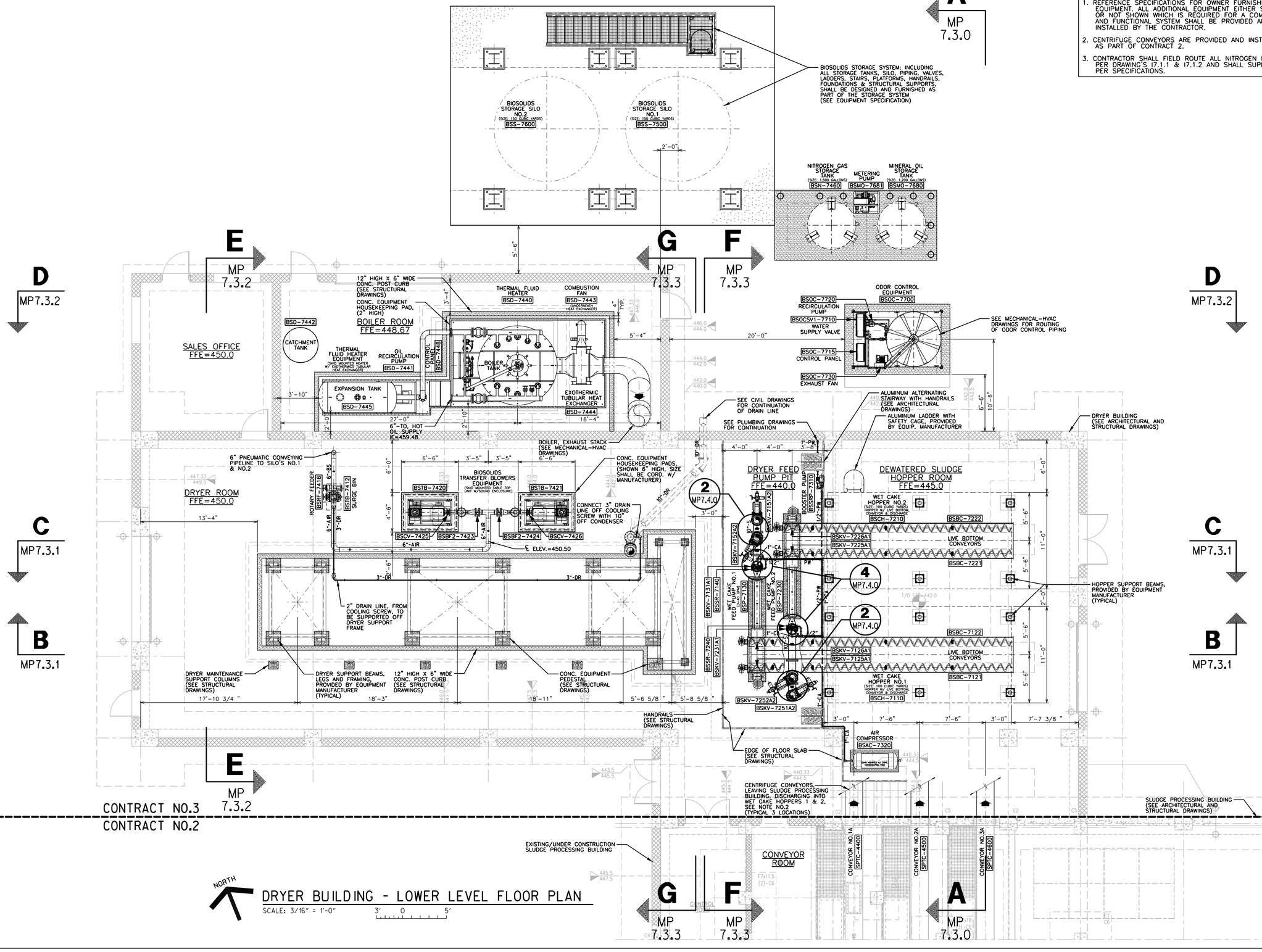
MP7.1.0

PROJECT: 26064.01
DATE: JULY, 2010

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NOTES:

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DRYER BUILDING - LOWER LEVEL FLOOR PLAN

SCALE: 3/16" = 1'-0" 3' 0 5'

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

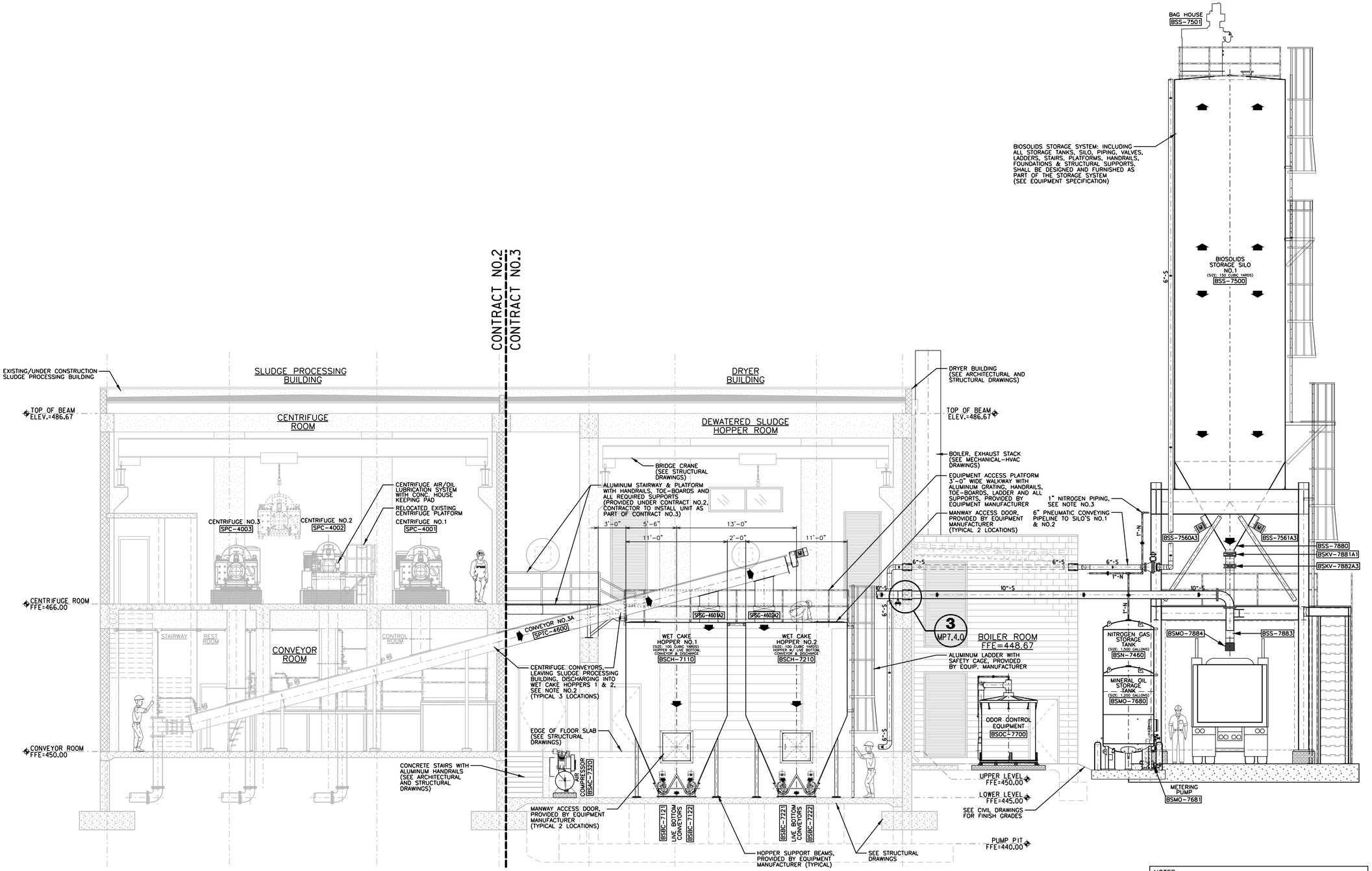
REVISION		
No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

MECHANICAL PROCESS SLUDGE PROCESSING & DRYER BUILDING LOWER LEVEL PLAN

MP7.2.0

PROJECT: 26064.01
DATE: JULY, 2010

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A SECTION

SCALE: 3/16" = 1'-0"

3' 0 5'

NOTES:

1. REFERENCE SPECIFICATIONS FOR OWNER FURNISHED EQUIPMENT. ALL ADDITIONAL EQUIPMENT EITHER SHOWN OR NOT SHOWN WHICH IS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

REVISION

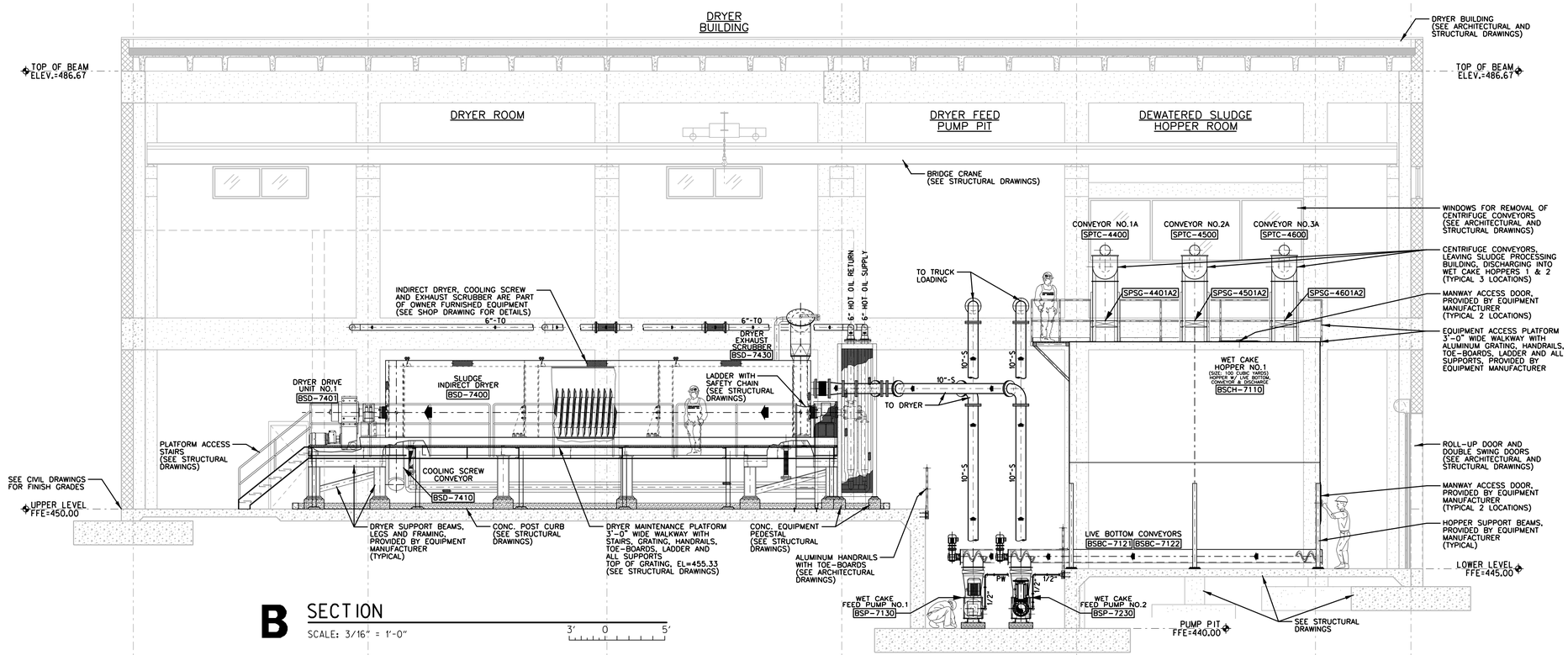
No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

MECHANICAL PROCESS SLUDGE PROCESSING & DRYER BUILDING SECTION A

MP7.3.0

PROJECT: 26064.01
DATE: JULY, 2010

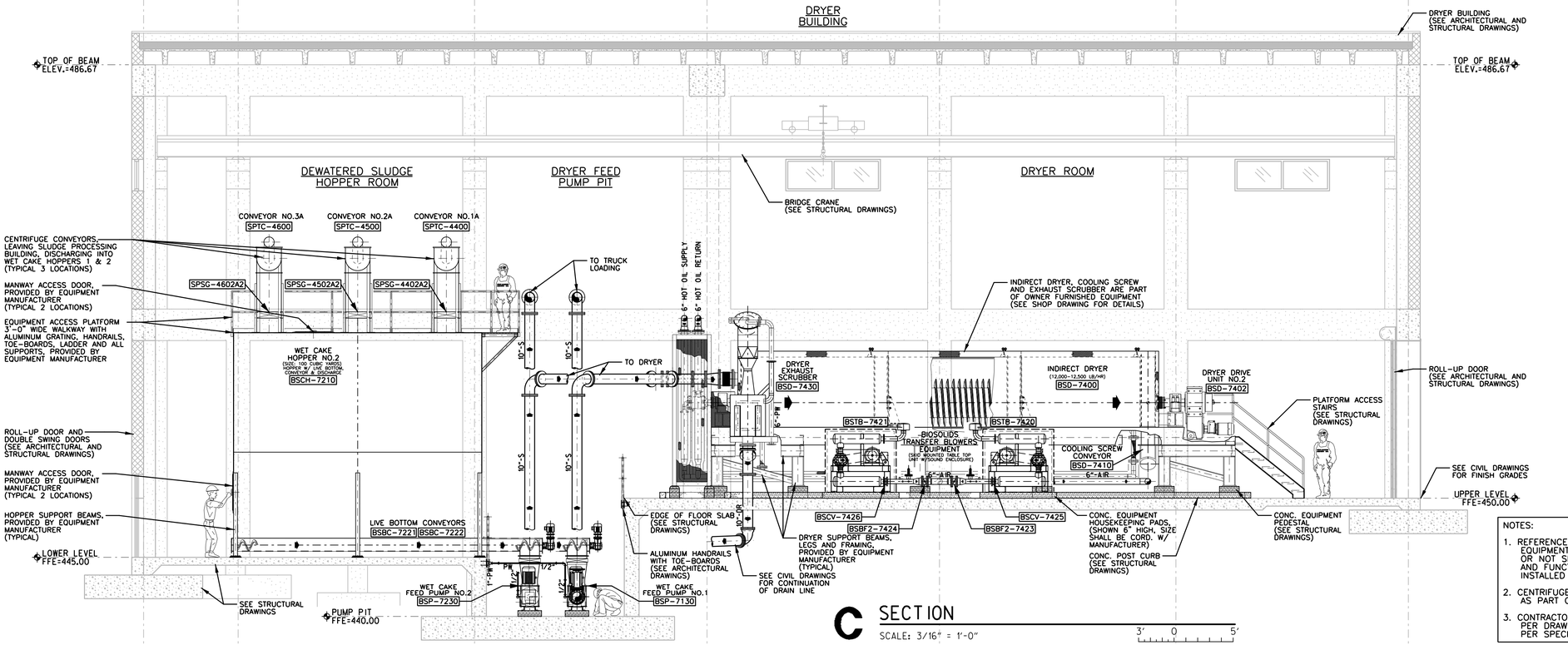
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B SECTION

SCALE: 3/16" = 1'-0"

3' 0 5'



C SECTION

SCALE: 3/16" = 1'-0"

3' 0 5'

NOTES:

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CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

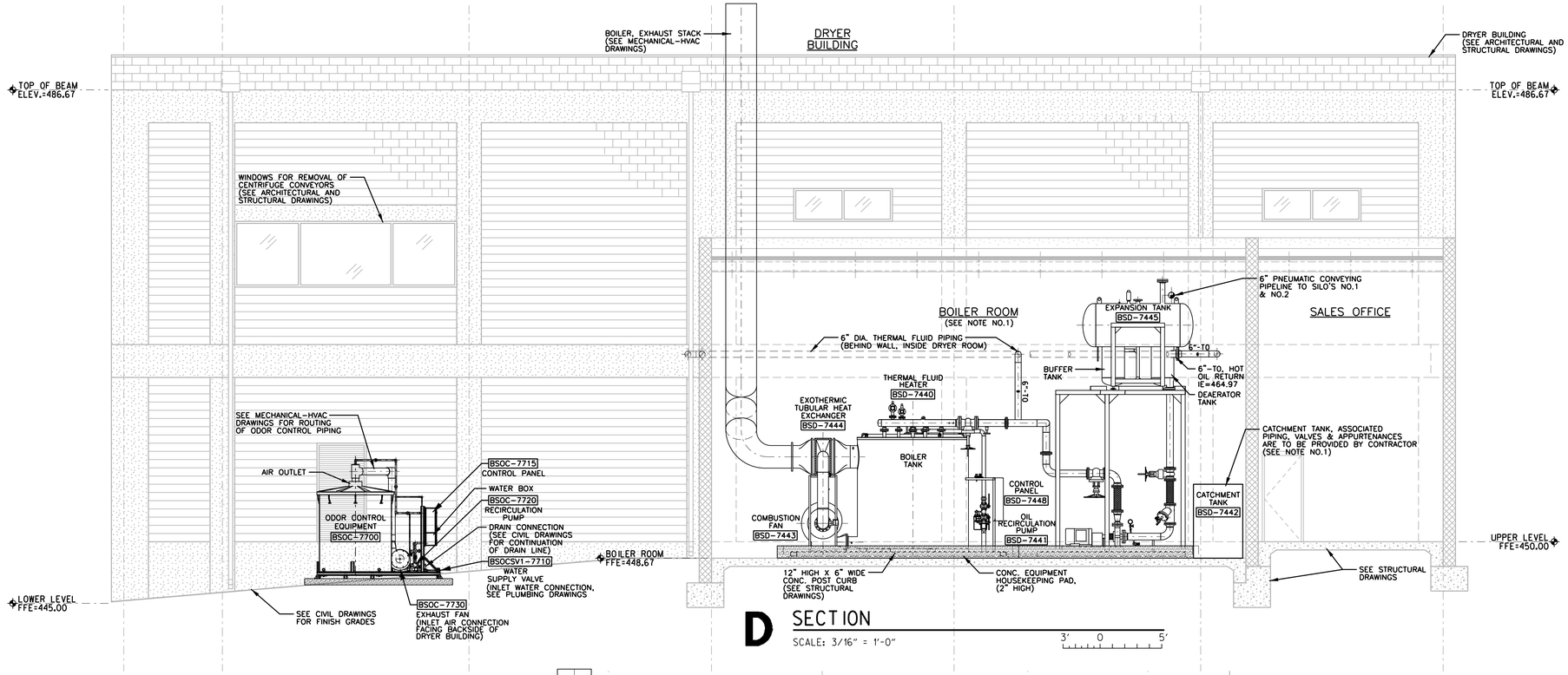
REVISION		
No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

MECHANICAL PROCESS
DRYER BUILDING
SECTIONS B AND C

MP7.3.1

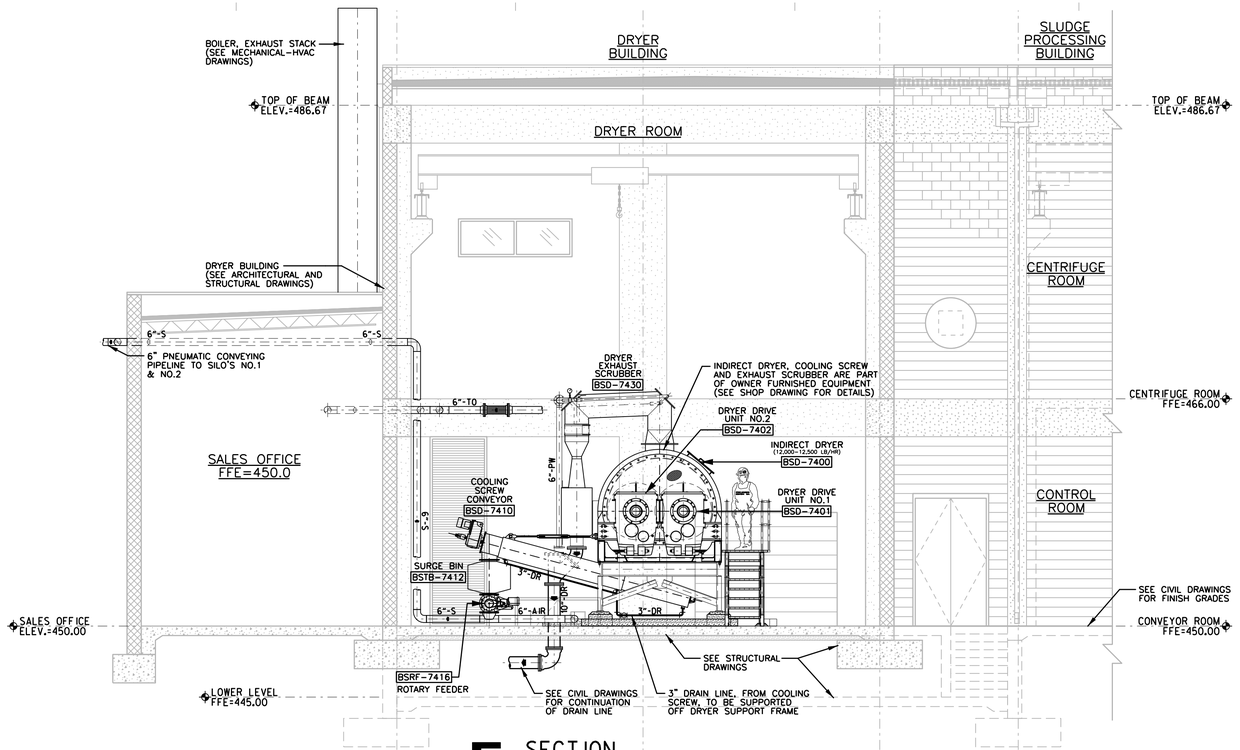
PROJECT: 26064.01
DATE: JULY, 2010

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D SECTION

SCALE: 3/16" = 1'-0"



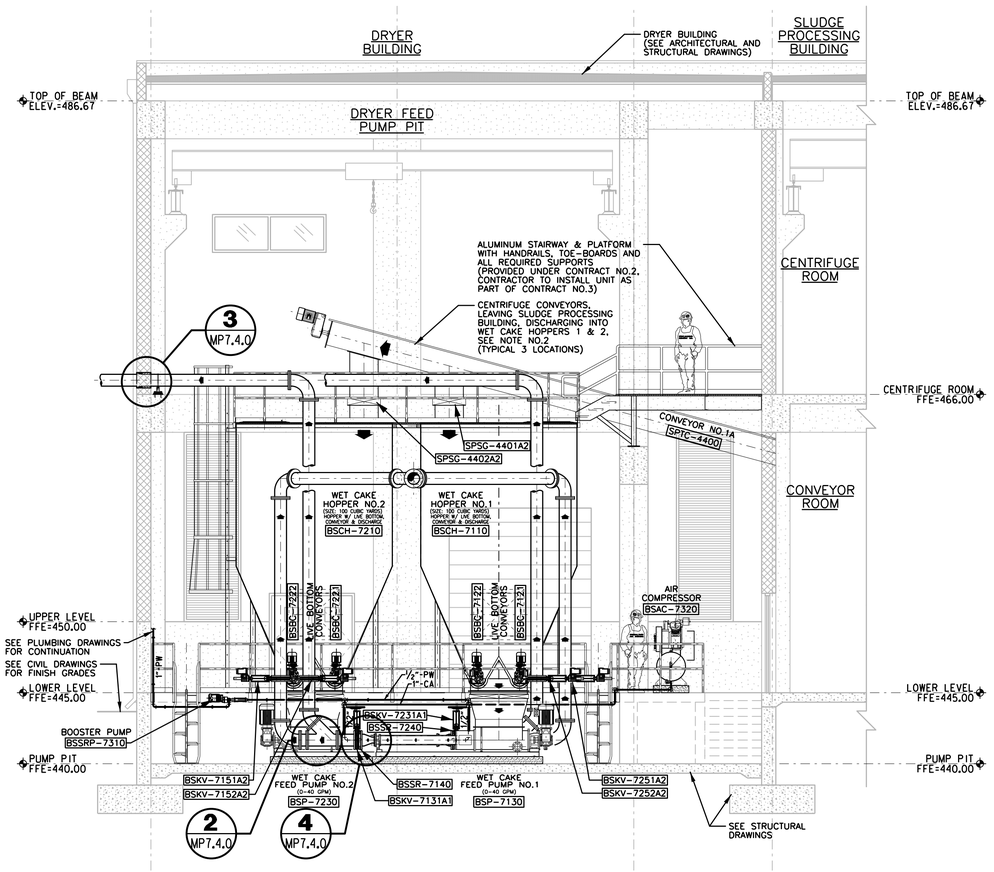
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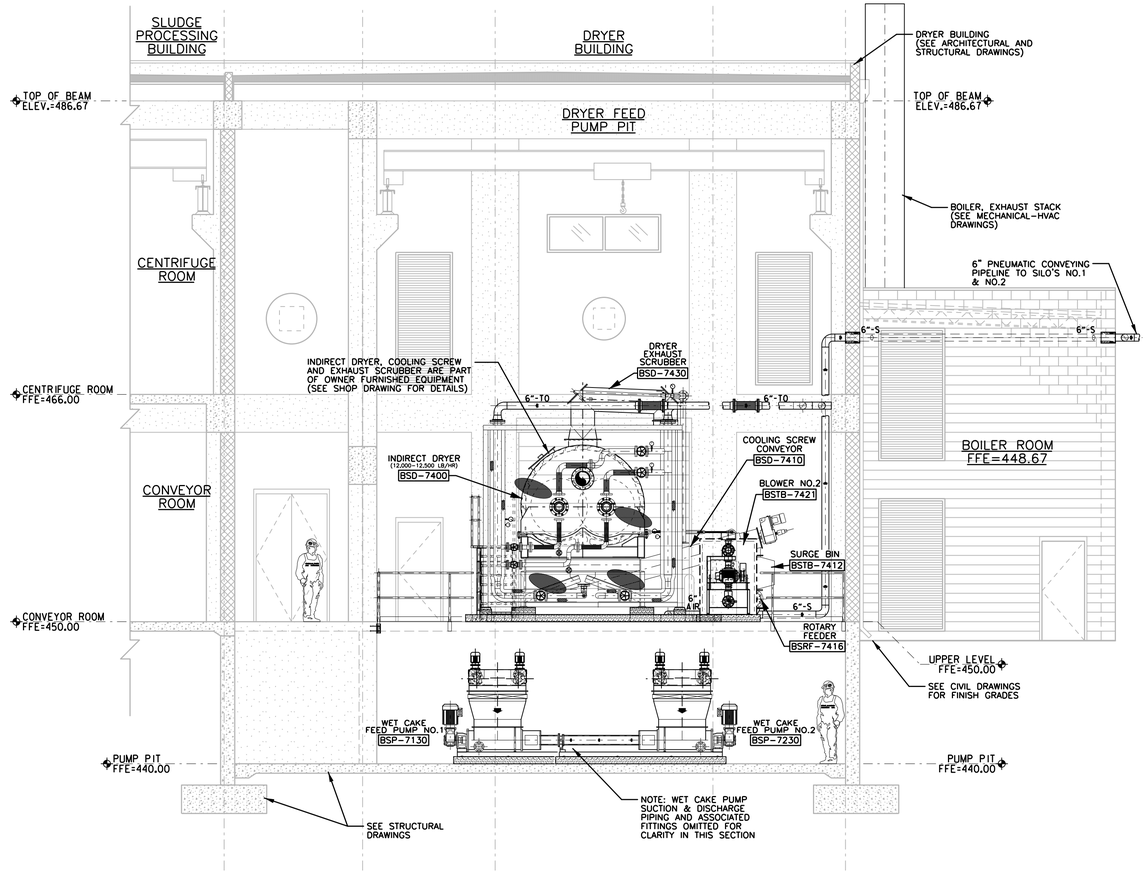
SCALE: 3/16" = 1'-0"

NOTES:

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F SECTION

SCALE: 3/16" = 1'-0"

G SECTION

SCALE: 3/16" = 1'-0"

NOTES:

1. REFERENCE SPECIFICATIONS FOR OWNER FURNISHED EQUIPMENT. ALL ADDITIONAL EQUIPMENT EITHER SHOWN OR NOT SHOWN WHICH IS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

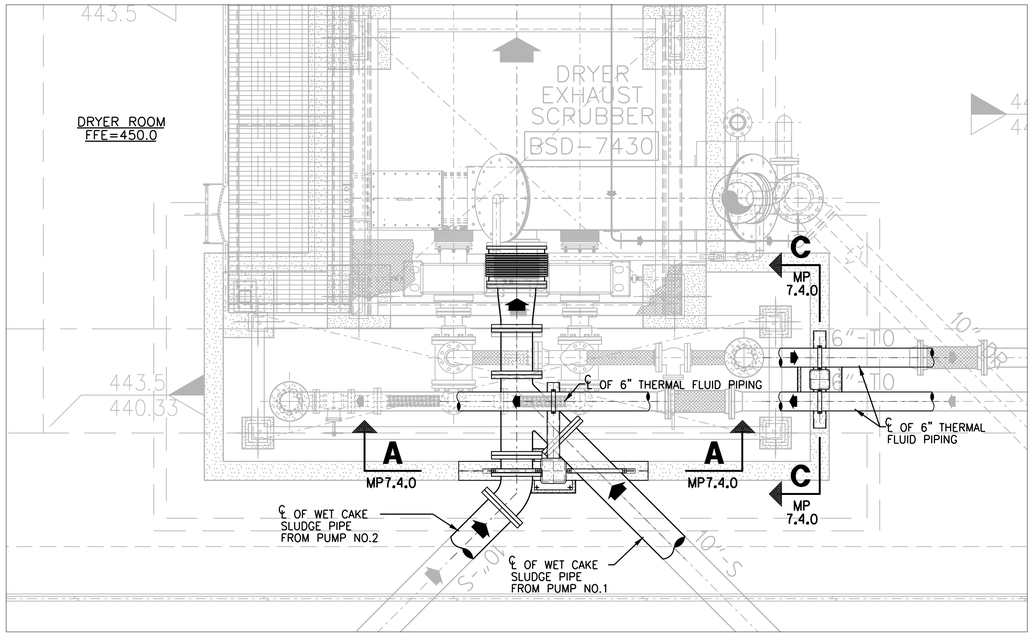
REVISION		
No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

MECHANICAL PROCESS
DRYER BUILDING
SECTIONS F AND G

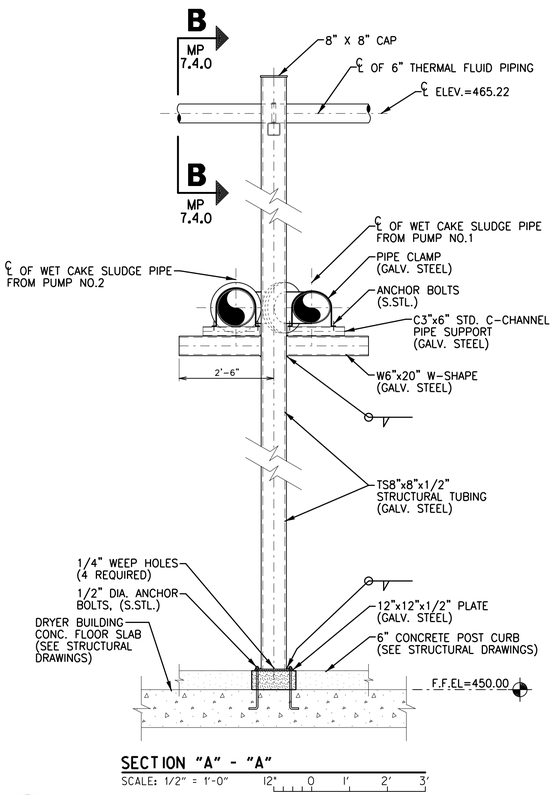
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PROJECT: 26064.01
DATE: JULY, 2010

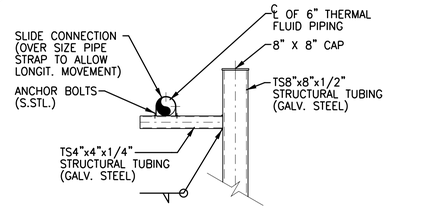
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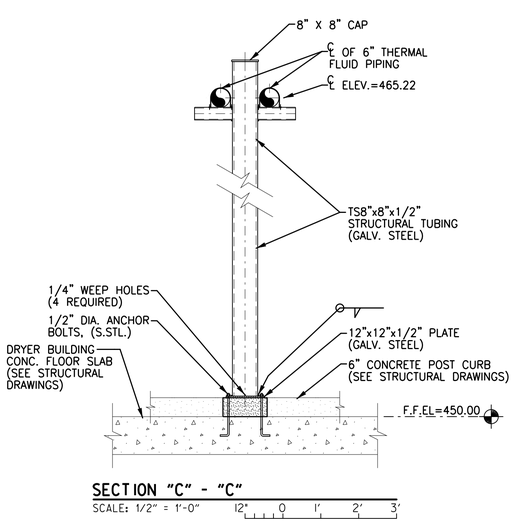
PLAN-VIEW
SCALE: 1/2" = 1'-0"
1 MP7.1.0



SECTION "A" - "A"
SCALE: 1/2" = 1'-0"

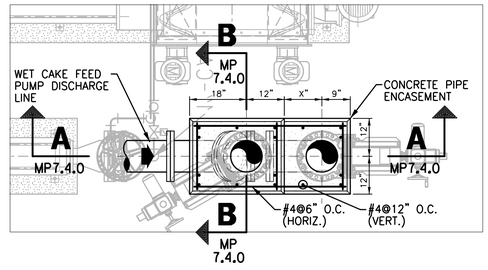


SECTION "B" - "B"
SCALE: 1/2" = 1'-0"

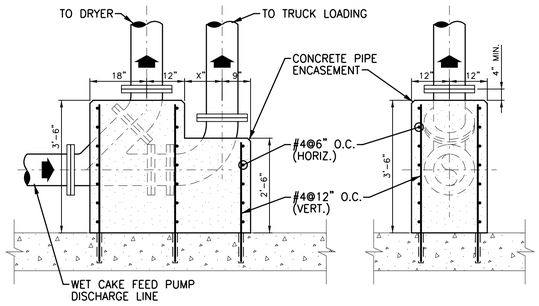


SECTION "C" - "C"
SCALE: 1/2" = 1'-0"

1 DETAIL: PIPE SADDLE SUPPORT
AS NOTED



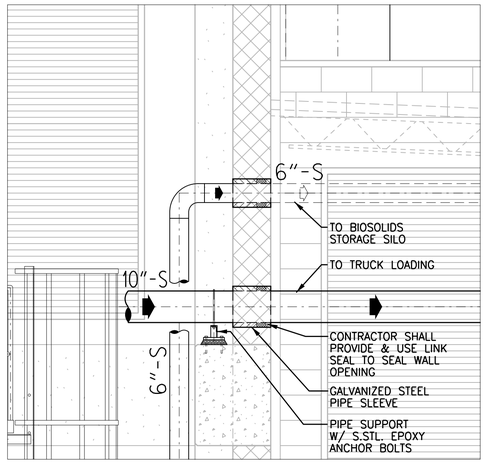
PLAN-VIEW
SCALE: 1/2" = 1'-0"
2 MP7.2.0



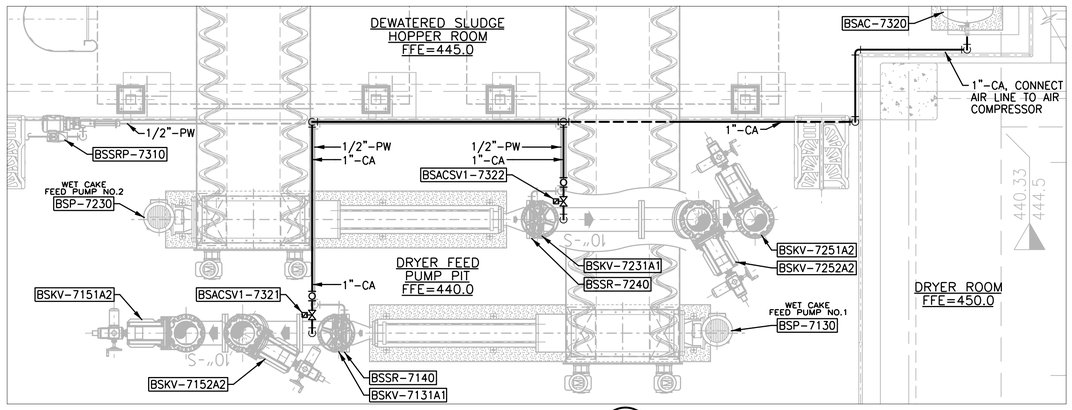
SECTION "A" - "A"
SCALE: 1/2" = 1'-0"

SECTION "B" - "B"
SCALE: 1/2" = 1'-0"

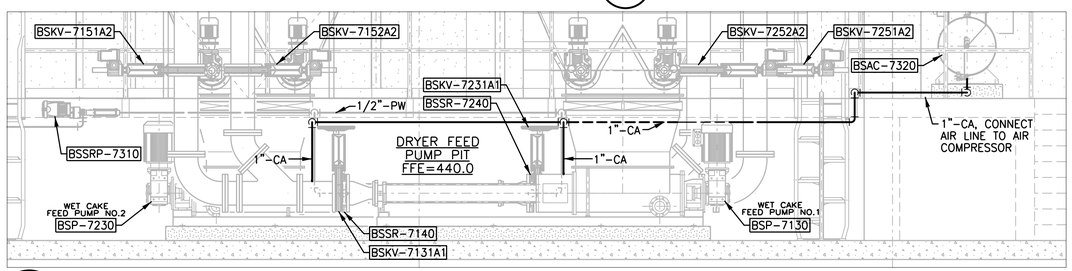
2 DETAIL: CONC. PIPE ENCASEMENT
AS NOTED



3 DETAIL: PIPE SUPPORT
NOT TO SCALE



PLAN-VIEW
SCALE: 3/8" = 1'-0"
4 MP7.2.0



4 DETAIL: COMPRESSED AIR CONNECTION AT SLUDGE PUMPS
AS NOTED

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION
CONTRACT 3
BIOSOLIDS DRYER SYSTEM ADDITION
BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION

No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

MECHANICAL PROCESS DRYER BUILDING DETAILS

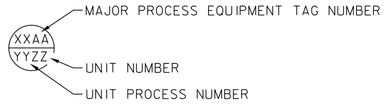
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PROJECT: 26064.01
DATE: JULY, 2010

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INSTRUMENT IDENTIFICATION

EXAMPLE SYMBOLS



EXAMPLES:



PRESSURE GAUGE FOR WELL PUMP



REAR-OF-PANEL MOUNTED INSTRUMENT



PANEL MOUNTED INSTRUMENT



MOTOR CONTROLLER MOUNTED INSTRUMENT

INSTRUMENT SOCIETY OF AMERICA TABLE

LETTER	FIRST LETTER (S) PROCESS OR INITIATING VARIABLE	FIRST LETTER (S) MODIFIER	SUCCEEDING LETTERS READOUT OR PASSIVE FUNCTION	SUCCEEDING LETTERS OUTPUT FUNCTION	SUCCEEDING LETTERS MODIFIER
A	ANALYSIS (+)		ALARM		
B	BURNER			CLOSE, STOP OR DEC.	
C	CONDUCTIVITY (ELEC)			CONTROL	
D	DENSITY OR SP. GR.	DIFFERENTIAL		OPEN, START OR INC.	
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO			FAIL
G	GATE		GLASS		
H	HAND (MANUAL)				HIGH OR OPENED
I	CURRENT (ELEC)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW OR CLOSED
M	MOTOR MOTION				MIDDLE OR INTERMEDIATE
N	USERS CHOICE		USERS CHOICE	USERS CHOICE	ON OR OPERATE
O			ORIFICE (RESTRICTION)		OVERLOAD
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT(+)	INTEGRATE			
R	RADIATION		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE (+)		MULTIFUNCTION (+)	MULTIFUNCTION (+)	MULTIFUNCTION (+)
V	VALVE, DAMPER OR LOUVER			VALVE, DAMPER OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED (+)		UNCLASSIFIED (+)	UNCLASSIFIED (+)	UNCLASSIFIED (+)
Y	ON STATUS			RELAY OR COMPUTE	
Z				DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.

