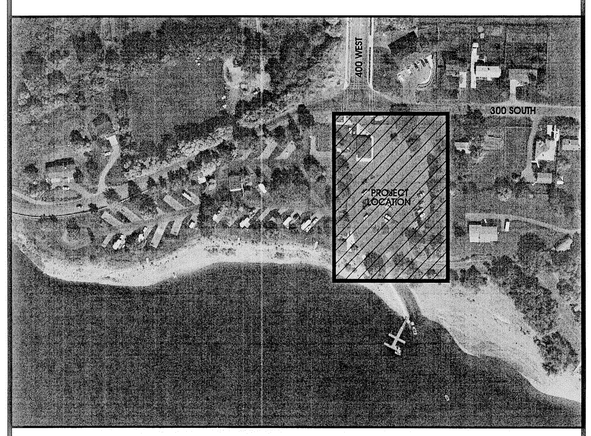
ABBREVIATIONS LEGEND:

A.F.F.	ABOVE FINISH FLOOR	EXP	EXPANSION	PART BD	PARTICLE BOARD
AC	ACOUSTIC	EXT	EXTERIOR	d	PENNY
ADJ	ADJUSTABLE	FOF	FACE OF FINISH	PL OR }	PLATE
ALT	ALTERNATE	FOS	FACE OF STUD	PLWD	PLYWOOD
ALUM	ALUMINUM	FOC	FACE OF CONCRETE	QT	QUARRY TILE
AB	ANCHOR BOLT	FIN	FINISH	RAD	RADIUS
L	ANGLE	FF	FINISHED FLOOR	REF	REFERENCE
&	AND	FEC	FIRE EXTINGUISHER CABINET	REFR	REFRIGERATOR
APPROX	APPROXIMATE	FL	FLOOR	REQD	REQUIRED
ARCH	ARCHITECTURAL/ARCHITECT	FD	FLOOR DRAIN	REINF	REINFORCE
@	AT	FS	FLOOR SINK	RD	ROOF DRAIN
BSMT	BASEMENT	FTG	FOOTING	RM	ROOM
BM	BEAM	FDN	FOUNDATION	RO	ROUGH OPENING
BRG	BEARING	GALV	GALVANIZED	SCHED	SCHEDULE
BM	BENCH MARK	GA	GAUGE	SH	SHELF
BLK	BLOCK	GB	GRAB BAR	SIM	SIMILAR
BLKG	BLOCKING	GL	GLASS	SC	SOLID CORE
BTM	BOTTOM	GYP BD	GYPSUM BOARD	S	SOUTH
BO	BOTTOM OF	HDWD	HARDWOOD	SPEC	SPECIFICATIONS
B.O.W.	BOTTOM OF WALL	HT	HEIGHT	SQ	SQUARE
BLDG	BUILDING	HC	HOLLOW CORE	SS	STAINLESS STEEL
CAB	CABINET	HM	HOLLOW METAL	STD	STANDARD
CI	CAST IRON	HORIZ	HORIZONTAL	ST	STEEL
CB	CATCH BASIN	H.B.	HOSE BIB	STOR	STORAGE
CLG	CEILING	ID	INSIDE DIAMETER	STRUC	STRUCTURAL
CL OR (	CENTER LINE	INSUL	INSULATION	SUSP	SUSPENDED
CT	CERAMIC TILE	INT	INTERIOR	T.B.C.	TOP BACK OF CURB
C	CHANNEL	JAN	JANITOR	TEL	TELEPHONE
CO	CLEAN OUT	JT	JOINT	TV	TELEVISION
COL	COLUMN	KIT	KITCHEN	TS	TUBE STEEL
CONC	CONCRETE	LAM	LAMINATE	THRES	THRESHOLD
CMU	CONCRETE MASONRY UNIT	LAV	LAVATORY	TOIL	TOILET
CONT	CONTINUOUS	MANUF	MANUFACTURER	T.O.	TOP OF
CORR	CORRIDOR	MTL	MATERIAL	T.O.W.	TOP OF WALL
DBL	DOUBLE	MH	MANHOLE	T & G	TONGUE & GROOVE
DEPT	DEPARTMENT	MAX	MAXIMUM	T & B	TOP & BOTTOM
DET	DETAIL	MECH	MECHANICAL	TYP	TYPICAL
DIA or [	DIAMETER	MC	MEDICINE CABINET	VERT	VERTICAL
DIM	DIMENSION	MIN	MINIMUM	VEST	VESTIBULE
DISP	DISPENSER	MISC	MISCELLANEOUS	UNO	UNLESS NOTED OTHERWISE
DS	DOWNSPOUT	N	NORTH	WC	WATER CLOSET
DRW	DRAWER	NIC	NOT IN CONTRACT	WWM	WELDED WIRE MESH
DWG	DRAWING	NTS	NOT TO SCALE	W	WEST
E	EAST	NO. or #	NUMBER	WF	WIDE FLANGE
ELEC	ELECTRICAL	OBS	OBSCURE	WDO	WINDOW
EWC	ELECTRIC WATER COOLER	O.C.	ON CENTER	WD	WOOD
ELEV	ELEVATION	OPP	OPPOSITE	W/	WITH
EQUIP	EQUIPMENT	OD	OUTSIDE DIAMETER		
EXIST	EXISTING	O.H.	OVERHEAD		

SYMBOLS LEGEND:

- (A) — GRID BUBBLE; SEE ARCH/STRUCT SHEETS
- (1) — WALL TYPES; SEE ARCH SHEETS
- (A) — WINDOW SYMBOL; SEE ARCH SHEETS
- (1) — KEY NOTE; SEE ARCH SHEETS
- (100) — DOOR SYMBOL; SEE ARCH SHEETS
- (#) — REVISION TRIANGE W/ REVISION CLOUD, SEE PLAN SHEETS
- ----- — ROOM NAME
- ----- — ROOM NUMBER
- ----- — CEILING ELEVATION SEE ARCH SHEETS
- (#/#) — SECTION LETTER OR # / PAGE REFERENCE, SEE PLAN SHEETS
- OBJECT ELEVATION SEE ARCH/STRUCT SHEETS
- (BM-HK) — BEAM MARK - SEE BEAM SCHEDULE
- (C-MK) — COLUMN MARK - SEE COLUMN SCHEDULE
- (CFW-X) — CONCRETE FND. WALL MARK - SEE CONCRETE FND. WALL SCHED.
- (CP-X) — CONCRETE PIER - SEE CONCRETE PIER SCHED.
- (MW-X) — MASONRY WALL MARK SEE MASONRY WALL SCHEDULE
- (MC-00) — MASONRY COL. MARK SEE MASONRY COL. SCHEDULE
- (ML-X) — MASONRY LINTEL MARK SEE MASONRY LINTEL SCHEDULE
- (ENDELEV) — TOP OF FOUNDATION WALL ELEVATION
- (FC2.0 / FELEV) — FOOTING MARK / T.O. FTG ELEVATION
- S——S — FND/FTG. STEP
- C.J. — CONST./CONTROL JOINT
- DEPRESS FOUNDATION & POUR FLOOR SLAB OVER
- EARTH
- GYP BOARD
- CONCRETE
- RIGID INSUL.
- INSULATION

SITE VICINITY MAP



Skyline A/E/S, INC.

HYRUM STATE PARK RESTROOM REPLACEMENT
HYRUM, UTAH
DFCM JOB#: 09198510 / SKYLINE JOB #: 09-126
DATE: 12/22/09 / CONSTRUCTION DOCUMENTS

PROJECT DESIGN TEAM:

ARCHITECT, LANDSCAPING, AND STRUCTURAL ENGINEER:

Skyline A/E/S, INC.
Architecture / Engineering / Surveying
95 W. Golf Course Rd. #101, Logan, UT 84321
(435) 752-8501 / Fax (435) 752-8597

ELECTRICAL ENGINEER:

Sine Source Engineering
545 West 465 North
Suite 150
Providence, Ut 84332
office: (435) 787-1445
fax: 1-877-207-3199
www.sinesource.net

MECHANICAL AND PLUMBING ENGINEER:

CARRILLO ENGINEERING
325 N. 400 E.
HYDE PARK, UT 84318
PHONE: 435-770-4702 FAX: 435-563-1870

CODE ANALYSIS

APPLICABLE BUILDING CODES			
CODE	YEAR	CODE	YEAR
INTERNATIONAL BUILDING CODE	2006	NATIONAL ELECTRICAL CODE	2008
INTERNATIONAL MECHANICAL CODE	2006	UNIFORM CODE FOR BUILDING CONSERVATION	
INTERNATIONAL PLUMBING CODE	2006		
INTERNATIONAL FIRE CODE	2006	ADA ACCESSIBILITY GUILDELINES	I.C.C./ANSI A117.1-2003
INTERNATIONAL ENERGY CONSERVATION CODE	2006		

A. OCCUPANCY AND GROUP: B
CHANGE IN USE: YES ___ NO X MIXED OCCUPANCY: YES ___ NO X
SPECIAL USE AND OCCUPANCY (E.G. HIGH RISE, COVERED MALL): ___

B. SEISMIC DESIGN CATEGORY: ___ DESIGN WIND SPEED: ___ MPH

C. TYPE OF CONSTRUCTION (CIRCLE ONE):
I/A I/B II/A II/B III/A III/B IV/HT V/A V/B

D. FIRE RESISTANCE RATING REQUIREMENTS FOR THE EXTERIOR WALLS BASED ON THE FIRE SEPARATION DISTANCE (IN HOURS):
NORTH: 0 SOUTH: 0 EAST: 0 WEST: 0

E. MIXED OCCUPANCIES: N/A NONSEPARATED USES: N/A

F. SPRINKLERS: NONE
REQUIRED: NO PROVIDED: NO TYPE OF SPRINKLER SYSTEM: N/A

G. NUMBER OF STORIES: 1 BUILDING HEIGHT: 11'-6"

H. ACTUAL AREA PER FLOOR (SQUARE FEET): 512 SQ. FT.

I. TABULAR AREA: 5,500 SQ. FT.

J. AREA MODIFICATIONS: N/A

A) $A_a = A_t + \left[\frac{A_t I_f}{100}\right] + \left[\frac{A_t I_s}{100}\right] \qquad I_f = 100\left[\frac{F}{P} - 0.25\right]\frac{W}{30}$

B) SUM OF THE RATIO CALCULATIONS FOR MIXED OCCUPANCIES: N/A

$\frac{\text{ACTUAL AREA}}{\text{ALLOWABLE AREA}} \leq 1$

C) TOTAL ALLOWABLE AREA FOR:
1) ONE STORY: 5,500 SQ. FT.
2) TWO STORY: $A_a(2)$ N/A
3) THREE STORY: $A_a(3)$ N/A

D) UNLIMITED AREA BUILDING: YES ___ NO X CODE SECTION: N/A

K. FIRE RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS).

ELEMENT	HOURS	ASSEMBLY LISTING	ELEMENT	HOURS	ASSEMBLY LISTING
EXTERIOR BEARING WALLS	0		FLOORS - CEILING FLOORS	0	
INTERIOR BEARING WALLS	0		ROOFS - CEILING ROOFS	0	
EXTERIOR NON-BEARING WALLS	0		EXTERIOR DOORS AND WINDOWS	0	
STRUCTURAL FRAME	0		SHAFT ENCLOSURES	0	
PARTITIONS - PERMANENT	0		FIRE WALLS	0	
FIRE BARRIERS	0		FIRE PARTITIONS	0	
			SMOKE PARTITIONS	0	

L. DESIGN OCCUPANT LOAD: 9
EXIT WIDTH REQUIRED: 32" EXIT WIDTH PROVIDED: 36"

M. MINIMUM NUMBER OF REQUIRED PLUMBING FACILITIES:
A) WATER CLOSETS - REQUIRED (M) ___ (F) ___ PROVIDED (M) ___ (F) ___
B) LAVATORIES - REQUIRED (M) ___ (F) ___ PROVIDED (M) ___ (F) ___
C) BATH TUBS OR SHOWERS: 3
D) DRINKING FOUNTAINS: 0 SERVICE SINKS: 1

FOOTNOTES:
1. IN CASE OF CONFLICT WITH THE U.S. DEPARTMENT OF JUSTICE FEDERAL REGISTERS PARTS I THROUGH XI - ADA GUIDELINES AND SPECIFIC REFERENCE TO THE INTERNATIONAL BUILDING
2. CODE ACCESSIBILITY CHAPTERS, THE MORE RESTRICTIVE REQUIREMENT SHALL GOVERN. ADDITIONAL CODE INFORMATION SHALL BE PROVIDED AT THE DISCRETION OF THE BUILDING OFFICIAL FOR COMPLEX BUILDINGS. INCLUDING, BUT NOT LIMITED TO:
   A) HIGH RISE REQUIREMENTS.
   B) ATRIUMS.
   C) PERFORMANCE BASED CRITERIA.
   D) MEANS OR EGRESS ANALYSIS.
   E) FIRE ASSEMBLY LOCATOR SHEET.
   G) FIRE STOPPING, INCLUDING TESTED DESIGN NUMBER.

SHEET INDEX:

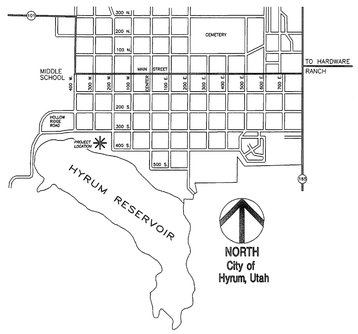
INDEX #:	SHEET #:	DRAWINGS:	DATE OF PREPARATION	REVISION:
1	COVER	COVER SHEET	12/22/09	01/13/10
2	A5101	DEMOLITION PLAN	12/22/09	01/13/10
3	A5102	ARCHITECTURAL SITE PLAN	12/22/09	01/13/10
4	S001	STRUCTURAL NOTES AND SCHEDULES	12/22/09	-----
5	S002	SPECIAL INSPECTIONS	-----	01/13/10
6	S101	STRUCTURAL PLANS	12/22/09	01/13/10
7	S201	STRUCTURAL DETAILS	12/22/09	01/13/10
8	A001	SYMBOLS LEGEND / WALL TYPES	12/22/09	-----
9	A101	FLOOR PLAN	12/22/09	01/13/10
10	A201	ADA ACCESSIBILITY PLAN / FIXTURE DIMENSION PLAN	12/22/09	01/13/10
11	A202	INTERIOR ELEVATIONS	12/22/09	01/13/10
12	A203	INTERIOR ELEVATIONS	-----	01/13/10
13	A301	EXTERIOR ELEVATIONS	12/22/09	01/13/10
14	A302	EXTERIOR ELEVATIONS	12/22/09	01/13/10
15	A401	BUILDING SECTION "A" / ENLARGED DETAILS	12/22/09	01/13/10
16	A501	ROOF PLAN	12/22/09	01/13/10
17	A601	SCHEDULES / DOOR & WINDOW ELEVATIONS / DETAILS	12/22/09	01/13/10
18	P001	PLUMBING GENERAL INFORMATION	12/22/09	-----
19	P002	PLUMBING GENERAL INFORMATION	12/22/09	-----
20	P101	PLUMBING PLAN, DETAILS AND SCHEDULES	12/22/09	-----
21	M001	MECHANICAL GENERAL INFORMATION	12/22/09	-----
22	M002	MECHANICAL GENERAL INFORMATION	12/22/09	-----
23	MH101	MECHANICAL PLAN, DETAILS AND SCHEDULES	12/22/09	-----
24	E001	G.P.N., LEGEND, SHEET INDEX AND ABBREVIATIONS	12/22/09	-----
25	ES101	ELECTRICAL SITE PLAN	12/22/09	-----
26	E101	ELECTRICAL FLOOR PLANS	12/22/09	-----
27	E601	ELECTRICAL DETAIL, ONE-LINE DIAGRAM AND SCHEDULES	12/22/09	-----

DEFERRED SUBMITTALS:

PRE-ENGINEERED TRUSS SHOP DRAWINGS; APPROXIMATE DATE OF SUBMITTAL: FEBRUARY 20, 2010

STATE OF UTAH
1-21-10
NO. 135313
KELLY D. CHRISTOFFERSEN
REGISTERED ARCHITECT

VICINITY MAP

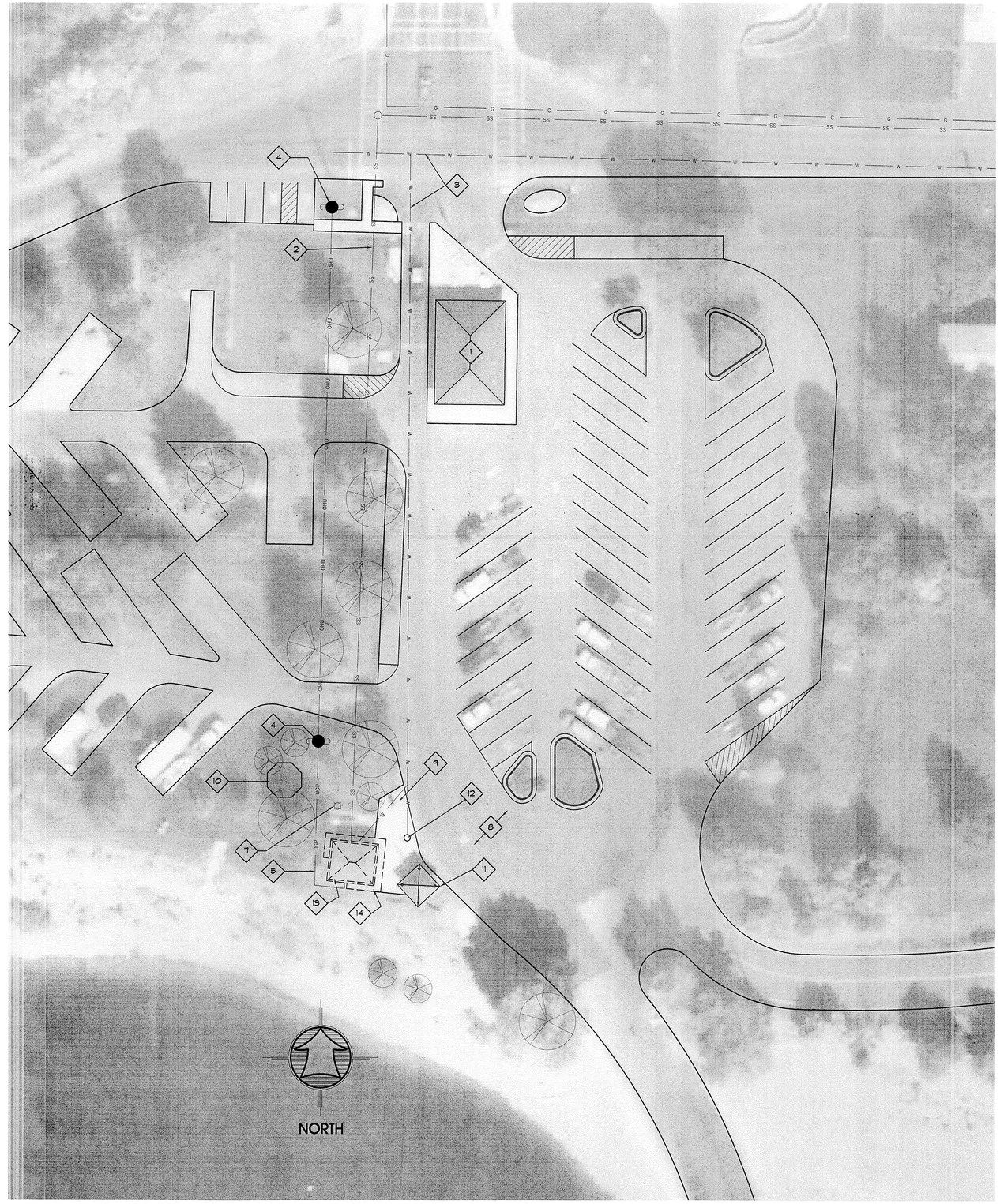


SYMBOLS LEGEND

G — G	EXISTING GAS LINE
SS — SS	EXISTING SEWER LINE
W — W	EXISTING WATER LINE
OHU	EXISTING OVERHEAD POWER LINE
UGP — UGP	EXISTING UNDERGROUND POWER LINE
	EXISTING POWER POLE
	EXISTING LIGHT POLE
	EXISTING TREE

FINISH FLOOR NOTES:

EXISTING RESTROOM FINISH FLOOR ELEVATION = 100'-0"
NEW RESTROOM FINISH FLOOR ELEVATION = 100'-6"



CONSTRUCTION NOTES

1. ALL CONSTRUCTION TO MEET CITY STANDARDS AND SPECIFICATIONS.

2. CONTRACTOR IS RESPONSIBLE TO CONTACT BLUE STAKES PRIOR TO ANY EXCAVATION TO DETERMINE THE EXACT LOCATION OF ALL UTILITIES. CONTRACTOR IS ALSO RESPONSIBLE TO PROTECT & MAINTAIN ALL UTILITIES DURING WORK ON THIS PROJECT.

3. EXISTING UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD VERIFIED PRIOR TO THE BEGINNING OF CONSTRUCTION.

4. EXISTING ELECTRICAL, SEWER AND WATER SERVICES SHALL BE RECONNECTED TO NEW RESTROOMS DURING CONSTRUCTION. CONNECT SEWER AND WATER SERVICES PER CITY STANDARDS AND SPECIFICATIONS.

5. NEW GAS SERVICE SHALL BE INSTALLED AS SHOWN. CONNECT NEW GAS SERVICE AS REQUIRED TO EXISTING GAS MAIN IN 300 SOUTH STREET. COORDINATE INSTALLATION WITH QUESTAR GAS PRIOR TO CONSTRUCTION.

6. EXISTING SITE ASPHALT AND CONCRETE THAT REQUIRES DEMOLITION FOR THE CONSTRUCTION OF THE NEW RESTROOM SHALL BE PATCHED AS REQUIRED.

7. EXISTING LANDSCAPING THAT GETS DAMAGED OR REQUIRES DEMOLITION FOR THE CONSTRUCTION OF THE NEW RESTROOM SHALL BE REPLACED.

KEY NOTES

1. EXISTING OFFICE BUILDING TO REMAIN UNDISTURBED
2. EXISTING SEWER LINE TO REMAIN UNDISTURBED
3. EXISTING WATER LINE TO REMAIN UNDISTURBED
4. EXISTING POWER POLE TO REMAIN UNDISTURBED
5. EXISTING UNDERGROUND POWER LINE, SEE NOTE: 4 ABOVE
6. NOT USED
7. EXISTING LIGHT POLE TO REMAIN UNDISTURBED
8. EXISTING ASPHALT TO REMAIN UNDISTURBED
9. EXISTING CONCRETE SLAB TO REMAIN UNDISTURBED
10. EXISTING FIRE PIT TO REMAIN UNDISTURBED
11. EXISTING FISH CLEANING STATION TO REMAIN UNDISTURBED
12. EXISTING DRINKING FOUNTAIN TO BE ABANDON
13. EXISTING RESTROOM BUILDING TO BE DEMOLISHED AND REMOVED FROM SITE AS REQUIRED FOR NEW RESTROOM CONSTRUCTION.
14. EXISTING CONCRETE SIDEWALKS TO BE REMOVED AS REQUIRED FOR NEW RESTROOM CONSTRUCTION.

REV#:	REVISION DESCRIPTION:	DATE:
R1	REVISED AS PER REVIEW COMMENTS	1-13-10

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Professional Seal:

STATE OF UTAH
KELLY D. CHRISTOFFERSEN
#136313
1-21-10
LICENSED ARCHITECT

Project Title:

HYRUM STATE PARK RESTROOM REPLACEMENT

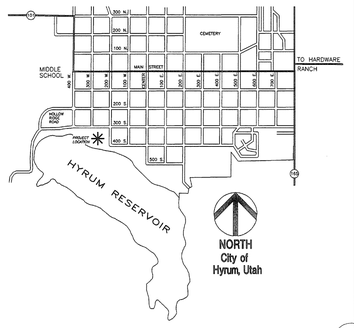
Hyrum, Utah

Sheet Title:

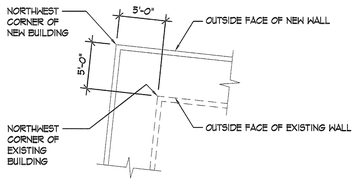
DEMOLITION PLAN

Drawn By: Courtney Wallace	Project Number: 09-126	DFCM Project Number: 09198510
Designed By: Courtney Wallace	Date: December 26, 2009	Sheet Number: AS101
Reviewed By: Kelly Christoffersen	Sheet Scale: 1" = 30'-0"	1 of 2

VICINITY MAP



BUILDING PLACEMENT DETAIL



SYMBOLS LEGEND

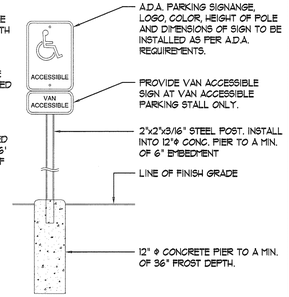
G	EXISTING GAS LINE
G	PROPOSED GAS LINE
SS	EXISTING SEWER LINE
W	EXISTING WATER LINE
OHU	EXISTING OVERHEAD POWER LINE
UGP	EXISTING UNDERGROUND POWER LINE
UGP	PROPOSED UNDERGROUND POWER LINE
	EXISTING POWER POLE
	EXISTING LIGHT POLE
	EXISTING TREE

FINISH FLOOR NOTES:

EXISTING RESTROOM FINISH FLOOR ELEVATION = 100'-0"
NEW RESTROOM FINISH FLOOR ELEVATION = 100'-6"

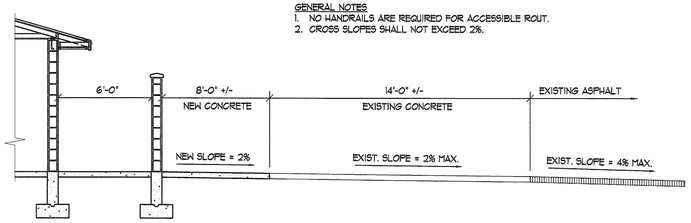
SIGNAGE DETAIL

GENERAL NOTES
1. SIGNAGE SHALL BE IN ACCORDANCE WITH IBC 1110 AND ANSI A117-1
2. SIGN SHOULD BE PROPERLY CENTERED AT FRONT OF PARKING SPACE.
3. SIGN FACE SHOULD BE LOCATED NO FURTHER THAN 6' FROM THE FRONT OF EACH PARKING SPACE WITH A MIN. 3'-0" CLEAR.



ACCESSIBLE ROUT SECTION

GENERAL NOTES
1. NO HANDRAILS ARE REQUIRED FOR ACCESSIBLE ROUT.
2. CROSS SLOPES SHALL NOT EXCEED 2%.



CONSTRUCTION NOTES

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KEY NOTES

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2. EXISTING SEWER LINE TO REMAIN UNDISTURBED
3. EXISTING WATER LINE TO REMAIN UNDISTURBED
4. EXISTING POWER POLE TO REMAIN UNDISTURBED
5. RELOCATED UNDERGROUND POWER LINE
6. NOT USED
7. NEW 6'-0" WIDE CONCRETE SIDEWALK, 4" CONCRETE OVER 4" WASHED GRAVEL.
8. EXISTING ASPHALT TO REMAIN UNDISTURBED
9. EXISTING CONCRETE SLAB TO REMAIN UNDISTURBED
10. EXISTING FIRE PIT TO REMAIN UNDISTURBED
11. EXISTING FISH CLEANING STATION TO REMAIN UNDISTURBED
12. EXISTING DRINKING FOUNTAIN TO BE ABANDON
13. NEW RESTROOM BUILDING
14. NEW CONCRETE 4" THICK CONCRETE OVER 4" WASHED GRAVEL.
15. NEW "PRIVATE" GAS LINE. CONNECT PAST EXISTING GAS METER AT OFFICE BUILDING. COORDINATE WITH QUESTAR PRIOR TO CONSTRUCTION. SEE NOTE. 5 ABOVE
16. LINE OF EXISTING BUILDING. NEW NORTHWEST BUILDING CORNER SHALL BE 5'-0" AWAY FROM OUTSIDE LINE OF EXISTING BUILDING. SEE ENLARGED BUILDING PLACEMENT DETAIL THIS SHEET.
17. ACCESSIBLE PARKING SIGNAGE, SEE DETAIL THIS SHEET.
18. ACCESSIBLE ROUT, SEE ACCESSIBLE ROUTE SECTION THIS SHEET.
19. VAN ACCESSIBLE PARKING STALL

REV#:	REVISION DESCRIPTION:	DATE:
R1	REVISED AS PER REVIEW COMMENTS	1-13-10

Skyline A/E/S, INC.
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Professional Seal:

STATE OF UTAH
KELLY D. CHRISTOFFERSEN
#136313
1-21-10
LICENSED ARCHITECT

Project Title:

HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

ARCHITECTURAL SITE PLAN

Drawn By: Courtney Wallace	Project Number: 09-126	DFCM Project Number: 09198510
Designed By: Courtney Wallace	Date: December 22, 2009	Sheet Number: AS102
Reviewed By: Kelly Christoffersen	Sheet Scale: 1" = 30'-0"	2 of 2

GENERAL

1. THE STRUCTURAL NOTES ARE INTENDED TO COMPLEMENT THE PROJECT SPECIFICATIONS. SPECIFIC NOTES AND DETAILS IN THE DRAWINGS SHALL GOVERN OVER THE STRUCTURAL NOTES AND TYPICAL DETAILS.
2. TYPICAL DETAILS AND SECTIONS SHALL APPLY WHERE SPECIFIC DETAILS ARE NOT SHOWN
3. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS AND DIMENSIONS. IF ACTUAL CONDITIONS DIFFER FROM THOSE SHOWN IN THE CONTRACT DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE FABRICATION OR CONSTRUCTION OF ANY EFFECTED ELEMENTS.
4. OMISSIONS OR CONFLICTS BETWEEN THE CONTRACT DRAWINGS AND/OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH ANY WORK INVOLVED. IN CASE OF CONFLICT, FOLLOW THE MOST STRINGENT REQUIREMENT AS DIRECTED BY THE ARCHITECT/ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
5. THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST TO THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH ANY CHANGES, SUBSTITUTIONS OR MODIFICATIONS. ANY WORK DONE BY THE CONTRACTOR BEFORE RECEIVING WRITTEN APPROVAL WILL BE AT THE CONTRACTOR'S RISK.
6. THE CONTRACTOR SHALL COORDINATE WITH ALL TRADES ANY ITEMS THAT ARE TO BE INTEGRATED INTO THE STRUCTURAL SYSTEM SUCH AS OPENINGS, PENETRATIONS, MECHANICAL AND ELECTRICAL EQUIPMENT, ETC. SIZES AND LOCATIONS OF MECHANICAL AND OTHER EQUIPMENT THAT DIFFERS FROM THOSE SHOWN ON THE CONTRACT DRAWINGS SHALL BE REPORTED TO THE ARCHITECT/ENGINEER.
7. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND BRACING AS REQUIRED FOR HIS METHOD OF ERECTION. SHORING AND BRACING SHALL REMAIN IN PLACE UNTIL FINAL CONNECTIONS FOR THE PERMANENT MEMBERS ARE COMPLETED. THE BUILDING SHALL NOT BE CONSIDERED STABLE UNTIL ALL CONNECTIONS ARE COMPLETED. WALLS SHALL NOT BE CONSIDERED SELF SUPPORTING AND SHALL BE BRACED UNTIL THE FLOOR/ROOF SYSTEM IS COMPLETED.
8. SITE OBSERVATIONS BY SKYLINE A/E/S/ INC'S FIELD REPRESENTATIVE SHALL NOT BE CONSTRUED AS APPROVAL OF CONSTRUCTION PROCEDURES NOR SPECIAL INSPECTION.
9. DETAILING AND SHOP DRAWING PRODUCTION FOR STRUCTURAL ELEMENTS WILL REQUIRE INFORMATION (INCLUDING DIMENSIONS) CONTAINED IN THE ARCHITECTURAL, STRUCTURAL AND/OR OTHER CONSULTANTS' DRAWINGS. THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE ARCHITECTURAL AND OTHER CONSULTANT'S DRAWINGS. SOME DIMENSIONS AND ELEMENTS SUCH AS ELEVATIONS, DEPRESSIONS, SLOPES, MECHANICAL HOUSEKEEPING PADS, ETC. MAY NOT BE SHOWN IN THE STRUCTURAL DRAWINGS.
10. REVIEW OF SHOP DRAWING SUBMITTALS BY SKYLINE A/E/S INC. IS FOR GENERAL COMPLIANCE ONLY AND IS NOT INTENDED FOR APPROVAL. THE SHOP DRAWING REVIEW SHALL NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF COMPLETING THE PROJECT ACCORDING TO THE CONTRACT DOCUMENTS.
11. SHOP DRAWINGS MADE FROM REPRODUCTIONS OF THE CONTRACT DRAWINGS WILL BE REJECTED UNLESS THE CONTRACTOR SIGNS A RELEASE AGREEMENT PRIOR TO THE SHOP DRAWINGS BEING REVIEWED.

BASIS OF DESIGN

1. GOVERNING BUILDING CODE: 2006 INTERNATIONAL BUILDING CODE

2. ROOF SNOW LOAD. . . . . .37 PSF
   ROOF COLLATERAL LOAD. . . . . .0 PSF
   ROOF DEAD LOAD. . . . . .15 PSF

3. SEISMIC LOADS
   SEISMIC DESIGN CATAGORY. . . . .D
   SOILS SITE CLASS. . . . . .D
   S_{D1} 0.432
   S_{DS} 0.810
   Cs. . . . . .0.113 (ASD)
   W. . . . . .DEAD LOADS OF STRUCTURE PLUS 20% OF SNOW LOAD
   BASE SHEAR. . . . . .Vs = CsW = .113W (ASD)
   IMPORTANCE FACTOR. . . . . . . .I = 1.00
   BUILDING TYPE. . . . . .R = 5.0

4. WIND LOADS LOADS
   BASIC WIND VELOCITY. . . . . . .90 MPH (3 SEC. GUST)
   EXPOSURE TYPE. C
   IMPORTANCE FACTOR. 1.00

FOUNDATION

1. SOILS INVESTIGATION REPORT: SKYLINE AES, INC.
2. SOIL BEARING PRESSURE: 2000 PSF
3. FROST PROTECTION: 36 INCHES MINIMUM
4. CLEAR EXCAVATIONS OF DEBRIS AND LOOSE SOIL PRIOR TO PLACING FOOTINGS. ALL FOOTINGS SHALL BEAR ON UNDISTURBED NATURAL SUB-GRADE OR ENGINEERED COMPACTED FILL AS NOTED IN THESE DRAWINGS.

EARTHWORK

1. CLEARING: THE ENTIRE BUILDING AREA SHALL BE SCRAPED TO REMOVE THE TOP 4 INCHES OF SOIL, INCLUDING ALL VEGETATION AND DEBRIS.
2. PROOF ROLLING: THE NATURAL UNDISTURBED SOIL BELOW ALL FOOTINGS SHALL BE PROOF ROLLED PRIOR TO PLACING CONCRETE. REMOVE ALL SOFT SPOTS AND REPLACE WITH COMPACTED STRUCTURAL FILL.
3. COMPACTED STRUCTURAL FILL: ALL FILL MATERIAL SHALL BE A WELL-GRADED GRANULAR MATERIAL WITH A MAXIMUM SIZE LESS THAN 4 INCHES AND WITH NOT MORE THAN 10 PERCENT PASSING A NO. 200 SIEVE. IT SHALL BE COMPACTED TO 95 PERCENT OF THE MAXIMUM LABORATORY DENSITY AS DETERMINED BY ASTM D 1557. ALL FILL SHALL BE TESTED.
4. CONSULT THE PROJECT SPECIFICATIONS FOR FURTHER EARTHWORK REQUIREMENTS.

CONCRETE

1. MATERIALS, UNLESS NOTED OTHERWISE:
   A. NORMAL WEIGHT AGGREGATES. . . . . ASTM C 33
   B. LIGHT WEIGHT AGGREGATES. . . . . ASTM C 330
   LIGHTWEIGHT CONCRETE SHALL NOT EXCEED 110 POUNDS PER CUBIC FOOT AND SHALL BE MADE OF LIGHTWEIGHT COURSE AGGREGATES AND A BLEND OF LIGHTWEIGHT AND NORMAL WEIGHT FINES.
   C. REINFORCING STEEL ASTM 615 GRADE 60 (FY = 60 KSI), USE GRADE 40 (FY = 40 KSI) FOR FIELD BENT DOWELS WITH SPACINGS INDICATED REDUCED BY 1/3.
   D. DEFORMED BAR ANCHORS (DBA). . . . . ASTM A496
   E. HEADED STUD ANCHORS (HSA). . . . . ASTM A108
   F. ANCHOR BOLTS: ASTM A307 WITH ASTM A563 HEAVY HEX NUTS WITH HARDENED WASHERS
   G. ADMIXTURES: AIR-ENTRAINING ADMIXTURES, COMPLY WITH ASTM C 260 (WHEN USED). CALCIUM CHLORIDE SHALL NOT BE ADDED TO THE CONCRETE MIX.
   H. NO ALUMINUM CONDUIT OR PRODUCT CONTAINING ALUMINUM OR ANY OTHER MATERIAL INJURIOUS TO CONCRETE SHALL BE EMBEDDED IN CONCRETE.
2. COMPRESSIVE STRENGTHS OF CONCRETE AT 28 DAYS SHALL BE AS FOLLOWS:
   A. FOOTINGS. 3000 PSI
   B. INTERIOR SLABS ON GRADE. . . . . 3000 PSI
   C. FOUNDATION WALLS. . . . . 4000 PSI
   D. COLUMNS. 4000 PSI
   E. JOISTS, BEAMS AND SUSPENDED SLABS. . . . . 4000 PSI
   F. TILT UP WALL PANELS. . . . . 4000 PSI
   G. NORMAL WEIGHT CONCRETE OVER STEEL DECK. . . . . 3500 PSI
   H. ALL SITE CAST CONCRETE. . . . . 4500 PSI
3. 2-1/2" THICK (4" OVERALL) NORMAL WEIGHT CONCRETE SLAB SHALL BE POURED OVER THE STEEL DECK. REINFORCE SLAB WITH 6" X 6" - W1.4/W1.4 WELDED WIRE FABRIC MINIMUM, UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL BE PLACED 1" TO 1-1/2" BELOW THE TOP OF THE SLAB
4. ONLY ONE GRADE OR TYPE OF CONCRETE SHALL BE POURED ON THE SITE AT ANY GIVEN TIME.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, DETAILING, CARE, PLACEMENT AND REMOVAL OF ALL FORM WORK AND SHORES.
   A. SUPPORTING FORMS AND SHORING SHALL NOT BE REMOVED UNTIL STRUCTURAL MEMBERS HAVE ACQUIRED SUFFICIENT STRENGTH TO SAFELY SUPPORT THEIR OWN WEIGHT AND ANY CONSTRUCTION LOAD TO WHICH THEY MAY BE SUBJECTED. IN NO CASE, HOWEVER,SHALL FORMS AND SHORING BE REMOVED IN LESS THAN 24 HOURS AFTER CONCRETE PLACEMENT.
   B. SUSPENDED SLABS SHALL BE RESUPPORTED AFTER FORM REMOVAL UNTIL CONCRETE REACHES ITS 28 DAY SPECIFIED COMPRESSIVE STRENGTH.
6. REINFORCEMENT SHALL HAVE THE FOLLOWING CONCRETE COVER:

CAST-IN-PLACE CONCRETE: — CLEAR COVER
- A. CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH. . . . . .3"
- B. FORMED CONCRETE EXPOSED TO EARTH OR WEATHER:
  - #6 THRU #18 BARS. . . . . .2"
  - #5 AND SMALLER BARS. . . . . .1-1/2"
- C. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
  - SLABS, WALLS, JOISTS; #11 BARS AND SMALLER. . . . . .3/4"
  - BEAMS, COLUMNS: PRIMARY REINF., TIES, STIRRUPS, SPIRALS. . . . . . .1-1/2"
  - CONCRETE TILT-UP PANELS (MANUFACTURED UNDER PLANT CONTROLLED CONDITIONS)
    - #8 BARS AND SMALLER. . . . . .1"
    - #9 THRU #18 BARS. . . . . .1-1/2"

PRE-CAST CONCRETE:
- A. CONCRETE EXPOSED TO EARTH OR WEATHER:
  - WALL PANELS:
    - #11 BARS AND SMALLER. . . . . .3/4"
    - #14 AND #18 BARS. . . . . .1-1/2"
  - OTHER MEMBERS:
    - #11 BARS AND SMALLER. . . . . .1-1/2"
    - #14 AND #18 BARS. . . . . .2"
- B. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
  - SLABS, WALLS, JOISTS:
    - #11 BARS AND SMALLER. . . . . .5/8"
    - #14 AND #18 BARS. . . . . .1-1/2"
  - BEAMS, COLUMNS:
    - PRIMARY REINFORCEMENT. . . . . .1-1/2"
    - TIES, STIRRUPS, SPIRALS. . . . . .3/8"

7. CONSTRUCTION JOINTS AND CONTROL JOINTS:
   A. PROVIDE A FORMED AND BEVELED 2 X 4 X CONTINUOUS KEYWAY IN ALL HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS INCLUDING BETWEEN TOP OF FOOTING AND FOUNDATION WALLS. IN ADDITION, ALL JOINTS SHALL BE INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY 1/4 INCH.
   B. CONTROL JOINTS SHALL BE INSTALLED IN SLABS ON GRADE SO THE LENGTH TO WIDTH RATIO OF THE SLAB IS NO MORE THAN 1.25:1. CONTROL JOINTS SHALL BE COMPLETED WITHIN 12 HOURS OF CONCRETE PLACEMENT. CONTROL JOINTS MAY BE INSTALLED BY: SAW CUT A DEPTH OF 1/4 THE THICKNESS OF THE SLAB TOOLED JOINTS A DEPTH OF 1/4 THE THICKNESS OF THE SLAB
   C. INSTALL CONSTRUCTION OR CONTROL JOINTS IN SLABS ON GRADE AT A SPACING NOT TO EXCEED 30 TIMES THE SLAB THICKNESS IN ANY DIRECTION FOR UNREINFORCED SLABS AND 75 TIMES THE SLAB THICKNESS IN ANY DIRECTION FOR REINFORCED SLABS, UNLESS NOTED OTHERWISE. CONSTRUCTION JOINTS SHALL NOT EXCEED A DISTANCE OF 125'-0" O.C. IN ANY DIRECTION.

CONCRETE CONTINUED

8. CONSTRUCTION
   A. USE CHAIRS OR OTHER SUPPORT DEVICES RECOMMENDED BY THE CRSI TO SUPPORT AND TIE REINFORCEMENT BARS AND WWF PRIOR TO PLACING CONCRETE. WWF SHALL BE CONTINUOUSLY SUPPORTED AT 36" O.C. MAXIMUM. REINFORCING STEEL FOR SLABS ON GRADE SHALL BE ADEQUATELY SUPPORTED ON PRECAST CONCRETE UNITS. LIFTING THE REINFORCING OFF THE GRADE DURING PLACEMENT OF CONCRETE IS NOT PERMITTED
   B. CONTRACTOR SHALL COORDINATE PLACEMENT OF ALL OPENINGS, CURBS, DOWELS, SLEEVES, CONDUITS, BOLTS, INSERTS AND OTHER EMBEDDED ITEMS PRIOR TO CONCRETE PLACEMENT.
   C. ALL EMBEDS AND DOWELS SHALL BE SECURELY TIED TO FORM WORK OR TO ADJACENT REINFORCING PRIOR TO THE PLACEMENT OF CONCRETE.
   D. NO PIPES, DUCTS, SLEEVES, ETC SHALL BE PLACED IN STRUCTURAL CONCRETE UNLESS SPECIFICALLY DETAILED OR APPROVED BY THE STRUCTURAL ENGINEER. PENETRATIONS THROUGH WALLS, WHEN APPROVED, SHALL BE BUILT INTO THE WALL PRIOR TO CONCRETE PLACEMENT. PENETRATIONS WILL NOT BE ALLOWED IN FOOTINGS OR GRADE BEAMS UNLESS DETAILED. PIPING SHALL BE ROUTED AROUND THESE ELEMENTS AND FOOTINGS STEPPED TO AVOID PIPING.
   E. REINFORCING BARS SHALL NOT BE WELDED UNLESS SPECIFICALLY SHOWN ON DRAWINGS. IN SUCH CASES, USE ONLY AWS STANDARDS. DO NOT SUBSTITUTE REINFORCING BARS FOR DBAS OR HSAS.
9. DETAILING:
   A. LAP LENGTHS SHALL BE AS FOLLOWS:
      FOR F'C = 3000 PSI
      #6 AND SMALLER 44 BD.
      #7 AND LARGER 55 BD.
      FOR F'C = 4000 PSI
      #6 AND SMALLER 38 BD.
      #7 AND LARGER 47 BD.
   B. AT JOINTS PROVIDE REINFORCING DOWELS TO MATCH THE MEMBER REINFORCING, UNLESS NOTED OTHERWISE.
   C. AT ALL DISCONTINUOUS CONTROL OR CONSTRUCTION SLAB ON GRADE JOINTS, PROVIDE 2 - #4 X 48 INCHES.
   D. PROVIDE CORNER BARS AT INTERSECTING WALL CORNERS USING THE SAME BAR SIZE AND SPACING AS THE HORIZONTAL WALL REINFORCING.
   E. ALL VERTICAL REINFORCING SHALL BE DOWELED TO FOOTINGS, OR TO THE STRUCTURE BELOW WITH THE SAME SIZE AND SPACING AS THE VERTICAL REINFORCING FOR THE ELEMENT ABOVE. DOWELS EXTENDING INTO FOOTINGS SHALL TERMINATE WITH A 90 DEGREE STANDARD HOOK AND SHALL EXTEND TO WITHIN 4" OF THE BOTTOM OF THE FOOTING. FOOTING DOWELS (#8 BARS AND SMALLER) WITH HOOKS NEED NOT EXTEND MORE THAN 20" INTO FOOTINGS.
   F. HORIZONTAL WALL REINFORCING SHALL TERMINATE AT ENDS OF WALLS AND OPENINGS INTO THE FAR END OF THE JAMB COLUMN WITH A 90 DEGREE STANDARD HOOK PLUS A 6 BAR DIAMETER EXTENSION. . HORIZONTAL WALL REINFORCING SHALL BE CONTINUOUS THROUGH CONSTRUCTION AND CONTROL JOINTS. SPLICES IN HORIZONTAL REINFORCEMENT SHALL BE STAGGERED. SPLICES IN TWO CURTAINS WHERE USED SHALL NOT OCCUR IN THE SAME LOCATION.
   G. PROVIDE 2- #5 BARS AROUND ALL OPENINGS LARGER THAN 8 INCHES IN ANY DIRECTION AND SMALLER THAN 36 INCHES, UNLESS NOTED OTHERWISE. EXTEND REINFORCING BARS A MINIMUM OF 24" BEYOND THE CORNER OF THE OPENINGS. WHERE 24" IS NOT AVAILABLE, EXTEND BARS AS FAR BEYOND THE OPENING AS POSSIBLE AND TERMINATE THEM WITH A 90 STANDARD HOOK. FOR LARGER UNREINFORCED OPENINGS CONTACT THE ENGINEER.
   H. PROVIDE 2-#5 X 4'-0" DIAGONAL BARS (OR 1 - #7 X 4'-0" BAR IN 10" WALLS AND THINNER) AT THE CORNERS OF ALL OPENINGS. DIAGONAL BARS SHALL BE CENTERED ON THE CORNER OF THE OPENING. ALL RECESSES IN CONCRETE WALLS THAT INTERRUPT REINFORCING STEEL SHALL BE REINFORCED THE SAME AS AN OPENING.

