

GLENDOVEER GOLF COURSE CART ENCLOSURE ADDITION

14015 NE GLISAN STREET, PORTLAND OREGON 97230

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF THE CITY OF PORTLAND STANDARD BUILDING AND DEVELOPMENT CONSTRUCTION SPECIFICATIONS.
2. A COPY OF THESE APPROVED PLANS, CITY SPECIFICATIONS, AND DETAILS SHALL BE ON-SITE DURING CONSTRUCTION.
3. ANY REVISIONS MADE TO THESE PLANS MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO ANY IMPLEMENTATION IN THE FIELD.
4. THE CONTRACTOR SHALL AT ALL TIMES ABIDE BY APPLICABLE SAFETY RULES OF OSHA AND IN PARTICULAR THOSE PERTAINING TO ADEQUATE SHORING AND TRENCH PROTECTION.
5. EXISTING UTILITY LOCATIONS ARE APPROXIMATE ONLY, EXACT LOCATIONS TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL COORDINATE WORK WITH ALL UTILITY COMPANIES AS REQUIRED TO COMPLETE THE PROJECT.
6. ALL DAMAGE CAUSED BY THE CONTRACTOR SHALL BE RESTORED TO AN "AS GOOD OR BETTER" CONDITION.
7. ATTENTION EXCAVATORS: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING (503-232-1987). IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CALL CENTER. YOU MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL (503-246-6699)
8. SAWCUT STRAIGHT MATCHLINES TO CREATE A BUTT JOINT BETWEEN THE EXISTING PAVEMENT AND NEW PAVEMENT. SAND SEAL ALL NEW PAVEMENT JOINTS.
9. REMOVE ALL MATERIALS EXCAVATED AND DISPOSE ON SITE AS DIRECTED BY OWNER.
10. ADJUST ALL MANHOLE LIDS AND VALVE BOXES TO FINISHED SITE GRADE.
11. USE 3300 PSI CONCRETE FOR ALL WALKWAYS AND DRIVEWAYS PER CITY OF PORTLAND'S STANDARDS

GRADING AND PAVING NOTES:

1. COMPACT SUBGRADE OF NEW PAVED AREAS TO ACHIEVE AT LEAST 95% OF THE MAXIMUM DRY DENSITY FOR A 12" DEPTH PER ASTM D1557. EMBANKMENTS OR FILL AREAS ARE TO BE CONSTRUCTED IN 6" MAXIMUM LIFTS, WITH EACH LIFT BEING COMPACTED TO 95% MAXIMUM OF DENSITY PER ASTM D1557 PRIOR TO PROCEEDING WITH THE NEXT LIFT. AREAS RECEIVING STRUCTURAL FILL ARE TO BE TESTED BY A QUALIFIED TESTING LAB.
2. ALL MATERIALS, INSTALLATION, TEST, AND INSPECTIONS ARE TO BE IN STRICT ACCORDANCE WITH THE CITY OF PORTLAND'S STANDARDS.
3. EXCAVATE A MINIMUM OF 8" ORGANIC MATERIALS UNDER BUILDING LOCATIONS
4. THE ABOVE GRADING NOTES ARE A MINIMUM ADDITIONAL MEASURES MAY BE NECESSARY

SANITARY SEWER NOTES

1. PVC SANITARY LINE SHALL CONFORM TO ASTM 3034 SDR 35.
2. CLEANOUT PIPE, FITTINGS, AND JOINTS SHALL BE THE SAME SPECIFICATIONS AS FOR THE PIPE.
3. GRANULAR BACKFILL IS TO BE COMPACTED TO 95% MAXIMUM DRY DENSITY PER ASTM D1557 AND NATIVE MATERIAL SHALL BE COMPACTED TO 92% OF IN-PLACE DRY DENSITY OF SURROUNDING SOIL.
4. SANITARY SEWER PIPE AND APPURTENANCES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH APWA REQUIREMENTS AND THE 2008 OREGON PLUMBING CODE.
5. ALL MATERIALS, INSTALLATION, TESTS, AND INSPECTIONS TO BE MADE IN STRICT ACCORDANCE WITH THE 2008 OREGON PLUMBING CODE.
6. ALL TRENCH BACKFILL IN AC AREAS IS TO BE 3/4" - 0 GRANULAR BACKFILL PER DETAIL ON SHEET

STORM SEWER NOTES

1. 4" STORM SEWER PIPE SHALL BE ABS SCHEDULE 40 AND N12 HDPE FOR MAINLINE STORM PIPE 6" OR LARGER WITH FLEXIBLE BEDDING AND BACKFILL (3/4" - 0 COMPACTED GRAVEL). 4" PERFORATED PIPE SHALL BE PVC ASTM D2729. THE USE OF ANY OTHER TYPE SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
2. TRENCHING, BEDDING, AND BACKFILL FOR PIPE SHALL CONFORM TO THE CITY OF PORTLAND'S STANDARDS AND DETAILS, USE GRANULAR BACKFILL FOR PIPES IN LANDSCAPE AREAS WITH LESS THAN 2' OF COVER.
3. DURING CONSTRUCTION, ALL EXISTING AND NEWLY INSTALLED DRAINAGE STRUCTURES SHALL BE PROTECTED FROM SEDIMENTS.
4. GRANULAR BACKFILL IS TO BE COMPACTED TO 95% MAXIMUM DRY DENSITY PER ASTM D1557 AND NATIVE MATERIAL SHALL BE COMPACTED TO 92% OF IN-PLACE DRY DENSITY OF SURROUNDING SOIL
5. ALL BACKFILL IN TRENCHES LOCATED UNDER ASPHALT OR RETAINING WALL / BUILDING FOOTINGS IS TO BE IMPORTED GRANULAR TRENCH BACKFILL PER SPEC. 204.3.17B (COMPACTED 3/4" - 0 GRANULAR BACKFILL)

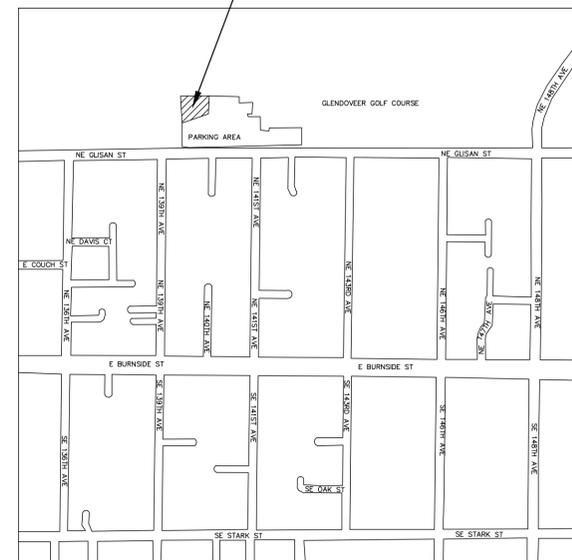
WATER NOTES

1. WATERLINE AND ALL RELATED FIXTURES AND DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE 2008 OREGON PLUMBING SPECIALITY CODE
2. GRANULAR BACKFILL IS TO BE COMPACTED TO 95% MAXIMUM DRY DENSITY PER ASTM D1557 AND NATIVE MATERIAL SHALL BE COMPACTED TO 92% ON IN-PLACE DRY DENSITY OF SURROUNDING SOIL.
3. ALL MATERIALS, INSTALLATION, TESTS, AND CHLORINATION TO BE IN STRICT ACCORDANCE WITH THE STANDARDS AND CODES OF THE CITY OF PORTLAND AND THE OREGON STATE HEALTH DIVISION ADMINISTRATION RULES, CHAPTER 333.
4. THE CONTRACTOR SHALL NOTIFY THE CITY OF PORTLAND'S BUREAU OF WATER WORKS 48 HOURS PRIOR TO CONSTRUCTION.
5. NO WATER VALVES SHALL BE OPERATED WITHOUT PRIOR AUTHORIZATION OF THE CITY OF PORTLAND'S WATER DEPARTMENT.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE PROPER SEPARATION BETWEEN SANITARY SEWER LINES AND WATERLINES AS REQUIRED BY THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY AND STATE DIVISION OF HEALTH.
7. PVC WATERLINES ARE TO BE ASTM D2241 CL 200

EROSION CONTROL

1. EROSION/SEDIMENTATION CONTROL (ESC) IS REQUIRED ON THIS PROJECT. IMPLEMENTATION OF THE ESC AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE PERMITTEE OR IT'S AGENT UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED. THE PERMITTEE OR IT'S AGENT SHALL PROVIDE INLET PROTECTION TO DOWNSTREAM INLETS FROM THE SITE PER THE EROSION CONTROL MANUAL [MARCH 2008]. CATCH BASIN AND STORM DRAIN INLET PROTECTION SHALL BE INSTALLED PER DETAIL DRAWINGS ON SHEET 5.