SPECIAL CASES



ON EVENT LIGHT



ON AND OFF EVENT LIGHTS (TWO LIGHTS TOTAL)



OPENED AND CLOSED POSITION LIGHTS (TWO LIGHTS TOTAL)



OPENED AND CLOSED POSITION SWITCHES (TWO SWITCHES)



ON-OFF HAND SWITCH. MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).



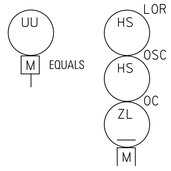
STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).



ELECTRIC ACTUATOR WITH INTEGRAL OPEN-STOP-CLOSE MOMENTARY CONTACT CONTROL SWITCH



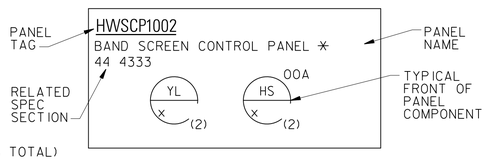
LOCK-OUT-SWITCH



ELECTRIC ACTUATOR WITH MULTI-VARIABLE, MULTI-FUNCTION OPERATOR STATION, INCLUDING LOCAL/OFF/REMOTE HANDSWITCH, OPEN/STOP/CLOSE PUSH BUTTON AND OPEN/CLOSED STATUS LIGHTS.

NOTE: ON TEMPORARY LOSS OF POWER
FC = FAIL CLOSED
FD = FAIL OPEN
FLP = FAIL LAST POSITION

EXAMPLE PACKAGE PANEL



OTHER DEVICES

SS SURGE SUPPRESSOR

IS INTRINSIC SAFETY BARRIER

UPS UNINTERRUPTABLE POWER SUPPLY

FOFC FIBER OPTIC FIBER CENTER

FOMC FIBER OPTIC MEDIA CONVERTER

PLC SYMBOL DEFINITIONS

▲ ANALOG INPUT

▼ ANALOG OUTPUT

⋀ DISCRETE INPUT

⋁ DISCRETE OUTPUT

TRANSDUCERS

A	= ANALOG	I	= CURRENT
D	= DIGITAL	P	= PNEUMATIC
E	= VOLTAGE	PF	= PULSE FREQUENCY
F	= FREQUENCY	PD	= PULSE DURATION
H	= HYDRAULIC	R	= RESISTANCE

EXAMPLE:

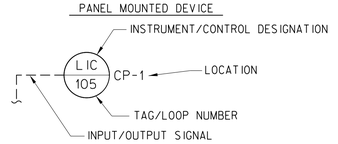


CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL IN A FLOW LOOP). UNIT PROCESS NUMBER 1B. LOOP NUMBER 21

ABBREVIATIONS & LETTER SYMBOLS

ACK ACKNOWLEDGE
ACP AREA CONTROL PANEL
AFF ABOVE FINISHED FLOOR
AFD ADJUSTABLE FREQUENCY DRIVE
ALT ALTERNATE
AM AUTO-MANUAL
AO AUTO-OFF
AS ADJUSTABLE SPEED
BFP BACK FLOW PREVENTER
BW BACKWASH
CC COMMUNICATION CABINET
CCP CENTRAL CONTROL PANEL
CK CLOSE COMMAND
CL_2 etc. CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATION)
CNTL CONTROL
CP-X CONTROL PANEL NO. X
CS CONSTANT SPEED
DC DIRECT CURRENT
DCM DISTRIBUTED CNTRL MODULE ENCLOSURE (OR MULTIPLEXER)
DCS DISTRIBUTED CONTROL SYSTEM
DF DEGREES FAHRENHEIT
DO DISSOLVED OXYGEN
DP DRIVE PANEL
DUR DURATION
ECP ENVIRONMENT CONTROL PANEL
ED ENABLE DISABLE
F FALLING/USED WITH SETPOINT ON DWGS
FA FAIL ALARM
FB FIBER
FC FAIL CLOSED
FLR FLOW RANGE
FOA FORWARD/OFF/AUTO
FOR FORWARD/OFF/REVERSE
FP-W-X FIELD PANEL NO. W-X (W = UNIT PROCESS NUMBER, X = PANEL NUMBER)
FREQ FREQUENCY
FR FORWARD-REVERSE
GR GAUGE RANGE
H2S HYDROGEN SULFIDE
HOA HAND-OFF-AUTO
HOR HAND-OFF-REMOTE
ICS INDICATING CONTROL STATION
I/O INPUT/OUTPUT
IP IN PLC MODE
IR IN REMOTE
ISR INTRINSICALLY SAFE RELAY
JOA JOG-OFF-AUTO
LCP LOCAL CONTROL PANEL
LEL LOWER EXPLOSIVE LIMIT
LOS LOCKOUT STOP
LR LOCAL-REMOTE
LS LINE SIZE
MA MANUAL-AUTO
MC MEDIA CONVERTER
MCC MOTOR CONTROL CENTER
MFR MANUFACTURER
MH MOTOR HEATER
MOL MOTOR OVERLOAD
MSC MANUFACTURER SUPPLIED CABLE
MTD MOTOR TEMPERATURE DETECTOR
MTS MANUAL TRANSFER SWITCH
NOM NOMINAL
NIC NOT IN CONTRACT
OA OFF-AUTO
OC OPEN-CLOSE(D)
OCA OPEN-CLOSE-AUTO
OCK OPEN & CLOSE COMMANDS
OCM OPTICAL COMMUNICATION MODULE
OCP OPEN-CLOSE-PLC
OCR OPEN-CLOSE-REMOTE
OIU OPERATOR INTERFACE UNIT
OK OPEN COMMAND
OO ON-OFF
OOA ON-OFF-AUTO
OOP ON-OFF-PLC
OSC OPEN-STOP-CLOSE
OWS OPERATOR WORKSTATION
PA/S/PB PORT A/STOP/PORT B
PDAMF PRESSURE DIFFERENTAL AT MAX FLOW
PDC POWER DISTRIBUTION CENTER
PFD PROCESS FLOW DIAGRAM
pH HYDROGEN ION CONCENTRATION
PP PATCH PANEL
PR PROCESS RANGE
PS POWER SUPPLY
PWR POWER
R RISING/USED WITH SETPOINTS ON DWGS
RFLA READY FOR LOCAL AUTOMATIC
RK RUN COMMAND
RIO REMOTE I/O
RTU-X REMOTE TELEMETRY UNIT NO. X
SDI SILT DENSITY INDEX
SED SEDIMENTATION
SEQ SEQUENCE
SF SLOWER-FASTER
SK SPEED ADJUST
SP SET POINT
SR SCALE RANGE
SS START-STOP
ST SPEED TRANSMITTER
TCL TOTAL CHLORINE
TRANS TRANSMITTANCE
TURB TURBIDITY
TYP TYPICAL
UON UNLESS OTHERWISE NOTED
UC UNDER COMPUTER CONTROL
UPS UNINTERRUPTIBLE POWER SUPPLY
USP UPSTREAM SETPOINT
VIB VIBRATION
WX WEATHER
YS ON STATUS
ZF POSITION FEEDBACK
ZK POSITION ADJUST
ZR ZERO REFERENCE
ZSOC OPEN & CLOSED LIMIT SWITCHES
Σ SUM
X MULTIPLY
÷ DIVIDE
f(x) CHARACTERIZED
⌐ SQUARE ROOT
AVG AVERAGE
> SELECT HIGHEST SIGNAL
< SELECT LOWEST SIGNAL

INSTRUMENT / CONTROL IDENTIFICATION:



INSTRUMENT LINE CONVENTIONS:

SYMBOL	DESIGNATION	DESCRIPTION
	NONE	INSTRUMENT ELECTRICAL ANALOG SIGNAL
	NONE	INSTRUMENT ELECTRICAL DISCRETE SIGNAL
	NONE	DIGITAL COMMUNICATION SIGNAL (ETHERNET, MODBUS, DH+, ETC.)
	NONE	INSTRUMENT PNEUMATIC SIGNAL
	NONE	CAPILLARY TUBE
	NONE	PIPING SPECIFICATION CLASS CHANGE
	NONE	INSTRUMENT SIGNAL (HYDRAULIC)
F F F	NONE	FUTURE PIPING OR EQUIPMENT
	NONE	VACUUM PUMP PRIMING PIPING
	NONE	DOMESTIC COLD WATER AND SEAL WATER PIPING
	NONE	CONE VALVE SUPPLY PIPING
	NONE	POWER ACTUATOR (VALVE SYMBOL AS APPLICABLE)
I	NONE	INTERLOCK
MSC	NONE	MANUFACTURER SUPPLIED CABLE
P	NONE	POWER (480V, 3ø, UNLESS OTHERWISE NOTED)

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION
CONTRACT 3
BIOSOLIDS DRYER SYSTEM ADDITION
BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION

No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

INSTRUMENTATION LEGEND

17.0.1

PROJECT: 26064.01
DATE: JULY, 2010

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GENERAL ABBREVIATIONS:

BOP	-	BOTTOM OF PIPE
℄	-	CENTERLINE
TYP	-	TYPICAL
NTS	-	NOT TO SCALE
SCFM	-	STANDARD CUBIC FEET PER MINUTE
CONC.	-	CONCRETE
STL.	-	STEEL
ALUM.	-	ALUMINUM
EL	-	ELEVATION
T/S EL	-	TOP OF SLAB ELEVATION
T/W EL	-	TOP OF WALL ELEVATION
T/C EL	-	TOP OF CHANNEL ELEVATION
MCC	-	MAIN CONTROL CONSOLE
AGC	-	AERATION GALLERY CONSOLE
TCC	-	THICKENER CONTROL CONSOLE

PIPING ABBREVIATIONS:

B.S.	-	BLACK STEEL - COATED & WRAPPED
C.I.	-	CAST IRON
C.M.P.	-	CORRUGATED METAL PIPE
C.U.	-	COPPER
D.I.	-	DUCTILE IRON
D.I.C.L.	-	DUCTILE IRON, CEMENT LINED
F.F.R.M.	-	FACTORY FABRICATED RESILIENT MATERIAL JOINT
FRP	-	FIBERGLASS REINFORCED PLASTIC
G.L.C.I.	-	GLASS LINED CAST IRON
G.L.D.I.	-	GLASS LINED DUCTILE IRON
G.S.P.	-	GALVANIZED STEEL PIPE
G.W.I.	-	GALVANIZED WROUGHT IRON
M.J.	-	MECHANICAL JOINT
P.C.C.P.	-	PRESTRESSED CONCRETE CYLINDER PIPE
P.O.	-	PUSH ON
P.V.C.	-	POLYVINYL CHLORIDE
R.C.P.	-	REINFORCED CONCRETE PIPE
R.C.P.P.	-	REINFORCED CONCRETE PRESSURE PIPE
R.C.S.P.	-	REINFORCED CONCRETE SEWER PIPE
RELOC.	-	RELOCATION OF EXISTING PIPE
S.E.R.G.	-	STEEL END-RING & O-RING RUBBER GASKET JOINT
STD.	-	STANDARD
S.W.	-	SOLVENT WELD
T.O.S.	-	THREADED OR SOCKET TYPE JOINT
V.C.P.	-	VITRIFIED CLAY PIPE
W.	-	WELDED
W.I.	-	WROUGHT IRON
X.C.S.P.	-	EXTRA-STRENGTH CONCRETE SEWER PIPE
FRP	-	FIBERGLASS REINFORCED PLASTIC

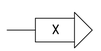
FLOW STREAM /TYPE:

AC	-	AIR COMPRESSOR
BC	-	BOTTOM CONVEYOR
CA	-	COMPRESSED AIR
CH	-	CAKE HOPPER
CK	-	CAKE
CN	-	CENTRATE
CP	-	CONTROL PANEL
D	-	DRYER
DR	-	PROCESS DRAIN
MO	-	MINERAL OIL
N	-	NITROGEN GAS
NG	-	NATURAL GAS
OA	-	ODOROUS AIR
OC	-	ODOR CONTROL
P	-	PUMP
PP	-	PUMP PIT
PW	-	PLANT WATER
S	-	SLUDGE / SILO
SR	-	SLIP RING
TB	-	TRANSFER BLOWER
TD	-	TANK DRAINAGE
TO	-	THERMAL OIL
W1	-	POTABLE WATER (BACKFLOW PREVENTED)
W2	-	POTABLE WATER (NOT BACKFLOW PREVENTED)
W3	-	PLANT EFFLUENT
WS	-	WASTE SLUDGE

AREA ABBREVIATIONS

BR	-	SEQUENCING BATCH REACTOR
BS	-	BIOSOLIDS
HW	-	HEADWORKS
PA	-	POST AERATION / ULTRAVIOLET DISINFECTION
SH	-	SLUDGE HANDLING
SP	-	SLUDGE PROCESSING

INTERFACE SYMBOLS:

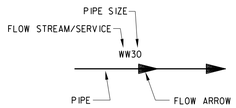


X = DESTINATION DRAWING NO.

X = SOURCE DRAWING NO.

NOTE: THE DRAWING NUMBERS ARE GIVEN IN TITLE BLOCKS.

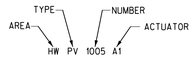
PIPING IDENTIFICATION:



NOTES

1. FLOW STREAM AND PIPELINE NUMBERS ARE SOMETIMES OMITTED.
2. PIPE SIZE IS IN INCHES.
3. NO PIPELINE NUMBERS ARE ASSIGNED TO EXISTING PIPING.

VALVE IDENTIFICATION:



NOTES

1. SEE VALVE SYMBOLS AND ACTUATORS FOR DESIGNATIONS.
2. SEE AREA ABBREVIATIONS FOR DESIGNATIONS.

PIPING LINE CONVENTIONS:

SYMBOL	DESIGNATION	DESCRIPTION
	VARIES	PRIMARY PROCESS FLOW (CLOSED CONDUIT)
	VARIES	SECONDARY PROCESS FLOW
	VARIES	STEAM TRACED
TP	VARIES	INSULATED AND ELECTRICALLY TRACED (SPACED TO SUIT) TP = TERMINATION POINT
	VARIES	JACKETED (PIPE WITHIN A PIPE)
	VARIES	EQUIPMENT
	VARIES	BARRIERS (IDENTIFIED AREA LOCATION)
P P P	VARIES	OUTLINE OF VENDOR SUPPLIED PACKAGE
	VARIES	FUTURE PIPING OR EQUIPMENT
	VARIES	PROCESS FLOW (OPEN CHANNEL)
	VARIES	AIR LINE

VALVE ACTUATORS:

SYMBOL	DESIGNATION	DESCRIPTION
	A1	HANDWHEEL (MANUAL)
M	A2	ELECTRIC MOTOR
S	NONE	SOLENOID
P	A3	PNUEMATIC
	NONE	DIAPHRAGM (SPRING OPPOSED)
	NONE	DIAPHRAGM WITH HANDWHEEL JACK

GENERAL NOTES

1. VERTICAL AND HORIZONTAL CONTROL IS REFERENCED TO THE FINISHED FLOOR SURFACES AND COLUMN LINES.
2. PROVIDE PIPING RESTRAINTS AND SUPPORTS INDEPENDENT OF PUMPS, VALVES, TANKS AND OTHER EQUIPMENT TO WITHSTAND TEST PRESSURE. LOCATE JOINTS, SUPPORTS AND RESTRAINTS WITH COUPLINGS, UNIONS, ETC. TO ALLOW EQUIPMENT REMOVAL.
3. PROVIDE DRAIN VALVES W/ THREADED CAPS AT LOW POINTS ON ALL PRESSURIZED PIPING SYSTEMS. PROVIDE MANUAL VENT VALVES WITH THREADED CAPS FOR AIR RELIEF ON ALL LIQUID PRESSURIZED PIPING SYSTEMS. VALVES SHALL BE 1/2-INCH OF SAME MATERIAL AS PIPING UNLESS OTHERWISE NOTED.
4. COMPONENTS AND PANELS SHOWN WITH AN ASTERISK (✳) ARE PART OF A PACKAGE SYSTEM; SEE EQUIPMENT SPECIFICATIONS. FOR MULTIPLE PACKAGES ON SAME DRAWING, USE ✳, ✳2, ✳3, ETC.

VALVE/GATE SYMBOLS

SYMBOL	DESIGNATION	DESCRIPTION
	GV	GATE VALVE
	BV1	BALL VALVE
	VB	VENTED BALL VALVE
	CV1	SWING CHECK VALVE
	CV2	OIL CUSHIONED SWING CHECK VALVE
	DV	DIAPHRAGM VALVE
	KV	KNIFE GATE VALVE
	MV	MUD VALVE
	NV	NEEDLE VALVE
	OV	PINCH VALVE
	PV1	PLUG VALVE
S	SV1	SOLENOID VALVE
S	SV2	SOLENOID VALVE - EXPLOSION PROOF
	BF1	BUTTERFLY VALVE (WATER SERVICE)
	BF2	BUTTERFLY VALVE (AIR SERVICE)
	RFV	PRESSURE RELIEF VALVE (ANGLE TYPE)
	PCV	PRESSURE CONTROL VALVE (SELF CONTAINED)
	PSV	PRESSURE SUSTAINING VALVE
	BPV	BACK PRESSURE VALVE
	SV	SEWAGE SURGE RELIEF VALVE
	VCS	SILENT CHECK VALVE
	AV	AIR / VACUUM VALVE
	PRV	PRESSURE REDUCING VALVE
	SG	SLUICE GATE
	CG	CHANNEL GATE
	FV	FLAP VALVE
	BD	BLEED VALVE
	FL	FLOW CONTROL VALVE

PIPING SYMBOLS

SYMBOL	DESIGNATION	DESCRIPTION
	VARIES	PROCESS PIPING
	NONE	PIPE REDUCER/INCREASER
	NONE	CAP/PLUG
	NONE	CHANGE IN PIPE SPEC.
	NONE	UNION
	QC	QUICK COUPLE CONNECTION
	FLC	FLEXIBLE CONNECTOR
	NONE	DIAPHRAGM SEAL
	PD	PULSATION DAMPENER
	ST	STRAINER (Y TYPE)
	STB	STRAINER (BASKET TYPE)
	RM	ROTAMETER
	F	FILTER
	NONE	INSULATED PIPING W/ HEAT TRACING
	NONE	NOZZLE
	FM	FLOW METER
	YH	YARD HYDRANT
S	SM	SAMPLER
	NONE	ANNULAR DIAPHRAGM SEAL
	NONE	FLOAT SWITCH

EQUIPMENT SYMBOLS

SYMBOL	DESIGNATION	DESCRIPTION	SYMBOL	DESIGNATION	DESCRIPTION
	P	METERING PUMP		OC	ODOR CONTROL
	P / F	HORIZONTAL PUMP / FAN	M		
	CF	CARTRIDGE FILTER OR STRAINER	M M	D	INDIRECT DRYER
	B	BLOWER	M M	WC	WET CAKE HOPPER WITH LIVE BOTTOM
M	RF	ROTARY FEEDER	M	PCP	PROGRESSIVE CAVITY PUMP
	ST	CHEMICAL STORAGE TANK	"OR"	S	STORAGE SILO

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

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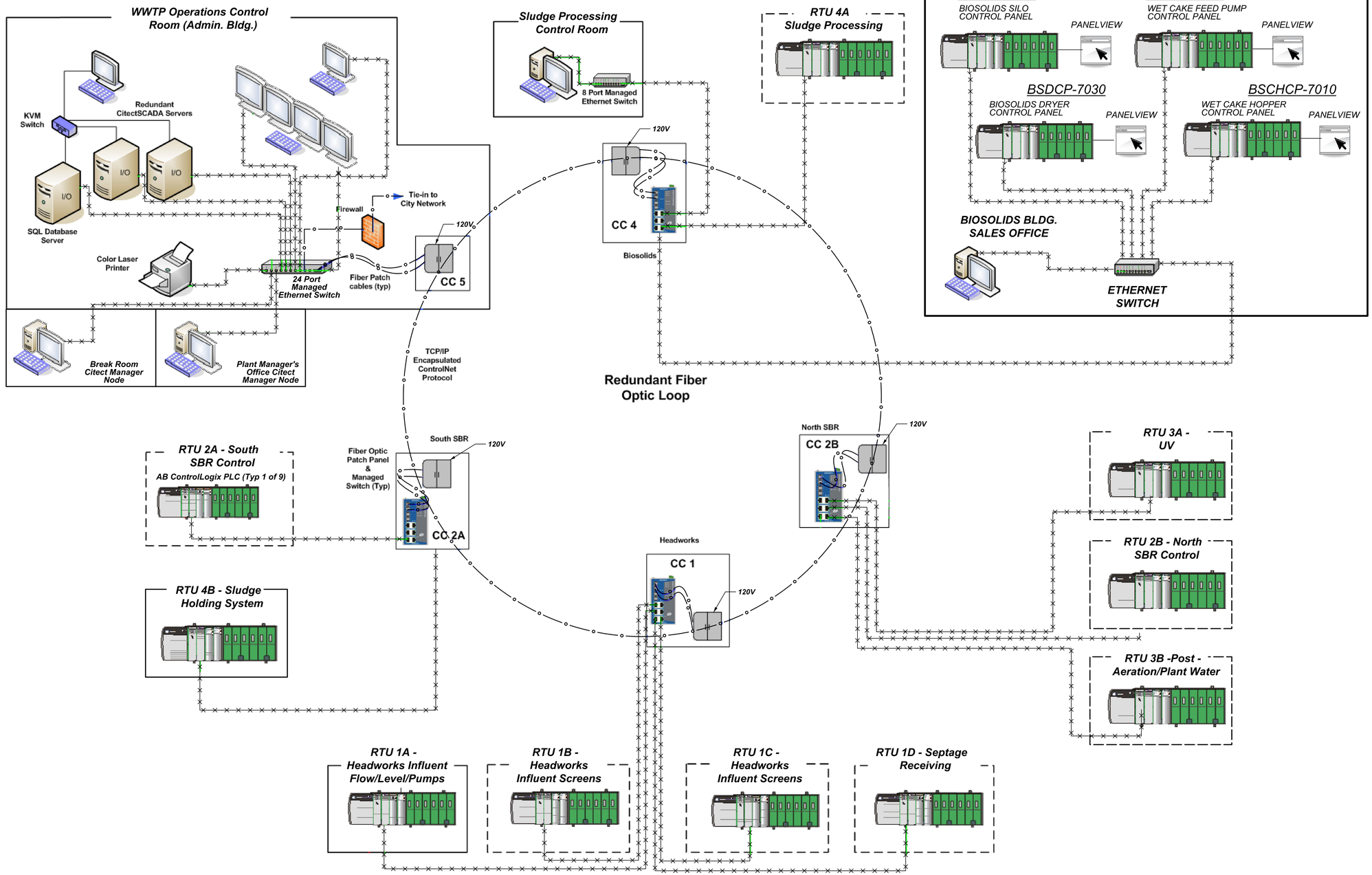
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INSTRUMENTATION LEGEND

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PROJECT: 26064.01
DATE: JULY, 2010

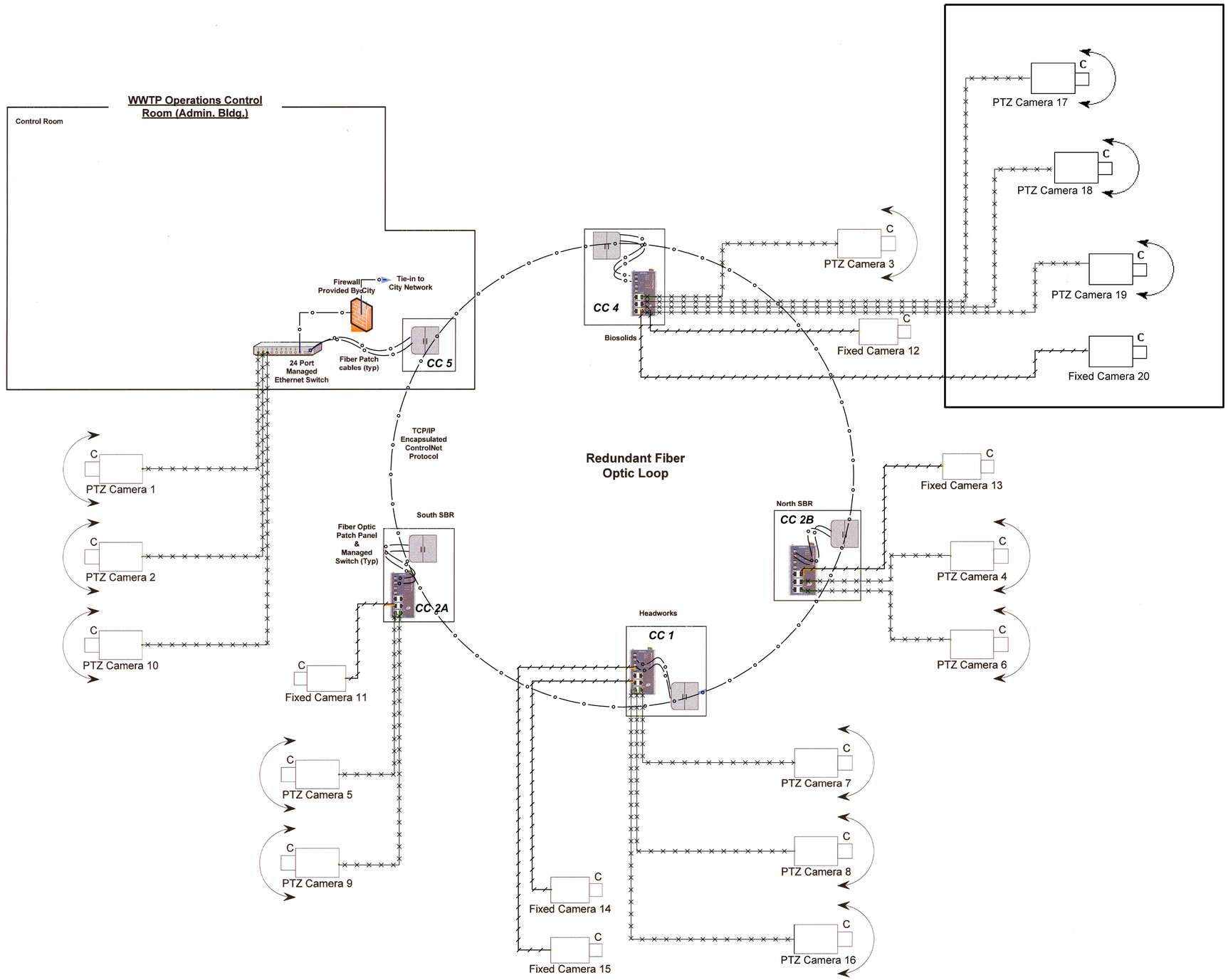
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Legend:

- *Copper EtherNet*
- *Fiber Optic EtherNet*
- *Remote I/O Cable*
- *Process Vendor Provided Panel*
- *SCADA Integrator Provided Panel*
- *Contract 3 Limits*

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(DGN FILE(S) ATTACHED, REF FILE(S), LEVEL(S), REF FILE(S) PATH(S), REF FILE(S) LEVEL(S), REF FILE(S) MODEL(S))
Error
Sorting
Progress
ILMO16
ILMO15
ILMO14
ILMO13
ILMO12
ILMO11
ILMO10
ILMO9
ILMO8
ILMO7
ILMO6
ILMO5
ILMO4
ILMO3
ILMO2
ILMO1
ILMO0



Legend:

- *Copper EtherNet with POE*
- *Copper EtherNet*
- *Fiber Optic EtherNet*
- *Remote I/O Cable*
- *Process Vendor Provided Panel*
- *SCADA Integrator Provided Panel*
- *Contract 3 Limits*

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CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
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BGMU Project No. S07-653

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SECURITY NETWORK ARCHITECTURE

I7.0.4

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BIOSOLIDS BUILDING ETHERNET SWITCH

BIOSOLIDS BUILDING ETHERNET SWITCH

480V

BSPCP-7020
WET CAKE FEED PUMP CONTROL PANEL

VFD (2)

I7.1.1

480V

VFD (4)

BSCHCP-7010
WET CAKE HOPPER CONTROL PANEL

TO CONVEYORS

TO WET CAKE FEED PUMPS

WET CAKE TRUCK LOADING

UU 7252 — BSKV-7252A2

UU 7152 — BSKV-7152A2

UU 7251 — BSKV-7251A2

UU 7151 — BSKV-7151A2

PT 7235

PT 7135

PT 7325

PE 7236

PE 7136

PE 7325

WE 7235

WE 7135

LS 7330

BSAC-7320 AIR COMPRESSOR

BSSR-7245

BSSR-7145

BSACSV1-7322

BSACSV1-7321

BSSRSV1-7242

BSSRSV1-7141

BSSRP-7310 SLIP RING PUMP

BSP-7230 PC PUMP NO.2

BSP-7130 PC PUMP NO.1

BSSR-7240

BSSR-7140

BSKV-7231A1

BSKV-7131A1

LT 7201

LT 7202

LT 7101

LT 7102

LE 7201

LE 7202

LE 7101

LE 7102

BSKV-7226A1

BSBC-7221

BSBC-7222

BSKV-7225A1

BSCH-7210 WET CAKE HOPPER NO.2 WITH LIVE BOTTOM

BSKV-7126A1

BSBC-7121

BSBC-7122

BSKV-7125A1

BSCH-7110 WET CAKE HOPPER NO.1 WITH LIVE BOTTOM

HOPPER VENT

MS 7161

MS 7162

MS 7146

MS 7147

WE 7204 (6)

WE 7104 (6)

TO DRAIN

I7.1.1

PLANT WATER

SLUDGE DRYER BUILDING

NOT TO SCALE

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

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BIOSOLIDS DRYER SYSTEM ADDITION

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SLUDGE PROCESSING & BIOSOLIDS DRYER P & ID

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BIOSOLIDS BUILDING ETHERNET SWITCH

BIOSOLIDS BUILDING ETHERNET SWITCH

480V

17.1.2

BSDCP-7030
BIOSOLIDS DRYER CONTROL PANEL

BSD-7406
JUNCTION BOX POWER PANEL

480V

MCC-4

BSD-7448
THERMAL FLUID HEATER CONTROL PANEL

BSD-7405
JUNCTION BOX PANEL

FROM SCRUBBER FLOW METER

FROM SCRUBBER WASTE TEMPERATURE

17.1.2

1"-N

1"-N

1/2"-N

BSNPRV1-7459
35 PSI

BSDSV1-7456A2
(SEE NOTE NO.1)

BSN-7453
0-1800 CFH

BSDSV1-7455A2
(SEE NOTE NO.1)

BSNPRV1-7458
35 PSI

1/2"-N

1/2"-N

2"-VENT

NITROGEN BLANKET
BSN-7451

BSD-7445
EXPANSION TANK

BUFFER TANK

DEAERATOR TANK

HIGH / LOW LEVEL

1/2"-DR

1/2"-DR

1"-DR

3"-DR

2 1/2"-DR

6"-TO

3"-DR

2 1/2"-DR

6"-TO

PRESSURE REL IEF VALVES

BSD-7442
CATCHMENT TANK

GATE VALVE

STRAINER

ISOLATION VALVE

BSD-7441
CIRCULATING PUMP
(2) DRAIN / FILL CONNECTIONS

BSD-7440
THERMAL FLUID HEATER

BSD-7444
HEAT EXCHANGER

BSD-7443
COMBUSTION FAN

FLUE

6"-AIR

4"-NG

FIT 7449

FE 7449

FLOW METER

PIT 7480

PE 7480

NOTE:
THERMAL FLUID HEATER SYSTEM AND PIPING SUBJECT TO CHANGE BASED ON ACTUAL UNIT PROVIDED BY DRYER SYSTEM SUPPLIER.

NATURAL GAS

4"-NG

TO BIOSOLIDS STORAGE & LOADOUT SYSTEM

17.1.2

6"-BS

BSTB-7412
SURGE BIN

BSD-7410
COOLING SCREW

BSDSV1-7411

2"-PW

NITROGEN PURGE
BSDN-7470

3"-DR

4"-TO

6"-TO

4"-TO

3"-TO

6"-TO

6"-TO

6"-TO

6"-TO

BSD-7402

BSD-7401

SPRAY WATER

BSD-7400
INDIRECT DRYER

4"-TO

3"-TO

4"-TO

3"-TO

10"-S

10"-S

17.1.0

6"-TO

6"-TO

6"-TO

6"-TO

4"-NG

120V

SS

TT 7419

TE 7419

TO DRAIN

3"-DR

DRAIN FOR THERMAL FLUID

6"-PW

FT 7435

UU 7431

FE 7435

BSDBF1-7431A2

BSDBV1-7418A1

BSDPRV1-7417

BSDPRV1-7415

BSDPRV1-7437

45 PSI

BSDBV1-7414A1

BSDBV1-7414A1

BSDGV1-7432A1

1/2"-PW

2"-PW

6"-PW

3/4"-PW

BSD-7430
EXHAUST SCRUBBER

10"-DR

4"-OA

TT 7436

TE 7436

TO DRAIN

12"-VENT

4"-OA

6"-OA

BSRV-7740

PRESSURE RELIEF VALVE

BSOCSV1-7710

BSDOCBV1-7712A1

BSOC-7700
ODOR CONTROL TREATMENT (BIOFILTER)

BSOC-7730
EXHAUST FAN

4"-OA

6"-OA

6"-OA

17.1.0

1-1/2" DR

BSOC-7720
RECIRCULATION PUMP

TO DRAIN

PLANT WATER

6"-PW

BSOC-7715
ODOR TREATMENT CONTROL PANEL

NOTES:
1. DRYER SUPPLIER TO PROVIDE NITROGEN GAS FEED CONTROL VALVE.
2. MUD VALVES IN DRYER CONTAINMENT AREA (SEE PLUMBING DRAWING, P7.2.0)

SLUDGE DRYER BUILDING
NOT TO SCALE

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

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SLUDGE PROCESSING & BIOSOLIDS DRYER P & ID

17.1.1

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BIOSOLIDS BUILDING
ETHERNET SWITCH

BIOSOLIDS BUILDING
ETHERNET SWITCH

480V

BSSCP-7040
BIOSOLIDS SILO CONTROL PANEL

I7.1.1

FROM SILO NO.2
(5) INPUTS

FROM SILO NO.1
(5) INPUTS

6"-BS

CA

3-WAY VALVE
BSS-7505A3

SHAKER

EXHAUST FAN

BAG HOUSE
BSS-7601

BAG HOUSE
BSS-7501

BSSV1-7602A2

BSSV1-7502A2

BIOSOLIDS STORAGE SILO NO.2
BSS-7600

BIOSOLIDS STORAGE SILO NO.1
BSS-7500

WE 7610 (4)
TT 7620
TE 7620
LT 7630
LE 7630
AT 7640
AE 7640 /CO
AT 7650
AE 7650 /O_2

WE 7510 (4)
TT 7520 (4)
TE 7520
LE 7530
LT 7530
AE 7540 /CO
AT 7540
AE 7550 /O_2
AT 7550

BSS-7570
AIR COMPRESSOR

BSNSV1-7690A2

BSNSV1-7590A2

BSS-7660A3

BSS-7661A3

BSS-7980

BSKV-7981A1

BSKV-7982A3

BSS-7560A3

BSS-7561A3

BSS-7880

BSKV-7881A1

BSKV-7882A3

1"-N

BSS-7983

BSMO-7984

BSMOPV-7686

BSS-7883

BSMO-7884

BSMOPV-7685

MO

120V

SS

PT 7422

PE 7422

BSRF-7416 ROTARY FEEDER

TO SLUDGE DRYER BUILDING

BSBF2-7424

BSBF2-7423

BSCV-7426

BSCV-7425

BLOWER NO.2

BLOWER NO.1

BSTB-7421

BSTB-7420

SILENCER

SILENCER

480V

MCC-4

TT 7683

LT 7682

LE 7682

TE 7683

PT 7454

LT 7452

LE 7452

PE 7454

BSMO-7680
MINERAL OIL STORAGE

BSMO-7681
METERING PUMP

BSN-7460
NITROGEN GAS STORAGE

BSNPRV1-7457

(SEE NOTE NO.1)

NOTE:
1. NITROGEN TANK SUPPLIER TO PROVIDE GAS FEED VALVES, REGULATORS, SAFETY COMPONENTS AND PIPING APPURTENANCES.