MASONRY

1. MATERIALS, UNLESS NOTED OTHERWISE:
   A. CONCRETE MASONRY UNITS (CMU):
   LIGHTWEIGHT GRADE N, TYPE I (MINIMUM UNIT STRENGTH OF 2100 PSI). FM = 1800 PSI
   B. HOLLOW CLAY UNITS: HOLLOW BRICK, GRADE I (MINIMUM UNIT STRENGTH OF 3,000 PSI) FM = 1800 PSI
   C. SOLID CLAY UNITS: GRADE SW (MINIMUM UNIT STRENGTH OF 3000 PSI). FM = 1800 PSI)
   D. MORTAR: USE TYPE "S" (1800 PSI MINIMUM COMPRESSIVE STRENGTH FOR FIELD SPECIMENS)
   E. GROUT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI AT 28 DAYS.
   F. REINFORCING STEEL. . . . . . . .ASTM 615 GRADE 60 (FY = 60 KSI)
   G. DEFORMED BAR ANCHORS (DBA). . .ASTM A496
   H. HEADED STUD ANCHORS (HSA). . . .ASTM A108
   I. ANCHOR BOLTS. . . . . .ASTM A307 WITH ASTM A563 HEAVY HEX NUTS HARDENED WASHERS
2. REINFORCEMENT SHALL HAVE THE FOLLOWING COVER:
   A. JOINT REINFORCEMENT SHALL HAVE NOT LESS THAN 5/8" MORTAR COVERAGE FROM THE EXPOSED FACE.
   B. OTHER REINFORCEMENT SHALL HAVE A MINIMUM COVERAGE OF ONE BAR DIAMETER OVER ALL THE BARS, BUT NOT LESS THAN 3/4". WHEN MASONRY IS EXPOSED TO SOIL, MINIMUM COVERAGE SHALL BE 1 1/2".
3. CONSTRUCTION REQUIREMENTS:
   A. ALL UNITS SHALL BE LAID WITH FULL MORTAR BEDS ON THE FACE SHELLS. ALL HEAD JOINTS SHALL BE FILLED SOLIDLY WITH MORTAR FOR A DISTANCE IN FROM THE FACE OF THE UNITS NOT LESS THAN THE THICKNESS OF THE LONGITUDINAL FACE SHELLS. CELLS WHICH ARE TO BE GROUTED SHALL HAVE FULL HEAD JOINTS.
   B. MASONRY WALLS, BEAMS AND COLUMNS SHALL BE CONSTRUCTED WITH RUNNING BOND, UNLESS NOTED OTHERWISE.
   C. ALL CELLS CONTAINING REINFORCEMENT, EMBEDS, ANCHOR BOLTS, ETC. SHALL BE FILLED SOLID WITH GROUT. GROUT SHALL BE PLACED BY MECHANICAL VIBRATION DURING PLACING AND REVIBRATED AFTER EXCESS MOISTURE HAS BEEN ABSORBED BUT BEFORE WORKABILITY IS LOST. PUDDLING OF GROUT IS NOT ALLOWED.
   D. WHERE WALLS ARE NOT GROUTED SOLID, EACH GROUT POUR SHALL TERMINATE FLUSH WITH THE TOP OF THE UPPERMOST UNIT EXCEPT AT CELLS WITH VERTICAL REINFORCING WHERE THE GROUT SHALL BE 1-1/2 INCHES BELOW TOP OF UNIT TO PROVIDE CONSTRUCTION KEY.
   E. GROUT POURS SHALL BE LIMITED TO 4'-0" UNLESS HIGH LIFT GROUTING PROCEDURES ARE FOLLOWED.
   F. VERTICAL CELLS TO BE FILLED WITH GROUT SHALL HAVE VERTICAL ALIGNMENT SUFFICIENT TO MAINTAIN A CLEAR, UNOBSTRUCTED VERTICAL CELL MEASURING NOT LESS THAN 2 INCHES BY 3 INCHES. ALL STEEL REINFORCEMENT SHALL BE SECURED AGAINST DISPLACEMENT PRIOR TO GROUTING BY WIRE POSITIONERS OR OTHER SUITABLE DEVICES AT INTERVALS NOT EXCEEDING 200 BAR DIAMETERS OR 10 FEET MAXIMUM, OR AT BAR SPLICE LOCATIONS. VERTICAL REINFORCING SHALL BE LOCATED AT THE CENTER OF THE WALL UNLESS NOTED OTHERWISE
   G. REINFORCING BARS SHALL NOT BE WELDED UNLESS SPECIFICALLY SHOWN ON DRAWINGS. IN SUCH CASES, USE ONLY AWS STANDARDS. DO NOT SUBSTITUTE REINFORCING BARS FOR DBAS OR HSAS.
   H. CONTROL JOINTS: SPACING SHALL NOT EXCEED 40'-0". SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS.
   I. GROUT ALL BEAM AND JOIST POCKETS SOLID AFTER INSTALLATION OF BEAMS AND JOISTS.
   J. EMBED CHANNELS AND PLATES SHALL BE PLACED SO AS TO CREATE A FLUSH SURFACE WITH THE FACE OF THE WALL.
   K. ANCHOR BOLTS AND HEADED STUD ANCHORS SHALL BE SET IN A GROUTED CELL. ANCHOR BOLTS AND HEADED STUD ANCHORS SHALL HAVE 1" GROUT SURROUNDING THE SHANK AT ITS PENETRATION. GROUT SHALL BE FLUSH WITH THE FACE OR TOP OF THE MASONRY.
4. DETAILING REQUIREMENT
   A. LAP ALL MASONRY REINFORCING A MINIMUM OF 48 BAR DIAMETERS WITH A MINIMUM LAP OF 24". JOINT REINFORCEMENT SHALL LAP A MINIMUM OF 6".
   B. ALL VERTICAL REINFORCING SHALL BE DOWELED TO THE FOUNDATION WALL, FOOTING (STRUCTURE BELOW) AND TO THE STRUCTURE BELOW WITH THE SAME SIZE DOWEL, SPACING (AND IN THE SAME CORE) AS THE VERTICAL WALL REINFORCING ABOVE.
   C. CORNER BARS: HORIZONTAL REINFORCEMENT SHALL BE CONTINUOUS AT ALL CORNERS AND AT INTERSECTING WALLS. PROVIDE CORNER BARS WITH THE REQUIRED LAP SPLICE LENGTH.
   D. WALL OPENINGS 24" WIDE AND WIDER: PROVIDE REINFORCED MASONRY LINTELS PER MASONRY LINTEL SCHEDULE OVER THE TOP OF, AND 2-#5 BARS, IN GROUTED SPACES, ON ALL SIDES AND ADJACENT TO EVERY UNSCHEDULED OPENING, UNLESS NOTED OTHERWISE. BARS FOR ALL OPENINGS SHALL EXTEND A MINIMUM OF 48 BAR DIAMETERS BEYOND THE CORNERS OF THE OPENING. VERTICAL BARS SHALL EXTEND FROM FLOOR LEVEL BELOW TO THE FLOOR, OR ROOF, LEVEL ABOVE. WHERE A 48 BAR DIAMETER EXTENSION IS NOT POSSIBLE, EXTEND BARS AS FAR BEYOND THE OPENING AS POSSIBLE AND TERMINATE THEM WITH A 90 DEGREE STANDARD ACI HOOK.
   E. HORIZONTAL WALL REINFORCING SHALL BE CONTINUOUS THROUGH JOINING CONCRETE WALLS, MASONRY WALLS, COLUMNS, AND PILASTERS. PROVIDE A KEY BETWEEN THE WALL AND THE COLUMN OR PILASTER. HORIZONTAL WALL REINFORCING SHALL BE PLACED INSIDE THE COLUMN VERTICAL REINFORCING.
   F. HORIZONTAL WALL REINFORCING SHALL TERMINATE AT EACH SIDE OF CONTROL JOINTS EXCEPT AT FLOOR AND ROOF LEVEL BEAMS AND AT TOP OF PARAPETS.
   G. ALL MASONRY COLUMN TIES SHALL TERMINATE WITH 135 DEGREE HOOKS PLUS A 6 BAR DIAMETER EXTENSION (4" MINIMUM).
5. MASONRY STRENGTH VERIFICATION:
   A. MASONRY STRENGTH, FM SHALL BE VERIFIED USING THE "UNIT STRENGTH METHOD" PER ACI 530-05/ASCE 5-05/TMS 402-05 TABLE 1.15.1 AND AS DESCRIBED BELOW:
      I. PRIOR TO CONSTRUCTION, A LETTER OF STRENGTH CERTIFICATION FROM THE SUPPLIERS OF THE MASONRY UNITS AND GROUT SHALL BE SUBMITTED.
      II DURING CONSTRUCTION, THE GROUT AND MORTAR SHALL BE TESTED FOR EVERY 5,000 SQUARE FEET OF MASONRY CONSTRUCTED.

WOOD

1. MATERIALS:
   A. GLU-LAM BEAMS SHALL BE DOUGLAS-FIR COMBINATION NUMBER 24F-V4 EXCEPT CANTILEVERED AND CONTINUOUS BEAMS SHALL BE COMBINATION NUMBER 24F-V8.
   B. FRAMING LUMBER SHALL BE # 2 DOUGLAS FIR-LARCH OR BETTER UNLESS NOTED OTHERWISE.
   C. WOOD SHEATHING SHALL BE APA STRUCTURAL #2 OR OSB, INTERIOR GRADE WITH EXTERIOR GLUE, SPAN INDEX RATIO, UNLESS NOTED OTHERWISE:
      24/0 WALLS (7/16 INCH THICK)
      32/16 FLOORS (3/4 INCH THICK)
      48/24 ROOF (5/8 INCH THICK)
      PLACE FACE GRAIN OF SHEATHING PERPENDICULAR TO ROOF JOISTS AND STUDS. STAGGER 4'-0" SIDE JOINTS. BLOCK ALL EDGES WITH 2X4 MINIMUM FLAT.
   D. NAILS: STANDARD COMMON WITH THE FOLLOWING PROPERTIES:

NAIL SIZE	SHANK DIAMETER	MIN. PENETRATION INTO SUPPORT MEMBER
6d	0.113"	1.25"
8d	0.131"	1.50"
10d	0.148"	1.63"
12d	0.148"	1.63"
16d	0.162"	1.75"

   NAILING MACHINES OR FASTENERS OTHER THAN COMMON NAILS ARE NOT PERMITTED WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
   E. BOLTS SHALL BE ASTM A307 WITH ASTM A563 HEAVY HEX NUTS AND HARDENED WASHERS, GRADE A, UNLESS NOTED OTHERWISE.
   F. ALL LAMINATED VENEER LUMBER (LVL) SHALL BE FURNISHED BY TRUS-JOIST CORPORATION OR APPROVED EQUAL.
   G. ALL PREFABRICATED WOOD JOISTS SHALL BE TJI AS MANUFACTURED BY TRUS JOIST MACMILLAN CORP. OR BCI AS MANUFACTURED BY BOISE CASCADE CORP. ALL REQUIRED BLOCKING BRIDGING AND BRACING SHALL BE PROVIDED BY JOIST MANUFACTURER AND INSTALLED BY CONTRACTOR. ALL PENETRATIONS THROUGH THE JOISTS SHALL BE DONE PER MANUFACTURERS RECOMMENDATIONS AND REQUIREMENTS.

WOOD

2. ALL WOOD IN CONTACT WITH CONCRETE, MASONRY OR SOIL SHALL BE PRESSURE TREATED OR REDWOOD.
3. GENERAL FRAMING AND CARPENTRY SHALL BE CONNECTED AS PER IBC TABLE 2304.9.1, "MINIMUM NAILING SCHEDULE", UNLESS NOTED OTHERWISE.
4. ALL FRAMING ANCHORS, POST CAPS, HOLD DOWNS, COLUMN BASES, ETC. SHALL BE PROVIDED BY SIMPSON STRONG-TIE OR APPROVED EQUAL.
5. PROVIDE SOLID SHAPED BLOCKING AT LEAST 2 IN.(NOMINAL) THICK AND FULL DEPTH OF JOIST AT ENDS AND AT EACH SUPPORT OF JOIST. PROVIDE APPROVED BRIDGING AT A 8'-0" O.C. MAXIMUM BETWEEN JOIST END SUPPORTS. SOLID BLOCKING BETWEEN JOISTS SHALL BE NAILED TO THE WOOD PLATE AT THE TOP OF THE WALL WITH ONE SIMPSON "A35" FRAMING ANCHOR PER EACH PIECE OF BLOCKING. FILL ALL HOLES IN THE FRAMING ANCHORS WITH 8-D X 1-1/2" NAILS (12 NAILS PER A35).
6. BUILT-UP BEAMS OF 2X MEMBER 12 IN. OR LESS IN DEPTH SHALL BE SPIKED TOGETHER WITH NOT LESS THAN 16-D SPIKES AT TWELVE-INCH (12 IN.) CENTERS, STAGGERED. IF THE DEPTH OF BEAM IS MORE THAN TWELVE INCHES (12 IN.), THE MEMBERS SHALL BE CONNECTED TOGETHER WITH 1/2" DIAMETER BOLTS @ 24 IN. O.C. STAGGERED. BOLTS SHALL BE PLACED 1/4 THE DEPTH OF THE MEMBER FROM THE TOP AND BOTTOM OF THE MEMBER.
7. ALL WALLS SHALL HAVE A MINIMUM OF TWO TOP PLATES. SPLICES IN TOP PLATES SHALL BE STAGGERED A MINIMUM OF FOUR FEET FROM THE NEAREST SPLICE IN ADJOINING TOP PLATE.
8. PROVIDE A DOUBLE JOIST UNDER PARALLEL PARTITIONS.

PRE-FABRICATED METAL PLATE WOOD TRUSSES

1. THE PREFABRICATED METAL PLATE WOOD TRUSSES SHALL BE DESIGNED, SIGNED, AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE SAME STATE AS THE PROJECT LOCATION. THEY SHALL BE DESIGNED TO SUPPORT THE CONCENTRATED AND OTHER DISTRIBUTED LOADS AS SHOWN ON THE FRAMING PLANS IN ADDITION TO THE FOLLOWING UNIFORM LOADS:
   DEAD LOAD (TOP CHORD) = 10 PSF
   DEAD LOAD (BOTTOM CHORD) = 10 PSF
   LIVE LOAD (TOP CHORD) = 40 PSF
   60 PSF TOTAL LOAD
   CORRELATE THE DESIGN WITH ALL MECHANICAL EQUIPMENT, FIRE SPRINKLING SYSTEMS AND HANGING WALLS SUPPORTED BY THE TRUSSES. PROVIDE EXTRA TRUSSES WHERE REQUIRED.
2. DESIGN ALL WOOD TRUSSES AND BEARING ATTACHMENTS FOR WIND UPLIFT. ASSUME A DEAD LOAD OF 15 PSF TO RESIST UPLIFT.
3. LIMIT MAXIMUM STRESS INCREASE TO 15% FOR SNOW LOAD AND 33% FOR WIND LOAD.
4. ALL TRUSS TO TRUSS CONNECTIONS SHALL BE DESIGNED AND PROVIDED BY THE TRUSS MANUFACTURER.
5. DESIGN, HANDLING, ERECTION, AND PERMANENT BRACING OF METAL PLATE CONNECTED WOOD TRUSSES SHALL BE IN ACCORDANCE WITH ANSI/TPI-1, NATIONAL DESIGN STANDARD FOR METAL PLATED CONNECTED WOOD TRUSS CONSTRUCTION.
6. STEEL CONNECTOR PLATES:
   ALL STEEL GUSSET PLATES SHALL BE GALVANIZED AND SHALL BE APPROVED BY THE "RESEARCH COMMITTEE FOR THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS". SUBMIT A COPY OF THE ICBO REPORT FOR THE CONNECTOR PLATE USED. VALUES ESTABLISHED BY THIS COMMITTEE MUST BE INDICATED ON THE SHOP DRAWINGS.
   A. THE MINIMUM SIZE FOR ANY CONNECTOR SHALL BE 8 SQUARE INCHES.
   B. ALL STEEL GUSSET PLATES SHALL BE LOCATED ON THE JOINT AS THE STRESSES REQUIRE AND SHALL PROVIDE A MINIMUM BITE OF 2 1/2" LENGTH ON ALL TENSION MEMBERS.
   C. PLATES SHALL BE PRESSED OR ROLLED INTO MEMBER TO OBTAIN FULL PENETRATION WITHOUT CRUSHING THE OUTER SURFACES OF WOOD.
   D. ALL STEEL PLATE DIMENSIONS SHALL BE INCREASED BY 10% ABOVE THAT REQUIRED BY ANALYSIS. STRESS INCREASES FOR STEEL CONNECTOR PLATE VALUES FOR DURATION OF LOAD ARE NOT ALLOWED.
7. NO WANE, KNOTS, SKIPS, OR OTHER DEFECTS SHALL OCCUR IN THE PLATED CONTACT AREA OR SCARFED AREA OF WEB MEMBERS. PLATES SHALL BE CENTERED WITH ONE REQUIRED EACH SIDE OF WOOD TRUSS.
8. THE TRUSSES SHALL BE HANDLED AND STORED IN A MANNER TO PREVENT MOISTURE FROM BEING ABSORBED BY THE WOOD.
9. REQUIREMENTS FOR TRUSS STABILITY AND ERECTION SHALL COMPLY WITH THE TRUSS PLATE INSTITUTE PUBLICATIONS ENTITLED "COMMENTARY AND RECOMMENDATIONS FOR BRACING WOOD TRUSSES" AND "COMMENTARY AND RECOMMENDATIONS FOR HANDLING AND ERECTING WOOD TRUSSES." THE CONTRACTOR SHALL HAVE COPIES OF THESE PUBLICATIONS ON SITE AND SHALL BE FAMILIAR WITH THEIR CONTENTS.
10. SHOP DRAWINGS: COMPLETE CALCULATIONS AND SHOP DRAWINGS INDICATING ALL MEMBER FORCES, STRESSES, DURATION FACTORS, LUMBER GRADES, DIMENSIONS, TRUSS TO TRUSS CONNECTIONS, STEEL TRUSS PLATE SIZES AND LOCATIONS SHALL BE SUBMITTED AND REVIEWED BY THE ENGINEER BEFORE FABRICATION. EACH CONNECTOR SHALL BE DIMENSIONED ON THE SHOP DRAWINGS AS TO ITS EXACT LOCATION AT THE JOINT.

SPECIAL INSPECTIONS

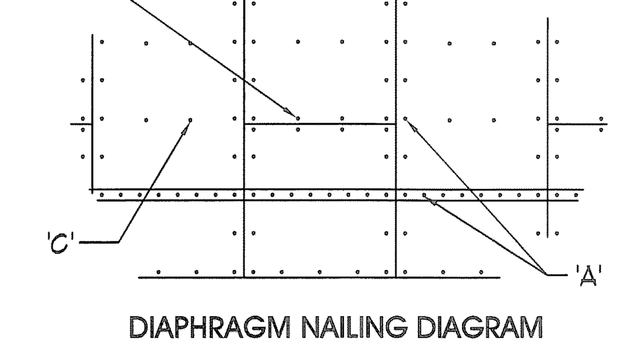
SPECIAL INSPECTION, AS REQUIRED BY TABLE 1704.4 OF THE IBC, SHALL BE PROVIDED BY AN INDEPENDENT AGENCY EMPLOYED BY THE OWNER UNLESS WAIVED BY THE BUILDING OFFICIAL. THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH THE REQUIRED INSPECTIONS. ITEMS REQUIRING SPECIAL INSPECTION ARE:
1. CONCRETE PLACEMENT
2. BOLTS INSTALLED IN CONCRETE
3. CONCRETE REINFORCING STEEL PLACEMENT
4. STRUCTURAL MASONRY AS REQUIRED BY THE CONTRACT DOCUMENTS. SEE MASONRY SECTION OF THE GENERAL STRUCTURAL NOTES AND MASONRY SCHEDULES FOR ADDITIONAL INFORMATION. SPECIAL INSPECTION SHALL BE PROVIDED DURING PREPARATION AND TAKING OF ANY REQUIRED PRISMS OR TEST SPECIMENS, PLACING OF ALL MASONRY UNITS, PLACEMENT OF REINFORCING, INSPECTION OF GROUT SPACE, IMMEDIATELY PRIOR TO CLOSING OF CLEANOUTS AND DURING ALL GROUTING OPERATIONS.

WOOD SHEATHING DIAPHRAGM SCHEDULE

DIAPHRAGM MARK	PANEL THICKNESS	PANEL EDGES	COMMON NAIL SPACING 'A'	'B'	'C'	COMMENTS
1	5/8"	UNBLOCKED	8d - 4"	8d - 6"	8d - 12"	ROOF

WOOD DIAPHRAGM NOTES:
1. ALL SHEATHING SHALL BE APA RATED EXPOSURE 1.
2. BLOCK ALL NOTED PANEL JOINTS W/ 2 X 4 MINIMUM (FLAT).
3. SEE GENERAL STRUCTURAL NOTES FOR ALL OTHER REQUIREMENTS.

COMMON NAIL SPACING LEGEND:
A = CONTINUOUS PANEL EDGES AND DIAPHRAGM BOUNDARIES.
B = ALL OTHER PANEL EDGES.
C = INTERMEDIATE PANEL SUPPORTS (IN FIELD NAILING).



DIAPHRAGM NAILING DIAGRAM

CONCRETE FOOTING SCHEDULE

FOOTING MARK	DIMENSIONS WIDTH	LENGTH	THICK.	TRANSVERSE REINF. QTY.	SIZE	LENGTH	SPCG.	LENGTHWISE REINF. QTY.	SIZE	LENGTH	SPCG.	COMMENTS
FC1.5	1'-6"	CONT.	10"	--	--	--	--	2	#4	CONT.	EQ.	
FC1.67	1'-8"	CONT.	12"	--	--	--	--	2	#4	CONT.	EQ.	
FC2.0	2'-0"	CONT.	12"	--	--	--	--	2	#4	CONT.	EQ.	

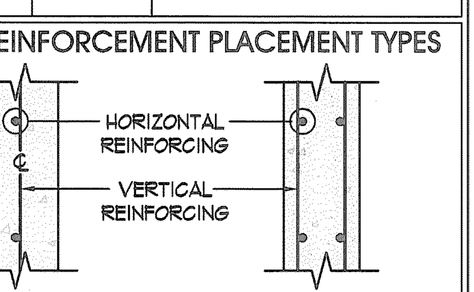
FOOTING SCHEDULE NOTES:
1. PLACE ALL FOOTING REINFORCING IN BOTTOM OF FOOTING WITH 3" CLEAR CONCRETE COVER, UNLESS NOTED OTHERWISE.
2. TOP REINFORCING, WHERE SPECIFIED, SHALL BE PLACED IN THE TOP OF THE FOOTING WITH 2" MINIMUM CONCRETE COVER.
3. IF FOOTINGS ARE EARTH FORMED, FOOTING WIDTH AND LENGTH SHALL BE 4" WIDER AND LONGER THAN SCHEDULED.
4. SEE GENERAL STRUCTURAL NOTES FOR ALL OTHER REQUIREMENTS.

CONCRETE FOUNDATION WALL SCHEDULE

WALL MARK	THICKNESS	REINFORCING VERTICAL	HORIZONTAL	TOP & BOTTOM	WALL TYPE	REMARKS
CFW-1	8"	#4 BARS @ 18" O.C.	#4 BARS @ 12" O.C. or #5 BARS @ 18" O.C.	(one) #5 BAR	A	

FOUNDATION SCHEDULE NOTES:
1. SEE GENERAL STRUCTURAL NOTES FOR ALL OTHER REQUIREMENTS NOT NOTED IN THE CONCRETE FOUNDATION WALL SCHEDULE.
2. PLACE STEEL IN THE CENTER OF THE WALL (EXPECT CONCRETE RETIANING WALLS). WALLS THICKER THAN 10" SHALL HAVE TWO CURTINS OF REINFORCEMENT (PLACED NEAR EACH FACE OF THE WALL, SEE GENERAL STRUCTURAL NOTES FOR CLEARANCE)
3. REFER TO RETAINING WALL DETAIL WHEN A RETAINING WALL OCCURS.

WALL REINFORCEMENT PLACEMENT TYPES

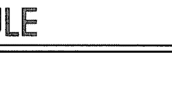


MASONRY WALL SCHEDULE

WALL MARK	THICKNESS	MATERIALS	REINFORCING VERTICAL	HORIZONTAL	JOINTS	COMMENTS
MW-1	8"	8"x8"x16"	#5 BARS @ 32" O.C.	#5 BARS @ 48" O.C.	-	

MASONRY WALL NOTES:
1. COORDINATE WITH ARCHITECTURAL DRAWINGS, MASONRY WALL FINISHES, TYPES OF MATERIAL, COURSING, ETC.
2. DO NOT SOLID GROUT WALLS UNLESS NOTED OTHERWISE.
3. HORIZONTAL WALL REINFORCING SHALL BE PLACED BETWEEN VERTICAL MASONRY COLUMN REINFORCING BARS.
4. HORIZONTAL WALL REINFORCING SHALL CONTINUE THRU MASONRY LINTELS. WHERE BOTH HORIZONTAL WALL REINFORCING AND LINTEL REINFORCING OCCUR IN THE SAME COURSE, USE THE LARGER REINFORCING.
5. SEE GENERAL STRUCTURAL NOTES FOR ALL OTHER REQUIREMENTS.

MASONRY COLUMN SCHEDULE

COLUMN MARK	COLUMN SIZE	REINFORCING VERTICAL	TIES	COMMENTS
MC-1	8"x8"	(ONE)- #5 BAR	#2 TIES @ 8" O.C.	

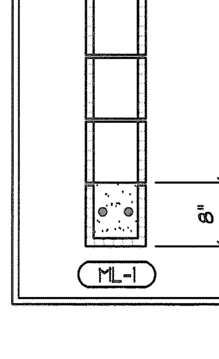
MASONRY COLUMN NOTES:
1. THE CENTERLINE OF VERTICAL BARS SHALL BE LOCATED 2 1/2" FROM THE FACE OF THE MASONRY. HORIZONTAL WALL REINFORCEMENT SHALL BE LOCATED TO THE INSIDE OF VERTICAL BARS.
2. UNLESS NOTED OTHERWISE, VERTICAL REINFORCING AND TIES SHALL EXTEND TO FULL WALL HEIGHT.
3. VERTICAL MASONRY COLUMN REINFORCING SHALL EXTEND INTO THE FOOTING AND TERMINATE WITH A STANDARD 90° HOOK. FOR CONCRETE FOUNDATION WALLS OVER 5'-0" TALL, VERTICAL COLUMN REINFORCING REINFORCING SHALL DOWEL 4'-0" MINIMUM INTO THE FOUNDATION WALL.
4. IN CONCRETE FOUNDATION WALLS, VERTICAL MASONRY COLUMN REINFORCING SHALL BE TIED WITH #3 TIES @ 8" O.C.
5. SEE GENERAL STRUCTURAL NOTES FOR ALL OTHER REQUIREMENTS.

MASONRY LINTEL SCHEDULE

LINTEL MARK	LINTEL DEPTH	LINTEL SPAN MAXIMUM	REINFORCING HORIZONTAL	STIRRUPS	COMMENTS
ML-1	8"	3'-4"	(2) #5 BAR CONT		

MASONRY LINTEL NOTES:
1. LINTEL WIDTH AND MATERIAL TYPE SHALL BE THE SAME AS THE WALL IN WHICH THE LINTEL IS CONSTRUCTED.
2. GROUT MASONRY LINTELS MONOLITHICALLY WITH THE SUPPORT WALL OR COLUMN AT EACH END.
3. MASONRY LINTELS ML-1 THRU ML-4 SHALL BE USED OVER OPENINGS IN MASONRY WALLS WHEN A SPECIFIC MASONRY LINTEL IS NOT OTHERWISE SPECIFIED. WHEN A LINTEL IS SPECIFIED ON THE PLANS, THE MAXIMUM SPAN AS NOTED IN THIS SCHEDULE SHALL NOT APPLY. CONSULT THE STRUCTURAL ENGINEER FOR LINTELS NOT SPECIFIED ON THE PLANS WHICH HAVE A SPAN GREATER THAN 10'-0".
4. OMITTED
5. EXTEND ALL HORIZONTAL REINFORCING 48 BAR DIAMETERS MINIMUM BEYOND THE EDGE OF ALL OPENINGS. IF HORIZONTAL REINFORCING CANNOT EXTEND 48 BAR DIAMETERS BEYOND EDGE OF OPENING, PROVIDE 90° STANDARD HOOK.
6. SPLICE TOP BARS AT MIDSPAN OF LINTEL ONLY AND BOTTOM BARS OVER SUPPORTS ONLY.
7. HORIZONTAL WALL REINFORCING SHALL CONTINUE THRU MASONRY LINTELS. WHERE BOTH HORIZONTAL WALL REINFORCING AND LINTEL REINFORCING OCCUR IN THE SAME COURSE, USE THE LARGER REINFORCING.
8. DOWEL VERTICAL REINFORCING OF WALL ABOVE LINTEL INTO THE FULL DEPTH OF LINTEL OR 48 BAR DIAMETERS, WHICHEVER IS LESS.
9. SEE GENERAL STRUCTURAL NOTES FOR ALL OTHER REQUIREMENTS.

LINTEL REINFORCEMENT PLACEMENT TYPES



REV#:	REVISION DESCRIPTION:	DATE:

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Professional Seal: LICENSED PROFESSIONAL ENGINEER GARY E. KNIGHTON #170411 1.21.2010 STATE OF UTAH

Project Title:
HYRUM STATE PARK RESTROOM REPLACEMENT
Hyrum, Utah

Sheet Title:
GENERAL STRUCTURAL NOTES AND SCHEDULES

Drawn By:	Project Number:	DFCM Project Number:
T. Ekins	09-126	09198510
Designed By: G. Knighton	Date: November 22, 2009	Sheet Number: S001
Reviewed By: G. Knighton	Sheet Scale: 1" = 1'-0"	1 of 4

SPECIAL INSPECTION AND TESTING UNDER THE PROVISIONS OF IBC 1704 AND FOR MISCELLANEOUS AREAS

Indicate required Special inspections for project by checking the appropriate boxes and provide specific instructions as to the inspection requirements and the expectations of the architect, engineer and owner:

FABRICATORS (IBC 1704.2)

☐ Approved Fabricator	Fabricators Name:
☐ Unapproved Fabricator	Fabricators Name:

In-plant inspections
☐ Steel Construction ☐ Welding ☐ Details

STEEL (IBC 1704.3)

Item			Detailed Instructions and Frequencies
High Strength Bolting(1704.3.3)	☐ Continuous	☐ Periodic	
WELDING (1704.3.1)			
Details (1704.3.2)			
Complete & partial penetration groove welds	☐ Continuous	☐ Periodic	
Multipass fillet welds	☐ Continuous	☐ Periodic	
Single-pass fillet welds > 5/16"	☐ Continuous	☐ Periodic	
Single-pass fillet welds ≤ 5/16"	☐ Continuous	☐ Periodic	
Floor & roof deck welds	☐ Continuous	☐ Periodic	
REINFORCEMENT STEEL	☐ Continuous		
Verification of weldability	☐ Continuous	☐ Periodic	
Shear wall and shear reinforcement	☐ Continuous	☐ Periodic	
Other reinforcement	☐ Continuous	☐ Periodic	
Steel frame joint details	☐ Continuous	☐ Periodic	

CONCRETE CONSTRUCTION (IBC 1704.4)

Item			Detailed Instructions and Frequencies
Materials (1704.4.1)	☐ Continuous	☐ Periodic	
Steel placement	☐ Continuous	☑ Periodic	CHECK REBAR PLACEMENT PRIOR TO POUR
Steel welding	☐ Continuous	☐ Periodic	
Bolts prior & during placement	☐ Continuous	☑ Periodic	CHECK BOLT PLACEMENT PRIOR TO POUR
Use of required design mix	☐ Continuous	☑ Periodic	REVIEW OF DESIGN MIX
Concrete sampling for strength test, slump, air content, and temperature of concrete	☐ Continuous	☑ Periodic	TAKE A SET OF (2) CYLINDERS FOR EACH POUR AND EVERY 50 CY
Concrete & shotcrete placement	☐ Continuous	☐ Periodic	
Curing temperature and techniques	☐ Continuous	☐ Periodic	
Pre-stressed concrete	☐ Continuous	☐ Periodic	
Pre-cast concrete	☐ Continuous	☐ Periodic	
Posttensioned concrete	☐ Continuous	☐ Periodic	
Form work	☐ Continuous	☐ Periodic	

MASONRY CONSTRUCTION (IBC 1704.5)

Item			Detailed Instructions and Frequencies
As masonry construction begins:			
Site prepared mortar	☐ Continuous	☑ Periodic	
Construction of mortar joints	☐ Continuous	☐ Periodic	
Location of reinforcement, connectors, pre-stressing tendons and anchorages	☐ Continuous	☐ Periodic	
Pre-stressing technique	☐ Continuous	☐ Periodic	
Grade and size of pre-stressing tendons and anchorages	☐ Continuous	☐ Periodic	
Inspection program verify:			
Size and location of structural elements	☐ Continuous	☑ Periodic	CHECK EMBEDS PRIOR TO GROUTING
Type, size and location of anchors	☐ Continuous	☑ Periodic	CHECK ANCHORS PRIOR TO GROUTING
Size, grade and type of reinforcement	☐ Continuous	☑ Periodic	CHECK REBAR PRIOR TO GROUTING
Welding of reinforcement	☐ Continuous	☐ Periodic	
Cold and hot weather protection	☐ Continuous	☐ Periodic	
Application and measurement of pre-stressing force	☐ Continuous	☐ Periodic	
Prior to grouting verify			
Clean grout space	☐ Continuous	☑ Periodic	INSPECT MASONRY PRIOR TO GROUT
Placement of reinforcement	☐ Continuous	☑ Periodic	INSPECT REBAR PRIOR TO GROUTING
Grout mix	☐ Continuous	☑ Periodic	REVIEW DESIGN MIX
Mortar joints	☐ Continuous	☑ Periodic	
Grout placement	☑ Continuous	☐ Periodic	CONTINUOUS INSPECTION OF GROUTING
Grout and mortar specimens and prisms	☐ Continuous	☑ Periodic	PROVIDE 1 SET OF PRISMS
Construction and submittal compliance verification	☐ Continuous	☐ Periodic	
Empirical masonry – Cat. I-III (1708.1.1)	☐ Continuous	☐ Periodic	
Empirical masonry – Cat. IV (1708.1.1)	☐ Continuous	☐ Periodic	
Engineered masonry – Cat. I-III 1708.1.1	☐ Continuous	☐ Periodic	
Engineered masonry – Cat. IV (1708.1.1)	☐ Continuous	☐ Periodic	
Engineering & pre-stressing steel (1708.3)	☐ Continuous	☐ Periodic	
Structural steel (1708.4)	☐ Continuous	☐ Periodic	
Qualification of mechanical & electrical equipment (1708.5)	☐ Continuous	☐ Periodic	
Seismically isolated structures (1708.6)	☐ Continuous	☐ Periodic	
Testing for seismic resistance is	☐ Continuous	☐ Periodic	

WOOD CONSTRUCTION (IBC 1704.6)

Item			Detailed Instructions and Frequencies
Prefabricated elements & assembly	☐ Continuous	☑ Periodic	INSPECT TRUSSES

SOILS CONSTRUCTION (IBC 1704.7)

Item			Detailed Instructions and Frequencies
Site preparation	☐ Continuous	☐ Periodic	
Structural fill material	☐ Continuous	☑ Periodic	PROCTOR OF FILL MATERIAL
Structural fill lift thickness	☐ Continuous	☑ Periodic	DENSITY TESTING OF EACH LIFT
Structural fill soil densities	☐ Continuous	☑ Periodic	DENSITY TESTING OF EACH LIFT
Backfill soils materials	☐ Continuous	☐ Periodic	
Backfill soil densities	☐ Continuous	☐ Periodic	

PILE FOUNDATIONS (IBC 1704.8)

Item			Detailed Instructions and Frequencies
Observe driving operation and reporting	☐ Continuous	☐ Periodic	
Verify placement & installation data	☐ Continuous	☐ Periodic	

PIER FOUNDATIONS (IBC 1704.9)

Item			Detailed Instructions and Frequencies
Observe drilling operation and reporting	☐ Continuous	☐ Periodic	
Verify placement & installation data	☐ Continuous	☐ Periodic	

SPRAYED FIRE-RESISTANT MATERIALS (IBC 1704.10)

Item			Detailed Instructions and Frequencies
Structural member surface conditions	☐ Continuous	☐ Periodic	
Material application	☐ Continuous	☐ Periodic	
Material thickness	☐ Continuous	☐ Periodic	
Material density	☐ Continuous	☐ Periodic	
Bonding strength	☐ Continuous	☐ Periodic	

MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS (IBC 1704.11)

Item			Detailed Instructions and Frequencies
Material and installation	☐ Continuous	☐ Periodic	

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) (IBC 1704.12)

Item			Detailed Instructions and Frequencies
Material and installation	☐ Continuous	☐ Periodic	

ALTERNITIVE CONSTRUCTION METHODS OR MATERIALS (IBC 1704.13)

Item			Detailed Instructions and Frequencies
Material and installation	☐ Continuous	☐ Periodic	

EPOXY (IBC 1704.13)

Item			Detailed Instructions and Frequencies
Material and installation (specify locations)	☐ Continuous	☐ Periodic	

SMOKE CONTROL (IBC 1704.14)

Item			Detailed Instructions and Frequencies
Material	☐ Continuous	☐ Periodic	

SOILS CONSTRUCTION (IBC 1704.7)

Item			Detailed Instructions and Frequencies
Site preparation	☐ Continuous	☐ Periodic	
Structural fill material	☐ Continuous	☑ Periodic	PROCTOR OF FILL MATERIAL
Structural fill lift thickness	☐ Continuous	☑ Periodic	DENSITY TESTING OF EACH LIFT
Structural fill soil densities	☐ Continuous	☑ Periodic	DENSITY TESTING OF EACH LIFT
Backfill soils materials	☐ Continuous	☐ Periodic	
Backfill soil densities	☐ Continuous	☐ Periodic	

PILE FOUNDATIONS (IBC 1704.8)

Item			Detailed Instructions and Frequencies
Observe driving operation and reporting	☐ Continuous	☐ Periodic	
Verify placement & installation data	☐ Continuous	☐ Periodic	

PIER FOUNDATIONS (IBC 1704.9)

Item			Detailed Instructions and Frequencies
Observe drilling operation and reporting	☐ Continuous	☐ Periodic	
Verify placement & installation data	☐ Continuous	☐ Periodic	

SPRAYED FIRE-RESISTANT MATERIALS (IBC 1704.10)

Item			Detailed Instructions and Frequencies
Structural member surface conditions	☐ Continuous	☐ Periodic	
Material application	☐ Continuous	☐ Periodic	
Material thickness	☐ Continuous	☐ Periodic	
Material density	☐ Continuous	☐ Periodic	
Bonding strength	☐ Continuous	☐ Periodic	

MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS (IBC 1704.11)

Item			Detailed Instructions and Frequencies
Material and installation	☐ Continuous	☐ Periodic	

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) (IBC 1704.12)

Item			Detailed Instructions and Frequencies
Material and installation	☐ Continuous	☐ Periodic	

ALTERNITIVE CONSTRUCTION METHODS OR MATERIALS (IBC 1704.13)

Item			Detailed Instructions and Frequencies
Material and installation	☐ Continuous	☐ Periodic	

EPOXY (IBC 1704.13)

Item			Detailed Instructions and Frequencies
Material and installation (specify locations)	☐ Continuous	☐ Periodic	

SMOKE CONTROL (IBC 1704.14)

Item			Detailed Instructions and Frequencies
Material	☐ Continuous	☐ Periodic	

Seismic supports for electrical raceways, cable trays and lights	☐ Continuous	☐ Periodic	
Seismic supports for plumbing lines including gas, water and steam and condensation	☐ Continuous	☐ Periodic	
Seismic bracing for mechanical units both on slab and suspended	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
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	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	
	☐ Continuous	☐ Periodic	

Special Inspectors Shall:

- Be approved by the Building Official prior to performing any duties;
- Provide proof of licensure as a special inspector by the State of Utah for each type of inspection;
- Inspection reports are to meet the requirements of IBC 1704.1.2 and DFCM standards;
- Inspection reports are to be submitted to the code consultant, architect, DFCM project manager, and the State of Utah Building Official within 48 hrs. of inspections;
- A final inspection report shall be submitted following completion of the project documenting the types of special inspections performed and a statement indicating that the structure is in compliance with the drawings, specifications and applicable codes. IBC 1704.1.2

Updated October 8, 2009

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

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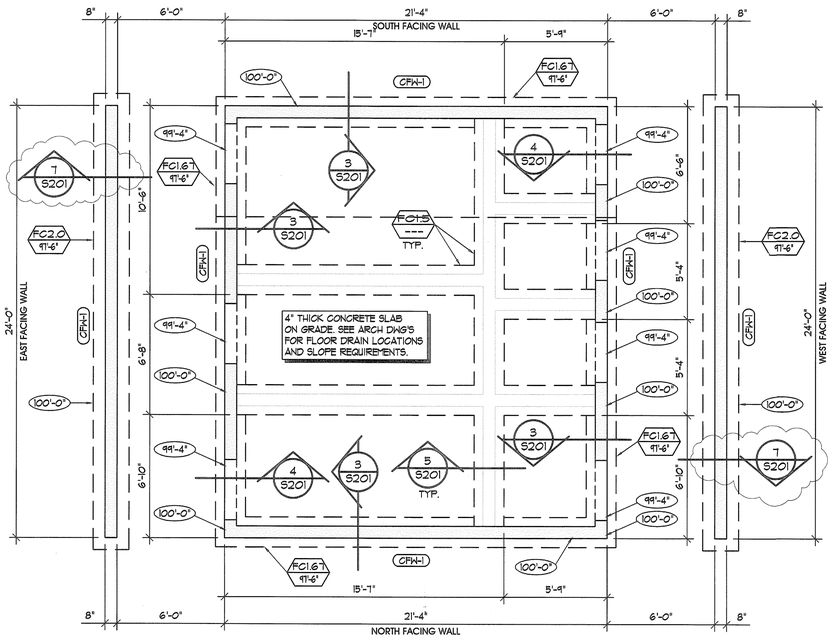
Professional Seal:
LICENSED PROFESSIONAL ENGINEER
GARY E. KNIGHTON
#170411
STATE OF UTAH

Project Title:
HYRUM STATE PARK RESTROOM REPLACEMENT
Hyrum, Utah

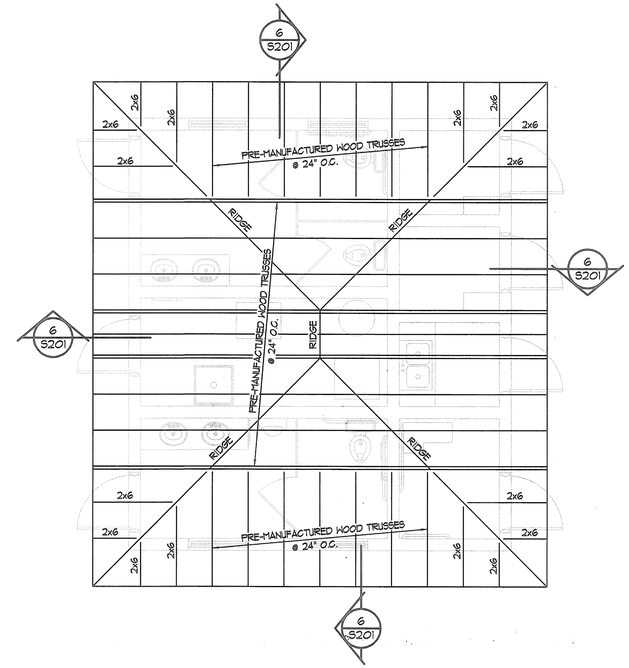
Sheet Title:
SPECIAL INSPECTIONS

Drawn By: T. Ekins	Project Number: 09-126	DFCM Project Number: 09198510
Designed By: G. Knighton	Date: November 22, 2009	Sheet Number: S002
Reviewed By: G. Knighton	Sheet Scale: 1" = 1'-0"	2 of 4



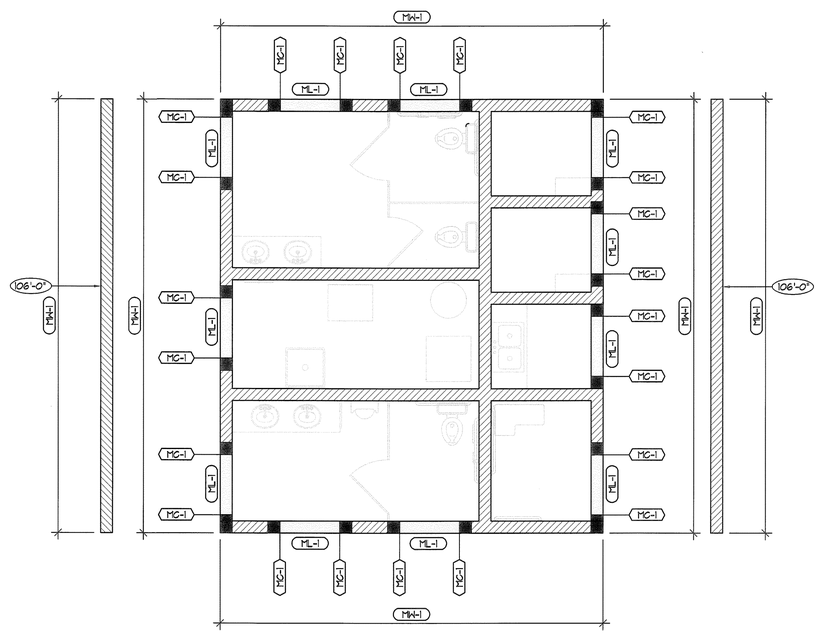
FOOTING AND FOUNDATION PLAN

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



ROOF FRAMING PLAN

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



MASONRY PLAN

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

FC2.0 / 97.0'V	FOOTING MARK / T.O. FTG ELEVATION
CFW-1	FOUNDATION WALL MARK SEE FOUNDATION WALL SCHEDULE
99'-4"	TOP OF FOUNDATION WALL ELEVATION
MW-X	MASONRY WALL MARK SEE MASONRY WALL SCHEDULE
MC-00	MASONRY COL. MARK SEE MASONRY COL. SCHEDULE
ML-X	MASONRY LINTEL MARK SEE MASONRY LINTEL SCHEDULE
# / #	SECTION LETTER OR # / PAGE REFERENCE SEE PLAN SHEETS
	OBJECT ELEVATION

REV#:	REVISION DESCRIPTION:	DATE:
R1	REVISED AS PER REVIEW COMMENTS	1-13-10

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LICENSED PROFESSIONAL ENGINEER — GARY E. KNIGHTON — #170411 — 1-21-2010 — STATE OF UTAH

Project Title:

HYRUM STATE PARK RESTROOM REPLACEMENT

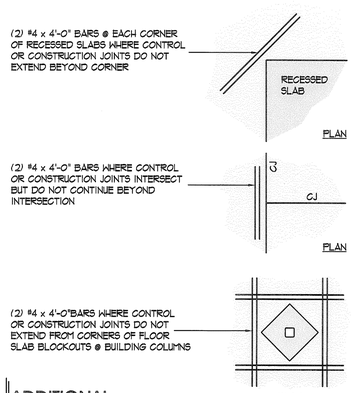
Hyrum, Utah

Sheet Title:

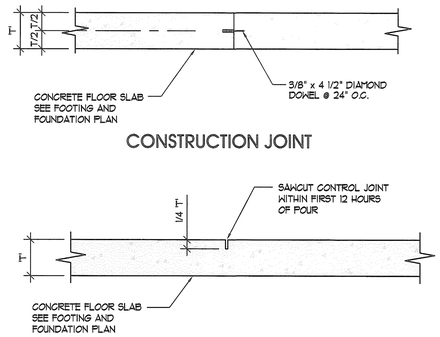
STRUCTURAL PLANS

Drawn By: T. Ekins	Project Number: 09-126	DFCM Project Number: 09198510
Designed By: G. Knighton	Date: November 22, 2009	Sheet Number: S101
Reviewed By: G. Knighton	Sheet Scale: 1" = 1'-0"	2 of 3

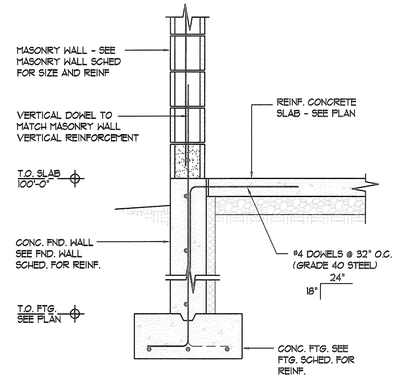
LOCATIONS REQUIRING ADDITIONAL SLAB REINFORCING STEEL:



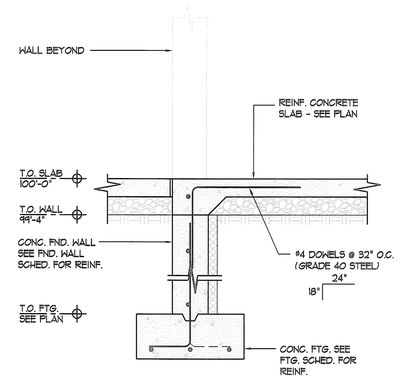
ADDITIONAL SLAB REINFORCING DETAIL (1 / S201)
SCALE: 3/4" = 1'-0"



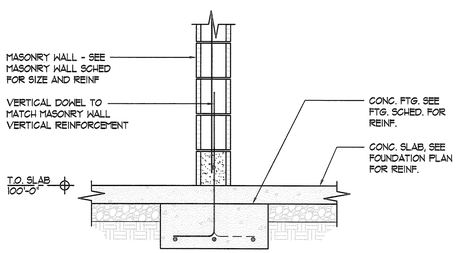
TYPICAL CONCRETE JOINT DETAIL (2 / S201)
SCALE: 3/4" = 1'-0"



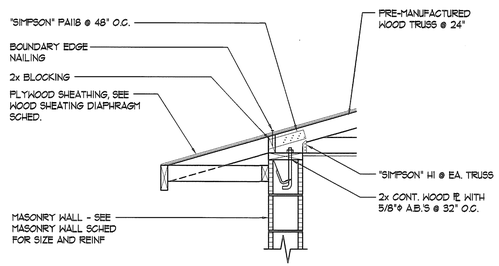
DETAIL (3 / S201)
SCALE: 3/4" = 1'-0"



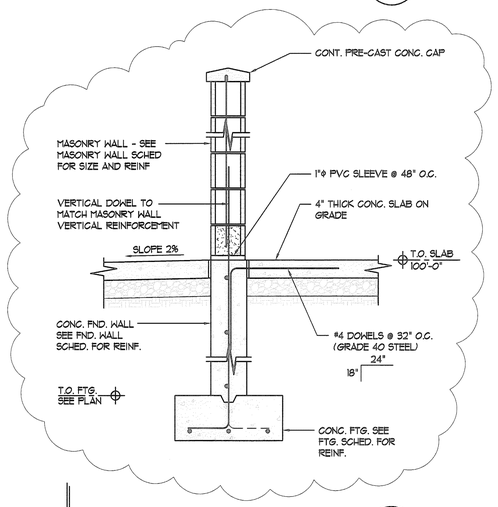
DETAIL (4 / S201)
SCALE: 3/4" = 1'-0"



DETAIL (5 / S201)
SCALE: 3/4" = 1'-0"



DETAIL (6 / S201)
SCALE: 3/4" = 1'-0"



DETAIL (7 / S201)
SCALE: 3/4" = 1'-0"

REV#:	REVISION DESCRIPTION:	DATE:
R1	REVISED AS PER REVIEW COMMENTS	1-13-10

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Professional Seal: LICENSED PROFESSIONAL ENGINEER GARY E. KNIGHTON #170411 1-21-2010 STATE OF UTAH

Project Title:

HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

STRUCTURAL DETAILS

Drawn By: T. Ekins	Project Number: 09-126	DFCM Project Number: 09198510
Designed By: G. Knighton	Date: November 22, 2009	Sheet Number: S201
Reviewed By: G. Knighton	Sheet Scale: 3/4" = 1'-0"	4 of 4

ABBREVIATIONS/SYMBOLS LEGEND:

A.F.F.	ABOVE FINISH FLOOR	H.B.	HOSE BIB
AC	ACOUSTIC	ID	INSIDE DIAMETER
ADJ	ADJUSTABLE	INSUL	INSULATION
ALT	ALTERNATE	INT	INTERIOR
ALUM	ALUMINUM	JAN	JANITOR
AB	ANCHOR BOLT	JT	JOINT
L	ANGLE	KIT	KITCHEN
&	AND	LAM	LAMINATE
APPROX	APPROXIMATE	LAV	LAVATORY
ARCH	ARCHITECTURAL/ARCHITECT	MANUF	MANUFACTURER
@	AT	MTL	MATERIAL
BSMT	BASEMENT	MH	MANHOLE
BM	BEAM	MAX	MAXIMUM
BRG	BEARING	MECH	MECHANICAL
BM	BENCH MARK	MC	MEDICINE CABINET
BLK	BLOCK	MIN	MINIMUM
BLKG	BLOCKING	MISC	MISCELLANEOUS
BTM	BOTTOM	N	NORTH
BO	BOTTOM OF	NIC	NOT IN CONTRACT
B.O.W.	BOTTOM OF WALL	NTS	NOT TO SCALE
BLDG	BUILDING	NO. OR #	NUMBER
CAB	CABINET	OBS	OBSCURE
CI	CAST IRON	O.C.	ON CENTER
CB	CATCH BASIN	OPP	OPPOSITE
CLG	CEILING	OD	OUTSIDE DIAMETER
CL OR ℄	CENTER LINE	O.H.	OVERHEAD
CT	CERAMIC TILE	PART BD	PARTICLE BOARD
C	CHANNEL	d	PENNY
CO	CLEAN OUT	PL OR }	PLATE
COL	COLUMN	PLWD	PLYWOOD
CONC	CONCRETE	QT	QUARRY TILE
CMU	CONCRETE MASONRY UNIT	RAD	RADIUS
CONT	CONTINUOUS	REF	REFERENCE
CORR	CORRIDOR	REFR	REFRIGERATOR
DBL	DOUBLE	REQD	REQUIRED
DEPT	DEPARTMENT	REINF	REINFORCE
DET	DETAIL	RD	ROOF DRAIN
DIA or ∅	DIAMETER	RM	ROOM
DIM	DIMENSION	RO	ROUGH OPENING
DISP	DISPENSER	SCHED	SCHEDULE
DS	DOWNSPOUT	SH	SHELF
DRW	DRAWER	SIM	SIMILIAR
DWG	DRAWING	SC	SOLID CORE
E	EAST	S	SOUTH
ELEC	ELECTRICAL	SPEC	SPECIFICATIONS
EWC	ELECTRIC WATER COOLER	SQ	SQUARE
ELEV	ELEVATION	SS	STAINLESS STEEL
EQUIP	EQUIPMENT	STD	STANDARD
EXIST	EXISTING	ST	STEEL
EXP	EXPANSION	STOR	STORAGE
EXT	EXTERIOR	STRUC	STRUCTURAL
FOF	FACE OF FINISH	SUSP	SUSPENDED
FOS	FACE OF STUD	T.B.C.	TOP BACK OF CURB
FOC	FACE OF CONCRETE	TEL	TELEPHONE
FIN	FINISH	TV	TELEVISION
FF	FINISHED FLOOR	TS	TUBE STEEL
FEC	FIRE EXTINGUISHER CABINET	THRES	THRESHOLD
FL	FLOOR	TOIL	TOILET
FD	FLOOR DRAIN	T.O.	TOP OF
FS	FLOOR SINK	T.O.W.	TOP OF WALL
FTG	FOOTING	T & G	TONGUE & GROOVE
FDN	FOUNDATION	T & B	TOP & BOTTOM
GALV	GALVANIZED	TYP	TYPICAL
GA	GAUGE	VERT	VERTICAL
GB	GRAB BAR	VEST	VESTIBULE
GL	GLASS	UNO	UNLESS NOTED OTHERWISE
GYP BD	GYPSUM BOARD	WC	WATER CLOSET
HDWD	HARDWOOD	WWM	WELDED WIRE MESH
HT	HEIGHT	W	WEST
HC	HOLLOW CORE	WF	WIDE FLANGE
HM	HOLLOW METAL	WDO	WINDOW
HORIZ	HORIZONTAL	WD	WOOD
		W/	WITH