PROJECT LOCATION



VICINITY MAP
SCALE: 1"=600'

CONTRACTOR RESPONSIBLE FOR UTILITY LOCATES ON PRIVATE PROPERTY:

NOTICE TO EXCAVATORS:
ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503)-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS

Dig Safely.

Call the Oregon One-Call Center
DIAL 811 or 1-800-332-2344

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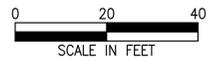
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COVER SHEET
BUILDING ADDITION FOR
A PORTION OF GLENDOVEER GOLF COURSE

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LEGEND

- EOG EDGE OF GRAVEL
- EOP EDGE OF PAVEMENT
- IRRIGATION CONTROL BOX
- UTILITY POLE
- STORM INLET / AREA DRAIN
- GUY WIRE
- TREE DECIDUOUS
- TREE CONIFEROUS
- CHAIN LINK FENCE
- OVERHEAD LINE

NOTES

- 1 REMOVE EXIST PORTION OF ASPHALT
- 2 PROTECT EXIST ASPHALT
- 3 REMOVE EXIST TREE WELL AND TREE
- 4 REMOVE EXIST TREE (BY OTHERS)
- 5 REMOVE EXIST SHED (BY OTHERS)
- 6 REMOVE EXIST PUTTING GREEN
- 7 RELOCATE EXIST IRRIGATION VALVE BOX AND APPURTENANCES, CONTRACTOR TO CONTACT OWNER FOR NEW LOCATION
- 8 OVERHEAD LINES TO BE UNDERGROUND, SEE ELECTRICAL PLANS
- 9 REMOVE EXIST LANDSCAPE WALL
- 10 ADJUST EXIST LANDSCAPE WALL AS NEEDED



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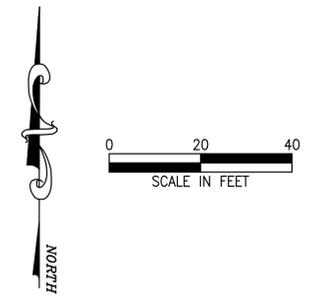
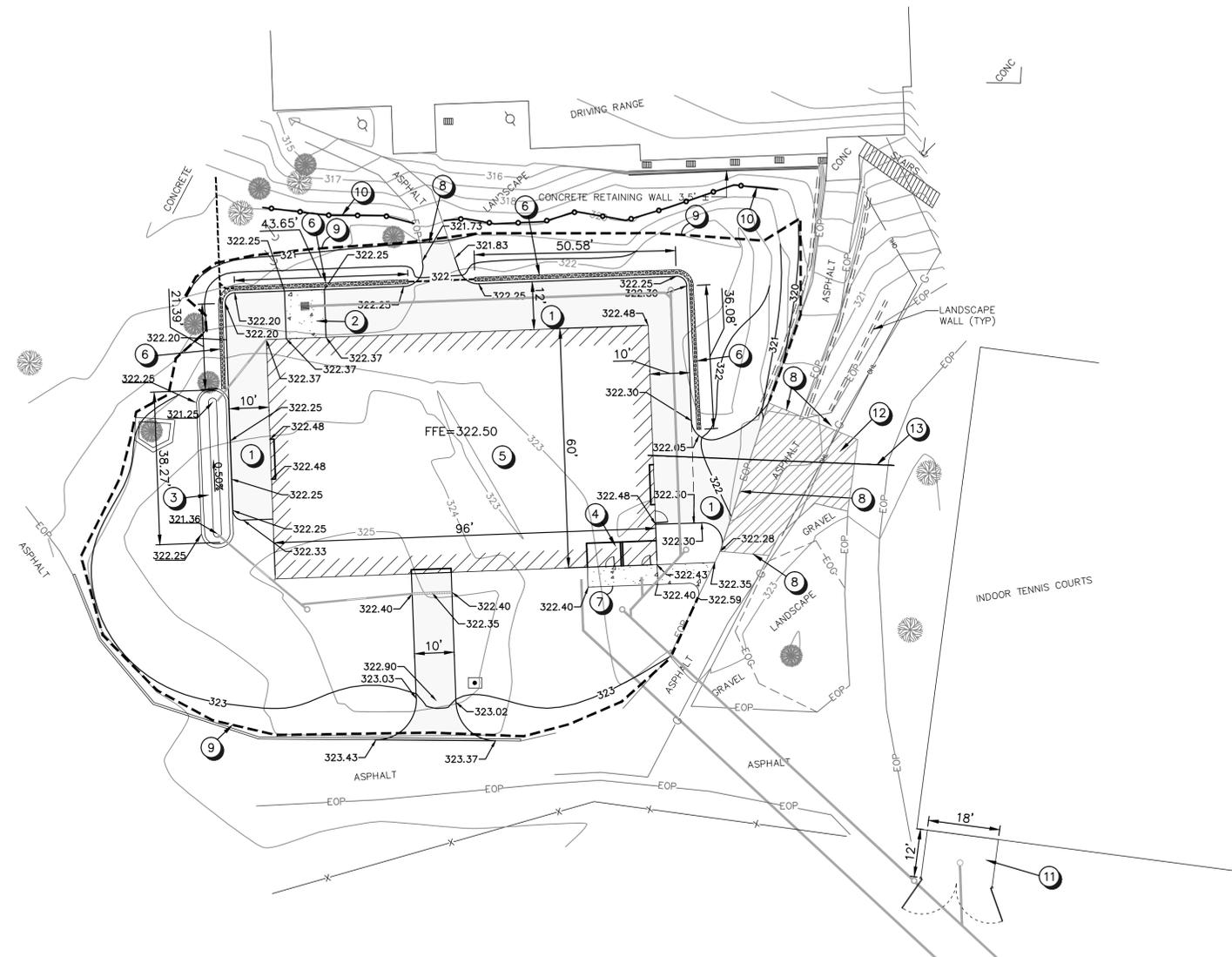
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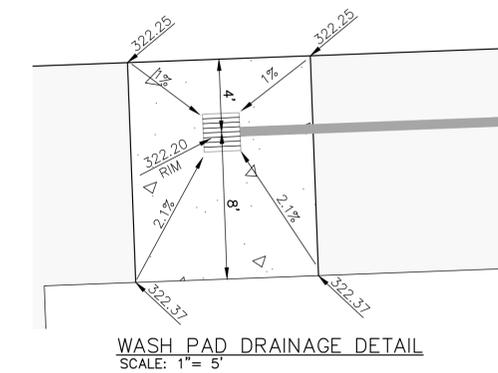
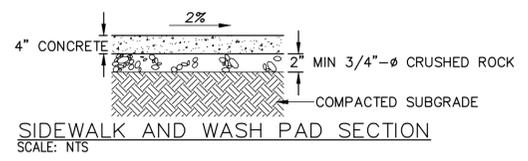
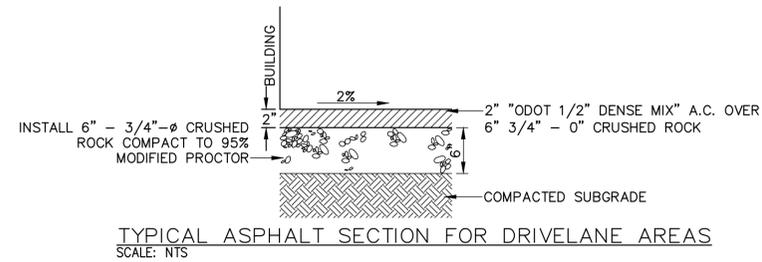
EXISTING CONDITIONS AND DEMO PLAN
 BUILDING ADDITION FOR
 A PORTION OF GLENDOVEER GOLF COURSE