BIOSOLIDS STORAGE & LOADOUT SYSTEM

NOT TO SCALE

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3
BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

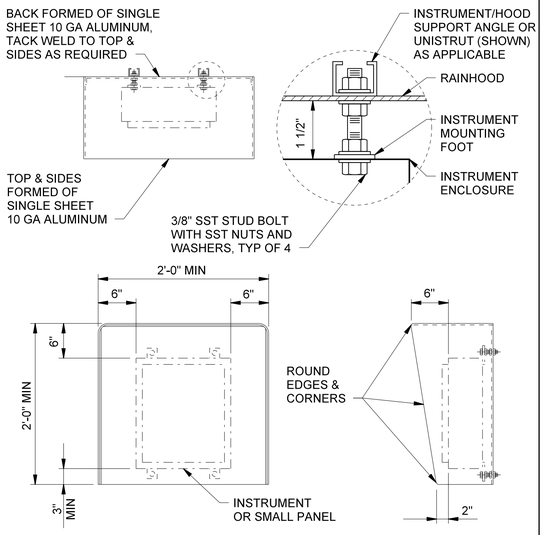
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SLUDGE PROCESSING & BIOSOLIDS DRYER P & ID

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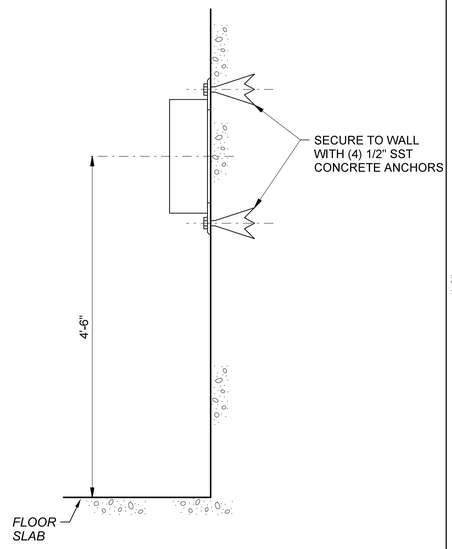
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ENGINEER
ENGINEER
ENGINEER

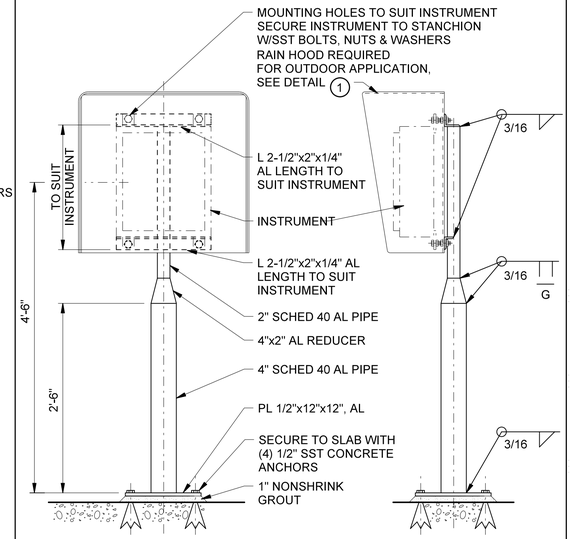


1. MOUNT RAIN HOOD BETWEEN INSTRUMENT AND MOUNTING BRACKET. DRILL HOLES IN RAIN HOOD AS PER MOUNTING HOLES FOR INSTRUMENT.

1 RAIN HOOD INSTALLATION
NOT TO SCALE



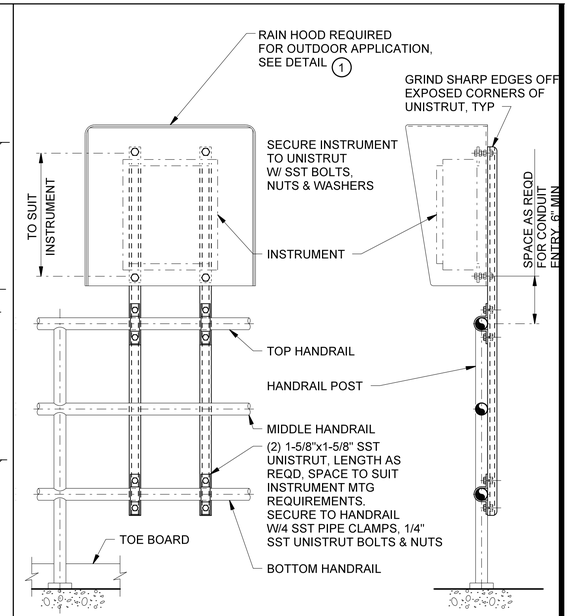
2 WALL MOUNTED PANEL OR INSTRUMENT INSTALLATION
NOT TO SCALE



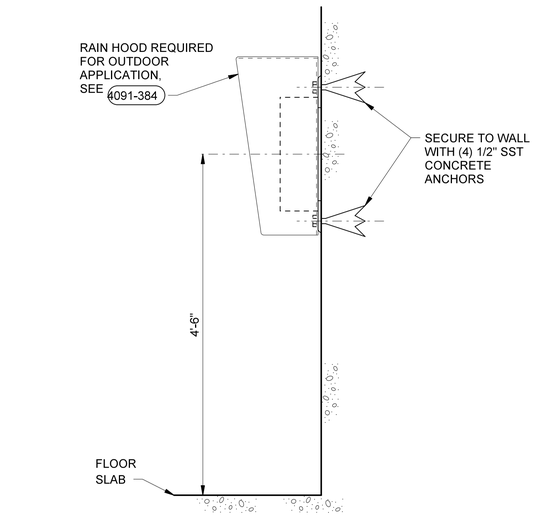
NOTES:

1. ROUND OFF ALL EXPOSED EDGES AND CORNERS.
2. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.

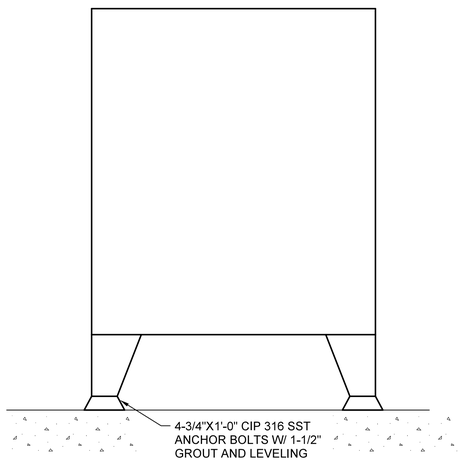
3 STANCHION SUPPORT FOR CASE MOUNTED INSTRUMENTS
NOT TO SCALE



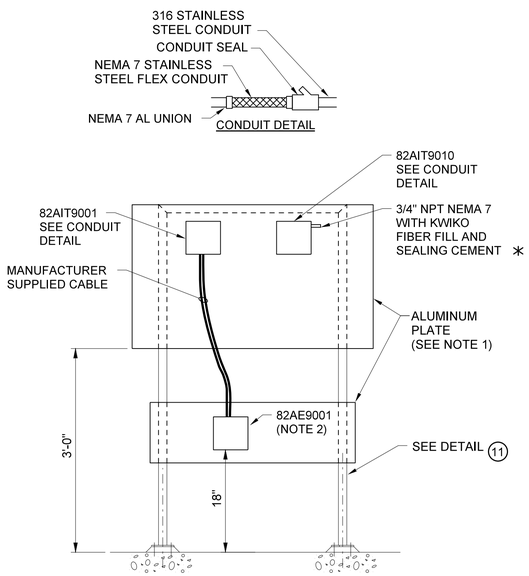
4 TYPICAL HANDRAIL MOUNTING FOR CASE MOUNTED INSTRUMENTS
NOT TO SCALE



5 WALL MOUNTED PANEL OR INSTRUMENT INSTALLATION WITH RAINHOOD
NOT TO SCALE



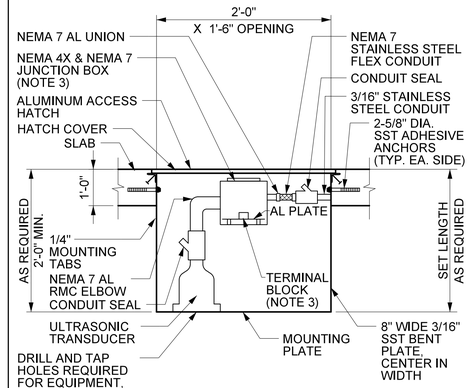
6 FREE STANDING PANEL MOUNTING
NOT TO SCALE



NOTES:

1. SIZE THE PLATES TO ACCOMMODATE THE NUMBER OF INSTRUMENTS AND TRANSMITTERS MOUNTED.
2. INSTALL H2S SENSOR/TJB 18" ABOVE THE GROUND. INSTALL PER MANUFACTURER RECOMMENDED INSTALLATION.

7 RACK MOUNTED INSTRUMENT INSTALLATION
NOT TO SCALE



NOTES:

1. LOCATE BOTTOM OF TRANSDUCER NOT LESS THAN MFR'S RECOMMENDED DISTANCE FROM MAX LIQUID LEVEL.
2. LOCATE AWAY FROM WALLS AND OBSTRUCTIONS PER MFR'S RECOMMENDATION.
3. SIZE TERMINAL JUNCTION BOX AND TERMINAL STRIP FOR THE NUMBER OF CONDUCTORS ENTERING THE BOX.

8 ULTRASONIC LEVEL ELEMENT INSTALLATION
NOT TO SCALE

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

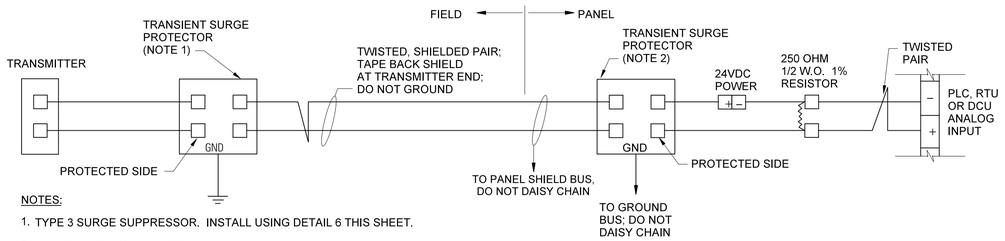
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INSTRUMENTATION STANDARD DETAILS

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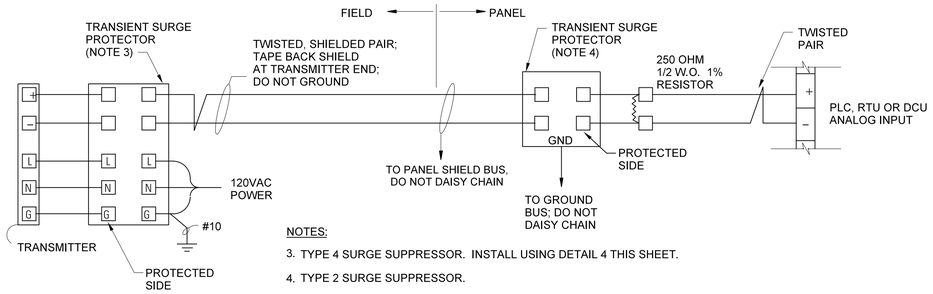
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NOTES:

1. TYPE 3 SURGE SUPPRESSOR. INSTALL USING DETAIL 6 THIS SHEET.
2. TYPE 2 SURGE SUPPRESSOR.

2-WIRE TRANSMITTER

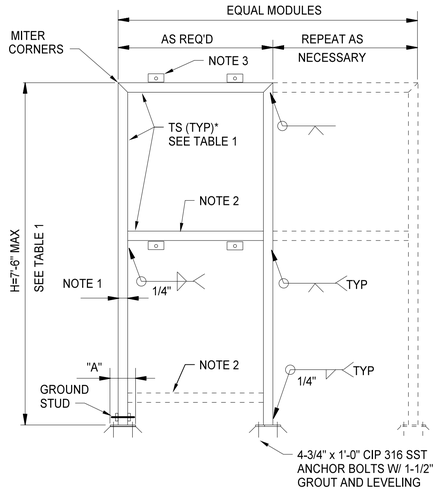


NOTES:

3. TYPE 4 SURGE SUPPRESSOR. INSTALL USING DETAIL 4 THIS SHEET.
4. TYPE 2 SURGE SUPPRESSOR.

4-WIRE TRANSMITTER

1 *TYPICAL OUTDOOR TRANSMITTERS*
NOT TO SCALE



ELEVATION



PROVIDE ONE 3/8" DIA, SILICON BRONZE GROUND STUD WITH SILICON BRONZE NUTS AND WASHERS. (NOTE 8)

PLAN

NOTES:

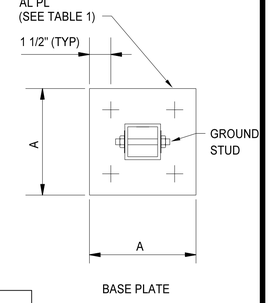
1. TOTAL WEIGHT OF PANEL(S) SHALL NOT EXCEED 750 LB IN EACH MODULE.
2. FOR PANELS WITH "H" GREATER THAN 4'-0", ONE HORIZONTAL MEMBER MUST BE LOCATED WITHIN THE MIDDLE THIRD OF THE FRAME HEIGHT. PROVIDE ADD'L MEMBERS AS NECESSARY FOR PANEL MOUNTING.
3. PROVIDE L 2 1/2"x 2 1/2"x 1/4"x 0'-3" WELD ALL AROUND TO TS: TYP AT EACH PANEL MOUNT.



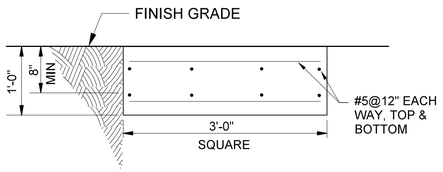
4. GRIND ALL WELDS AND SHARP CORNERS SMOOTH.
5. THIS DETAIL APPLIES TO NON-FREE STANDING ELECTRICAL EQUIPMENT OVER 25 LB WHICH IS NOT MOUNTED ON A FREE STANDING FRAME OR IS NOT WALL MOUNTED.
6. PANEL OR INSTRUMENT FRONT FACES NORTH, UNLESS OTHERWISE NOTED.

TABLE 1			
HEIGHT "H"	ALUMINUM FRAME		
	TS (MIN SIZE)	BASE PLATE (IN)	
		A	t
5'-0" MAX.	TS 3 x 3 x.188	8	1/2
7'-6" MAX.	TS 4 x 4 x.188	9	5/8

7. FOR OUTDOOR APPLICATIONS, PROVIDE RAINHOOD/ SOLAR SHIELD AS PER DETAIL 1 SHEET I7.8.0.
8. PROVIDE #6 BARE COPPER GROUND WIRE FROM EACH PANEL AND INSTRUMENT MOUNTED ON RACK TO GROUND STUD. CONNECTION TO GROUND GRID SPECIFIED UNDER DIVISION 16.

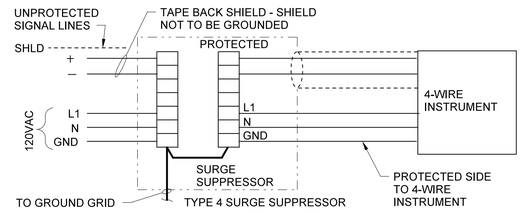


2 *PANEL MOUNTING RACK*
NOT TO SCALE

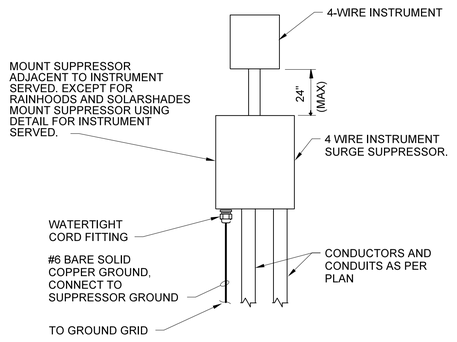


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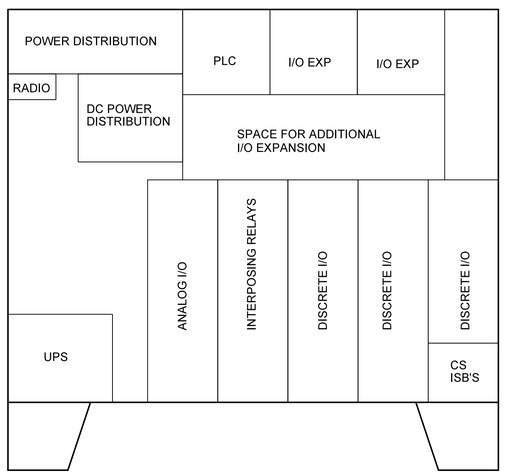
3 *SLAB BASE INSTRUMENT MOUNTING PEDESTAL DETAIL*
NOT TO SCALE



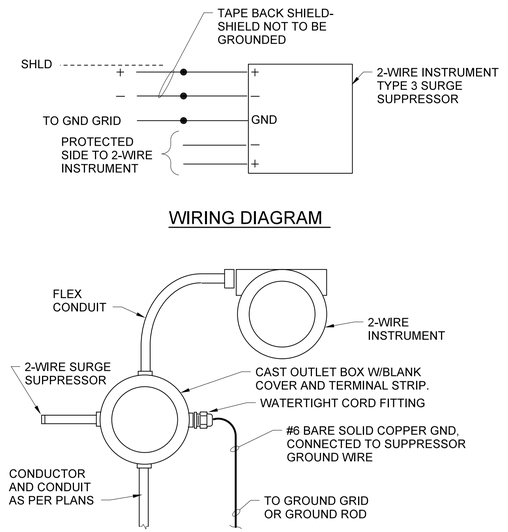
WIRING DIAGRAM



4 *TYPE "4" SURGE SUPPRESSOR INSTALLATION 4-WIRE INSTRUMENT*
NOT TO SCALE



5 *8XCP01 RTU LAYOUT*
NOT TO SCALE



WIRING DIAGRAM

6 *TYPE "3" SURGE SUPPRESSOR INSTALLATION 2-WIRE INSTRUMENT*
NOT TO SCALE

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

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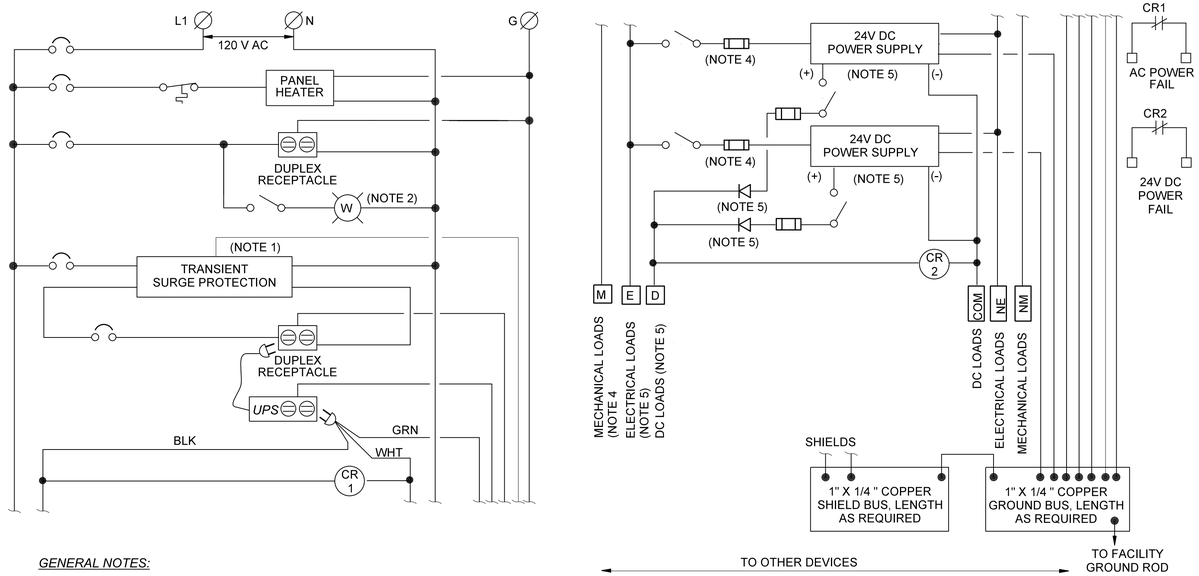
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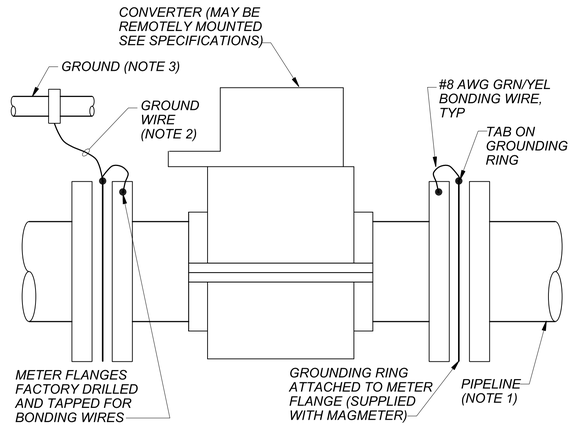
GENERAL NOTES:

A. SCHEMATIC DIAGRAM SHOWN IS A TYPICAL EXAMPLE TO BE USED AS A GUIDE FOR PREPARING DETAILED SCHEMATIC DIAGRAM.

SPECIFIC NOTES:

1. IF LOAD EXCEEDS 15 AMPS PROVIDE ADDITIONAL PARALLEL CIRCUITS WITH TRANSIENT SURGE PROTECTION AS SHOWN.
2. PROVIDE APPROPRIATE LIGHTING PACKAGE FOR PANEL SIZE HOFFMAN BULLETIN A-80, OR EQUAL.
3. PROVIDE PROPERLY SIZED BREAKER FOR EACH LOAD.
4. PROVIDE PROPERLY SIZED FUSE FOR EACH LOAD.
5. PROVIDE ONE MORE (N + 1) DC POWER SUPPLY THAN REQUIRED BY LOAD WITH DIODE AUCTIONEERING.

1 *BATTERY BACK UP FOR PLC*
NOT TO SCALE



NOTES:

1. USE THIS DETAIL WHEN PIPELINE IS ELECTRICALLY NON-CONDUCTIVE (NON-METALLIC OR METALLIC WITH INSIDE COATING OR LINING).
2. NO. 12 AWG INSULATED IF LENGTH IS LESS THAN 6'. IF MORE THAN 6', INSTALL CONDUCTOR IN 3/4" CONDUIT.
3. BOND MAGMETER TO ONE OF THE FOLLOWING ACCEPTABLE GROUNDS:
   A) METALLIC WATER PIPE IF BURIED PORTION IS MORE THAN 10'.
   B) STRUCTURAL STEEL
   C) IF BOTH OF THE ABOVE NOT AVAILABLE, INSTALL 3/4" DIA x 10'-0" LONG COPPER CLAD STEEL GROUND ROD IN GROUND OUTSIDE OF STRUCTURE

2 *NON-CONDUCTIVE MAGMETER GROUNDING*
NOT TO SCALE

3 *DETAIL NAME:*
NOT TO SCALE

4 *DETAIL NAME:*
NOT TO SCALE

5 *DETAIL NAME:*
NOT TO SCALE

6 *DETAIL NAME:*
NOT TO SCALE

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
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BGMU Project No. S07-653

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ABBREVIATIONS

AC	AIR CONDITIONING UNIT
ACC	AIR-COOLED CONDENSER
ACCU	AIR-COOLED CONDENSING UNIT
AD	ACCESS DOOR
AF	AIR FOIL
A.F.F.	ABOVE FINISHED FLOOR
AFM	AIR FLOW MEASURING DEVICE
AHU	AIR HANDLING UNIT
AMD	AIR MIXING DEVICE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP (INCHES OF WATER)
APU	AIR PURIFICATION UNIT
AS	AIR SEPERATOR
ASD	ADJUSTABLE SPEED DRIVE W/MAIN POWER DISCONNECT SWITCH
ATC	AUTOMATIC TEMPERATURE CONTROL PANEL
BAS	BUILDING AUTOMATION SYSTEM
BFP	BACK FLOW PREVENTER
BI	BACKWARD INCLINED
B.O.J.	BOTTOM OF JOIST
B.O.D.	BOTTOM OF DUCT (ELEVATION)
B.O.P.	BOTTOM OF PIPE (ELEVATION)
B.O.S.	BOTTOM OF STEEL
BTU/H	BTU PER HOUR
CC	COOLING COIL
CD	CEILING DIFFUSER
CFC	CONSTANT VOLUME FLOW CONTROLLER
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CLG	CEILING
CO	CLEAN OUT
COMP	COMPRESSOR UNIT
CONV.	CONVECTOR
CP	CONDENSATE PUMP
CR	CONDENSATE RETURN
CRU	CONDENSATE RETURN UNIT
CT	COOLING TOWER
CU	CONDENSING UNIT
CXL	COMBINATION ACROSS THE LINE STARTER
DB	DRY BULB TEMPERATURE, °F
dB	DECIBELS
D	AUTOMATIC CONTROL DAMPER
DD	DISCHARGE DAMPER
Dp	DEW POINT TEMPERATURE, °F
DPS	DIFFERENTIAL PRESSURE SENSOR
DS	DOWN SPOUT
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAG	EXHAUST AIR GRILLE
EAR	EXHAUST AIR REGISTER
EAT	ENTERING AIR TEMPERATURE, °F
ECC	ENGINEERING CONTROL CENTER
ECD	EDDY CURRENT DRIVE
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EOM	END OF MAIN DRIP (STEAM)
ERC	ENERGY RECOVERY COIL
ERP	ELECTRIC RADIANT CEILING PANEL
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EWB	ENTERING WET BULB TEMPERATURE, °F
EWT	ENTERING WATER TEMPERATURE, °F
EXG.	EXISTING
F.A.	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FC	FAN COIL UNIT
FCO	FLOOR CLEAN OUT
F.F.	FINAL FILTER
FLR.	FLOOR
FD	FLOOR DRAIN
FD	FIRE DAMPER
F/SD	COMBINATION FIRE/SMOKE DAMPER
F.O.B.	FLAT ON BOTTOM
F.O.T.	FLAT ON TOP
FLA	FULL LOAD AMPS
FTR	FIN TUBE RADIATION
GH	GRAVITY HOOD (RELIEF,EXHAUST,INTAKE,O.A.)
GPM	GALLONS PER MINUTE
HB	HOSE BIB
HC	HEATING COIL
HD	HOOD
HE	AIR TO AIR HEAT EXCHANGER
HF	HEPA FILTER
HP	HORSE POWER
HPR	HIGH PRESSURE STEAM CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM (60 PSIG & ABOVE)
HRP	HYDRONIC RADIANT CEILING PANEL
HV	HEATING AND VENTILATING UNIT
HW	HOT WATER
HHWS	HEATING HOT WATER SUPPLY
HHWR	HEATING HOT WATER RETURN
HX	HEAT EXCHANGER
IV (OR VIV)	INLET VANES (OR VARIABLE INLET VANES)
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS/HR	POUNDS PER HOUR
LCD	LINEAR CEILING DIFFUSER
LPR	LOW PRESSURE STEAM CONDENSATE RETURN
LPS	LOW PRESSURE STEAM (15 PSIG & BELOW)
LTCP	LOCAL TEMPERATURE CONTROL PANEL
LWT	LEAVING WATER TEMPERATURE
MAX.	MAXIMUM
MB	MIXING BOX
MBH	1000 BTU/HOUR
MCC	MOTOR CONTROL CENTER
MIN.	MINIMUM
MMS	MANUAL MOTOR STARTER
MPR	MEDIUM PRESSURE CONDENSATE RETURN
MPS	MEDIUM PRESSURE STEAM
MVD	MANUAL VOLUME DAMPER
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NOM.	NOMINAL
OA	OUTSIDE AIR
OD	OVERFLOW DRAIN
OBD	OPOSED BLADE DAMPER
P	PUMP
PC	PUMPED CONDENSATE
PD	PRESSURE DROP (FEET OF WATER)
PF	PRE-FILTER
PH	PREHEAT
PRV	PRESSURE REDUCING VALVE
QD	QUICK DISCONNECT
RA	RETURN AIR
RAG	RETURN AIR GRILLE
RAR	RETURN AIR REGISTER
RD	ROOF DRAIN
RF	RETURN FAN
RH	REHEAT COIL
Rh	RELATIVE HUMIDITY
RW	RAW WATER
SA	SUPPLY AIR
SAU	SOUND ATTENUATING UNIT
SAG	SUPPLY AIR GRILLE
SAR	SUPPLY AIR REGISTER
SCD	SMOKE CONTROL DAMPER
SD	SMOKE DAMPER
SF	SUPPLY FAN
SH	STEAM HUMIDIFIER
SP	STATIC PRESSURE (INCHES OF WATER)
SP	SUMP PUMP
SPS	STATIC PRESSURE SENSOR
SRV	SAVETY RELIEF VALVE
SS	STAINLESS STEEL
TDH	TOTAL DYNAMIC HEAD
T.O.S.	TOP OF SLAB
TP	TRAP PRIMER
TWU	THRU WALL UNIT
US	UTILITY STATION
UH	UNIT HEATER
V	VALVE
VFD	VARIABLE FREQUENCY DRIVE
VE	VOLUME EXTRACTOR
VFD	VARIABLE FREQUENCY DRIVE
VFC	VARIABLE VOLUME FLOW CONTROLLER
VI	VIBRATION ISOLATOR
VTR	VENT THRU ROOF
WB	WET BULB TEMPERATURE, °F
WC	WALL CLEANOUT
WFM	WATER FLOW MEASURING DEVICE
WSF	WATER SAND FILTER
WF	WATER FILTER

PIPING SYMBOLS

AIR CONDITIONING

- CWS — COOLING WATER SUPPLY
- CWR — COOLING WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- D — CONDENSATE DRAIN LINE
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION

HEATING

- HPS *
- HPC
- MPS *
- MPC
- LPS *
- LPC
- CR
- PCR
- HHWS — HOT WATER HEATING SUPPLY
- HHWR — HOT WATER HEATING RETURN

GENERAL

- PRS — PRESSURE REDUCING STATION
- DIRECTION OF FLOW
- ELBOW, TURNED UP
- ELBOW, TURNED DOWN
- RISE OR DROP IN PIPE
- TOP CONNECTION, 45° OR 90°
- BOTTOM CONNECTION, 45° OR 90°
- POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
- UNION (TYPICAL) OR INTERFACE BETWEEN TRADES
- QUICK DISCONNECT
- HOUSEKEEPING VACUUM INLET
- PIPE GUIDE
- PIPE ANCHOR
- EXPANSION JOINT, SINGLE DIRECTION
- EXPANSION JOINT, DUAL DIRECTION
- FLEXIBLE CONNECTOR, GENERAL
- METAL BRAIDED FLEXIBLE CONNECTOR
- METAL HOSE
- RUBBER BELOWS CONNECTOR

DIRECTIONAL FLOW SYMBOLOGY

- PIPE RISE TO FLOOR LEVEL ABOVE
- PIPE DROP FROM FLOOR LEVEL ABOVE
- PIPE DROP TO FLOOR LEVEL BELOW
- PIPE RISE FROM FLOOR LEVEL BELOW
- PIPE RISE FROM FLOOR LEVEL BELOW TO FLOOR LEVEL ABOVE (THRU)
- PIPE DROP FROM FLOW LEVEL ABOVE TO FLOOR LEVEL BELOW (THRU)
- 0.5% — SLOPE 0.5% TO THE RIGHT
- 1.0% — SLOPE 1.0% TO THE LEFT

VALVES

- VALVE, GENERAL
- GATE VALVE
- GATE VALVE (OS&Y)
- GLOBE VALVE
- DIAPHRAGM VALVE
- BALL VALVE
- BALANCING VALVE
- BALANCING VALVE w/TEST PORTS AND DRAIN
- NEEDLE VALVE
- PLUG VALVE
- DRAIN VALVE w/CAP
- REGULATING VALVE, MANUAL
- 2-WAY CONTROL VALVE, MOTOR ACTUATOR
- 2-WAY CONTROL VALVE, PNEUMATIC ACTUATOR
- 2-WAY CONTROL VALVE, HYDRAULIC ACTUATOR
- SOLENOID VALVE
- 2-WAY CONTROL VALVE, THERMOSTAT
- 3-WAY CONTROL VALVE, MANUAL
- 3-WAY CONTROL VALVE, MOTOR ACTUATOR
- 3-WAY CONTROL VALVE, PNEUMATIC ACTUATOR
- 3-WAY CONTROL VALVE, HYDRAULIC ACTUATOR
- SAFETY RELIEF VALVE
- SAFETY RELIEF VALVE
- TRIPLE DUTY VALVE
- PRESSURE RELIEF VALVE, BACK PRESSURE VALVE

VALVES CONTINUED

- SWING CHECK VALVE
- LIFT CHECK VALVE
- BALL CHECK VALVE
- BUTTERFLY VALVE

SENSING AND MEASURING DEVICES

- TEMPERATURE GAGE
- TEMPERATURE GAGE
- PRESSURE GAGE w/COCK
- PRESSURE GAGE w/DIAPHRAGM SEAL AND COCK
- DIFFERENTIAL PRESSURE GAGE
- PRESSURE SENSOR
- PRESSURE TRANSMITTER
- TEMPERATURE SENSOR
- TEMPERATURE TRANSMITTER
- DIFFERENTIAL PRESSURE TRANSMITTER
- PRESSURE REGULATOR, BACK PRESSURE, SELF-ACTUATED, EXTERNAL TAP
- PRESSURE REGULATOR, BACK PRESSURE, SELF-ACTUATED, INTERNAL TAP
- PRESSURE REGULATOR, LINE PRESSURE, SELF-ACTUATED, EXTERNAL TAP
- PRESSURE REGULATOR, LINE PRESSURE, SELF-ACTUATED, INTERNAL TAP
- DIFFERENTIAL PRESSURE, REGULATOR, SELF-ACTUATED, EXTERNAL TAP
- DIFFERENTIAL PRESSURE, REGULATOR, SELF-ACTUATED, INTERNAL TAP
- CONDUCTIVITY SENSOR/TRANSMITTER
- pH — SENSOR/TRANSMITTER
- LIQUID SENSOR/TRANSMITTER
- FLOW METER, GENERAL
- CORIOLIS FLOW METER
- ORIFICE FLOW METER
- VENTURI FLOW METER
- TURBINE OR PROPELLER FLOW METER

EQUIPMENT

- BASKET STRAINER
- Y-TYPE STRAINER
- CARTIRIDGE FILTER, SINGLE ELEMENT
- CARTIRIDGE FILTER, MULTIPLE ELEMENT
- BAG FILTER
- HIGH POINT AIR SEPARATOR WITH MANUAL DRAIN/VENT LINE
- MANUAL AIR VENT
- AIR FILTER/BREATHER
- AUTOMATIC AIR VENT
- VACCUM BREAKER
- CENTRIFUGAL PUMP, HORIZONTAL SPLIT CASE, BASE MOUNTED
- PUMP/CIRCULATOR, GENERAL
- INLINE PUMP
- CENTRIFUGAL PUMP, FLEX COUPLED, BASE MOUNTED
- CENTRIFUGAL PUMP, CLOSE COUPLED, BASE MOUNTED
- POSITIVE DISPLACEMENT PUMP
- PLATE HEAT EXCHANGER
- SHELL & TUBE HEAT EXCHANGER
- BLADDER EXPANSION TANK
- DIAPHRAGM EXPANSION TANK
- AIR SEPERATOR w/DRAIN
- AIR SEPERATOR TANK, STRAINER TYPE w/AUTOMATIC VENT AND DRAIN
- OPEN DRAIN TO FUNNEL, ROUTE TO NEAREST DRAIN
- TEST PLUG (PRESSURE/TEMPERATURE)
- THERMO WELL/PORT
- FS — FLOW SWITCH

DRAWING SYMBOLS

- A / M4.1 — SECTION LETTER, DRAWING NUMBER WHERE SHOWN
- UP DN — SUPPLY DUCT (UP & DOWN)
- UP DN — RETURN/EXHAUST DUCT (UP & DOWN)
- 1-200S — CEILING DIFFUSERS (TYPE 1 – 200 CFM)
- 4-200S — SIDEWALL SUPPLY GRILLE OR REGISTER (TYPE 4 – 200 CFM)
- 3-200S — LINEAR SLOT DIFFUSERS (TYPE 3 – 200 CFM)
- 5-200R (E) — SIDEWALL RETURN (OR EXHAUST) GRILLE OR REGISTER (TYPE 5 – 200 CFM)
- 2-200R (E) — CEILING RETURN (OR EXHAUST) GRILLE OR REGISTER (TYPE 2 – 200 CFM)
- 9-200R (E) — DOOR GRILLE (TYPE 9 – 200 CFM)
- VANE TURN ELBOW & PROPORTIONAL AIR SPLIT TYPE DUCT TAKE-OFF W/ SPLITTER DAMPER
- 45° BRANCH DUCT TAKE-OFF (SUPPLY)
- 45° BRANCH DUCT TAKE-OFF (RETURN OR EXHAUST)
- RISE — INCLINED RISE, IN DIRECTION OF AIR FLOW
- DROP — INCLINED DROP, IN DIRECTION OF AIR FLOW
- FLEXIBLE CONNECTION
- VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH AIR FOILVANES EVEN IF SYMBOL IS MISSING)
- STANDARD RADIUS ELBOW (CENTERLINE RADIUS EQUAL 1.5 TIMES DUCT WIDTH R=1.5 x DUCT WIDTH
- 10x8 — RECT. DUCT-WIDTH x DEPTH (FIRST FIGURE INDICATES SIDE SHOWN)
- 20x10 — FLAT OVAL DUCT-WIDTH x DEPTH (FIRST FIGURE INDICATES SIDE SHOWN)
- 14Ø — ROUND DUCT – DIAMETER
- 10x4 T.D. — RETURN AIR TRANSFER DUCT W/ 1" INTERNAL LINER
- LOUVER
- ACOUSTICAL DUCT LINING
- MVD OR MVD — MANUAL VOLUME DAMPER
- FD — FIRE DAMPER
- SD — SMOKE DAMPER
- F/SD — COMBINATION FIRE/SMOKE DAMPER
- ΔP — ROOM CONTROL: ROOM PRESSURIZATION
- T — ROOM CONTROL: THERMOSTAT
- H — ROOM CONTROL: HUMIDISTAT
- S — WALL SWITCH
- AIR FLOW — DUCT MOUNTED HUMIDIFIER
- DUCT MOUNTED SMOKE DETECTOR

AIR HEATING & COOLING UNITS SYMBOLS

- UNIT HEATER (HORIZONTAL)
- CABINET UNIT HEATER (CEILING-MOUNTED)
- UNIT HEATER OR FAN COIL (VERTICAL CABINET)
- VARIABLE VOLUME/CONSTANT VOLUME FLOW CONTROLLER
- FC-1 — HORIZONTAL CABINET FAN COIL UNIT
- ΔP MH — WALL-MOUNTED ANALOG DIFFERENTIAL PRESSURE SENSOR, MAGNEHELIC
- ΔP (±) — DIFFERENTIAL PRESSURE SENSOR, TRANSMITTER
- HEATING COIL / REHEAT COIL

GENERAL NOTES-MECHANICAL:

1. ALL DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR.
2. ALL DUCTS SHALL BE INSULATED PER SPECIFICATION AND AS NOTED ON DRAWINGS.
3. ALL LOW PRESSURE DUCT TRANSITIONS ARE FLAT ON TOP (F.O.T.) UNLESS OTHERWISE NOTED OR SHOWN ON DRAWINGS.
4. ALL SUPPLY DUCT SPLITTERS SHALL BE SIZED AND CONSTRUCTED PER S.M.A.C.N.A. DUCT STANDARDS.
5. ALL TURNING VANES SHOWN SHALL BE DOUBLE THICKNESS. TURNING VANES SHALL BE CONSTRUCTED PER S.M.A.C.N.A. DUCT STANDARDS.
6. ALL TRANSITIONS SHALL BE 30° MAX. ON CONTRACTING FLOW (7" IN 12"); 20° MAX. ON DIVERGING FLOW (4-3/8" IN 12") PER S.M.A.C.N.A. DUCT STANDARDS.
7. ACCESS PANELS IN SUSPENDED CEILINGS ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC.
8. ALL LOUVER SIZES ARE APPROX. ON MECH. DWGS. SEE ARCH. DWGS. FOR EXACT LOUVER SIZES.
9. ALL FAN COIL CONDENSATE DRAINS ARE TO BE ¾" UNLESS OTHERWISE NOTED.
10. ALL AIR HANDLER CONDENSATE DRAINS ARE TO BE 2" UNLESS OTHERWISE NOTED.
11. ALL SUPPLY, RETURN, AND EXHAUST DUCTS ARE TO BE SEALED AT LONGITUDINAL AND TRANSVERSE JOINTS TO MINIMIZE LEAKAGE.
12. PROVIDE VOLUME DAMPERS ON ALL BRANCH DUCTWORK WHETHER INDICATED OR NOT. EXTRACTORS AND AIR SCOOPS ARE NOT ALLOWED.
13. MECHANCIAL CONTRACTOR RESPONSIBLE FOR ALL HVAC & PLUMBING EQUIPMENT CONTROL WIRING, INSTALLATION AND ALL RELATED ITEM NECESSARY FOR COMPLETE AND FULLY OPERATIONAL EQUIPMENT SYSTEMS.