SYMBOLS LEGEND:

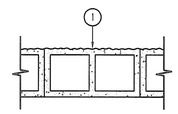
- (A) — GRID BUBBLE; SEE ARCH/STRUCT SHEETS
- (1) — WALL TYPES; SEE ARCH SHEETS
- (A) — WINDOW SYMBOL; SEE ARCH SHEETS
- (1) — KEY NOTE; SEE ARCH SHEETS
- (100) — DOOR SYMBOL; SEE ARCH SHEETS
- (8) — REVISION TRIANGE W/ REVISION CLOUD, SEE PLAN SHEETS
- ROOM NAME
- (---) — ROOM NUMBER
- (---) — CEILING ELEVATION SEE ARCH SHEETS
- (8/9) — SECTION LETTER OR # PAGE REFERENCE, SEE PLAN SHEETS
- OBJECT ELEVATION SEE ARCH/STRUCT SHEETS
- (BM-MK) — BEAM MARK - SEE BEAM SCHEDULE
- (C-MK) — COLUMN MARK - SEE COLUMN SCHEDULE
- (CFM-X) — CONCRETE FND. WALL MARK - SEE CONCRETE FND. WALL SCHED.
- (CP-X) — CONCRETE PIER - SEE CONCRETE PIER SCHED.
- (MW-X) — MASONRY WALL MARK SEE MASONRY WALL SCHEDULE
- (MC-00) — MASONRY COL. MARK SEE MASONRY COL. SCHEDULE
- (ML-X) — MASONRY LINTEL MARK SEE MASONRY LINTEL SCHEDULE
- (FNDELEV) — TOP OF FOUNDATION WALL ELEVATION
- (FG2.0 / ELEV) — FOOTING MARK / T.O. FTG ELEVATION
- S——S — FND/FTG. STEP
- C.J. — CONST./CONTROL JOINT
- DEPRESS FOUNDATION & POUR FLOOR SLAB OVER
- EARTH
- GYPSUM BOARD
- CONCRETE
- RIGID INSULATION
- INSULATION

MARK# 1 — WALL TYPE #1

EXTERIOR CMU WALL — SCALE: 1"=1'-0"

1	CMU WALL:	8"x8"x16" CMU BLOCK WALL; SPLIT-FACE ON EXTERIOR SIDE & SMOOTH FACE ON INTERIOR SIDE. FILL ALL NON-GROUTED CELLS W/ PERLITE INSULATION
2	WALL HEIGHT:	SEE EXTERIOR ELEVATIONS A201 & SECTIONS A401

PLAN VIEW:



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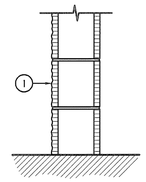
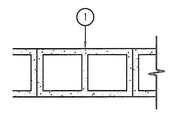


MARK# 2 — WALL TYPE #2

INTERIOR CMU WALL — SCALE: 1"=1'-0"

1	CMU WALL:	8"x8"x16" CMU BLOCK WALL; SMOOTH FACE ON EACH SIDE. FILL ALL NON-GROUTED CELLS W/ PERLITE INSULATION
2	WALL HEIGHT:	SEE EXTERIOR ELEVATIONS A201 & SECTIONS A401

PLAN VIEW:



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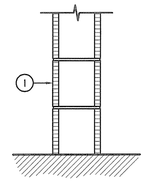

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STATE OF UTAH — KELLY D. CHRISTOFFERSEN — #136313 — LICENSED ARCHITECT

Project Title:

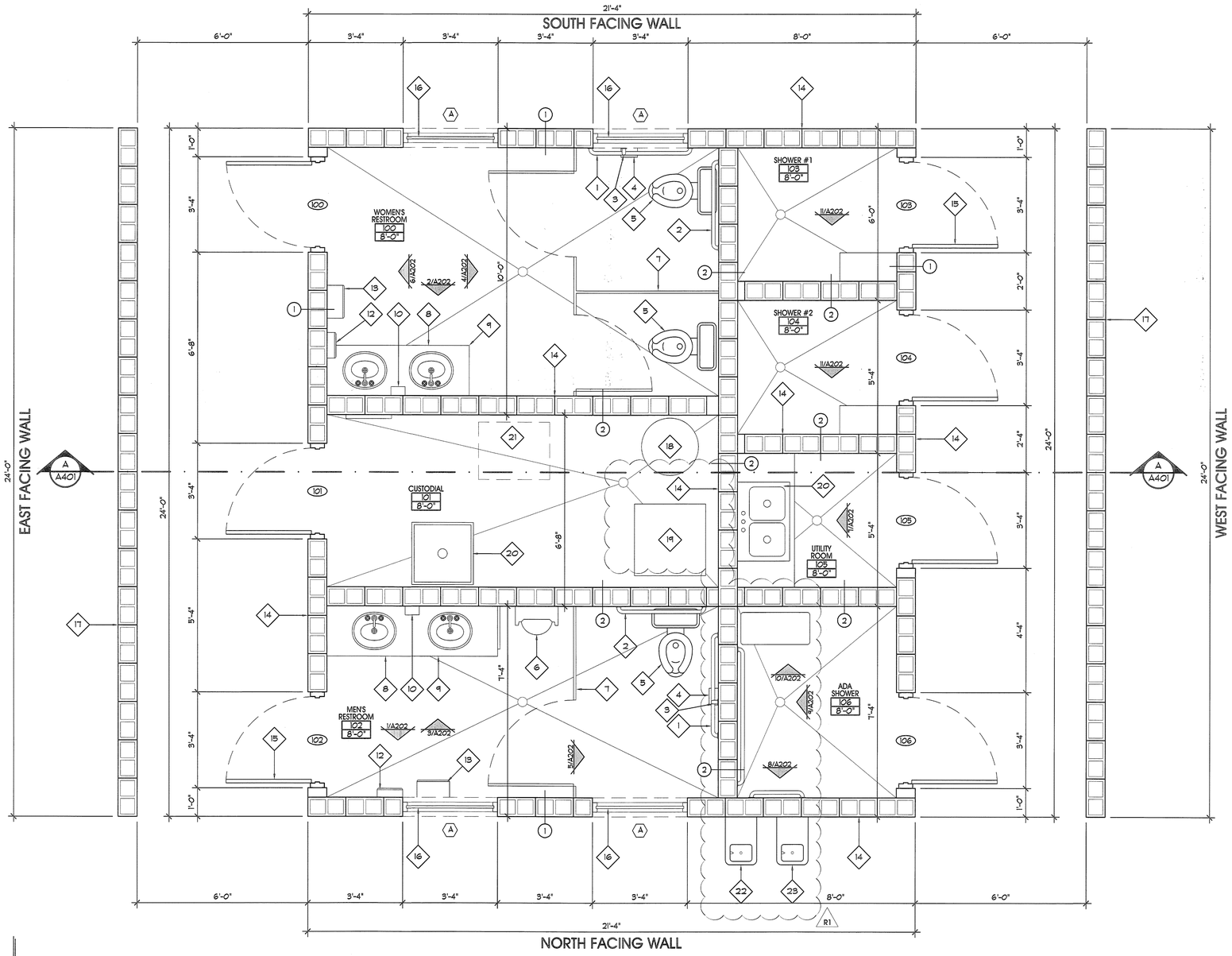
HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

SYMBOLS LEGEND/ WALL TYPES

Drawn By: Courtney Wallace	Project Number: 09-126	DFCM Project Number: 09198510
Designed By: Courtney Wallace	Date: November 22, 2009	Sheet Number: A001
Reviewed By: Kelly Christoffersen	Sheet Scale: 1" = 1'-0"	1 of 9



FLOOR PLAN

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

KEY NOTES

1. HORIZONTAL GRAB BAR 1 1/2" DIA. X 42"
2. HORIZONTAL GRAB BAR 1 12" DIA. X 36"
3. VERTICAL GRAB BAR 1 12" DIA. X 18"
4. TOILET TISSUE DISPENSER, DOUBLE ROLL, SURFACE MOUNT; MAKE & STYLE BY OWNER
5. TOILET; SEE PLUMBING PLANS
6. URINAL; SEE PLUMBING PLANS
7. PARTITION; COLOR & TYPE BY OWNER
8. COUNTER; SEE DETAIL 12/A202
9. AT ACCESSIBLE SINK PROVIDE PROTECTION AGAINST CONTACT AT HOT WATER AND DRAIN PIPING.
10. SOAP DISPENSER; MAKE & STYLE BY OWNER
11. NOT USED
12. PAPER TOWEL DISPENSER; MAKE & STYLE BY OWNER
13. ELECTRIC HAND DRYER; MAKE & STYLE BY OWNER
14. FOR WALL TYPES SEE THIS SHEET
15. DOOR; FOR DOOR SCHEDULE SEE SHEET A601
16. WINDOW; FOR WINDOW SCHEDULE SEE SHEET A601
17. GMU FENCE; SEE DETAILS ON SHEET A401
18. WATER HEATER; SEE PLUMBING PLANS
19. FURNACE; SEE MECHANICAL PLANS
20. SINK; SEE PLUMBING PLANS
21. 22"x30" ATTIC ACCESS
22. ADA ACCESSIBLE DRINKING FOUNTAIN; SEE SHEET 4/A203
23. STANDING PERSONS DRINKING FOUNTAIN; SEE SHEET 4/A203

R1

GENERAL NOTES

- SUBMIT SHOP DRAWINGS OF ALL TOILET ACCESSORIES SHOWING SIZES, METHOD OF CONSTRUCTION AND MOUNTING TECHNIQUES.
- TOILET ACCESSORIES SHALL BE BOBRICK OR EQUAL
- COORDINATE WITH ALL OTHER TRADES WHOSE WORK RELATES TO ACCESSORY ITEMS FOR PLACING OF ALL REQUIRED BACKING AND FURRING TO INSURE PROPER LOCATIONS & ANCHORING
- SEE SPECIFICATIONS FOR DETAILED HARDWARE DESCRIPTIONS

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

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STATE OF UTAH
KELLY D. CHRISTOFFERSEN
#136313
1-21-10
LICENSED ARCHITECT

Project Title:

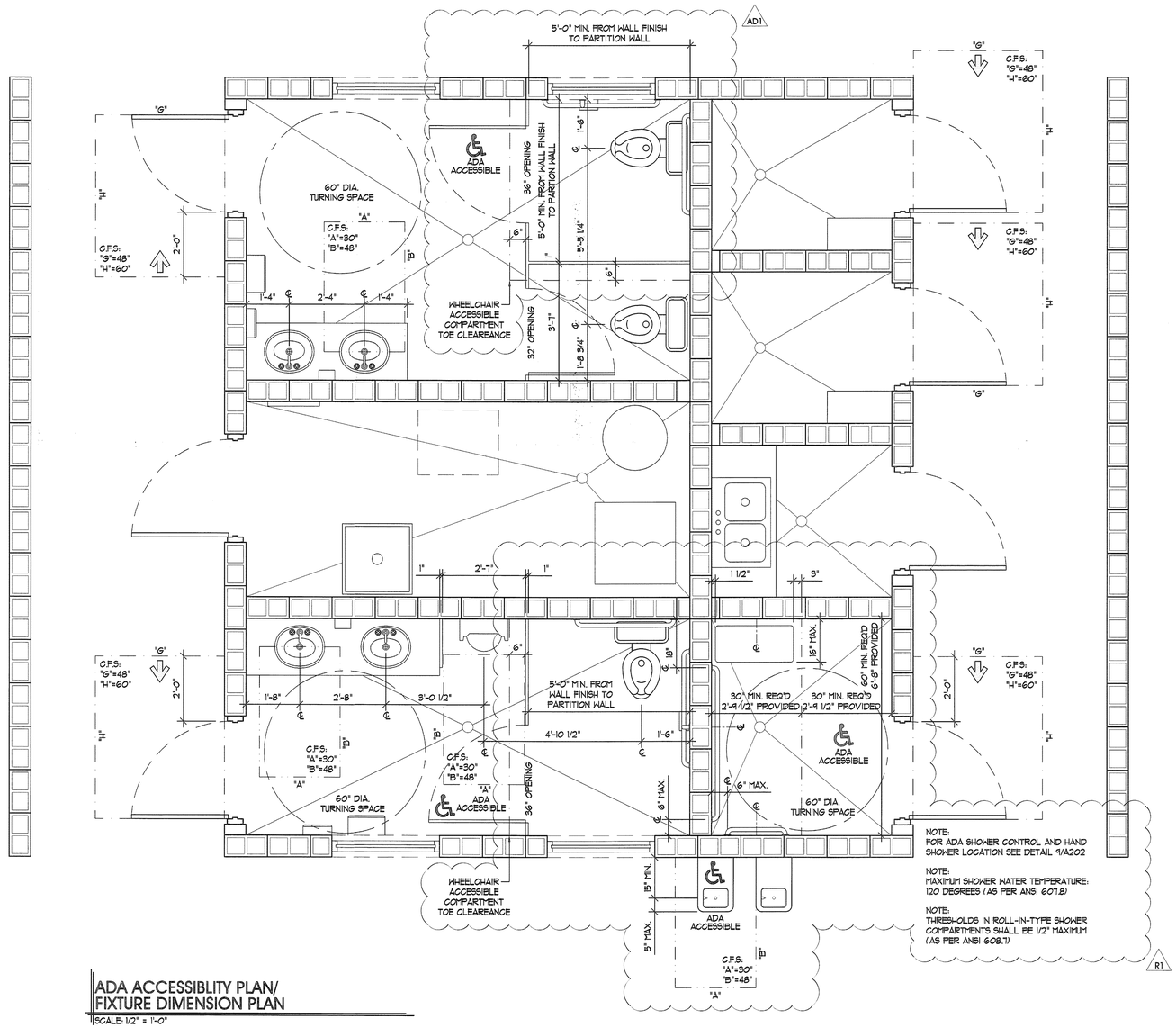
HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

FLOOR PLAN

Drawn By:	Project Number:	DFCM Project Number:
Courtney Wallace	09-126	09198510
Designed By:	**Date:**	**Sheet Number:**
Courtney Wallace	November 22, 2009	A101
Reviewed By:	**Sheet Scale:**	
Kelly Christoffersen	1/2" = 1'-0"	2 of 9



ADA ACCESSIBLITY PLAN/ FIXTURE DIMENSION PLAN

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

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

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STATE OF UTAH
KELLY D. CHRISTOFFERSEN
#136313
1-21-10
LICENSED ARCHITECT

Project Title:

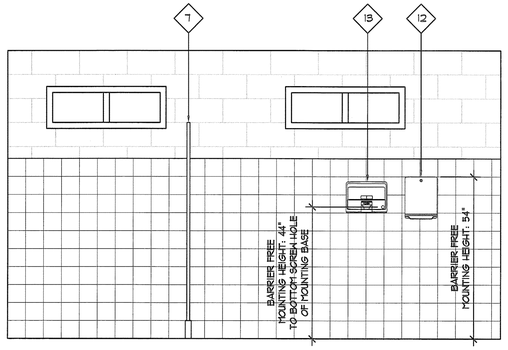
HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

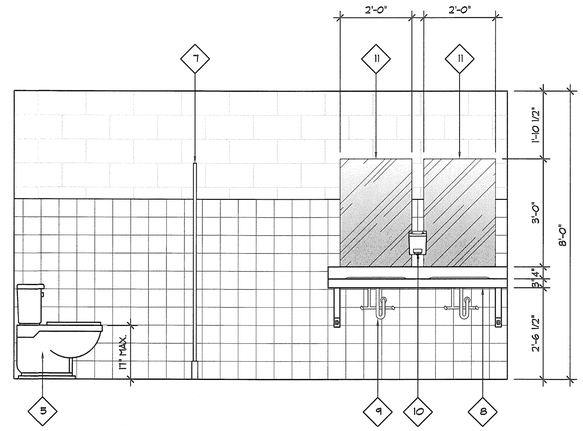
Sheet Title:

ADA ACCESSIBILITY PLAN/ FIXTURE DIMENSION PLAN

Drawn By:	Project Number:	DFCM Project Number:
Courtney Wallace	09-126	09198510
Designed By:	Date:	Sheet Number:
Courtney Wallace	November 22, 2009	A201
Reviewed By:	Sheet Scale:	
Kelly Christoffersen	1/2" = 1'-0"	3 of 10



INTERIOR ELEVATIONS 1/A202 12
SCALE: 1/2" = 1'-0"



INTERIOR ELEVATIONS 2/A202 12
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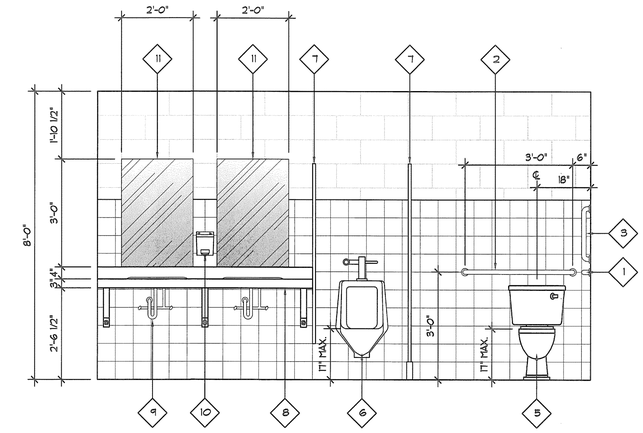

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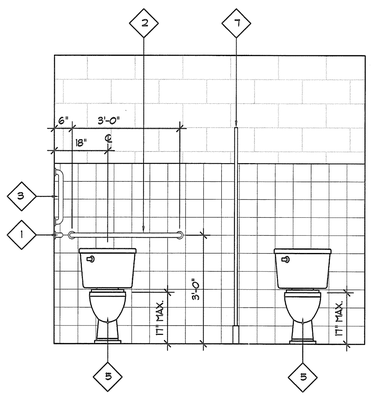
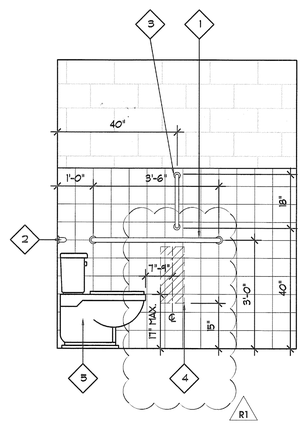
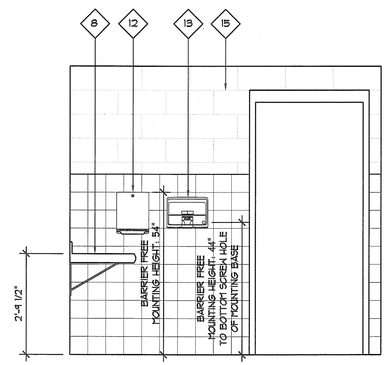


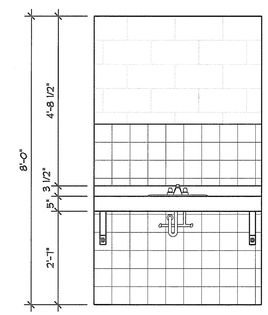
INTERIOR ELEVATIONS 4/A202 12
SCALE: 1/2" = 1'-0"



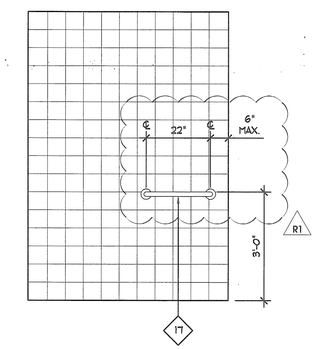
INTERIOR ELEVATIONS 5/A202 12
SCALE: 1/2" = 1'-0"



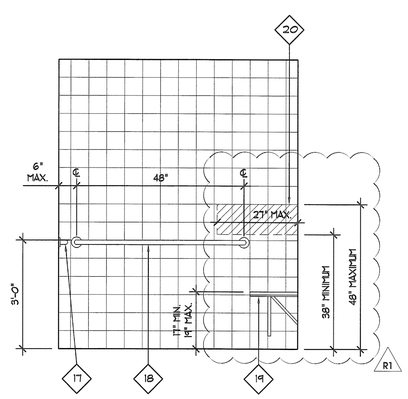
INTERIOR ELEVATIONS 6/A202 12
SCALE: 1/2" = 1'-0"



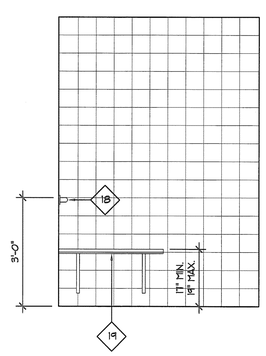
INTERIOR ELEVATIONS 7/A202 12
SCALE: 1/2" = 1'-0"



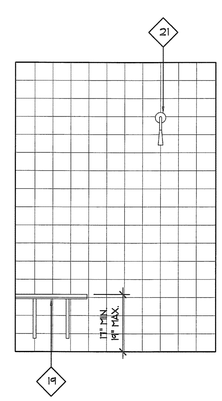
INTERIOR ELEVATIONS 8/A202 12
SCALE: 1/2" = 1'-0"



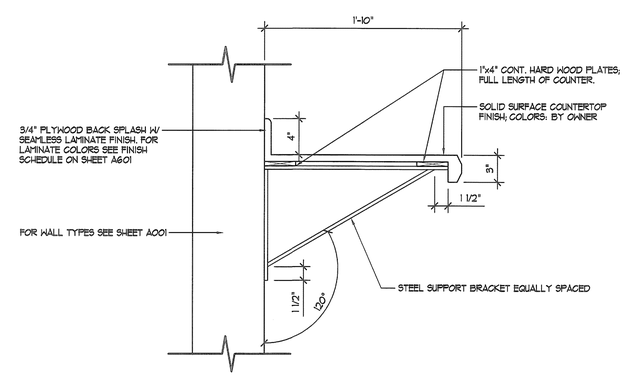
INTERIOR ELEVATIONS 9/A202 12
SCALE: 1/2" = 1'-0"



INTERIOR ELEVATIONS 10/A202 12
SCALE: 1/2" = 1'-0"



INTERIOR ELEVATIONS 11/A202 12
SCALE: 1/2" = 1'-0"



COUNTERTOP DETAIL 12/A202
SCALE: 1 1/2" = 1'-0"

KEY NOTES

1. HORIZONTAL GRAB BAR 1 1/2" DIA. X 42"
2. HORIZONTAL GRAB BAR 1 12" DIA. X 36"
3. VERTICAL GRAB BAR 1 12" DIA. X 18"
4. TOILET TISSUE DISPENSER, DOUBLE ROLL, SURFACE MOUNT; MAKE & STYLE BY OWNER
5. TOILET; SEE PLUMBING PLANS
6. URINAL; SEE PLUMBING PLANS
7. PARTITION; COLOR & TYPE BY OWNER
8. COUNTER; SEE DETAIL 12/A202
9. AT ACCESSIBLE SINK PROVIDE PROTECTION AGAINST CONTACT AT ALL PIPING, SHUT-OFF VALVES, & HOSE BIBS AS PER ANSI 606.6
10. SOAP DISPENSER; MAKE & STYLE BY OWNER — R1
11. MIRROR; SEE INTERIOR ELEVATIONS FOR SIZE.
12. PAPER TOWEL DISPENSER; MAKE & STYLE BY OWNER
13. HAND DRYER; MAKE & STYLE BY OWNER
14. FOR WALL TYPES SEE SHEET A001
15. DOOR; FOR DOOR SCHEDULE SEE SHEET A601
16. WINDOW; FOR WINDOW SCHEDULE SEE SHEET A601
17. HORIZONTAL GRAB BAR 1 1/2" DIA. X 24"
18. HORIZONTAL GRAB BAR 1 12" DIA. X 48" — R1
19. ADA SHOWER SEAT
20. ADA SHOWER CONTROL AND HANDSHOWER LOCATION
21. SHOWER HEAD; SEE PLUMBING PLANS

GENERAL NOTES

- SUBMIT SHOP DRAWINGS OF ALL TOILET ACCESSORIES SHOWING SIZES, METHOD OF CONSTRUCTION AND MOUNTING TECHNIQUES.
- TOILET ACCESSORIES SHALL BE BOBRICK OR EQUAL
- COORDINATE WITH ALL OTHER TRADES WHOSE WORK RELATES TO ACCESSORY ITEMS FOR PLACING OF ALL REQUIRED BACKING AND FURRING TO INSURE PROPER LOCATIONS & ANCHORING
- SEE SPECIFICATIONS FOR DETAILED HARDWARE DESCRIPTIONS

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

Skyline A/E/S, INC.
Architecture / Engineering / Surveying
95 W. Golf Course Rd. #101, Logan, UT 84321
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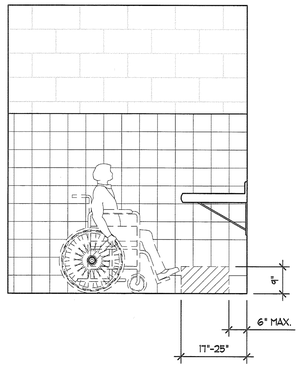
Professional Seal:
STATE OF UTAH — KELLY D. CHRISTOFFERSEN #136313 — LICENSED ARCHITECT

Project Title:
HYRUM STATE PARK RESTROOM REPLACEMENT
Hyrum, Utah

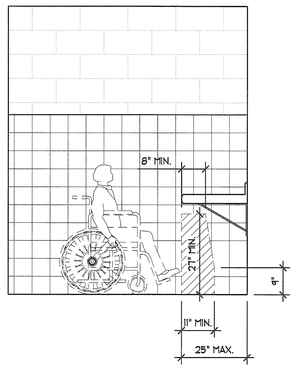
Sheet Title:
INTERIOR ELEVATIONS

Drawn By:	Project Number:	DFCM Project Number:
Courtney Wallace	09-126	09198510
Designed By: Courtney Wallace	Date: November 22, 2009	Sheet Number: A202
Reviewed By: Kelly Christoffersen	Sheet Scale: 1/2" = 1'-0"	4 of 10



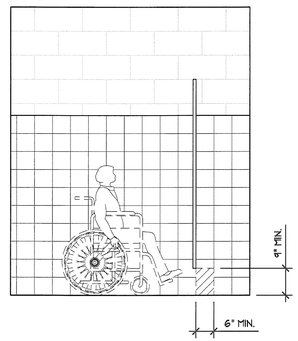
ADA TOE CLEARANCE DETAIL — 1 / A203

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



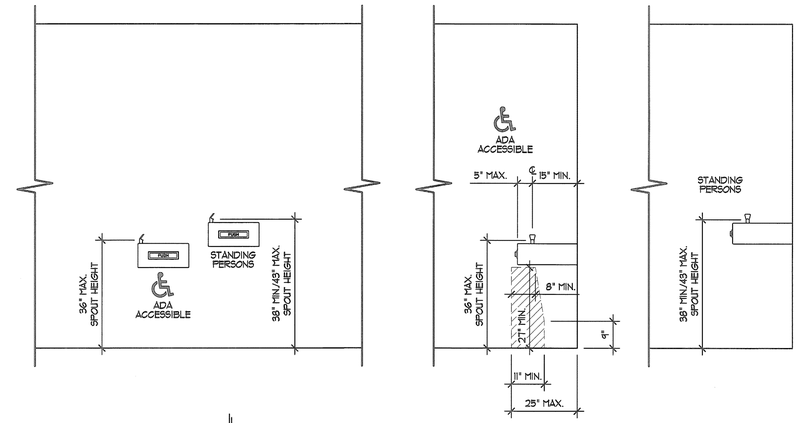
ADA KNEE CLEARANCE DETAIL — 2 / A203

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



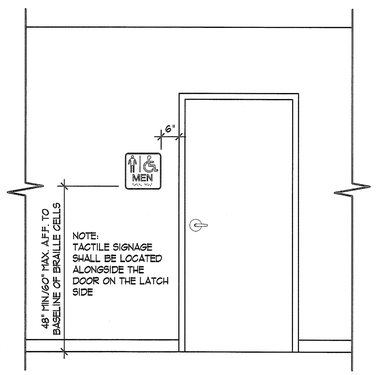
ADA PARTITION DETAIL — 3 / A203

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



ACCESSIBLE DRINKING FOUNTAIN — 4 / A203

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



TACTILE SIGNAGE DETAIL — 5 / A203

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

GENERAL NOTES

- SUBMIT SHOP DRAWINGS OF ALL TOILET ACCESSORIES SHOWING SIZES, METHOD OF CONSTRUCTION AND MOUNTING TECHNIQUES.
- TOILET ACCESSORIES SHALL BE BOBRICK OR EQUAL
- COORDINATE WITH ALL OTHER TRADES WHOSE WORK RELATES TO ACCESSORY ITEMS FOR PLACING OF ALL REQUIRED BACKING AND FURRING TO INSURE PROPER LOCATIONS & ANCHORING
- SEE SPECIFICATIONS FOR DETAILED HARDWARE DESCRIPTIONS

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

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Professional Seal:

STATE OF UTAH — KELLY D. CHRISTOFFERSEN — #136313 — 1-21-10 — LICENSED ARCHITECT

Project Title:

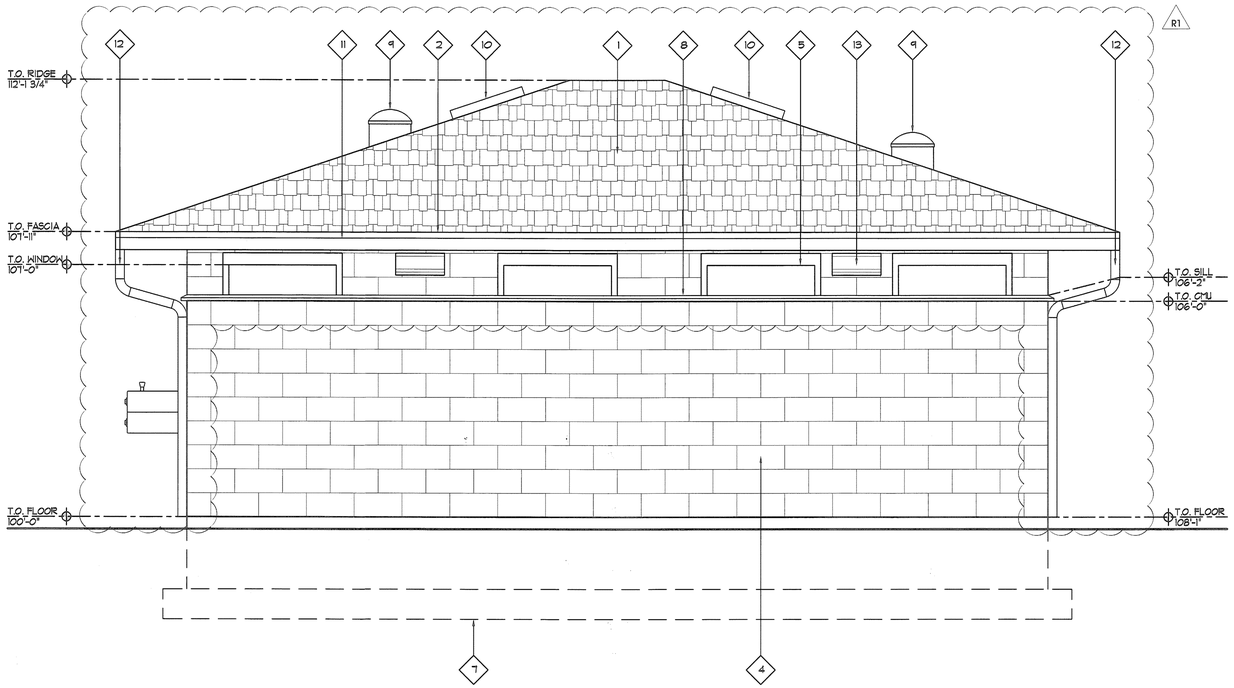
HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

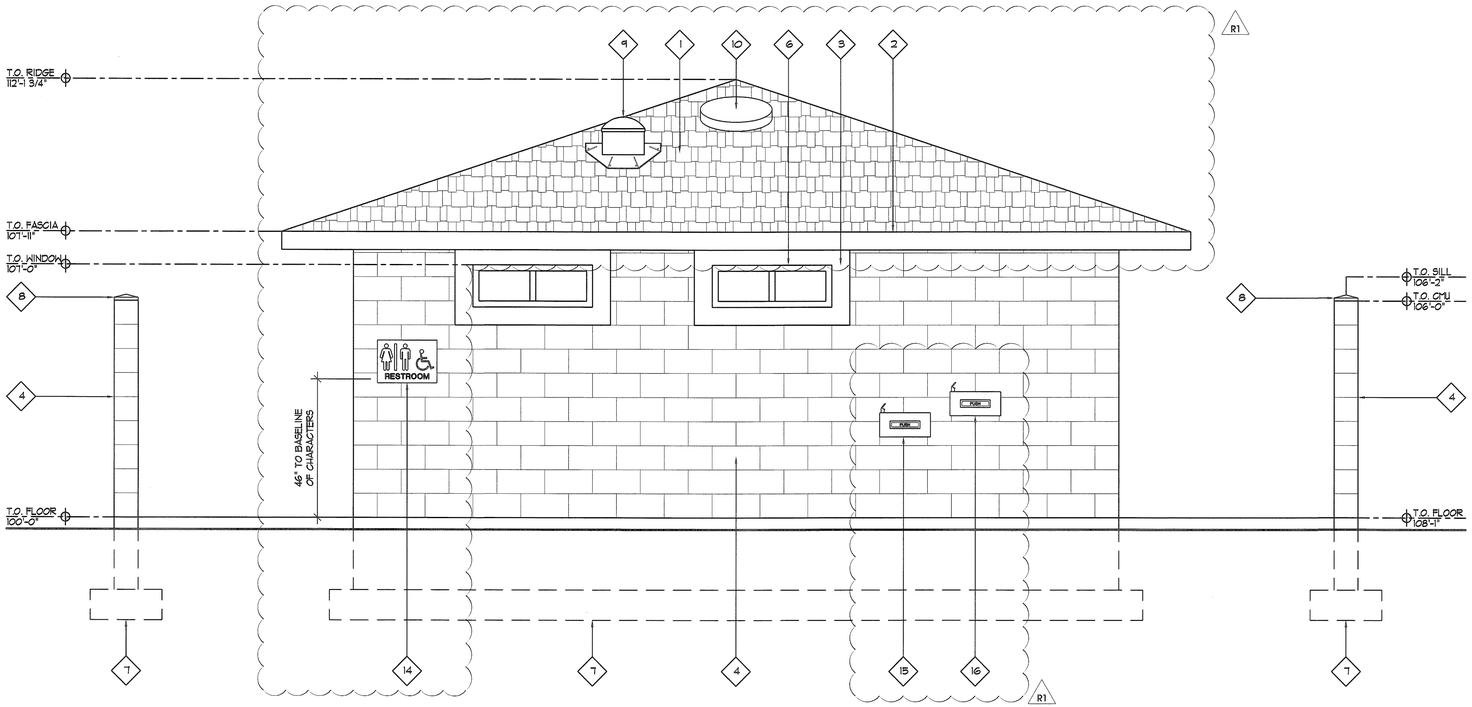
INTERIOR ELEVATIONS

Drawn By:	Project Number:	DFCM Project Number:
Courtney Wallace	09-126	09198510
Designed By:	Date:	Sheet Number:
Courtney Wallace	November 22, 2009	A203
Reviewed By:	Sheet Scale:	5 of 10
Kelly Christoffersen	1/2" = 1'-0"	



WEST FACING EXTERIOR ELEVATION

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



NORTH FACING EXTERIOR ELEVATION

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

KEY NOTES

1. ARCHITECTURAL ASPHALT SHINGLES OVER #30 ROOFING FELT OVER 1/2" PLY SHEATHING
2. 2x6 FASCIA WRAPPED W/ ALUM.; MANUF. TO PROVIDE OWNER W/ FULL RANGE OF COLOR SAMPLES FOR APPROVAL
3. 6" FIBER BOARD TRIM; PAINT: WHITE
4. 8"x8"x16" SPLIT-FACE CMU BLOCK; PAINT COLOR: BY OWNER
5. FOR DOOR SIZES SEE SCHEDULES SHEET GD401
6. FOR WINDOW SIZES SEE SCHEDULES SHEET GD401
7. LINE OF FTG. & FND.; SEE STRUCTURAL DRAWINGS
8. PRE-CAST CONCRETE SILL; COLOR: CONCRETE
9. SOLATUBE 290 "BRIGHTEN UP SERIES" DAYLIGHTING SYSTEM W/ "VUSION" DIFFUSER AND FITCHED FLASHING PACKAGE
10. OWENS CORNING VTS6-144 BK VENTSUIRE METAL DOME ROOF VENT WITH SCREEN
11. ALUM. RAINGUTTER; MANUF. TO PROVIDE FULL RANGE OF COLOR SAMPLES & STYLES FOR APPROVAL
12. ALUM. DOWNSPOUT; MANUF. TO PROVIDE FULL RANGE OF COLOR SAMPLES & STYLES FOR APPROVAL
13. EXTERIOR LIGHTING; SEE ELECTRICAL DRAWINGS
14. ADA SIGNAGE; MOUNT 46" A.F.F. TO BASELINE OF CHARACTERS
15. ADA ACCESSIBLE DRINKING FOUNTAIN; SEE SHEET 4/A203
16. STANDING PERSONS DRINKING FOUNTAIN; SEE SHEET 4/A203

R1

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

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Professional Seal:

STATE OF UTAH
KELLY D. CHRISTOFFERSEN
#136313
1-21-10
LICENSED ARCHITECT

Project Title:

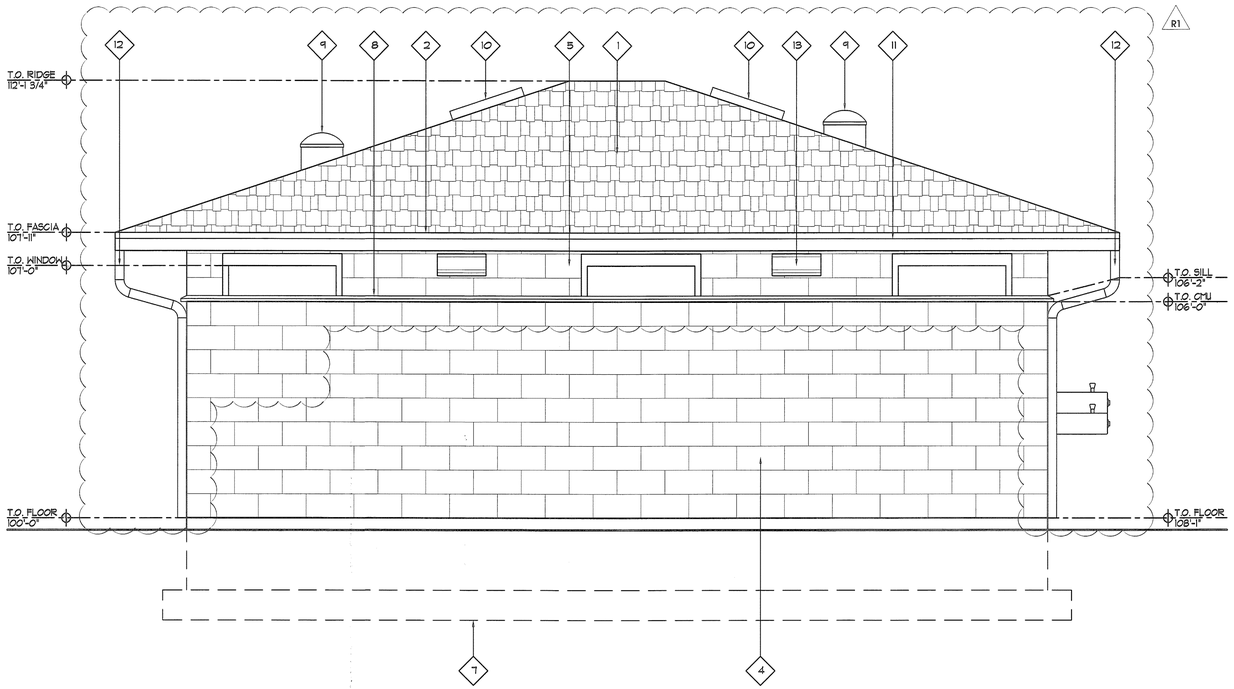
HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

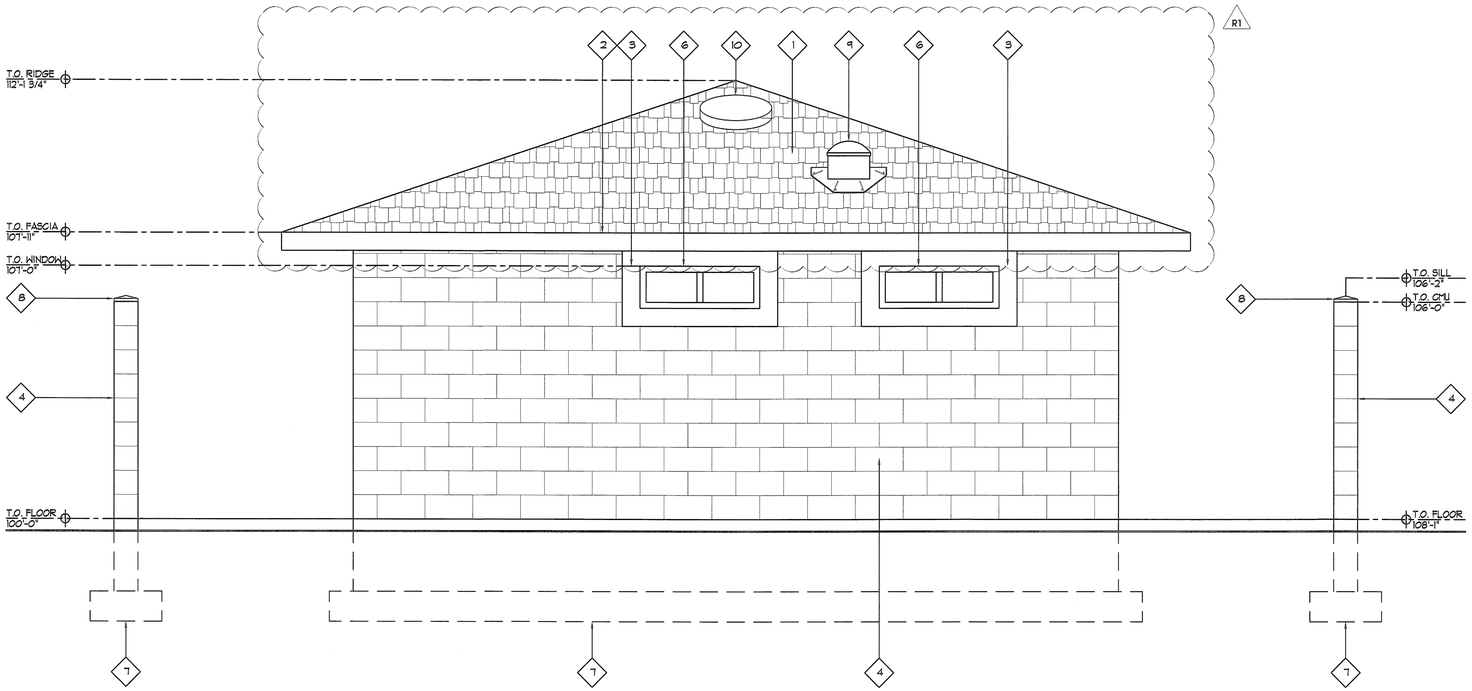
EXTERIOR ELEVATIONS

Drawn By:	Project Number:	DFCM Project Number:
Courtney Wallace	09-126	09198510
Designed By:	Date:	Sheet Number:
Courtney Wallace	November 22, 2009	A301
Reviewed By:	Sheet Scale:	6 of 10
Kelly Christoffersen	1/2" = 1'-0"	



EAST FACING EXTERIOR ELEVATION

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



SOUTH FACING EXTERIOR ELEVATION

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

KEY NOTES

1. ARCHITECTURAL ASPHALT SHINGLES OVER #30 ROOFING FELT OVER 1/2" PLY SHEATHING
2. 2x6 FASCIA WRAPPED W/ ALUM.; MANUF. TO PROVIDE OWNER W/ FULL RANGE OF COLOR SAMPLES FOR APPROVAL
3. 6" FIBER BOARD TRIM; PAINT: WHITE
4. 8"x8"x16" SPLIT-FACE CMU BLOCK; PAINT COLOR: BY OWNER
5. FOR DOOR SIZES SEE SCHEDULES SHEET GD401
6. FOR WINDOW SIZES SEE SCHEDULES SHEET GD401
7. LINE OF FTG. & FND.; SEE STRUCTURAL DRAWINGS
8. PRE-CAST CONCRETE SILL; COLOR: CONCRETE
9. SOLATUBE 290 "BRIGHTEN UP SERIES" DAYLIGHTING SYSTEM W/ "VUSION" DIFFUSER AND PITCHED FLASHING PACKAGE
10. OWENS CORNING VTSG-144 BK VENTSURE METAL DOME ROOF VENT WITH SCREEN
11. ALUM. RAINGUTTER; MANUF. TO PROVIDE FULL RANGE OF COLOR SAMPLES & STYLES FOR APPROVAL
12. ALUM. DOWNSPOUT; MANUF. TO PROVIDE FULL RANGE OF COLOR SAMPLES & STYLES FOR APPROVAL
13. EXTERIOR LIGHTING; SEE ELECTRICAL DRAWINGS

R1

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

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Professional Seal:

STATE OF UTAH
KELLY B. CHRISTOFFERSEN
#136313
1-21-10
LICENSED ARCHITECT

Project Title:

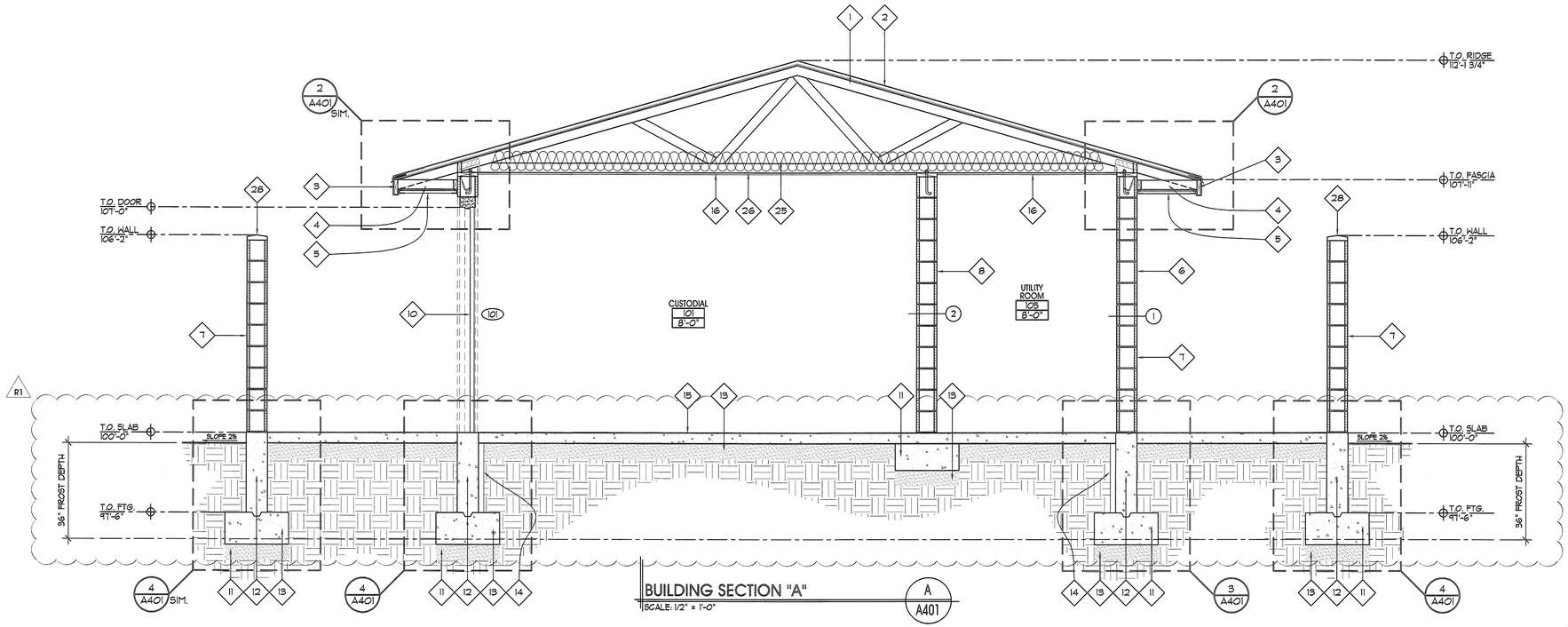
HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

EXTERIOR ELEVATIONS

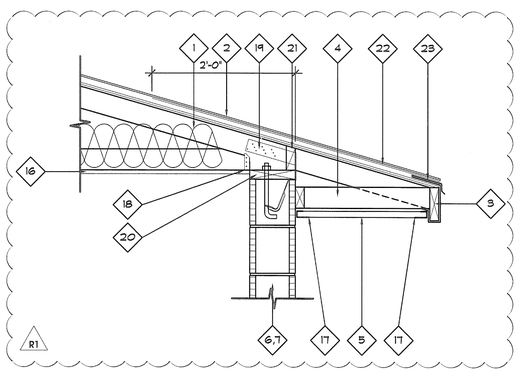
Drawn By:	Project Number:	DFCM Project Number:
Courtney Wallace	09-126	09198510
Designed By:	**Date:**	**Sheet Number:**
Courtney Wallace	November 22, 2009	A302
Reviewed By:	**Sheet Scale:**	
Kelly Christoffersen	1/2" = 1'-0"	7 of 10



BUILDING SECTION "A"