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NOTES

- ① ASPHALT GOLF CART DRIVELANE, SEE CROSS SECTIONAL DETAIL THIS SHEET
- ② 10' X 12' CONCRETE GOLF CART WASH AREA, SEE DETAIL THIS SHEET
- ③ 8" WIDE WATER QUALITY SWALE PER CITY OF PORTLAND'S STANDARDS, SEE DETAIL ON SHEET 6
- ④ 6' X 8.5' UNI-SEX RESTROOMS, SEE FLOOR PLAN ON SHEET 7
- ⑤ BUILDING FURNISHED AND INSTALLED BY OWNER, CONTRACTOR TO COORDINATE WITH INSTALLER
- ⑥ INFILTRATION FRENCH DRAIN, SEE SHEET 5 FOR DETAILS
- ⑦ 5' CONCRETE WALKWAY, SEE SECTION DETAIL THIS SHEET
- ⑧ MATCH EXIST ASPHALT PATHWAY
- ⑨ GRADING LIMITS
- ⑩ TEMPORARY SILT FENCE, SEE NOTES AND DETAIL ON SHEET 5
- ⑪ 6' TALL WOOD FENCE ENCLOSURE WITH SHED ROOF, CONTRACTOR TO CONSTRUCT 4" THICK CONCRETE SLAB AT EXISTING ASPHALT GRADES
- ⑫ SAWCUT AND REGRADE PORTION OF EXISTING ASPHALT AS DIRECTED BY OWNER
- ⑬ INSTALL 65 ± LF 2 INCH ELECTRICAL CONDUIT FOR FUTURE TELEPHONE / INTERNET CONNECTION. EXPOSE CONDUIT ON INTERIOR SIDE OF BUILDING



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SITE, GRADING, AND EROSION CONTROL PLAN
 BUILDING ADDITION FOR
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EROSION CONTROL NOTES:

- APPROVAL OF THIS EROSION, SEDIMENT AND POLLUTION CONTROL PLAN (ESPCP) DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
- THE IMPLEMENTATION OF THIS ESPCP AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESPCP FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
- THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
- THE ESPCP FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
- THE ESPCP FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESPCP FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
- THE ESPCP FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT / CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
- THE ESPCP FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A WEEK OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
- STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

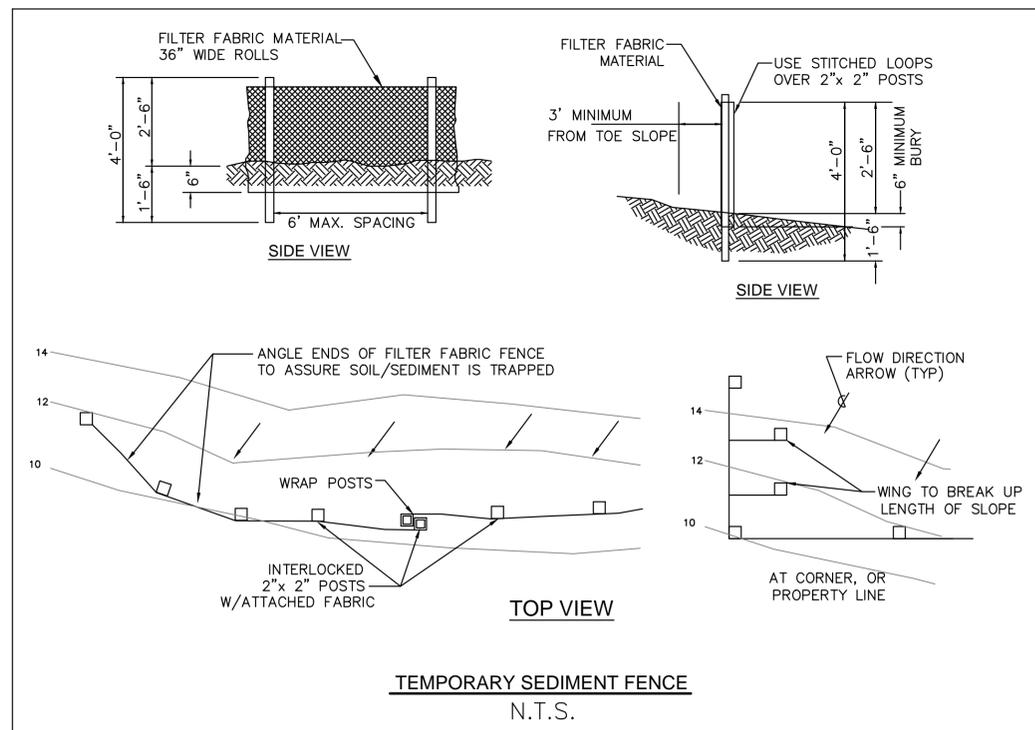
EROSION AND SEDIMENT CONTROL INSPECTION REQUIREMENTS:

- ALL SITES 1 ACRE AND GREATER SHALL HAVE A PERSON WITH KNOWLEDGE AND EXPERIENCE IN CONSTRUCTION STORM WATER CONTROLS AND MANAGEMENT PRACTICES CONDUCT ALL INSPECTIONS. THE INSPECTOR SHALL KEEP A WRITTEN RECORD OF EACH INSPECTION.
- THE EROSION CONTROL INSPECTOR FOR THIS PROJECT IS (CONTRACTOR TO BE DETERMINED)
- ACTIVE SITES: FREQUENCY OF INSPECTIONS SHALL BE DAILY.
- INACTIVE SITES: INSPECTIONS SHALL BE REQUIRED ONCE EVERY WEEK AND IN THE FIRST 24 HOURS FOLLOWING A STORM EVENT. PRIOR TO DISCONTINUING ACTIVITIES AT THE SITE. ANY EXPOSED AREA SHALL BE STABILIZED TO PREVENT EROSION. STABILIZATION MAY OCCUR BY APPLYING APPROPRIATE COVER (MULCH, EROSION CONTROL BLANKET, SOIL TACKIFIER, ETC.) OR ESTABLISHING ADEQUATE VEGETATIVE COVER.