G S & P

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

REVISION

No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

HVAC LEGENDS AND GENERAL NOTES

M7.0.0

PROJECT: 26064.01
DATE: JULY, 2010

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shelldb
B.O.

SPLIT SYSTEM AC UNIT SCHEDULE

MARK	SERVICE	TOTAL CFM	OA CFM	E.S.P.	EAT DB/WB	TOTAL COOLING CAPACITY (MBH)	SENS. COOLING CAPACITY (MBH)	OA AMB	HEATER KW	INDOOR VOLT.	OUTDOOR VOLT.	INDOOR FAN HP	OUTDOOR FAN HP	INDOOR F.L.A.	INDOOR M.C.A.	INDOOR M.O.C.P.	OUTDOOR F.L.A.	OUTDOOR M.C.A.	OUTDOOR M.O.C.P.	DESIGN BASIS INDOOR	DESIGN BASIS OUTDOOR	REMARKS
AHU-8/ CU-8	OFFICE	1050	100	0.375"	77/67	20.0	18.5	95	7.0	208/3/60	460/3/60	1/3	1/5	30	37	40	1	7	15	TRANE 4TEC3F 24 B1000	TRANE 4TWA0036A4	ⒶⒷⒸⒹⒺⒻⒼⒽ

Ⓐ R-410A REFRIGERANT
Ⓑ EXPOXY COATED COILS
Ⓒ LOW AMBIENT MODE FOR CU
Ⓓ HEAT PUMP
Ⓔ SINGLE POINT POWER CONNECTION TO AHU & CU WITH DISCONNECTS
Ⓕ MIN 5-YEAR COMPRESSOR WARRANTY
Ⓖ PRECHARGED REFRIGERANT LINE SETS
Ⓗ MOTORIZED OA DAMPER OPEN WHEN AHU IS ENERGIZED

FAN SCHEDULE

MARK	SERVICE	TYPE	OPENING APPROX. SIZE	FLOW (CFM)	STATIC PRESS. (in. wg)	MAX. RPM	MAX. TS (ft/min)	VOLTAGE	H. P.	STARTER TYPE	OPERATING WEIGHT	DESIGN BASIS	REMARKS
VF-11	DRYER ROOM	BELT DRIVE PROP	51.75x51.75	23,000	0.5	800	7,300	460/60/3	5	CXT	200	SBE-2L42-50	ⒷⒸⒹⒽⒾⒿⓀ
VF-12	DRYER ROOM	BELT DRIVE CENTRIFUGAL	17.5x17.5	4,000	0.35	900	5,000	460/60/3	1	CXT	150	CWB-200-10	ⒷⒸⒹⒽⒾⒿⓀ
VF-13	DRYER ROOM	BELT DRIVE PROP	51.75x51.75	23,000	0.5	800	7,300	460/60/3	5	CXT	200	SBE-2L42-50	ⒷⒸⒹⒽⒾⒿⓀ
SF-2	BOILER ROOM	BELT DRIVE PROP	45.75x45.75	15,000	0.25	600	6,300	460/60/3	2	CXT	200	SBS-2H42-15	ⒷⒸⒽⒾⒿⓀ

Ⓐ ROOF CURB
Ⓑ BACKDRAFT DAMPER
Ⓒ DISCONNECT SWITCH
Ⓓ WALL HOUSING
Ⓔ HIGH TEMPERATURE-SELECT FOR 150 F AIRSTREAM
Ⓕ SPARKPROOF CONSTRUCTION
Ⓖ EXPLOSION PROOF MOTOR
Ⓗ EPOXY COATED
Ⓘ FAN/MOTOR GUARD
Ⓙ BELT GUARD
Ⓚ INLET & OUTLET SCREEN
Ⓛ SWITCH WITH ROOM LIGHT

GAS-FIRED UNIT HEATER SCHEDULE

MARK	TYPE	SERVICE	CFM	CAPACITY MBH INPUT	CAPACITY MBH OUTPUT	FUEL	TEMP. RISE °F	MOUNTING HEIGHT	FAN HP	VOLTAGE	FLUE SIZE	BASIS OF DESIGN	REMARKS
GUH-19 THRU 24	SEPARATED COMBUSTION	DRYER BUIDING	2,562	200	166	NATURAL GAS	60	24" BELOW STRUCTURE	1/2	120/1/60	6" DIA	REZNOR MODEL UDAS 200	ⒶⒷⒸ Ⓓ

Ⓐ PROVIDE WITH OPTIONAL DOWNTURN NOZZLE WITH 60° AIR DEFLECTION ANGLE
Ⓑ ALL UNIT HEATERS TO HAVE SEPARATED COMBUSTION SYSTEM WITH CONCENTRIC DUCT WALL TERMINATION KIT
Ⓒ CORROSION RESISTANT CONSTRUCTION
Ⓓ PROVIDE MANUFACTURER WALL MOUNTING BRACKET; SEE M7.0.3 FOR WALL MOUNTING DETAIL AND BRACKET IF NOT AVAILABLE FROM MANUFACTURER

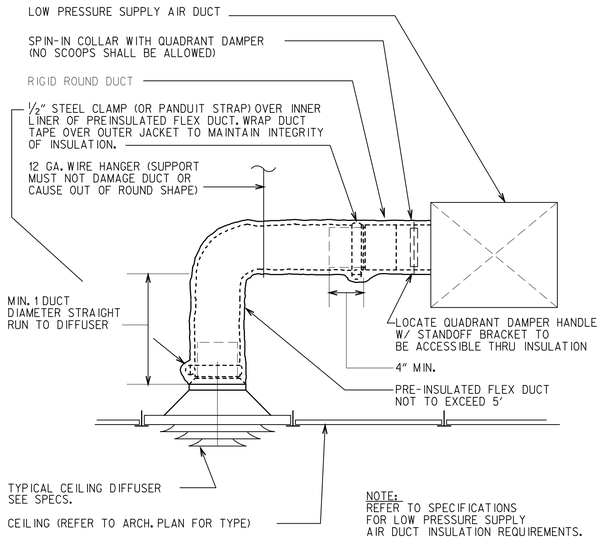
AIR DISTRIBUTION DEVICE SCHEDULE

TYPE	SERVICE	CFM RANGE	FACE SIZE	NECK	RUNOUT
1 TITUS MODEL TDCAA	SUPPLY AIR SQUARE CEILING DIFFUSER	0-50	12"x12"	6"Φ	6"Φ / 8"x4"
		55-110	24"x24"	6"Φ	6"Φ / 8"x4"
		115-220	24"x24"	8"Φ	8"Φ / 10"x6"
		225-340	24"x24"	10"Φ	10"Φ / 12"x8"
		345-645	24"x24"	12"Φ	12"Φ / 16"x8"
2 TITUS MODEL 50R AND 50F (MAX NC 20)	RETURN AIR/ EXHAUST AIR CEILING REGISTER	0-100	6"x6"	6"SO/6" Φ	10"x4"/6" Φ
		105-250	8"x8"	8"SO/9" Φ	12"x6"/9" Φ
		255-425	12"x12"	12"SO/12" Φ	14"x8" /12"Φ
		430-600	15"x15"	15"SO/14" Φ	20"x8" /14"Φ
		605-805	18"x18"	18"SO/14" Φ	24"x8" /14"Φ
		810-1000	21"x21"	21"SO/16" Φ	22"x10"/16"Φ
		1005-1350	24"x24"	24"SO/18" Φ	28"x10"/18"Φ
		1355-1500	24"x24"	24"SO/18" Φ	30"x10"/18"Φ
		1505-1800	24"x24"	24"SO/20"Φ	36"x10"/20"Φ
3 TITUS MODEL ML-39 (1" SLOTS)	LINEAR SUPPLY CEILING DIFFUSER	REFER TO DRAWINGS FOR CFM'S, SIZES AND RUNOUTS			
4 TITUS MODEL 300FS	SIDEWALL SUPPLY REGISTER	REFER TO DRAWINGS FOR CFM'S, SIZES AND RUNOUTS			
5 TITUS MODEL 33R	SIDEWALL RETURN/ EXHAUST REGISTER	REFER TO DRAWINGS FOR CFM'S, SIZES AND RUNOUTS			
6 TITUS MODEL TLF-AL	LAMINAR FLOW DIFFUSER	50-150	12"x48"	7"Φ	7"Φ / 8"x6"
		100-200	24"x48"	8"Φ	8"Φ / 10"x6"

NOTES:

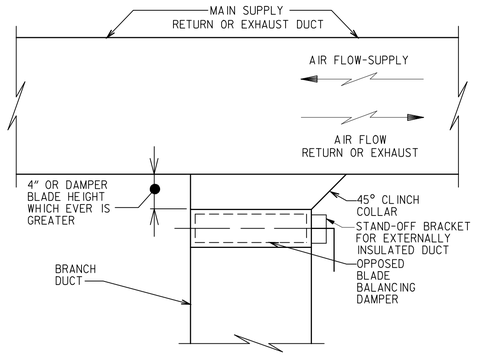
1. REFER TO MECHANICAL FLOOR PLANS FOR LOCATIONS AND QUANTITIES.
2. FACE AND RUNOUT SIZES ARE AS NOTED IN SCHEDULE UNLESS OTHERWISE NOTED ON PLANS OR DETAILS.
3. NOT ALL SIZES SHOWN MAY BE USED ON THIS PROJECT.

(D-051)
P:\26064m\m\606m701dgn
DGN LEVELS ON: ALL
(CONSTRUCT ON) SUMMER,ABS,FILLERS,SYMBOLOGY,LINE_STYLES,PATTERN,POINTS,TAGS,TEXT,DIMENSION,SECTION,ELEVATION,MATCHLINE,CALLOUT,GRID,REVISION,TITLE,ENGINEERING,WATERMARK,ATTRIBUTES,ENGINEERING WATERMARK,ATTRIBUTES,ENGINEERING WATERMARK,ATTRIBUTES,ENGINEERING



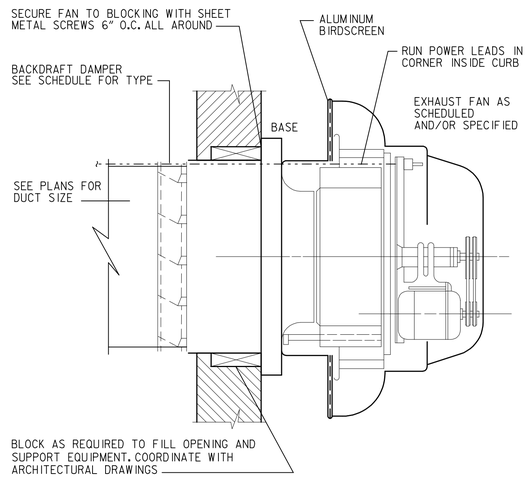
TYPICAL DUCT CONNECTION DETAIL

NO SCALE



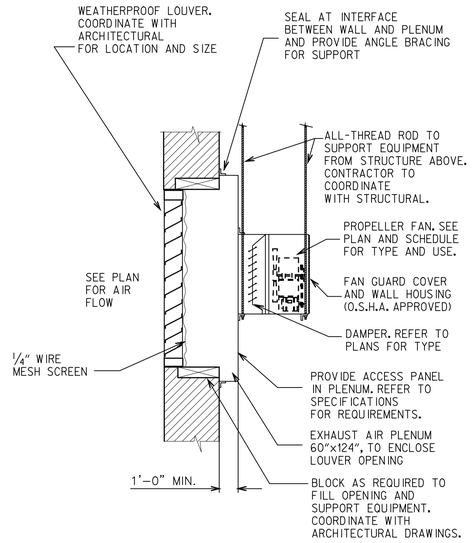
BRANCH TAKE-OFF DETAIL

NO SCALE



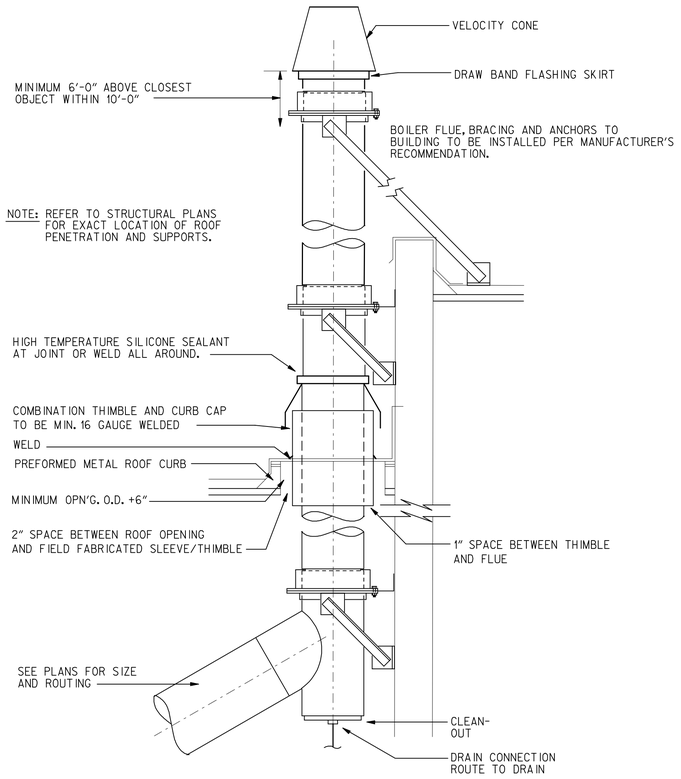
WALL-MOUNTED EXHAUST FAN DETAIL

NO SCALE



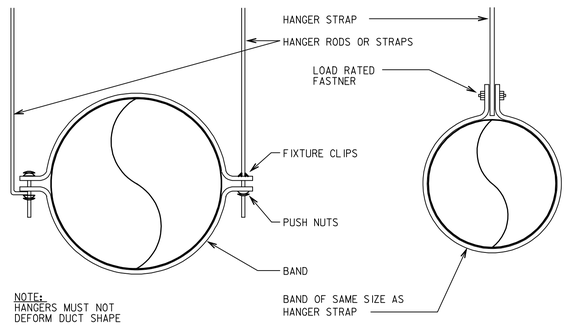
PROPELLER FAN DETAIL

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VENTILATING ROOF THIMBLE FOR FLUE DETAIL

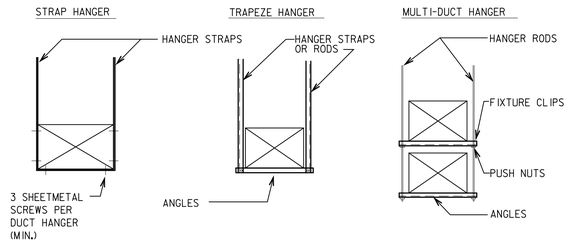
NO SCALE



HANGER SIZES FOR ROUND DUCT					
DUCT DIAMETER	ROUND HANGERS	STRAP HANGERS	MAXIMUM SPACING	HANGER ROD	NUMBER OF HANGERS
UP THRU 10"	12 GAUGE WIRE	1"X22 GAUGE	10'-0"	1/4"	1
11" THRU 18"	8 GAUGE WIRE	1"X22 GAUGE	10'-0"	1/4"	1
19" THRU 24"	———	1"X22 GAUGE	10'-0"	1/4"	1
25" THRU 36"	———	1"X20 GAUGE	10'-0"	3/8"	1
37" THRU 50"	———	2"X20 GAUGE	10'-0"	3/8"	2
51" THRU 84"	———	2"X16 GAUGE	10'-0"	3/8"	2

ROUND DUCT HANGERS DETAIL

NO SCALE

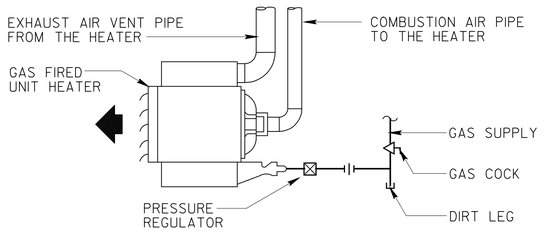


HANGER SIZES FOR RECTANGULAR DUCT				
LONGEST DIMENSION OF DUCT	ROD HANGERS	STRAP HANGERS	TRAPEZE SHELF ANGLES	MAXIMUM SPACING
UP THRU 18"	8 GA. WIRE	1"X22 GAUGE	1"X1"X1/8"	10'-0"
19" THRU 30"	8 GA. WIRE	1"X22 GAUGE	1"X1"X1/8"	10'-0"
31" THRU 42"	3/8" ROD	1"X18 GAUGE	1-1/2"X1-1/2"X1/8"	10'-0"
43" THRU 60"	3/8" ROD	1"X18 GAUGE	1-1/2"X1-1/2"X1/8"	10'-0"
61" THRU 84"	3/8" ROD	1"X18 GAUGE	2"X2"X1/8"	8'-0"
85" THRU 96"	3/8" ROD	1"X18 GAUGE	2"X2"X3/16"	8'-0"
97" THRU 120"	3/8" ROD	1"X16 GAUGE	2"X2"X1/4"	8'-0"

RECTANGULAR DUCT HANGERS DETAIL

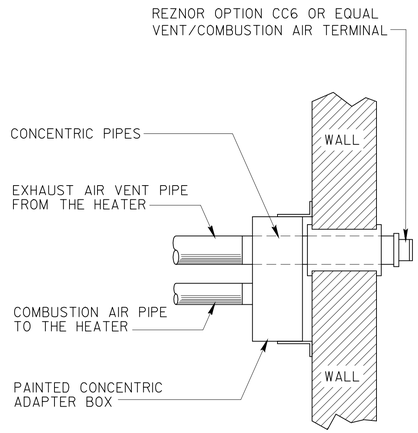
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DRAWN BY: Mitch Hall
CHECKED BY: Mitch Hall
Project: 3414
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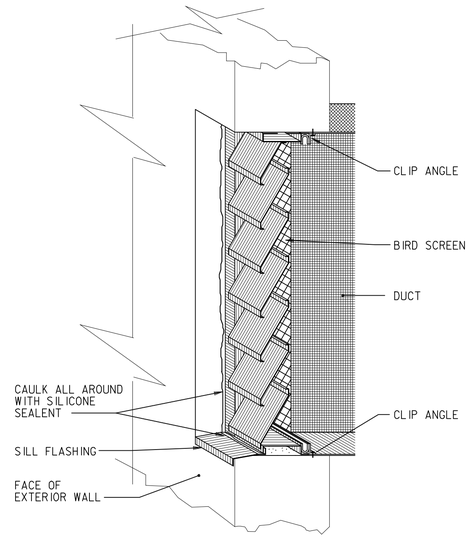
GAS-FIRED UNIT HEATER DETAIL

NO SCALE



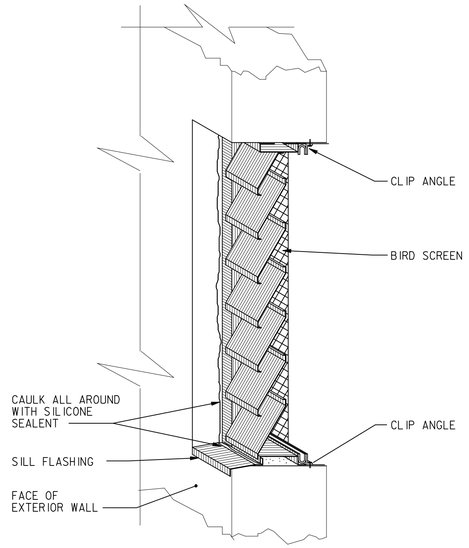
THRU WALL FLUE DETAIL

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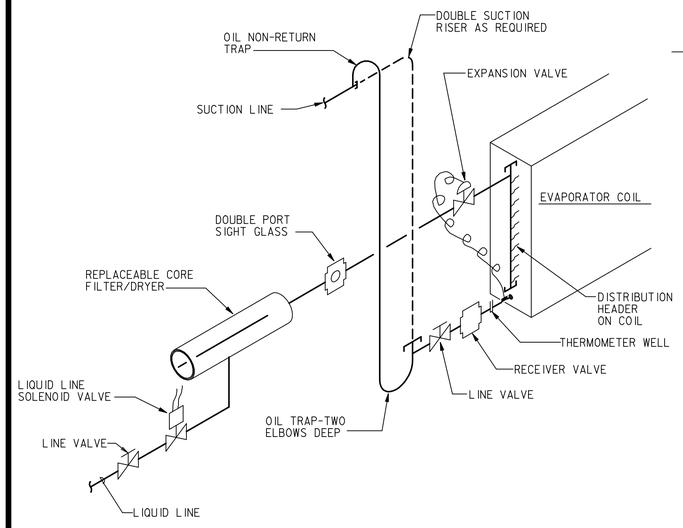
LOUVER DETAIL

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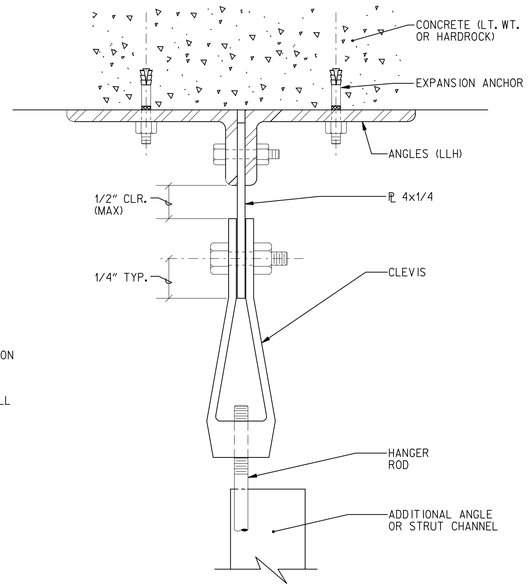
LOUVER NO DUCT DETAIL

NO SCALE



REFRIGERANT PIPING DETAIL

NO SCALE



HANGER ROD CONNECTION TO CONCRETE

NO SCALE

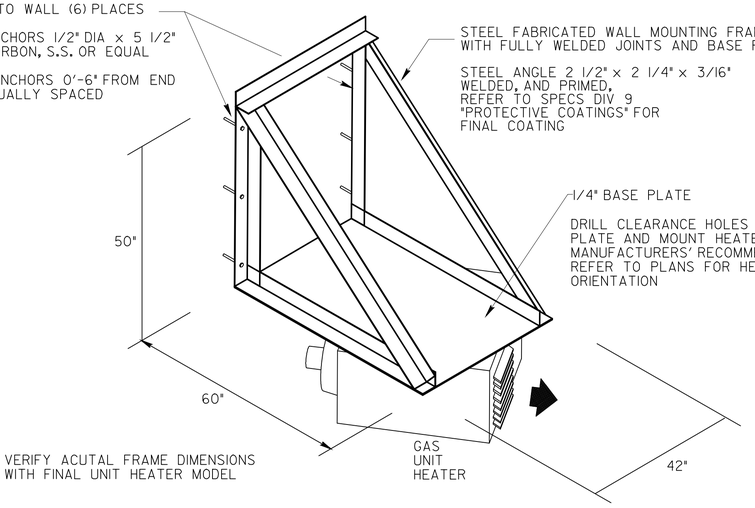
FILL CMU CELLS AT ANCHOR BOLT CENTERLINE WITH COARSE GROUT APPROX. 12" BELOW AND ABOVE THE OUTSIDE ANCHOR, FOR BOTH VERTICAL BRACES

FABRICATE FRAME WIDTH WITH VERTICAL BRACES SET ON CENTER WITH CMU CELLS TO BE FILLED, EACH SIDE

MOUNT THIS SIDE TO WALL (6) PLACES

USE EXPANSION ANCHORS 1/2" DIA x 5 1/2" HILTIKWIK BOLT CARBON, S.S. OR EQUAL

LOCATE OUTSIDE ANCHORS 0'-6" FROM END OF BRACE AND EQUALLY SPACED



WALL MOUNTING FRAME DETAIL FOR GAS-FIRED UNIT HEATER

NO SCALE

G S & P

Design Services For The Built Environment

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Charlotte
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Dallas
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Jacksonville
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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION

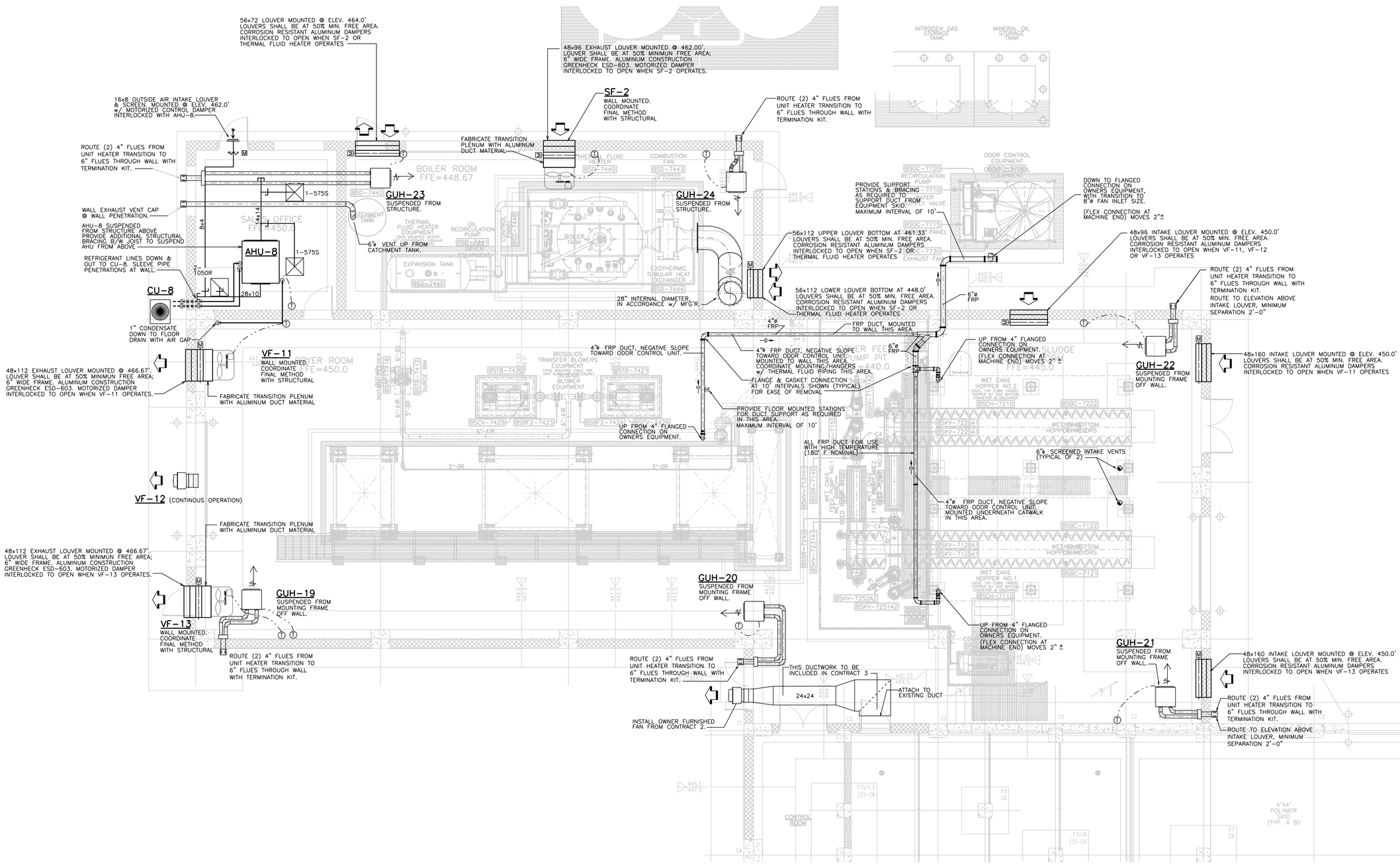
No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

HVAC - DETAILS

M7.0.3

PROJECT: 26064.01
DATE: JULY, 2010

shelldb
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ABBREVIATIONS

AC	AIR CONDITIONING UNIT
ACC	AIR-COOLED CONDENSER
ACCU	AIR-COOLED CONDENSING UNIT
AD	ACCESS DOOR
AF	AIR FOIL
A.F.F.	ABOVE FINISHED FLOOR
AFM	AIR FLOW MEASURING DEVICE
AHU	AIR HANDLING UNIT
AMD	AIR MIXING DEVICE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP (INCHES OF WATER)
APU	AIR PURIFICATION UNIT
AS	AIR SEPERATOR
ASD	ADJUSTABLE SPEED DRIVE W/MAIN POWER DISCONNECT SWITCH
ATC	AUTOMATIC TEMPERATURE CONTROL PANEL
BAS	BUILDING AUTOMATION SYSTEM
BFP	BACK FLOW PREVENTER
BI	BACKWARD INCLINED
B.O.J.	BOTTOM OF JOIST
B.O.D.	BOTTOM OF DUCT (ELEVATION)
B.O.P.	BOTTOM OF PIPE (ELEVATION)
B.O.S.	BOTTOM OF STEEL
BTU/H	BTU PER HOUR
CC	COOLING COIL
CD	CEILING DIFFUSER
CFC	CONSTANT VOLUME FLOW CONTROLLER
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CLG	CEILING
CO	CLEAN OUT
COMP	COMPRESSOR UNIT
CONV.	CONVECTOR
CP	CONDENSATE PUMP
CR	CONDENSATE RETURN
CRU	CONDENSATE RETURN UNIT
CT	COOLING TOWER
CU	CONDENSING UNIT
CXL	COMBINATION ACROSS THE LINE STARTER
DB	DRY BULB TEMPERATURE, °F
dB	DECIBELS
D	AUTOMATIC CONTROL DAMPER
DD	DISCHARGE DAMPER
Dp	DEW POINT TEMPERATURE, °F
DPS	DIFFERENTIAL PRESSURE SENSOR
DS	DOWN SPOUT
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAG	EXHAUST AIR GRILLE
EAR	EXHAUST AIR REGISTER
EAT	ENTERING AIR TEMPERATURE, °F
ECC	ENGINEERING CONTROL CENTER
ECD	EDDY CURRENT DRIVE
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EOM	END OF MAIN DRIP (STEAM)
ERC	ENERGY RECOVERY COIL
ERP	ELECTRIC RADIANT CEILING PANEL
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EWB	ENTERING WET BULB TEMPERATURE, °F
EWT	ENTERING WATER TEMPERATURE, °F
EXG.	EXISTING
F.A.	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FC	FAN COIL UNIT
FCO	FLOOR CLEAN OUT
F.F.	FINAL FILTER
FLR.	FLOOR
FD	FLOOR DRAIN
FD	FIRE DAMPER
F/SD	COMBINATION FIRE/SMOKE DAMPER
F.O.B.	FLAT ON BOTTOM
F.O.T.	FLAT ON TOP
FLA	FULL LOAD AMPS
FTR	FIN TUBE RADIATION
GH	GRAVITY HOOD (RELIEF,EXHAUST,INTAKE,O.A.)
GPM	GALLONS PER MINUTE
HB	HOSE BIB
HC	HEATING COIL
HD	HOOD
HE	AIR TO AIR HEAT EXCHANGER
HF	HEPA FILTER
HP	HORSE POWER
HPR	HIGH PRESSURE STEAM CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM (60 PSIG & ABOVE)
HRP	HYDRONIC RADIANT CEILING PANEL
HV	HEATING AND VENTILATING UNIT
HW	HOT WATER
HWS	HEATING HOT WATER SUPPLY
HWR	HEATING HOT WATER RETURN
HX	HEAT EXCHANGER
IV (OR VIV)	INLET VANES (OR VARIABLE INLET VANES)
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS/HR	POUNDS PER HOUR
LCD	LINEAR CEILING DIFFUSER
LPR	LOW PRESSURE STEAM CONDENSATE RETURN
LPS	LOW PRESSURE STEAM (15 PSIG & BELOW)
LTCP	LOCAL TEMPERATURE CONTROL PANEL
LWT	LEAVING WATER TEMPERATURE
MAX.	MAXIMUM
MB	MIXING BOX
MBH	1000 BTU/HOUR
MCC	MOTOR CONTROL CENTER
MIN.	MINIMUM
MMS	MANUAL MOTOR STARTER
MPR	MEDIUM PRESSURE CONDENSATE RETURN
MPS	MEDIUM PRESSURE STEAM
MVD	MANUAL VOLUME DAMPER
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NOM.	NOMINAL
OA	OUTSIDE AIR
OD	OVERFLOW DRAIN
OBD	OPOSED BLADE DAMPER
P	PUMP
PC	PUMPED CONDENSATE
PD	PRESSURE DROP (FEET OF WATER)
PF	PRE-FILTER
PH	PREHEAT
PRV	PRESSURE REDUCING VALVE
QD	QUICK DISCONNECT
RA	RETURN AIR
RAG	RETURN AIR GRILLE
RAR	RETURN AIR REGISTER
RD	ROOF DRAIN
RF	RETURN FAN
RH	REHEAT COIL
Rh	RELATIVE HUMIDITY
RW	RAW WATER
SA	SUPPLY AIR
SAU	SOUND ATTENUATING UNIT
SAG	SUPPLY AIR GRILLE
SAR	SUPPLY AIR REGISTER
SCD	SMOKE CONTROL DAMPER
SD	SMOKE DAMPER
SF	SUPPLY FAN
SH	STEAM HUMIDIFIER
SP	STATIC PRESSURE (INCHES OF WATER)
SP	SUMP PUMP
SPS	STATIC PRESSURE SENSOR
SRV	SAVETY RELIEF VALVE
SS	STAINLESS STEEL
TDH	TOTAL DYNAMIC HEAD
T.O.S.	TOP OF SLAB
TP	TRAP PRIMER
TWU	THRU WALL UNIT
US	UTILITY STATION
UH	UNIT HEATER
V	VALVE
VFD	VARIABLE FREQUENCY DRIVE
VE	VOLUME EXTRACTOR
VFD	VARIABLE FREQUENCY DRIVE
VFC	VARIABLE VOLUME FLOW CONTROLLER
VI	VIBRATION ISOLATOR
VTR	VENT THRU ROOF
WB	WET BULB TEMPERATURE, °F
WC	WALL CLEANOUT
WFM	WATER FLOW MEASURING DEVICE
WSF	WATER SAND FILTER
WF	WATER FILTER

PIPING SYMBOLS

AIR CONDITIONING

- CWS — COOLING WATER SUPPLY
- CWR — COOLING WATER RETURN
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- D — CONDENSATE DRAIN LINE
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION

HEATING

- HPS- * — HIGH PRESSURE STEAM (60 PSIG & ABOVE)
- HPC — HIGH PRESSURE STEAM CONDENSATE RETURN
- MPS- * — MEDIUM PRESSURE STEAM (16 PSIG THRU 60 PSIG)
- MPC — MEDIUM PRESSURE CONDENSATE RETURN
- LPS- * — LOW PRESSURE STEAM (1 PSIG THRU 15 PSIG)
- LPC — LOW PRESSURE CONDENSATE RETURN
- CR — CONDENSATE RETURN
- PCR — PUMPED CONDENSATE RETURN
- HWS — HOT WATER HEATING SUPPLY
- HWR — HOT WATER HEATING RETURN

GENERAL

- PRS — PRESSURE REDUCING STATION
- DIRECTION OF FLOW
- ELBOW, TURNED UP
- ELBOW, TURNED DOWN
- RISE OR DROP IN PIPE
- TOP CONNECTION, 45° OR 90°
- BOTTOM CONNECTION, 45° OR 90°
- POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
- UNION (TYPICAL) OR INTERFACE BETWEEN TRADES
- QUICK DISCONNECT
- HOUSEKEEPING VACUUM INLET
- PIPE GUIDE
- PIPE ANCHOR
- EXPANSION JOINT, SINGLE DIRECTION
- EXPANSION JOINT, DUAL DIRECTION
- FLEXIBLE CONNECTOR, GENERAL
- METAL BRAIDED FLEXIBLE CONNECTOR
- METAL HOSE
- RUBBER BELOWS CONNECTOR