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

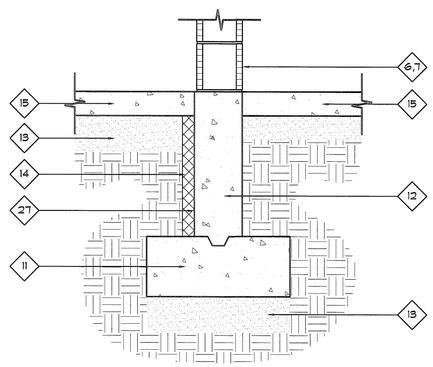
A
A401



FASCIA DETAIL

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

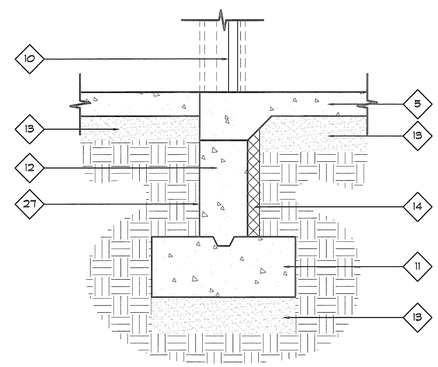
2
A401



FOUNATION WALL DETAIL

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

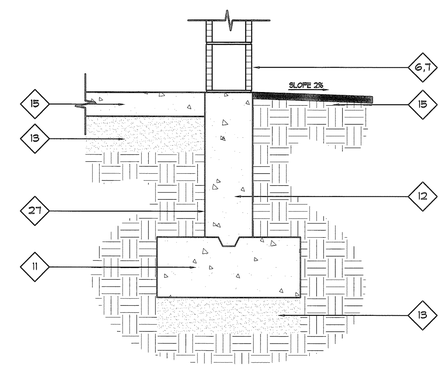
3
A401



FOUNATION WALL DETAIL

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

4
A401



FOUNATION WALL DETAIL

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

5
A401

KEY NOTES

1. PRE-MANUFACTURED ROOF TRUSSES; SEE STRUCTURAL DRAWINGS
2. ASPHALT SHINGLES CLASS "C" OVER #30 ROOFING FELT OVER 1/2" PLY SHEATHING.
3. 2x6 FASCIA WRAPPED W/ ALUM.; MANUF. TO PROVIDE OWNER W/ FULL RANGE OF COLOR SAMPLES FOR APPROVAL
4. 2x OUTRIGGER
5. PERFORATED ALUMINUM SOFFIT
6. FOR WALL TYPES SEE SHEET A101
7. 8"x8"x16" SPLIT-FACE CMU BLOCK; PAINT COLOR: BY OWNER
8. 8"x8"x16" CMU BLOCK; PAINT COLOR: BY OWNER
9. 6'-0" HIGH VINYL PRIVACY FENCING; SEE DETAILS 6 & 7 ON THIS SHEET
10. FOR DOOR SIZES SEE SCHEDULES SHEET A601
11. CONC. FTG; SEE STRUCTURAL DRAWINGS
12. REINFORCED CONCRETE FOUNDATION WALL; SEE FOOTING AND FND. PLAN FOR SIZE AND REINF. WALL TO BE DAMP PROOFED
13. SAND & GRAVEL OVER UNDISTURBED SOIL OR ENGINEERED FILL SEE STRUCTURAL DRAWINGS
14. 2" RIGID INSULATION
15. 4" SEALED CONC. SLAB; SEE STRUCTURAL DRAWINGS
16. 1/2" GYP. BOARD
17. "J" MOLD
18. "SIMPSON" H1 @ EA. TRUSS
19. "SIMPSON" PA11B @ 48" O.C.
20. 2x CONT. WOOD PL W/ 5/8"Φ A.B.'S @ 32" O.C.
21. 2X SOLID BLOCKING BETWEEN TRUSSES; NOTCH BLOCKING FOR ATTIC VENTILATION
22. SELF-ADHERING POLYMER MODIFIED BITUMINOUS ICE SHEET; EXTEND ICE SHEET 24" INTO THE WARM SIDE OF CMU WALL.
23. CONT. ALUMINUM FLASHING
24. INSULATION BAFFEL; ALLOW 1" AIR FLOW
25. R-38 BLOWN-IN INSULATION
26. VAPOR BARRIER; ATTACHED TO BOTTOM OF ROOF TRUSSES
27. ASPHALT EMULSION DAMPPROOFING
28. PRE-CAST CONCRETE SILL; COLOR: CONCRETE

R1

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

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Professional Seal:

STATE OF UTAH
KELLY D. CHRISTOFFERSEN
#136313
1-21-10
LICENSED ARCHITECT

Project Title:

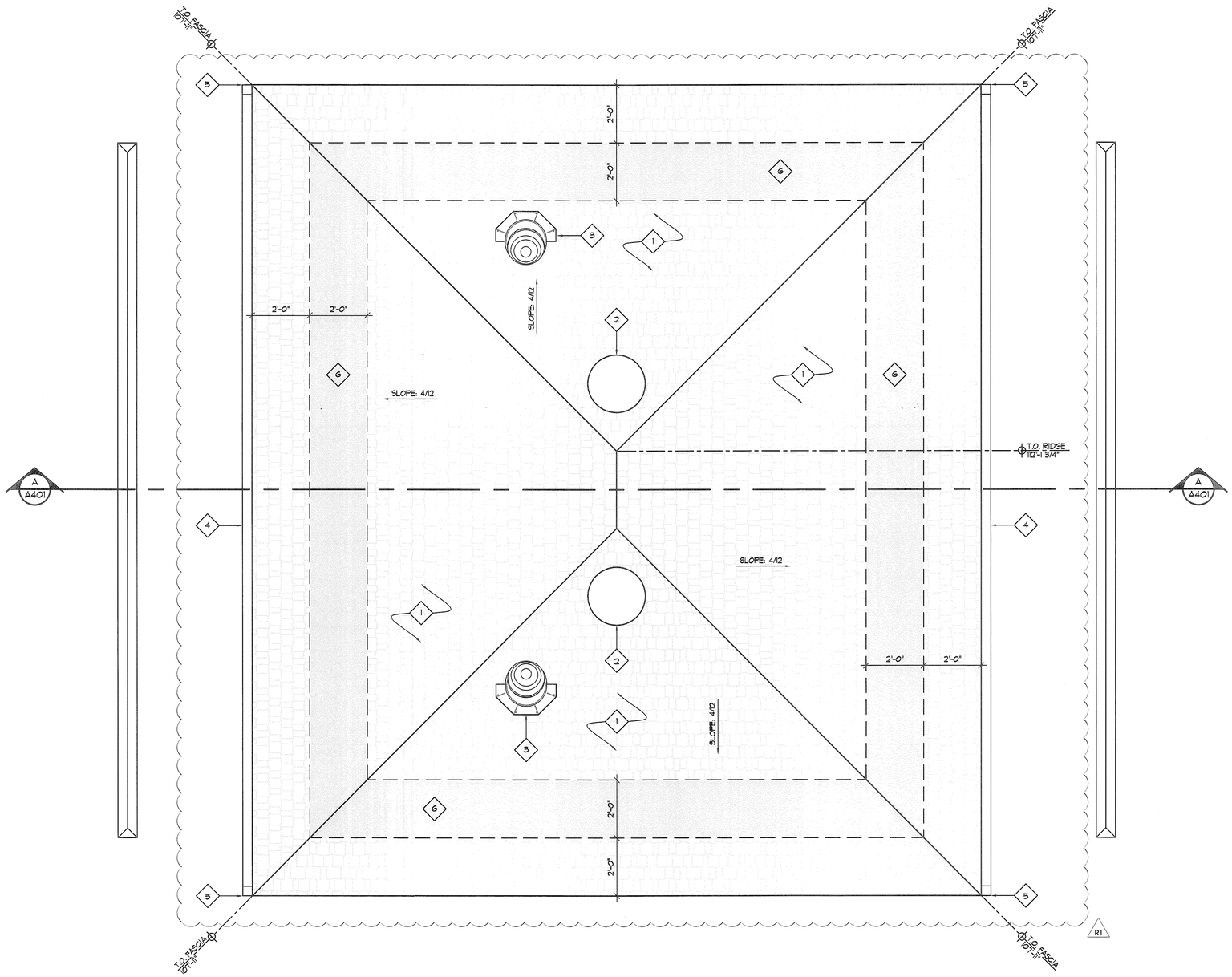
HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

BUILDING SECTION "A" ENLARGED DETAILS

Drawn By:	Project Number:	DFCM Project Number:
Courtney Wallace	09-126	09198510
Designed By:	Date:	Sheet Number:
Courtney Wallace	November 22, 2009	A401
Reviewed By:	Sheet Scale:	8 of 10
Kelly Christoffersen	1/2" = 1'-0"	



ROOF PLAN

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

KEY NOTES

1. ARCHITECTURAL ASPHALT SHINGLES OVER #30 ROOFING FELT OVER 1/2" PLY SHEATHING
2. OWENS CORNING VTSG-144 BK VENTSURE METAL DOME ROOF VENT WITH SCREEN
3. SOLATUBE 290 "BRIGHTEN UP SERIES" DAYLIGHTING SYSTEM W/ "VUSION" DIFFUSER AND PITCHED FLASHING PACKAGE
4. ALUM. RAINGUTTER; MANUF. TO PROVIDE FULL RANGE OF COLOR SAMPLES & STYLES FOR APPROVAL
5. ALUM. DOWNSPOUT; MANUF. TO PROVIDE FULL RANGE OF COLOR SAMPLES & STYLES FOR APPROVAL
6. SELF-ADHERING POLYMER MODIFIED, BITUMINOUS ICE SHEET; EXTEND ICE SHEET 24" INTO THE WARM SIDE OF CMU WALL

R1

R1

ATTIC VENTILATION CALCS (IBC 2006, SEC. 1203.2)

TOTAL BLDG. SQ. FT.: 512

50% OF REQ'D. VENTILATING AREA SQ. FT.: 256
(50% THROUGH ATTIC; 50% THROUGH SOFFIT)

NET FREE VENTILATING AREA (1/150): 256/150=1.71 SQ. FT. (246 SQ. IN.)

50% NET FREE AREA: 246 SQ. IN./144 SQ. IN. (NET FREE AREA PER ATTIC VENT)
TOTAL AMOUNT OF VENTILATORS REQ'D: 2

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

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Professional Seal:

STATE OF UTAH
KELLY D. CHRISTOFFERSEN
#136313
1-21-10
LICENSED ARCHITECT

Project Title:

HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

ROOF PLAN

Drawn By:	Project Number:	DFCM Project Number:
Courtney Wallace	09-126	09198510
Designed By:	Date:	Sheet Number:
Courtney Wallace	November 22, 2009	A501
Reviewed By:	Sheet Scale:	
Kelly Christoffersen	1/2" = 1'-0"	9 of 10

FINISH SCHEDULE

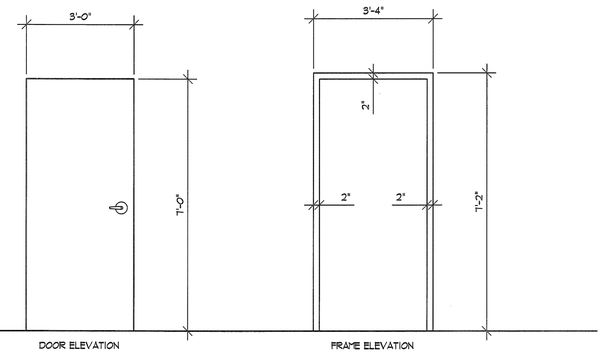
RM#	ROOM NAME	FLOORING: MATERIAL: SEALED CONCRETE	FLOORING: MATERIAL: 1"X1" CERAMIC MOSAIC TILE	FLOORING: BASE: NO BASE	FLOORING: BASE: TILE BASE	WALLS: CMU, EPOXY PAINTED	WALLS: 4 1/4"X4 1/4" CERAMIC TILE TO 60" ABOVE FINISHED FLOOR	WALLS: 4 1/4"X4 1/4" CERAMIC TILE TO CEILING LINE	CEILING: TEXTURED GYP. BOARD	CEILING: 4 1/4"X4 1/4" CERAMIC TILE	NOTES
100	WOMEN'S RESTROOM		●		●		●		●		
101	CUSTODIAL	●		●		●			●		
102	MEN'S RESTROOM		●		●		●		●		
103	SHOWER #1		●		●			●		●	
104	SHOWER #2		●		●			●		●	
105	UTILITY ROOM	●		●		●			●		
106	ADA SHOWER		●		●			●		●	

DOOR SCHEDULE

DR#	TYPE	SIZE	DOOR: MATERIAL: EXTERIOR GRADE INSULATED HOLLOW METAL	DOOR: FINISH: PAINT; WHITE	FRAME: MATERIAL: HOLLOW METAL	FRAME: FINISH: PAINT; WHITE	DOOR HARDWARE: HARDWARE GROUP	NOTES: SEE SPECIFICATIONS	NOTES: FIRE RATING (MINUTES)
100	EXT.	3'-0"x7'-0"	●	●	●	●	#1	●	
101	EXT.	3'-0"x7'-0"	●	●	●	●	#1	●	
102	EXT.	3'-0"x7'-0"	●	●	●	●	#1	●	
103	EXT.	3'-0"x7'-0"	●	●	●	●	#1	●	
104	EXT.	3'-0"x7'-0"	●	●	●	●	#1	●	
105	EXT.	3'-0"x7'-0"	●	●	●	●	#1	●	
106	EXT.	3'-0"x7'-0"	●	●	●	●	#1	●	

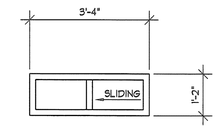
WINDOW SCHEDULE

WN#	SIZE	QTY	MATERIAL: VINYL	MANUF.: KAWNEER OR EQUAL	STYLE: SLIDING	GLASS TYPE: 1", INSUL. LOW "E", OBSCURED	MISC. NOTES: SEE SPECIFICATIONS
A	3'-4" x 1'-2"	4	●	●	●	●	●



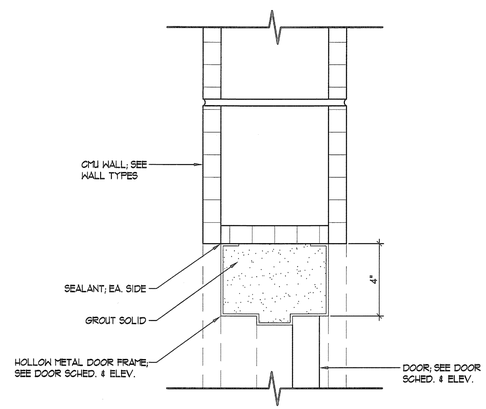
DOOR ELEVATION 1/A601
SCALE: 1/2" = 1'-0"

DOOR NOTES:
FOR USE W/ DOORS: 100-106
HEAD DETAIL: 3/A601
JAMB DETAIL: 4/A601

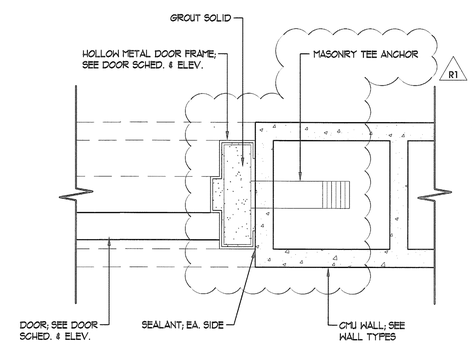


WINDOW ELEVATION 2/A601
SCALE: 1/2" = 1'-0"

WINDOW NOTES:
FOR USE W/ WINDOWS: A
HEAD DETAIL: 5/A601
JAMB DETAIL: 6/A601
JAMB DETAIL: 7/A601



DOOR HEAD DETAIL 3/A601
SCALE: 3" = 1'-0"



DOOR JAMB DETAIL 4/A601
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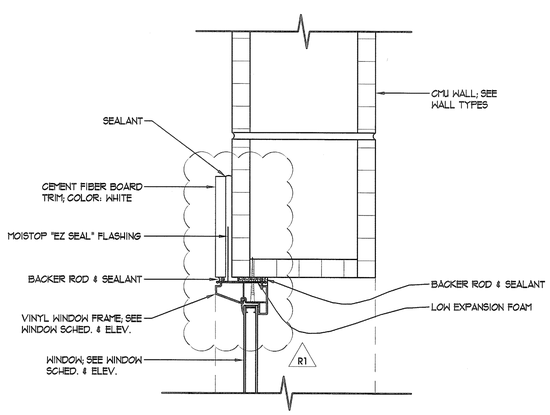
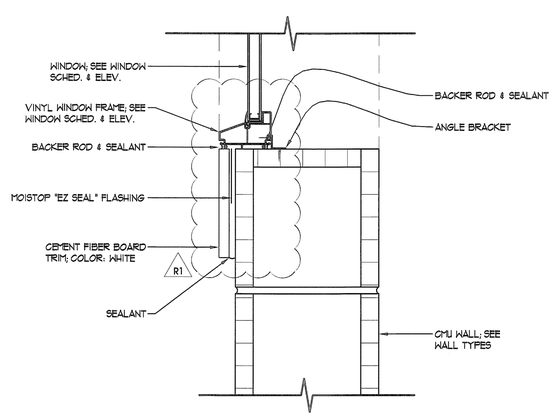
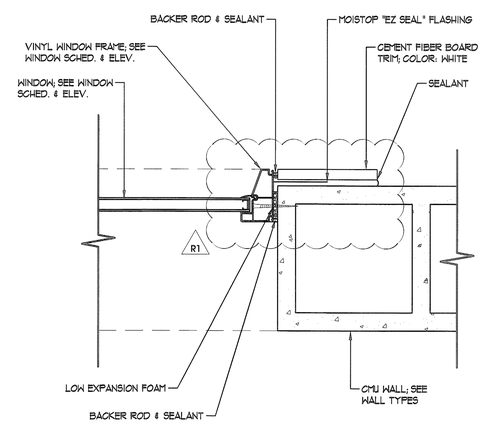


WINDOW HEAD DETAIL 5/A601
SCALE: 3" = 1'-0"



WINDOW HEAD DETAIL 6/A601
SCALE: 3" = 1'-0"



WINDOW HEAD DETAIL 7/A601
SCALE: 3" = 1'-0"

REV#:	REVISION DESCRIPTION:	DATE:
R1	PLANS REVISED PER DFCM REVIEW	01/13/10

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1-21-10
LICENSED ARCHITECT

Project Title:
HYRUM STATE PARK RESTROOM REPLACEMENT
Hyrum, Utah

Sheet Title:
SCHEDULES/DOOR AND WINDOW ELEV./DETAILS

Drawn By:	Project Number:	DFCM Project Number:
Courtney Wallace	09-126	09198510
Designed By: Courtney Wallace	Date: November 22, 2009	Sheet Number: A601
Reviewed By: Kelly Christoffersen	Sheet Scale: 1/2" = 1'-0"	10 of 10

SPECIFICATIONS

SECTION 15050 – BASIC MECHANICAL MATERIALS AND METHODS
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUMMARY: GENERAL REQUIREMENTS FOR MOTORS, HANGERS AND SUPPORTS, VIBRATION ISOLATION AND SEISMIC RESTRAINTS, VALVES, AND METERS AND GAGES.
B. SUBMITTALS: PRODUCT DATA FOR MATERIALS AND EQUIPMENT SPECIFIED IN THIS SECTION.
PART 2 – PRODUCTS
2.1 MOTORS
A. MOTOR CHARACTERISTICS:
1. MOTORS 3/4 HP AND LARGER: THREE PHASE.
2. MOTORS SMALLER THAN 3/4 HP: SINGLE PHASE.
3. FREQUENCY RATING: 60 HZ.
4. VOLTAGE RATING: NEMA STANDARD VOLTAGE SELECTED TO OPERATE ON NOMINAL CIRCUIT VOLTAGE TO WHICH MOTOR IS CONNECTED.
5. SERVICE FACTOR: 1.15 FOR OPEN DRIPPROOF MOTORS; 1.0 FOR TOTALLY ENCLOSED MOTORS.
6. DUTY: CONTINUOUS DUTY AT AMBIENT TEMPERATURE OF 105°F AND AT ALTITUDE OF 4500 FEET ABOVE SEA LEVEL.
7. CAPACITY AND TORQUE CHARACTERISTICS: SUFFICIENT TO START, ACCELERATE, AND OPERATE CONNECTED LOADS AT DESIGNATED SPEEDS, AT INSTALLED ALTITUDE AND ENVIRONMENT, WITH INDICATED OPERATING SEQUENCE, AND WITHOUT EXCEEDING NAMEPLATE RATINGS OR CONSIDERING SERVICE FACTOR.
8. ENCLOSURE: UNLESS OTHERWISE INDICATED, OPEN DRIPPROOF.
9. MOTORS USED WITH VARIABLE FREQUENCY CONTROLLERS: RATINGS, CHARACTERISTICS, AND FEATURES COORDINATED WITH AND APPROVED BY CONTROLLER MANUFACTURER.
2.2 HANGERS AND SUPPORTS
A. HANGER AND PIPE ATTACHMENTS: FACTORY FABRICATED WITH GALVANIZED COATINGS; NONMETALLIC COATED FOR HANGERS IN DIRECT CONTACT WITH COPPER TUBING.
B. BUILDING ATTACHMENTS: POWDER–ACTUATED–TYPE, DRIVE–PIN ATTACHMENTS WITH PULLOUT AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.
C. MECHANICAL–EXPANSION ANCHORS: INSERT WEDGE–TYPE ATTACHMENTS WITH PULLOUT AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.
2.3 VIBRATION ISOLATION AND SEISMIC CONTROL DEVICES
A. VIBRATION SUPPORTS:
1. RESTRAINED ELASTOMERIC MOUNTS: DOUBLE–DEFLECTION TYPE, WITH MOLDED, OIL–RESISTANT RUBBER OR NEOPRENE ISOLATOR ELEMENTS WITH FACTORY–DRILLED, ENCAPSULATED TOP PLATE FOR BOLTING TO EQUIPMENT AND BASEPLATE FOR BOLTING TO STRUCTURE. PROVIDE ISOLATOR WITH MINIMUM 0.5–INCH STATIC DEFLECTION.
2. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN–SPRING ISOLATORS. PROVIDE ISOLATOR WITH MINIMUM 1–INCH STATIC DEFLECTION.
B. VIBRATION HANGERS:
1. ELASTOMERIC HANGERS: DOUBLE–DEFLECTION TYPE, WITH MOLDED, OIL–RESISTANT RUBBER OR NEOPRENE ISOLATOR ELEMENTS BONDED TO STEEL HOUSINGS WITH THREADED CONNECTIONS FOR HANGER RODS. PROVIDE ISOLATOR WITH MINIMUM 0.5–INCH STATIC DEFLECTION.
2. SPRING HANGERS: COMBINATION COIL–SPRING AND ELASTOMERIC–INSERT HANGER WITH SPRING AND INSERT IN COMPRESSION. PROVIDE ISOLATOR WITH MINIMUM 1–INCH STATIC DEFLECTION.
C. SEISMIC RESTRAINTS:
1. RESILIENT ISOLATION WASHERS AND BUSHINGS: 1–PIECE, MOLDED, BRIDGE–BEARING NEOPRENE COMPLYING WITH AASHTO M 251 AND HAVING A DUROMETER HARDNESS OF 50, PLUS OR MINUS 5, WITH A FLAT WASHER FACE.
2. RESTRAINING CABLES: GALVANIZED STEEL CABLES WITH END CONNECTIONS MADE OF STEEL ASSEMBLIES THAT SWIVEL TO FINAL INSTALLATION ANGLE AND UTILIZE TWO CLAMPING BOLTS FOR CABLE ENGAGEMENT.
3. ANCHOR BOLTS: SEISMIC–RATED, DRILL–IN, AND STUD–WEDGE OR FEMALE–WEDGE TYPE. SELECT ANCHOR BOLTS WITH STRENGTH REQUIRED FOR ANCHOR AND AS TESTED ACCORDING TO ASTM E 488/E 488M.
2.4 PRESSURE GAGES AND TEST PLUGS
A. PRESSURE GAGES: DIRECT–MOUNTING, INDICATING–DIAL TYPE COMPLYING WITH ASME B40.100. DRY METAL CASE, MINIMUM 2–1/2 INCH DIAMETER WITH RED POINTER ON WHITE FACE, AND PLASTIC WINDOW. MINIMUM ACCURACY 3 PERCENT OF MIDDLE HALF OF RANGE. RANGE TWO TIMES OPERATING PRESSURE.
B. TEST PLUG: CORROSION–RESISTANT BRASS OR STAINLESS–STEEL BODY WITH TWO SELF–SEALING RUBBER CORE INSERTS AND GASKETED AND THREADED CAP, WITH EXTENDED STEM FOR UNITS TO BE INSTALLED IN INSULATED PIPING. MINIMUM PRESSURE AND TEMPERATURE RATING 500 PSIG AT 200°F.
PART 3 – EXECUTION
3.1 MOTOR INSTALLATION
A. ANCHOR MOTOR ASSEMBLY TO BASE, ADJUSTABLE RAILS, OR OTHER SUPPORT, ARRANGED AND SIZED ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
3.2 GENERAL PIPING INSTALLATIONS
A. INSTALL PIPING FREE OF SAGS AND BENDS.
B. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
C. INSTALL SLEEVES FOR PIPES PASSING THROUGH CONCRETE AND MASONRY WALLS, GYPSOM–BOARD PARTITIONS AND CONCRETE FLOOR AND ROOF SLABS.
D. EXTERIOR WALL, PIPE PENETRATIONS: MECHANICAL SLEEVE SEALS INSTALLED IN STEEL OR CAST–IRON PIPES FOR WALL SLEEVES.
E. FIRE–BARRIER PENETRATIONS: SEAL PIPE PENETRATIONS WITH THROUGH–PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
F. INSTALL UNIONS AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT.
G. INSTALL DIELECTRIC UNIONS AND FLANGES TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN GAS PIPING.
H. INSTALL DIELECTRIC COUPLING AND NIPPLE FITTINGS TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN WATER PIPING.
3.3 GENERAL EQUIPMENT INSTALLATIONS
A. INSTALL EQUIPMENT TO ALLOW MAXIMUM POSSIBLE HEADROOM UNLESS SPECIFIC MOUNTING HEIGHTS ARE NOT INDICATED.
B. INSTALL EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, UNLESS OTHERWISE INDICATED.
C. INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE TO OTHER INSTALLATIONS. EXTEND GREASE FITTINGS TO ACCESSIBLE LOCATIONS.
D. INSTALL EQUIPMENT TO ALLOW RIGHT OF WAY FOR PIPING INSTALLED AT REQUIRED SLOPE.
3.4 CONCRETE BASES
A. ANCHOR EQUIPMENT TO CONCRETE BASE ACCORDING TO EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS AND ACCORDING TO SEISMIC CODES AT PROJECT.
B. CONSTRUCT CONCRETE BASES OF DIMENSIONS INDICATED, BUT NOT LESS THAN 4 INCHES LARGER IN BOTH DIRECTIONS THAN SUPPORTED UNIT.
C. UNLESS OTHERWISE INDICATED, INSTALL DOWEL RODS ON 18–INCH CENTERS AROUND THE FULL PERIMETER OF THE BASE TO CONNECT CONCRETE BASE TO CONCRETE FLOOR.
D. INSTALL EPOXY–COATED ANCHOR BOLTS FOR SUPPORTED EQUIPMENT THAT EXTEND THROUGH CONCRETE BASE, AND ANCHOR INTO STRUCTURAL CONCRETE FLOOR.
E. PLACE AND SECURE ANCHORAGE DEVICES. USE SUPPORTED EQUIPMENT MANUFACTURER'S SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS, AND DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED.
F. INSTALL ANCHOR BOLTS TO ELEVATIONS REQUIRED FOR PROPER ATTACHMENT TO SUPPORTED EQUIPMENT.
G. USE 3000–PSI, 28–DAY COMPRESSIVE–STRENGTH CONCRETE AND REINFORCEMENT AS SPECIFIED IN DIVISION 3 SECTION "CAST–IN–PLACE CONCRETE."
3.5 HANGERS AND SUPPORTS
A. COMPLY WITH MSS SP–69 AND MSS SP–89. INSTALL BUILDING ATTACHMENTS WITHIN CONCRETE OR TO STRUCTURAL STEEL.
B. INSTALL HANGERS AND SUPPORTS TO ALLOW CONTROLLED THERMAL AND SEISMIC MOVEMENT OF PIPING SYSTEMS.
C. INSTALL POWDER–ACTUATED DRIVE–PIN FASTENERS IN CONCRETE AFTER CONCRETE IS CURED. DO NOT USE IN LIGHTWEIGHT CONCRETE OR IN SLABS LESS THAN 4 INCHES THICK.
D. INSTALL MECHANICAL–EXPANSION ANCHORS IN CONCRETE AFTER CONCRETE IS CURED. DO NOT USE IN LIGHTWEIGHT CONCRETE OR IN SLABS LESS THAN 4 INCHES THICK.
E. SEE DIVISION 13 SECTION "FIRE SUPPRESSION PIPING" FOR SUPPORT OF FIRE–PROTECTION SYSTEM PIPING.
F. LOAD DISTRIBUTION: INSTALL HANGERS AND SUPPORTS SO PIPING LIVE AND DEAD LOADING AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT.
G. HORIZONTAL–PIPING HANGERS AND SUPPORTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
1. ADJUSTABLE STEEL CLEVIS HANGERS (MSS TYPE 1): FOR SUSPENSION OF NONINSULATED OR INSULATED STATIONARY PIPES.
2. PIPE HANGERS (MSS TYPE 5): FOR SUSPENSION OF PIPES, NPS 1/2 TO NPS 4, TO ALLOW OFF–CENTER CLOSURE FOR HANGER INSTALLATION BEFORE PIPE ERECTION.
3. ADJUSTABLE STEEL BAND HANGERS (MSS TYPE 7): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
4. ADJUSTABLE BAND HANGERS (MSS TYPE 9): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
5. ADJUSTABLE SWIVEL–RING BAND HANGERS (MSS TYPE 10): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
H. VERTICAL–PIPING CLAMPS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
1. EXTENSION PIPE OR RISER CLAMPS (MSS TYPE 8): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20.
2. CARBON– OR ALLOY–STEEL RISER CLAMPS (MSS TYPE 42): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20, IF LONGER ENDS ARE REQUIRED FOR RISER CLAMPS.
3.6 VIBRATION ISOLATION AND SEISMIC CONTROL DEVICE INSTALLATION
A. ADJUST VIBRATION ISOLATORS TO ALLOW FREE MOVEMENT OF EQUIPMENT LIMITED BY RESTRAINTS.
B. INSTALL RESILIENT BOLT ISOLATION WASHERS ON EQUIPMENT ANCHOR BOLTS.
C. INSTALL CABLES SO THEY DO NOT BEND ACROSS SHARP EDGES OF ADJACENT EQUIPMENT OR BUILDING STRUCTURE.
3.7 PRESSURE GAGES AND TEST PLUGS
A. INSTALL PRESSURE GAGES AT SUCTION AND DISCHARGE OF EACH PUMP.
B. INSTALL TEST PLUGS AT SUPPLY AND RETURN FOR HYDRONIC TERMINALS, AND BOILERS.
END OF SECTION 15050

SPECIFICATIONS

SECTION 15071 – MECHANICAL VIBRATION AND SEISMIC CONTROLS
PART 1 – GENERAL
1.1 SEISMIC AND VIBRATION CONTROL
A. GENERAL: DIVISION 15 SHALL BE RESPONSIBLE FOR PURCHASING AND INSTALLING VIBRATION ISOLATORS, FLEXIBLE CONNECTIONS, RIGID STEEL FRAMES, ANCHORS, INSERTS, HANGERS AND ATTACHMENTS AND SEISMIC BRACING AND SNUBBERS AS REQUIRED FOR SEISMIC CONTROL AND PREVENTION OF THE TRANSMISSION OF VIBRATION FOR BOTH ISOLATED AND NON–ISOLATED SYSTEMS.
B. ALL MECHANICAL EQUIPMENT SHALL BE DESIGNED FOR THE SITE SPECIFIC SEISMIC ZONE AS PER THE INTERNATIONAL BUILDING CODE.
C. REFERENCE STANDARDS: THE WORK SHALL COMPLY TO THE FOLLOWING STANDARDS:
1. INTERNATIONAL BUILDING CODE, CURRENT EDITION
2. NFPA BULLETIN 90A, CURRENT EDITION
3. BRIDGE BEARING SPECIFICATIONS
D. DESIGN PARAMETERS: REFER TO SECTION 1621 OF THE 2003 INTERNATIONAL BUILDING CODE AND ASCE 7–02.
E. APPROVED MANUFACTURERS:
1. IN ORDER TO INSURE THAT THE REQUIREMENTS OF THE PROJECT ARE ACHIEVED, THE CONTRACTOR MUST SECURE THE SERVICES OF A MANUFACTURER OR SUPPLIER WHO HAS PROVEN CAPABILITIES OF DEALING EFFECTIVELY WITH VIBRATION CHARACTERISTICS, EFFECTS AND CRITERIA AND CAN PROVIDE FACILITIES AND CAPABILITIES FOR MEASURING, EVALUATING AND DESIGNING FOR SEISMIC DISTURBANCES.
2. MANUFACTURERS APPROVED FOR USE ARE:
A. MASON INDUSTRIES, INC.
B. AMBER/BOOTH COMPANY.
C. VIBRATION ELIMINATOR CO.
D. KINETICS NOISE CONTROL.
3. THE MANUFACTURER'S RESPONSIBILITIES SHALL INCLUDE DESIGNING AND PROVIDING ALL VIBRATION ISOLATORS AND SEISMIC RESTRAINTS. HE SHALL ALSO BE RESPONSIBLE FOR THE PROPER INSTALLATION OF THESE COMPONENTS. PERIODIC INSPECTIONS TO THE JOB SITE WILL BE MADE AS REQUIRED. HE SHALL MAKE A FINAL INSPECTION AND SUBMIT A REPORT TO THE ARCHITECT CERTIFYING COMPLIANCE TO THESE SPECIFICATIONS, DRAWINGS AND RELATED STANDARDS. PROVIDE SUBMITTALS AS SPECIFIED.
F. SUBMITTALS: SUBMITTAL DATA PRIOR TO FABRICATION, SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
1. COMPLETE ENGINEERING CALCULATIONS AND SHOP DRAWINGS FOR ALL VIBRATION AND SEISMIC REQUIREMENTS FOR ALL EQUIPMENT, PIPING AND DUCTWORK.
2. THE UTAH STATE PROFESSIONAL STAMP OF THE ENGINEER WHO IS RESPONSIBLE FOR THE DESIGN AND OPERATION OF THE VIBRATION AND SEISMIC SYSTEM.
3. THE TYPE, SIZE, AND DEFLECTION OF EACH ISOLATOR PROPOSED FOR ITEMS IN THIS SPECIFICATION AND ON THE DRAWINGS.
4. DETAILS FOR ALL THE ISOLATORS AND SEISMIC BRACING WITH SNUBBERS PROPOSED FOR ITEMS IN THIS SPECIFICATION AND ON THE DRAWINGS.
5. THE SIZE, LOADING AND LOCATION OF PIPE AND DUCT SUPPORTS WITH AN AS–BUILT PLAN OR COMPLETE DESCRIPTION OF THE SYSTEM.
G. VIBRATION ISOLATION:
1. ALL MECHANICAL EQUIPMENT 1 HP, AND OVER UNLESS OTHERWISE NOTED, SHALL BE ISOLATED FROM THE STRUCTURE BY MEANS OF RESILIENT VIBRATION AND NOISE ISOLATORS DESIGNED AND SUPPLIED BY THE SEISMIC AND VIBRATION CONTROL MANUFACTURER. PIPING AND DUCTWORK CONNECTED TO VIBRATING EQUIPMENT SHALL BE ISOLATED FROM THE STRUCTURE AS REQUIRED TO PREVENT VIBRATION TRANSMISSION. ISOLATION EQUIPMENT, HANGERS, CONNECTIONS, AND OTHER ISOLATING DEVICES SHALL BE DESIGNED AND INSTALLED TO PREVENT TRANSMISSION OF VIBRATION TO THE STRUCTURE FROM THE MECHANICAL EQUIPMENT OR ANY OF THE ASSOCIATED PIPING AND DUCTWORK.
H. VIBRATION ISOLATORS SHALL BE PROVIDED AS FOLLOWS AND AS OTHERWISE INDICATED:
1. ISOLATE ALL WATER PIPING THAT IS CONNECTED TO VIBRATION ISOLATED EQUIPMENT, FOR A DISTANCE OF AT LEAST 50 FEET FROM THE EQUIPMENT. ISOLATORS SHALL BE TYPE D SPRING HANGERS.
2. ISOLATE ALL DUCTWORK THAT IS CONNECTED TO VIBRATION ISOLATED EQUIPMENT, FOR A DISTANCE OF AT LEAST 50 FEET FROM THE EQUIPMENT. ISOLATORS SHALL BE TYPE D SPRING HANGERS WITH NEOPRENE ELEMENTS.
I. VIBRATION ISOLATORS SHALL BE AS FOLLOWS:
1. TYPE D SPRING HANGERS: VIBRATION HANGERS SHALL CONTAIN A STEEL SPRING AND 0.3" DEFLECTION NEOPRENE ELEMENT IN SERIES. THE NEOPRENE ELEMENT SHALL BE MOLDED WITH A ROD ISOLATION BUSHING THAT PASSES THROUGH THE HANGER BOX. SPRING DIAMETERS AND HANGER BOX LOWER HOLE SIZES SHALL BE LARGE ENOUGH TO PERMIT THE HANGER ROD TO SWING THROUGH A 30 DEGREE ARC BEFORE CONTACTING THE HOLE AND SHORT CIRCUITING THE SPRING. SPRINGS SHALL HAVE A MINIMUM ADDITIONAL TRAVEL TO SOLID EQUAL TO 50% OF THE RATED DEFLECTION. HANGERS SHALL BE TYPE 30N AS MANUFACTURED BY MASON INDUSTRIES, INC. OR EQUAL BY AMBER–BOOTH.
2. TYPE P NEOPRENE PAD: A PAD TYPE MOUNTING CONSISTING OF TWO LAYERS OF 3/8" THICK RIBBED OR WAFFLED BRIDGE BEARING NEOPRENE PADS BONDED TO A 16 GAGE GALVANIZED STEEL SEPARATOR PLATE. ANCHOR BOLT WITH NEOPRENE WASHER AND SLEEVE.
J. SEISMIC RESTRAINTS:
1. GENERAL: THE INTENT OF THE SEISMIC RESTRAINTS IS TO RESTRAIN THE MECHANICAL EQUIPMENT, PIPES AND DUCTS DURING AN EARTHQUAKE FOR LIFE SAFETY PURPOSES; TO PREVENT EQUIPMENT FROM OVERTURNING; TO PREVENT SUSPENDED EQUIPMENT, PIPES AND DUCTS FROM SWAYING OR FALLING AND CREATING A POTENTIAL LIFE SAFETY HAZARD. FOR "ESSENTIAL" AND "HAZARDOUS" FACILITIES (AS DEFINED IN THE INTERNATIONAL BUILDING CODE), THE INTENT OF THE SEISMIC RESTRAINT SYSTEM ALSO INCLUDES KEEPING THE MECHANICAL SYSTEMS OPERATIONAL DURING AND FOLLOWING AN EARTHQUAKE. SEE SECTION 05500 "METAL FABRICATION" FOR STANDARDS FOR MISCELLANEOUS METAL FABRICATION.
2. THE FOLLOWING MECHANICAL ITEMS SHALL BE SEISMIC ALLY BRACED AS SPECIFIED, DETAILED ON THE DRAWINGS, OR AS RECOMMENDED BY THE SEISMIC AND VIBRATION CONTROL MANUFACTURER:
A. ROOF HOODS – ANCHOR BOLTS
B. PACKAGED ROOFTOP AIR HANDLERS – ANCHOR BOLTS
C. WATER HEATER – ANCHOR BOLTS
D. INLINE EXHAUST FANS – CABLES
E. ALL DUCT WORK AND PIPING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS IN ACCORDANCE WITH THE CURRENT EDITION OF THE INTERNATIONAL BUILDING CODE. INSULATED PIPING LONGITUDINAL RESTRAINTS SHALL BE ATTACHED DIRECTLY TO PIPING.
3. CONNECTIONS OF THE SEISMIC BRACING TO THE STRUCTURE SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND ACCEPTABLE TO THE STRUCTURAL ENGINEERS. IN GENERAL, CONNECT TO BEAMS, CONCRETE SLABS, OR TO THE TOP MEMBER OF THE JOISTS AT THE PANEL POINTS. DIVISION 15 SHALL PROVIDE SPANNER BEAMS WHERE REQUIRED FOR SEISMIC BRACING. SEISMIC ANCHORAGE SHALL EXTEND THROUGH CONCRETE HOUSE KEEPING PADS AND ANCHOR TO THE BUILDING FLOOR SLABS.
4. THE SEISMIC AND VIBRATION CONTROL MANUFACTURER SHALL DETERMINE THE NUMBER, SIZE, AND TYPE OF ANCHOR BOLTS, CABLE RESTRAINTS, SEISMIC SNUBBERS, ETC., FOR EACH PIECE OF EQUIPMENT AND GROUPS OF PIPES AND DUCTS. INDIVIDUAL PIPES AND DUCTS SHALL BE BRACED AS PER THE SMACNA DETAILS AND APPROVED AND VERIFIED BY THE SEISMIC AND VIBRATION CONTROL MANUFACTURER.
K. SEISMIC SNUBBERS:
1. THE CAPACITY OF THE SEISMIC SNUBBER AT 3/8" DEFLECTION SHALL BE 3 TO 4 TIMES THE LOAD ASSIGNED TO THE MOUNT GROUPING IN ITS IMMEDIATE AREA. SUBMITTALS SHALL INCLUDE LOAD DEFLECTION CURVES UP TO 1/2" DEFLECTION IN THE Y AND Z PLANES. TEST SHALL BE CONDUCTED IN AN INDEPENDENT LABORATORY OR UNDER THE SIGNED SUPERVISION OF AN INDEPENDENT REGISTERED ENGINEER. THE SNUBBER ASSEMBLIES SHALL BE BOLTED TO THE TEST MACHINE AS THE SNUBBER IS NORMALLY INSTALLED. TEST REPORTS SHALL CERTIFY THAT NEITHER THE NEOPRENE ELEMENTS NOR THE SNUBBER BODY SUSTAINED ANY OBVIOUS DEFORMATION AFTER RELEASE OF LOAD. SNUBBERS SHALL BE SERIES Z–1011 AS MANUFACTURED BY MASON INDUSTRIES, INC. OR EQUAL BY AMBER–BOOTH.
END OF SECTION 15071

SYMBOL LEGEND

SYMBOL	DESCRIPTION
VALVES, METERS, AND GAUGES	
	SHUT OFF VALVE
	GATE VALVE
	CHECK VALVE
	BALL VALVE
	RELIEF VALVE
	PRESSURE REDUCING VALVE
S	SOLENOID VALVE
	ANGLE VALVE
	BALANCING OR PLUG COCK
	FLOW SETTER
	GAS COCK
MAV	MANUAL AIR VENT
	STRAINER
	GAUGE COCK
	FLEXIBLE CONNECTION
	PRESSURE GAUGE
	THERMOMETER
	VICTUALIC COUPLING
	REDUCER CONCENTRIC
	REDUCER ECCENTRIC
	90° ELBOW UP
	90° ELBOW DOWN
	90° TEE UP
	90° TEE DOWN
	UNION
	CAPPED PIPE
PLUMBING SYMBOLS	
W.H.	WALL HYDRANT
H.B.	HOSE BIBB
	CLEANOUT TO GRADE
	FLOOR CLEANOUT
	WALL CLEANOUT
PLUMBING PIPING	
	SOIL, WASTE – ABOVE GRADE
	SOIL, WASTE – BELOW GRADE
	VENT
	COLD WATER
	HOT WATER
	HOT WATER CIRCULATE
VTR	VENT THRU ROOF
	NON POTABLE WATER
(E)	EXISTING PIPE
(E)	EXISTING PIPE TO BE REMOVED
HVAC PIPING	
D	DRAIN LINE
(E)	EXISTING PIPE
(E)	EXISTING PIPE TO BE REMOVED

PLUMBING SHEET INDEX

SHEET NO	SHEET TITLE
P001	PLUMBING GENERAL INFORMATION
P002	PLUMBING GENERAL INFORMATION
P101	PLUMBING PLANS, DETAILS & SCHEDULES

SYMBOL LEGEND

SYMBOL	DESCRIPTION
REFERENCE AND LINE SYMBOLS	
# / SHEET	DETAIL INDICATOR: # INDICATES DETAIL NUMBER, SHEET INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, EXTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, INTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
100	ROOM OR SPACE NUMBER.
1	KEYNOTE INDICATOR.
	REVISION INDICATOR.
CU–1	EQUIPMENT INDICATOR.
P–	PLUMBING FIXTURE INDICATOR.
TYPE / CFM / SIZE	DIFFUSER/GRILLE INDICATOR.
TYPE / SIZE	DIFFUSER/GRILLE INDICATOR.
	BREAK, STRAIGHT
	BREAK, ROUND.
--------	HIDDEN FEATURES LINE: HIDDEN, THIN LINE.

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED

AD	ACCESS DOOR
AIR COND	AIR CONDITION(–ING,–ED)
APD	AIR PRESSURE DROP
BD	BALANCING DAMPER
BHP	BRAKE HORSE POWER
BTU	BRITISH THERMAL UNIT
BTUH	BTU/HOUR
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	COOLING
COMP	COMPONENT
COND	CONDENS(–ER, –ING, –ATION)
CV	CONTROL VALVE
CW	COLD WATER
DIA	DIAMETER
DISCH	DISCHARGE
DP	DEPTH OR DEEP
DB	DRY BULB TEMPERATURE
(E)	EXISTING
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
EG	ETHYLENE GLYCOL
ELEC	ELECTRIC
ELEV	ELEVATION
ENT	ENTERING
EVAP	EVAPORAT(–E, –ING, –ED, –OR)
EWT	ENTERING WATER TEMPERATURE
EXT	EXTERNAL
(F)	FUTURE
F	FAHRENHEIT
FC	FLEXIBLE CONNECT(–OR, –ION)
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
FT	FEET
GAL	GALLON(S)
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HG	MERCURY
HR	HOUR
HT	HEIGHT
HTG	HEATING
HP	HORSE POWER
HW	HOT WATER
HZ	HERTZ(FREQUENCY)
ID	INSIDE DIAMETER
IN	INCH
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LG	LENGTH
LH	LATENT HEAT
LRA	LOCKED ROTOR AMPS
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTURER
MIN	MINIMUM
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OZ	OUNCE
PD	PRESSURE DROP OR DIFFERENCE
PG	PROPYLENE GLYCOL
PH	PHASE
PPM	PARTS PER MILLION
PRESS	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAUGE
R	THERMAL RESISTANCE
RA	RETURN AIR
RECIRC	RECIRCULATE
REFR	REFRIGERATION
REQD	REQUIRED
RLA	RATED --- AMPS
RPM	REVOLUTIONS PER MINUTE
RW	RAINWATER
SA	SUPPLY AIR
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCW	SOFT COLD WATER
SF	SAFETY FACTOR
SH	SENSIBLE HEAT
SL	SEA LEVEL
SP	STATIC PRESSURE
SPECS(S)	SPECIFICATION(S)
SQ	SQUARE
STD	STANDARD
STM	STEAM
TEMP	TEMPERATURE
TD	TEMP. DROP OR DIFF.
THERM	THERMAL
TOT	TOTAL
TSTAT	THERMOSTAT
V	VOLT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VENT	VENT, VENTILATION
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
WTR	WATER
WT	WEIGHT
WB	WET BULB TEMP
YR	YEAR

GENERAL NOTES

1. DO NOT ROUTE PIPES ABOVE ELECTRICAL PANELS. ALL ELECTRICAL PANELS MUST HAVE CLEAR ACCESS SPACE IN FRONT OF PANEL 4'–0" DEEP AND 6'–6" HIGH.
2. STEEL ROOF DECK SHALL NOT BE USED TO SUPPORT LOADS FROM PIPING OR EQUIPMENT, UNLESS NOTED OTHERWISE. HANGER LOADS LESS THAN 50 LBS. MAY BE HUNG FROM THE STEEL ROOF DECK IN CASES WHEN HANGING FROM THE STEEL ROOF DECK CANNOT BE AVOIDED; THE ATTACHMENT METHOD MUST DISTRIBUTE THE LOAD ACROSS THE DECK AS APPROVED BY THE STRUCTURAL ENGINEER.
3. INSTALL GAS PIPING AS HIGH AS POSSIBLE.
4. GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL WITH THREADED FITTINGS. ALL EXTERIOR GAS PIPING SHALL BE PAINTED.
5. INSTALL WATER, GAS, VENT AND ROOF DRAIN PIPING SHOWN ABOVE THE CEILING UNLESS NOTED OTHERWISE.
6. INSTALL WASTE PIPING SHOWN BELOW THE FLOOR UNLESS NOTED OTHERWISE.
7. INSTALL ALL PIPING SHOWN IN EXTERIOR WALLS ON THE WARM SIDE OF THE BUILDING INSULATION.
8. INSTALL EXTERIOR DRAINAGE PIPING 36" DEEP MINIMUM.
9. PROVIDE 2" MINIMUM WASTE PIPING BELOW GRADE.
10. WATER PIPING SHALL BE TYPE L HARD DRAWN WITH COPPER FITTINGS AND LEAD FREE SOLDER JOINTS.
11. INSULATE ALL WATER PIPING WITH 1" FIBERGLASS INSULATION WITH ALL SERVICE JACKET.
12. WASTE AND VENT PIPING BELOW GRADE SHALL BE SERVICE WEIGHT CAST IRON DWV WITH BELL AND SPIGOT JOINTS.
13. WASTE AND VENT PIPING ABOVE GRADE SHALL BE SERVICE WEIGHT DWV WITH NO HUB JOINTS.
14. COORDINATE EXACT LOCATION OF FIXTURES AND DRAINS WITH ARCHITECTURAL DRAWINGS.
15. PROVIDE 3" MINIMUM VENT THRU ROOF. INCREASE VENT LINE 12" BELOW BUILDING INSULATION.
16. PROVIDE CEILING ACCESS PANELS AS REQUIRED WHERE MECHANICAL EQUIPMENT, VALVES, ETC. ARE LOCATED ABOVE INACCESSIBLE CEILINGS.
17. ALL SURFACES DAMAGED AS A RESULT OF NEW CONSTRUCTION SHALL BE PATCHED AND REPAIRED AS REQUIRED TO MATCH EXISTING SURFACES. PROVIDE COMPLETE DOCUMENTATION OF EXISTING SURFACES PRIOR TO CONSTRUCTION.
18. PROVIDE MANUFACTURER'S RECOMMENDED SERVICE CLEARANCE AROUND ALL SIDES OF MECHANICAL EQUIPMENT.
19. LOCATE ALL PLUMBING VENTS MINIMUM 10 FT. FROM ALL BUILDING INTAKES.