NOTE:
TOPSOIL MUST BE STOCKPILED ON SITE AND REUSED TO THE EXTENT PRACTICABLE

ADDITIONAL EROSION AND SEDIMENT CONTROL REQUIREMENTS:

- THE INTENT OF THE REQUIREMENT IS TO PREVENT SILTATION FROM REACHING STORM DRAIN SYSTEMS AND DRAINAGE WAYS. THE EROSION AND SEDIMENT CONTROL (ESC) FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENT AND TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.
- THE FOLLOWING CONTROLS AND PRACTICES ARE REQUIRED:
 - EACH SITE SHALL HAVE GRAVELED OR PAVED ENTRANCES, EXITS AND PARKING AREAS. PRIOR TO BEGINNING ANY OTHER WORK, TO REDUCE THE TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS.
 - ALL UNPAVED ROADS LOCATED ON-SITE SHALL BE GRAVELED. OTHER EFFECTIVE EROSION AND SEDIMENT CONTROL MEASURES EITHER ON THE ROAD OR DOWN GRADIENT MAY BE USED IN PLACE OF GRAVELING.
 - WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER WATER-TIGHT TRUCKS SHALL BE USED OR LOADS SHALL BE DRAINED ON SITE UNTIL DRIPPING HAS STOPPED TO ELIMINATE SPILLAGE ON ROAD.
 - CONCRETE TRUCKS BEING WASHED OUT ONSITE SHALL BE PARKED IN A LOCATION THAT WILL PREVENT ALL WASH WATER FROM ENTERING THE STORM DRAIN SYSTEM OR THE PUBLIC RIGHT-OF-WAY. CONCRETE REMNANTS AND RESIDUE SHALL BE PROPERLY DISPOSED OF.
 - WASHING STREETS WITH A WATER TRUCK IS NOT ALLOWED. A VACUUM SWEEPER SHALL BE USED TO CLEAN THE STREETS.
- ADDITIONAL CONTROLS AND PRACTICES SHALL BE DEVELOPED THAT ARE APPROPRIATE FOR THE SITE. AT A MINIMUM THE FOLLOWING SHALL BE CONSIDERED:
 - WHENEVER PRACTICABLE, CLEANING AND GRADING SHALL BE DONE IN A PHASED MANNER TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION.
 - IN DEVELOPING VEGETATIVE EROSION CONTROL PRACTICES, AT A MINIMUM THE FOLLOWING SHALL BE CONSIDERED: TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, SOD STABILIZATION, VEGETATIVE BUFFER STRIPS, AND PROTECTION OF TREES WITH PROTECTIVE CONSTRUCTION FENCES.
 - THE FOLLOWING SHALL BE CONSIDERED FOR THE PROTECTION OF EXPOSED AREAS AND THE PREVENTION OF SOIL FROM BEING ERODED BY STORM WATER: MULCHING WITH STRAW OR OTHER VEGETATION, USE OF EROSION CONTROL BLANKETS, AND APPLICATION OF SOIL TACKIFIERS.
 - THE FOLLOWING SHALL BE CONSIDERED FOR THE DIVERSION OF FLOWS FROM EXPOSED SOIL: STORE FLOWS TO ALLOW FOR SEDIMENTATION, FILTER FLOWS, OR OTHERWISE REDUCE SOIL LADEN RUNOFF; USE OF SILT FENCES, EARTH DIKES, BRUSH BARRIERS, DRAINAGE SWALES, CHECK DAMS, SUBSURFACE DRAINS, PIPE SLOPE DRAINS, ROCK OUTLET PROTECTION, SEDIMENT TRAPS, AND TEMPORARY OR PERMANENT SEDIMENTATION BASINS. ALL TEMPORARY SEDIMENT CONTROL PRACTICES SHALL NOT BE REMOVED UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED.
 - THE FOLLOWING SHALL BE IMPLEMENTED TO PREVENT THE STOCKPILES FROM BECOMING A SOURCE OF EROSION: DIVERSION OF UNCONTAMINATED FLOWS AROUND STOCKPILES; USE OF COVER OVER STOCKPILES, AND INSTALLATION OF SILT FENCES AROUND STOCKPILES.



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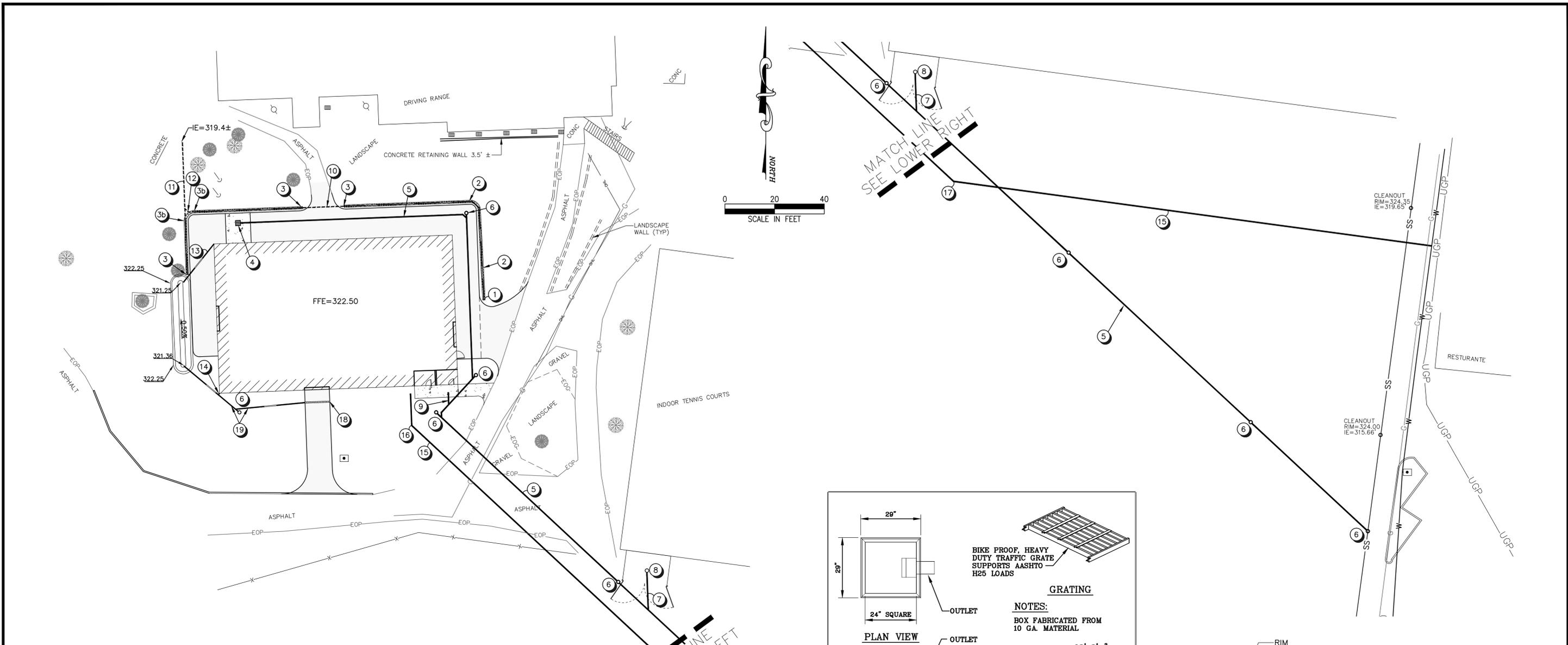
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EROSION CONTROL NOTES AND DETAILS
 BUILDING ADDITION FOR
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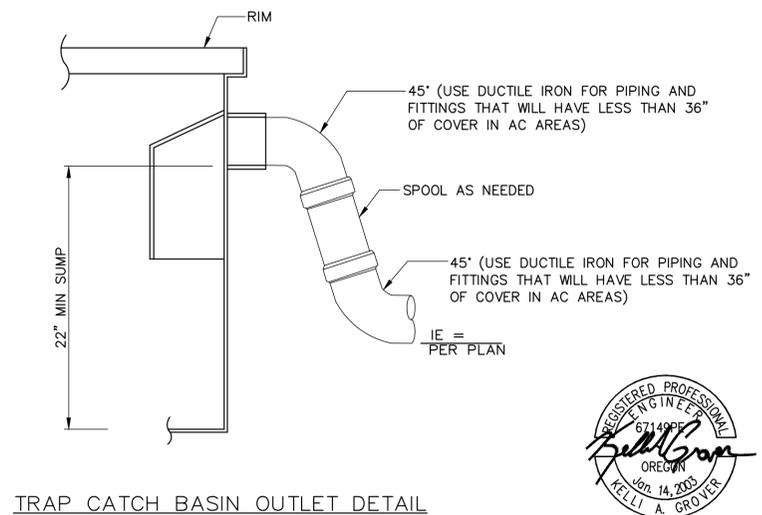
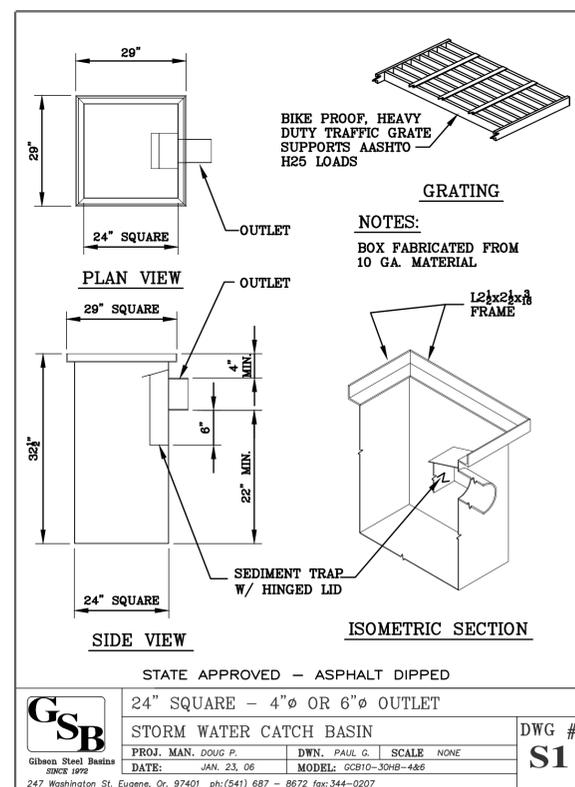
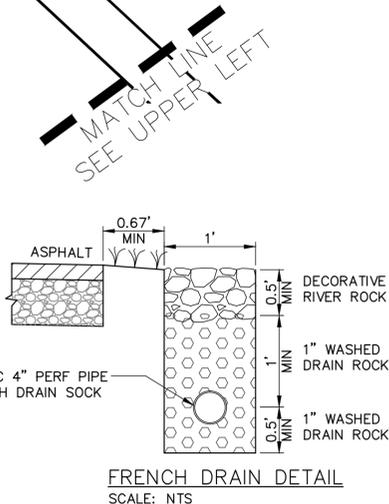