DIRECTIONAL FLOW SYMBOLOGY

- PIPE RISE TO FLOOR LEVEL ABOVE
- PIPE DROP FROM FLOOR LEVEL ABOVE
- PIPE DROP TO FLOOR LEVEL BELOW
- PIPE RISE FROM FLOOR LEVEL BELOW
- PIPE RISE FROM FLOOR LEVEL BELOW TO FLOOR LEVEL ABOVE (THRU)
- PIPE DROP FROM FLOW LEVEL ABOVE TO FLOOR LEVEL BELOW (THRU)
- 0.5% — SLOPE 0.5% TO THE RIGHT
- 1.0% — SLOPE 1.0% TO THE LEFT

VALVES

- VALVE, GENERAL
- GATE VALVE
- GATE VALVE (OS&Y)
- GLOBE VALVE
- DIAPHRAGM VALVE
- BALL VALVE
- BALANCING VALVE
- BALANCING VALVE w/TEST PORTS AND DRAIN
- NEEDLE VALVE
- PLUG VALVE
- DRAIN VALVE w/CAP
- REGULATING VALVE, MANUAL
- 2-WAY CONTROL VALVE, MOTOR ACTUATOR
- 2-WAY CONTROL VALVE, PNEUMATIC ACTUATOR
- 2-WAY CONTROL VALVE, HYDRAULIC ACTUATOR
- SOLENOID VALVE
- 2-WAY CONTROL VALVE, THERMOSTAT
- 3-WAY CONTROL VALVE, MANUAL
- 3-WAY CONTROL VALVE, MOTOR ACTUATOR
- 3-WAY CONTROL VALVE, PNEUMATIC ACTUATOR
- 3-WAY CONTROL VALVE, HYDRAULIC ACTUATOR
- SAFETY RELIEF VALVE
- SAFETY RELIEF VALVE
- TRIPLE DUTY VALVE
- PRESSURE RELIEF VALVE, BACK PRESSURE VALVE

VALVES CONTINUED

- SWING CHECK VALVE
- LIFT CHECK VALVE
- BALL CHECK VALVE
- BUTTERFLY VALVE

SENSING AND MEASURING DEVICES

- TEMPERATURE GAGE
- TEMPERATURE GAGE
- PRESSURE GAGE w/COCK
- PRESSURE GAGE w/DIAPHRAGM SEAL AND COCK
- DIFFERENTIAL PRESSURE GAGE
- PRESSURE SENSOR
- PRESSURE TRANSMITTER
- TEMPERATURE SENSOR
- TEMPERATURE TRANSMITTER
- DIFFERENTIAL PRESSURE TRANSMITTER
- PRESSURE REGULATOR, BACK PRESSURE, SELF-ACTUATED, EXTERNAL TAP
- PRESSURE REGULATOR, BACK PRESSURE, SELF-ACTUATED, INTERNAL TAP
- PRESSURE REGULATOR, LINE PRESSURE, SELF-ACTUATED, EXTERNAL TAP
- PRESSURE REGULATOR, LINE PRESSURE, SELF-ACTUATED, INTERNAL TAP
- DIFFERENTIAL PRESSURE, REGULATOR, SELF-ACTUATED, EXTERNAL TAP
- DIFFERENTIAL PRESSURE, REGULATOR, SELF-ACTUATED, INTERNAL TAP
- CONDUCTIVITY SENSOR/TRANSMITTER
- pH - SENSOR/TRANSMITTER
- LIQUID SENSOR/TRANSMITTER
- FLOW METER, GENERAL
- CORIOLIS FLOW METER
- ORIFICE FLOW METER
- VENTURI FLOW METER
- TURBINE OR PROPELLER FLOW METER

EQUIPMENT

- BASKET STRAINER
- Y-TYPE STRAINER
- CARTIRIDGE FILTER, SINGLE ELEMENT
- CARTIRIDGE FILTER, MULTIPLE ELEMENT
- BAG FILTER
- HIGH POINT AIR SEPARATOR WITH MANUAL DRAIN/VENT LINE
- MANUAL AIR VENT
- AIR FILTER/BREATHER
- AUTOMATIC AIR VENT
- VACCUM BREAKER
- CENTRIFUGAL PUMP, HORIZONTAL SPLIT CASE, BASE MOUNTED
- PUMP/CIRCULATOR, GENERAL
- INLINE PUMP
- CENTRIFUGAL PUMP, FLEX COUPLED, BASE MOUNTED
- CENTRIFUGAL PUMP, CLOSE COUPLED, BASE MOUNTED
- POSITIVE DISPLACEMENT PUMP
- PLATE HEAT EXCHANGER
- SHELL & TUBE HEAT EXCHANGER
- BLADDER EXPANSION TANK
- DIAPHRAGM EXPANSION TANK
- AIR SEPERATOR w/DRAIN
- AIR SEPERATOR TANK, STRAINER TYPE w/AUTOMATIC VENT AND DRAIN
- OPEN DRAIN TO FUNNEL, ROUTE TO NEAREST DRAIN
- TEST PLUG (PRESSURE/TEMPERATURE)
- THERMO WELL/PORT
- FS — FLOW SWITCH

DRAWING SYMBOLS

- A / M4.1 — SECTION LETTER, DRAWING NUMBER WHERE SHOWN
- UP / DN — SUPPLY DUCT (UP & DOWN)
- UP / DN — RETURN/EXHAUST DUCT (UP & DOWN)
- 1-200S — CEILING DIFFUSERS (TYPE 1 - 200 CFM)
- 4-200S — SIDEWALL SUPPLY GRILLE OR REGISTER (TYPE 4 - 200 CFM)
- 3-200S — LINEAR SLOT DIFFUSERS (TYPE 3 - 200 CFM)
- 5-200R (E) — SIDEWALL RETURN (OR EXHAUST) GRILLE OR REGISTER (TYPE 5 - 200 CFM)
- 2-200R (E) — CEILING RETURN (OR EXHAUST) GRILLE OR REGISTER (TYPE 2 - 200 CFM)
- 9-200R (E) — DOOR GRILLE (TYPE 9 - 200 CFM)
- VANE TURN ELBOW & PROPORTIONAL AIR SPLIT TYPE DUCT TAKE-OFF W/ SPLITTER DAMPER
- 45° BRANCH DUCT TAKE-OFF (SUPPLY)
- 45° BRANCH DUCT TAKE-OFF (RETURN OR EXHAUST)
- RISE — INCLINED RISE, IN DIRECTION OF AIR FLOW
- DROP — INCLINED DROP, IN DIRECTION OF AIR FLOW
- FLEXIBLE CONNECTION
- VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH AIR FOILVANES EVEN IF SYMBOL IS MISSING)
- R=1.5 x DUCT WIDTH — STANDARD RADIUS ELBOW (CENTERLINE RADIUS EQUAL 1.5 TIMES DUCT WIDTH
- 10x8 — RECT. DUCT-WIDTH x DEPTH (FIRST FIGURE INDICATES SIDE SHOWN)
- 20x10 — FLAT OVAL DUCT-WIDTH x DEPTH (FIRST FIGURE INDICATES SIDE SHOWN)
- 14Ø — ROUND DUCT - DIAMETER
- 10x4 T.D. — RETURN AIR TRANSFER DUCT W/ 1" INTERNAL LINER
- LOUVER
- ACOUSTICAL DUCT LINING
- MVD / OR / MVD — MANUAL VOLUME DAMPER
- FD — FIRE DAMPER
- SD — SMOKE DAMPER
- F/SD — COMBINATION FIRE/SMOKE DAMPER
- ΔP — ROOM CONTROL: ROOM PRESSURIZATION
- T — ROOM CONTROL: THERMOSTAT
- H — ROOM CONTROL: HUMIDISTAT
- S — WALL SWITCH
- AIR FLOW — DUCT MOUNTED HUMIDIFIER
- DUCT MOUNTED SMOKE DETECTOR

AIR HEATING & COOLING UNITS SYMBOLS

- UNIT HEATER (HORIZONTAL)
- CABINET UNIT HEATER (CEILING-MOUNTED)
- UNIT HEATER OR FAN COIL (VERTICAL CABINET)
- VARIABLE VOLUME/CONSTANT VOLUME FLOW CONTROLLER
- FC-1 — HORIZONTAL CABINET FAN COIL UNIT
- ΔP MH — WALL-MOUNTED ANALOG DIFFERENTIAL PRESSURE SENSOR, MAGNEHELIC
- ΔP (±) — DIFFERENTIAL PRESSURE SENSOR, TRANSMITTER
- HEATING COIL / REHEAT COIL

GENERAL NOTES-MECHANICAL:

1. ALL DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR.
2. ALL DUCTS SHALL BE INSULATED PER SPECIFICATION AND AS NOTED ON DRAWINGS.
3. ALL LOW PRESSURE DUCT TRANSITIONS ARE FLAT ON TOP (F.O.T.) UNLESS OTHERWISE NOTED OR SHOWN ON DRAWINGS.
4. ALL SUPPLY DUCT SPLITTERS SHALL BE SIZED AND CONSTRUCTED PER S.M.A.C.N.A. DUCT STANDARDS.
5. ALL TURNING VANES SHOWN SHALL BE DOUBLE THICKNESS. TURNING VANES SHALL BE CONSTRUCTED PER S.M.A.C.N.A. DUCT STANDARDS.
6. ALL TRANSITIONS SHALL BE 30° MAX. ON CONTRACTING FLOW (7" IN 12"); 20° MAX. ON DIVERGING FLOW (4-3/8" IN 12") PER S.M.A.C.N.A. DUCT STANDARDS.
7. ACCESS PANELS IN SUSPENDED CEILINGS ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC.
8. ALL LOUVER SIZES ARE APPROX. ON MECH. DWGS. SEE ARCH. DWGS. FOR EXACT LOUVER SIZES.
9. ALL FAN COIL CONDENSATE DRAINS ARE TO BE ¾" UNLESS OTHERWISE NOTED.
10. ALL AIR HANDLER CONDENSATE DRAINS ARE TO BE 2" UNLESS OTHERWISE NOTED.
11. ALL SUPPLY, RETURN, AND EXHAUST DUCTS ARE TO BE SEALED AT LONGITUDINAL AND TRANSVERSE JOINTS TO MINIMIZE LEAKAGE.
12. PROVIDE VOLUME DAMPERS ON ALL BRANCH DUCTWORK WHETHER INDICATED OR NOT. EXTRACTORS AND AIR SCOOPS ARE NOT ALLOWED.
13. MECHANCIAL CONTRACTOR RESPONSIBLE FOR ALL HVAC & PLUMBING EQUIPMENT CONTROL WIRING, INSTALLATION AND ALL RELATED ITEM NECESSARY FOR COMPLETE AND FULLY OPERATIONAL EQUIPMENT SYSTEMS.

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION

No. -	Date -	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

PLUMBING LEGENDS AND GENERAL NOTES

P7.0.0

PROJECT: 26064.01
DATE: JULY, 2010

PLUMBING FIXTURE CONNECTION SCHEDULE

P-NO.	FIXTURE DESCRIPTION	DRAINAGE SYSTEM WASTE	DRAINAGE SYSTEM VENT	WATER SYSTEM COLD	WATER SYSTEM HOT	REMARKS
P-506	UTILITY SINK (FLOOR MODEL 24" x 24")	3"	2"	1/2"	1/2"	
P-720	AUTOMATIC TRAP PRIMER (FLOOR DRAIN CONNECTION)	-----	-----	1/2"	-----	
P-735	HOSE BIBB	-----	-----	3/4"	-----	
P-810	FLOOR DRAIN (EQUIPMENT ROOMS, FULL GRATE)	AS SHOWN	AS SHOWN	-----	-----	
P-814	HUB DRAIN	2"	2"	-----	-----	

REMARKS: PLUMBING FIXTURE NUMBERS ARE DERIVED FROM THE GS&P MASTER SPECIFICATIONS, AND ONLY THOSE THAT APPLY TO THIS PROJECT ARE LISTED. SKIPS IN SEQUENCE ARE INTENTIONAL.

DOMESTIC WATER HEATER SCHEDULE

WATER HEATER IDENTIFICATION NUMBER	SYSTEM TYPE / AREA SERVED	MANUFACTURER / MODEL / REMARKS	FUEL TYPE / INPUT RATING	VOLTAGE / PHASE / HZ	FLA / MCA / MOCP	GALLONS STORAGE	E.W.T.	L.W.T.	FLOW RECOVERY IN GPH	TANK HEIGHT	TANK DIAMETER
WH-7	DRYER ROOM	LOCHINVAR / JRJ 020 H	ELEC. / 3.0 kW	208/1/60	14.4 / 18 / 20	19	40	140	12	24 3/4	18
WH-8	DRYER ROOM	LOCHINVAR / JRJ 020 H	ELEC. / 3.0 kW	208/1/60	14.4 / 18 / 20	19	40	140	12	24 3/4	18

Ⓐ FOR USE IN CLASS I DIVISION I HAZARDOUS LOCATIONS, INCLUDING THERMOSTAT, FAN MOTOR, AND DISCONNECT.

PLUMBING SYMBOL LEGEND

SCHEMATIC SYMBOL	SYMBOL DESCRIPTION
——— – ———	DOMESTIC COLD WATER PIPE ABOVE FLOOR SLAB/GRADE
——— – – ———	DOMESTIC HOT WATER PIPE ABOVE FLOOR SLAB/GRADE
——— • ———	DOMESTIC COLD WATER PIPE BELOW FLOOR SLAB/GRADE
– – – – V – – – –	SANITARY VENT PIPE
——— CD ———	CONDENSATE DRAIN PIPE ABOVE FLOOR SLAB/GRADE
——— NG ———	NATURAL GAS PIPE ABOVE FLOOR SLAB/GRADE
– – – – NG – – – –	NATURAL GAS PIPE BELOW FLOOR SLAB/GRADE
——— PW ———	PLANT WATER PIPE ABOVE FLOOR SLAB/GRADE (NON POTABLE)
– – – – PW – – – –	PLANT WATER PIPE BELOW FLOOR SLAB/GRADE (NON POTABLE)
——— FCO	FLOOR CLEANOUT IN HORIZONTAL BELOW FLOOR SLAB/GRADE
	PIPE TURNED UP
	PIPE TURNED DOWN
	DROP FROM BOTTOM OF PIPING
	DROP OR RISE IN PIPING
	VALVE IN RISE/DROP
	BALL VALVE
	GAS PRESSURE REDUCING VALVE
	REDUCED PRESSURE BACKFLOW PREVENTER/DOUBLE CHECK VALVE ASSEMBLY
P-*	TRAP PRIMER
FD	FLOOR DRAIN
V.T.R.	SANITARY VENT PIPE THRU ROOF
*	REFER TO NOTE(S)
P-1, P-2, ETC.	FIXTURE IDENTIFICATION (REFER TO SPECIFICATIONS)
WH-1, WH-2, ETC.	WATER HEATER IDENTIFICATION NUMBER
CO	INTERIOR CLEANOUT
ECO	EXTERIOR CLEANOUT
AFF	ABOVE FINISH FLOOR
CW	DOMESTIC COLD WATER PIPE
HW	DOMESTIC HOT WATER PIPE
VTR	VENT THRU ROOF
FD	FLOOR DRAIN
IE	INVERT ELEVATION
SAN	SANITARY WASTE
TP	TRAP PRIMER
V	VENT
HB	HOSE BIBB
AFF	ABOVE FINISH FLOOR

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[REFERENCE, MASTER, NAMEMAKER, FONTMAP, LEVEL, WORKSPACE, SETTINGS, LEVELSYMBOLOGY, MSTN VARS, ELEMENTS]
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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

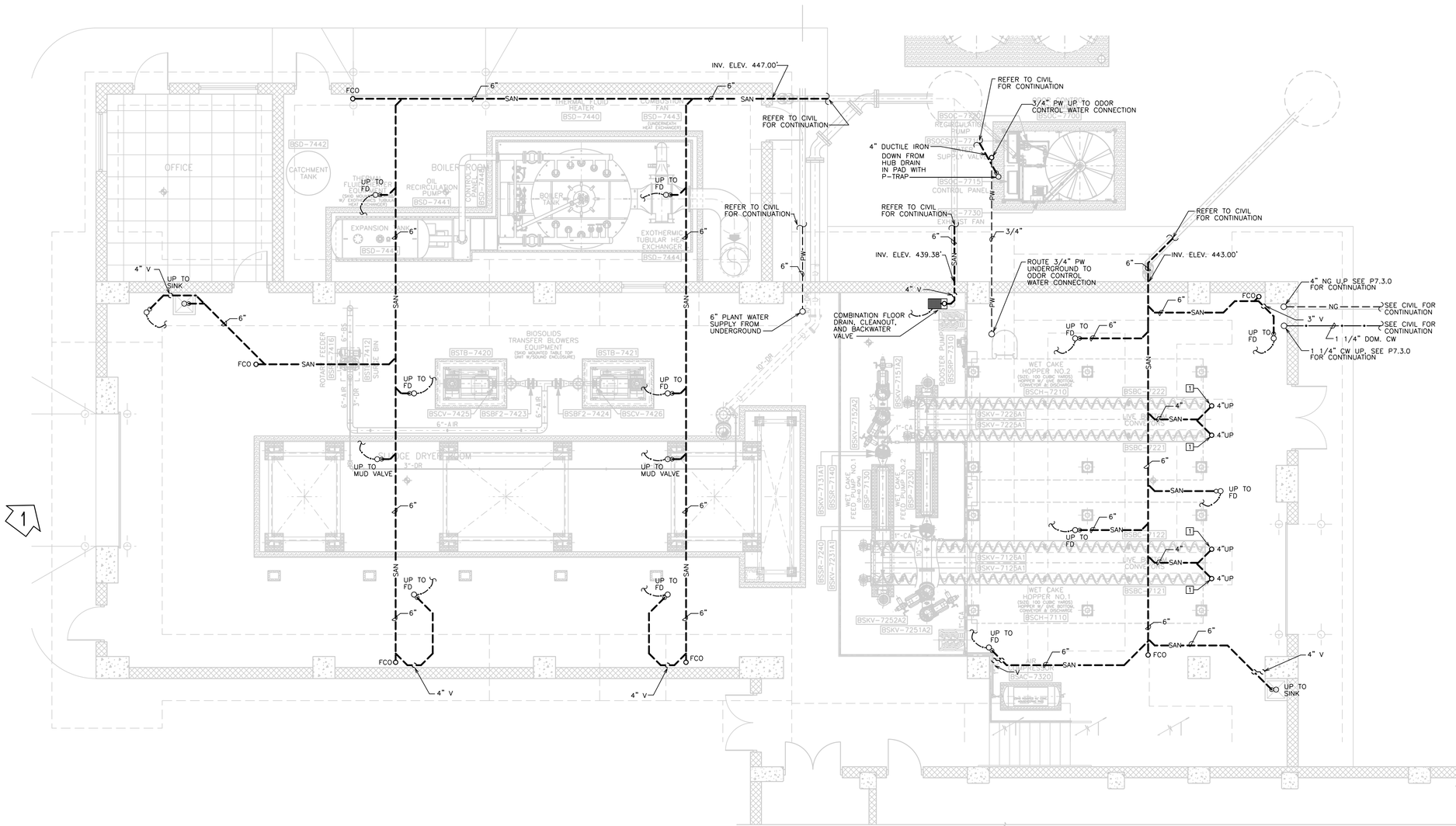
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PLUMBING SCHEDULES

P7.1.0

PROJECT: 26064.01
DATE: JULY, 2010



KEYED NOTES:

1 4" CAST IRON UP TO PROCESS EQUIPMENT REFER TO MP DRAWINGS

NORTH

PLUMBING
UNDERGROUND FLOOR PLAN

SCALE: 3/16" = 1'-0"

3' 0 5'

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BIOSOLIDS DRYER SYSTEM ADDITION

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Warren County
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BGMU Project No. S07-653

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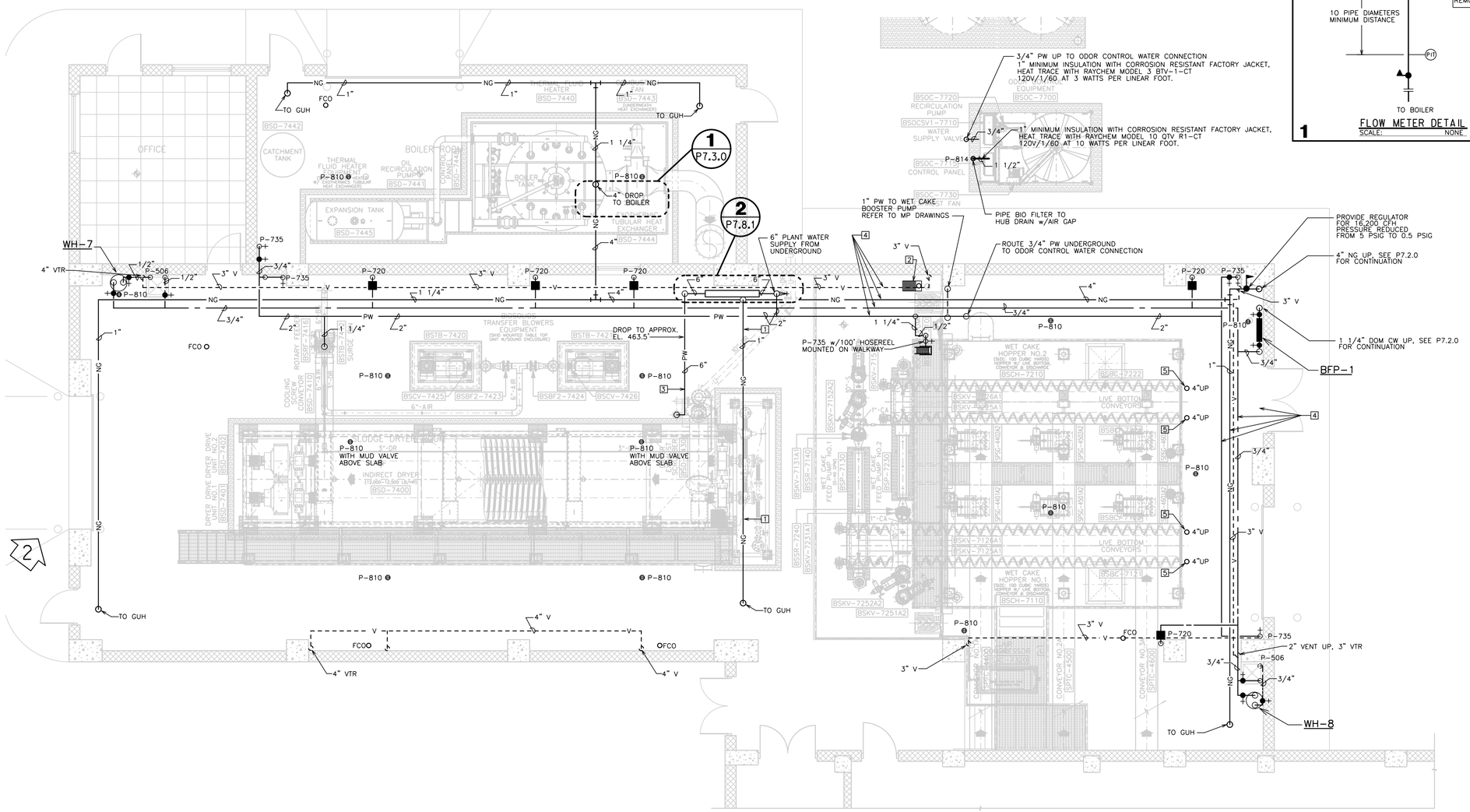
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	07-12-10	ISSUED FOR CONSTRUCTION

PLUMBING
SLUDGE PROCESSING & DRYER BUILDING
UNDERGROUND
FLOOR PLAN

P7.2.0

PROJECT: 26064.01
DATE: JULY, 2010

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[CONSTRUCT] [NONCAD] [MEP_FULL LINE STYLES, PATTERN, POINTS, TAGS, WEIGHTS, FILL]



KEYED NOTES:

1. COORDINATE PIPING WITH INSTALLATION OF BRIDGE CRANE - FULL LENGTH MOUNT THIS NG BRANCH AS HIGH AS POSSIBLE UNDER STRUCTURAL ROOF TEES.
2. FLOOR DRAIN: JOSAM MONEL 38624-40 SERIES, DEEP SEAL TRAP AND CLEANOUT, WITH BACKWATER VALVE, PIPE SIZE 4".
3. TO PROCESS SCRUBBER REFER TO MP DRAWINGS CONNECTIONS TO BE COORDINATED WITH EQUIPMENT MANUFACTURER.
4. COORDINATE WITH THERMAL FLUID PIPING THIS AREA REFER TO MP DRAWINGS. DW, NG, PW TO BE WALL MOUNTED AT APPROX. ELEV. 465' OR WHERE COMMON MOUNTING STRUCTURE IS POSSIBLE.
5. 4" CAST IRON UP TO PROCESS EQUIPMENT REFER TO MP DRAWINGS

NORTH

PLUMBING
ABOVEGROUND FLOOR PLAN
SCALE: 3/16" = 1'-0"
3' 0 5'

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

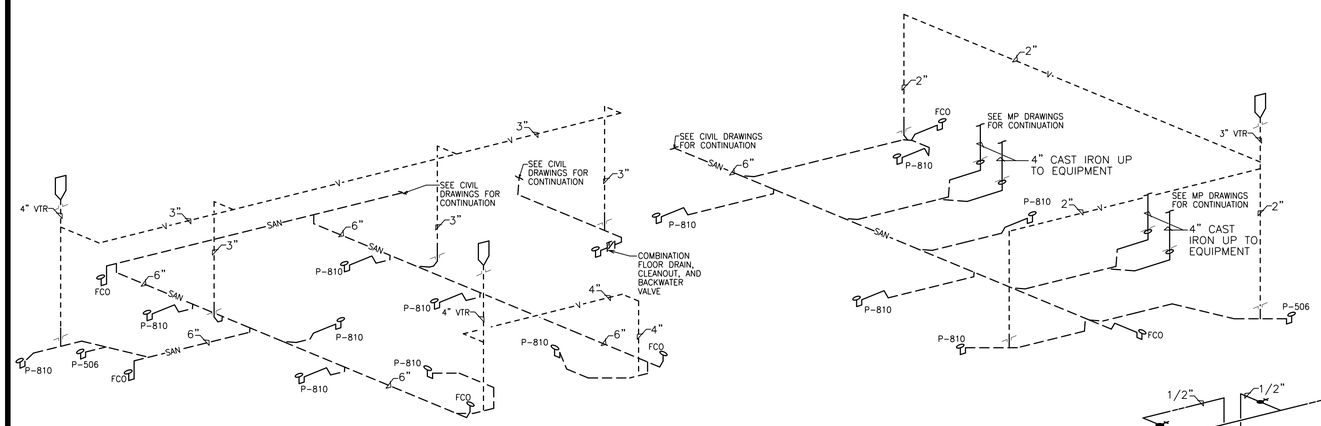
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PLUMBING
SLUDGE PROCESSING & DRYER BUILDING
ABOVEGROUND
FLOOR PLAN

P7.3.0

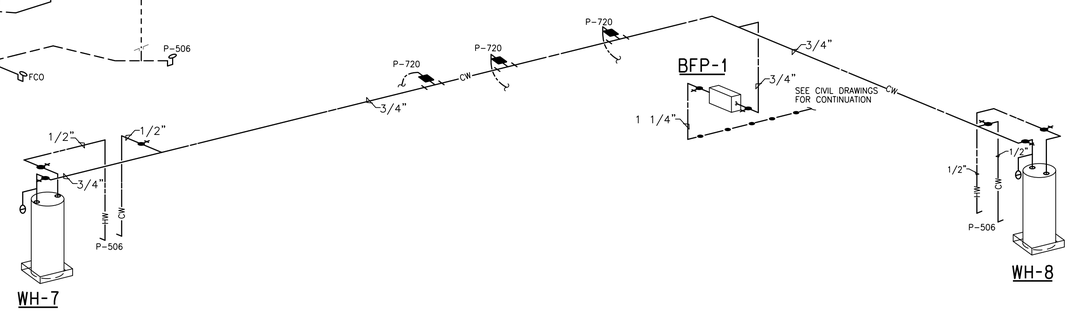
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WASTE RISER 1

SCALE: NONE



WATER RISER 2

SCALE: NONE

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

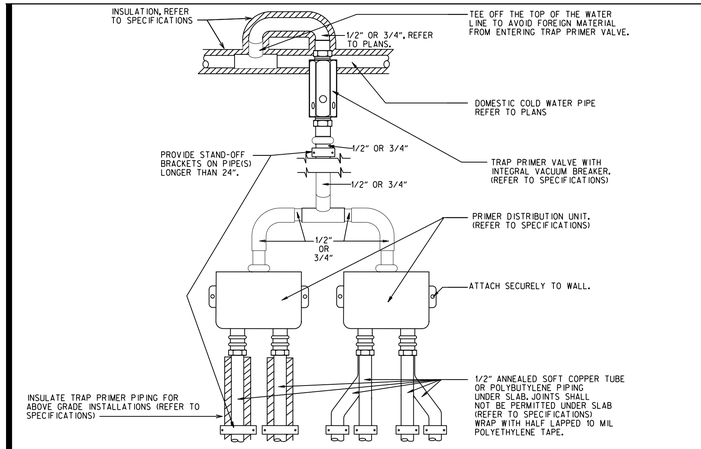
REVISION		
No. –	Date –	Revision
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PLUMBING RISER DIAGRAMS

P7.7.0

PROJECT: 26064.01
DATE: JULY, 2010

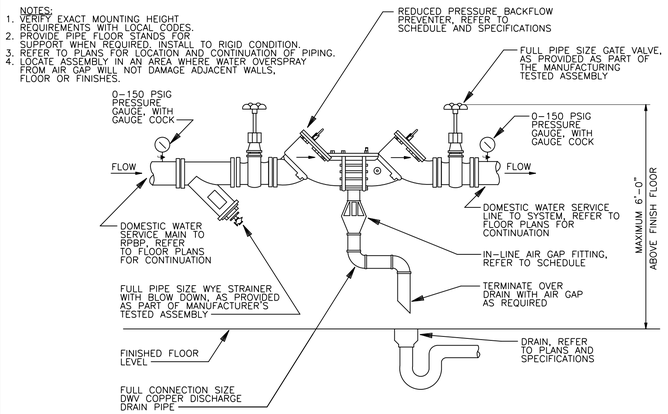
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NOTE:
REFER TO PLANS FOR QUANTITY OF DISTRIBUTION UNITS REQUIRED.

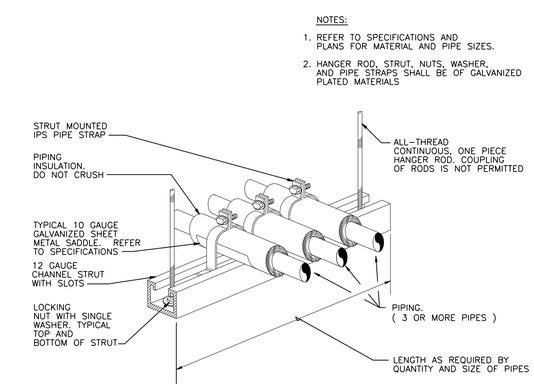
1 AUTOMATIC TRAP PRIMER DETAIL

SCALE: NONE



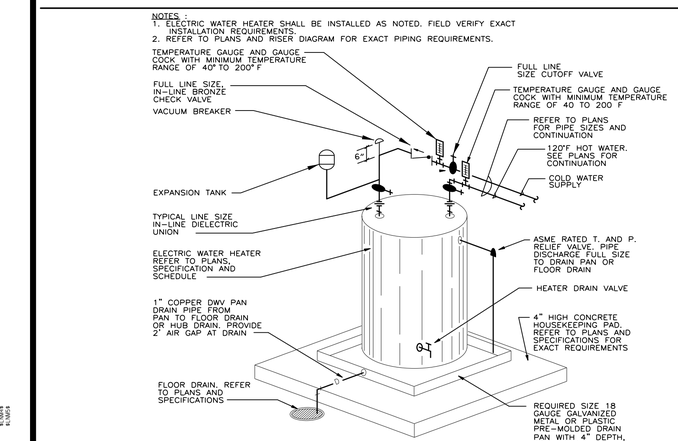
2 LARGE SIMPLEX REDUCED PRESSURE BACKFLOW PREVENTER DETAIL

SCALE: NONE



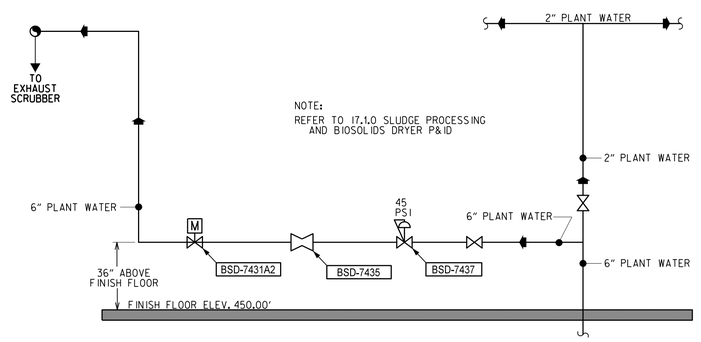
3 TRAPEZE PIPE HANGER DETAIL

SCALE: NONE



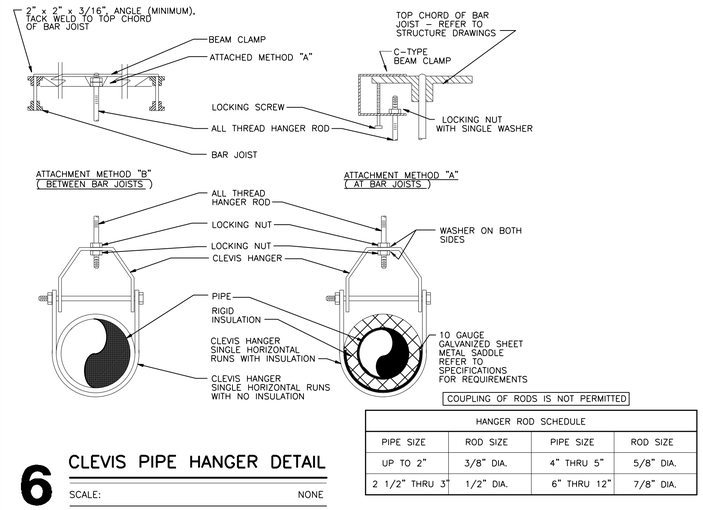
4 ELECTRIC WATER HEATER DETAIL (FLOOR MOUNTED)

SCALE: NONE



5 SCRUBBER PIPING DETAIL

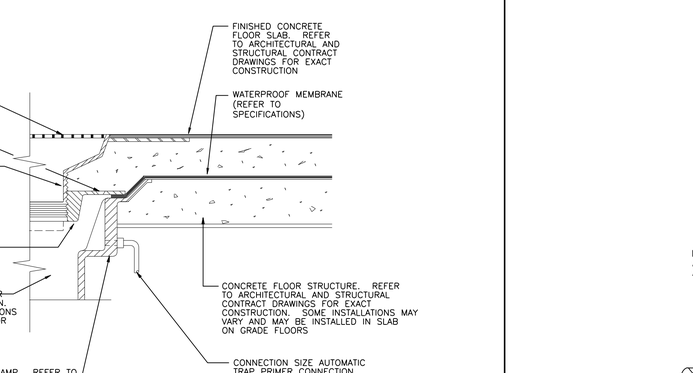
SCALE: NONE



HANGER ROD SCHEDULE			
PIPE SIZE	ROD SIZE	PIPE SIZE	ROD SIZE
UP TO 2"	3/8" DIA.	4" THRU 5"	5/8" DIA.
2 1/2" THRU 3"	1/2" DIA.	6" THRU 12"	7/8" DIA.

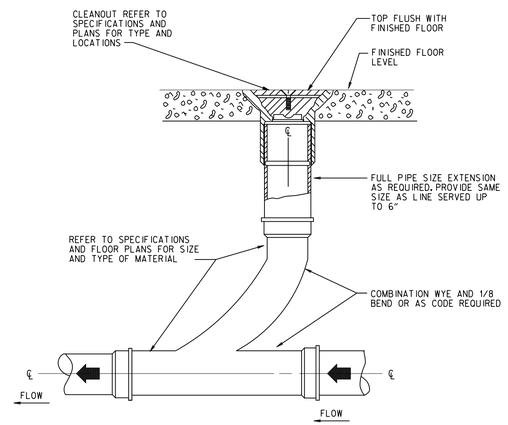
6 CLEVIS PIPE HANGER DETAIL

SCALE: NONE



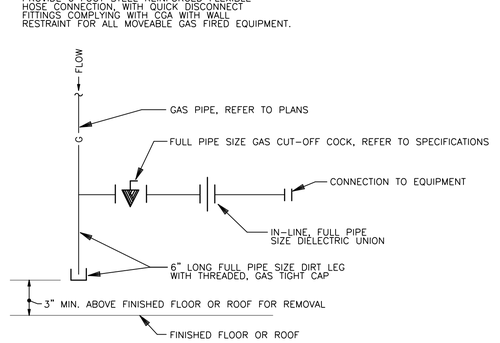
7 EQUIPMENT ROOM FLOOR DRAIN INSTALLATION DETAIL

SCALE: NONE



8 INTERIOR CLEANOUT DETAIL

SCALE: NONE



9 GAS FIRED EQUIPMENT CONNECTION DETAIL

SCALE: NONE

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Bowling Green, Kentucky

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PLUMBING DETAILS

P7.8.0

PROJECT: 26064.01
DATE: JULY, 2010

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B.O.