REV#:	REVISION DESCRIPTION:	DATE:

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Professional Seal: LICENSED PROFESSIONAL ENGINEER No. 264969 KENNETH M. CARRILLO 12/23/09 STATE OF UTAH

Project Title:
HYRUM STATE PARK RESTROOM REPLACEMENT
BRIGHAM CITY, UTAH

Sheet Title:
PLUMBING GENERAL INFORMATION

Drawn By:	Project Number:	DFCM Project Number:
K. Carrillo	06-083	09198510
Designed By:	Date:	Sheet Number:
K. Carrillo	December 22, 2009	P001
Reviewed By:	Sheet Scale:	
K. Carrillo		of

SPECIFICATIONS

SECTION 15080 – MECHANICAL INSULATION
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUBMITTALS: PRODUCT DATA FOR EACH TYPE OF MECHANICAL INSULATION.
B. QUALITY ASSURANCE: LABELED WITH MAXIMUM FLAME-SPREAD INDEX OF 25 AND MAXIMUM SMOKE- DEVELOPED INDEX OF 50 ACCORDING TO ASTM E 84.
PART 2 – PRODUCTS
2.1 PIPE INSULATION
A. PERFORMED, GLASS-FIBER PIPE INSULATION: ASTM C 547, CLASS 1, WITH FACTORY-APPLIED, ALL-PURPOSE, VAPOR-RETARDER JACKET.
B. FLEXIBLE, ELASTOMERIC-CELLULAR PIPE INSULATION: CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I.
C. POLYOLEFIN PIPE INSULATION: UNICELLULAR POLYETHYLENE, PERFORMED PIPE INSULATION. COMPLY WITH ASTM C 534, TYPE I, EXCEPT FOR DENSITY.
PART 3 – EXECUTION
3.1 PIPE INSULATION INSTALLATION
A. INSTALL VAPOR BARRIERS ON INSULATED PIPES WITH SURFACE OPERATING TEMPERATURES BELOW 60°F.
B. INSULATE PIPE, FITTINGS, VALVES, AND SPECIALTIES, EXCEPT IN HOT WATER SYSTEMS, WHERE VALVES AND SPECIALTIES DO NOT REQUIRE INSULATION.
C. SEAL VAPOR-BARRIER PENETRATIONS FOR HANGERS, SUPPORTS, ANCHORS, AND OTHER PROJECTIONS.
D. COAT GLASS-FIBER PIPE INSULATION ENDS WITH VAPOR-BARRIER COATING.
E. ROOF PENETRATIONS: APPLY INSULATION FOR INTERIOR APPLICATIONS TO THE ROOF FLASHING.
F. EXTERIOR WALL PENETRATIONS: FOR PENETRATIONS BELOW GRADE, TERMINATE INSULATION FLUSH WITH MECHANICAL SLEEVE SEAL. FOR PENETRATIONS ABOVE GRADE, TERMINATE AT INSIDE SURFACE OF EXTERIOR CLADDING.
G. INTERIOR WALLS AND PARTITIONS PENETRATIONS: APPLY INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS, EXCEPT FIRE-RATED WALLS AND PARTITIONS.
H. FIRE-RATED WALLS AND PARTITIONS PENETRATIONS: TERMINATE INSULATION AT PENETRATIONS THROUGH FIRE-RATED WALLS AND PARTITIONS. SEAL AROUND PENETRATION WITH THROUGH-PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
I. FLOOR PENETRATIONS: TERMINATE INSULATION AT THE UNDERSIDE OF THE FLOOR ASSEMBLY AND AT THE FLOOR SUPPORT AT TOP OF FLOOR. SEAL AROUND PENETRATION WITH THROUGH-PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
J. FLEXIBLE ELASTOMERIC INSULATION INSTALLATION: SEAL JOINTS WITH ADHESIVE.
K. INTERIOR PIPING SYSTEM APPLICATIONS: INSULATE THE FOLLOWING PIPING SYSTEMS:
1. DOMESTIC HOT WATER.
2. RECIRCULATED DOMESTIC HOT WATER.
3. ROOF DRAIN BODIES AND HORIZONTAL RAINWATER LEADERS OF STORM WATER PIPING.
4. EXPOSED WATER SUPPLIES AND SANITARY DRAINS OF FIXTURES FOR PEOPLE WITH DISABILITIES.
5. REFRIGERANT SUCTION PIPING.
6. VENT PIPING 5 FT. INSIDE BUILDING.
L. DO NOT APPLY INSULATION TO THE FOLLOWING SYSTEMS, MATERIALS, AND EQUIPMENT:
1. FLEXIBLE CONNECTORS.
2. FIRE-PROTECTION PIPING SYSTEMS.
3. SANITARY DRAINAGE AND VENT PIPING.
4. DRAINAGE PIPING LOCATED IN CRAWLSPACES, UNLESS OTHERWISE INDICATED.
5. CHROME-PLATED PIPES AND FITTINGS, EXCEPT FOR PLUMBING FIXTURES FOR PEOPLE WITH DISABILITIES.
6. PIPING SPECIALTIES, INCLUDING AIR CHAMBERS, UNIONS, STRAINERS, CHECK VALVES, PLUG VALVES, AND FLOW REGULATORS.
M. PIPE INSULATION THICKNESSS APPLICATION SCHEDULE: INSULATE PIPING WITH THE FOLLOWING MATERIALS AND THICKNESSES:
1. DOMESTIC HOT WATER AND RECIRCULATED HOT WATER: 1-INCH THICK, PERFORMED, GLASS-FIBER PIPE INSULATION.
2. HYDRONIC COOLING PIPING, 40 TO 60°F: PERFORMED, GLASS- FIBER PIPE INSULATION.
A. PIPE DIAMETER LESS THAN NPS 1-1/2: 1 INCH THICK.
B. PIPE DIAMETER NPS 1-1/2 AND LARGER: 1 INCH THICK.
3. HYDRONIC HEATING PIPING, 140 TO 200°F: 1-INCH THICK, PERFORMED, GLASS-FIBER PIPE INSULATION.
4. REFRIGERANT SUCTION PIPING: 1/2-INCH THICK, FLEXIBLE, ELASTOMERIC-CELLULAR PIPE INSULATION.
5. SANITARY DRAINS AND STORM WATER PIPING: 1-INCH THICK, PERFORMED, GLASS-FIBER PIPE INSULATION.
END OF SECTION 15080

SECTION 15110 – VALVES
PART 1 – GENERAL (NOT APPLICABLE)
PART 2 – PRODUCTS
2.1 GENERAL-DUTY VALVES
A. END CONNECTIONS: THREADS SHALL COMPLY WITH ANSI B1.20.1. FLANGES SHALL COMPLY WITH ANSI B16.1 FOR CAST-IRON VALVES AND ANSI B16.24 FOR BRONZE VALVES. SOLDER-JOINT CONNECTIONS SHALL COMPLY WITH ANSI B16.18.
B. ONE-PIECE, COPPER-ALLOY BALL VALVES: BRASS OR BRONZE BODY WITH CHROME-PLATED BRONZE BALL, PTFE OR TFE SEATS, AND 400-PSIG MINIMUM CWP RATING.
C. TWO-PIECE, COPPER-ALLOY BALL VALVES: BRONZE BODY WITH REGULAR-PORT, CHROME-PLATED BRONZE BALL; PTFE OR TFE SEATS; AND 600-PSIG MINIMUM CWP RATING AND BLOWOUT-PROOF STEM.
D. BRONZE, SWING CHECK VALVES: CLASS 125, BRONZE BODY WITH NONMETALLIC DISC AND SEAT.
E. BRONZE GATE VALVES: CLASS 125, BRONZE BODY WITH NONRISING STEM AND BRONZE SOLID WEDGE.
F. CAST-IRON GATE VALVES: CLASS 125, NONRISING CAST-IRON BODY AND SOLID-WEDGE DISC.
G. BRONZE GLOBE VALVES: CLASS 125, BRONZE BODY WITH BRONZE DISC.
PART 3 – EXECUTION
3.1 INSTALLATION
A. USE GATE AND BALL VALVES FOR SHUTOFF DUTY; GLOBE AND BALL FOR THROTTLING DUTY.
B. LOCATE VALVES FOR EASY ACCESS AND PROVIDE SEPARATE SUPPORT WHERE NECESSARY.
C. INSTALL VALVES FOR EACH FIXTURE AND ITEM OF EQUIPMENT.
D. INSTALL THREE-VALVE BYPASS AROUND EACH PRESSURE-REDUCING VALVE USING THROTTLING-TYPE VALVES.
E. INSTALL VALVES IN HORIZONTAL PIPING WITH STEM AT OR ABOVE CENTER OF PIPE.
F. INSTALL VALVES IN A POSITION TO ALLOW FULL STEM MOVEMENT.
G. INSTALL CHECK VALVES FOR PROPER DIRECTION OF FLOW IN HORIZONTAL POSITION WITH HINGE PIN LEVEL.
END OF SECTION 15110

SECTION 15140 – DOMESTIC WATER PIPING
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. PERFORMANCE REQUIREMENTS: UNLESS OTHERWISE INDICATED, MINIMUM PRESSURE REQUIREMENTS FOR WATER PIPING ARE AS FOLLOWS:
1. SERVICE ENTRANCE PIPING: 160 PSIG.
2. DOMESTIC WATER PIPING: 125 PSIG.
B. COMPLY WITH NSF 14, "PLASTIC PIPING COMPONENTS AND MATERIALS."
C. COMPLY WITH NSF 61, "DRINKING WATER SYSTEM COMPONENTS – HEALTH EFFECTS."
PART 2 – PRODUCTS
2.1 PIPE AND FITTINGS
A. STEEL PIPING: ASTM A 53/A 53M, SCHEDULE 40, GALVANIZED STEEL PIPE, WITH CLASS 125, GALVANIZED, STANDARD PATTERN GRAY-IRON, THREADED FITTINGS.
B. SOFT COPPER TUBING: ASTM B 88, TYPE L, WATER TUBE, ANNEALED TEMPER WITH COPPER PRESSURE FITTINGS, CAST-COPPER-ALLOY OR WROUGHT-COPPER, SOLDER-JOINT FITTINGS. FURNISH WROUGHT-COPPER FITTINGS IF INDICATED.
C. HARD COPPER TUBING: ASTM B 88, TYPE L ASTM B 88M, TYPES B AND C, WATER TUBE, DRAWN TEMPER WITH WROUGHT-COPPER, SOLDER-JOINT FITTINGS. FURNISH WROUGHT-COPPER FITTINGS IF INDICATED.
1. COPPER UNIONS: CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES AND SOLDER-JOINT OR THREADED ENDS.
D. CPVC PIPING: SCHEDULE 40 PIPE COMPLYING WITH CPVC SCHEDULE 40 SOCKET-TYPE FITTINGS.
E. PE PIPING: SIDR NOS. 5.3, 7, OR 9; WITH PE PIPE, COMPOUND NUMBER REQUIRED TO GIVE PRESSURE RATING NOT LESS THAN 200 PSIG AND INSERT FITTINGS MADE OF PA, PP, OR PVC, WITH SERRATED, MALE INSERT ENDS MATCHING INSIDE OF PIPE. INCLUDE BANDS OR CRIMP RINGS.
F. SCHEDULE 40 PVC PIPING: PVC PIPE AND PVC SCHEDULE 40 SOCKET-TYPE FITTINGS.

SPECIFICATIONS

G. SPECIAL-DUTY VALVES:
1. CPVC UNION BALL VALVES: FULL-PORT BALL, SOCKET OR THREADED DETACHABLE END CONNECTORS, AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
2. CPVC NON-UNION BALL VALVES: FULL- OR REDUCED-PORT BALL, SOCKET OR THREADED ENDS, AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
3. CPVC CHECK VALVES: SWING OR BALL-CHECK DESIGN AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
4. PVC UNION BALL VALVES: FULL-PORT BALL, SOCKET OR THREADED DETACHABLE END CONNECTORS, AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
5. PVC NON-UNION BALL VALVES: FULL- OR REDUCED-PORT BALL, SOCKET OR THREADED ENDS, AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
6. PVC BUTTERFLY VALVES: WITH LEVER HANDLE AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
7. PVC CHECK VALVES: SWING OR BALL-CHECK DESIGN AND PRESSURE RATING NOT LESS THAN 150 PSIG AT 73 DEG F.
PART 3 – EXECUTION
3.1 PIPING APPLICATIONS
A. INSTALL LISTED PIPE MATERIALS AND JOINING METHODS BELOW IN THE FOLLOWING APPLICATIONS:
1. UNDERGROUND, SERVICE ENTRANCE PIPING: SOFT COPPER TUBING OR SCHEDULE 80 PVC PIPING.
2. ABOVEGROUND DISTRIBUTION PIPING: TYPE L HARD COPPER TUBING.
3.2 VALVE APPLICATIONS
A. INSTALL GATE VALVES CLOSE TO MAIN ON EACH BRANCH AND RISER SERVING TWO OR MORE PLUMBING FIXTURES OR EQUIPMENT CONNECTIONS AND WHERE INDICATED.
B. INSTALL GATE OR BALL VALVES ON INLET TO EACH PLUMBING EQUIPMENT ITEM, ON EACH SUPPLY TO EACH PLUMBING FIXTURE NOT HAVING STOPS ON SUPPLIES, AND ELSEWHERE AS INDICATED.
C. INSTALL DRAIN VALVE AT BASE OF EACH RISER, AT LOW POINTS OF HORIZONTAL RUNS, AND WHERE REQUIRED TO DRAIN WATER DISTRIBUTION PIPING SYSTEM.
D. INSTALL SWING CHECK VALVE ON DISCHARGE SIDE OF EACH PUMP AND ELSEWHERE AS INDICATED.
E. INSTALL BALL VALVES IN EACH HOT-WATER CIRCULATING LOOP AND DISCHARGE SIDE OF EACH PUMP.
3.3 PIPING INSTALLATIONS
A. INSTALL HANGERS AND SUPPORTS AT INTERVALS INDICATED IN THE APPLICABLE PLUMBING CODE AND AS RECOMMENDED BY PIPE MANUFACTURER.
B. SUPPORT VERTICAL PIPING AT EACH FLOOR.
3.4 INSPECTING AND CLEANING
A. INSPECT AND TEST PIPING SYSTEMS FOLLOWING PROCEDURES OF AUTHORITIES HAVING JURISDICTION.
B. CLEAN AND DISINFECT WATER DISTRIBUTION PIPING FOLLOWING PROCEDURES OF AUTHORITIES HAVING JURISDICTION.
END OF SECTION 15140

SECTION 15150 – SANITARY WASTE AND VENT PIPING
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. MINIMUM PRESSURE REQUIREMENT FOR SOIL, WASTE, AND VENT: 10 FEET HEAD.
B. COMPLY WITH NSF 14, "PLASTIC PIPING COMPONENTS AND RELATED MATERIALS."
PART 2 – PRODUCTS
2.1 PIPES AND FITTINGS
A. HUB-AND-SPIGOT SOIL PIPE: ASTM A 74, SERVICE CLASS CAST IRON; ASTM C 564 RUBBER GASKETS.
B. HUBLESS SOIL PIPE: ASTM A 888 OR CISPI 301 CAST-IRON PIPE AND HUBLESS, CAST-IRON FITTINGS WITH NEOPRENE SEALING SLEEVE AND STAINLESS-STEEL CORRUGATED SHIELD AND CLAMP ASSEMBLY.
C. PVC PLASTIC, DWV PIPE: ASTM D 2665, SCHEDULE 40, PLAIN ENDS WITH PVC SOCKET-TYPE, DWV PIPE FITTINGS.
PART 3 – EXECUTION
3.1 PIPE APPLICATIONS
A. ABOVEGROUND APPLICATIONS: HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS, PVC PLASTIC, DWV PIPE AND FITTINGS WITH SOLVENT-CEMENTED JOINTS AND FIRE/SMOKE RATED WRAP FOR INSTALLATION IN RETURN AIR PLENUM.
B. BELOWGROUND APPLICATIONS: HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS, PVC PLASTIC, DWV PIPE AND DRAINAGE-PATTERN FITTINGS WITH CEMENTED JOINTS.
3.2 PIPING INSTALLATION
A. INSTALL CAST-IRON SOIL PIPING ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK," CHAPTER IV, "INSTALLATION OF CAST IRON SOIL PIPE AND FITTINGS."
B. INSTALL CAST-IRON SLEEVE WITH WATER STOP AND MECHANICAL SLEEVE SEAL AT EACH SERVICE PIPE PENETRATION THROUGH FOUNDATION WALL. MAKE INSTALLATION WATERTIGHT.
3.3 INSPECTION
A. INSPECT AND TEST PIPING SYSTEMS FOLLOWING PROCEDURES OF AUTHORITIES HAVING JURISDICTION.
END OF SECTION 15150

SECTION 15194 – FUEL GAS PIPING
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. GAS SYSTEM PRESSURES: TWO DISTRIBUTION PRESSURES. PRIMARY PRESSURE IS MORE THAN 2.0 PSIG BUT NOT MORE THAN 5.0 PSIG, AND IS REDUCED TO SECONDARY PRESSURE OF MORE THAN 0.5 PSIG BUT NOT MORE THAN 2.0 PSIG.
B. SUBMITTALS: PRODUCT DATA FOR MANUFACTURED PRODUCTS AND MATERIALS.
C. QUALITY ASSURANCE: COMPLY WITH NFPA 54, "NATIONAL FUEL GAS CODE."
PART 2 – PRODUCTS
2.1 PIPE, TUBE, AND SPECIALTIES
A. CORRUGATED, STAINLESS-STEEL TUBING: COMPLY WITH AGA LC 1; INCLUDE PLASTIC JACKET, COPPER-ALLOY THREADED ENDS, AND STRIKER PLATES.
B. STEEL PIPE: ASTM A 53/A 53M SCHEDULE 40, PLAIN ENDS WITH CLASS 150, THREADED, MALLEABLE-IRON FITTINGS.
2.2 VALVES
A. APPLIANCE CONNECTOR VALVES: COMPLY WITH STANDARDS LISTED OR, IF APPROPRIATE, TO ANSI Z21.15.
B. GAS STOPS: AGA-CERTIFIED, BRONZE-BODY, PLUG TYPE WITH BRONZE PLUG, FOR 2-PSIG OR LESS NATURAL GAS. INCLUDE AGA STAMP, FLAT OR SQUARE HEAD OR LEVER HANDLE, AND THREADED ENDS COMPLYING WITH ASME B1.20.1.
C. GAS VALVES: 125-PSIG WOG, TAPERED-PLUG TYPE; CAST-IRON OR BRONZE BODY, BRONZE PLUG, STRAIGHTAWAY PATTERN, AND SQUARE HEAD.
D. ELECTRICALLY OPERATED, AUTOMATIC SHUTOFF VALVES: ANSI Z21.21, FOR OPERATION BY APPLIANCE AUTOMATIC SHUTOFF DEVICE.
E. GAS-PRESSURE REGULATORS: ANSI Z21.18; SINGLE STAGE, STEEL JACKETED, AND CORROSION RESISTANT. INCLUDE ATMOSPHERIC VENT AND ELEVATION COMPENSATOR.
1. LINE GAS-PRESSURE REGULATORS: INLET PRESSURE RATING NOT LESS THAN SYSTEM PRESSURE.
2. APPLIANCE GAS-PRESSURE REGULATORS: INLET PRESSURE RATING NOT LESS THAN SYSTEM PRESSURE, WITH CAPACITY- AND PRESSURE-SETTING MATCHING APPLIANCE.
3. GAS-PRESSURE REGULATOR VENTS: FACTORY- OR FIELD-INSTALLED CORROSION-RESISTANT SCREEN IN OPENING WHEN NOT CONNECTED TO VENT PIPING.
2.3 SPECIALTIES
A. FLEXIBLE CONNECTORS: ANSI Z21.24, COPPER ALLOY.
PART 3 – EXECUTION
3.1 PIPING APPLICATIONS
A. FUEL GAS PIPING, 0.5 PSIG OR LESS: STEEL PIPING. PROVIDE CORRUGATED, STAINLESS-STEEL TUBING CONNECTIONS TO APPLIANCES; MAXIMUM 72 INCHES LONG.
B. FUEL GAS PIPING, 0.5 TO 2 PSIG: STEEL PIPING. PROVIDE CORRUGATED, STAINLESS-STEEL TUBING CONNECTIONS TO APPLIANCES; MAXIMUM 72 INCHES LONG.
C. FUEL GAS PIPING 2 TO 5 PSIG: STEEL PIPING.
3.2 INSTALLATION
A. CLOSE EQUIPMENT SHUTOFF VALVES BEFORE TURNING OFF GAS TO PREMISES OR SECTION OF PIPING. PERFORM LEAKAGE TEST AS SPECIFIED TO DETERMINE THAT ALL EQUIPMENT IS TURNED OFF IN AFFECTED PIPING SECTION.
B. INSTALL SHUTOFF VALVE, DOWNSTREAM FROM GAS METER, OUTSIDE BUILDING AT GAS SERVICE ENTRANCE.
C. INSTALL GAS STOPS FOR SHUTOFF TO APPLIANCES WITH NPS 2 OR SMALLER LOW-PRESSURE GAS SUPPLY.
D. DRIPS AND SEDIMENT TRAPS: INSTALL DRIPS AT POINTS WHERE CONDENSATE MAY COLLECT. INCLUDE OUTLETS OF GAS METERS. LOCATE WHERE READILY ACCESSIBLE TO PERMIT CLEANING AND EMPTYING. DO NOT INSTALL WHERE CONDENSATE IS SUBJECT TO FREEZING.
E. INSTALL GAS PIPING AT UNIFORM SLOPE OF 0.1 PERCENT UPWARD TOWARD RISERS.
F. USE ECCENTRIC REDUCER FITTINGS TO MAKE REDUCTIONS IN PIPE SIZES. INSTALL FITTINGS WITH LEVEL SIDE DOWN.
G. CONNECT BRANCH PIPING FROM TOP OR SIDE OF HORIZONTAL PIPING.
H. INSTALL CORRUGATED, STAINLESS-STEEL TUBING ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. INCLUDE STRIKER PLATES TO PROTECT TUBING FROM PUNCTURE WHERE TUBING IS RESTRAINED AND CANNOT MOVE.
I. INSTALL STRAINERS ON SUPPLY SIDE OF EACH CONTROL VALVE, GAS-PRESSURE REGULATOR, SOLENOID VALVE, AND ELSEWHERE AS INDICATED.
J. INSTALL VALVES IN ACCESSIBLE LOCATIONS, PROTECTED FROM DAMAGE. TAG VALVES WITH METAL TAG INDICATING SERVICE. ATTACH TAG TO VALVE WITH METAL CHAIN.
K. INSTALL GAS VALVES UPSTREAM FROM EACH GAS-PRESSURE REGULATOR. WHERE TWO GAS-PRESSURE REGULATORS ARE INSTALLED IN SERIES, VALVE IS NOT REQUIRED AT INLET TO SECOND REGULATOR.
L. INSTALL PRESSURE-RELIEF OR PRESSURE-LIMITING DEVICES SO THEY CAN BE READILY OPERATED TO DETERMINE WHETHER VALVES ARE FREE; TESTED TO DETERMINE PRESSURE AT WHICH THEY WILL OPERATE; AND EXAMINED FOR LEAKAGE WHEN IN CLOSED POSITION.
M. CONNECT GAS PIPING TO EQUIPMENT AND APPLIANCES WITH SHUTOFF VALVES AND UNIONS. INSTALL GAS VALVE UPSTREAM FROM AND WITHIN 72 INCHES OF EACH APPLIANCE USING GAS. INSTALL UNION OR FLANGED CONNECTIONS DOWNSTREAM FROM VALVES.
N. INSPECT, TEST, AND PURGE PIPING ACCORDING TO NFPA 54, PART 4, "GAS PIPING INSPECTION, TESTING, AND PURGING"; AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
END OF SECTION 15194

SPECIFICATIONS

SECTION 15410 – PLUMBING FIXTURES
1.1 SECTION REQUIREMENTS
A. SUBMITTALS: PRODUCT DATA FOR EACH TYPE OF PLUMBING FIXTURE.
B. COMPLY WITH REQUIREMENTS OF PUBLIC LAW 102-486, "ENERGY POLICY ACT," REGARDING WATER FLOW RATE AND WATER CONSUMPTION OF PLUMBING FIXTURES.
C. COMPLY WITH APPLICABLE STANDARDS BELOW:
1. NATIONAL SANITATION FOUNDATION CONSTRUCTION: NSF 61.
2. PUBLIC LAW 90-480, "ARCHITECTURAL BARRIERS ACT"; AND PUBLIC LAW 101-336, "AMERICANS WITH DISABILITIES ACT."
3. PUBLIC LAW 102-486, "ENERGY POLICY ACT."
4. ANSI STANDARD A117.1, "BUILDINGS AND FACILITIES -- PROVIDING ACCESSIBILITY AND USEABILITY FOR PHYSICALLY HANDICAPPED PEOPLE,".
5. LISTING AND LABELING: PROVIDE ELECTRICALLY OPERATED FIXTURES SPECIFIED IN THIS SECTION THAT ARE LISTED AND LABELED.
1.2 DEFINITIONS
A. FIXTURE: INSTALLED RECEPTOR CONNECTED TO THE WATER DISTRIBUTION SYSTEM, THAT RECEIVES AND MAKES AVAILABLE POTABLE WATER AND DISCHARGES THE USED LIQUID OR LIQUID-BORNE WASTES DIRECTLY OR INDIRECTLY INTO THE DRAINAGE SYSTEM. THE TERM "FIXTURE" MEANS THE ACTUAL RECEPTOR, EXCEPT WHEN USED IN A GENERAL APPLICATION WHERE TERMS "FIXTURE" AND "PLUMBING FIXTURE" INCLUDE ASSOCIATED TRIM, FITTINGS, ACCESSORIES, APPLIANCES, APPURTENANCES, SUPPORT, AND EQUIPMENT.
C. ROUGHING-IN: INSTALLATION OF PIPING AND SUPPORT FOR THE FIXTURE PRIOR TO THE ACTUAL INSTALLATION OF THE FIXTURE.
D. TRIM: HARDWARE AND MISCELLANEOUS PARTS, SPECIFIC TO A FIXTURE AND NORMALLY SUPPLIED WITH IT REQUIRED TO COMPLETE FIXTURE ASSEMBLY AND INSTALLATION.
PART 2 – PRODUCTS
2.1 PLUMBING FIXTURES, GENERAL
A. PROVIDE PLUMBING FIXTURES AND TRIM, FITTINGS, OTHER COMPONENTS, AND SUPPORTS AS SPECIFIED IN "FIXTURE SCHEDULE.
B. PLUMBING FIXTURES SHALL BE THE MANUFACTURER'S STANDARD COLOR UNLESS SPECIFIC COLORS ARE NOTED.
2.2 FITTINGS, EXCEPT FAUCETS
A. FITTINGS GENERAL: UNLESS OTHERWISE SPECIFIED, PROVIDE FITTINGS FABRICATED OF BRASS, WITH A POLISHED CHROME PLATED FINISH.
B. ESCUTCHEONS: POLISHED CHROME-PLATED, SHEET STEEL WALL FLANGE WITH FRICTION CLIPS.
PART 3 – EXECUTION
3.1 EXAMINATION
A. EXAMINE ROUGHING-IN FOR POTABLE COLD WATER AND HOT WATER SUPPLIES AND SOIL, WASTE, AND VENT PIPING SYSTEMS TO VERIFY ACTUAL LOCATIONS OF PIPING CONNECTIONS PRIOR TO INSTALLING FIXTURES.
B. EXAMINE WALLS, FLOORS, AND CABINETS FOR SUITABLE CONDITIONS WHERE FIXTURES ARE TO BE INSTALLED.
C. DO NOT PROCEED UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
3.2 APPLICATION
A. INSTALL PLUMBING FIXTURES AND SPECIFIED COMPONENTS, IN ACCORDANCE WITH DESIGNATIONS AND LOCATIONS INDICATED ON DRAWINGS.
B. INSTALL SUPPORTS FOR PLUMBING FIXTURES IN ACCORDANCE WITH TYPE REQUIRED.
3.3 INSTALLATION OF PLUMBING FIXTURES
A. INSTALL PLUMBING FIXTURES LEVEL AND PLUMB, IN ACCORDANCE WITH FIXTURE MANUFACTURERS' WRITTEN INSTALLATION INSTRUCTIONS, ROUGHING-IN DRAWINGS, AND REFERENCED STANDARDS.
B. FASTEN FLOOR-MOUNTED FIXTURES AND SPECIAL FIXTURES HAVING HOLES FOR SECURING FIXTURE TO WALL CONSTRUCTION, TO REINFORCEMENT BUILT INTO WALLS.
C. INSTALL TRAP ON FIXTURE OUTLET EXCEPT FOR FIXTURES HAVING INTEGRAL TRAP.
D. INSTALL ESCUTCHEONS AT EACH WALL, FLOOR, AND CEILING PENETRATION IN EXPOSED FINISHED LOCATIONS AND WITHIN CABINETS AND MILLWORK. USE DEEP PATTERN ESCUTCHEONS WHERE REQUIRED TO CONCEAL PROTRUDING PIPE FITTINGS.
E. SEAL FIXTURES TO WALLS, FLOORS, AND COUNTERS USING A SANITARY-TYPE, ONE-PART, MILDEW-RESISTANT, SILICONE SEALANT IN ACCORDANCE WITH SEALING REQUIREMENTS SPECIFIED IN DIVISION 7 SECTION "JOINT SEALANT." MATCH SEALANT COLOR TO FIXTURE COLOR.
3.4 CONNECTIONS
A. PIPING INSTALLATION REQUIREMENTS ARE SPECIFIED IN OTHER SECTIONS OF DIVISION 15. THE DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES. THE FOLLOWING ARE SPECIFIC CONNECTION REQUIREMENTS:
1. INSTALL PIPING CONNECTIONS BETWEEN PLUMBING FIXTURES AND PIPING SYSTEMS AND PLUMBING EQUIPMENT SPECIFIED IN OTHER SECTIONS OF DIVISION 15.
2. INSTALL PIPING CONNECTIONS INDICATED BETWEEN APPLIANCES AND EQUIPMENT SPECIFIED IN OTHER SECTIONS, DIRECT CONNECTED TO PLUMBING PIPING SYSTEMS.
3.5 FIELD QUALITY CONTROL
A. INSPECT EACH INSTALLED FIXTURE FOR DAMAGE. REPLACE DAMAGED FIXTURES AND COMPONENTS.
B. TEST FIXTURES TO DEMONSTRATE PROPER OPERATION UPON COMPLETION OF INSTALLATION AND AFTER UNITS ARE WATER PRESSURIZED. REPLACE MALFUNCTIONING FIXTURES AND COMPONENTS, THEN RETEST. REPEAT PROCEDURE UNTIL ALL UNITS OPERATE PROPERLY.
C. VERIFY THAT INSTALLED PLUMBING FIXTURES ARE CATEGORIES AND TYPES SPECIFIED FOR LOCATIONS WHERE INSTALLED.
D. CHECK THAT PLUMBING FIXTURES ARE COMPLETE WITH TRIM, FAUCETS, FITTINGS, AND OTHER SPECIFIED COMPONENTS.
3.6 ADJUSTING AND CLEANING
A. OPERATE AND ADJUST FAUCETS AND CONTROLS. REPLACE DAMAGED AND MALFUNCTIONING FIXTURES, FITTINGS, AND CONTROLS.
B. OPERATE AND ADJUST DISPOSERS, HOT WATER DISPENSERS, AND CONTROLS. REPLACE DAMAGED AND MALFUNCTIONING UNITS AND CONTROLS.
D. REPLACE WASHERS OF LEAKING AND DRIPPING FAUCETS AND STOPS.
E. CLEAN FIXTURES, FITTINGS, AND SPOUT AND DRAIN STRAINERS WITH MANUFACTURERS' RECOMMENDED CLEANING METHODS AND MATERIALS.
3.7 PROTECTION
A. PROVIDE PROTECTIVE COVERING FOR INSTALLED FIXTURES AND FITTINGS.
3.8 FIXTURE SCHEDULE
A. SEE PLUMBING FIXTURE SCHEDULE ON PLANS.
END OF SECTION 15410

SECTION 15430 – PLUMBING SPECIALTIES
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUBMITTALS: PRODUCT DATA.
PART 2 – PRODUCTS
2.1 MANUFACTURED UNITS
A. CLEANOUTS:
1. APPLICATION: FLOOR CLEANOUT, WALL CLEANOUT.
2. BODY OR FERRULE MATERIAL: CAST IRON, PLASTIC.
3. CLAMPING DEVICE: REQUIRED.
4. OUTLET CONNECTION: THREADED.
5. CLOSURE: BRASS PLUG WITH STRAIGHT THREADS AND GASKET, PLASTIC PLUG.
6. ADJUSTABLE HOUSING MATERIAL: CAST IRON, PLASTIC WITH THREADS SET-SCREWS OR OTHER DEVICE.
7. FRAME AND COVER MATERIAL AND FINISH: NICKEL-BRONZE, COPPER ALLOY.
8. FRAME AND COVER SHAPE: ROUND.
9. DELETE SUBPARAGRAPH BELOW IF NOT APPLICABLE
10. TOP LOADING CLASSIFICATION: MEDIUM DUTY.
B. FLOOR DRAINS:
1. APPLICATION: FLOOR DRAIN.
2. BODY MATERIAL: GRAY IRON.
3. SEEPAGE FLANGE: REQUIRED.
4. CLAMPING DEVICE: REQUIRED.
5. OUTLET: BOTTOM.
6. SEDIMENT BUCKET: SEE MODEL NUMBER.
8. TOP OR STRAINER MATERIAL: GRAY IRON.
9. TOP OF BODY AND STRAINER FINISH: NICKEL BRONZE.
10. TOP SHAPE: ROUND.
11. TOP LOADING CLASSIFICATION: MEDIUM DUTY.
12. INLET FITTING: GRAY IRON, WITH THREADED INLET AND THREADED OR SPIGOT OUTLET, AND TRAP SEAL PRIMER VALVE CONNECTION.
13. TRAP MATERIAL: CAST IRON.
14. TRAP PATTERN: DEEP-SEAL P-TRAP.
15. TRAP FEATURES: TRAP SEAL PRIMER VALVE DRAIN CONNECTION.
C. PIPE-APPLIED, ATMOSPHERIC VACUUM BREAKERS: ASSE 1001, WITH FLOATING DISC AND ATMOSPHERIC VENT.
D. HOSE CONNECTION VACUUM BREAKERS: NICKEL-PLATED BRONZE, WITH NONREMOVABLE AND MANUAL DRAIN FEATURES AND GARDEN-HOSE THREADED CONNECTION.
E. THERMOSTATIC MIXING VALVES: MANUALLY ADJUSTABLE, BRONZE BODY. INCLUDE CHECK STOP AND UNION ON HOT- AND COLD-WATER-SUPPLY INLETS.
F. HOSE BIBBS: BRONZE BODY IN CHROME-PLATED FINISH, ANTIBACKFLOW TYPE WITH REMOVABLE COMPOSITION DISC, THREADED OR SOLDERED INLET, GARDEN-HOSE THREADED OUTLET, AND LOOSE-KEY HANDLE.
G. WALL HYDRANT: ASME A112.21.3M, ASSE 1019, PROJECTING, NONFREEZE, AUTOMATIC DRAINING, ANTIBACKFLOW TYPE, WITH KEY OPERATOR AND THREADED OR SOLDERED INLET, GARDEN-HOSE THREADED OUTLET, AND ROUGH-BRONZE FINISH.
H. WATER HAMMER ARRESTER: BELLOWS OR PISTON TYPE WITH PRESSURIZED CUSHIONING CHAMBER.
I. STRAINERS: Y-PATTERN, BRONZE BODY, 125-PSIG MINIMUM STEAM WORKING PRESSURE.
PART 3 – EXECUTION
3.1 INSTALLATION
A. INSTALL BACKFLOW PREVENTERS AT EACH WATER-SUPPLY CONNECTION TO MECHANICAL EQUIPMENT AND WHERE REQUIRED BY AUTHORITIES HAVING JURISDICTION.
B. INSTALL HOSE BIBBS WITH INTEGRAL OR FIELD-INSTALLED VACUUM BREAKER.
C. INSTALL FLOOR DRAINS AT LOW PINTS OF SURFACE AREAS AND WHERE INDICATED. SET TOPS OF DRAINS FLUSH WITH FINISHED FLOOR.
1. TRAP DRAINS CONNECTED TO SANITARY BUILDING DRAIN.
2. INSTALL DRAIN FLASHING COLLAR OR FLANGE SO NO LEAKAGE OCCURS BETWEEN DRAIN AND ADJOINING FLOORING. MAINTAIN INTEGRITY OF WATERPROOF MEMBRANES.
END OF SECTION 15430

SPECIFICATIONS

SECTION 15441 – DOMESTIC WATER PUMPS
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUMMARY: FACTORY-ASSEMBLED AND -TESTED CENTRIFUGAL PUMPS, AS DEFINED IN HI 1.1-1.2 AND HI 1.3.
B. SUBMITTALS: PRODUCT DATA FOR EACH PUMP, INCLUDING PUMP-PERFORMANCE CURVES, FURNISHED SPECIALTIES, MOTOR HORSEPOWER, AND ELECTRICAL CHARACTERISTICS.
C. COMPLY WITH UL 778 FOR CONSTRUCTION REQUIREMENTS.
D. NEMA MG 1, "STANDARD FOR MOTORS AND GENERATORS," FOR ELECTRIC MOTORS. INCLUDE NEMA LISTING AND LABELING.
PART 2 – PRODUCTS
2.1 MOTORS
A. LESS THAN 1/2 HP: BUILT-IN THERMAL-OVERLOAD PROTECTION.
B. 1/2 TO 3 HP: PERMANENTLY LUBRICATED BALL BEARINGS.
C. 5 HP AND LARGER: GREASE LUBRICATED BALL BEARINGS.
D. MOTOR SHALL BE NON-OVERLOADING WITHIN FULL RANGE OF PUMP PERFORMANCE.
2.2 DOMESTIC WATER PUMPS
A. CLOSE COUPLED, IN-LINE, SEALLESS CENTRIFUGAL PUMPS: HORIZONTAL, HERMETICALLY SEALED, REPLACEABLE-CARTRIDGE-TYPE UNIT; RATED FOR 125-PSIG MINIMUM WORKING PRESSURE AND MINIMUM CONTINUOUS WATER TEMPERATURE OF 225 DEG F.
1. CASING: BRONZE, WITH THREADED COMPANION-FLANGE CONNECTIONS.
2. IMPELLER: CORROSION-RESISTANT MATERIAL.
PART 3 – EXECUTION
3.1 INSTALLATION
A. INSTALL PUMPS WITH ACCESS FOR PERIODIC MAINTENANCE, INCLUDING REMOVAL OF MOTORS, IMPELLERS, COUPLINGS, AND ACCESSORIES.
B. SUPPORT PUMPS AND PIPING SO WEIGHT OF PIPING IS NOT SUPPORTED BY PUMP VOLUTE.
C. INSTALL ELECTRICAL CONNECTIONS FOR POWER, CONTROLS, AND DEVICES.
D. SUSPEND IN-LINE PUMPS INDEPENDENT FROM PIPING. USE CONTINUOUS-THREAD HANGER RODS AND VIBRATION ISOLATION HANGERS. FABRICATE BRACKETS OR SUPPORTS AS REQUIRED FOR PUMPS.
E. CONNECT PIPING WITH VALVES THAT ARE AT LEAST THE SAME SIZE AS PIPING CONNECTING TO PUMPS.
F. INSTALL SUCTION AND DISCHARGE PIPE SIZES EQUAL TO OR GREATER THAN DIAMETER OF PUMP NOZZLES.
G. INSTALL SHUTOFF VALVE AND STRAINER ON SUCTION SIDE OF PUMPS.
H. INSTALL NONSLAM CHECK VALVE AND THROTTLING VALVE ON DISCHARGE SIDE OF PUMPS.
I. INSTALL PRESSURE GAGES, ON SUCTION AND DISCHARGE OF EACH PUMP. INSTALL AT INTEGRAL PRESSURE GAGE TAPPINGS WHERE PROVIDED.
END OF SECTION 15441

SECTION 15480 – DOMESTIC WATER HEATERS
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUBMITTALS: PRODUCT DATA.
B. GAS-FIRED WATER HEATERS: BEAR AGA CERTIFICATION LABEL.
C. COMPLY WITH REQUIREMENTS OF APPLICABLE NSF, AWWA, OR FDA AND EPA REGULATORY STANDARDS FOR TASTELESS AND ODORLESS, POTABLE-WATER-TANK LININGS.
D. COMPLY WITH PERFORMANCE EFFICIENCIES PRESCRIBED IN ASHRAE 90.2, "ENERGY EFFICIENT DESIGN OF NEW LOW-RISE RESIDENTIAL BUILDINGS."
E. WARRANTIES: SUBMIT A WRITTEN WARRANTY EXECUTED BY MANUFACTURER AGREEING TO REPAIR OR REPLACE WATER HEATERS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN FIVE YEARS FROM DATE OF SUBSTANTIAL COMPLETION. FAILURES INCLUDE, BUT ARE NOT LIMITED TO, TANKS AND ELEMENTS.
PART 2 – PRODUCTS
2.1 WATER HEATERS, GENERAL
A. INSULATION: SUITABLE FOR OPERATING TEMPERATURE AND REQUIRED INSULATING VALUE. INCLUDE INSULATION MATERIAL THAT SURROUNDS ENTIRE TANK EXCEPT CONNECTIONS AND CONTROLS.
B. ANODE RODS: FACTORY INSTALLED, MAGNESIUM.
C. COMBINATION TEMPERATURE AND PRESSURE RELIEF VALVE: ASME RATED AND STAMPED AND COMPLYING WITH ASME PTC 25.3. INCLUDE RELIEVING CAPACITY AT LEAST AS GREAT AS HEAT INPUT AND PRESSURE SETTING LESS THAN WATER HEATER WORKING-PRESSURE RATING. SELECT RELIEF VALVE WITH SENSING ELEMENT THAT EXTENDS INTO TANK.
D. DRAIN VALVE: FACTORY OR FIELD INSTALLED.
2.2 GAS-FIRED WATER HEATERS
A. COMMERCIAL, STORAGE, GAS WATER HEATERS: ANSI Z21.10.3, 82-GAL. CAPACITY AND 75-KBTU/H INPUT BURNER; WITH ADJUSTABLE THERMOSTAT FOR USE WITH POWERED-VENT WATER HEATERS FOR NATURAL-GAS FUEL. STEEL TANK WITH 150-PSIG WORKING-PRESSURE RATING, ASME LABELED.
PART 3 – EXECUTION
3.1 INSTALLATION
A. INSTALL TEMPERATURE AND PRESSURE RELIEF VALVES AND EXTEND TO CLOSEST FLOOR DRAIN.
B. INSTALL VACUUM RELIEF VALVES IN COLD-WATER-INLET PIPING.
C. INSTALL SHUTOFF VALVES AND UNIONS AT HOT- AND COLD-WATER PIPING CONNECTIONS.
D. MAKE PIPING CONNECTIONS WITH DIELECTRIC FITTINGS WHERE DISSIMILAR PIPING MATERIALS ARE JOINED.
E. ELECTRICALLY GROUND UNITS ACCORDING TO AUTHORITIES HAVING JURISDICTION.
F. CONNECT GAS WATER HEATERS ACCORDING TO NFPA 54. CONNECT GAS VENT AND DRAFT HOODS AND DIVERTERS WHERE REQUIRED. EXTEND TO OUTSIDE AND TERMINATE IN VENT CAP.
END OF SECTION 15480

SECTION 15530 – FURNACES
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUBMITTALS: PRODUCT DATA.
B. THERMAL EFFICIENCY: EQUAL TO OR GREATER THAN PRESCRIBED BY ASHRAE/IESNA 90.1.
C. WARRANTIES: SUBMIT A WRITTEN WARRANTY EXECUTED BY MANUFACTURER AGREEING TO REPAIR OR REPLACE FURNACES THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN [10] [20] <INSERT NUMBER> YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
PART 2 – PRODUCTS
2.2 GAS-FIRED FURNACES, CONDENSING
A. COMPLY WITH AGA Z21.47, NFPA 54, AND BEAR AGA LABEL.
1. TYPE OF GAS: NATURAL.
2. FAN MOTOR: MULTISPEED.
3. HEAT EXCHANGER: ALUMINIZED-STEEL WELDED CONSTRUCTION WITH ALUMINUM-FINNED, CONDENSING COIL.
4. AUTOMATIC CONTROLS: SOLID-STATE BOARD TO DELAY FAN START AND SHUTDOWN.
5. CONFIGURATION: DOWNFLOW, WITH ADDITIVE STEEL BASE AT FLOOR.
6. HEATING CAPACITY: SEE SCHEDULE.
7. COOLING CAPACITY: SEE SCHEDULE.
8. ACCESSORIES: COMBINATION COMBUSTION-AIR INTAKE AND VENT AND VENTILATION-AIR HEAT EXCHANGER.
2.5 ACCESSORIES
A. CONTROLS: INCLUDE COMPONENTS REQUIRED FOR OPERATION OF FURNACES AND AUXILIARY EQUIPMENT IN ALL SEASONS.
B. FILTERS: 1-INCH THICK, DISPOSABLE, FIBERGLASS TYPE IN SHEET METAL RACK.
2.7 REFRIGERATION COMPONENTS
A. EVAPORATOR COIL: COMPLY WITH ARI 210/240. MATCH SIZE WITH FURNACE. MATCH REMOTE CONDENSING UNIT SPECIFIED IN DIVISION 15 SECTION "CONDENSING UNITS" WITH TYPE, CAPACITY, PRESSURE-DROP RATINGS, RESTRICTED DISTRIBUTOR, OR EXPANSION VALVE. INCLUDE CONDENSATE DRAIN PAN WITH DRAIN OUTLET.
B. EVAPORATOR COIL ENCLOSURE: AS REQUIRED TO SUIT FURNACE AND COOLING COIL. STEEL CABINET WITH ACCESS PANEL AND FLANGES FOR INTEGRAL MOUNTING AT OR ON FURNACE CABINET.
C. REFRIGERANT LINE KITS: ANNEALED-COPPER SUCTION AND LIQUID LINES FACTORY CLEANED, DRIED, PRESSURIZED, AND SEALED; WITH INSULATED SUCTION LINE AND APPROPRIATE FITTINGS AT ENDS.
2.8 CONTROLS
A. THERMOSTAT: 24-V AC, SOLID-STATE, PROGRAMMABLE, MICROPROCESSOR-BASED, WALL-MOUNTED UNIT WITH AUTOMATIC SWITCHING FROM HEATING TO COOLING, HEAT ANTICIPATOR, MINIMUM FOUR TEMPERATURE PRESETS SELECT ABLE BY DAY AND TIME, AND BATTERY BACKUP PROTECTION OF PROGRAM SETTINGS AGAINST POWER FAILURE.
PART 3 – EXECUTION
3.1 INSTALLATION
A. INSTALL AND CONNECT GAS-FIRED FURNACES AND ASSOCIATED FUEL AND VENT FEATURES AND SYSTEMS ACCORDING TO NFPA 54, APPLICABLE LOCAL CODES AND REGULATIONS, AND MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
B. VENTS, OUTSIDE-AIR PIPE CONNECTIONS, AND DRAINS: INSTALL VENT TERMINAL DESIGNED TO PROTECT AGAINST BIRDS, INSECTS, AND DIRT.
C. CONNECT CONDENSATE DRAINS TO INDIRECT WASTE USING COPPER TUBING WITH STREAMLINE DRAINAGE FITTINGS AND SOLDERED JOINTS. EXTEND TO NEAREST EQUIPMENT DRAIN OR FLOOR DRAIN. CONSTRUCT VENTED, DEEP TRAP AT CONNECTION TO DRAIN PAN AND INSTALL CLEANOUTS AT CHANGES IN DIRECTION. TERMINATE TO SUIT LOCAL CODE REQUIREMENTS.
E. BASE-MOUNTED UNITS: SECURE UNITS TO SUBSTRATE. PROVIDE OPTIONAL BOTTOM CLOSURE BASE WHERE INSTALLATION CONDITIONS REQUIRE.
F. CONTROLS: INSTALL THERMOSTATS ADJACENT TO LIGHT SWITCHES AT APPROXIMATELY 60 INCHES ABOVE FINISHED FLOOR.
END OF SECTION 15530

REV#:	REVISION DESCRIPTION:	DATE:

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Project Title:
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BRIGHAM CITY, UTAH

Sheet Title:
PLUMBING GENERAL INFORMATION

Drawn By:	Project Number:	DFCM Project Number:
K. Carrillo	06-083	09198510
Designed By: K. Carrillo	Date: December 22, 2009	Sheet Number: P002 of
Reviewed By: K. Carrillo	Sheet Scale:	