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NOTES

- 1 TOP OF ROCK = 322.00, IE PERF PIPE = 320.25
- 2 TOP OF ROCK = 322.20, IE PERF PIPE = 320.20
- 3 TOP OF ROCK = 322.20, IE PERF PIPE = 320.15
- 3b TOP OF ROCK = 322.20, IE PERF PIPE = 320.00
- 4 WASH PAD AREA DRAIN (TRAP CATCH BASIN) INTO SEWER RIM=322.20
IE OUT (6" PVC, E)=320.20
SEE DETAILS THIS SHEET
- 5 539± LF 6" PVC
S=0.010 MIN
IE AT DOWNSTREAM SEWER =314.80 ±
CONTRACTOR TO VERIFY LOCATION AND DEPTH OF EXIST SEWER LATERAL PRIOR TO CONSTRUCTION
- 6 INSTALL CLEANOUT TO FINISH GRADE, SEE DETAILS ON SHEET 6
- 7 17 LF 6" PVC, S=0.020 MIN
IE AT AREA DRAIN = 317.60 (BASE BID)
- 8 AREA DRAIN FOR FUTURE TRASH ENCLOSURE, CONTRACTOR TO VERIFY RIM ELEVATION WITH OWNER PRIOR TO CONSTRUCTION, SEE DETAIL THIS SHEET (BASE BID)
- 9 5 LF 6" PVC, S=0.020 MIN
IE AT STUB (3' FROM BUILDING)=318.60
- 10 17 LF 4" SOLID PVC, S=0.00
- 11 32± LF 4" SOLID PVC, S=0.020 MIN, DAYLIGHT IE=319.40±
- 12 4 LF SOLID PVC, CONNECT INTO SOLID DAYLIGHT PIPE, S=0.020 MIN
- 13 20 LF 4" PVC RAIN DRAIN LINE, S=0.010 MIN, IE INTO SWALE = 321.30
- 14 CONNECT RAIN DRAIN INTO 4" PVC
- 15 360± LF PVC WATER SUPPLY LINE, CONTRACTOR TO VERIFY LOCATION AND SIZE OF EXISTING LINE PRIOR TO CONSTRUCTION
- 16 45" PVC BEND
- 17 DEFLECT 36° ±
- 18 ZURN Z886-8601 TRENCH DRAIN
RIM=322.35
IE INTO SWALE = 321.40
- 19 55 LF SCHEDULE 40 PVC, S=0.010 MIN



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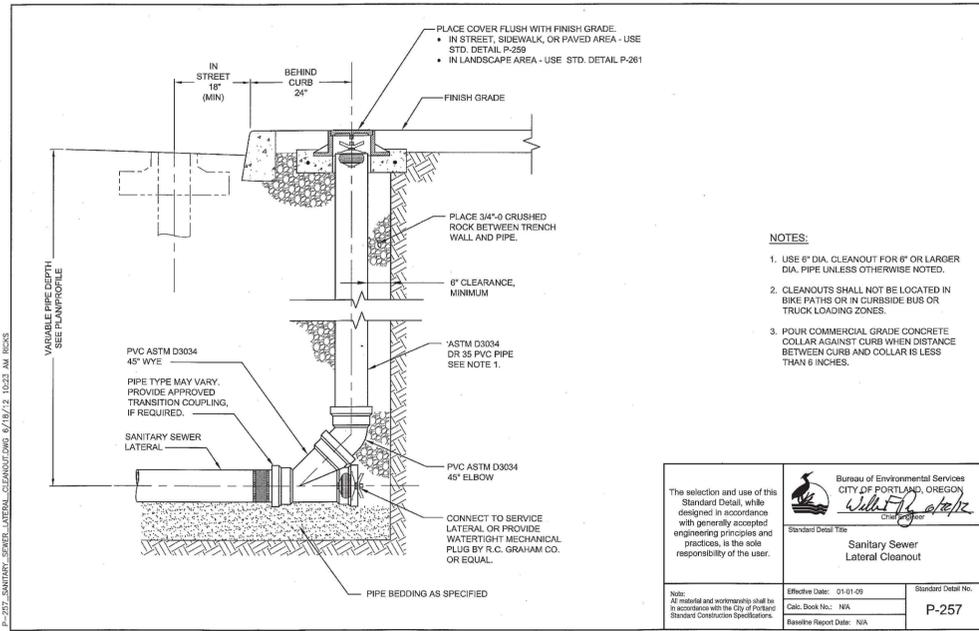
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UTILITY PLAN
 BUILDING ADDITION FOR
 A PORTION OF GLENDOVER GOLF COURSE

5
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BID SET EXPIRES: 06/30/13
 SIGNATURE DATE: 3/11/2013



- NOTES:**
1. USE 6" DIA. CLEANOUT FOR 6" OR LARGER DIA. PIPE UNLESS OTHERWISE NOTED.
 2. CLEANOUTS SHALL NOT BE LOCATED IN BIKE PATHS OR IN CURBSIDE BUS OR TRUCK LOADING ZONES.
 3. POUR COMMERCIAL GRADE CONCRETE COLLAR AGAINST CURB WHEN DISTANCE BETWEEN CURB AND COLLAR IS LESS THAN 6 INCHES.