ELECTRICAL LEGEND

(NOT ALL SYMBOLS NECESSARILY SHOWN ON PLANS)

LIGHTING

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
O_C	--	CEILING MOUNTED LIGHTING FIXTURE. LETTER DENOTES FIXTURE "MARK"
O	--	WALL MOUNTED LIGHTING FIXTURE. SEE LIGHTING FIXTURE SCHEDULE FOR EXACT MOUNTING HEIGHT
	--	FLUORESCENT LIGHTING FIXTURE - 2' X 2'
	--	FLUORESCENT LIGHTING FIXTURE - 2' X 4'
	--	WALL MOUNTED FLUORESCENT LIGHTING FIXTURE. SEE LIGHTING FIXTURE SCHEDULE FOR EXACT MOUNTING HEIGHT
	--	EGRESS LIGHTING FIXTURE ON EMERGENCY POWER
	--	4' STRIP OR CHANNEL FLUORESCENT LIGHTING FIXTURE
	--	8' STRIP OR CHANNEL FLUORESCENT LIGHTING FIXTURE
	--	CEILING MOUNTED EXIT LIGHT- PROVIDE CHEVRONS WHERE DIRECTIONAL INDICATORS ARE SHOWN. (DARKENED IN TO SHOW NUMBER AND SIDE OF FACES)
	BOTTOM 2" ABOVE TOP OF DOOR	WALL MOUNTED EXIT LIGHT- PROVIDE CHEVRONS WHERE DIRECTIONAL INDICATORS ARE SHOWN. (DARKENED IN TO SHOW NUMBER AND SIDE OF FACES)
	--	EMERGENCY LIGHT, WALL PACK TYPE WITH BATTERY BACK-UP (TWO HEADS INDICATED). SEE LIGHTING FIXTURE SCHEDULE FOR EXACT MOUNTING HEIGHT
	--	POLE MOUNTED LIGHTING FIXTURE OR FIXTURES.

RACEWAYS AND FITTINGS

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
	--	CONDUIT AND WIRING CONCEALED
	--	CONDUIT AND WIRING UNDERSLAB OR UNDERGROUND
	--	CONDUIT AND WIRING EXPOSED
	--	HOMERUN TO PANELBOARD. PANELBOARD DESIGNATION AND CIRCUIT NUMBER AS NOTED
	--	MARKS INDICATE NUMBER OF 12 CONDUCTORS, EXCLUSIVE OF GROUND, IN RACEWAY, UON. NO MARKS INDICATES 2#12 & 1#12 GROUND, UON
	--	CONDUIT AND WIRING TURNED UP
	--	CONDUIT AND WIRING TURNED DOWN
—X—	--	SEAL-OFF FITTING
	--	CONDUIT STUBBED OUT OR UP AND CAPPED
J J	--	JUNCTION BOX AND JUNCTION BOX WITH FLEX CONNECTION TO EQUIPMENT
H H	18" U.O.N	WALL MOUNTED JUNCTION BOX AND JUNCTION BOX WITH FLEX CONNECTION TO EQUIPMENT
	--	FLEXIBLE CONDUIT, WATERPROOF
FWC	--	FLEXIBLE CABLE SUPPLIED WITH PUMP OR EQUIPMENT, WATERPROOF
EDB	--	ELECTRICAL DUCT BANK UNDERGROUND
FOC	--	FIBER OPTIC CONTROLS UNDERGROUND
HH	--	ELECTRICAL HAND HOLE
MH	--	ELECTRICAL MANHOLE
PB	--	ELECTRICAL PULL BOX FOR POWER WIRING
SPB	--	ELECTRICAL PULL BOX FOR SIGNAL WIRING

LIGHTING SWITCHES AND CONTROLS

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
S	46"	SINGLE POLE SWITCH
S_2	46"	DOUBLE POLE SWITCH
S_3	46"	3-WAY SWITCH
S_4	46"	4-WAY SWITCH
D	46"	DIMMER SWITCH
$O_{(C)}$	46"	OCCUPANCY SENSOR; 'C' DENOTES CEILING MOUNTED
LC	--	LIGHTING CONTACTOR
PC	--	PHOTOCELL

POWER RECEPTACLES

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
	18"	DUPLEX RECEPTACLE
	--	DUPLEX RECEPTACLE ABOVE COUNTER BACK SPLASH. OR 54"AFF WHERE NO COUNTER IS PRESENT
WP	18"	DUPLEX RECEPTACLE GROUND FAULT INTERRUPTING TYPE IN CAST BOX WITH WEATHERPROOF COVERS
G	18"	DUPLEX RECEPTACLE-GROUND FAULT INTERRUPTING TYPE
	18"	DOUBLE DUPLEX RECEPTACLE IN 2 GANG BOX WITH SINGLE COVERPLATE
	--	DOUBLE DUPLEX RECEPTACLE IN 2 GANG BOX WITH SINGLE COVERPLATE ABOVE COUNTER BACK SPLASH OR 54"AFF WHERE NO COUNTER IS PRESENT
	18"	SINGLE RECEPTACLE, TYPE AS INDICATED

NOTE: RECEPTACLES SHALL BE MOUNTED 18" AFF. IN FINISHED AREAS UON.
RECEPTACLES SHALL BE MOUNTED 48" AFF IN UNFINISHED & PROCESS AREAS UON.

GROUNDING

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
--G--	--	BARE COPPER GROUND WIRE
	--	GROUND ROD BONDED TO CONDUCTOR

FLUID MONITORING AND CONTROLS

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
SV	--	SOLENOID VALVE
SV_3	--	THREE-WAY SOLENOID VALVE
GV	--	GAS SOLENOID VALVE CONNECTION FOR SHUT-OFF
AV	--	AIR VALVE
LS	--	LIMIT SWITCH
EP	--	ELECTRIC PNEUMATIC SWITCH
PT	--	PRESSURE TRANSMITTER
PS	--	PRESSURE SWITCH
DPT	--	DIFFERENTIAL PRESSURE TRANSMITTER
DP	--	DIFFERENTIAL PRESSURE SWITCH
SI	--	SCALE INDICATOR
SCC	--	UV SYSTEM CONTROL CENTER PANEL
LPA	--	LINE PRESSURE ALARM PANEL
CD	--	CHLORINE LEAK DETECTOR
TM	--	TURBIDITY METER
PC	--	PARTICAL COUNTER
AE	--	ANALYZER ELEMENT
AIT	--	ANALYZER INDICATE TRANSMIT
AT	--	ANALYZER TRANSMITTER
AN	--	ANALYZER
LT	--	LEVEL TRANSMITTER
	--	FLOAT SWITCH
LE	--	LEVEL ELEMENT
FM	--	FLOW METER
FT	--	FLOW TRANSMITTER
FIT	--	FLOW INDICATE TRANSMIT
LIT	--	LEVEL INDICATE TRANSMIT
FE	--	FLOW ELEMENT
TT	--	TEMPERATURE TRANSMITTER
TE	--	TEMPERATURE ELEMENT
TS	--	TEMPERATURE SENSOR
DS	--	SLUDGE DENSITY METER
SS	--	SUSPENDED SOLIDS SENSOR
DO	--	DISSOLVED OXYGEN SENSOR
DOT	--	DISSOLVED OXYGEN TRANSMITTER
PH	--	P.H. SENSOR
PHT	--	P.H. TRANSMITTER
ORP	--	O.R.P. SENSOR
ORPT	--	O.R.P. TRANSMITTER
LSHH	--	O.R.P. TRANSMITTER
LSLL	--	O.R.P. TRANSMITTER
PIT	--	PRESSURE INDICATE TRANSMIT
PE	--	PRESSURE ELEMENT
WE	--	WEIGHT ELEMENT
MS	--	MOTION SENSOR
ALH	--	ANALYZE LEVEL HORN

NOTE:
1. FOR ALL FLUID MONITORING INSTRUMENTS REQUIRING 120V PROVIDE TOGGLE TYPE, LOCKABLE, NEMA 4X DISCONNECT SWITCH.
2. ALL TRANSMITTERS SHALL BE MOUNTED 24" MIN. ABOVE SLAB. REFER TO DETAIL #10 AND #11 SHEET E7.0.5 FOR MOUNTING DETAILS.
3. FLUID MONITORING AND CONTROL DEVICES FBO.

HVAC AND PLUMBING

SYMBOL	TO CENTER LINE	DESCRIPTION
UH	--	UNIT HEATER
E	--	EXHAUST FAN
F	--	FRACTIONAL HORSEPOWER
VFD	--	VARIABLE FREQUENCY DRIVE
WH	--	WATER HEATER
ATC	--	AUTOMATIC TEMPERATURE CONTROL PANEL
DDC	--	DIRECT DIGITAL CONTROL PANEL
T	--	THERMOSTAT
MD	--	MOTORIZED DAMPER

POWER SUPPLY, PROTECTION AND CONTROLS

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
SWD	46"	TOGGLE TYPE, LOCKABLE, NEMA 4X DISCONNECT SWITCH. PROVIDE OVERLOADS WHERE REQUIRED FOR MOTOR CIRCUITS
	66"	NON-FUSED SAFETY SWITCH, 30A/3P U.O.N.
	66"	FUSED SAFETY SWITCH, FUSE PER EQUIPMENT NAMEPLATE, 30A/3P U.O.N.
	--	CONNECTION TO MOTOR, CONTROL PANEL, OR STARTER, FBO
	66"	COMBINATION STARTER & FUSED DISCONNECT
TR	--	TRANSFORMER, FLOOR MOUNTED U.O.N.
	66"	ENCLOSED CIRCUIT BREAKER, FLUSH MOUNTED
	--	LIGHTING PANELBOARD, SURFACE MOUNTED
	--	LIGHTING PANELBOARD, FLUSH MOUNTED
	--	POWER PANELBOARD
CT	--	CURRENT TRANSFORMER CABINET, SIZE AS NOTED
ST	--	SHUNT TRIP PUSHBUTTON
ATS	--	AUTOMATIC TRANSFER SWITCH
GRA	--	GENERATOR REMOTE ANNUNCIATOR
5	--	MOTOR, NUMBER DENOTES HORSEPOWER
1/4	--	VALVE MOTOR W/ ELECTRIC ACTUATOR, NUMBER DENOTES HORSEPOWER
M	--	ELECTRIC METER, FURNISHED BY POWER COMPANY
ABCD	--	SWITCHBOARD OR MCC, SURFACE MOUNTED. LETTERS INDICATE NAME OF EQUIPMENT
PDC	--	UV POWER DISTRIBUTION CENTER
	--	EQUIPMENT CONTROL PANEL, FURNISHED W/ EQUIPMENT
HOA	--	HAND/OFF/AUTOMATIC CONTROL SWITCH

WIRING DIAGRAM SYMBOLS

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
R	--	RELAY
TD	--	TIME DELAY RELAY
CR	--	CONTROL RELAY
Z	--	ZERO SPEED RELAY
RA	--	RELAY ALARM LIGHT
G	--	RUN LIGHT
M	--	MOTOR STARTER COIL
	--	CONTACT
	--	CIRCUIT BREAKER
	--	SWITCH
	--	FUSE
	--	TRANSFORMER
N.O.	--	NORMALLY OPEN
N.C.	--	NORMALLY CLOSED

VOICE AND DATA

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
	18"	VOICE AND DATA OUTLET, 3/4" CONDUIT STUBBED ABOVE ACCESSIBLE CEILING. CABLE INSTALLED & TERMINATED WITH CAT 6 CABLE AS INDICATED.
	--	VOICE AND DATA OUTLET MOUNTED ABOVE COUNTER TOP (COORDINATE WITH ARCHITECTURAL ELEVATION FOR MOUNTING HEIGHT), 3/4" CONDUIT STUBBED ABOVE ACCESSIBLE CEILING. CABLE INSTALLED & TERMINATED WITH CAT 6 CABLE AS INDICATED.
WAP	--	WIRELESS ACCESS POINT (DUPLEX OUTLET @ 6'-0" A.F.F, VOICE/DATA OUTLET @ 6'-0" A.F.F, AND ROUTER, FBO)
TV	12" BELOW FINISHED CLG.	CATV OUTLET FOR WALL MOUNTED TV

FIRE ALARM

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
F	46"	FIRE ALARM PULL STATION
FH	80"	COMBINATION HORN AND FLASHING LIGHT
FP	80"	FLASHING LIGHT ONLY
D	--	SMOKE DETECTOR, CEILING MOUNTED
DD	--	DUCT SMOKE DETECTOR
DD (C)	46"	DUCT SMOKE DETECTOR REMOTE ALARM INDICATOR, AND KEY TEST SWITCH. "C" = CEILING MOUNTED
H	--	HEAT DETECTOR, CEILING MOUNTED
DM	--	SMOKE DAMPER MOTOR OPERATOR
FACP	--	FIRE ALARM CONTROL PANEL
FATC	--	FIRE ALARM TRANSPONDER CABINET
RH	--	RANGE HOOD ANSUL EXTINGUISHING SYSTEM
FRA	--	FIRE ALARM REMOTE ANNUNCIATOR

SECURITY

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
PS	--	POWER SUPPLY
CR	--	CARD READER (REQUIRES SINGLE GANG BOX, (REFER TO MFG SPECIFICATIONS)
MDL	--	MAGNETIC DOOR LOCK (REFER TO MFG SPECIFICATIONS)
EDS	--	ELECTRIC DOOR STRIKE (FAIL SAFE OR FAIL SECURE) (REFER TO MFG SPECIFICATIONS)
PE	46"	PUSH TO EXIT PUSHBUTTON FOR MAGNETIC DOOR LOCKS AT SELECTED DOORS.
EB	--	EXIT BAR DEVICE MOUNTED ON DOOR
SC (PTZ)	--	CCTV CAMERA FOR SECURITY, WALL MOUNTED (PTZ = PAN/TILT/ZOOM)
SC (PTZ)	--	CCTV CAMERA FOR SECURITY, CEILING MOUNTED (PTZ = PAN/TILT/ZOOM)
SM	--	CCTV CAMERA MONITOR FOR SECURITY
AP	--	ACCESS POINT
IS	--	INTERCOM SYSTEM
SP	--	SECURITY SPEAKER
SP	84"	WALL MOUNTED SECURITY SPEAKER
REM	--	REQUEST TO EXIT MOTION

GENERAL SECURITY MOUNTING NOTE:

1. REFER TO MANUFACTURER'S DETAILS AND/OR SPECIFICATIONS FOR MOUNTING HEIGHTS FOR DEVICES INDICATED ON THIS LEGEND.
2. SECURITY DEVICES FBO.

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ELECTRICAL LEGEND

E7.0.0

PROJECT: 26064.01
DATE: JULY, 2010

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ELECTRICAL LEGEND

(NOT ALL SYMBOLS NECESSARILY SHOWN ON PLANS)

LIGHTING FIXTURE SCHEDULE

LIGHT FIXTURE SCHEDULE

FIXTURE TYPE	FIXTURE WATTAGE	DESCRIPTION	MANUFACTURE'S CATALOG NUMBER	VOLTAGE	LAMP	MOUNTING	MOUNTING HEIGHT	NOTES
A3	88	2' X 4' PARABOLIC FLUORESCENT FIXTURE	LITHONIA# 2PM3N G B 332 18LS MVOLT GEB10IS LP841	120	(3) 32W T8 4100K	RECESSED	CEILING	PROVIDE FIXTURE WITH TWO BALLASTS: ONE(1); ONE(1) LAMP BALLAST & ONE(1); TWO(2) LAMP BALLAST.
FL1	85	FLOOD LIGHT FIXTURE	LITHONIA# F70ML 120 M6	120	(1) 70W MH	SURFACE	SEE NOTES	MOUNT 2'-0" ABOVE SILO LADDER. AIM FIXTURE TO SHINE LIGHT BEAM DOWN SILO LADDER.
HB1	462	HIGHBAY FLUORESCENT FIXTURE WITH SAFETY CHAIN AND CORD & PLUG	LITHONIA# FGB28 6 54T5HO N1X20 ACL MVOLT GEB10PS LP841 IBAC120M20 CS3W CS93W	120	(6) 54W T5HO 4100K	PENDANT	SEE NOTES	REFER TO DETAIL #6 SHEET E7.0.4 FOR ADDITIONAL REQUIREMENTS
HB2	288	HIGHBAY FLUORESCENT FIXTURE WITH SAFETY CHAIN AND CORD & PLUG	LITHONIA# FGB168 4 54T5HO N1X20 ACL MVOLT GEB10PS LP841 IBAC120M20 CS3W CS93W	120	(4) 54W T5HO 4100K	PENDANT	SEE NOTES	REFER TO DETAIL #6 SHEET E7.0.4 FOR ADDITIONAL REQUIREMENTS
LB1	85	LOWBAY FIXTURE	LITHONIA# VR4C 70M LPI	120	(1) 70W MH	SURFACE	SEE NOTES	MOUNT ON UNDERSIDE OF ALUMINUM PLATFORM. LOCATIONS AS SHOWN ON PLANS.
LP1	368	SINGLE HEAD POLE FIXTURE	LITHONIA# KAD320MSR4SCTBSPD04LPI POLE: LITHONIA# STSH306GDM19DDB	208	(1) 320W MH	30'-0" POLE	SEE NOTES	REFER TO DETAIL #3 SHEET E7.0.4 FOR ADDITIONAL REQUIREMENTS
WL1	208	EXTERIOR WALL PACK FIXTURE	LITHONIA# KAD175MSR4SCTBWBD04LP1	208	(1) 175W MH	WALL	SEE NOTES	MOUNT 5'-0" BELOW ROOF LINE
WL2	62	WET CAKE PUMP PIT LIGHTING	LITHONIA# TWR1 50M TB LPI TWR1WG	120	(1) 50W MH	WALL	SEE NOTES	8'-0" AFF OF PIT
X1	NA	EXIT SIGN FIXTURE	LITHONIA# LES W 2R 120/277 EL N SD	120	LED	WALL/ CEILING	SEE NOTES	WALL MOUNTED: 6" ABOVE CENTER OF DOOR OR 8'-0" AFF
E1	11	EMERGENCY LIGHTING UNIT	LITHONIA# IND1254 H1212 SEL	120	(2) 20W HALOGEN	WALL	8'-0" AFF	
E2	NA	EMERGENCY REMOTE LAMP HEAD FIXTURE	LITHONIA# ELA NX H1212	12	(1) 12W HALOGEN	WALL	6" ABOVE CENTER OF DOOR	

RISER & ONE LINE DIAGRAM SYMBOLS

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
TR	--	TRANSFORMER
	--	PANELBOARD
	--	INDICATES 4" CONCRETE HOUSEKEEPING PAD UNDER FLOOR MOUNTED ELECTRICAL EQUIPMENT (SWITCHBOARD, TRANS-FORMER, MCC, ETC)
	--	SWITCH
	--	CIRCUIT BREAKER
	--	DRAW-OUT DEVICE
	--	FUSE
	--	TRANSFER SWITCH
	--	TRANSFORMER
1	--	MAGNETIC STARTER, SIZE INDICATED
SS	--	SURGE SUPPRESSOR
RTM	--	RUN TIME METER
	--	GROUND ROD(S) OR CONNECTION TO BUILDING GROUND
AFC	--	AVAILABLE FAULT CIRCUIT
AIC	--	AMPERE INTERRUPTING CAPACITY OF EQUIPMENT
MCP	--	MOTOR CIRCUIT PROTECTOR
VFD	--	VARIABLE FREQUENCY DRIVE
ELM	--	ELECTRONIC METER
TVSS	--	TRANSIENT VOLTAGE SURGE SURPRESSION

ABBREVIATIONS

SYMBOL	MOUNTING HEIGHT TO CENTER LINE	DESCRIPTION
ABC	--	ABOVE COUNTER (REFER TO SPECIFICATIONS FOR MOUNTING)
AC	--	AIR CONDITIONER
AFF	--	ABOVE FINISHED FLOOR
AFG	--	ABOVE FINISHED GRADE
AHU	--	AIR HANDLING UNIT
ATS	--	AUTOMATIC TRANSFER SWITCH
C	--	CONDUIT
CKT	--	CIRCUIT
CR	--	CORROSION RESISTANT
CU	--	CONDENSING UNIT
DN	--	CONDUIT AND WIRING TURNED DOWN
EX	--	EXISTING TO REMAIN
EXR	--	EXISTING RELOCATED TO POSITION INDICATED ON PLAN
FBO	--	FURNISHED BY OTHERS
FL	--	FLOOR
FVNR	--	FULL VOLTAGE NONREVERSING
G/GND	--	GROUND
HH	--	HANDHOLE
KK	--	KIRK KEY
MCC	--	MOTOR CONTROL CENTER
MH	--	MANHOLE
MTD	--	MOUNTED
MTO	--	MAGNETIC TRIP ONLY
MTS	--	MANUAL TRANSFER SWITCH
NL	--	NIGHT LIGHT
NTS	--	NOT TO SCALE
RF	--	RETURN FAN
RTD	--	RESISTANCE TEMPERATURE DETECTOR
RTU	--	ROOFTOP UNIT
RV	--	REDUCED VOLTAGE
SBRCP	--	SEQUENCING BATCH REACTOR CONTROL PANEL
SSRV	--	SOLID STATE REDUCED VOLTAGE
SWBD	--	SWITCHBOARD
TR	--	TRANSFORMER
TVSS	--	TRANSIENT VOLTAGE SURGE SURPRESSION
UON	--	UNLESS OTHERWISE NOTED
UP	--	CONDUIT AND WIRING TURNED UP
WP	--	WEATHERPROOF ENCLOSURE (NEMA 4X)
XP	--	EXPLOSION PROOF

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BOWLING GREEN MUNICIPAL UTILITIES

WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

REVISION

No.	Date	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

ELECTRICAL LEGEND & LIGHT FIXTURE SCHEDULE

E7.0.1

PROJECT: 26064.01
DATE: JULY, 2010

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CONDUIT AND WIRE SIZING DESIGNATIONS

MAX WIRE AMPS	DESIGNATION NUMBER	DESCRIPTION
20	1	1/2" – 2#12 & #12 GND
20	2	1/2" – 3#12 & #12 GND
20	3	1/2" – 4#12 & #12 GND
30	4	3/4" – 2#10 & #10 GND
30	5	3/4" – 3#10 & #10 GND
30	6	1" – 4#10 & #10 GND
50	7	3/4" – 2#8 & #10 GND
50	8	1" – 3#8 & #10 GND
50	9	1" – 4#8 & #10 GND
65	10	1" – 2#6 & #10 GND
65	11	1" – 3#6 & #10 GND
65	12	1–1/4" – 4#6 & #10 GND
85	13	1–1/4" – 2#4 & #8 GND
85	14	1–1/4" – 3#4 & #8 GND
85	15	1–1/4" – 4#4 & #8 GND
100	16	1–1/4" – 2#3 & #8 GND
100	17	1–1/4" – 3#3 & #8 GND
100	18	1–1/2" – 4#3 & #8 GND
115	19	1–1/4" – 2#2 & #8 GND
115	20	1–1/4" – 3#2 & #8 GND
115	21	1–1/2" – 4#2 & #8 GND
130	22	1–1/4" – 2#1 & #6 GND
130	23	1–1/2" – 3#1 & #6 GND
130	24	2" – 4#1 & #6 GND
150	25	1–1/2" – 2#1/0 & #6 GND
150	26	2" – 3#1/0 & #6 GND
150	27	2" – 4#1/0 & #6 GND
175	28	1–1/2" – 2#2/0 & #6 GND
175	29	2" – 3#2/0 & #6 GND
175	30	2" – 4#2/0 & #6 GND
200	31	1–1/2" – 2#3/0 & #6 GND
200	32	2" – 3#3/0 & #6 GND
200	33	2–1/2" – 4#3/0 & #6 GND

MAX WIRE AMPS	DESIGNATION NUMBER	DESCRIPTION
230	34	2–1/2" – 3#4/0 & #4 GND
230	35	2–1/2" – 4#4/0 & #4 GND
255	36	2–1/2" – 3#250MCM & #4 GND
255	37	3" – 4#250MCM & #4 GND
285	38	3" – 3#300MCM & #4 GND
285	39	3" – 4#300MCM & #4 GND
310	40	3" – 3#350MCM & #2 GND
310	41	3" – 4#350MCM & #2 GND
335	42	3" – 3#400MCM & #2 GND
335	43	3–1/2" – 4#400MCM & #2 GND
380	44	3" – 3#500MCM & #2 GND
380	45	4" – 4#500MCM & #2 GND
400	46	2 SETS EACH 2–1/2" – 3#3/0 & #3 GND
400	47	2 SETS EACH 2–1/2" – 4#3/0 & #3 GND
460	48	2 SETS EACH 2–1/2" – 4#4/0 & #2 GND
510	49	2 SETS EACH 3" – 4#250MCM & #2 GND
570	50	2 SETS EACH 3" – 4#300MCM & #1 GND
620	51	2 SETS EACH 3" – 4#350MCM & #1 GND
760	52	2 SETS EACH 4" – 4#500MCM & #1/0 GND
855	53	3 SETS EACH 3" – 4#300MCM & #1/0 GND
930	54	3 SETS EACH 3" – 4#350MCM & #2/0 GND
1005	55	3 SETS EACH 3–1/2" – 4#400MCM & #2/0 GND
1140	56	3 SETS EACH 4" – 4#500MCM & #3/0 GND
1240	57	4 SETS EACH 3" – 4#350MCM & #3/0 GND
1675	58	5 SETS EACH 3–1/2" – 4#400MCM & #4/0 GND
1900	59	5 SETS EACH 4" – 4#500MCM & #250MCM GND
2010	60	6 SETS EACH 3–1/2" – 4#400MCM & #250MCM GND
2280	61	6 SETS EACH 4" – 4#500MCM & #350MCM GND
2660	62	7 SETS EACH 4" – 4#500MCM & #350MCM GND
3040	63	8 SETS EACH 4" – 4#500MCM & #400MCM GND
4180	64	11 SETS EACH 4" – 4#500MCM & #500MCM GND
5320	65	14 SETS EACH 4" – 4#500MCM & #700MCM GND

CONDUIT AND WIRE SIZING DESIGNATIONS GENERAL NOTES

1. IN GENERAL ACTUAL BKR. AMPS SHALL BE EQUAL TO OR NEXT STANDARD SIZE SMALLER THAN MAX. WIRE AMPS EXCEPTIONS SHALL BE MOTOR AND SPECIAL EQUIPMENT BREAKERS WHICH SHALL BE SIZED PER N.E.C. 430 AND VENDOR REQUIREMENTS.
2. PRIOR TO BID COORDINATE BKRS. AND FEEDERS SHOWN AS REQUIRED TO CONFIRM AMPACITIES OF BOTH ARE IN ACCORDANCE WITH NOTE #1. (WHERE CONFLICTS EXIST, OBTAIN WRITTEN CLARIFICATION PRIOR TO BID.)
3. OMIT GROUND CONDUCTORS ON SERVICE ENTRANCE FEEDERS. (TYPICAL)

PANEL SCHEDULE NOTE FIELD ABBREVIATIONS

AF – ARC FAULT CIRCUIT INTERRUPTER TYPE CIRCUIT BREAKER
GF – GROUND FAULT CIRCUIT INTERRUPTER TYPE CIRCUIT BREAKER
IG – CIRCUIT TO BE PROVIDED WITH ISOLATED GROUND CONDUCTOR–
K – KEY OPERATED CIRCUIT BREAKER
LO – PROVIDE CIRCUIT BREAKER WITH LOCK–ON DEVICE
PL – PROVIDE POWER LINK CONTROLS – REFER TO SPECIFICATIONS
ST – SHUNT TRIP TYPE CIRCUIT BREAKER

ONE–LINE DIAGRAM NOTE ABBREVIATIONS

TVSS PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSION AT BUS INDICATED. REFER TO PROJECT SPECIFICATIONS.

MAXIMUM BRANCH CIRCUIT LENGTH FOR SINGLE–PHASE LOADS (IN FEET)

MAXIMUM ALLOWABLE VOLTAGE DROP	3%					
BRANCH CIRCUIT VOLTAGE	120V		208V		277V	
	BRANCH CIRCUIT BREAKER		BRANCH CIRCUIT BREAKER		BRANCH CIRCUIT BREAKER	
CONDUCTOR WIRE SIZE (AWG)	20A/1P	30A/1P	20A/1P	30A/1P	20A/1P	30A/1P
#12	60	N/A	105	N/A	140	N/A
#10	95	65	170	110	225	150
#8	150	95	260	170	345	230
#6	235	150	410	270	545	360
#4	365	245	635	425	850	565
#3	465	310	810	540	1,080	720
#2	560	375	975	650	1,295	865
#1	700	465	1,215	810	1,620	1,080

NOTES:
1. CALCULATIONS BASED ON LOAD 80% OF BRANCH BREAKER SIZE.
2. VOLTAGE DROP BASED ON 0.95 POWER FACTOR.
3. BRANCH CIRCUIT LENGTH VALUES INDICATED ARE WIRE DISTANCE FROM PANELBOARD TO LOAD.

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CONTRACT 3
BIOSOLIDS DRYER SYSTEM ADDITION
BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION

No. –	Date –	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

ELECTRICAL SCHEDULES

E7.0.2

PROJECT: 26064.01
DATE: JULY, 2010

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COM*check* Software Version 3.7.0

Interior Lighting and Power Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **Addition**
Project Title : Wastewater Treatment Plant Expansion & Renovation

Construction Site:
Bowling Green, KY

Owner/Agent:
Bowling Green Municipal Utilities
Bowling Green, KY

Designer/Contractor:
Gresham, Smith, and Partners
511 Union Street
Suite 1400
Nashville, TN 37219

Section 2: General Information

Building Use Description by: **Activity Type**

Activity Type(s)	Floor Area
Common Space Types:Office - Enclosed	255
Common Space Types:Electrical/Mechanical	5756

Section 3: Requirements Checklist

Interior Lighting:

☑ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
8915	8849	YES

☑ 2. Exit signs 5 Watts or less per sign.

Controls, Switching, and Wiring:

☑ 3. Independent manual or occupancy sensing controls for each space (remote switch with indicator allowed for safety or security).

☑/☐ 4. Occupant sensing control in class rooms, conference/meeting rooms, and employee lunch and break rooms.
Exceptions:
Spaces with multi-scene control; shop classrooms, laboratory classrooms, and preschool through 12th grade classrooms.

☑/☐ 5. Automatic shutoff control for lighting in >5000 sq.ft buildings by time-of-day device, occupant sensor, or other automatic control.
Exceptions:
24 hour operation lighting; patient care areas; where auto shutoff would endanger safety or security.

☑/☐ 6. Master switch at entry to hotel/motel guest room.

☑/☐ 7. Separate control device for display/accent lighting, case lighting, task lighting, nonvisual lighting, lighting for sale, and demonstration lighting.

☑ 8. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).
Exceptions:
Electronic high-frequency ballasts;
Luminaires not on same switch;
Recessed luminaires 10 ft. apart or surface/pendant not continuous;
Luminaires on emergency circuits.

Voltage Drop:

☑ 9. Feeder conductors have been designed for a maximum voltage drop of 2 percent.

☑ 10. Branch circuit conductors have been designed for a maximum voltage drop of 3 percent.

Section 4: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 90.1 (2007) Standard requirements in COM*check* Version 3.7.0 and to comply with the mandatory requirements in the Requirements Checklist.

Jon D. Long, P.E.
Name - Title | Signature | Date

Section 5: Post Construction Compliance Statement

Record Drawings and Operating and Maintenance Manuals:

☐ 1. Construction documents with record drawings and operating and maintenance manuals provided to the owner.

Lighting Designer or Contractor Name | Signature | Date

Project Notes:
CONTRACT NO. 3
Biosolids Dryer
System Addition

COM*check* Software Version 3.7.0

Interior Lighting Application Worksheet

90.1 (2007) Standard

Section 1: Allowed Lighting Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Common Space Types:Office - Enclosed	255	1.1	281
Common Space Types:Electrical/Mechanical	5756	1.5	8634
		Total Allowed Watts =	8915

Section 2: Proposed Lighting Power Calculation

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Common Space Types:Office - Enclosed (255 sq.ft.)				
Linear Fluorescent 12: A3: Parabolic Fixture / 48" T8 32W / Electronic	3	4	88	352
Common Space Types:Electrical/Mechanical (5756 sq.ft.)				
Linear Fluorescent 2: HB1: High Bay Fluorescent Fixture / 46" T5 HO 54W / Electronic	6	19	359	6821
Linear Fluorescent 3: HB2: High Bay Fluorescent Fixture / 46" T5 HO 54W / Electronic	4	6	220	1320
HID 1: LB1: Lowbay Fixture / Metal Halide 70W / Pulse start	1	2	85	170
HID 2: WL2: Wet Cake Pump Pit Fixture / Metal Halide 50W / Pulse start	1	3	62	186
		Total Proposed Watts =		8849

Section 3: Compliance Calculation

If the Total Allowed Watts minus the Total Proposed Watts is greater than or equal to zero, the building complies.

Total Allowed Watts = 8915
Total Proposed Watts = 8849
Project Compliance = 66

Interior Lighting PASSES: Design 1% better than code.

COM*check* Software Version 3.7.0

Exterior Lighting Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **Addition**
Project Title : Wastewater Treatment Plant Expansion & Renovation

Construction Site:
Bowling Green, KY

Owner/Agent:
Bowling Green Municipal Utilities
Bowling Green, KY

Designer/Contractor:
Gresham, Smith, and Partners
511 Union Street
Suite 1400
Nashville, TN 37219

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (C x D)	F Proposed Watts
Free standing canopy	1628 ft2	1.25	Yes	2035	1020
Walkway < 10 feet wide	1960 ft of walkway length	1	Yes	1960	1040
			Total Tradable Watts* =	3995	2060
			Total Allowed Watts =	3995	
			Total Allowed Supplemental Watts** =	200	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.
** A supplemental allowance equal to 5% of total allowed wattage may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Free standing canopy (1628 ft2): Tradable Wattage				
HID 2: LB1: Low Bay Fixture / Metal Halide 70W / Pulse start	1	12	85	1020
Walkway < 10 feet wide (1960 ft of walkway length): Tradable Wattage				
HID 8: WL1: Wall Pack Fixture / Metal Halide 175W / Pulse start	1	5	208	1040
			Total Tradable Proposed Watts =	2060

Section 4: Requirements Checklist

Lighting Wattage:

☑ 1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.
Compliance: Passes.

Controls, Switching, and Wiring:

☑/☐ 2. All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.

☑/☐ 3. All lighting fixtures are controlled by a photosensor or astronomical time switch that is capable of automatically turning off the fixture when sufficient daylight is available or the lighting is not required.
Exceptions:
Covered vehicle entrance/exit areas requiring lighting for safety, security and eye adaptation.

Exterior Lighting Efficacy:

☑ 4. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lumen/watt.
Exceptions:
Lighting that has been claimed as exempt and is identified as such in Section 3 table above.
Lighting that is specifically designated as required by a health or life safety statue, ordinance, or regulation.
Emergency lighting that is automatically off during normal building operation.
Lighting that is controlled by motion sensor.

Exterior Lighting PASSES: Design 51% better than code.

Section 5: Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 90.1 (2007) Standard requirements in COM*check* Version 3.7.0 and to comply with the mandatory requirements in the Requirements Checklist.

Jon D. Long, P.E.
Name - Title | Signature | Date

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Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION

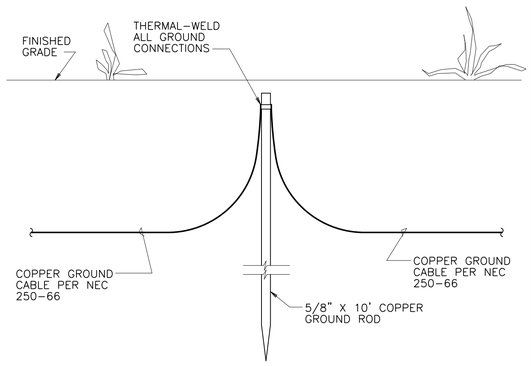
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	07-12-10	ISSUED FOR CONSTRUCTION

ENERGY COMPLIANCE

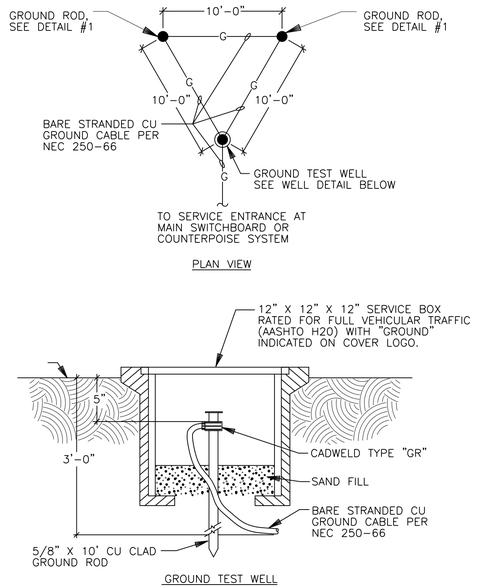
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PROJECT: 26064.01
DATE: JULY, 2010

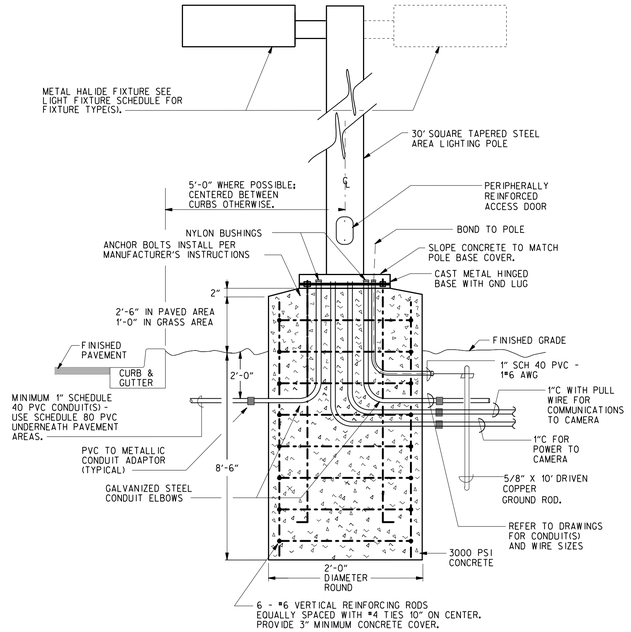
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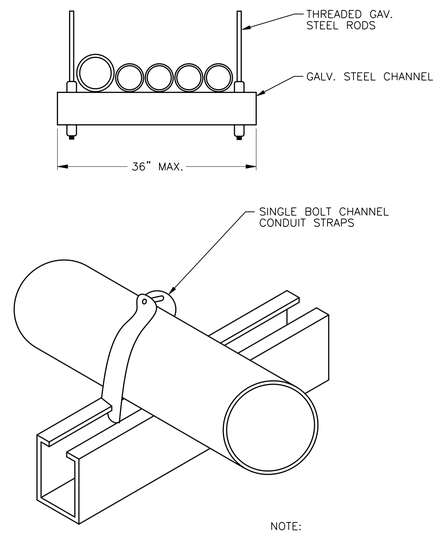
1 TYPICAL GROUND ROD INSTALLATION DETAIL
NO SCALE



2 GROUND TRIAD
NO SCALE



3 TYPICAL LIGHT POLE BASE
NO SCALE



NOTE:

THREADED ROD SPACING TO BE PER NEC.