PLUMBING FIXTURE SCHEDULE

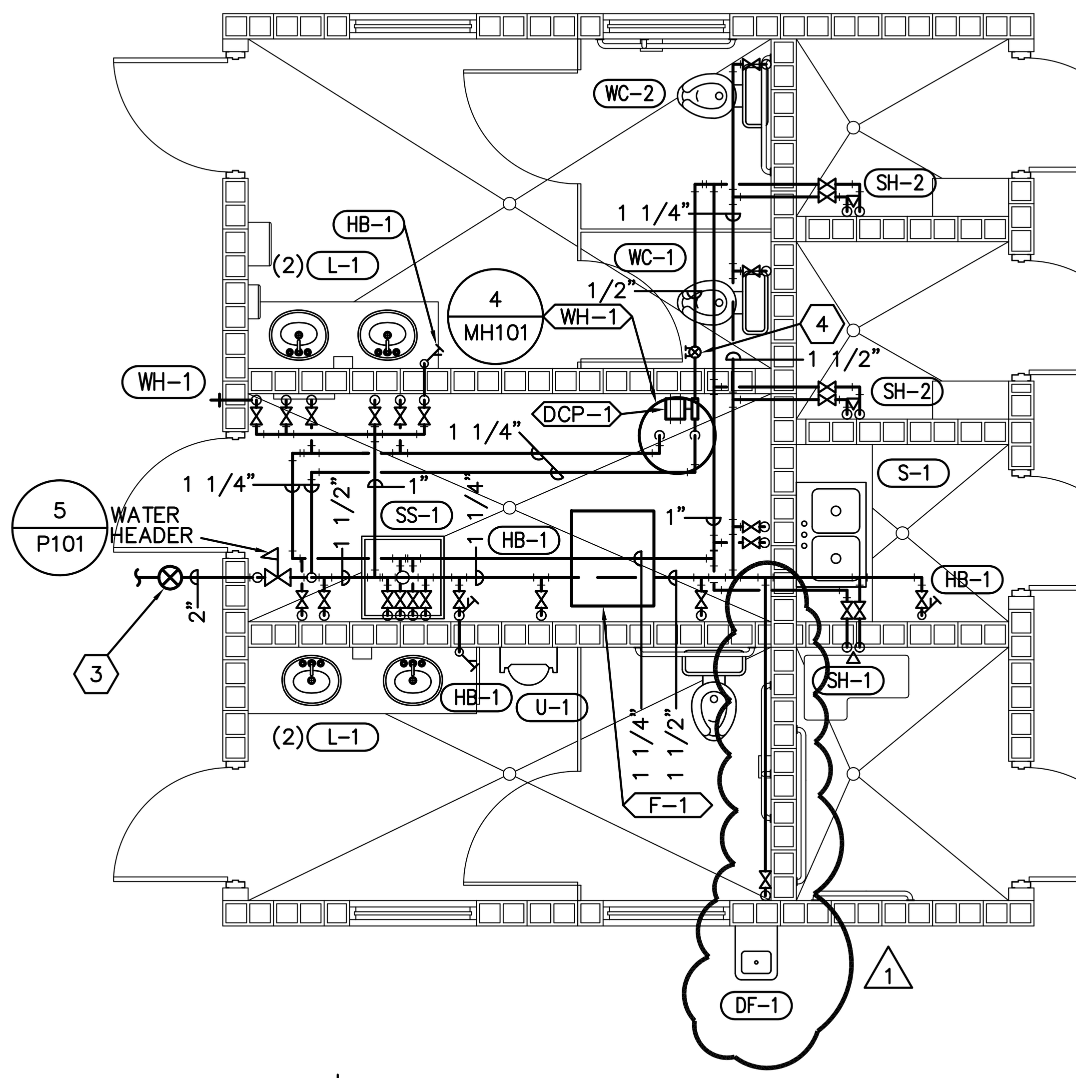
SYMBOL	FIXTURE	MANUFACTURER AND MODEL NO.	COLD WATER	HOT WATER	TRAP	WASTE	VENT	FIXTURE
L-1	LAVATORY, ACCESSIBLE COUNTER-MOUNTED OVAL	KOHLER K-2195 (OR APPROVED EQUAL)	1/2"	1/2"	1-1/4"	1-1/2"	1-1/2"	KOHLER K-2195 PENNINGTON 20"x 17" OVAL VITREOUS CHINA COUNTER MOUNTED LAVATORY WITH 4" FAUCET CENTERS; TECHNICAL CONCEPTS AUTOFAUCET WITH SURROUND SENSOR TECHNOLOGY MODEL 500484 4" PLATE, THERMOSTATIC MIXING VALVE AND BATTERY POWERED SENSOR. ADA INSULATION KIT, JAY R. SMITH 2698 TAILPIECE. (1)
U-1	URINAL, ACCESSIBLE WALL-HUNG	KOHLER K-4972-T (OR APPROVED EQUAL)	3/4"	-	-	2"	1-1/2"	KOHLER K-4972-T STANWELL WATER GUARD VITREOUS CHINA WALL HUNG SIPHON JET URINAL WITH 3/4" TOP SPUD INLET AND 2" N.P.S. OUTLET. SLOAN 8186 OPTIMA BATTERY OPERATED FLUSH VALVE. MOUNT URINAL RIM AT 17" TO MEET ADA REQUIREMENTS.
WC-1	WATER CLOSET, FLOOR-MOUNTED FLUSH VALVE	KOHLER - K-4368 (OR APPROVED EQUAL)	1"	-	INT.	4"	2"	HIGHCLIFF LITE VITREOUS CHINA, FLOOR MOUNTED; 12" ROUGHING IN; SIPHON JET ELONGATED TOILET WITH 2-1/4" PASSAGEWAY, 1-1/2" TOP SPUD, (2) 52048 BOLT CAPS; SLOAN 111 FLUSH VALVE; 1.6 GALLON FLUSH. ACTUATOR SHALL BE ON WIDE SIDE OF STALL. SEAT: K-4670-C WHITE, OPEN FRONT, SOLID PLASTIC SEAT WITH CHECK HINGE.
WC-2	WATER CLOSET, ACCESSIBLE FLOOR-MOUNTED FLUSH VALVE	KOHLER - K-4368 (OR APPROVED EQUAL)	1"	-	INT.	4"	2"	HIGHCLIFF LITE VITREOUS CHINA, FLOOR MOUNTED; 12" ROUGHING IN; SIPHON JET ELONGATED TOILET WITH 2-1/4" PASSAGEWAY, 1-1/2" TOP SPUD, (2) 52048 BOLT CAPS; SLOAN 111 FLUSH VALVE; 1.6 GALLON FLUSH. ACTUATOR SHALL BE ON WIDE SIDE OF STALL. SEAT: K-4670-C WHITE, OPEN FRONT, SOLID PLASTIC SEAT WITH CHECK HINGE.
SH-1	SHOWER VALVE (ACCESSIBLE)	BRADLEY WS-1WCA-ADA (OR APPROVED EQUAL)	1/2"	1/2"	-	-	-	ACCESSIBLE SHOWER VALVE: BRADLEY MODEL WS-1WCA-ADA EF-SF-SHV-HN600 WALL MOUNTED STAINLESS STEEL SHOWER WITH PRESSURE BALANCE SHOWER VALVE WITH INTEGRALL STOPS, DELUXE SHOWER HEAD, STAINLESS STEEL SHROUD TO CEILING AND HAND HELD ADA APPROVED ACCESSIBLE SHOWER HEAD. ALL FASTENERS SHALL BE STAINLESS STEEL, PINNED SECURITY TYPE.
SH-2	SHOWER VALVE	BRADLEY WS-1WCA (OR APPROVED EQUAL)	1/2"	1/2"	-	-	-	SHOWER VALVE: BRADLEY MODEL WS-1WCA EF-SF-SHV WALL MOUNTED STAINLESS STEEL SHOWER WITH PRESSURE BALANCE SHOWER VALVE WITH INTEGRALL STOPS, DELUXE SHOWER HEAD, STAINLESS STEEL SHROUD TO CEILING. ALL FASTENERS SHALL BE STAINLESS STEEL, PINNED SECURITY TYPE.
SS-1	SERVICE SINK, FLOOR MOUNTED	PROFLO PFMB260024 (OR APPROVED EQUAL)	1/2"	1/2"	3"	3"	1-1/2"	MOP SINK: PROFLO MODEL PFMB260024 MOP SINK; 24" X 24" X 10" HIGH WITH PLAIN CURB. MOP SINK SHALL BE ONE PIECE MOLDED COMPOSITE BASIN WITH PVC DRAIN BODY AND STAINLESS STEEL DOME STRAINER/LINT BASKET. FIAT MODEL 830AA SERVICE SINK FAUCET WITH HEAVY DUTY FITTING WITH 1/2" INLETS, 8" CENTER TO CENTER WITH ADJUSTABLE, THREADED FLANGES; EQUIPPED WITH INTEGRAL STOPS, FOUR-ARM HANDLES, THREAD ON OUTLET, CHROME PLATE; EQUIPPED WITH 30" RUBBER HOSE ON SPOUT OUTLET AND CHROME PLATED WALL HOOK.
S-1	SINK (DOUBLE COMPARTMENT)	ELKAY LR3319 (OR APPROVED EQUAL)	1/2"	1/2"	1-1/2"	2"	1-1/2"	COUNTER SINK: (2) COMPARTMENT SINK: ELKAY LR3319 18 GA. TYPE 302 STAINLESS STEEL (2) COMPARTMENT SINK; 33" X 19" X 8" DEEP; SELF RIMMING; (3) FAUCET HOLES ON 4" CENTERS; (2) LK-35 DUO STRAINER; MOEN CHATEAU MODEL 67425 KITCHEN FAUCET WITH SINGLE LIFT HANDLE AND VANDAL RESISTANT AERATOR, BRASSCRAFT HTCR-19 ZC STOPS, ESCUTCHEONS, S. S. SUPPLIES, 1 1/2" 17GA. P-TRAP, AND DEARBORN 17GA. EOL CONTINUOUS WASTE.
D-1	FLOOR DRAIN TOILET ROOMS	JR SMITH 2005Y02-B06NB-P050 (OR APPROVED EQUAL)	-	-	2"	2"	1-1/2"	FLOOR DRAIN: SMITH FIGURE 2005Y02-B06NB-P050 CAST IRON BODY AND FLASHING COLLAR WITH PROTECTIVE CAP AND SQUARE NICKEL BRONZE ADJUSTABLE STRAINER HEAD WITH SECURED SQUARE HOLE GRATE. DEEP SEAL TRAP COMPLETE WITH PROSET TRAP GUARD INSERT.
D-2	FLOOR DRAIN SHOWER	JR SMITH 2005Y02-A OR B06NB (OR APPROVED EQUAL)	-	-	2"	2"	1-1/2"	SHOWER DRAIN: SMITH FIGURE 2005Y02-A OR B06NB - A OR B CAST IRON BODY AND FLASHING COLLAR WITH PROTECTIVE CAP AND NICKEL BRONZE ADJUSTABLE STRAINER HEAD WITH SECURED SQUARE HOLE GRATE. PROVIDE SQUARE STRAINERS IN FLOORS WITH SQUARE PATTERNS, PROVIDE ROUND STRAINERS ELSEWHERE. PROVIDE AND INSTALL 40 MIL VINYL SHOWER PAN LINER. LINER SHALL BE 30" SQUARE. DEEP SEAL TRAP COMPLETE WITH PROSET TRAP GUARD INSERT.
D-3	FLOOR DRAIN MECHANICAL ROOM	JR SMITH 2005Y04-B06NB-P050 (OR APPROVED EQUAL)	-	-	4"	4"	2"	MECHANICAL DRAIN: SMITH FIGURE 2005Y04-B06NB-P050 CAST IRON BODY AND FLASHING COLLAR WITH PROTECTIVE CAP AND SQUARE NICKEL BRONZE ADJUSTABLE STRAINER HEAD WITH SECURED SQUARE HOLE GRATE. DEEP SEAL TRAP COMPLETE WITH PROSET TRAP GUARD INSERT.
WH-1	WALL HYDRANT (EXTERIOR, NON-FREEZE)	J.R. SMITH 5609QT-PB (OR APPROVED EQUAL)	3/4"	-	-	-	-	NON-FREEZE, POLISHED BRONZE HYDRANT, 3/4" HOSE CONNECTION WITH INTEGRAL VACUUM BREAKER, UNDERSAL INLET CONNECTION AND T-HANDLE KEY.
HB-1	HOSE BIBB (INTERIOR, NON-FREEZE)	J.R. SMITH 5609QT-SAP (OR APPROVED EQUAL)	1/2"	-	-	-	-	BRONZE NICKEL PLATED BODY, RENEWABLE COMPOSITION DISC, GARDEN HOSE THREAD OUTLET, INTEGRAL NON-REMOVABLE, DRAINABLE HOSE CONNECTION VACUUM BREAKER; CHROME PLATED; OPERATING KEY (PROVIDE ONE OPERATING KEY.)
DF-1	DRINKING FOUNTAIN (ACCESSIBLE)	STERN-WILLIAMS MODEL BF-5020 (OR APPROVED EQUAL)	1/2"	-	1-1/4"	1-1/2"	1-1/4"	STERN-WILLIAMS BF-5020 BARRIER FREE STAINLESS STEEL WALL MOUNTED DRINKING FOUNTAIN WITH STAINLESS STEEL BACK PLATE. SINGLE DRINKING FOUNTAIN ONE-PIECE STAINLESS STEEL CONSTRUCTION. COMPLETE WITH MODEL-24 FROST PROOF VALVE SYSTEM INCLUDING SURFACE MOUNTED STAINLESS STEEL BOX COMPLETE WITH ACCESS PANEL AND TAMPER PROOF SCREWS.

(1). PROVIDE SYMMONS THERMIXER MODEL 5-120 THERMOSTATIC MIXING VALVE BELOW LAVATORIES AND SINK. SET OUTLET AT 110° F. CONNECT TO HOT WATER INLET OF FAUCET.

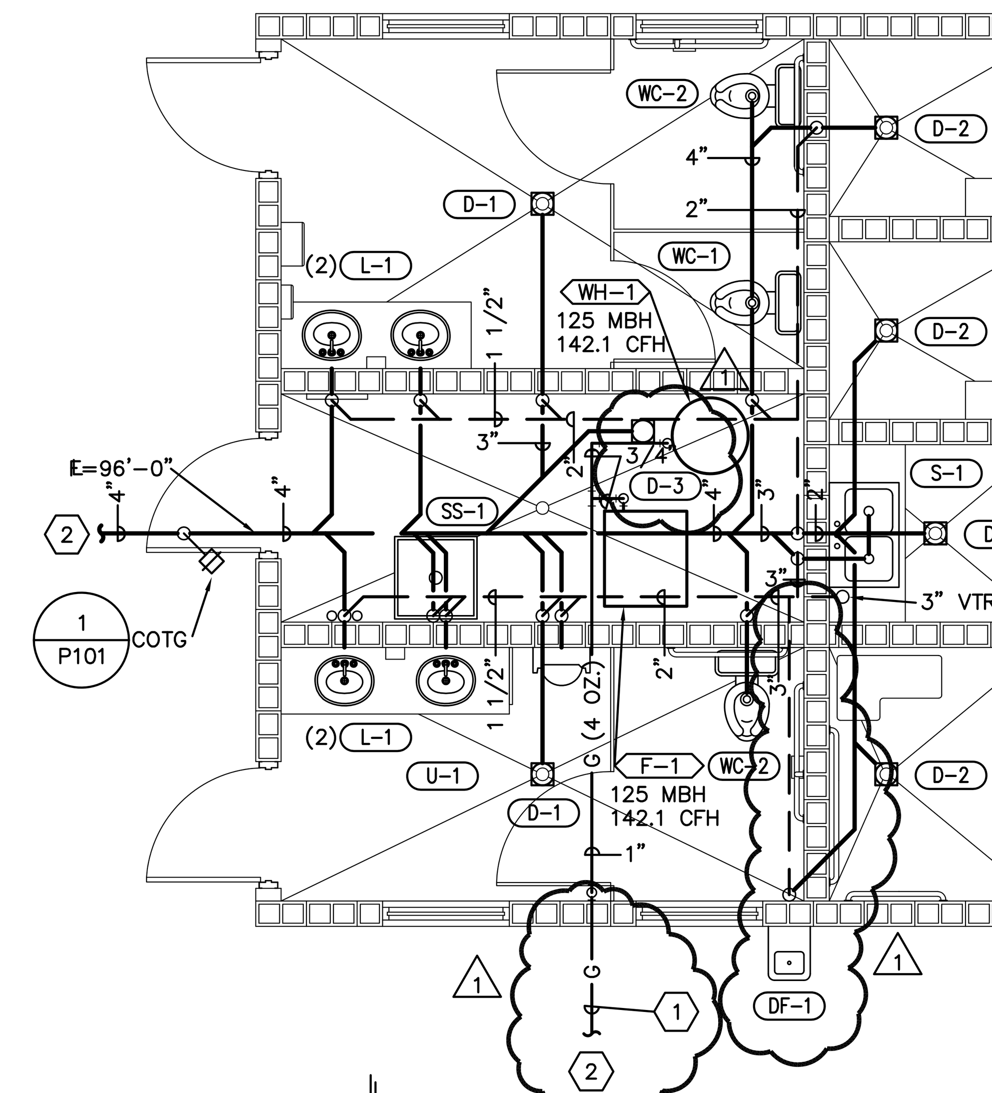
GAS FIRED DOMESTIC HOT WATER HEATER SCHEDULE

SYMBOL	MANUFACTURERS AND MODEL NO.	TANK CAPACITY GALLONS	FUEL TYPE	INPUT MBH (1)	HP	VOLTS/ PHASE/ CYCLE	RECOVERY RATE GPH (1)	WATER TEMP IN/OUT	STACK SIZE	COMMENTS
WH-1	A.O. SMITH CYCLONE BTH-120	60	NAT GAS	125	15 AMP	120/1/60	137	50/140	(2)	(1)(2)(3)(4)

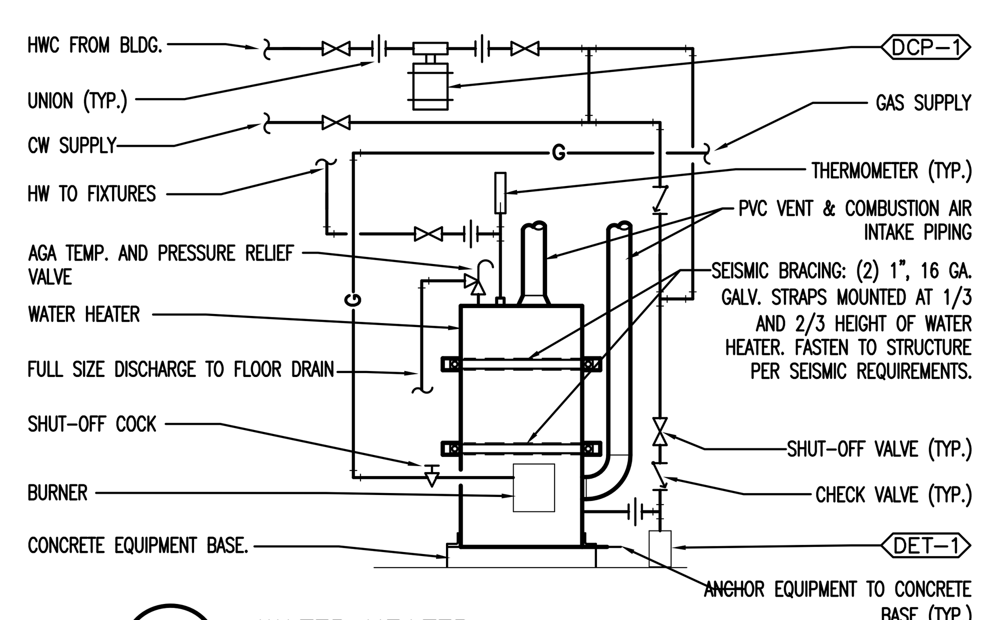
(1) 0 FT ELEV./4800 FT ELEV. MANUFACTURER DOES NOT REQUIRE DERATION THIS MODEL. ALTERNATE MANUFACTURER'S MUST HAVE EQUAL OUTPUT.
(2) 3" PVC COMBUSTION INTAKE AND 3" PVC VENT. COMPLETE WITH PVC CONCENTRIC ROOF VENT KIT.
(3) MAINTAIN MANUFACTURER'S MINIMUM CLEARANCES.
(4) COMPLETE WITH ELECTRONIC CONTROLS, POWER BURNER, GLASS LINED TANK, HANDHOLE CLEANOUT, INSULATION AND P & T RELIEF VALVE



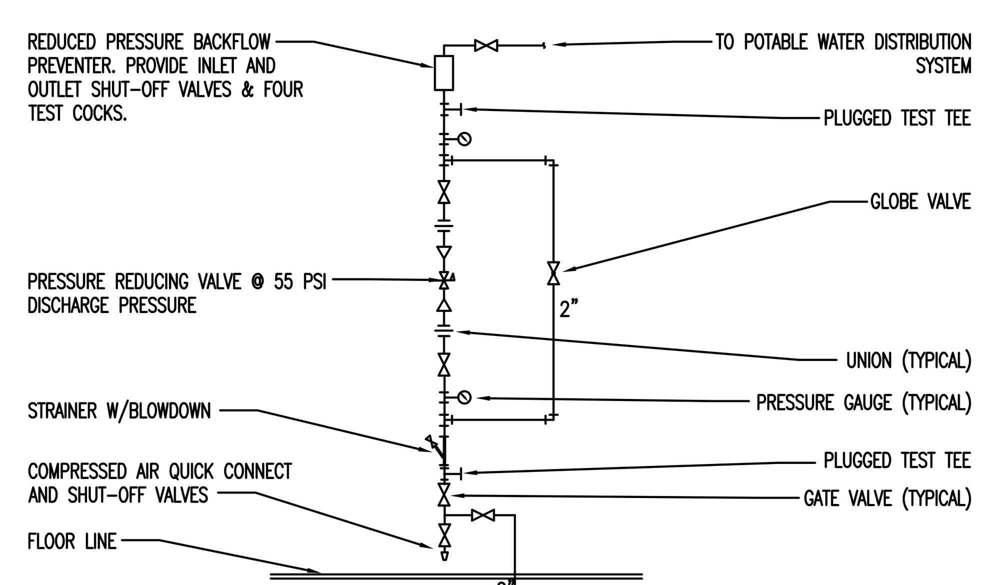
DOMESTIC WATER PIPING PLAN
SCALE: 1/4"=1'-0"



WASTE/VENT AND GAS PIPING PLAN
SCALE: 1/4"=1'-0"



4 WATER HEATER
SCALE: NTS



5 WATER PRESSURE REDUCING VALVE STATION
SCALE: NTS

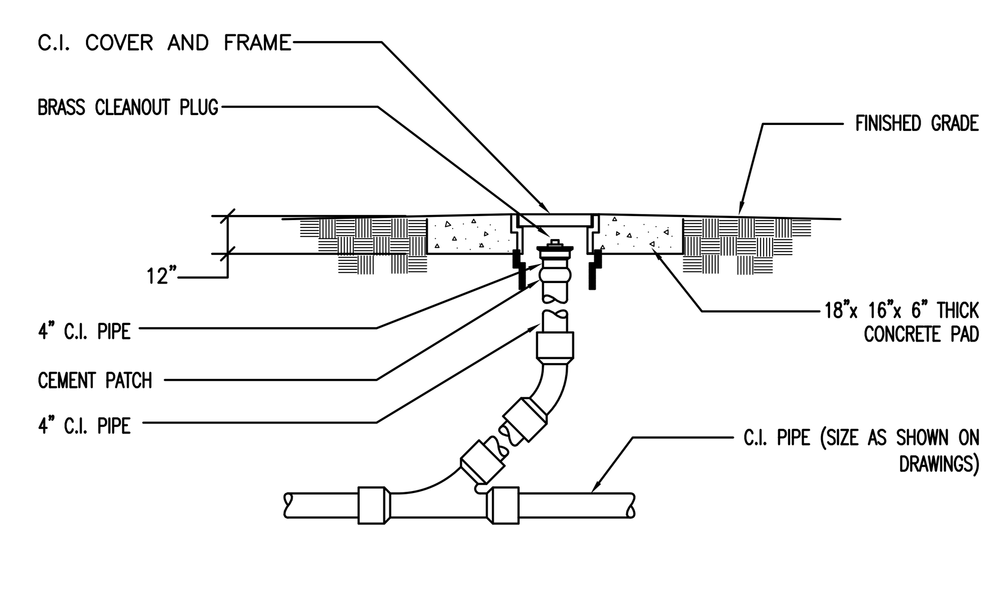
DOMESTIC HOT WATER EXPANSION TANK

SYMBOL	MANUFACTURERS	MODEL NO.	GALLONS ACCEPTANCE VOLUME	GALLONS TOTAL VOLUME	INITIAL FILL PRESSURE	COMMENTS
DET-1	AMTROL	ST-12-C	3.2	6.4	40	-

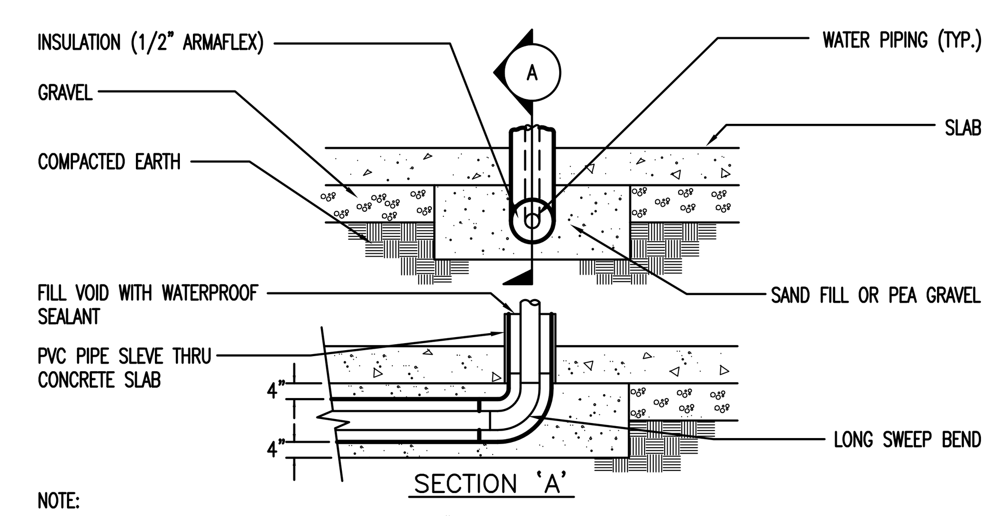
DOMESTIC WATER CIRCULATE PUMP SCHEDULE

SYMBOL	MANUFACTURER AND MODEL NO.	GPM	HEAD FT.	H.P.	RPM	VOLTS/PHASE/ CYCLE	EQUIPMENT OR AREA SERVED	COMMENTS
DCP-1	B & G SERIES PR 3/4	1	10	1/6	1750	115/1/60	DOMESTIC HOT WATER	(1)(2)

(1) EQUIPPED WITH 24-HOUR 7-DAY TIMER.
(2) ALL BRONZE CONSTRUCTION.

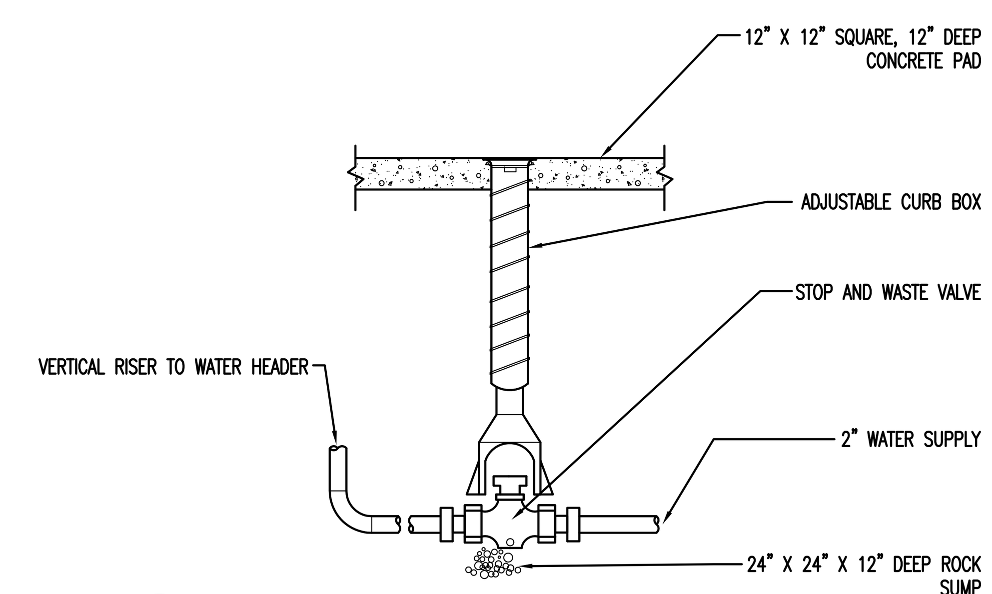


1 CLEANOUT TO GRADE (COTG)
SCALE: NTS



NOTE:
SAND FILL OR PEA GRAVEL TO BE A MINIMUM OF 4" AROUND PIPES. MATERIAL SHALL BEHAND TAMPED, RODDED, OR LIGHTLY COMPACTED DURING INSTALLATION. CARE SHOULD BE TAKEN NOT TO DEFORM OR OTHERWISE DAMAGE PIPING.

2 UNDER-SLAB WATER PIPING
SCALE: NTS



3 STOP AND WASTE VALVE DETAIL
SCALE: NTS

GENERAL NOTES

1. PROVIDE INDIVIDUAL SHUTOFF VALVES ON HOT AND COLD WATER SUPPLIES TO EACH PLUMBING FIXTURE. PROVIDE A VALVE WITH AIR CONNECTION FITTING IN BOTH SUPPLY LINES AS REQUIRED TO BLOW DOWN WITH COMPRESSED AIR.
2. EACH SHOWER SHALL BE CAPABLE OF BEING WINTERIZED AND SHUTDOWN DURING THE WINTER MONTHS. PIPE A DRAIN WITH A SHUTOFF ON THE BOTTOM OF EACH SHOWER VALVE TO THE MECHANICAL ROOM TO DRAIN EACH SHOWER VALVE. ROUTE PIPING TO THE MECHANICAL ROOM DRAIN. PROVIDE ACCESS TO DRAIN VALVES.
3. ALL PIPING SHALL BE EXPOSED. LOCATE EXPOSED PIPING IN UTILITY ROOM WHERE POSSIBLE. LOCATE EXPOSED PIPING EXTENDING TO FIXTURES TIGHT TO CEILING. COORDINATE WITH LIGHTING AND DIFFUSERS.
4. ALL EXPOSED PIPING SHALL BE INSULATED WITH PREFORMED PIPE INSULATION AND JACKETED WITH PVC JACKETING. COLOR TO BE SELECTED BY ARCHITECT.

SHEET KEYNOTES

1. EXTEND NEW 1" 4 OZ. GAS LINE TO EXISTING GAS METER AND CONNECT. COORDINATE ESTIMATED GAS LOAD WITH GAS SUPPLIER. ESTIMATED LOAD IS 285 CFH.
2. SEE SITE UTILITY PLAN FOR CONTINUATION.
3. PROVIDE STOP AND WASTE. SEE DETAILS 2/P101 AND 3/P101.
4. BALANCE FLOW SETTER TO 1 GPM.

REV#:	REVISION DESCRIPTION:	DATE:
1	01-14-10	

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Project Title:
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BRIGHAM CITY, UTAH

Sheet Title:
PLUMBING PLANS, DETAILS & SCHEDULES

Drawn By:	Project Number:	DFCM Project Number:
K. Carrillo	06-083	09198510
Designed By: K. Carrillo	Date: December 22, 2009	Sheet Number: P101 of
Reviewed By: K. Carrillo	Sheet Scale:	

SPECIFICATIONS

SECTION 15050 – BASIC MECHANICAL MATERIALS AND METHODS
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUMMARY: GENERAL REQUIREMENTS FOR MOTORS, HANGERS AND SUPPORTS, VIBRATION ISOLATION AND SEISMIC RESTRAINTS, VALVES, AND METERS AND GAGES.
B. SUBMITTALS: PRODUCT DATA FOR MATERIALS AND EQUIPMENT SPECIFIED IN THIS SECTION.
PART 2 – PRODUCTS
2.1 MOTORS
A. MOTOR CHARACTERISTICS:
1. MOTORS 3/4 HP AND LARGER: THREE PHASE.
2. MOTORS SMALLER THAN 3/4 HP: SINGLE PHASE.
3. FREQUENCY RATING: 60 HZ.
4. VOLTAGE RATING: NEMA STANDARD VOLTAGE SELECTED TO OPERATE ON NOMINAL CIRCUIT VOLTAGE TO WHICH MOTOR IS CONNECTED.
5. SERVICE FACTOR: 1.15 FOR OPEN DRIPPROOF MOTORS; 1.0 FOR TOTALLY ENCLOSED MOTORS.
6. DUTY: CONTINUOUS DUTY AT AMBIENT TEMPERATURE OF 105°F AND AT ALTITUDE OF 4500 FEET ABOVE SEA LEVEL.
7. CAPACITY AND TORQUE CHARACTERISTICS: SUFFICIENT TO START, ACCELERATE, AND OPERATE CONNECTED LOADS AT DESIGNATED SPEEDS, AT INSTALLED ALTITUDE AND ENVIRONMENT, WITH INDICATED OPERATING SEQUENCE, AND WITHOUT EXCEEDING NAMEPLATE RATINGS OR CONSIDERING SERVICE FACTOR.
8. ENCLOSURE: UNLESS OTHERWISE INDICATED, OPEN DRIPPROOF.
9. MOTORS USED WITH VARIABLE FREQUENCY CONTROLLERS: RATINGS, CHARACTERISTICS, AND FEATURES COORDINATED WITH AND APPROVED BY CONTROLLER MANUFACTURER.
2.2 HANGERS AND SUPPORTS
A. HANGER AND PIPE ATTACHMENTS: FACTORY FABRICATED WITH GALVANIZED COATINGS; NONMETALLIC COATED FOR HANGERS IN DIRECT CONTACT WITH COPPER TUBING.
B. BUILDING ATTACHMENTS: POWDER–ACTUATED–TYPE, DRIVE–PIN ATTACHMENTS WITH PULLOUT AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.
C. MECHANICAL–EXPANSION ANCHORS: INSERT WEDGE–TYPE ATTACHMENTS WITH PULLOUT AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS.
2.3 VIBRATION ISOLATION AND SEISMIC CONTROL DEVICES
A. VIBRATION SUPPORTS:
1. RESTRAINED ELASTOMERIC MOUNTS: DOUBLE–DEFLECTION TYPE, WITH MOLDED, OIL–RESISTANT RUBBER OR NEOPRENE ISOLATOR ELEMENTS WITH FACTORY–DRILLED, ENCAPSULATED TOP PLATE FOR BOLTING TO EQUIPMENT AND BASEPLATE FOR BOLTING TO STRUCTURE. PROVIDE ISOLATOR WITH MINIMUM 0.5–INCH STATIC DEFLECTION.
2. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN–SPRING ISOLATORS. PROVIDE ISOLATOR WITH MINIMUM 1–INCH STATIC DEFLECTION.
B. VIBRATION HANGERS:
1. ELASTOMERIC HANGERS: DOUBLE–DEFLECTION TYPE, WITH MOLDED, OIL–RESISTANT RUBBER OR NEOPRENE ISOLATOR ELEMENTS BONDED TO STEEL HOUSINGS WITH THREADED CONNECTIONS FOR HANGER RODS. PROVIDE ISOLATOR WITH MINIMUM 0.5–INCH STATIC DEFLECTION.
2. SPRING HANGERS: COMBINATION COIL–SPRING AND ELASTOMERIC–INSERT HANGER WITH SPRING AND INSERT IN COMPRESSION. PROVIDE ISOLATOR WITH MINIMUM 1–INCH STATIC DEFLECTION.
C. SEISMIC RESTRAINTS:
1. RESILIENT ISOLATION WASHERS AND BUSHINGS: 1–PIECE, MOLDED, BRIDGE–BEARING NEOPRENE COMPLYING WITH AASHTO M 251 AND HAVING A DUROMETER HARDNESS OF 50, PLUS OR MINUS 5, WITH A FLAT WASHER FACE.
2. RESTRAINING CABLES: GALVANIZED STEEL CABLES WITH END CONNECTIONS MADE OF STEEL ASSEMBLIES THAT SWIVEL TO FINAL INSTALLATION ANGLE AND UTILIZE TWO CLAMPING BOLTS FOR CABLE ENGAGEMENT.
3. ANCHOR BOLTS: SEISMIC–RATED, DRILL–IN, AND STUD–WEDGE OR FEMALE–WEDGE TYPE. SELECT ANCHOR BOLTS WITH STRENGTH REQUIRED FOR ANCHOR AND AS TESTED ACCORDING TO ASTM E 488/E 488M.
2.4 PRESSURE GAGES AND TEST PLUGS
A. PRESSURE GAGES: DIRECT–MOUNTING, INDICATING–DIAL TYPE COMPLYING WITH ASME B40.100. DRY METAL CASE, MINIMUM 2–1/2 INCH DIAMETER WITH RED POINTER ON WHITE FACE, AND PLASTIC WINDOW. MINIMUM ACCURACY 3 PERCENT OF MIDDLE HALF OF RANGE. RANGE TWO TIMES OPERATING PRESSURE.
B. TEST PLUG: CORROSION–RESISTANT BRASS OR STAINLESS–STEEL BODY WITH TWO SELF–SEALING RUBBER CORE INSERTS AND GASKETED AND THREADED CAP, WITH EXTENDED STEM FOR UNITS TO BE INSTALLED IN INSULATED PIPING. MINIMUM PRESSURE AND TEMPERATURE RATING 500 PSIG AT 200°F.
PART 3 – EXECUTION
3.1 MOTOR INSTALLATION
A. ANCHOR MOTOR ASSEMBLY TO BASE, ADJUSTABLE RAILS, OR OTHER SUPPORT, ARRANGED AND SIZED ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.
3.2 GENERAL PIPING INSTALLATIONS
A. INSTALL PIPING FREE OF SAGS AND BENDS.
B. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.
C. INSTALL SLEEVES FOR PIPES PASSING THROUGH CONCRETE AND MASONRY WALLS, GYPSOM–BOARD PARTITIONS AND CONCRETE FLOOR AND ROOF SLABS.
D. EXTERIOR WALL, PIPE PENETRATIONS: MECHANICAL SLEEVE SEALS INSTALLED IN STEEL OR CAST–IRON PIPES FOR WALL SLEEVES.
E. FIRE–BARRIER PENETRATIONS: SEAL PIPE PENETRATIONS WITH THROUGH–PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
F. INSTALL UNIONS AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT.
G. INSTALL DIELECTRIC UNIONS AND FLANGES TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN GAS PIPING.
H. INSTALL DIELECTRIC COUPLING AND NIPPLE FITTINGS TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS IN WATER PIPING.
3.3 GENERAL EQUIPMENT INSTALLATIONS
A. INSTALL EQUIPMENT TO ALLOW MAXIMUM POSSIBLE HEADROOM UNLESS SPECIFIC MOUNTING HEIGHTS ARE NOT INDICATED.
B. INSTALL EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, UNLESS OTHERWISE INDICATED.
C. INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE TO OTHER INSTALLATIONS. EXTEND GREASE FITTINGS TO ACCESSIBLE LOCATIONS.
D. INSTALL EQUIPMENT TO ALLOW RIGHT OF WAY FOR PIPING INSTALLED AT REQUIRED SLOPE.
3.4 CONCRETE BASES
A. ANCHOR EQUIPMENT TO CONCRETE BASE ACCORDING TO EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS AND ACCORDING TO SEISMIC CODES AT PROJECT.
B. CONSTRUCT CONCRETE BASES OF DIMENSIONS INDICATED, BUT NOT LESS THAN 4 INCHES LARGER IN BOTH DIRECTIONS THAN SUPPORTED UNIT.
C. UNLESS OTHERWISE INDICATED, INSTALL DOWEL RODS ON 18–INCH CENTERS AROUND THE FULL PERIMETER OF THE BASE TO CONNECT CONCRETE BASE TO CONCRETE FLOOR.
D. INSTALL EPOXY–COATED ANCHOR BOLTS FOR SUPPORTED EQUIPMENT THAT EXTEND THROUGH CONCRETE BASE, AND ANCHOR INTO STRUCTURAL CONCRETE FLOOR.
E. PLACE AND SECURE ANCHORAGE DEVICES. USE SUPPORTED EQUIPMENT MANUFACTURER'S SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS, AND DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED.
F. INSTALL ANCHOR BOLTS TO ELEVATIONS REQUIRED FOR PROPER ATTACHMENT TO SUPPORTED EQUIPMENT.
G. USE 3000–PSI, 28–DAY COMPRESSIVE–STRENGTH CONCRETE AND REINFORCEMENT AS SPECIFIED IN DIVISION 3 SECTION "CAST–IN–PLACE CONCRETE."
3.5 HANGERS AND SUPPORTS
A. COMPLY WITH MSS SP–69 AND MSS SP–89. INSTALL BUILDING ATTACHMENTS WITHIN CONCRETE OR TO STRUCTURAL STEEL.
B. INSTALL HANGERS AND SUPPORTS TO ALLOW CONTROLLED THERMAL AND SEISMIC MOVEMENT OF PIPING SYSTEMS.
C. INSTALL POWDER–ACTUATED DRIVE–PIN FASTENERS IN CONCRETE AFTER CONCRETE IS CURED. DO NOT USE IN LIGHTWEIGHT CONCRETE OR IN SLABS LESS THAN 4 INCHES THICK.
D. INSTALL MECHANICAL–EXPANSION ANCHORS IN CONCRETE AFTER CONCRETE IS CURED. DO NOT USE IN LIGHTWEIGHT CONCRETE OR IN SLABS LESS THAN 4 INCHES THICK.
E. SEE DIVISION 13 SECTION "FIRE SUPPRESSION PIPING" FOR SUPPORT OF FIRE–PROTECTION SYSTEM PIPING.
F. LOAD DISTRIBUTION: INSTALL HANGERS AND SUPPORTS SO PIPING LIVE AND DEAD LOADING AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT.
G. HORIZONTAL–PIPING HANGERS AND SUPPORTS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
1. ADJUSTABLE STEEL CLEVIS HANGERS (MSS TYPE 1): FOR SUSPENSION OF NONINSULATED OR INSULATED STATIONARY PIPES.
2. PIPE HANGERS (MSS TYPE 5): FOR SUSPENSION OF PIPES, NPS 1/2 TO NPS 4, TO ALLOW OFF–CENTER CLOSURE FOR HANGER INSTALLATION BEFORE PIPE ERECTION.
3. ADJUSTABLE STEEL BAND HANGERS (MSS TYPE 7): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
4. ADJUSTABLE BAND HANGERS (MSS TYPE 9): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
5. ADJUSTABLE SWIVEL–RING BAND HANGERS (MSS TYPE 10): FOR SUSPENSION OF NONINSULATED STATIONARY PIPES, NPS 1/2 TO NPS 8.
H. VERTICAL–PIPING CLAMPS: UNLESS OTHERWISE INDICATED AND EXCEPT AS SPECIFIED IN PIPING SYSTEM SPECIFICATION SECTIONS, INSTALL THE FOLLOWING TYPES:
1. EXTENSION PIPE OR RISER CLAMPS (MSS TYPE 8): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20.
2. CARBON– OR ALLOY–STEEL RISER CLAMPS (MSS TYPE 42): FOR SUPPORT OF PIPE RISERS, NPS 3/4 TO NPS 20, IF LONGER ENDS ARE REQUIRED FOR RISER CLAMPS.
3.6 VIBRATION ISOLATION AND SEISMIC CONTROL DEVICE INSTALLATION
A. ADJUST VIBRATION ISOLATORS TO ALLOW FREE MOVEMENT OF EQUIPMENT LIMITED BY RESTRAINTS.
B. INSTALL RESILIENT BOLT ISOLATION WASHERS ON EQUIPMENT ANCHOR BOLTS.
C. INSTALL CABLES SO THEY DO NOT BEND ACROSS SHARP EDGES OF ADJACENT EQUIPMENT OR BUILDING STRUCTURE.
3.7 PRESSURE GAGES AND TEST PLUGS
A. INSTALL PRESSURE GAGES AT SUCTION AND DISCHARGE OF EACH PUMP.
B. INSTALL TEST PLUGS AT SUPPLY AND RETURN FOR HYDRONIC TERMINALS, AND BOILERS.
END OF SECTION 15050

SPECIFICATIONS

SECTION 15071 – MECHANICAL VIBRATION AND SEISMIC CONTROLS
PART 1 – GENERAL
1.1 SEISMIC AND VIBRATION CONTROL
A. GENERAL: DIVISION 15 SHALL BE RESPONSIBLE FOR PURCHASING AND INSTALLING VIBRATION ISOLATORS, FLEXIBLE CONNECTIONS, RIGID STEEL FRAMES, ANCHORS, INSERTS, HANGERS AND ATTACHMENTS AND SEISMIC BRACING AND SNUBBERS AS REQUIRED FOR SEISMIC CONTROL AND PREVENTION OF THE TRANSMISSION OF VIBRATION FOR BOTH ISOLATED AND NON–ISOLATED SYSTEMS.
B. ALL MECHANICAL EQUIPMENT SHALL BE DESIGNED FOR THE SITE SPECIFIC SEISMIC ZONE AS PER THE INTERNATIONAL BUILDING CODE.
C. REFERENCE STANDARDS: THE WORK SHALL COMPLY TO THE FOLLOWING STANDARDS:
1. INTERNATIONAL BUILDING CODE, CURRENT EDITION
2. NFPA BULLETIN 90A, CURRENT EDITION
3. BRIDGE BEARING SPECIFICATIONS
D. DESIGN PARAMETERS: REFER TO SECTION 1621 OF THE 2003 INTERNATIONAL BUILDING CODE AND ASCE 7–02.
E. APPROVED MANUFACTURERS:
1. IN ORDER TO INSURE THAT THE REQUIREMENTS OF THE PROJECT ARE ACHIEVED, THE CONTRACTOR MUST SECURE THE SERVICES OF A MANUFACTURER OR SUPPLIER WHO HAS PROVEN CAPABILITIES OF DEALING EFFECTIVELY WITH VIBRATION CHARACTERISTICS, EFFECTS AND CRITERIA AND CAN PROVIDE FACILITIES AND CAPABILITIES FOR MEASURING, EVALUATING AND DESIGNING FOR SEISMIC DISTURBANCES.
2. MANUFACTURERS APPROVED FOR USE ARE:
A. MASON INDUSTRIES, INC.
B. AMBER/BOOTH COMPANY.
C. VIBRATION ELIMINATOR CO.
D. KINETICS NOISE CONTROL.
3. THE MANUFACTURER'S RESPONSIBILITIES SHALL INCLUDE DESIGNING AND PROVIDING ALL VIBRATION ISOLATORS AND SEISMIC RESTRAINTS. HE SHALL ALSO BE RESPONSIBLE FOR THE PROPER INSTALLATION OF THESE COMPONENTS. PERIODIC INSPECTIONS TO THE JOB SITE WILL BE MADE AS REQUIRED. HE SHALL MAKE A FINAL INSPECTION AND SUBMIT A REPORT TO THE ARCHITECT CERTIFYING COMPLIANCE TO THESE SPECIFICATIONS, DRAWINGS AND RELATED STANDARDS. PROVIDE SUBMITTALS AS SPECIFIED.
F. SUBMITTALS: SUBMITTAL DATA PRIOR TO FABRICATION, SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
1. COMPLETE ENGINEERING CALCULATIONS AND SHOP DRAWINGS FOR ALL VIBRATION AND SEISMIC REQUIREMENTS FOR ALL EQUIPMENT, PIPING AND DUCTWORK.
2. THE UTAH STATE PROFESSIONAL STAMP OF THE ENGINEER WHO IS RESPONSIBLE FOR THE DESIGN AND OPERATION OF THE VIBRATION AND SEISMIC SYSTEM.
3. THE TYPE, SIZE, AND DEFLECTION OF EACH ISOLATOR PROPOSED FOR ITEMS IN THIS SPECIFICATION AND ON THE DRAWINGS.
4. DETAILS FOR ALL THE ISOLATORS AND SEISMIC BRACING WITH SNUBBERS PROPOSED FOR ITEMS IN THIS SPECIFICATION AND ON THE DRAWINGS.
5. THE SIZE, LOADING AND LOCATION OF PIPE AND DUCT SUPPORTS WITH AN AS–BUILT PLAN OR COMPLETE DESCRIPTION OF THE SYSTEM.
G. VIBRATION ISOLATION:
1. ALL MECHANICAL EQUIPMENT 1 HP, AND OVER UNLESS OTHERWISE NOTED, SHALL BE ISOLATED FROM THE STRUCTURE BY MEANS OF RESILIENT VIBRATION AND NOISE ISOLATORS DESIGNED AND SUPPLIED BY THE SEISMIC AND VIBRATION CONTROL MANUFACTURER. PIPING AND DUCTWORK CONNECTED TO VIBRATING EQUIPMENT SHALL BE ISOLATED FROM THE STRUCTURE AS REQUIRED TO PREVENT VIBRATION TRANSMISSION. ISOLATION EQUIPMENT, HANGERS, CONNECTIONS, AND OTHER ISOLATING DEVICES SHALL BE DESIGNED AND INSTALLED TO PREVENT TRANSMISSION OF VIBRATION TO THE STRUCTURE FROM THE MECHANICAL EQUIPMENT OR ANY OF THE ASSOCIATED PIPING AND DUCTWORK.
H. VIBRATION ISOLATORS SHALL BE PROVIDED AS FOLLOWS AND AS OTHERWISE INDICATED:
1. ISOLATE ALL WATER PIPING THAT IS CONNECTED TO VIBRATION ISOLATED EQUIPMENT, FOR A DISTANCE OF AT LEAST 50 FEET FROM THE EQUIPMENT. ISOLATORS SHALL BE TYPE D SPRING HANGERS.
2. ISOLATE ALL DUCTWORK THAT IS CONNECTED TO VIBRATION ISOLATED EQUIPMENT, FOR A DISTANCE OF AT LEAST 50 FEET FROM THE EQUIPMENT. ISOLATORS SHALL BE TYPE D SPRING HANGERS WITH NEOPRENE ELEMENTS.
I. VIBRATION ISOLATORS SHALL BE AS FOLLOWS:
1. TYPE D SPRING HANGERS: VIBRATION HANGERS SHALL CONTAIN A STEEL SPRING AND 0.3" DEFLECTION NEOPRENE ELEMENT IN SERIES. THE NEOPRENE ELEMENT SHALL BE MOLDED WITH A ROD ISOLATION BUSHING THAT PASSES THROUGH THE HANGER BOX. SPRING DIAMETERS AND HANGER BOX LOWER HOLE SIZES SHALL BE LARGE ENOUGH TO PERMIT THE HANGER ROD TO SWING THROUGH A 30 DEGREE ARC BEFORE CONTACTING THE HOLE AND SHORT CIRCUITING THE SPRING. SPRINGS SHALL HAVE A MINIMUM ADDITIONAL TRAVEL TO SOLID EQUAL TO 50% OF THE RATED DEFLECTION. HANGERS SHALL BE TYPE 30N AS MANUFACTURED BY MASON INDUSTRIES, INC. OR EQUAL BY AMBER–BOOTH.
2. TYPE P NEOPRENE PAD: A PAD TYPE MOUNTING CONSISTING OF TWO LAYERS OF 3/8" THICK RIBBED OR WAFFLED BRIDGE BEARING NEOPRENE PADS BONDED TO A 16 GAGE GALVANIZED STEEL SEPARATOR PLATE. ANCHOR BOLT WITH NEOPRENE WASHER AND SLEEVE.
J. SEISMIC RESTRAINTS:
1. GENERAL: THE INTENT OF THE SEISMIC RESTRAINTS IS TO RESTRAIN THE MECHANICAL EQUIPMENT, PIPES AND DUCTS DURING AN EARTHQUAKE FOR LIFE SAFETY PURPOSES; TO PREVENT EQUIPMENT FROM OVERTURNING; TO PREVENT SUSPENDED EQUIPMENT, PIPES AND DUCTS FROM SWAYING OR FALLING AND CREATING A POTENTIAL LIFE SAFETY HAZARD. FOR "ESSENTIAL" AND "HAZARDOUS" FACILITIES (AS DEFINED IN THE INTERNATIONAL BUILDING CODE), THE INTENT OF THE SEISMIC RESTRAINT SYSTEM ALSO INCLUDES KEEPING THE MECHANICAL SYSTEMS OPERATIONAL DURING AND FOLLOWING AN EARTHQUAKE. SEE SECTION 05500 "METAL FABRICATION" FOR STANDARDS FOR MISCELLANEOUS METAL FABRICATION.
2. THE FOLLOWING MECHANICAL ITEMS SHALL BE SEISMIC ALLY BRACED AS SPECIFIED, DETAILED ON THE DRAWINGS, OR AS RECOMMENDED BY THE SEISMIC AND VIBRATION CONTROL MANUFACTURER:
A. ROOF HOODS – ANCHOR BOLTS
B. PACKAGED ROOFTOP AIR HANDLERS – ANCHOR BOLTS
C. WATER HEATER – ANCHOR BOLTS
D. INLINE EXHAUST FANS – CABLES.
E. ALL DUCT WORK AND PIPING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS IN ACCORDANCE WITH THE CURRENT EDITION THE INTERNATIONAL BUILDING CODE. INSULATED PIPING LONGITUDINAL RESTRAINTS SHALL BE ATTACHED DIRECTLY TO PIPING.
3. CONNECTIONS OF THE SEISMIC BRACING TO THE STRUCTURE SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND ACCEPTABLE TO THE STRUCTURAL ENGINEERS. IN GENERAL, CONNECT TO BEAMS, CONCRETE SLABS, OR TO THE TOP MEMBER OF THE JOISTS AT THE PANEL POINTS. DIVISION 15 SHALL PROVIDE SPANNER BEAMS WHERE REQUIRED FOR SEISMIC BRACING. SEISMIC ANCHORAGE SHALL EXTEND THROUGH CONCRETE HOUSE KEEPING PADS AND ANCHOR TO THE BUILDING FLOOR SLABS.
4. THE SEISMIC AND VIBRATION CONTROL MANUFACTURER SHALL DETERMINE THE NUMBER, SIZE, AND TYPE OF ANCHOR BOLTS, CABLE RESTRAINTS, SEISMIC SNUBBERS, ETC., FOR EACH PIECE OF EQUIPMENT AND GROUPS OF PIPES AND DUCTS. INDIVIDUAL PIPES AND DUCTS SHALL BE BRACED AS PER THE SMACNA DETAILS AND APPROVED AND VERIFIED BY THE SEISMIC AND VIBRATION CONTROL MANUFACTURER.
K. SEISMIC SNUBBERS:
1. THE CAPACITY OF THE SEISMIC SNUBBER AT 3/8" DEFLECTION SHALL BE 3 TO 4 TIMES THE LOAD ASSIGNED TO THE MOUNT GROUPING IN ITS IMMEDIATE AREA. SUBMITTALS SHALL INCLUDE LOAD DEFLECTION CURVES UP TO 1/2" DEFLECTION IN THE Y AND Z PLANES. TEST SHALL BE CONDUCTED IN AN INDEPENDENT LABORATORY OR UNDER THE SIGNED SUPERVISION OF AN INDEPENDENT REGISTERED ENGINEER. THE SNUBBER ASSEMBLIES SHALL BE BOLTED TO THE TEST MACHINE AS THE SNUBBER IS NORMALLY INSTALLED. TEST REPORTS SHALL CERTIFY THAT NEITHER THE NEOPRENE ELEMENTS NOR THE SNUBBER BODY SUSTAINED ANY OBVIOUS DEFORMATION AFTER RELEASE OF LOAD. SNUBBERS SHALL BE SERIES Z–1011 AS MANUFACTURED BY MASON INDUSTRIES, INC. OR EQUAL BY AMBER–BOOTH.
END OF SECTION 15071

SYMBOL LEGEND

SYMBOL		DESCRIPTION
DUCTWORK		
SINGLE LINE	DOUBLE LINE	DESCRIPTION
		RECTANGULAR SUPPLY DUCT UP
		RECTANGULAR SUPPLY DUCT DOWN
		RECTANGULAR EXHAUST DUCT UP
		RECTANGULAR EXHAUST DUCT DOWN
		ROUND DUCT UP
		ROUND DUCT DOWN
		ACCOUSTICALLY LINED RECTANGULAR DUCT
		90° RECTANGULAR ELBOW WITH TURNING VANES
		90° RADIUS ELBOW R=1.5
		DUCT SIZE OR SHAPE TRANSITION
		OPPOSED BLADE BALANDING DAMPER (O.B.D.) IN RECT DUCT
		BUTTERFLY BALANCING DAMPER IN ROUND DUCTS
		COMBINATION TEE
		SQUARE OR RECTANGULAR CEILING DIFFUSER
		ROUND FLEXIBLE DUCT
		EXHAUST GRILLE
FC	FC	FLEXIBLE CONNECTION

SYMBOL LEGEND

SYMBOL	DESCRIPTION
VALVES, METERS, AND GAUGES	
HVAC SYMBOLS	
(T)	THERMOSTAT
(S)	TEMPERATURE SENSOR
(H)	HUMIDISTAT
PLUMBING SYMBOLS	
W.H.	WALL HYDRANT
H.B.	HOSE BIBB
	CLEANOUT TO GRADE
	FLOOR CLEANOUT
	WALL CLEANOUT
HVAC PIPING	
——D——	DRAIN LINE
——(E)——	EXISTING PIPE

MECHANICAL SHEET INDEX

SHEET NO	SHEET TITLE
M001	MECHANICAL GENERAL INFORMATION
M002	MECHANICAL GENERAL INFORMATION
MH101	MECHANICAL PLAN, DETAILS & SCHEDULES

SYMBOL LEGEND

SYMBOL	DESCRIPTION
REFERENCE AND LINE SYMBOLS	
# / SHEET	DETAIL INDICATOR: # INDICATES DETAIL NUMBER, SHEET INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, EXTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
# / SHEET	ELEVATION OR SECTION INDICATOR, INTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
100	ROOM OR SPACE NUMBER.
1	KEYNOTE INDICATOR.
	REVISION INDICATOR.
CU–1	EQUIPMENT INDICATOR.
P–	PLUMBING FIXTURE INDICATOR.
TYPE / CFM / SIZE	DIFFUSER/GRILLE INDICATOR.
TYPE / SIZE	DIFFUSER/GRILLE INDICATOR.
	BREAK, STRAIGHT
	BREAK, ROUND.
--------	HIDDEN FEATURES LINE: HIDDEN, THIN LINE.