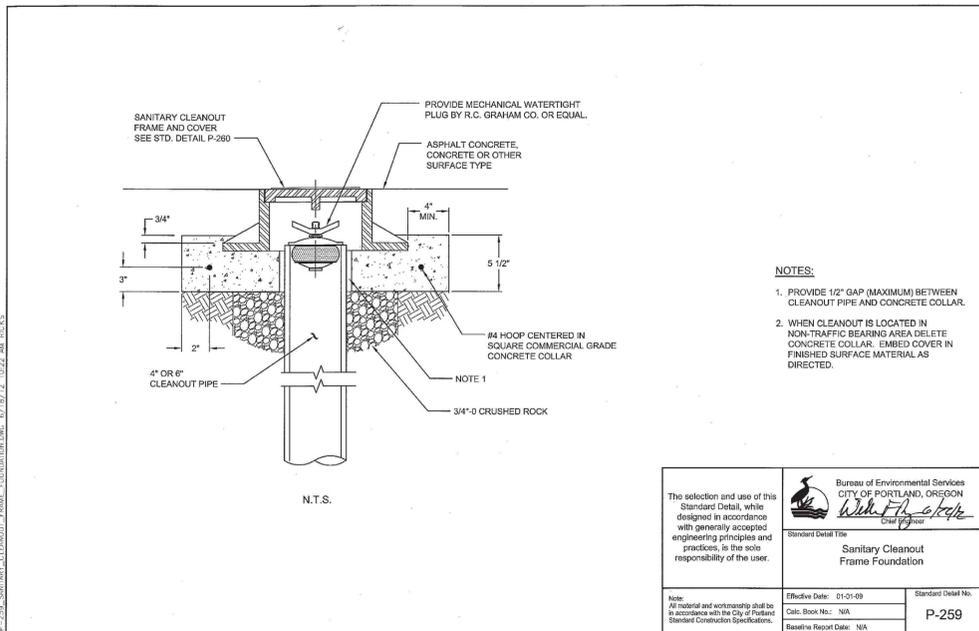
The selection and use of this Standard Detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.

**Bureau of Environmental Services
CITY OF PORTLAND, OREGON**
William F. Groves
Chief Engineer

Standard Detail Title: **Sanitary Sewer Lateral Cleanout**

Effective Date: 01-01-09
Calc. Book No.: N/A
Baseline Report Date: N/A

Standard Detail No.: **P-257**



- NOTES:**
1. PROVIDE 1/2" GAP (MAXIMUM) BETWEEN CLEANOUT PIPE AND CONCRETE COLLAR.
 2. WHEN CLEANOUT IS LOCATED IN NON-TRAFFIC BEARING AREA DELETE CONCRETE COLLAR. EMBED COVER IN FINISHED SURFACE MATERIAL AS DIRECTED.

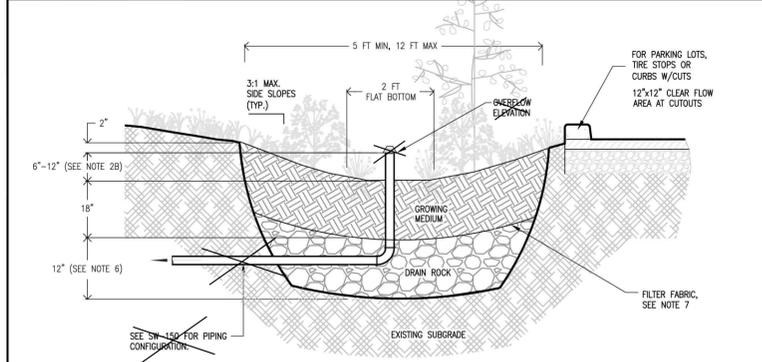
The selection and use of this Standard Detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.

**Bureau of Environmental Services
CITY OF PORTLAND, OREGON**
William F. Groves
Chief Engineer

Standard Detail Title: **Sanitary Cleanout Frame Foundation**

Effective Date: 01-01-09
Calc. Book No.: N/A
Baseline Report Date: N/A

Standard Detail No.: **P-259**



1. Provide protection from all vehicle traffic, equipment staging, and foot traffic in proposed infiltration areas prior to, during, and after construction.
2. Dimensions:
 - a. Width of swale: 5' - 12'.
 - b. Depth of swale ((from top of growing medium to overflow elevation); Simplified: 9", Presumptive: 6" - 12").
 - c. Longitudinal slope of swale: 6.0% or less.
 - d. Flat bottom width: 2'.
 - e. Side slopes of swale: 3:1 maximum.
3. Setbacks (from centerline of facility):
 - a. Infiltration swales must be 10' from foundations and 5' from property lines.
 - b. Flow-through swales must be lined with connection to approved discharge point according to SWMM Section 1.3.
4. Overflow:
 - a. Overflow required for Simplified Approach
 - b. Inlet elevation must allow for 2" of freeboard, minimum.
 - c. Protect from debris and sediment with strainer or grate.
5. Piping: shall be ABS Sch.40, cast iron, or PVS Sch.40. 3" pipe required for up to 1,500 sq ft of impervious area, otherwise 4" min. Piping must have 1% grade and follow the Uniform Plumbing Code.
6. Drain rock:
 - a. Size for infiltration swale: 1 1/2" - 3/4" washed
 - b. Size for flow-through swale: 3/4" washed
 - c. Depth for Simplified: 12"
 - d. Depth for Presumptive: 0-48", see calcs.
7. Separation between drain rock and growing medium: Use filter fabric (see SWMM Exhibit 2-4 Geotextile table) or a gravel lens (1/2 - 3/4 inch washed, crushed rock 2 to 3 inches deep).
8. Growing medium:
 - a. 18" minimum
 - b. See Appendix F.3 for specification or use sand/loam/compost 3-way mix.
9. Vegetation: Follow landscape plans otherwise refer to plant list in SWMM Appendix F. Minimum container size is 1 gallon. # of plantings per 100sf of facility area:
 - a. Zone A (wet): 115 herbaceous plants OR 100 herbaceous plants and 4 small shrubs.
 - b. Zone B (moderate to dry): 1 tree AND 3 large shrubs / small trees AND 4 small shrubs AND 140 groundcover plants.
 The delineation between Zone A and B shall be either at the outlet elevation or the check dam elevation, whichever is lowest.
10. Waterproof liner: Shall be 30 mil PVC or equivalent for flow-through facilities.
11. Install washed pea gravel or river rock to transition from inlets and splash pad to growing medium.
12. Check dams: Shall be placed according to facility design. Refer to SW-340 for profile and spacing.
13. Inspections: Call BDS IVR Inspection Line, (503) 823-7000, for appropriate inspections.

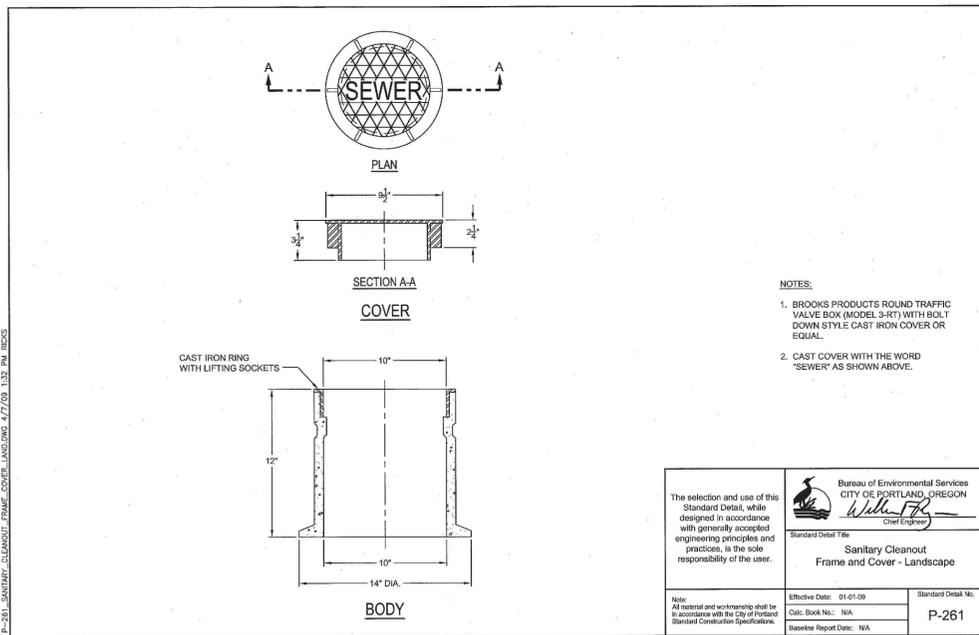
STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

- Simplified / Presumptive Design Approach -

Swale

NUMBER: **SW-120**

Bureau of Environmental Services



- NOTES:**
1. BROOKS PRODUCTS ROUND TRAFFIC VALVE BOX (MODEL S-RT) WITH BOLT DOWN STYLE CAST IRON COVER OR EQUAL.
 2. CAST COVER WITH THE WORD "SEWER" AS SHOWN ABOVE.