4 CONDUIT HANGER DETAIL
NO SCALE

WARNING

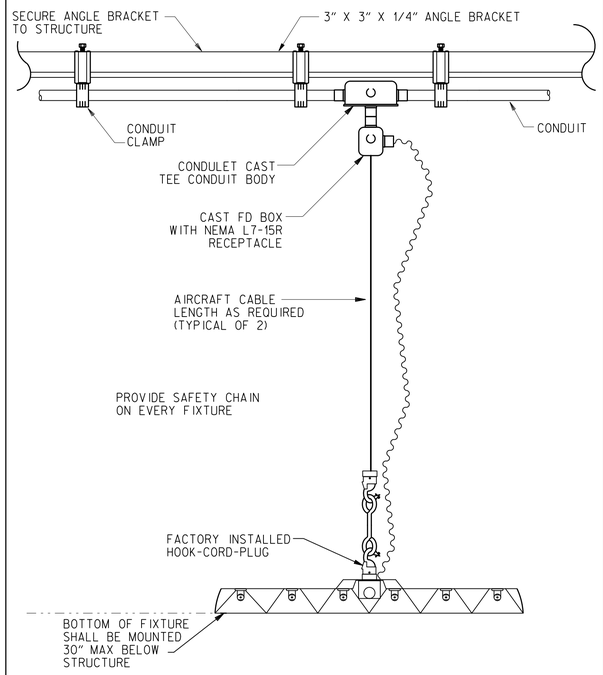
Flash and Shock Hazard Proper PPE Required

		Level 3 PPE
Available Fault Current:	39,325 Amps - Sym.	Fire Resistive Undergarments (Including Crew Neck Tee Shirts)
Flash Protection Boundary:	48"	Fire Resistive Long Sleeve Shirt
Cal /cm 2 Flash Hazard at 18":	9.50 Cal /cm 2	Fire Resistive Long Pants
Minimum PPE Required:	Level 3 PPE	
Shock Hazard Present: (With covers removed)	480Y/277 Volts	
Limited Approach Boundary:	42"	
Restricted Approach Boundary:	12"	
Prohibited Approach Boundary:	1"	

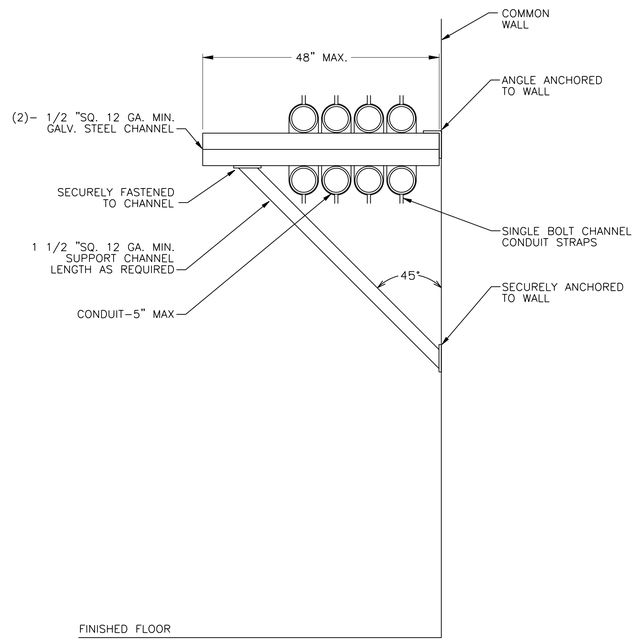
NOTES:

1. SIGN MADE IN ACCORDANCE WITH ANSI Z535.4-1998 TO BE FURNISHED AND INSTALLED ON EACH SWITCHBOARD, SWITCHGEAR, PANELBOARD, MOTOR CONTROL CENTER, AND TRANSFER SWITCH.
2. RESULTS OF ARC FLASH STUDY TO BE USED TO DETERMINE AVAILABLE FAULT CURRENT, FLASH PROTECTION BOUNDARY, FLASH HAZARD INCIDENT ENERGY, MINIMUM PERSONAL PROTECTIVE EQUIPMENT (PPE) LEVEL, SHOCK HAZARD (VOLTAGE), LIMITED APPROACH BOUNDARY, RESTRICTED APPROACH BOUNDARY, AND PROHIBITED APPROACH BOUNDARY FOR EACH DEVICE REQUIRING SIGNAGE. FOR DEFINITION OF TERMS AND TABLE TO DETERMINE VALUES, REFER TO NFPA-70E-2000 EDITION.
3. FINISHED SIGN TO BE 8 1/2" X 11".

5 SAMPLE ARC FLASH WARNING SIGN DETAIL
NO SCALE



6 HIGH BAY DETAIL LIGHTING FIXTURE PENDANT MOUNTING DETAIL
NO SCALE



7 CONDUIT HANGER WALL SUPPORT DETAIL
NO SCALE

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

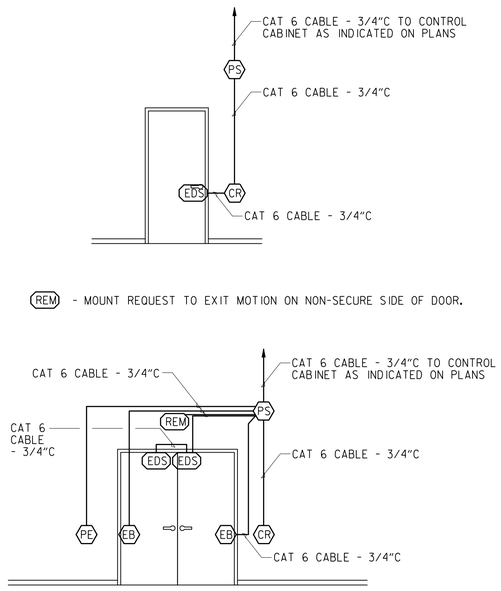
REVISION		
No. -	Date -	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

ELECTRICAL DETAILS

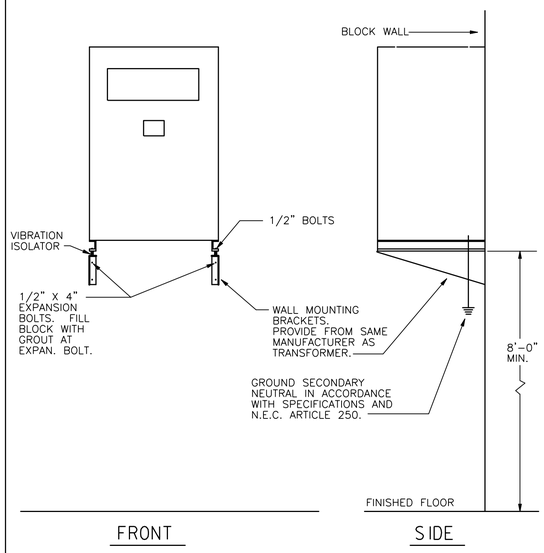
E7.0.4

PROJECT: 26064.01
DATE: JULY, 2010

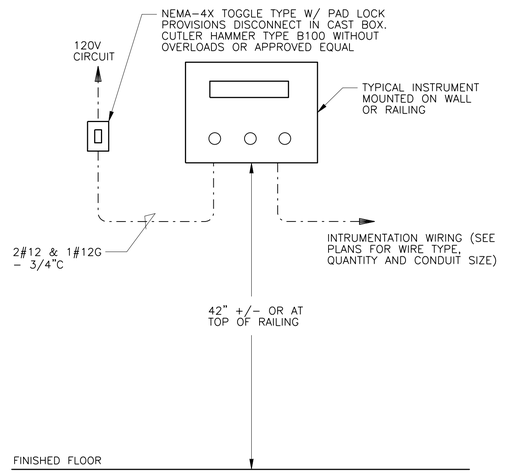
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8 TYPICAL SINGLE & DOUBLE DOOR WIRING DIAGRAM
NO SCALE



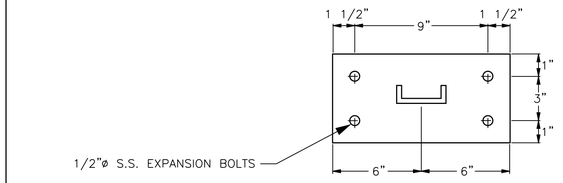
9 TRANSFORMER - WALL MOUNTED
NO SCALE



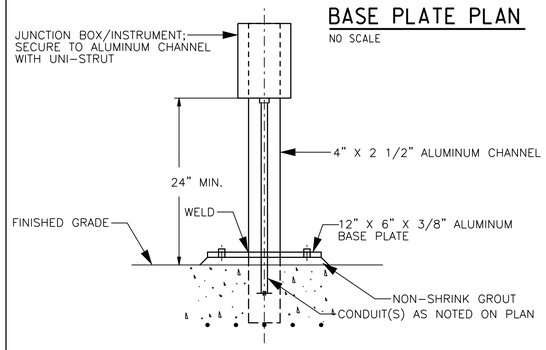
10 TYPICAL INTSRUMENT CONNECTION
NO SCALE

NOTES;

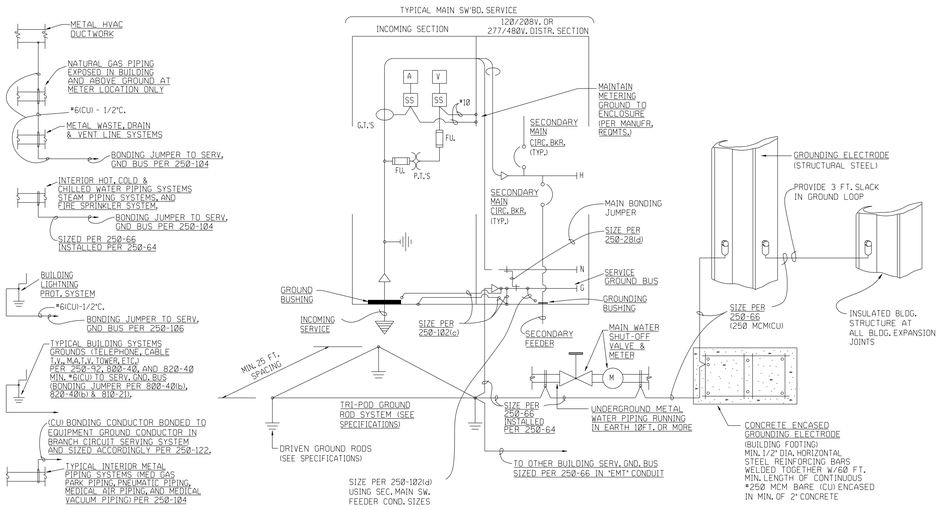
1. ALL HARDWARE SHALL BE STAINLESS STEEL.
2. THIS DETAIL SHALL BE USED FOR TERMINATION OF ALL MANUFACTURER SUPPLIED CABLES (MSC) EXITING A WET WELL IF NO OTHER DETAIL IS CALLED OUT ON THE DRAWINGS.
3. COORDINATE EXACT LOCATION OF JUNCTION BOXES WITH OTHERS TO ALLOW FOR FULL ACCESS TO WET WELL AND VALVE VAULT.



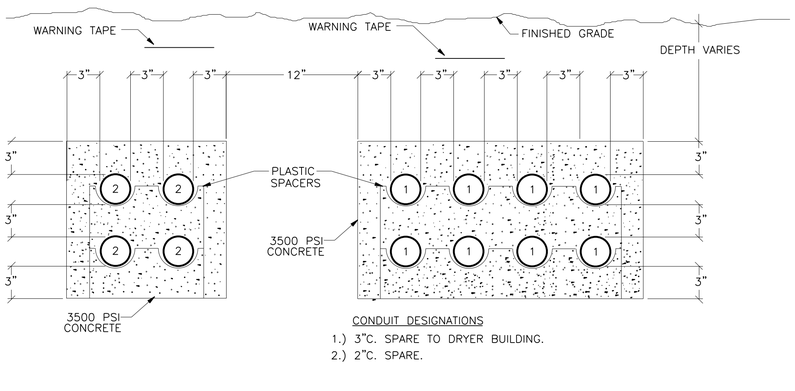
BASE PLATE PLAN
NO SCALE



11 TYPICAL EQUIPMENT MOUNTED ON ALUMINUM CHANNEL DETAIL
NO SCALE



12 TYPICAL BUILDING SERVICE GROUNDING SCHEMATIC DETAIL
NO SCALE



CONDUIT DESIGNATIONS

1.) 3"C. SPARE TO DRYER BUILDING.
2.) 2"C. SPARE.

13 DUCT BANK DETAIL
NO SCALE

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BIOSOLIDS DRYER SYSTEM ADDITION

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Warren County
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BGMU Project No. S07-653

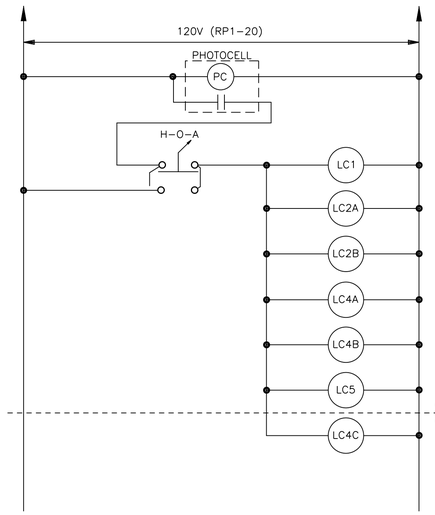
REVISION		
No. -	Date -	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

ELECTRICAL DETAILS

E7.0.5

PROJECT: 26064.01
DATE: JULY, 2010

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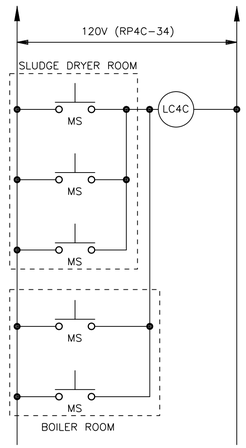
LIGHTING CONTACTOR SCHEDULE					
DESIGNATION	VOLTS	AMPS	POLES	COIL VOLTAGE	CONTROLLED BY:
LC-1	240	30	12	120	PHOTOCELL, H-O-A
LC-2A	240	30	12	120	PHOTOCELL, H-O-A
LC-2B	240	30	12	120	PHOTOCELL, H-O-A
LC-4A	240	30	12	120	PHOTOCELL, H-O-A
LC-4B	240	30	12	120	PHOTOCELL, H-O-A
LC-5	240	30	12	120	PHOTOCELL, H-O-A
LC-4C	240	30	12	120	PHOTOCELL, H-O-A

CONTRACT NO. 2
CONTRACT NO. 3

NOTES:
1. ALL CONTACTORS TO BE ELECTRICALLY HELD WITH COIL-CLEARING CONTACTS.
2. PROVIDE ALL CONTACTORS WITH NEMA 1 ENCLOSURES (UON).
3. PROVIDE CONTACTOR 'LC-4C' WITH NEMA 4X ENCLOSURE.

NOTES:
1. MOUNT H-O-A SWITCHES IN NEMA 1 ENCLOSURE.
2. PROVIDE NAMEPLATES FOR SWITCHES.
3. ALL WIRING TO BE #12 W/ #12G IN 1/2"C.

14 SITE LIGHTING CONTROL DIAGRAM
NO SCALE



NOTES:
1. PROVIDE NAMEPLATES FOR SWITCHES.
2. ALL WIRING TO BE #12 W/ #12G IN 1/2"C.
3. MS = MOMENTARY CONTACT SWITCH.

LIGHTING CONTACTOR SCHEDULE					
DESIGNATION	VOLTS	AMPS	POLES	COIL VOLTAGE	CONTROLLED BY:
LC-4D	240	30	12	120	MOMENTARY CONTACT SWITCHES

NOTES:
1. PROVIDE MECHANICALLY HELD LATCHING CONTACTOR.
2. PROVIDE CONTACTOR WITH NEMA 4X ENCLOSURE.
3. MOUNT MOMENTARY CONTACT SWITCH IN NEMA 4X ENCLOSURE.

15 HIGH BAY LIGHTING CONTROL DIAGRAM
NO SCALE

16

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BGMU Project No. S07-653

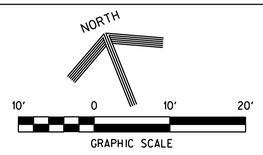
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	07-12-10	ISSUED FOR CONSTRUCTION

ELECTRICAL DETAILS

E7.0.6

PROJECT: 26064.01
DATE: JULY, 2010

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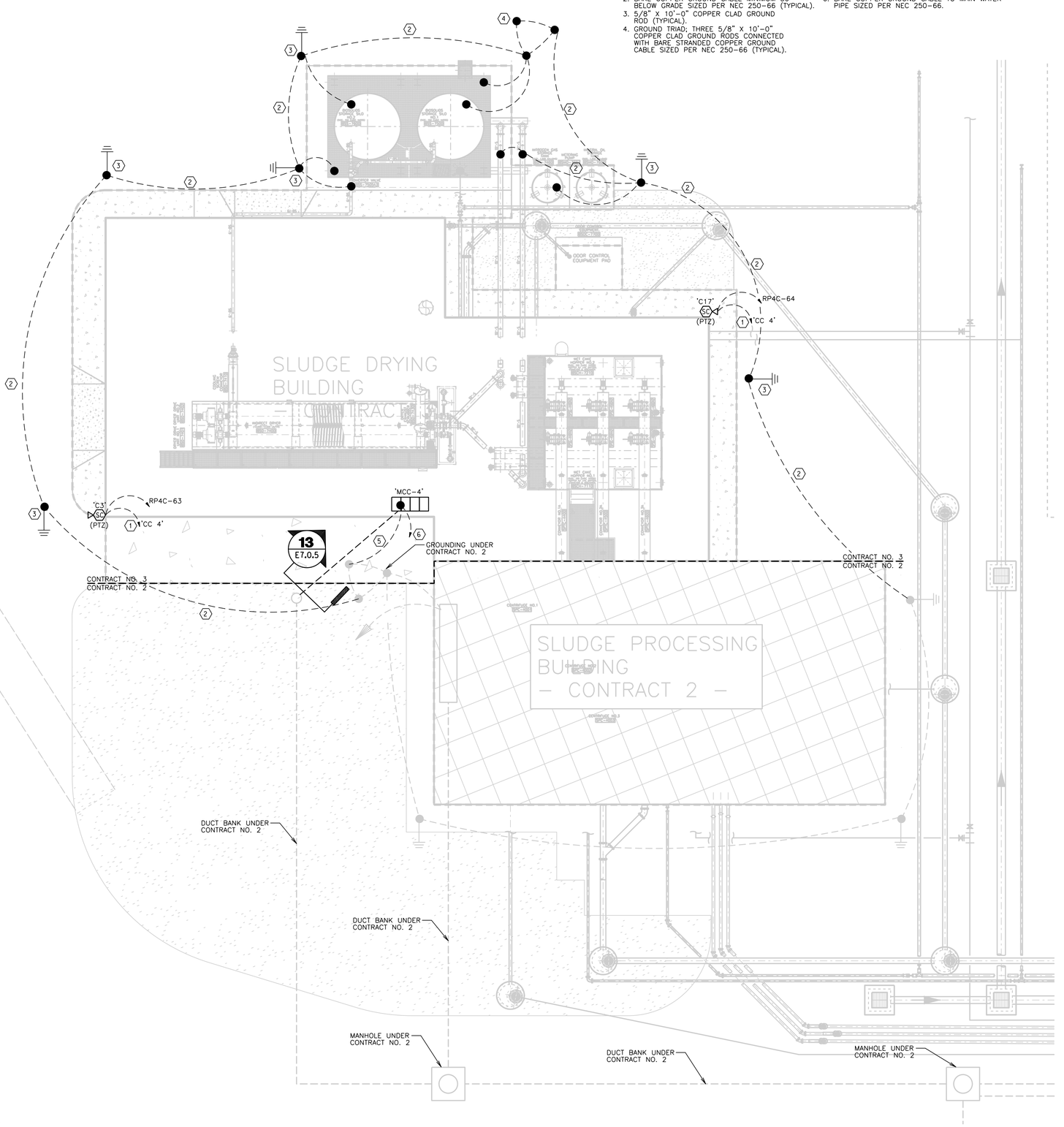


GENERAL NOTES:

1. COORDINATE EXACT MOUNTING REQUIREMENTS FOR CAMERAS AND ACCESS POINTS WITH MANUFACTURER PRIOR TO ROUGH-IN.

KEY NOTES:

1. (1) CAT 6 CABLE - 1"C.
2. BARE COPPER GROUND CABLE MINIMUM 36" BELOW GRADE SIZED PER NEC 250-66 (TYPICAL).
3. 5/8" X 10'-0" COPPER CLAD GROUND ROD (TYPICAL).
4. GROUND TRIAD; THREE 5/8" X 10'-0" COPPER CLAD GROUND RODS CONNECTED WITH BARE STRANDED COPPER GROUND CABLE SIZED PER NEC 250-66 (TYPICAL).
5. #3/0 BARE COPPER GROUND CABLE.
6. BARE COPPER GROUND CABLE TO MAIN WATER PIPE SIZED PER NEC 250-66.



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ELECTRICAL SITE PLAN

E7.0.7

PROJECT: 26064.01
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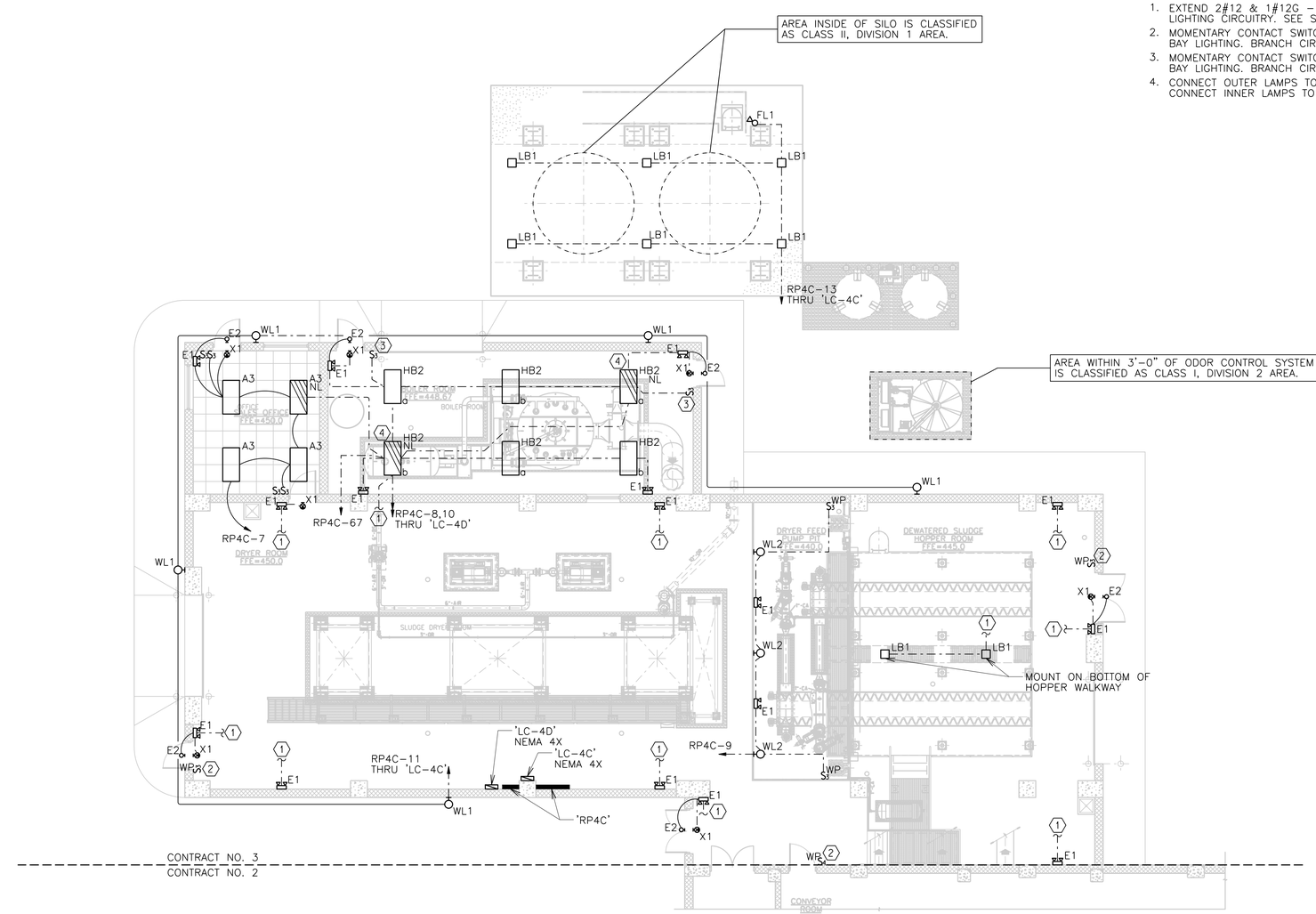
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[10-13, 17-1751]
Pages Ref'ns
1 E1.01
2 E1.02
3 E1.03
4 E1.04
5 E1.05
6 E1.06

GENERAL NOTES:

1. EMERGENCY LIGHTING UNITS SHALL BE CIRCUITED AHEAD OF SWITCH.
2. CONNECT OUTER LAMPS TO ONE SWITCHED CIRCUIT. CONNECT INNER LAMP TO OTHER SWITCHED CIRCUIT /NIGHT LIGHT CIRCUIT. (TYPICAL FOR ALL 'A3' FIXTURES.)
3. LETTERS 'a' & 'b' INDICATE PHASE TO NEUTRAL CONNECTION FOR EACH FIXTURE.
4. ALL WORK IN CLASSIFIED AREAS SHALL BE DONE IN ACCORDANCE WITH NEC ARTICLE 501.

KEY NOTES:

1. EXTEND 2#12 & 1#12G – 3/4"C UP TO HIGH BAY LIGHTING CIRCUITRY. SEE SHEET E7.2.0.
2. MOMENTARY CONTACT SWITCH FOR CONTROL OF HIGH BAY LIGHTING. BRANCH CIRCUITS #1–#6 IN PANEL 'RP4C'.
3. MOMENTARY CONTACT SWITCH FOR CONTROL OF HIGH BAY LIGHTING. BRANCH CIRCUITS #8 & #10 IN PANEL 'RP4C'.
4. CONNECT OUTER LAMPS TO ONE SWITCHED CIRCUIT. CONNECT INNER LAMPS TO NIGHT LIGHT CIRCUIT.



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DRYER BUILDING - LOWER LEVEL FLOOR PLAN - LIGHTING

SCALE: 1/8" = 1'-0"

0 10'

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

Warren County
Bowling Green, Kentucky

BGMU Project No. S07-653

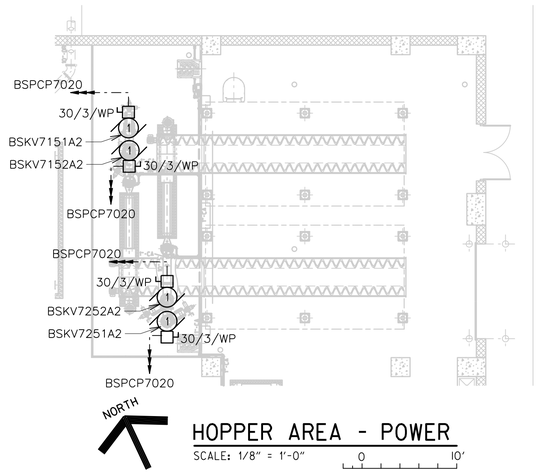
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	07-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING LOWER LEVEL FLOOR PLAN - LIGHTING

E7.1.0

PROJECT: 26064.01
DATE: JULY, 2010

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HOPPER AREA - POWER

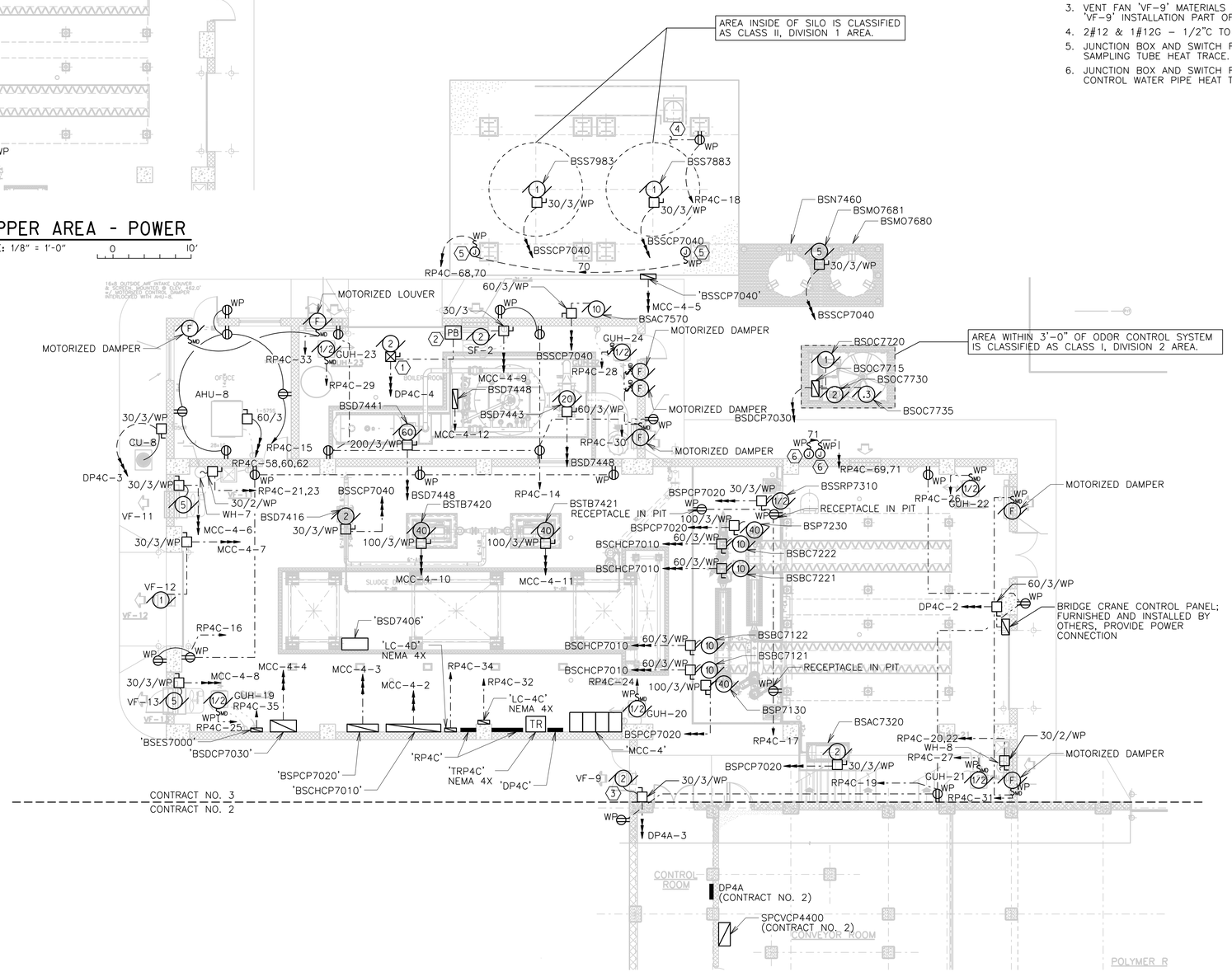
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GENERAL NOTES:

1. ALL WORK IN CLASSIFIED AREAS SHALL BE DONE IN ACCORDANCE WITH NEC ARTICLE 501.
2. FEEDERS/BRANCH CIRCUITS FOR DRYER TO BE ROUTED THROUGH VENDOR SUPPLIED J-BOX 'BSD7406'.

KEY NOTES:

1. 30/3/15F NEMA SIZE 0 COMBINATION STARTER FOR CONNECTION TO OVERHEAD DOOR MOTOR.
2. PUSH BUTTON FOR DOOR OPERATION. PROVIDE FIELD WIRING PER MANUFACTURER'S RECOMMENDATIONS.
3. VENT FAN 'VF-9' MATERIALS PART OF CONTRACT NO. 2. 'VF-9' INSTALLATION PART OF CONTRACT NO. 3.
4. 2#12 & 1#12G - 1/2"C TO RECEPTACLES ON PLATFORM ABOVE.
5. JUNCTION BOX AND SWITCH FOR CONNECTION TO SILO SAMPLING TUBE HEAT TRACE.
6. JUNCTION BOX AND SWITCH FOR CONNECTION TO ODOR CONTROL WATER PIPE HEAT TRACE.



DRYER BUILDING - LOWER LEVEL FLOOR PLAN - POWER

SCALE: 1/8" = 1'-0" 0 10'

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BIOSOLIDS DRYER SYSTEM ADDITION

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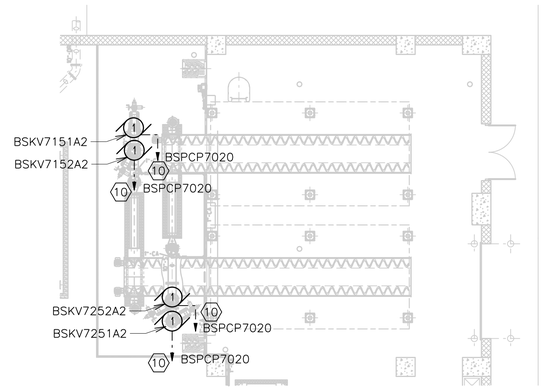
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DRYER BUILDING LOWER LEVEL FLOOR PLAN - POWER

E7.1.1

PROJECT: 26064.01
DATE: JULY, 2010

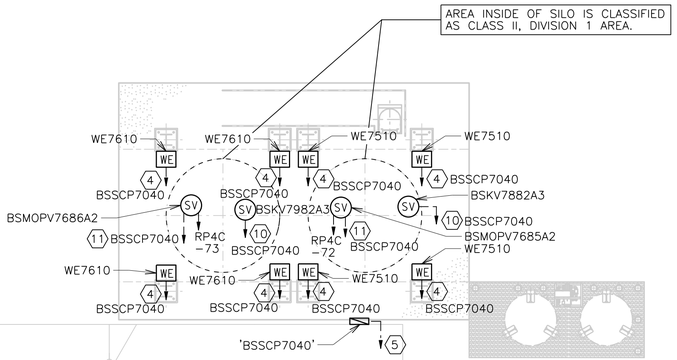
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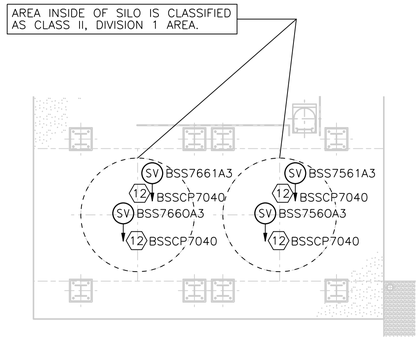


NORTH

HOPPER AREA - PROCESS

SCALE: 1/8" = 1'-0" 0 10'

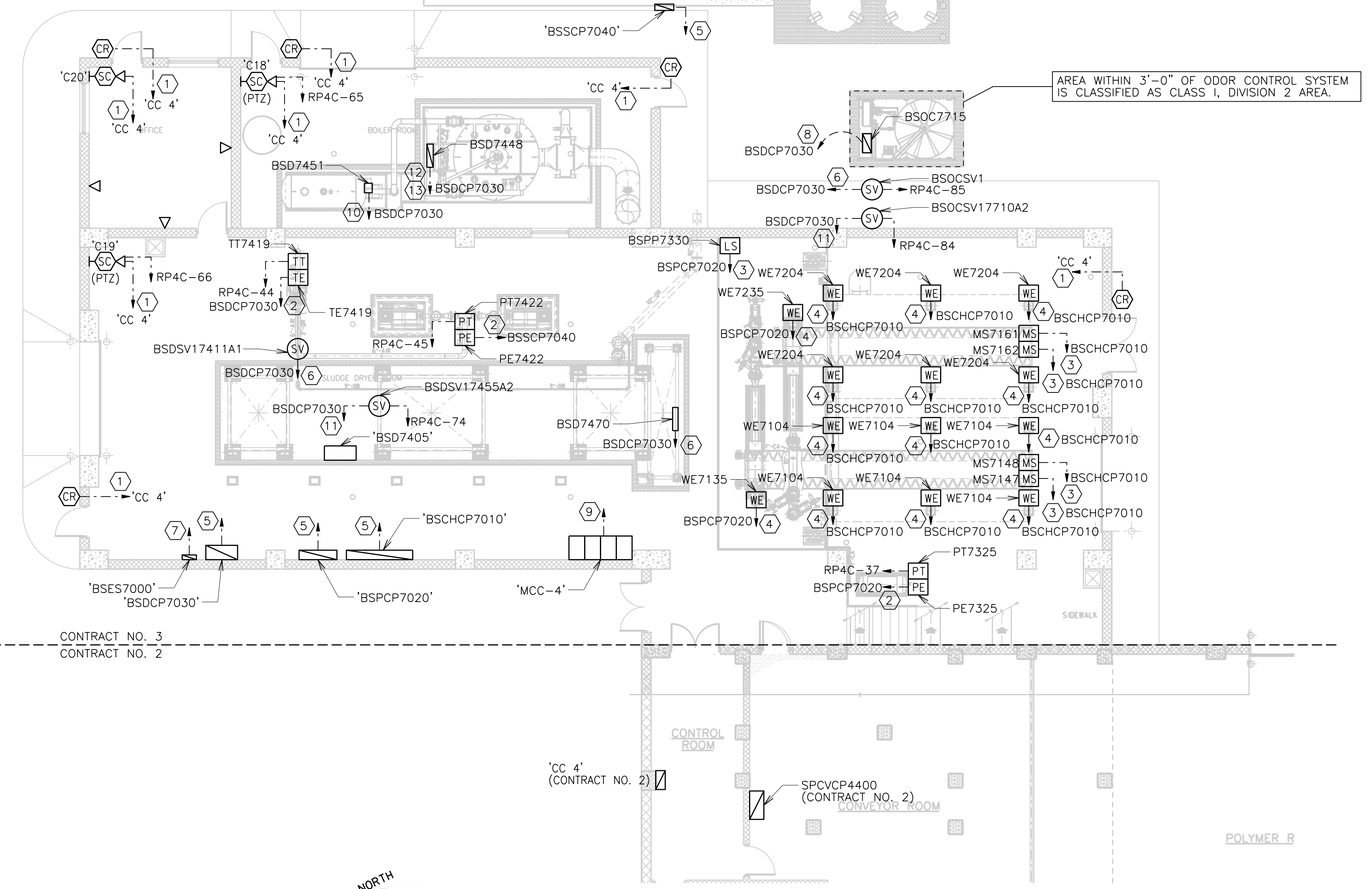




NORTH

SILO AREA - PROCESS

SCALE: 1/8" = 1'-0" 0 10'



NORTH

DRYER BUILDING - LOWER LEVEL FLOOR PLAN - PROCESS

SCALE: 1/8" = 1'-0" 0 10'

GENERAL NOTES:

1. COORDINATE EXACT LOCATION OF INSTRUMENTATION DEVICES WITH INSTRUMENTATION CONTRACTOR PRIOR TO ROUGH-IN.
2. REFER TO DETAIL #8 SHEET E7.0.5 FOR DOOR WIRING DIAGRAM.
3. ALL WORK IN CLASSIFIED AREAS SHALL BE DONE IN ACCORDANCE WITH NEC ARTICLE 501.
4. PROVIDE (1) CAT 6 CABLE – 3/4"C TO BSES7000 FROM ALL VOICE/DATA OUTLETS IN OFFICE AREA.
5. CONTROL CIRCUITS FOR DRYER TO BE ROUTED THROUGH VENDOR SUPPLIED J-BOX 'BSD7405'.