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED

AD	ACCESS DOOR	MCA	MINIMUM CIRCUIT AMPS
AIR COND	AIR CONDITION(–ING,–ED)	MFR	MANUFACTURER
APD	AIR PRESSURE DROP	MIN	MINIMUM
BD	BALANCING DAMPER	N/A	NOT APPLICABLE
BHP	BRAKE HORSE POWER	NC	NORMALLY CLOSED
BTU	BRITISH THERMAL UNIT	NC	NOISE CRITERIA
BTUH	BTU/HOUR	NIC	NOT IN CONTRACT
CFH	CUBIC FEET PER HOUR	NO	NORMALLY OPEN
CFM	CUBIC FEET PER MINUTE	NPSH	NET POSITIVE SUCTION HEAD
CLG	COOLING	NTS	NOT TO SCALE
COMP	COMPONENT	OA	OUTSIDE AIR
COND	CONDENS(–ER, –ING, –ATION)	OD	OUTSIDE DIAMETER
CV	CONTROL VALVE	OZ	OUNCE
CW	COLD WATER	PD	PRESSURE DROP OR DIFFERENCE
DIA	DIAMETER	PG	PROPYLENE GLYCOL
DISCH	DISCHARGE	PH	PHASE
DP	DEPTH OR DEEP	PPM	PARTS PER MILLION
DB	DRY BULB TEMPERATURE	PRESS	PRESSURE
(E)	EXISTING	PSF	POUNDS PER SQUARE FOOT
EER	ENERGY EFFICIENCY RATIO	PSI	POUNDS PER SQUARE INCH
EFF	EFFICIENCY	PSIA	PSI ABSOLUTE
EG	ETHYLENE GLYCOL	PSIG	PSI GAUGE
ELEC	ELECTRIC	R	THERMAL RESISTANCE
ELEV	ELEVATION	RA	RETURN AIR
ENT	ENTERING	RECIRC	RECIRCULATE
EVAP	EVAPORAT(–E, –ING, –ED, –OR)	REFR	REFRIGERATION
EWT	ENTERING WATER TEMPERATURE	REQD	REQUIRED
EXT	EXTERNAL	RLA	RATED ––– AMPS
(F)	FUTURE	RPM	REVOLUTIONS PER MINUTE
F	FAHRENHEIT	RW	RAINWATER
FC	FLEXIBLE CONNECT(–OR, –ION)	SA	SUPPLY AIR
FD	FIRE DAMPER	SC	SHADING COEFFICIENT
FLA	FULL LOAD AMPS	SCFM	STANDARD CUBIC FEET PER MINUTE
FPI	FINS PER INCH	SCW	SOFT COLD WATER
FPM	FEET PER MINUTE	SF	SAFETY FACTOR
FPS	FEET PER SECOND	SH	SENSIBLE HEAT
FSD	FIRE SMOKE DAMPER	SL	SEA LEVEL
FT	FEET	SP	STATIC PRESSURE
GAL	GALLON(S)	SPECS(S)	SPECIFICATION(S)
GPH	GALLONS PER HOUR	SQ	SQUARE
GPM	GALLONS PER MINUTE	STD	STANDARD
HD	HEAD	STM	STEAM
HG	MERCURY	TEMP	TEMPERATURE
HR	HOUR	TD	TEMP. DROP OR DIFF.
HT	HEIGHT	THERM	THERMAL
HTG	HEATING	TOT	TOTAL
HP	HORSE POWER	TSTAT	THERMOSTAT
HW	HOT WATER	V	VOLT
HZ	HERTZ(FREQUENCY)	VAC	VACUUM
ID	INSIDE DIAMETER	VAV	VARIABLE AIR VOLUME
IN	INCH	VEL	VELOCITY
KW	KILOWATT	VENT	VENT, VENTILATION
LAT	LEAVING AIR TEMPERATURE	VERT	VERTICAL
LBS	POUNDS	VFD	VARIABLE FREQUENCY DRIVE
LG	LENGTH	VOL	VOLUME
LH	LATENT HEAT	WC	WATER COLUMN
LRA	LOCKED ROTOR AMPS	WG	WATER GAUGE
LVG	LEAVING	WPD	WATER PRESSURE DROP
LWT	LEAVING WATER TEMPERATURE	WTR	WATER
MAX	MAXIMUM	WT	WEIGHT
MBH	THOUSAND BTU PER HOUR	WB	WET BULB TEMP
		YR	YEAR

GENERAL NOTES

1. ALL CEILING DIFFUSERS SHOWN AS SUCH ARE CD–1, CFM AS NOTED, UNLESS OTHERWISE NOTED. REFER TO DETAIL 1/ME501. (CFM)
2. ALL CEILING EXHAUST GRILLES SHOWN AS SUCH ARE EG–1 UNLESS OTHERWISE NOTED. REFER TO DETAIL 1/ME501.
3. COORDINATE EXACT LOCATION OF THERMOSTAT WITH OWNER.
4. DO NOT ROUTE DUCTS AND PIPES ABOVE ELECTRICAL PANELS. ALL ELECTRICAL PANELS MUST HAVE CLEAR ACCESS SPACE IN FRONT OF PANEL 4'–0" DEEP AND 6'–6" HIGH. DO NOT ROUTE DUCTS AND PIPES IN ELECTRICAL ROOMS, EXCEPT DUCTS AND PIPES SERVING THE ROOM.
5. COORDINATE EXACT LOCATIONS OF CEILING DIFFUSERS AND GRILLES WITH ARCHITECTURAL REFLECTED CEILING PLAN.
6. ALL DUCT DIMENSIONS ARE INSIDE FREE AREA DIMENSIONS. ADJUST SHEET METAL DIMENSION FOR LINED DUCT.
7. PROVIDE CEILING ACCESS PANELS AS REQUIRED WHERE MECHANICAL EQUIPMENT, VALVES, ETC. ARE LOCATED ABOVE INACCESSIBLE CEILINGS.
8. ROOF DECK SHALL NOT BE USED TO SUPPORT LOADS FROM PIPING, DUCTWORK OR EQUIPMENT, UNLESS NOTED OTHERWISE. HANGER LOADS LESS THAN 50 LBS. MAY BE HUNG FROM THE STEEL ROOF DECK IN CASES WHEN HANGING FROM THE STEEL ROOF DECK CANNOT BE AVOIDED; THE ATTACHMENT METHOD MUST DISTRIBUTE THE LOAD ACROSS THE DECK AS APPROVED BY THE STRUCTURAL ENGINEER.
9. ALL SURFACES DAMAGED AS A RESULT OF NEW CONSTRUCTION SHALL BE PATCHED AND REPAIRED AS REQUIRED TO MATCH EXISTING SURFACES. PROVIDE COMPLETE DOCUMENTATION OF EXISTING SURFACES PRIOR TO CONSTRUCTION.
10. PROVIDE MANUFACTURER'S RECOMMENDED SERVICE CLEARANCE AROUND ALL SIDES OF MECHANICAL EQUIPMENT.
11. THERMOSTATS SHALL NOT BE LOCATED ON EXTERIOR WALLS. COORDINATE EXACT LOCATION OF THERMOSTAT WITH OWNER.
12. LOCATE ALL EXHAUST VENTS AND PLUMBING VENTS MINIMUM 10 FT. FROM ALL BUILDING INTAKES.

REV#:	REVISION DESCRIPTION:	DATE:

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Professional Seal: LICENSED PROFESSIONAL ENGINEER No. 254969 KENNETH M. CARRILLO 12/23/09 STATE OF UTAH

Project Title:
HYRUM STATE PARK RESTROOM REPLACEMENT
BRIGHAM CITY, UTAH

Sheet Title:
MECHANICAL GENERAL INFORMATION

Drawn By:	Project Number:	DFCM Project Number:
K. Carrillo	06-083	09198510
Designed By: K. Carrillo	Date: December 22, 2009	Sheet Number: M001 of
Reviewed By: K. Carrillo	Sheet Scale:	

SPECIFICATIONS

SECTION 15080 – MECHANICAL INSULATION
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUBMITTALS: PRODUCT DATA FOR EACH TYPE OF MECHANICAL INSULATION.
B. QUALITY ASSURANCE: LABELED WITH MAXIMUM FLAME-SPREAD INDEX OF 25 AND MAXIMUM SMOKE- DEVELOPED INDEX OF 50 ACCORDING TO ASTM E 84.
PART 2 – PRODUCTS
2.1 PIPE INSULATION
A. PERFORMED, GLASS-FIBER PIPE INSULATION: ASTM C 547, CLASS 1, WITH FACTORY-APPLIED, ALL-PURPOSE, VAPOR-RETARDER JACKET.
B. FLEXIBLE, ELASTOMERIC-CELLULAR PIPE INSULATION: CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE I.
C. POLYOLEFIN PIPE INSULATION: UNICELLULAR POLYETHYLENE, PERFORMED PIPE INSULATION. COMPLY WITH ASTM C 534, TYPE I, EXCEPT FOR DENSITY.
2.2 DUCT AND EQUIPMENT INSULATION
A. GLASS-FIBER-BOARD INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 612, TYPE IB, WITHOUT FACING AND WITH ALL-SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRIM, ALUMINUM FOIL, AND VINYL FILM.
B. GLASS-FIBER-BLANKET INSULATION: GLASS FIBERS BONDED WITH A THERMOSETTING RESIN. COMPLY WITH ASTM C 553, TYPE II, WITHOUT FACING AND WITH ALL-SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRIM, ALUMINUM FOIL, AND VINYL FILM.
C. FLEXIBLE ELASTOMERIC-CELLULAR SHEET INSULATION: CLOSED-CELL, SPONGE- OR EXPANDED-RUBBER MATERIALS. COMPLY WITH ASTM C 534, TYPE II.
PART 3 – EXECUTION
3.1 PIPE INSULATION INSTALLATION
A. INSTALL VAPOR BARRIERS ON INSULATED PIPES WITH SURFACE OPERATING TEMPERATURES BELOW 60°F.
B. INSULATE PIPE, FITTINGS, VALVES, AND SPECIALTIES, EXCEPT IN HOT WATER SYSTEMS, WHERE VALVES AND SPECIALTIES DO NOT REQUIRE INSULATION.
C. SEAL VAPOR-BARRIER PENETRATIONS FOR HANGERS, SUPPORTS, ANCHORS, AND OTHER PROJECTIONS.
D. COAT GLASS-FIBER PIPE INSULATION ENDS WITH VAPOR-BARRIER COATING.
E. ROOF PENETRATIONS: APPLY INSULATION FOR INTERIOR APPLICATIONS TO THE ROOF FLASHING.
F. EXTERIOR WALL PENETRATIONS: FOR PENETRATIONS BELOW GRADE, TERMINATE INSULATION FLUSH WITH MECHANICAL SLEEVE SEAL. FOR PENETRATIONS ABOVE GRADE, TERMINATE AT INSIDE SURFACE OF EXTERIOR CLADDING.
G. INTERIOR WALLS AND PARTITIONS PENETRATIONS: APPLY INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS, EXCEPT FIRE-RATED WALLS AND PARTITIONS.
H. FIRE-RATED WALLS AND PARTITIONS PENETRATIONS: TERMINATE INSULATION AT PENETRATIONS THROUGH FIRE-RATED WALLS AND PARTITIONS. SEAL AROUND PENETRATION WITH THROUGH-PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
I. FLOOR PENETRATIONS: TERMINATE INSULATION AT THE UNDERSIDE OF THE FLOOR ASSEMBLY AND AT THE FLOOR SUPPORT AT TOP OF FLOOR. SEAL AROUND PENETRATION WITH THROUGH-PENETRATION FIRESTOP SYSTEMS SPECIFIED IN DIVISION 7.
J. FLEXIBLE ELASTOMERIC INSULATION INSTALLATION: SEAL JOINTS WITH ADHESIVE.
K. INTERIOR PIPING SYSTEM APPLICATIONS: INSULATE THE FOLLOWING PIPING SYSTEMS:
1. DOMESTIC HOT WATER.
2. RECIRCULATED DOMESTIC HOT WATER.
3. ROOF DRAIN BODIES AND HORIZONTAL RAINWATER LEADERS OF STORM WATER PIPING.
4. EXPOSED WATER SUPPLIES AND SANITARY DRAINS OF FIXTURES FOR PEOPLE WITH DISABILITIES.
5. REFRIGERANT SUCTION PIPING.
6. VENT PIPING 5 FT. INSIDE BUILDING.
L. DO NOT APPLY INSULATION TO THE FOLLOWING SYSTEMS, MATERIALS, AND EQUIPMENT:
1. FLEXIBLE CONNECTORS.
2. FIRE-PROTECTION PIPING SYSTEMS.
3. SANITARY DRAINAGE AND VENT PIPING.
4. DRAINAGE PIPING LOCATED IN CRAWLSPACES, UNLESS OTHERWISE INDICATED.
5. CHROME-PLATED PIPES AND FITTINGS, EXCEPT FOR PLUMBING FIXTURES FOR PEOPLE WITH DISABILITIES.
6. PIPING SPECIALTIES, INCLUDING AIR CHAMBERS, UNIONS, STRAINERS, CHECK VALVES, PLUG VALVES, AND FLOW REGULATORS.
M. PIPE INSULATION THICKNESSS APPLICATION SCHEDULE: INSULATE PIPING WITH THE FOLLOWING MATERIALS AND THICKNESSES:
1. DOMESTIC HOT WATER AND RECIRCULATED HOT WATER: 1-INCH THICK, PERFORMED, GLASS-FIBER PIPE INSULATION.
2. HYDRONIC COOLING PIPING, 40 TO 60°F: PERFORMED, GLASS- FIBER PIPE INSULATION.
A. PIPE DIAMETER LESS THAN NPS 1-1/2: 1 INCH THICK.
B. PIPE DIAMETER NPS 1-1/2 AND LARGER: 1 INCH THICK.
3. HYDRONIC HEATING PIPING, 140 TO 200°F: 1-INCH THICK, PERFORMED, GLASS-FIBER PIPE INSULATION.
4. REFRIGERANT SUCTION PIPING: 1/2-INCH THICK, FLEXIBLE, ELASTOMERIC-CELLULAR PIPE INSULATION.
5. SANITARY DRAINS AND STORM WATER PIPING: 1-INCH THICK, PERFORMED, GLASS-FIBER PIPE INSULATION.
3.2 DUCT INSULATION INSTALLATION
A. INSTALL INSULATION CONTINUOUSLY ON DUCTS THAT PENETRATE WALLS AND FLOORS, EXCEPT WHERE FIRE-RATED ASSEMBLIES TERMINATE INSULATION AT THE ASSEMBLY. MAINTAIN INSULATION VAPOR RETARDERS ON COLD DUCTS.
B. INSTALL REMOVABLE OR SEGMENTED INSULATION ON ACCESS PANELS AND DOORS.
C. INSTALL VAPOR BARRIERS ON INSULATED DUCTS AND PLENUMS WITH SURFACE OPERATING TEMPERATURES BELOW 60 °F. SEAL JOINTS AND SEAMS TO MAINTAIN VAPOR BARRIER ON INSULATION REQUIRING A VAPOR BARRIER.
D. TAPER GLASS-FIBER INSULATION ENDS AT A 45-DEGREE ANGLE AND SEAL WITH ADHESIVE. CUT ENDS OF FLEXIBLE ELASTOMERIC CELLULAR INSULATION SQUARE AND SEAL WITH ADHESIVE.
E. BOARD INSULATION INSTALLATION: SECURE INSULATION TIGHT AND SMOOTH WITH SPEED WASHERS AND ANCHOR PINS. SPACE ANCHOR PINS 18 INCHES APART EACH WAY AND 3 INCHES FROM INSULATION JOINTS. APPLY VAPOR-BARRIER COATING COMPOUND TO INSULATION AT OPEN JOINTS, BREAKS, PUNCTURES, AND VOIDS IN VAPOR BARRIER.
F. BLANKET INSULATION INSTALLATION: BOND DUCTS HAVING LONG SIDES OR DIAMETERS SMALLER THAN 24 INCHES WITH BONDING ADHESIVE APPLIED IN 6-INCH-WIDE TRANSVERSE STRIPS ON 12-INCH CENTERS. BOND DUCTS HAVING LONG SIDES OR DIAMETERS 24 INCHES AND LARGER WITH ANCHOR PINS SPACED 12 INCHES APART EACH WAY. APPLY BONDING ADHESIVE TO PREVENT SAGGING OF INSULATION. OVERLAP JOINTS 3 INCHES . SEAL JOINTS, BREAKS, AND PUNCTURES WITH VAPOR-BARRIER COMPOUND.
G. DUCT SYSTEM APPLICATIONS: INSULATE INDOOR CONCEALED SUPPLY-, RETURN-, AND OUTSIDE-AIR DUCTS.
H. DO NOT APPLY INSULATION TO THE FOLLOWING SYSTEMS, MATERIALS, AND EQUIPMENT:
1. METAL DUCTS WITH DUCT LINER.
2. FACTORY-INSULATED FLEXIBLE DUCTS.
3. FACTORY-INSULATED PLENUMS, CASINGS, TERMINAL BOXES, AND FILTER BOXES AND SECTIONS.
4. FLEXIBLE CONNECTORS.
5. VIBRATION-CONTROL DEVICES.
6. TESTING LABORATORY LABELS AND STAMPS.
7. NAMEPLATES AND DATA PLATES.
I. DUCT INSULATION THICKNESS AND APPLICATION SCHEDULE: INSULATE DUCTS WITH THE FOLLOWING MATERIALS AND THICKNESSES:
1. CONCEALED APPLICATIONS: GLASS-FIBER BLANKET, 1-1/2 INCHES THICK.
2. EXPOSED APPLICATIONS: GLASS-FIBER BOARD, 2 INCHES THICK.
END OF SECTION 15080

SPECIFICATIONS

SECTION 15530 – FURNACES
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUBMITTALS: PRODUCT DATA.
B. THERMAL EFFICIENCY: EQUAL TO OR GREATER THAN PRESCRIBED BY ASHRAE/IESNA 90.1.
C. WARRANTIES: SUBMIT A WRITTEN WARRANTY EXECUTED BY MANUFACTURER AGREEING TO REPAIR OR REPLACE FURNACES THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN [10] [20] <INSERT NUMBER> YEARS FROM DATE OF SUBSTANTIAL COMPLETION.
PART 2 – PRODUCTS
2.2 GAS-FIRED FURNACES, CONDENSING
A. COMPLY WITH AGA Z21.47, NFPA 54, AND BEAR AGA LABEL.
1. TYPE OF GAS: NATURAL.
2. FAN MOTOR: MULTISPEED.
3. HEAT EXCHANGER: ALUMINIZED-STEEL WELDED CONSTRUCTION WITH ALUMINUM-FINNED, CONDENSING COIL.
4. AUTOMATIC CONTROLS: SOLID-STATE BOARD TO DELAY FAN START AND SHUTDOWN.
5. CONFIGURATION: DOWNFLOW, WITH ADDITIVE STEEL BASE AT FLOOR.
6. HEATING CAPACITY: SEE SCHEDULE.
7. COOLING CAPACITY: SEE SCHEDULE.
8. ACCESSORIES: COMBINATION COMBUSTION-AIR INTAKE AND VENT AND VENTILATION-AIR HEAT EXCHANGER.
2.5 ACCESSORIES
A. CONTROLS: INCLUDE COMPONENTS REQUIRED FOR OPERATION OF FURNACES AND AUXILIARY EQUIPMENT IN ALL SEASONS.
B. FILTERS: 1-INCH THICK, DISPOSABLE, FIBERGLASS TYPE IN SHEET METAL RACK.
2.7 REFRIGERATION COMPONENTS
A. EVAPORATOR COIL: COMPLY WITH ARI 210/240. MATCH SIZE WITH FURNACE. MATCH REMOTE CONDENSING UNIT SPECIFIED IN DIVISION 15 SECTION "CONDENSING UNITS" WITH TYPE, CAPACITY, PRESSURE-DROP RATINGS, RESTRICTED DISTRIBUTOR, OR EXPANSION VALVE. INCLUDE CONDENSATE DRAIN PAN WITH DRAIN OUTLET.
B. EVAPORATOR COIL ENCLOSURE: AS REQUIRED TO SUIT FURNACE AND COOLING COIL. STEEL CABINET WITH ACCESS PANEL AND FLANGES FOR INTEGRAL MOUNTING AT OR ON FURNACE CABINET.
C. REFRIGERANT LINE KITS: ANNEALED-COPPER SUCTION AND LIQUID LINES FACTORY CLEANED, DRIED, PRESSURIZED, AND SEALED; WITH INSULATED SUCTION LINE AND APPROPRIATE FITTINGS AT ENDS.
2.8 CONTROLS
A. THERMOSTAT: 24-V AC, SOLID-STATE, PROGRAMMABLE, MICROPROCESSOR-BASED, WALL-MOUNTED UNIT WITH AUTOMATIC SWITCHING FROM HEATING TO COOLING, HEAT ANTICIPATOR, MINIMUM FOUR TEMPERATURE PRESETS SELECT ABLE BY DAY AND TIME, AND BATTERY BACKUP PROTECTION OF PROGRAM SETTINGS AGAINST POWER FAILURE.
PART 3 – EXECUTION
3.1 INSTALLATION
A. INSTALL AND CONNECT GAS-FIRED FURNACES AND ASSOCIATED FUEL AND VENT FEATURES AND SYSTEMS ACCORDING TO NFPA 54, APPLICABLE LOCAL CODES AND REGULATIONS, AND MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
B. VENTS, OUTSIDE-AIR PIPE CONNECTIONS, AND DRAINS: INSTALL VENT TERMINAL DESIGNED TO PROTECT AGAINST BIRDS, INSECTS, AND DIRT.
C. CONNECT CONDENSATE DRAINS TO INDIRECT WASTE USING COPPER TUBING WITH STREAMLINE DRAINAGE FITTINGS AND SOLDERED JOINTS. EXTEND TO NEAREST EQUIPMENT DRAIN OR FLOOR DRAIN. CONSTRUCT VENTED, DEEP TRAP AT CONNECTION TO DRAIN PAN AND INSTALL CLEANOUTS AT CHANGES IN DIRECTION. TERMINATE TO SUIT LOCAL CODE REQUIREMENTS.
E. BASE-MOUNTED UNITS: SECURE UNITS TO SUBSTRATE. PROVIDE OPTIONAL BOTTOM CLOSURE BASE WHERE INSTALLATION CONDITIONS REQUIRE.
F. CONTROLS: INSTALL THERMOSTATS ADJACENT TO LIGHT SWITCHES AT APPROXIMATELY 60 INCHES ABOVE FINISHED FLOOR.
END OF SECTION 15530

SECTION 15810 – DUCTS AND ACCESSORIES
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUMMARY: METAL AND NONMETAL DUCTS AND ACCESSORIES IN PRESSURE CLASSES 2-INCH WG OR LESS AND A MAXIMUM VELOCITY OF 2400 FPM.
B. SUBMITTALS: PRODUCT DATA FOR FIRE AND SMOKE DAMPERS[AND SHOP DRAWINGS DETAILING DUCT LAYOUT AND INCLUDING LOCATIONS AND TYPES OF DUCT ACCESSORIES, DUCT SIZES, TRANSITIONS, RADIUS AND VANED ELBOWS, SPECIAL SUPPORTS DETAILS, AND INLETS AND OUTLET TYPES AND LOCATIONS].
C. COMPLY WITH NFPA 90A FOR SYSTEMS SERVING SPACES MORE THAN 25,000 CU. FT. IN VOLUME OR BUILDING TYPES II, IV, AND V CONSTRUCTION MORE THAN 3 STORIES IN HEIGHT.
D. COMPLY WITH NFPA 90B FOR SYSTEMS SERVING SPACES IN 1- OR 2-FAMILY DWELLINGS OR SERVING SPACES LESS THAN 25,000 CU. FT.
E. COMPLY WITH NFPA 96, "VENTILATION CONTROL AND FIRE PROTECTION OF COMMERCIAL COOKING OPERATIONS," CHAPTER 3, "DUCT SYSTEM," FOR RANGE HOOD DUCTS, EXCEPT SINGLE-FAMILY RESIDENTIAL USAGE, UNLESS OTHERWISE INDICATED.
F. COMPLY WITH UL 181 AND UL 181A FOR DUCTS AND CLOSURES.
PART 2 – PRODUCTS
2.1 DUCTS
A. GALVANIZED STEEL SHEET: FORMING STEEL WITH MINIMUM G60 HOT-DIP GALVANIZED COATING.
B. DUCT LINER: ASTM C 1071, TYPE II, 1 INCH THICK; WITH AN AIRSTREAM SURFACE COATED WITH A HIGH-TEMPERATURE-RESISTANT COATING.
1. ADHESIVE: ASTM C 916, TYPE I.
2. MECHANICAL FASTENERS: GALVANIZED STEEL PIN, LENGTH REQUIRED TO PENETRATE LINER PLUS A MAXIMUM 1/8-INCH PROJECTION INTO THE AIRSTREAM.
C. JOINT AND SEAM TAPE, AND SEALANT: COMPLY WITH UL 181A.
D. RECTANGULAR METAL DUCT FABRICATION: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARD" FOR METAL THICKNESS, REINFORCING TYPES AND INTERVALS, TIE-ROD APPLICATIONS, AND JOINT TYPES AND INTERVALS.
E. FIBROUS-GLASS LINER: COMPLY WITH NFPA 90A OR NFPA 90B AND WITH NAIMA AH124.
1. THICKNESS: 1 INCH.
2. LINER ADHESIVE: COMPLY WITH NFPA 90A OR NFPA 90B AND WITH ASTM C 916.
3. MECHANICAL FASTENERS: GALVANIZED STEEL SUITABLE FOR ADHESIVE ATTACHMENT, MECHANICAL ATTACHMENT, OR WELDING ATTACHMENT.
2.2 ACCESSORIES
A. VOLUME-CONTROL DAMPERS: FACTORY-FABRICATED VOLUME-CONTROL DAMPERS, COMPLETE WITH REQUIRED HARDWARE AND ACCESSORIES. SINGLE BLADE AND MULTIPLE OPPOSED BLADE, STANDARD LEAKAGE RATING, AND SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS.
B. FLEXIBLE CONNECTORS: FLAME-RETARDED OR NONCOMBUSTIBLE FABRICS, COATINGS, AND ADHESIVES COMPLYING WITH UL 181, CLASS 1.
C. FLEXIBLE DUCTS: FACTORY-FABRICATED, INSULATED, ROUND DUCT, WITH AN OUTER JACKET ENCLOSING 1-INCH THICK, GLASS-FIBER INSULATION AROUND A CONTINUOUS INNER LINER.
PART 3 – EXECUTION
3.1 INSTALLATION
A. DUCT SYSTEM PRESSURE CLASS: CONSTRUCT AND INSTALL EACH DUCT SYSTEM FOR THE SPECIFIC DUCT PRESSURE CLASSIFICATION INDICATED.
1. HIGH PRESSURE SUPPLY DUCT BETWEEN FAN UNIT AND TERMINAL BOXES: 6 INCHES W.G. POSITIVE.
2. LOW PRESSURE SUPPLY DUCT BETWEEN TERMINAL BOXES AND ROOM OUTLETS: 1 INCH W.G. POSITIVE.
3. EXHAUST AIR DUCT WHEN FAN RATED AT 2 INCHES W.G. SP OR LOWER, RETURN AIR DUCT, TRANSFER AIR DUCT, COMBUSTION AIR DUCT, OUTSIDE AIR DUCT: 2 INCHES W.G. NEGATIVE.
B. CONCEAL DUCTS FROM VIEW IN FINISHED AND OCCUPIED SPACES.
C. AVOID PASSING THROUGH ELECTRICAL EQUIPMENT SPACES AND ENCLOSURES.
D. SUPPORT AND CONNECT METAL DUCTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARD."
E. INSTALL DUCT ACCESSORIES ACCORDING TO DETAILS OF CONSTRUCTION AS SHOWN IN SMACNA STANDARDS.
F. INSTALL VOLUME-CONTROL DAMPERS IN LINED DUCT WITH METHODS TO AVOID DAMAGE TO LINER AND TO AVOID EROSION OF DUCT LINER.
3.2 TESTING, ADJUSTING, AND BALANCING
A. BALANCE AIRFLOW WITHIN DISTRIBUTION SYSTEMS, INCLUDING SUBMAINS, BRANCHES, AND TERMINALS TO INDICATED QUANTITIES.
END OF SECTION 15810

SPECIFICATIONS

SECTION 15838 – POWER VENTILATORS
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUBMITTALS: PRODUCT DATA.
B. BEAR THE AMCA SEAL.
C. COMPLY WITH UL 705.
PART 2 – PRODUCTS
2.1 CENTRIFUGAL VENTILATORS
A. HOUSING: REMOVABLE, SPUN-ALUMINUM, ; SQUARE, ONE-PIECE, ALUMINUM BASE WITH VENTURI INLET CONE.
1. UPBLAST UNITS: ALUMINUM DISCHARGE BAFFLE TO DIRECT DISCHARGE AIR UPWARD, WITH RAIN AND SNOW DRAINS.
2. WALL-MOUNTING UNITS: ALUMINUM RECTANGULAR BASE WITH VENTURI INLET CONE, MOTOR MOUNT, AND VIBRATION ISOLATORS DESIGNED FOR WALL MOUNTING.
C. FAN WHEELS: ALUMINUM HUB AND WHEEL WITH BACKWARD-INCLINED BLADES.
D. BELT-DRIVEN DRIVE ASSEMBLY: RESILIENTLY MOUNTED TO HOUSING:
1. FAN SHAFT: TURNED, GROUND, AND POLISHED STEEL; KEYED TO WHEEL HUB.
2. SHAFT BEARINGS: PERMANENTLY LUBRICATED, PERMANENTLY SEALED, SELF-ALIGNING BALL BEARINGS.
3. PULLEYS: CAST-IRON, ADJUSTABLE-PITCH MOTOR PULLEY.
4. FAN AND MOTOR ISOLATED FROM EXHAUST AIRSTREAM.
E. ACCESSORIES:
1. DISCONNECT SWITCH: NONFUSIBLE TYPE, WITH THERMAL-OVERLOAD PROTECTION MOUNTED INSIDE FAN HOUSING, FACTORY WIRED THROUGH AN INTERNAL ALUMINUM CONDUIT.
2. BIRD SCREENS: REMOVABLE, 1/2-INCH MESH, ALUMINUM WIRE.
3. MOTORIZED DAMPERS: PARALLEL-BLADE DAMPERS MOUNTED IN CURB BASE WITH ELECTRIC ACTUATOR; WIRED TO CLOSE WHEN FAN STOPS.
F. ROOF CURBS: GALVANIZED STEEL; MITERED AND WELDED CORNERS; 1-1/2-INCH THICK, RIGID, FIBERGLASS INSULATION ADHERED TO INSIDE WALLS; AND 1-1/2-INCH WOOD NAILER. SIZE AS REQUIRED TO SUIT ROOF OPENING AND FAN BASE.
1. CONFIGURATION: BUILT-IN CANT AND MOUNTING FLANGE.
2. OVERALL HEIGHT: 12 INCHES.
3. PITCH MOUNTING: MANUFACTURE CURB FOR ROOF SLOPE.
4. HINGED SUBBASE: GALVANIZED STEEL HINGED ARRANGEMENT PERMITTING SERVICE AND MAINTENANCE.
A. MOUNTING PEDESTAL: GALVANIZED STEEL WITH REMOVABLE ACCESS PANEL.
2.2 CEILING-MOUNTING OR IN-LINE CENTRIFUGAL VENTILATORS
A. HOUSING: STEEL, LINED WITH ACOUSTICAL INSULATION.
C. FAN WHEEL: CENTRIFUGAL WHEELS DIRECTLY MOUNTED ON MOTOR SHAFT. FAN SHROUDS, MOTOR, AND FAN WHEEL SHALL BE REMOVABLE FOR SERVICE.
D. GRILLE: ALUMINUM, LOUVERED OR EGG-CRATE GRILLE WITH FLANGE ON INTAKE AND THUMBSCREW ATTACHMENT TO FAN HOUSING.
E. ELECTRICAL REQUIREMENTS: JUNCTION BOX FOR ELECTRICAL CONNECTION ON HOUSING AND RECEPTACLE FOR MOTOR PLUG-IN.
F. ACCESSORIES:
1. VARIABLE-SPEED CONTROLLER: SOLID-STATE CONTROL TO REDUCE SPEED FROM 100 PERCENT TO LESS THAN 50 PERCENT.
2. MANUAL STARTER SWITCH: SINGLE-POLE ROCKER SWITCH ASSEMBLY WITH COVER AND PILOT LIGHT.
3. ISOLATION: RUBBER-IN-SHEAR VIBRATION ISOLATORS.
PART 3 – EXECUTION
3.1 INSTALLATION
A. ROOF-MOUNTED UNITS: INSTALL ROOF CURB ON ROOF STRUCTURE, ACCORDING TO ARI GUIDELINE B. INSTALL AND SECURE ROOF-MOUNTED FANS ON CURBS, AND COORDINATE ROOF PENETRATIONS AND FLASHING WITH ROOF CONSTRUCTION.
B. CEILING-MOUNTED UNITS: SUSPEND UNITS FROM STRUCTURE USING STEEL WIRE OR METAL STRAPS.
C. GROUND POWER VENTILATORS.
END OF SECTION 15838

SECTION 15855 – DIFFUSERS, REGISTERS, AND GRILLES
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. SUBMIT PRODUCT DATA, INCLUDING COLOR CHARTS FOR FACTORY FINISHES.
PART 2 – PRODUCTS
2.1 OUTLETS AND INLETS
A. DIFFUSERS:
1. MATERIAL: STEEL.
3. FINISH: BAKED ENAMEL, COLOR SELECTED BY ARCHITECT.
4. MOUNTING: FLUSH OR LAY IN AS REQUIRED FOR CEILING TYPE.
B. WALL AND CEILING GRILLES:
1. MATERIAL: STEEL.
3. FINISH: BAKED ENAMEL, COLOR SELECTED BY ARCHITECT.
4. MOUNTING: COUNTERSUNK SCREW.
PART 3 – EXECUTION
3.1 INSTALLATION
A. COORDINATE LOCATION AND INSTALLATION WITH DUCT INSTALLATION AND INSTALLATION OF OTHER CEILING- AND WALL-MOUNTED ITEMS.
B. LOCATE CEILING DIFFUSERS, REGISTERS, AND GRILLES, AS INDICATED ON DRAWINGS. UNLESS OTHERWISE INDICATED, LOCATE UNITS ON CENTER LINE OF ACOUSTICAL CEILING PANELS.
END OF SECTION 15855

SPECIFICATIONS

SECTION 15950 – TESTING, ADJUSTING, AND BALANCING
PART 1 – GENERAL
1.1 SECTION REQUIREMENTS
A. THIS SECTION INCLUDES TESTING AND BALANCING TO PRODUCE DESIGN OBJECTIVES FOR AIR AND HYDRONIC SYSTEMS.
B. CERTIFIED REPORTS: SUBMIT TWO COPIES OF REPORTS PREPARED, AS SPECIFIED IN THIS SECTION, ON APPROVED FORMS CERTIFIED BY TEST AND BALANCE FIRM.
C. TAB FIRM QUALIFICATIONS: ENGAGE A TAB FIRM CERTIFIED BY EITHER AABC OR NEBB.
D. TAB REPORT FORMS: USE STANDARD FORMS FROM AABC'S "NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS."
PART 2 – PRODUCTS (NOT APPLICABLE)
PART 3 – EXECUTION
3.1 EXAMINATION
A. EXAMINE THE CONTRACT DOCUMENTS TO BECOME FAMILIAR WITH PROJECT REQUIREMENTS AND TO DISCOVER CONDITIONS IN SYSTEMS' DESIGNS THAT MAY PRECLUDE PROPER TEST AND BALANCE OF SYSTEMS AND EQUIPMENT.
B. EXAMINE APPROVED SUBMITTAL DATA OF HVAC SYSTEMS AND EQUIPMENT.
C. EXAMINE SYSTEM AND EQUIPMENT INSTALLATIONS TO VERIFY THAT THEY ARE COMPLETE AND THAT TESTING, CLEANING, ADJUSTING, AND COMMISSIONING SPECIFIED IN INDIVIDUAL SECTIONS HAVE BEEN PERFORMED.
D. EXAMINE HVAC SYSTEM AND EQUIPMENT INSTALLATIONS TO VERIFY THAT INDICATED BALANCING DEVICES, SUCH AS TEST PORTS, GAGE COCKS, THERMOMETER WELLS, FLOW-CONTROL DEVICES, BALANCING VALVES AND FITTINGS, AND MANUAL VOLUME DAMPERS, ARE PROPERLY INSTALLED, AND THAT THEIR LOCATIONS ARE ACCESSIBLE AND APPROPRIATE FOR EFFECTIVE BALANCING AND FOR EFFICIENT SYSTEM AND EQUIPMENT OPERATION.
E. EXAMINE SYSTEMS FOR FUNCTIONAL DEFICIENCIES THAT CANNOT BE CORRECTED BY ADJUSTING AND BALANCING.
F. EXAMINE HVAC EQUIPMENT TO ENSURE THAT CLEAN FILTERS HAVE BEEN INSTALLED, BELTS ARE ALIGNED AND TIGHT, AND EQUIPMENT WITH FUNCTIONING CONTROLS IS READY FOR OPERATION.
G. EXAMINE TERMINAL UNITS, SUCH AS AIR TERMINALS, TO VERIFY THAT THEY ARE ACCESSIBLE AND THEIR CONTROLS ARE CONNECTED AND FUNCTIONING.
H. EXAMINE AUTOMATIC TEMPERATURE SYSTEM COMPONENTS TO VERIFY THE FOLLOWING:
1. DAMPERS, VALVES, AND OTHER CONTROLLED DEVICES ARE OPERATED BY THE INTENDED CONTROLLER.
2. DAMPERS AND VALVES ARE IN THE POSITION INDICATED BY THE CONTROLLER.
3. INTEGRITY OF DAMPERS AND VALVES FOR FREE AND FULL OPERATION AND FOR TIGHTNESS OF FULLY CLOSED AND FULLY OPEN POSITIONS. THIS INCLUDES DAMPERS IN MULTIZONE UNITS, MIXING BOXES, AND VARIABLE-AIR-VOLUME TERMINALS.
4. AUTOMATIC MODULATING AND SHUTOFF VALVES, INCLUDING TWO-WAY VALVES AND THREE-WAY MIXING AND DIVERTING VALVES, ARE PROPERLY CONNECTED.
5. THERMOSTATS AND HUMIDISTATS ARE LOCATED TO AVOID ADVERSE EFFECTS OF SUNLIGHT, DRAFTS, AND COLD WALLS.
6. SENSORS ARE LOCATED TO SENSE ONLY THE INTENDED CONDITIONS.
7. SEQUENCE OF OPERATION FOR CONTROL MODES IS ACCORDING TO THE CONTRACT DOCUMENTS.
8. CONTROLLER SET POINTS ARE SET AT INDICATED VALUES.
9. INTERLOCKED SYSTEMS ARE OPERATING.
10. CHANGEOVER FROM HEATING TO COOLING MODE OCCURS ACCORDING TO INDICATED VALUES.
I. REPORT DEFICIENCIES DISCOVERED BEFORE AND DURING PERFORMANCE OF TEST AND BALANCE PROCEDURES.
3.2 GENERAL PROCEDURES FOR TESTING AND BALANCING
A. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN AABC'S "NATIONAL STANDARDS FOR TESTING AND BALANCING HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS"
B. CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY TO ALLOW ADEQUATE PERFORMANCE OF PROCEDURES. AFTER TESTING AND BALANCING, CLOSE PROBE HOLES AND PATCH INSULATION WITH NEW MATERIALS IDENTICAL TO THOSE REMOVED. RESTORE VAPOR BARRIER AND FINISH ACCORDING TO INSULATION SPECIFICATIONS FOR THIS PROJECT.
C. MARK EQUIPMENT AND BALANCING DEVICE SETTINGS WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL, INCLUDING DAMPER-CONTROL POSITIONS, VALVE POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, TO SHOW FINAL SETTINGS.
D. TAKE AND REPORT TESTING AND BALANCING MEASUREMENTS IN INCH-POUND (IP) UNITS.
3.3 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS
A. PREPARE SCHEMATIC DIAGRAMS OF SYSTEMS' "AS-BUILT" DUCT LAYOUTS.
B. FOR VARIABLE-AIR-VOLUME SYSTEMS, DEVELOP A PLAN TO SIMULATE DIVERSITY.
C. DETERMINE THE BEST LOCATIONS IN MAIN AND BRANCH DUCTS FOR ACCURATE DUCT AIRFLOW MEASUREMENTS.
D. VERIFY THAT MOTOR STARTERS ARE EQUIPPED WITH PROPERLY SIZED THERMAL PROTECTION.
E. CHECK FOR AIRFLOW BLOCKAGES.
F. CHECK CONDENSATE DRAINS FOR PROPER CONNECTIONS AND FUNCTIONING.
G. CHECK FOR PROPER SEALING OF AIR-HANDLING UNIT COMPONENTS.
H. CHECK FOR PROPER SEALING OF AIR DUCT SYSTEM.
3.4 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS
A. PREPARE TEST REPORTS WITH PERTINENT DESIGN DATA; NUMBER IN SEQUENCE STARTING AT PUMP TO END OF SYSTEM. CHECK THE SUM OF BRANCH-CIRCUIT FLOWS AGAINST APPROVED PUMP FLOW RATE.
B. PREPARE SCHEMATIC DIAGRAMS OF SYSTEMS' "AS-BUILT" PIPING LAYOUTS.
C. PREPARE HYDRONIC SYSTEMS FOR TESTING AND BALANCING ACCORDING TO THE FOLLOWING, IN ADDITION TO THE GENERAL PREPARATION PROCEDURES SPECIFIED ABOVE:
1. OPEN ALL MANUAL VALVES FOR MAXIMUM FLOW.
2. CHECK EXPANSION TANK LIQUID LEVEL.
3. CHECK MAKEUP-WATER-STATION PRESSURE GAGE FOR ADEQUATE PRESSURE FOR HIGHEST VENT.
4. SET SYSTEM CONTROLS SO AUTOMATIC VALVES ARE WIDE OPEN TO HEAT EXCHANGERS.
5. CHECK PUMP-MOTOR LOAD. IF MOTOR IS OVERLOADED, THROTTLE MAIN FLOW-BALANCING DEVICE SO MOTOR NAMEPLATE RATING IS NOT EXCEEDED.
3.5 TOLERANCES
A. SET HVAC SYSTEM AIRFLOW AND WATER FLOW RATES WITHIN THE FOLLOWING TOLERANCES:
1. SUPPLY, RETURN, AND EXHAUST FANS AND EQUIPMENT WITH FANS: PLUS 5 TO PLUS 10 PERCENT.
2. AIR OUTLETS AND INLETS: 0 TO MINUS 10 PERCENT.
3. HEATING-WATER FLOW RATE: 0 TO MINUS 10 PERCENT.
4. COOLING-WATER FLOW RATE: 0 TO MINUS 5 PERCENT.
END OF SECTION 15950

REV#:	REVISION DESCRIPTION:	DATE:

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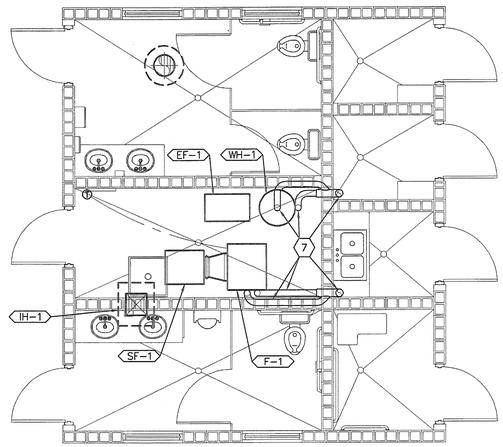
No. 264969
KENNETH M. CARRILLO
12/23/09
STATE OF UTAH

Project Title:
HYRUM STATE PARK RESTROOM REPLACEMENT
BRIGHAM CITY, UTAH

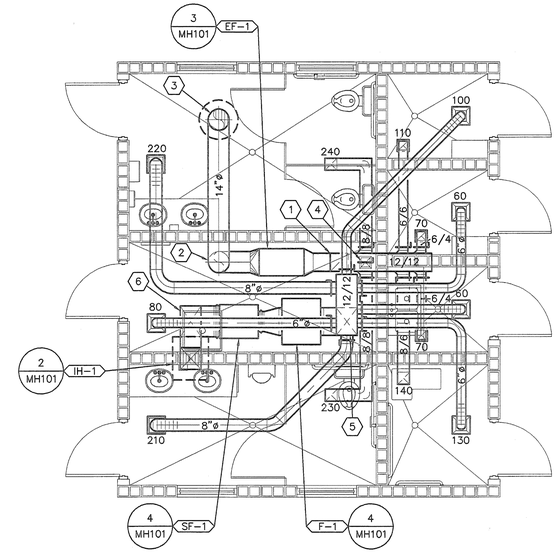
Sheet Title:
MECHANICAL GENERAL INFORMATION

Drawn By:	Project Number:	DFCM Project Number:
K. Carrillo	06-083	09198510
Designed By:	Date:	Sheet Number:
K. Carrillo	December 22, 2009	M002
Reviewed By:	Sheet Scale:	
K. Carrillo		of



MECHANICAL PLAN (VENTS)

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



MECHANICAL PLAN (DUCTWORK)

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

REGISTER AND GRILLE SCHEDULE

SYMBOL	MANUFACTURER	MODEL	PRESSURE	SIZE	MAX. CFM	MAX. N.C.	COMMENTS
CD-1	E.H. PRICE.	PDN	PERFORATED FACE CEILING DIFFUSERS REMOVABLE FACE & CORE. W/O.B.D. FRAME SHALL BE FOR SURFACE MOUNTING AS REQUIRED BY CEILING TYPE. FRAMES SHALL BE SIZED TO HANDLE AIR FLOW AND FIT CEILING SPACE AVAILABLE. DIFFUSER SHALL HAVE INDIVIDUALLY ADJUSTABLE CURED BLADES. PROVIDE ROUND NECK ADAPTER.	6 8 10 12 14 15	190 320 490 620 850 980	30	COLOR BY ARCHITECT.
EG-1	E.H. PRICE.	630	EXHAUST GRILLE. W/O.B.D. HORIZONTAL STATIONARY EXT., ALUM. DEFLECTION VANES SET ON 1/2" CENTERS, COMPLETE WITH O.B.D. ADJUSTABLE THRU FACE.	12 x 12 14 x 14 16 x 16 18 x 18 20 x 20 22 x 22	500 550 725 900 1000 1320	30	COLOR BY ARCHITECT.

EXHAUST FAN SCHEDULE

SYMBOL	MANUFACTURER	MODEL	CFM	STATIC PRESSURE IN. WG.	HP	RPM	VOLTS/PHASE/CYCLE	AREA SERVED	STATIC EFF %	COMMENTS
EF-1	TWIN CITY	ISD 120C	900	0.35	1/2	1214	120/1/60	RESTROOM BUILDING	28.62	(1)(2)(3)

(1) ALL CAPACITIES AT 4800 FT. ELEVATION.
(2) DIRECT DRIVE IN-LINE EXHAUST FAN. PROVIDE GRAVITY BACKDRAFT DAMPER, INTEGRAL THERMAL OVERLOAD PROTECTION, DISCONNECT, FAN SPEED CONTROL AND VENT CAP W/BIRDSCREEN.
(3) CONTROL: INTERLOCK WITH SUPPLY FAN SF-1.

SUPPLY FAN SCHEDULE

SYMBOL	MANUFACTURER	MODEL	CFM	STATIC PRESSURE IN. WG.	HP	RPM	VOLTS/PHASE/CYCLE	AREA SERVED	STATIC EFF %	COMMENTS
SF-1	LOREN COOK	SDB 120	840	1.0	1/4	1382	120/1/60	RESTROOM BUILDING	40.0	(1)(2)(3)

(1) ALL CAPACITIES AT 4800 FT. ELEVATION.
(2) IN-LINE EXHAUST FAN. PROVIDE GRAVITY BACKDRAFT DAMPER, INTEGRAL THERMAL OVERLOAD PROTECTION, DISCONNECT, FAN SPEED CONTROL AND FILTER UNIT.
(3) CONTROL: 7-DAY PROGRAMMABLE THERMOSTAT WITH LOCKING COVER.

DUCT FURNACE SCHEDULE (GAS)

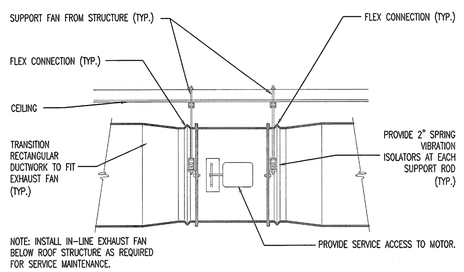
SYMBOL	MANUFACTURER	MODEL	FUEL	INPUT MBH	OUTPUT MBH	FLUE SIZE	AIRFLOW CFM	TEMP. RIZE (°F)	AREA SERVED	COMMENTS
F-1	HASTINGS	ISHRDV 125	N.G.	125	100	6"	900	100	RESTROOM BUILDING	(1)(2)(3)(4)(4)

(1) ALL CAPACITIES AT 4800 FT. ELEVATION.
(2) UNIT HEATER COMPLETE WITH MODULATING GAS VALVE DOWN TO 30% RATED INPUT.
(3) SEALED COMBUSTION UNIT COMPLETE WITH CONCENTRIC VENT KIT.
(4) UNIT COMPLETE WITH OUTDOOR AIR THERMOSTAT WITH REMOTE BULB (MODEL T6031A1029).
(5) UNIT COMPLETE WITH MODUSNAP GAS VALVE AND BYPASSMANIFOLD.

INTAKE HOOD SCHEDULE

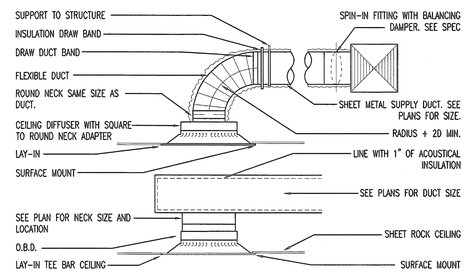
SYMBOL	MANUFACTURER	MODEL	CFM	STATIC PRESSURE IN. WG.	THROAT SIZE (IN.)	HOOD SIZE (IN.)	HOOD HEIGHT (IN.)	AREA SERVED	COMMENTS
IH-1	LOREN COOK	GI 12/12	1,000	0.11	12/12	28/24	11	SF-1	(1)(2)

(1) ALL CAPACITIES AT 4800 FT. ELEVATION.
(2) ROOF MOUNTED INTAKE HOOD, COMPLETE WITH PRE-FAB ROOF CURB, BIRD SCREEN AND MOTORIZED DAMPER.