The selection and use of this Standard Detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.

**Bureau of Environmental Services
CITY OF PORTLAND, OREGON**
William F. Groves
Chief Engineer

Standard Detail Title: **Sanitary Cleanout Frame and Cover - Landscape**

Effective Date: 01-01-09
Calc. Book No.: N/A
Baseline Report Date: N/A

Standard Detail No.: **P-261**

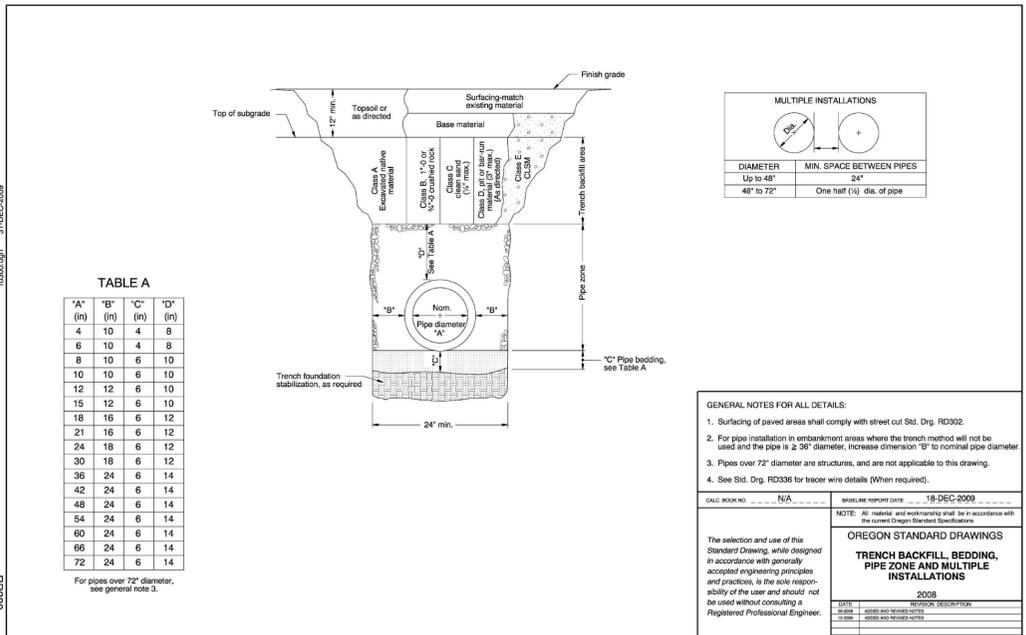


TABLE A

"A" (ft)	"B" (ft)	"C" (ft)	"D" (ft)
4	10	4	8
6	10	4	8
8	10	6	10
10	10	6	10
12	12	6	10
15	12	6	10
18	16	6	12
21	16	6	12
24	18	6	12
30	18	6	12
36	24	6	14
42	24	6	14
48	24	6	14
54	24	6	14
60	24	6	14
66	24	6	14
72	24	6	14

For pipes over 72" diameter, see general note 3.

GENERAL NOTES FOR ALL DETAILS:

1. Surfacing of paved areas shall comply with street cut Std. Drg. RD302.
2. For pipe installation in embankment areas where the trench method will not be used and the pipe is $\geq 36"$ diameter, increase dimension "B" to nominal pipe diameter.
3. Pipes over 72" diameter are structures, and are not applicable to this drawing.
4. See Std. Drg. RD336 for tracer wire details (When required).

Calc. Book No.: N/A
Baseline Report Date: 18-DEC-2009

OREGON STANDARD DRAWINGS

TRENCH BACKFILL, BEDDING, PIPE ZONE AND MULTIPLE INSTALLATIONS

2008

DATE: 12-18-09
DESIGNER: WFG
CHECKER: WFG
APPROVED: WFG

E12-011 C6.dwg 12:49 03/11/2013

DATE:	NO.	REVISION

DRAWN:	DESIGNED:	CHECKED:
SCALE: AS SHOWN	DATE: August 2012	
PROJECT NO. E12-011		

FDG
Firwood Design Group, LLC
SURVEYING • ENGINEERING • PLANNING

39065 PIONEER BLVD., SUITE 104
SANDY, OREGON 97055
BUS: (503) 668-3737 • FAX: (503) 668-3788

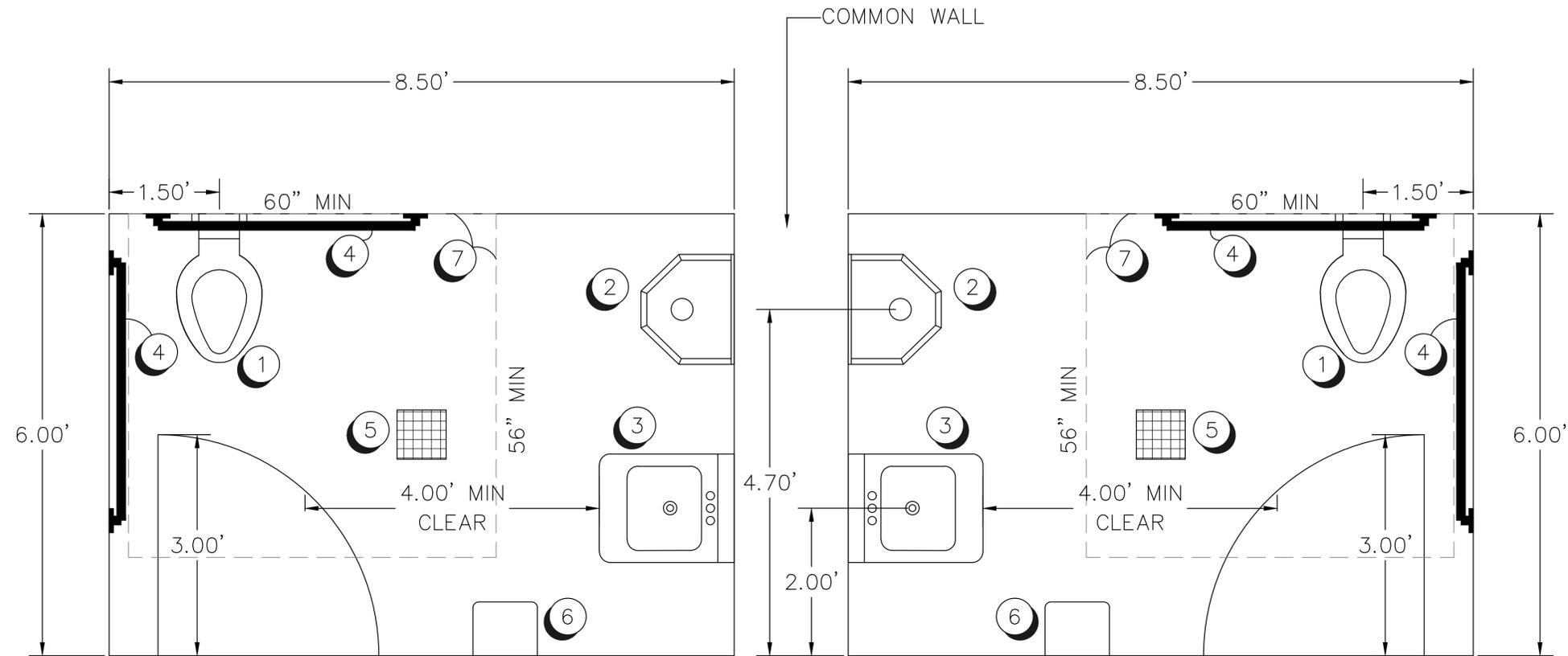
METRO; LYDIA NEILL
600 NE GRAND AVENUE
PORTLAND, OREGON 97232