KEY NOTES:

1. (1) CAT 6 CABLE – 3/4"C.
2. 2/C #16 SHIELDED CABLE – 3/4"C.
3. 2#14 & 1#14G – 3/4"C.
4. 4/C #16 SHIELDED CABLE – 1"C.
5. (1) CAT 6 CABLE – 3/4"C. TO 'BSES7000'.
6. 4#14 & 1#14G – 3/4"C.
7. (1) CAT 6 CABLE – 3/4"C TO 'CC 4'.
8. 12#14 & 1#14G – 3/4"C.
9. 6#14 & 1#14G – 3/4"C FROM EACH BLOWER STARTER TO 'BSSCP7040'.
10. 10#14 & 1#14G – 3/4"C.
11. 8#14 & 1#14G – 3/4"C.
12. 12#14 & 1#14G – 3/4"C.
13. (2)2/C #16 SHIELDED CABLE – 1"C.

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WASTEWATER TREATMENT PLANT EXPANSION AND RENOVATION

CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

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BGMU Project No. S07-653

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DRYER BUILDING LOWER LEVEL FLOOR PLAN - PROCESS

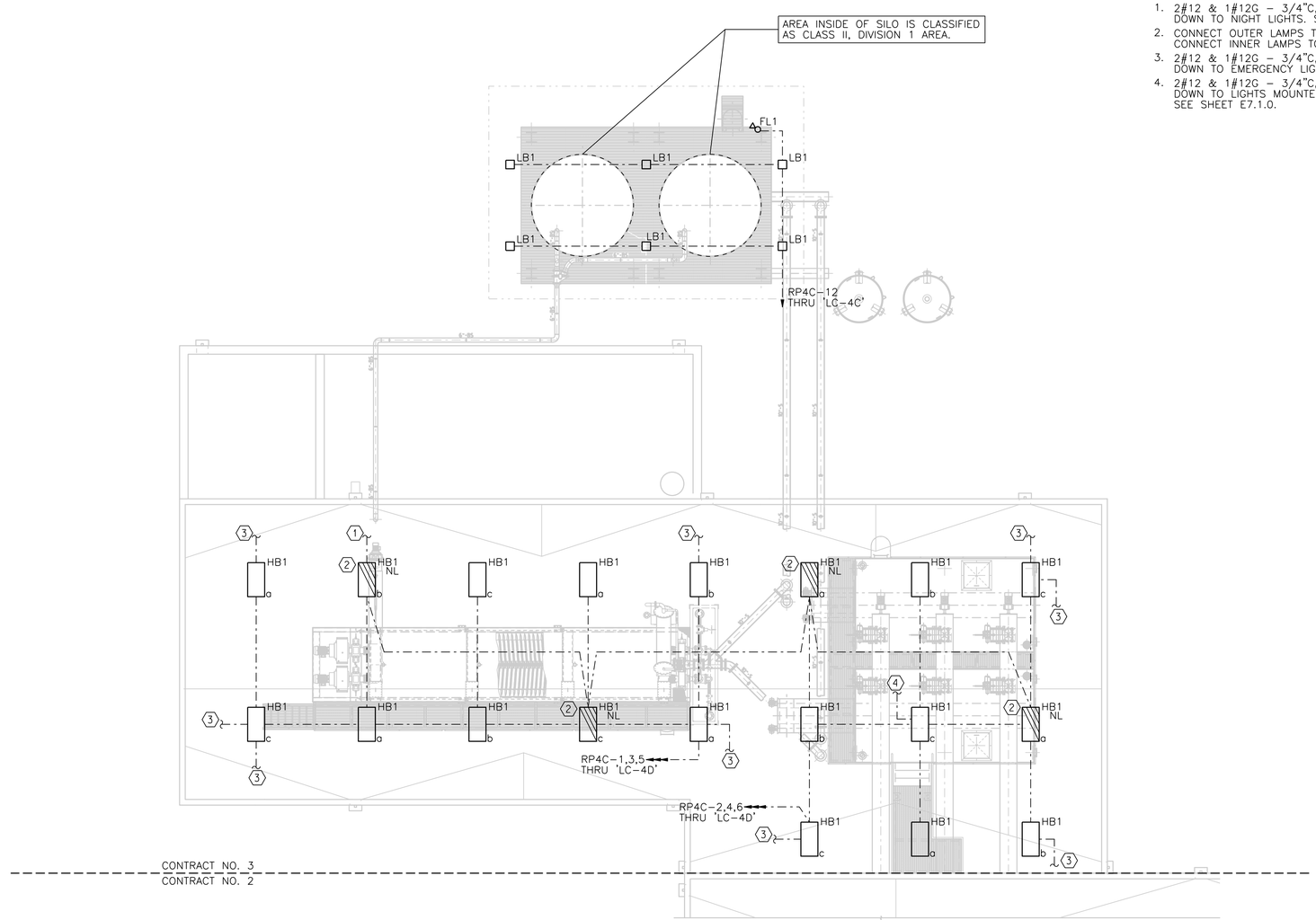
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PROJECT: 26064.01
DATE: JULY, 2010

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GENERAL NOTES:
1. LETTERS 'a', 'b', & 'c' INDICATE PHASE TO NEUTRAL CONNECTION FOR EACH FIXTURE.
2. ALL WORK IN CLASSIFIED AREAS SHALL BE DONE IN ACCORDANCE WITH NEC ARTICLE 501.

KEY NOTES:
1. 2#12 & 1#12G – 3/4"C, UNSWITCHED PHASE CONDUCTOR, DOWN TO NIGHT LIGHTS. SEE SHEET E7.1.0.
2. CONNECT OUTER LAMPS TO ONE SWITCHED CIRCUIT. CONNECT INNER LAMPS TO NIGHT LIGHT CIRCUIT.
3. 2#12 & 1#12G – 3/4"C, UNSWITCHED PHASE CONDUCTOR, DOWN TO EMERGENCY LIGHTING FIXTURES. SEE SHEET E7.1.0.
4. 2#12 & 1#12G – 3/4"C, SWITCHED PHASE CONDUCTOR, DOWN TO LIGHTS MOUNTED ON BOTTOM OF HOPPER WALKWAY. SEE SHEET E7.1.0.



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DRYER BUILDING - UPPER LEVEL FLOOR PLAN - LIGHTING

SCALE: 1/8" = 1'-0"

0 10'

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Bowling Green, Kentucky

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	07-12-10	ISSUED FOR CONSTRUCTION

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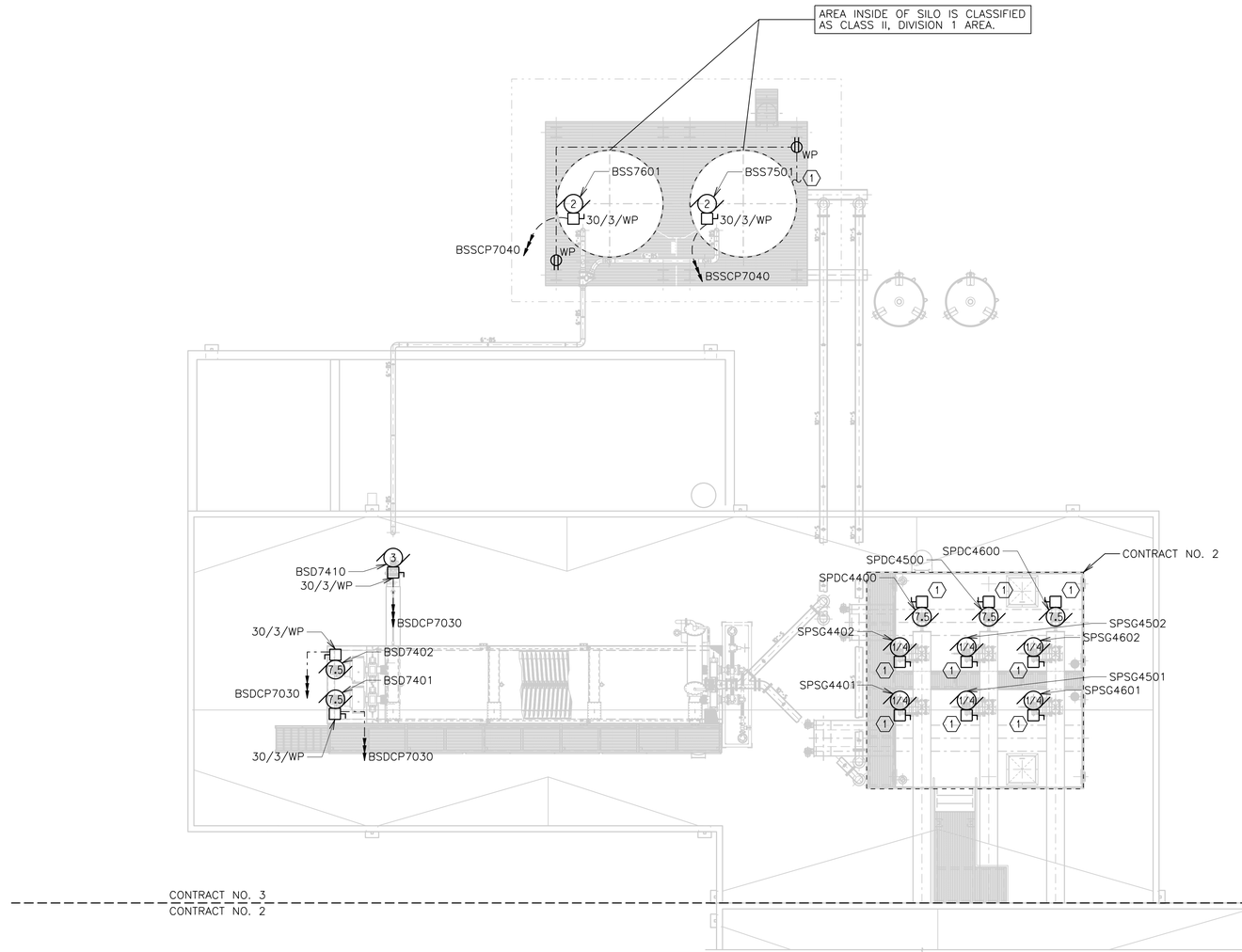
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PROJECT: 26064.01
DATE: JULY, 2010

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GENERAL NOTES:
1. ALL WORK IN CLASSIFIED AREAS SHALL BE DONE IN ACCORDANCE WITH NEC ARTICLE 501.
2. FEEDERS/BRANCH CIRCUITS FOR DRYER TO BE ROUTED THROUGH VENDOR SUPPLIED 'BSD' J-BOX.

KEY NOTES:
1. 30/3/WP. 3#12 & 1#12G - 1/2"C TO SPCVCP4400.
2. 2#12 & 1#12G - 1/2"C TO RECEPTACLE BELOW.



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DRYER BUILDING - UPPER LEVEL FLOOR PLAN - POWER

SCALE: 1/8" = 1'-0"

0 10'

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CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES

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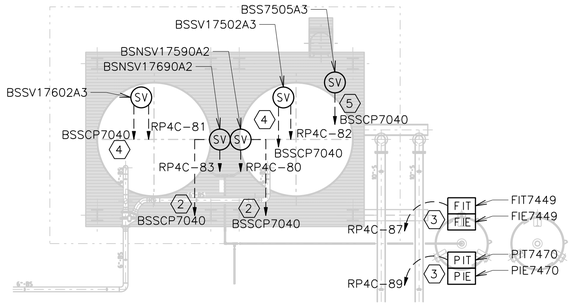
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DRYER BUILDING UPPER LEVEL FLOOR PLAN - POWER

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PROJECT: 26064.01
DATE: JULY, 2010

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SILO AREA - PROCESS

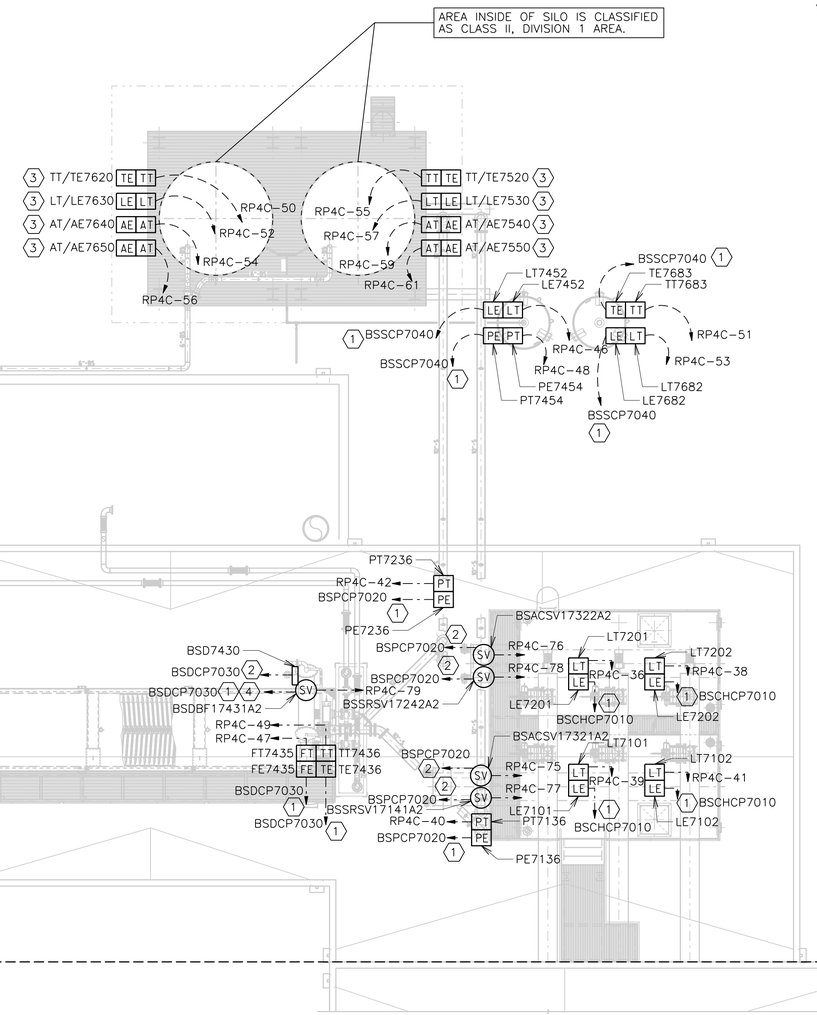
SCALE: 1/8" = 1'-0" 0 10'

GENERAL NOTES:

1. COORDINATE EXACT LOCATION OF INSTRUMENTATION DEVICES WITH INSTRUMENTATION CONTRACTOR PRIOR TO ROUGH-IN.
2. ALL WORK IN CLASSIFIED AREAS SHALL BE DONE IN ACCORDANCE WITH NEC ARTICLE 501.
3. CONTROL CIRCUITS FOR DRYER TO BE ROUTED THROUGH VENDOR SUPPLIED 'BSD' J-BOX.

KEY NOTES:

1. 2/C #16 SHIELDED CABLE – 3/4"C.
2. 4#14 & 1#14G – 3/4"C.
3. 2/C #16 SHIELDED CABLE – 3/4"C TO BSSCP7040 FROM INSTRUMENTATION ELEMENT.
4. 8#14 & 1#14G – 3/4"C.
5. 10#14 & 1#14G – 3/4"C.



CONTRACT NO. 3
CONTRACT NO. 2

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DRYER BUILDING - UPPER LEVEL FLOOR PLAN - PROCESS

SCALE: 1/8" = 1'-0" 0 10'

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CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

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Bowling Green, Kentucky
BGMU Project No. S07-653

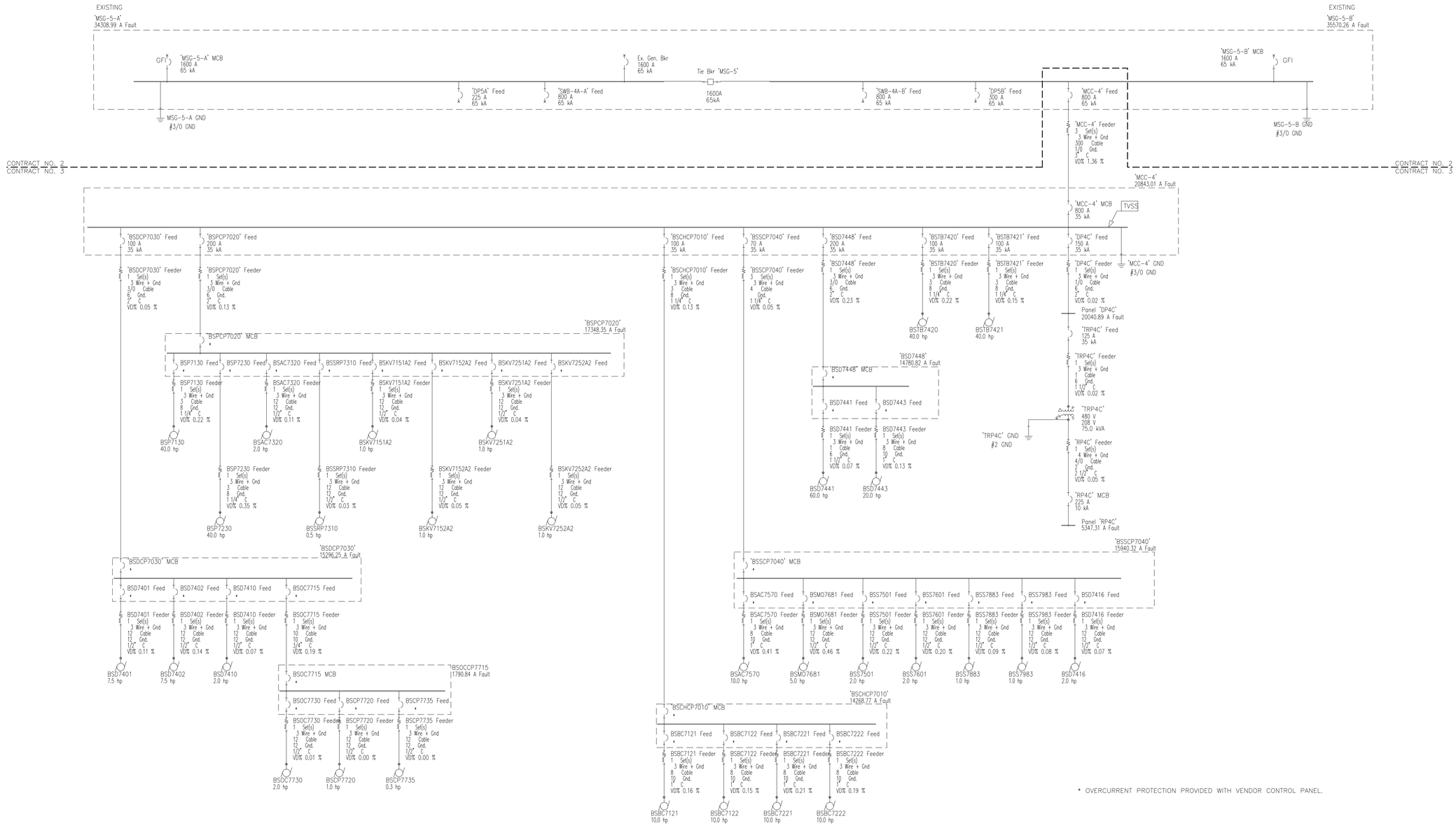
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PROJECT: 26064.01
DATE: JULY, 2010

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* OVERCURRENT PROTECTION PROVIDED WITH VENDOR CONTROL PANEL.

DRYER BUILDING - SINGLE LINE DIAGRAM

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DRYER BUILDING SINGLE LINE DIAGRAM

E7.7.0

PROJECT: 26064.01
DATE: JULY, 2010

PANEL: 'MSG-5-B'_ | OC DEVICE TYPE: Breaker | ENCLOSURE: NEMA 1 | MAINS(A): 1600 MCB | CONTINUOUS(A): 1600
LOCATION: Elec Rm 202 Admin | DEVICE FAMILY: Bolt On | MOUNTING: Free Standing | WIRING: 3-Phase 3-Wire | AIC RATING(A): 65000
FED FROM: 'MSG-B'_ | VOLTAGE: 480 | FAULT CURRENT(A): 35570
EXISTING SWITCHGEAR | Main-tie-main generator with kirk key interlock.

	CUBICLE NO	DESCRIPTION	CONNECTED kVA	DEMAND kVA	DESIGN kVA	DESIGN MAX AMPS	OC DEVICE TYPE	OC DEVICE SIZE	P	NOTES
	1	'SWB-4A-B'	326.94	265.04	292.15	353.16	BKR	800	3	See Single Line Diag
	2	Panel 'DP5B'	204.41	158.76	161.89	197.80	BKR	300	3	See Single Line
*	3	'MCC-4'	417.84	371.78	389.75	470.62	BKR	800	3	See Single Line
	4	Ex. Spare	0.00	0.00	0.00	0.00	BKR	400	3	
	5	Ex. Spare	0.00	0.00	0.00	0.00	BKR	60	3	
	6	Ex. Spare	0.00	0.00	0.00	0.00		225	3	
	7	Ex. Spare	0.00	0.00	0.00	0.00		225	3	
	8	Ex. Spare	0.00	0.00	0.00	0.00		225	3	
	9	Ex. Spare	0.00	0.00	0.00	0.00		225	3	
	10	Ex. Spare	0.00	0.00	0.00	0.00		225	3	
	11	Ex. Spare	0.00	0.00	0.00	0.00		225	3	
	12	Ex. Spare	0.00	0.00	0.00	0.00		225	3	
	13	Ex. Spare	0.00	0.00	0.00	0.00		225	3	
	14	Ex. Spare	0.00	0.00	0.00	0.00		225	3	

ALL CONNECTED	KVA	MAX PH AMPS	* PHASE TOTALS	VA	AMPS	BUS TOTALS	KVA
TOTAL CONNECTED	942.80	1141.1	* A-N	315434.2	1138.2	CONNECTED	942.80
TOTAL DEMAND	771.45	933.4	* B-N	316235.7	1141.1	DEMAND	771.45
TOTAL DESIGN	803.77	972.9	* C-N	311155.5	1122.8	DESIGN	803.77

All branch conductors to be 2#12, #12G, 1/2"C unless otherwise noted
by conduit and wire designation number, 'See One Line', or 'See Drawings' in Notes field of panelboard schedule.
Refer to CONDUIT AND WIRE SIZING DESIGNATIONS schedule, One Line Diagram, or drawings for additional details.

* New circuit breaker as indicated.

PANEL: 'DP4C' | OC DEVICE TYPE: Breaker | ENCLOSURE: NEMA 4X | MAINS(A): MLO | CONTINUOUS(A): 225
LOCATION: Dryer Building | DEVICE FAMILY: Bolt On | MOUNTING: Surface | WIRING: 3-Phase 3-Wire | AIC RATING(A): 35000
FED FROM: 'MCC-4' | VOLTAGE: 480 | FAULT CURRENT(A): 20041

CUBICLE NO	DESCRIPTION	CONNECTED kVA	DEMAND kVA	DESIGN kVA	DESIGN MAX AMPS	OC DEVICE TYPE	OC DEVICE SIZE	P	NOTES
1	'TRP4C' Pri.	55.65	49.61	53.05	66.57	BKR	125	3	See Single Line
2	Dryer Bldg Bridge Crane	20.05	20.05	25.07	31.46	BKR	50	3	Desig. #8
3	CU-8	0.83	0.67	0.67	1.00	BKR	15	3	Desig. #2
4	Boiler Rm OH Door	1.00	1.00	1.25	1.57	BKR	15	3	Desig. #2
5	Spare	0.00	0.00	0.00	0.00	BKR	20	3	
6	Spare	0.00	0.00	0.00	0.00	BKR	20	3	
7	Spare	0.00	0.00	0.00	0.00	BKR	20	3	
8	Spare	0.00	0.00	0.00	0.00	BKR	30	3	
9	Spare	0.00	0.00	0.00	0.00	BKR	30	3	
10	Spare	0.00	0.00	0.00	0.00	BKR	50	3	
11	Space	0.00	0.00	0.00	0.00		60	3	
12	Space	0.00	0.00	0.00	0.00		60	3	

ALL CONNECTED	KVA	MAX PH AMPS	* PHASE TOTALS	VA	AMPS	BUS TOTALS	KVA
TOTAL CONNECTED	76.45	94.3	* A-N	26057.2	94.0	CONNECTED	76.45
TOTAL DEMAND	70.24	86.5	* B-N	26122.7	94.3	DEMAND	70.24
TOTAL DESIGN	78.38	96.7	* C-N	24308.6	87.7	DESIGN	78.38

All branch conductors to be 2#12, #12G, 1/2"C unless otherwise noted
by conduit and wire designation number, 'See One Line', or 'See Drawings' in Notes field of panelboard schedule.
Refer to CONDUIT AND WIRE SIZING DESIGNATIONS schedule, One Line Diagram, or drawings for additional details.

PANEL: 'MCC-4'_ | OC DEVICE TYPE: Breaker | ENCLOSURE: NEMA 4X | MAINS(A): 800 MCB | CONTINUOUS(A): 800
LOCATION: Dryer Building | DEVICE FAMILY: Bolt On | MOUNTING: Free Standing | WIRING: 3-Phase 3-Wire | AIC RATING(A): 35000
FED FROM: 'MSG-5-B' | VOLTAGE: 480 | FAULT CURRENT(A): 20843

NO	DESCRIPTION	NOTES	HP	Max FLA	OC DEVICE TYPE	OC DEVICE AMPS	P	STARTER SIZE	STARTER TYPE	STARTER SP	STARTER AC	FEEDER/RACEWAY STANDARD DESC	%VD
1	Panel 'DP4C'	See Single Line		96.7	BKR	150	3						0.023
2	'BSCHCP7010'	See Single Line		51.257	BKR	200	3						0.144
3	'BSPCP7020'	See Single Line		116.38	BKR	200	3						0.132
4	'BSDCP7030'	See Single Line		26.784	BKR	200	3						0.052
5	'BSSCP7040'	See Single Line		30.754	BKR	40	3						0.18
6	VF-11		5	6.03	MCP	15	3	1	ATL			Desig. #2	0
7	VF-12		1	1.21	MCP	7	3	0	ATL			Desig. #2	0
8	VF-13		5	6.03	MCP	15	3	1	ATL			Desig. #2	0
9	SF-2		2	2.41	MCP	7	3	0	ATL			Desig. #2	0
10	'BSTB7420'	See Single Line		60.302	MCP	100	3	3	RVSS				0.282
11	'BSTB7421'	See Single Line		0	MCP	100	3	3	RVSS				
12	'BSD7448'	See Single Line		114.57	BKR	200	3						0.26
13	Space			0		100	3						
14	Space			0		100	3						
15	Space			0		100	3						
16	Space			0		100	3						

ALL CONNECTED	KVA	MAX PH AMPS	* PHASE TOTALS	VA	AMPS	BUS TOTALS	KVA
TOTAL CONNECTED	417.84	505.6	* A-N	139592.6	503.7	CONNECTED	417.84
TOTAL DEMAND	371.78	449.3	* B-N	140110.9	505.6	DEMAND	371.78
TOTAL DESIGN	389.75	470.6	* C-N	138144.7	498.5	DESIGN	389.75

All branch conductors to be 2#12, #12G, 1/2"C unless otherwise noted
by conduit and wire designation number, 'See One Line', or 'See Drawings' in Notes field of panelboard schedule.
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PANEL: 'RP4C' | OC DEVICE TYPE: Breaker | ENCLOSURE: NEMA 4X | MAINS(A): 225 MCB | CONTINUOUS(A): 225
LOCATION: Dryer Building | DEVICE FAMILY: Bolt On | MOUNTING: Surface | WIRING: 3-Phase 4-Wire | AIC RATING(A): 10000
FED FROM: 'TRP4C' Sec. | VOLTAGE: 208/120 | FAULT CURRENT(A): 5509

CKT	DESCRIPTION	NOTES	DEMAND CODE	VA	OC AMPS	P	PHASE	OC AMPS	P	VA	DEMAND CODE	NOTES	DESCRIPTION	CKT
1	High Bay Lighting	Desig. #6	LIGHTING	4686	30	3	A	20	3	4361	LIGHTING	Desig. #3	High Bay Lighting	2
3	"			-	"		B	"		-			"	4
5	"			-	"		C	"		-			"	6
7	Office Lighting		LIGHTING	367	20	1	A	20	2	1772	LIGHTING		High Bay Lighting	8
9	Pit Lighting		LIGHTING	208	20	1	B	"		-			"	10
11	Exterior Wall Packs		LIGHTING	1040	20	1	C	20	1	595	LIGHTING		Silo Lighting	12
13	Silo Lighting		LIGHTING	595	20	1	A	20	1	1080	RECEPTACLES		Boiler Rm Recept	14
15	Office Receptacles		RECEPTACLES	900	20	1	B	20	1	900	RECEPTACLES		Dryer Rm Recept	16
17	Pit Receptacles		RECEPTACLES	540	20	1	C	20	1	540	RECEPTACLES		Silo Receptacles	18
19	Hopper Area Recept		RECEPTACLES	720	20	1	A	20	2	3000	HEAT 1-PHASE		WH-8	20
21	WH-7		HEAT 1-PHASE	3000	20	2	B	"		-			"	22
23	"			-	"		C	20	1	1176	1 PHASE MOTO		GUH-20	24
25	GUH-19		1 PHASE MOTO	1176	20	1	A	20	1	1176	1 PHASE MOTO		GUH-22	26
27	GUH-21		1 PHASE MOTO	1176	20	1	B	20	1	1176	1 PHASE MOTO		GUH-24	28
29	GUH-23		1 PHASE MOTO	1176	20	1	C	20	1	500	1 PHASE MOTO		Motorized Dampers	30
31	Motorized Dampers		1 PHASE MOTO	500	20	1	A	20	1	500	MISC @100%	1	'LC-4C'	32
33	Motorized Dampers		1 PHASE MOTO	500	20	1	B	20	1	500	MISC @100%	1	'LC-4D'	34
35	BSES7000		MISC @100%	500	20	1	C	20	1	500	MISC @100%	1	LT7201	36
37	PT7325		MISC @100%	200	20	1	A	20	1	200	MISC @100%	1	LT7202	38
39	LT7101		MISC @100%	200	20	1	B	20	1	200	MISC @100%	1	PT7136	40
41	LT7102		MISC @100%	200	20	1	C	20	1	200	MISC @100%	1	PT7236	42
43	Spare		SPARE	0	20	1	A	20	1	200	MISC @100%	1	TT7419	44
45	PT7422		MISC @100%	200	20	1	B	20	1	200	MISC @100%	1	PT7451	46
47	FT7435		MISC @100%	200	20	1	C	20	1	200	MISC @100%	1	LT7454	48
49	TT7436		MISC @100%	200	20	1	A	20	1	200	MISC @100%	1	TT7620	50
51	TT7683		MISC @100%	200	20	1	B	20	1	200	MISC @100%	1	LT7630	52
53	LT7682		MISC @100%	200	20	1	C	20	1	200	MISC @100%	1	AT7640	54
55	TT7520		MISC @100%	200	20	1	A	20	1	200	MISC @100%	1	AT7650	56
57	LT7530		MISC @100%	200	20	1	B	40	3	10808	MISC @ 80%	3 Desig. #8	AHU-8	58
59	AT7540		MISC @100%	200	20	1	C	"		-			"	60
61	AT7550		MISC @100%	200	20	1	A	"		-			"	62
63	Security Cam 'C3'		MISC @100%	200	20	1	B	20	1	200	MISC @100%	1	Security Cam 'C17'	64
65	Security Cam 'C18'		MISC @100%	200	20	1	C	20	1	200	MISC @100%	1	Security Cam 'C19'	66
67	Night Lighting		LIGHTING	575	20	1	A	20	1	500	HEAT 1-PHASE	GF BKR	Silo Heat Trace	68
69	Door Ctl Heat Trace	GF BKR	HEAT 1-PHASE	1000	20	1	B	20	1	500	HEAT 1-PHASE	GF BKR	Silo Heat Trace	70
71	Door Ctl Heat Trace	GF BKR	HEAT 1-PHASE	1000	20	1	C	20	1	200	1 PHASE MOTO		BSMOPV7685A2	72
73	BSMOPV7686A2		1 PHASE MOTO	200	20	1	A	20	1	200	1 PHASE MOTO		BSDSV17455A2	74
75	BSACSV17321A2		1 PHASE MOTO	200	20	1	B	20	1	200	1 PHASE MOTO		BSACSV17322A2	76
77	BSSRSV17141A2		1 PHASE MOTO	200	20	1	C	20	1	200	1 PHASE MOTO		BSSRSV17242A2	78
79	BSDBF17431A2		1 PHASE MOTO	200	20	1	A	20	1	200	1 PHASE MOTO		BSNSV17590A2	80
81	BSSV17602A3		1 PHASE MOTO	200	20	1	B	20	1	200	1 PHASE MOTO		BSSV17502A3	82
83	BSNSV17690A2		1 PHASE MOTO	200	20	1	C	20	1	200	1 PHASE MOTO		BSDCSV17710A2	84
85	BSDCSV1		1 PHASE MOTO	200	20	1	A	30	3	0	SPARE		Spare	86
87	FIT7449		MISC @100%	200	20	1	B	"		-			"	88
89	PIT7470		MISC @100%	200	20	1	C	"		-			"	90
91	Spare		SPARE	0	30	3	A	20	2	0	SPARE		Spare	92
93	"			-	"		B	"		-			"	94
95	"			-	"		C	20	1	0	SPARE		Spare	96
97	Spare		SPARE	0	20	1	A	20	1	0	SPARE		Spare	98
99	Spare		SPARE	0	20	1	B	20	1	0	SPARE		Spare	100
101	Spare		SPARE	0	20	1	C	20	1	0	SPARE		Spare	102
103	Spare		SPARE	0	20	1	A	20	1	0	SPARE		Spare	104
105	Spare		SPARE	0	20	1	B	20	1	0	SPARE		Spare	106
107	Spare		SPARE	0	20	1	C	20	1	0	SPARE		Spare	108
109	Space		USABLE SPACE	0	20	1	A	20	1	0	USABLE SPACE		Space	110
111	Space		USABLE SPACE	0	20	1	B	20	1	0	USABLE SPACE		Space	112
113	Space		USABLE SPACE	0	20	1	C	20	1	0	USABLE SPACE		Space	114
115	Space		USABLE SPACE	0	20	1	A	20	1	0	USABLE SPACE		Space	116
117	Space		USABLE SPACE	0	20	1	B	20	1	0	USABLE SPACE		Space	118
119	Space		USABLE SPACE	0	20	1	C	20	1	0	USABLE SPACE		Space	120
121	Space		USABLE SPACE	0	20	1	A	20	1	0	USABLE SPACE		Space	122
123	Space		USABLE SPACE	0	20	1	B	20	1	0	USABLE SPACE		Space	124
125	Space		USABLE SPACE	0	20	1	C	20	1	0	USABLE SPACE		Space	126
127	Space		USABLE SPACE	0	20	1	A	20	1	0	USABLE SPACE		Space	128

ALL CONNECTED	KVA	MAX PH AMPS	* PHASE TOTALS	VA	AMPS	BUS TOTALS	KVA
TOTAL CONNECTED	55.65	164.1	* A-N	17901.6	149.1	CONNECTED	55.65
TOTAL DEMAND	49.61	145.1	* B-N	19702.2	164.1	DEMAND	49.61
TOTAL DESIGN	53.05	153.6	* C-N	18105.2	150.8	DESIGN	53.05

All branch conductors to be 2#12, #12G, 1/2"C unless otherwise noted
by conduit and wire designation number, 'See One Line', or 'See Drawings' in Notes field of panelboard schedule.
Refer to CONDUIT AND WIRE SIZING DESIGNATIONS schedule, One Line Diagram, or drawings for additional details.

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DGNCORE=0000000000000000
PASSWD=1C00F1D0A10A1ACA7B
RFDEF=
MSLIB=P:\DOT\geni\data\ups\GSP.pen
ACTIVE MODEL: Default
Plotting Scale: 1.000000 x 1.000000
Plotted: 10-DEC-2010 08:45:21
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E-ANNO-TTLB On Thaw 7 0 0
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E-ANNO-TTLB3 On Thaw 7 0 0
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CONTRACT 3

BIOSOLIDS DRYER SYSTEM ADDITION

BOWLING GREEN MUNICIPAL UTILITIES
Warren County
Bowling Green, Kentucky
BGMU Project No. S07-653

REVISION

No.	Date	Revision
	07-12-10	ISSUED FOR CONSTRUCTION

DRYER BUILDING PANEL SCHEDULES

E7.7.1

PROJECT: 26064.01
DATE: JULY, 2010