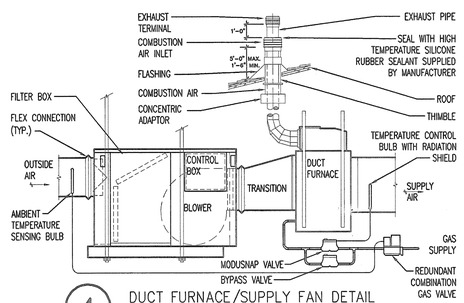
3 IN-LINE EXHAUST FAN DETAIL

SCALE: NTS



1 CEILING DIFFUSER DETAIL

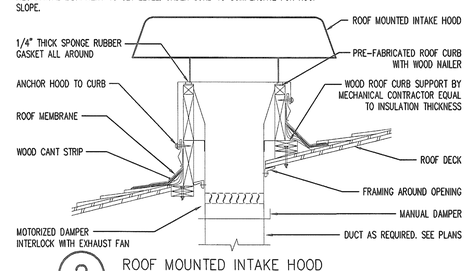
SCALE: NTS



4 DUCT FURNACE/SUPPLY FAN DETAIL

SCALE: NTS

NOTE:
MECHANICAL EQUIPMENT TO SET LEVEL. ORDER CURB TO COMPENSATE FOR ROOF SLOPE.



2 ROOF MOUNTED INTAKE HOOD

SCALE: NTS

SHEET KEYNOTES

1. RISE 12/12 EXHAUST DUCT BETWEEN ROOF TRUSSES AND EXTEND TO EXTEND TO EXHAUST GRILLES AS SHOWN. FIELD COORDINATE EXACT ROUTING OF DUCTWORK WITH STRUCTURE.
2. RISE 14"ø (OR 12/12) EXHAUST DUCT BETWEEN ROOF TRUSSES AND EXTEND TO DISCHARGE 10 FT. FROM INTAKE HOOD. FIELD COORDINATE EXACT ROUTING OF DUCTWORK WITH STRUCTURE.
3. EXTEND 14"ø (OR 12/12) EXHAUST DUCT UP THROUGH ROOF AND TERMINATE WITH BIRD SCREEN AND WEATHER CAP. LOCATE DISCHARGE MINIMUM 10 FT. FROM INTAKE HOOD. FILED COORDINATE EXACT ROUTING.
4. DROP 6/6 EXHAUST DUCT DOWN TO EG-1. PROVIDE BALANCING DAMPER IN VERTICAL DROP AND BALANCE EXHAUST TO 80 CFM.
5. RISE 12/16 SUPPLY DUCT UP BETWEEN ROOF TRUSSES AND EXTEND TO 12/12 SUPPLY AIR PLENUM. FIELD COORDINATE EXACT ROUTING OF DUCTWORK WITH STRUCTURE.
6. RISE 12/18 OUTSIDE AIR INTAKE DUCT UP BETWEEN ROOF TRUSSES AND EXTEND TO 12/12 INTAKE HOOD. FIELD COORDINATE EXACT ROUTING OF DUCTWORK WITH STRUCTURE.
7. EXTEND PVC COMBUSTION AIR INLET AND VENT TO CONCENTRIC VENT KIT AND EXTEND THROUGH ROOF. LOCATE 10 FT. FROM INTAKE HOOD IH-1. SIZE INTAKE AND VENT PER EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. FIELD COORDINATE EXACT ROUTING WITH NEW EQUIPMENT, DUCTWORK AND PIPING AS REQUIRED.

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Project Title:

HYRUM STATE PARK RESTROOM REPLACEMENT

BRIGHAM CITY, UTAH

Sheet Title:

MECHANICAL PLANS, DETAILS & SCHEDULES

Drawn By:	Project Number:	DFCM Project Number:
K. Carrillo	06-083	09198510
Designed By:	Date:	Sheet Number:
K. Carrillo	December 22, 2009	MH101
Reviewed By:	Sheet Scale:	
K. Carrillo		of

GENERAL PROJECT NOTES

38. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR, PULLED INTO THE CONDUIT WITH THE PHASE CONDUCTOR, IN ALL SERVICE, FEEDER, AND BRANCH CIRCUITS.

39. PROVIDE A NEUTRAL CONDUCTOR FOR EACH BREAKER TRIP HANDLE. NEUTRALS SHALL NOT BE SHARED BETWEEN BRANCH CIRCUITS.

40. ALL CIRCUITS TO BE MINIMUM #12 CU IN MINIMUM 3/4" CONDUIT UNLESS OTHERWISE NOTED.

41. MC CABLE IS AN APPROVED ALTERNATE TO CONDUCTORS IN CONDUIT FOR BRANCH CIRCUIT WIRING BETWEEN DEVICES, BUT NOT FOR HOME-RUNS.

42. WHERE THERE ARE CONFLICTS IN THE DRAWINGS AND/OR SPECIFICATIONS THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO BID. WHERE NO NOTIFICATION IS GIVEN THE MORE STRINGENT INTERPRETATION (GENERALLY INTERPRETED TO BE THE MORE COSTLY) WILL BE ENFORCED.

GENERAL PROJECT NOTES

1. THE ELECTRICAL CONTRACTOR SHALL HAVE A COORDINATION MEETING WITH THE MECHANICAL CONTRACTOR, CONSTRUCTION SUPERINTENDANT AND ANY OTHER TRADES AS REQUIRED WITHIN SEVEN DAYS OF THE START OF THE JOB TO REVIEW CODE CLEARANCE REQUIREMENTS FOR PANELS, SWITCHES, AND OTHER ELECTRICAL GEAR SPECIFICALLY FOR THIS JOB. RECORD THE MEETING IN THE SUPERINDENT'S LOG. REPORT UNRESOLVED CONFLICTS TO THE ARCHITECT IMMEDIATELY.
2. REFER TO MECHANICAL PLANS FOR EXACT LOCATION OF MECHANICAL EQUIPMENT.
3. ALL ELECTRICAL INSTALLATIONS TO CONFORM TO THE LATEST NEC AND LOCAL CODES.
4. ALL RECESSED LIGHT FIXTURES MUST CONFORM TO NEC 410-65 THROUGH 410-66. ELECTRICAL CONTRACTOR COORDINATE WITH GENERAL CONTRACTOR AS REQUIRED.
5. CONTRACTOR SHALL VERIFY ALL SURFACE MOUNT FLUORESCENT FIXTURES CONFORM TO NEC 410.76.
6. EMT IS NOT ALLOWED OUT OF DOORS.
7. MOUNTING HEIGHT OF GENERAL PURPOSE OUTLETS AND SWITCHES SHALL BE 16" TO BOTTOM AND 48" TO TOP RESPECTIVELY UNLESS OTHERWISE NOTED.
8. COORDINATE MOUNTING HEIGHT AND LOCATION OF ALL OUTLETS, SWITCHES, AUXILIARY EQUIPMENT, AND OTHER DEVICES WITH THE ARCHITECTURAL DRAWINGS. PRIOR TO INSTALLATION, REVIEW WITH THE GENERAL CONTRACTOR THE LOCATION OF MILLWORK AS A FINAL CHECK TO PREVENT COVERING OF ELECTRICAL ITEMS.
9. COORDINATE LOCATION OF CEILING LIGHT FIXTURES WITH THE REFLECTED CEILING PLAN.
10. ALL FLUORESCENT LAMPS SHALL BE FROM THE SAME MANUFACTURER. ONLY STANDARD LAMPS BY GENERAL ELECTRIC, PHILIPS, OR SYLVANIA WILL BE ACCEPTED.
11. THERMOSTAT AND CONTROL WIRING FOR MECHANICAL EQUIPMENT BY MECHANICAL CONTRACTOR.
12. PROVIDE FACTORY RECOMMENDED LAMPS IN ALL HID FIXTURES.
13. CONTRACTOR SHALL LOCATE AND INSTALL TRANSFORMER PAD PER POWER COMPANY SPECIFICATIONS. VERIFY PROPER CLEARANCES FROM BUILDING AND OTHER EQUIPMENT BEFORE INSTALLATION. THE LOCATION OF THE TRANSFORMER SHOWN ON THE PLANS IS AN APPROXIMATE LOCATION.
14. PROVIDE SAFETY DISCONNECTS AS REQUIRED AT ALL CONNECTIONS TO MECHANICAL EQUIPMENT. PROVIDE FUSING PER NAMEPLATE RATING OF EQUIPMENT.
15. WHERE AUTOMATIC SPRINKLER CONTROLS ARE SHOWN ON THE LANDSCAPE OR ARCHITECTURAL DRAWINGS, PROVIDE A FLUSH SINGLE-GANG J-BOX BEHIND THE CONTROL AND CONNECT TO THE NEAREST OUTLET CIRCUIT WITH AVAILABLE CAPACITY.
16. COORDINATE LOCATION OF LIGHT FIXTURES IN MECHANICAL ROOMS WITH MECHANICAL EQUIPMENT. DETERMINE FINAL FIXTURE LOCATIONS AFTER DUCTWORK INSTALLATION HAS BEEN COMPLETED. CHAIN SUSPEND FIXTURES UNDER DUCTWORK AND CONDUIT RACKS AS REQUIRED.
17. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY ALL PANEL CLEARANCES PER NEC 110.26 AND 384.4 AND NOTIFY ALL OTHER TRADES ON THE JOB OF THESE CODE REQUIREMENTS.
18. LOCATE OUTLETS FOR ELECTRIC WATER COOLERS SO THAT THE OUTLET AND EXTENSION CORDS ARE CONCEALED FROM VIEW.
19. DISCONNECT SWITCHES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL ELECTRICAL SWITCHES AND MOTOR CONTROL FOR PROPER CODE CLEARANCES. NOTIFY ARCHITECT IMMEDIATELY OF ANY CONFLICTS WITH OTHER TRADES REGARDING PROPER EQUIPMENT CLEARANCES.
20. CONNECT EMERGENCY CIRCUIT OF EMERGENCY LIGHT BATTERY PACK TO UNSWITCHED LIGHTING CIRCUIT SERVING FIXTURES IN AREA. INSTALL EXTRA CONDUCTORS AS REQUIRED. WIRE SO LAMPS IN NORMAL MODE ARE SWITCHED WITH OTHER LIGHTS IN AREA. PROVIDE ADDITIONAL BALLASTS AS REQUIRED.
21. ALL DISCONNECT SWITCHES FOR MOTORS SHALL BE RATED A MINIMUM OF 10000 AIC UNLESS OTHERWISE SHOWN.
22. CIRCUIT WIRE SIZES MUST MATCH BRANCH CIRCUIT BREAKERS PER NEC. VERIFY WITH PANEL SCHEDULES BEFORE PULLING WIRE.
23. PANEL INDEXES SHALL INCLUDE ALL PERTINENT INFORMATION ON THE PANEL SCHEDULES INCLUDING INFORMATION ON LIGHTS AND OUTLETS. DO NOT SIMPLY COPY THE CIRCUIT DESCRIPTION COLUMN. INDEXES TO BE TYPEWRITTEN.
24. FIELD VERIFY MOUNTING OF SURFACE FIXTURES SHOWN IN CONTINUOUS ROWS. MAKE ADJUSTMENTS SIDEWAYS OR UNDER OBSTRUCTIONS AS REQUIRED AND PROVIDE NECESSARY RACEWAY CONNECTIONS.
25. PROVIDE NEUTRAL CONNECTION TO 208/240/480V, SINGLE-PHASE EQUIPMENT. RUN SEPARATE GROUND WIRE TO ALL OUTDOOR UNITS AND BOND TO THE EQUIPMENT GROUND LUG.
26. BEFORE RUNNING CONDUITS OR PLACING OUTLETS AND EQUIPMENT, THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS OF THE OTHER TRADES SERVED BY THE CONDUIT OR OUTLETS.
27. ALL ELECTRICAL EQUIPMENT SHALL BE LOCATED SO AS NOT TO INTERFERE WITH WOOD TRIM AND MOLDINGS. THE ELECTRICAL CONTRACTOR SHALL REVIEW FINISH SCHEDULES AND ARCHITECTURAL DETAILS BEFORE ROUGH-IN OF OUTLET OR SWITCH BOXES TO PREVENT BOXES AND PLATES FROM BEING PLACED BEHIND OR IN TRIMS AND MOLDINGS. REFER SPECIAL CONDITIONS TO ARCHITECT PRIOR TO ROUGH-IN.
28. FLUORESCENT EMERGENCY LIGHT BATTERY PACKS SHALL BE CONNECTED SO AS TO BE ABLE TO OPERATE IN THE TEST MODE WHEN THE NORMAL SWITCH LEG IS TURNED ON, AND SHALL ILLUMINATE ONE FIXTURE LAMP UNLESS OTHERWISE NOTED.
29. THE ELECTRICAL CONTRACTOR SHALL RUN BRANCH CIRCUIT CONDUITS IN ATTIC SPACES IN A NEAT AND WORKMANLIKE MANNER SO AS TO CONSERVE OPEN SPACES AS MUCH AS POSSIBLE. HVAC DUCTWORK AND PLUMBING SHALL HAVE LOCATION PRIORITY OVER BRANCH CIRCUIT CONDUIT RUNS.
30. THE CLARITY OF RECORD DRAWING CHANGES MADE BY THE CONTRACTOR SHALL BE EQUAL TO THE ORIGINAL DRAWINGS AS JUDGED BY THE ARCHITECT OR THE RECORD SET WILL BE RETURNED TO THE CONTRACTOR FOR CLARIFICATION.
31. OVER-MIRROR WALL LIGHTS ARE TO BE MOUNTED SO THE LENSE FACES DOWNARD.
32. ALL PATCH, REPAIR, REPAINT AND COVER UP REQUIRED AS A RESULT OF ELECTRICAL REMODEL IS TO BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, BUT ACTUAL WORK IS TO BE PERFORMED BY QUALIFIED PERSONNEL.
33. DO NOT SCALE ELECTRICAL FLOOR PLANS. SEE ARCHITECTURAL DRAWINGS FOR ACCURATE DIMENSIONS AND FLOOR PLANS.
34. ELECTRICAL CONTRACTOR SHALL CONTACT POWER COMPANY WITHIN THE FIRST WEEK OF THE START OF CONSTRUCTION AND NOTIFY THEM OF THE PROBABLE DATE WHEN THE NEW ELECTRICAL AND/OR TELPHONE SERVICE CONNECTION WILL BE NEEDED.
35. ALL CONVENIENCE OUTLETS MUST BE MOUNTED FLUSH WITH THE COVER PLATE AND SECURED FIRMLY TO THE OUTLET BOX.
36. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW ALL SWITCH LOCATIONS WITH THE GENERAL CONTRACTOR PRIOR TO ROUGH-IN TO PREVENT ANY SWITCHES FROM BEING LOCATED ON THE WRONG SIDE OF THE DOOR.
37. THE CONTRACTOR SHALL TAKE SPECIAL CARE TO MAKE SURE OUTLET BOXES ARE SET FLUSH WITH FINISH WALL SURFACES WHERE WALL PANELING OR ACOUSTICAL WALLS ARE INSTALLED OR WHERE OUTLETS ARE INSTALLED ON CARPETED RISERS.

ELECTRICAL LEGEND

LIGHTING FIXTURES

	EMERGENCY LIGHT
	BATTERY PACK
	RECESSED FIXTURE
	STRIP LIGHT
	FLUORESCENT FIXTURE
	EMERGENCY FIXTURE
	WALL MOUNT FIXTURE
	POLE LIGHT; ONE HEAD

LIGHTING CONTROL

$X	SINGLE POLE SWITCH; "x" INDICATES SWITCH GROUP
$3	THREE WAY SWITCH
$4	FOUR WAY SWITCH
	WALL MOUNT OCCUPANCY SENSOR: ADAPTIVE TECHNOLOGY
P	PHOTOCELL
	TIME CLOCK

BRANCH CIRCUITING

	SIMPLEX OUTLET
	SIMPLEX OUTLET: GROUND FAULT INTERRUPTER
	DUPLEX OUTLET
	DUPLEX OUTLET: GROUND FAULT INTERRUPTER
WP	DUPLEX OUTLET: WEATHERPROOF
	DOUBLE DUPLEX OUTLET
	DOUBLE DUPLEX OUTLET: GROUND FAULT INTERRUPTER
	DISCONNECT, 10K AIC MINIMUM
	OVERCURRENT PROTECTIVE DISCONNECT
$m	MOTOR PROTECTIVE THERMAL SWITCH
$SSU	MOTOR PROTECTIVE FUSED THERMAL SWITCH
	QUANTITY OF CONDUCTORS: SHORT LINES = PHASE /SWITCH LONG LINES = NEUTRAL
	HOME-RUN

POWER AND DISTRIBUTION

	DISTRIBUTION PANEL
	PANELBOARD
	METER/METER SOCKET

FIRE ALARM

FACP	FIRE ALARM CONTROL PANEL
ANN	FIRE ALARM REMOTE ANNUNCIATOR PANEL
NAC	NOTIFICATION APPLIANCE CIRCUIT PANEL
	SMOKE DETECTOR
H	HEAT DETECTOR
X	FIRE ALARM STROBE;"X" = MINIMUM CANDELA RATING
X	CEILING MOUNTED FIRE ALARM STROBE;"X" = MINIMUM CANDELA RATING
X	FIRE ALARM HORN AND STROBE;"X" = MINIMUM CANDELA RATING
X	CEILING MOUNTED FIRE ALARM HORN AND STROBE;"X" = MINIMUM CANDELA RATING

SITE ELECTRICAL

—3ØUP—	3-PHASE UNDERGROUND PRIMARY POWER
—3ØUS—	3-PHASE UNDERGROUND SECONDARY POWER
—1ØOP—	1-PHASE OVERHEAD PRIMARY POWER
—1ØUP—	1-PHASE UNDERGOUND PRIMARY POWER
—1ØUS—	1-PHASE UNDERGOUND SECONDARY POWER
—OTV—	OVERHEAD TV
—OT—	OVERHEAD TELEPHONE
—US—	UNDERGROUND SECURITY
	POINT OF DISCONNECTION
	POINT OF CONNECTION
	UTILITY POLE

ONE-LINE

XA YP	BREAKER: "x" = BREAKER AMPERAGE "y" = QUANTITY OF POLES
	BRANCH PANEL
	BRANCH PANEL WITH MAIN BREAKER
	BRANCH PANEL WITH SUBFEED BREAKER
x	FEEDER SIZE (REFER TO CONDUIT AND CONDUCTOR SCHEDULE UNLESS OTHERWISE NOTED)
	GROUND
M	DIRECT METER
	TRANSFORMER
hp	MOTOR; hp = MOTOR HORSEPOWER

SHEET INDEX

* INDICATES PREVIOUSLY / CURRENTLY ISSUED SHEETS

PLANCHECK SUBMITTAL

SHEET	TITLE
E001	G.P.N., LEGEND, SHEET INDEX & ABBREVIATIONS
ES101	ELECTRICAL SITE PLAN
E101	ELECTRICAL FLOOR PLANS
E601	ELECTRICAL DETAIL, ONE-LINE DIAGRAM & SCHEDULES

ELECTRICAL ABBREVIATIONS

A	AMPERE	DN	DOWN	ISC	SHORT CIRCUIT AMPERES, KA	P	POLE	TYP	TYPICAL
AF	AMP FUSE	DWG	DRAWING	JB, J-BOX	JUNCTION BOX	PH	PHASE	UBC	UNIFORM BUILDING CODE
AFF	ABOVE FINISHED FLOOR	EA	EACH	KCMIL	THOUSAND CIRCULAR MILS	PNL	PANEL	UL	UNDERWRITERS LABORATORY
AFG	ABOVE FINISHED GRADE	ELEC	ELECTRICAL	KVA	KILOVOLT AMPERE	PWR	POWER	UMC	UNIFORM MECHANICAL CODE
AFI	ARC-FAULT CIRCUIT-INTERRUPTER	ELEV	ELEVATOR	KW	KILOWATT	QTY	QUANTITY	UNO	UNLESS NOTED OTHERWISE
AIC	AMPERE INTERRUPTING CAPACITY	EMER, EM	EMERGENCY	LTG	LIGHTING	RECEP	RECEPTACLE	V	VOLT OR VOLTAGE
AL	ALUMINUM	EMT	ELECTRICAL METALLIC TUBING	MAX	MAXIMUM	REQ'D	REQUIRED	VA	VOLT AMPERE
ARCH	ARCHITECT(URAL)	EOLR	END OF LINE RESISTOR	MCB	MAIN CIRCUIT BREAKER	RGSC	RIGID GALVANIZED STEEL CONDUIT	W	WATT
AS	AMP SWITCH	EQUIP	EQUIPMENT	MECH	MECHANICAL	RM	ROOM	W/	WITH
AWG	AMERICAN WIRE GAUGE	EX, EXIST	EXISTING	MFR	MANUFACTURER	SCHED	SCHEDULE	WG	WIRE GUARD
BLDG	BUILDING	FBO	FURNISHED BY OTHERS	MIN	MINIMUM	SECT	SECTION	WP	UL LISTED WEATHERPROOF, NEMA 3R
BKBD	BACKBOARD	FCU	FAN COIL UNIT	MLO	MAIN LUGS ONLY	SP	SINGLE POLE		
C	CONDUIT	FF	FINISHED FLOOR	MTD	MOUNTED	SN	SOLID NEUTRAL		
CAB	CABINET	FIXT	FIXTURE	NEC	NATIONAL ELECTRICAL CODE	SPEC	SPECIFICATION		
CAT	CATALOG/CATEGORY	FLEX	FLEXIBLE METALLIC CONDUIT (STEEL)	NECA	NATIONAL ELECTRICAL CONTRACTOR'S ASSOCIATION	SW	SWITCH		
C/B	CIRCUIT BREAKER	FLUOR	FLUORESCENT	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION	SWBD	SWITCHBOARD		
CKT	CIRCUIT	FT	FEET OR FOOT	NEUT	NEUTRAL	SWGR	SWITCH GEAR		
CLG	CEILING	GFI	GROUND FAULT INTERRUPTER	NFC	NATIONAL FIRE CODE	SYS	SYSTEM		
CO	CONDUIT ONLY	GND	GROUND	NC	NORMALLY CLOSED	TEMP	TEMPORARY		
COMM	COMMUNICATION	HP	HORSEPOWER	NIC	NOT IN CONTRACT	TELE	TELEPHONE		
CONN	CONNECTION	HVAC	HEATING, VENTILATING & AIR CONDITIONING	NL	NIGHT LITE	TWP	TWISTED PAIR		
CU	COPPER	IG	ISOLATED GROUND	NO	NORMALLY OPEN	TWSP	TWISTED SHEILDED PAIR		
DEMO	DEMOLITION/DEMOLISH	IMC	INTERMEDIATE METAL CONDUIT	NTS	NOT TO SCALE	XFMR	TRANSFORMER		
DISC	DISCONNECT	IN	INCH(ES)	OCP	OVERCURRENT PROTECTION	T-STAT	THERMOSTAT		

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Professional Seal: REGISTERED PROFESSIONAL ENGINEER No. 294174 SHANE D. SWENSON 12/23/09 STATE OF UTAH

Project Title:

HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

ABBREVIATIONS, INDEX LEGEND & G.P.N.

Drawn By: DJP	Project Number: SSE# 2009058	DFCM Project Number: 091998
Designed By: DJP	Date: December 23, 2009	Sheet Number: E001
Reviewed By: SDS	Sheet Scale: AS NOTED	

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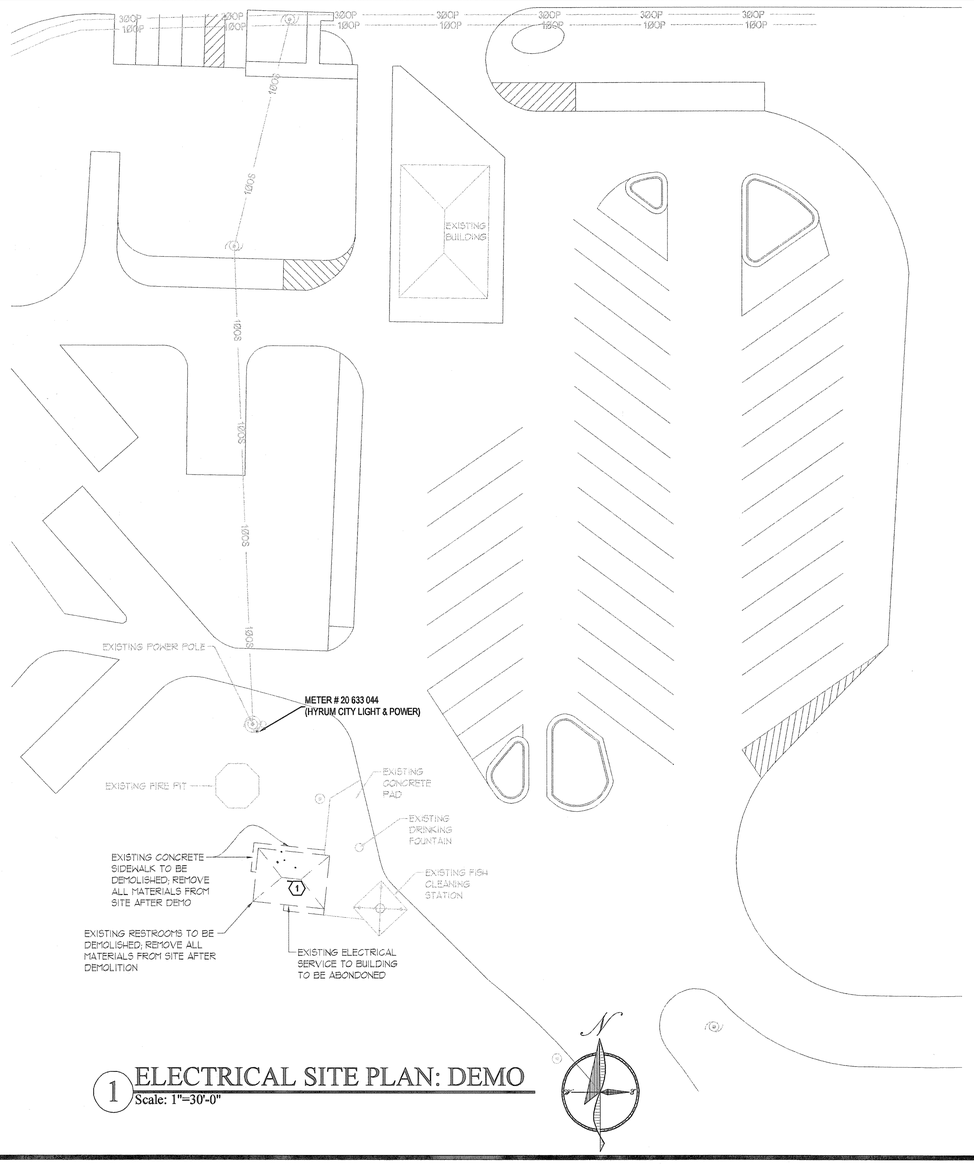
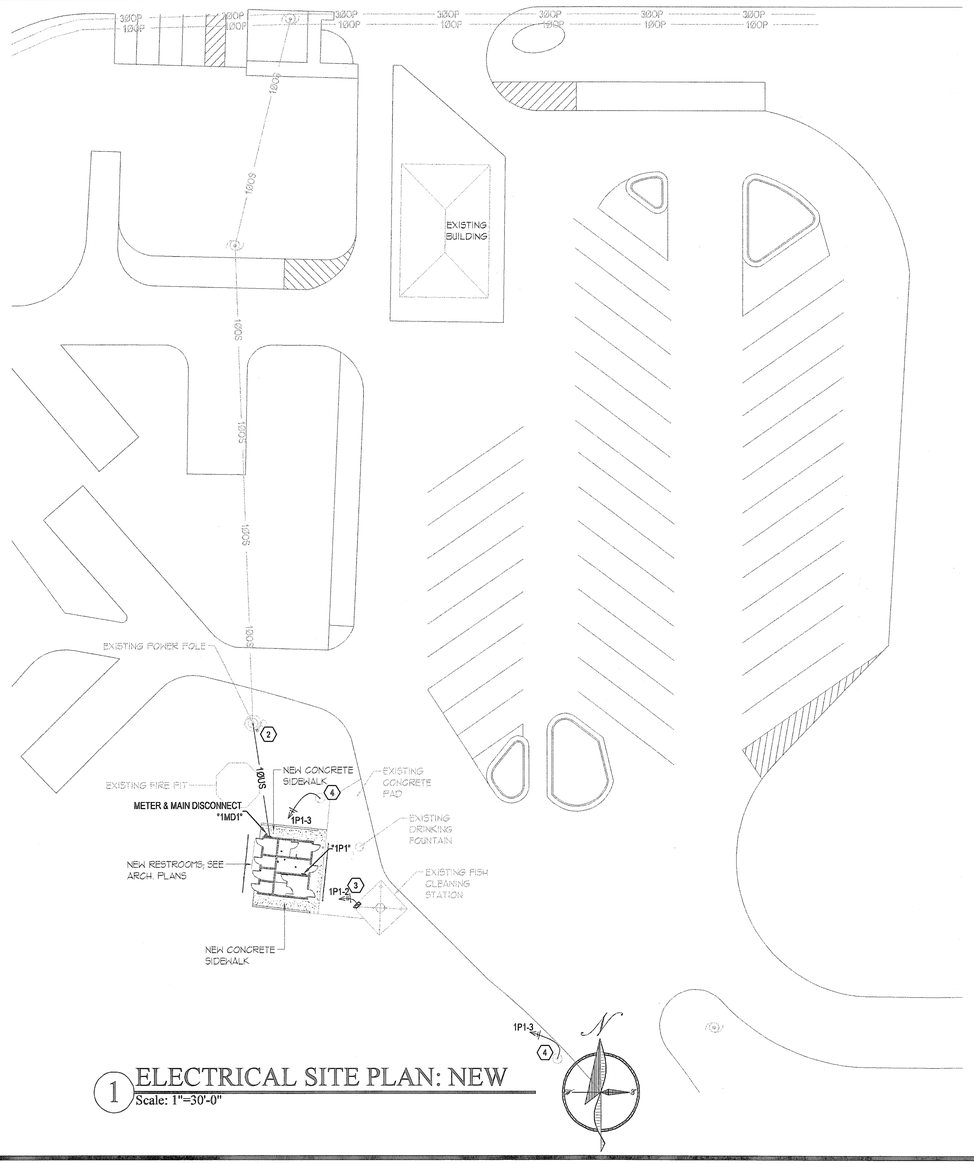
2009-12-21 User

SHEET KEYED NOTES

1. EXISTING PANEL TO BE REMOVED DURING DEMOLITION. DISCONNECT CIRCUITS SERVING AREA FOR REMOVAL. RE-CIRCUIT LIGHT POLES AND FISH CLEANING STATION FROM NEW PANEL. SEE PANEL SCHEDULES FOR ADDITIONAL INFORMATION.
2. PROVIDE NEW DROP AND UNDERGROUND FEEDERS TO NEW DISCONNECT LOCATED ON NEW RESTROOM AS INDICATED.
3. PROVIDE NEW FEEDERS TO FISH CLEANING STATION AND NEW DISCONNECT. PROVIDE GROUNDING AND BONDING FOR SEPERATE STRUCTURE PER NEC 250.32. CONTRACTOR, AT HIS OWN RISK, MAY OPT TO RE-USE PORTIONS OF EXISTING CONDUIT PREVIOUSLY SERVING CLEANING STATION, PROVIDED IT MEETS THIS PROJECT'S REQUIREMENTS. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
4. RE-FEED EXISTING LIGHT POLE FROM NEW PANEL AND LIGHTING CONTROL.



1 ELECTRICAL SITE PLAN: DEMO
Scale: 1"=30'-0"



1 ELECTRICAL SITE PLAN: NEW
Scale: 1"=30'-0"

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Project Title:
HYRUM STATE PARK RESTROOM REPLACEMENT
Hyrum, Utah

Sheet Title:
ELECTRICAL SITE PLAN

Drawn By: DJP	Project Number: SSE# 2009058	DFCM Project Number: 091985...
Designed By: DJP	Date: December 23, 2009	Sheet Number: ES101
Reviewed By: SDS	Sheet Scale: AS NOTED	

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2009-12-22 User

SHEET KEYED NOTES

*1. PROVIDE EM BATTERY BALLAST IN FIXTURES NOTED. CONNECT LAMPS TO OPERATE WITH SWITCHES IN NORMAL MODE AND OVERRIDE ON WITH NORMAL POWER FAILURE TO AREA LIGHTING

+2. PROVIDE QUARTZ EM LAMP FOR FIXTURES NOTED. CONNECT LAMP TO OUTPUT OF BATTERY INDICATED.

3. MOUNT BATTERY HIGH ON WALL. PROVIDE 12V OUTPUT CONNECTION TO EM QUARTZ LAMP IN EACH EXTERIOR EMERGENCY FIXTURE RAN SEPERATE FROM BRANCH CIRCUIT CONDUCTORS.

4. PROVIDE 2-ZONE; ELECTRONIC TIMECLOCK (TORK ES201 OR EQUIVALENT). ROUTE EXTERIOR BUILDING MOUNTED FIXTURES THROUGH ONE ZONE. ROUTE SITE POLES THROUGH 2ND ZONE. PROVIDE PHOTOCELL AND ASSOCIATED INPUT TO TIMECLOCK. PROGRAM TIME-CLOCK FOR PHOTOCELL ENABLE TIMECLOCK ON/OFF WITH TIMES AS DIRECTED BY OWNER.

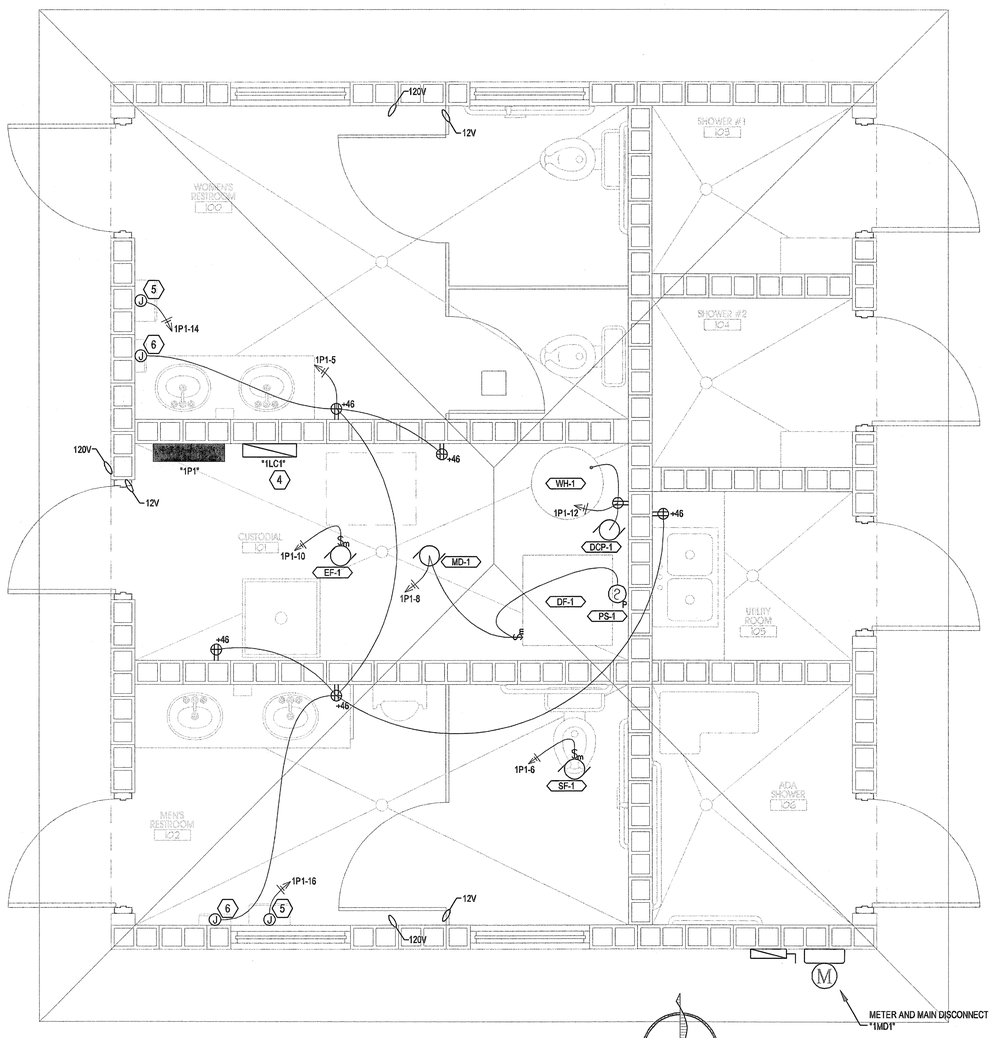
5. PROVIDE POWER TO HAND DRYERS.

6. PROVIDE POWER TO TOWEL DISPENSERS.

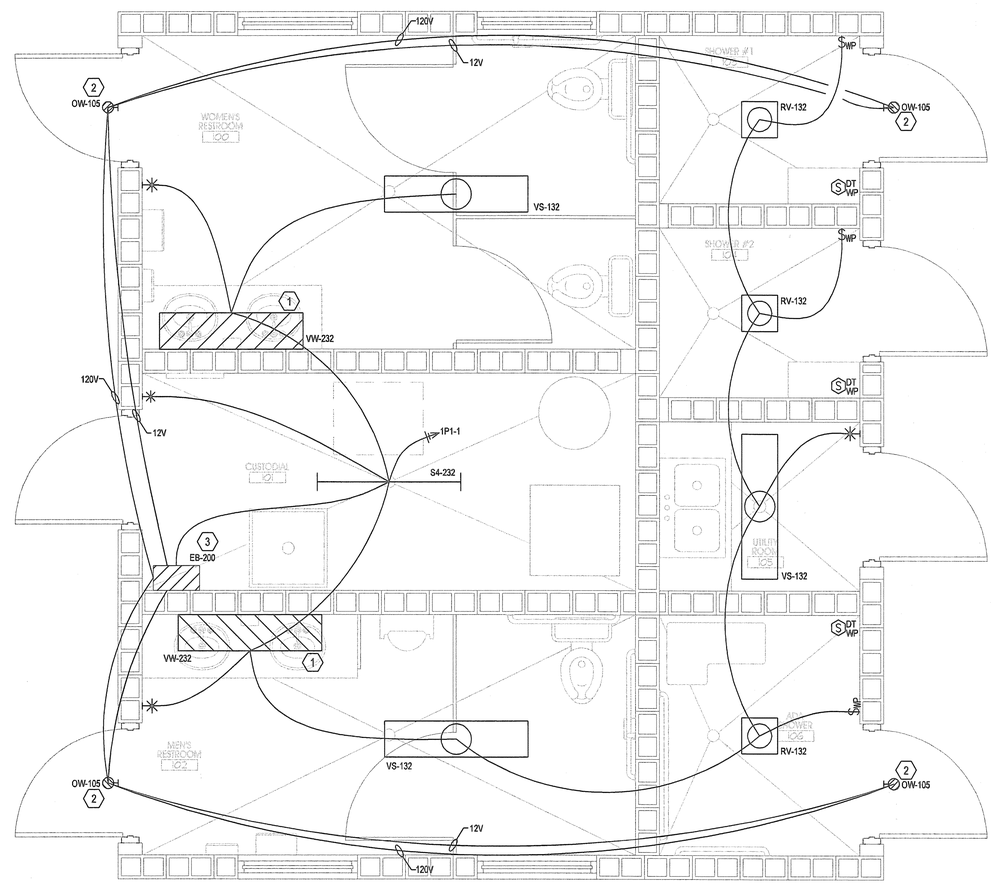
GENERAL SHEET NOTES

1. CONTRACTOR TO FURNISH OCCUPANCY SENSORS WITH COVERAGE PATTERNS APPROPRIATE FOR THIER INSTALLED LOCATIONS. COORDINATE WITH EQUIPMENT SUPPLIER PRIOR TO BID.

2. CONNECT OCCUPANCY SENSORS TO ENABLE ALL SWITCHES IN CONTROLLED SPACE.



1 POWER PLAN
Scale: 1/2"=1'-0"



1 LIGHTING PLAN
Scale: 1/2"=1'-0"

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Project Title:
HYRUM STATE PARK RESTROOM REPLACEMENT
Hyrum, Utah

Sheet Title:
ELECTRICAL FLOOR PLANS

Drawn By: DJP	Project Number: SSE# 2009058	DFCM Project Number: 091985...
Designed By: DJP	Date: December 23, 2009	Sheet Number: E101
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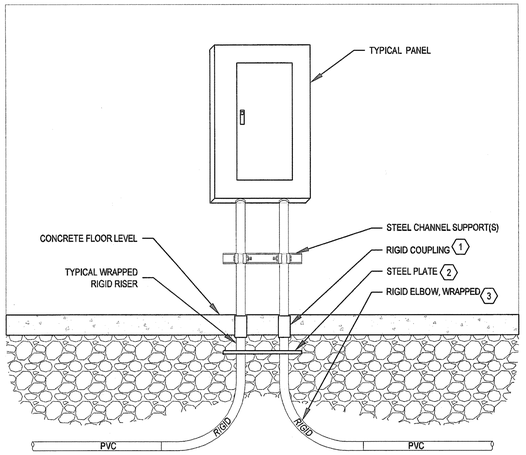
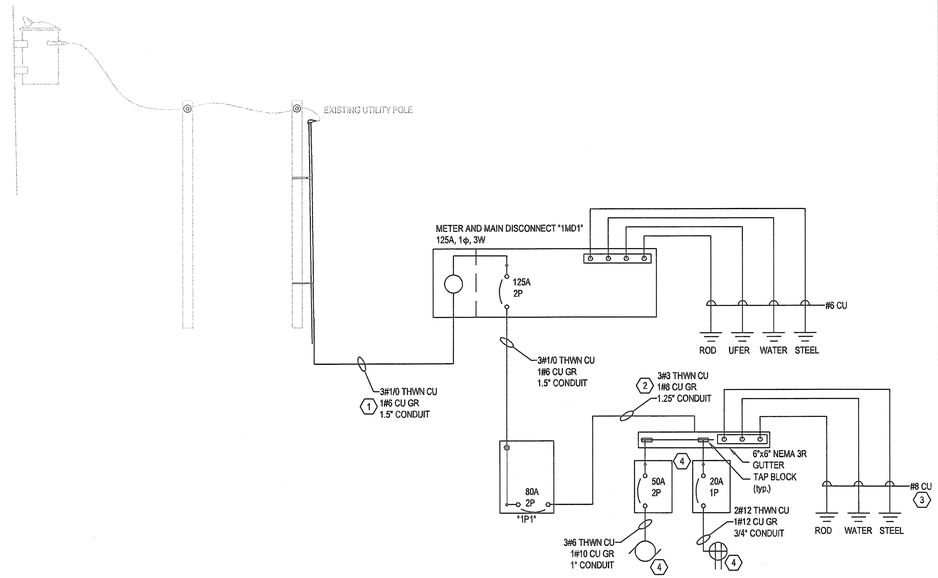


DETAIL KEYED NOTES

1. SET COUPLING FLUSH WITH FINISH FLOOR.
2. PROVIDE STEEL PLATE WITH SAME DIMENSIONS AS PANEL BOTTOM PLATE. PUNCH PLATE PER CONDUITS ENTERING PANEL TO STRAIGHTEN/ORGANIZE CONDUITS PRIOR TO FINAL RISE INTO PANEL.
3. TRANSITION TO WRAPPED RIGID CONDUIT PRIOR TO RISING ABOVE FLOOR AS SPECIFIED.

B EQUIPMENT CONDUIT RISER DETAIL

SCALE: NTS



A ELECTRICAL ONE-LINE DIAGRAM

SCALE: NTS

SHEET KEYED NOTES

1. PRIMARY AND SECONDARY CONDUIT, TRENCHING, AND BACKFILL AND SECONDARY CONDUCTORS BY CONTRACTOR. PRIMARY CONDUCTORS BY UTILITY. PROVIDE WIDE SWEEP BENDS PER UTILITY STANDARDS.
2. PROVIDE SUB-FEED TO EXISTING FISH CLEANING STATION.
3. PROVIDE NEW DISCONNECTS AND GROUNDING/BONDING FOR SEPERATE STRUCTURE PER NEC 250.32 (NO NEUTRAL TO GROUND BOND). FIELD VERIFY NEW EQUIPMENT LOCATION WITH FIELD CONDITIONS AND OWNER PRIOR TO ROUGH-IN.
4. RE-FEED EXISTING FAN AND OUTLET AS REQUIRED.

GENERAL SHEET NOTES

1. COMPLY WITH ROCKY MOUNTAIN POWER'S REQUIREMENTS FOR ALL UTILITY RELATED INSTALLATIONS. REVIEW CURRENT PACIFICORP ESR MANUAL PRIOR TO BID. NOTIFY ENGINEER OF CONFLICTS PRIOR TO BID.
2. AIC RATINGS SHOWN INIDICATE MINIMUM REQUIRED VALUES.
3. ALL CONDUCTORS ARE CONSIDERED TO BE COPPER UNLESS SPECIFICALLY NOTED OTHERWISE.
4. A FULL SIZE EQUIPMENT GROUNDING CONDUCTOR SIZED FOR THE OVERCURRENT PROTECTIVE DEVICE PROTECTING THE CIRCUIT IS REQUIRED IN EACH RACEWAY OR CABLE FOR PARALLELED CIRCUITS.

MECHANICAL EQUIPMENT SCHEDULE

SYM	DESCRIPTION	LOAD	VOLTS	PHASE	FIRE ALARM SHUTDOWN	CONTROL CIRCUITS BY	* STARTER BY	SAFETY DISCONNECT BY	REMARKS
DCP-1	DOMESTIC CIRC PUMP	1/6 HP	120	1	NO	MECH	ELE	ELEC	
DF-1	DUCT FURNACE	5 FLA	120	1	NO	MECH	MECH	ELEC	INTERLOCK WITH DUCT FURNACE TO OPEN WHEN FURNACE STARTS
EF-1	EXHAUST FAN	1/2 HP	120	1	NO	ELEC	MECH	ELEC	
MD-1	FURNACE MOTORIZED DAMPER	2 FLA	120	1	NO	MECH	MECH	ELEC	
PS-1	PROPANE SENSOR	5 FLA	120	1	NO	ELEC	MECH	ELEC	PROVIDE SMOKE DETECTOR IN DUCT WORK
SF-1	SUPPLY FAN	1/3 HP	120	1	NO	MECH	MECH	ELEC	INTERLOCK WITH DUCT FURNACE TO START WITH FURNACE
WH-1	WATER HEATER	3 FLA	120	1	NO	MECH	MECH	ELEC	

* ELECTRICAL CONTRACTOR VERIFY SINGLE SPEED OR TWO SPEED STARTERS WITH MECHANICAL DRAWINGS.

PANEL 1P1 — TYPE NQOD — 1 Ø 3 WIRE 120/240 VOLTS — LOCATION — MOUNTING

X NEW / EXISTING

REMARKS

BOLT ON BREAKERS / ISOLATED GROUND BUS

FLUSH / X SURFACE

125 AMP MAIN X LUGS / BREAKER

No.	BRKR A	BRKR P	CIRCUIT DESCRIPTION	L	O	M	Wire	CIRC. LOAD	A	B	CIRC. LOAD	Wire	L	O	M	CIRCUIT DESCRIPTION	BRKR A	BRKR P	No.
1	20	1	LTG: RESTROOM				12	652	4942		4290	3			1	FISH CLEANING STATION	80	2	2
3	20	1	LTG: SITE POLES	2			8	625		4915	4290	3			1	-	-	-	4
5	20	1	PLUGS: GENERAL		5	2	12	1140	2016		876	12			1	SUPPLY FAN	20	1	6
7	20	1	SPARE							1440	1440	12			3	FURNACE; DAMPER; SENSOR	20	1	8
9	20	1	SPARE						696		696	12			1	EXHAUST FAN	20	1	10
11	20	1	SPARE							756	756	12			2	WATER HEATER; DCP	20	1	12
13	20	1	SPARE						1920		1920	12			1	HAND DRYER	20	1	14
15	20	1	SPARE							1920	1920	12			1	HAND DRYER	20	1	16
17	20	1	SPARE						0							SPARE	20	1	18
19	20	1	SPARE							0						SPARE	20	1	20
21	20	1	SPARE						0							SPARE	20	1	22
23	20	1	SPARE							0						SPARE	20	1	24
25	20	1	SPARE						0							SPARE	20	1	26
27	20	1	SPARE							0						SPARE	20	1	28
29	20	1	SPARE						0							SPARE	20	1	30
								TOTALS	9674	9031									

AIC 10000

FEEDER SEE ONE-LINE — AMPS/PHASE 90 75 — parallel runs 1

LIGHT FIXTURE SCHEDULE

	TYPE	MANUFACTURER/CATALOG NO.	DESCRIPTION	MOUNTING	LAMPS
	EB- 200	LITHONIA IND12300-0HEAD-XTRA DUAL LITE AS-270-12V-I-0-WB6 EQUIVALENT	EMERGENCY BATTERY PACK; 12-VOLT OUTPUT, 200W MINIMUM; WALL-MOUNT; SELF-DIAGNOSTICS; TIME-DELAY OFF	WALL	EXTERIOR EM
	OW- 105	LITHONIA WST-50M-WT-TB-DDBT LSI GBWS-3-50MH-F-TB-BRZ DECO D444-50-M-MT-BZ EQUIVALENT	WALL-MOUNT, TRAPEZOID, CUT-OFF OPTICS, 4-TAP BALLAST	WALL - MOUNT	(1) 50W MH
	RV- 132	GOTHAM LGFV-32TRT-6RW-FOL-MVOLT-TRDA-GSKT EQUIVALENT WITH PRIOR APPROVAL	RECESSED, VANDAL-RESISTANT CAN; WHITE, TAMPER-RESISTANT DOOR; ELECTRONIC BALLAST; UL LISTED WET LOCATION; GASKETED	RECESS	32W TT CF
	VW- 232	LSI 63C-232-SSBR-16CRS-60/15EM-UE EQUIVALENT WITH PRIOR APPROVAL	CORNICE STYLE, VANDAL RESISTANT FIXTURE; 16 GAUGE MINIMUM STEEL HOUSING; .250 MINIMUM POLYCARBONATE LENS; TORX HEAD SCREW; EMERGENCY BALLAST WHERE NOTED; UNIVERSAL ELECTRONIC, PROGRAM-START BALLAST	CORNICE	(2) FO32/735
	VS- 132	LIGHTOLIER GVB-1-S-FS-VL-132-120/277-PS LSI VPF4132SSOR-EM-UE LITHONIA VSL-132-MVOLT-GEB10PRS EQUIVALENT	SURFACE MOUNTED, VANDAL RESISTENT WRAP SURFACE MOUNTED; VANDAL RESISISTANT WRAP; ELECTRONIC PROGRAM START; MULTI-VOLT BALLAST	SURFACE	(1) FO32/735

CONTRACTOR AND LIGHTING SUPPLIER SEE (*) FOR MULTIPLE BALLAST REQUIREMENTS AND (+) FOR QUARTZ EM REQUIREMENTS

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REV#:	REVISION DESCRIPTION:	DATE:

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Professional Seal: REGISTERED PROFESSIONAL ENGINEER No. 294174 SHANE D. SWENSON 12/23/09 STATE OF UTAH

Project Title:

HYRUM STATE PARK RESTROOM REPLACEMENT

Hyrum, Utah

Sheet Title:

ELECTRICAL DETAILS, SCHEDULES & ONE-LINE DIAGRAM

Drawn By: DJP	Project Number: SSE# 2009058	DFCM Project Number: 091985...
Designed By: DJP	Date: December 23, 2009	Sheet Number: E601
Reviewed By: SDS	Sheet Scale: AS NOTED	

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