DETAILS
BUILDING ADDITION FOR
A PORTION OF GLENDOVER GOLF COURSE

BID SET EXPIRES: 06/30/13
SIGNATURE DATE: 3/11/2013



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NOTES

- ① AMERICAN STANDARD 3351.160 OPTIMA 8111-1.28 FLUSH VALVE
- ② AMERICAN STANDARD 6210.010 OPTIMA 8186 FLUSH VALVE
- ③ AMERICAN STANDARD 9141.011 SLOAN OPTIMA EBF-85 FAUCET SLOAN MIX-60-A
- ④ 42" GRAB BAR (1-1/2")
- ⑤ AREA DRAIN, SEE MECHANICAL
- ⑥ TOWEL DISPENSER
- ⑦ 56" X 60" ADA TURNING SPACE

NOTES:

- 1. BASE BID INCLUDES INSTALLATION OF ALL PLUMBING STUB OUTS IN CONCRETE SLAB. DOORS PROVIDED BY BUILDING INSTALLER.
- 2. ALTERNATE #1 INCLUDES CONSTRUCTION OF WOOD FRAMING, DRY WALL, WALL FINISHING, INTERIOR VENTILATION AND LIGHTS, AND INSTALLATION OF ALL FIXTURES PER THIS SHEET



E12-011 C7.dwg 12:49 03/11/2013

ALTERNATE #1 BID SET

EXPIRES: 06/30/13
SIGNATURE DATE: 3/11/2013

DATE:	NO.	REVISION

DRAWN:	DESIGNED:	CHECKED:
SCALE: AS SHOWN	DATE: August 2012	
PROJECT NO. E12-011		



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PORTLAND, OREGON 97232

RESTROOM DETAILS
BUILDING ADDITION FOR
A PORTION OF GLENDOVEER GOLF COURSE

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F:\WORK\1179_Firwood Design Group\003_Glendover Golf Course Storage Bldg\001_Mechanical Design\DWG\E-01.dwg - Mar 11, 2013 - 3:07pm

LUMINAIRE SCHEDULE						
FIXTURE TYPE	DESCRIPTION	LAMP TYPE	LAMP	BALLAST	MANUFACTURER AND MODEL NUMBER	INPUT WATTS
'A'	2'X4' PENDANT MOUNTED LOW BAY LINEAR LUMINAIRE. BROAD BEAM REFLECTOR, 120V, 360 DEGREES PREWIRED MOTION SENSOR, V-HOOK WITH CHAIN, 10' CHAIN. 85 CRI, 4100K LAMP, HOUSING POWDER COATED WHITE, 20 GAUGE STEEL HOUSING, MOUNT LUMINAIRE AT +14'-0" A.F.F.	FLUORESCENT	(4) 32W TB	PROGRAM START ELECTRONIC BALLAST	LITHONIA LIGHTING: FOB24 SERIES	124W
'AE'	SAME AS TYPE 'A' EXCEPT EQUIPPED WITH INTEGRAL EMERGENCY 90 MINUTE BATTERY BACKUP BALLAST WITH TEST SWITCH. CONNECT EMERGENCY BATTERY PACK TO INNER TWO LAMPS. LAMPS TO PROVIDE 1100 LUMENS. MOUNT LUMINAIRE AT +14'-0" A.F.F.	FLUORESCENT	(4) 32W TB	PROGRAM START ELECTRONIC BALLAST	LITHONIA LIGHTING: FOB24 SERIES OR APPROVED. BODINE: B50 COLD PACK.	124W
'B'	2'X4' PENDANT MOUNTED LOW BAY LINEAR LUMINAIRE. BROAD BEAM REFLECTOR, 120V, 360 DEGREES PREWIRED MOTION SENSOR, V-HOOK WITH CHAIN, 10' CHAIN. 85 CRI, 4100K LAMP, HOUSING POWDER COATED WHITE, 20 GAUGE STEEL HOUSING, MOUNT LUMINAIRE AT +10'-0" A.F.F.	FLUORESCENT	(2) 32W TB	PROGRAM START ELECTRONIC BALLAST	LITHONIA LIGHTING: FOB14 SERIES OR APPROVED.	62W
'BE'	SAME AS TYPE 'A' EXCEPT EQUIPPED WITH INTEGRAL EMERGENCY 90 MINUTE BATTERY BACKUP BALLAST WITH TEST SWITCH. LAMPS TO PROVIDE 1100 LUMENS. MOUNT LUMINAIRE AT +10'-0" A.F.F.	FLUORESCENT	(2) 32W TB	PROGRAM START ELECTRONIC BALLAST	LITHONIA LIGHTING: FOB14 SERIES OR APPROVED. BODINE: B50 COLD PACK.	62W
'D'	7-1/4" H X 16-1/4" W X 9-1/8" D., WALL SCONCE WITH BACK BOX, (20) 4000K LEDS, TYPE 3 DISTRIBUTION, 120V, SURFACE MOUNT, DARK BRONZE FINISH, PHOTO-CELL, BUTTON TYPE.	LED	(2) ENGINE	DRIVER	LITHONIA LIGHTING: WST LED SERIES OR APPROVED.	47W
'FE'	WALL PACK, FLUORESCENT, POLYCARBONATE LENS, HOUSING IS POLYCARBONATE, DARK BRONZE FINISH, PHOTO-CELL, BUTTON TYPE. PROVIDE WITH 90 MINUTE REMOTE EMERGENCY BALLAST. SEE PLAN FOR LOCATION OF BALLAST.	FLUORESCENT	(1) 42W CFL	ELECTRONIC BALLAST	LITHONIA LIGHTING: OWP3 SERIES OR APPROVED.	46W
'X'	UNIVERSAL MOUNT LED THERMOPLASTIC EXIT SIGN. NICKEL-CADMIUM BATTERY, STENCILED FACE, WHITE HOUSING, RED LETTERING, 120V, SELF DIAGNOSTICS, NICKEL-CADMIUM BATTERY,	LED	1W	N/A	LITHONIA LIGHTING: QUANTUM LQM SERIES OR APPROVED.	1W
'X1'	PENDANT MOUNT LED THERMOPLASTIC EXIT SIGN. NICKEL-CADMIUM BATTERY, DOUBLED STENCILED FACE, WHITE HOUSING, RED LETTERING, 120V, SELF DIAGNOSTICS, NICKEL-CADMIUM BATTERY, UNIVERSAL CHEVRONS IN BOTH FACES. SUSPEND EXIT SIGN FROM CONDUIT AND J-BOX.	LED	1W	N/A	LITHONIA LIGHTING: QUANTUM LQM SERIES OR APPROVED.	1W

ELECTRICAL SYMBOL LIST			
A.F.F.	ABOVE FINISHED FLOOR		RECEPTACLE - DUPLEX, MOUNT 18" AFF, UON
D.B.	DIRECT BURIED		RECEPTACLE - SINGLE, MOUNT 65" AFF, UON
F	FLEX CONDUIT		SWITCH DESIGNATOR
G	GROUND WIRE		SWITCH - SINGLE-POLE, MOUNT 48" AFF, UON
GFI	GROUND FAULT INTERRUPTER		SWITCH - THREE-WAY, MOUNT 48" AFF UON.
GND	GROUND		SWITCH - FUSED DISCONNECT
IG	ISOLATED GROUND		THERMAL MOTOR SWITCH, HANDLE GUARD AND PADLOCK CAPABILITY "P" = PILOT LIGHT
OP	OVERHEAD POWER		
OT	OVERHEAD TELCO		
S-O	S-O CORD		
UP	UNDERGROUND POWER		
UT	UNDERGROUND TELCO		
WP	WEATHERPROOF		MOTOR CONNECTION
—OH—	OVER-HEAD UTILITY CABLES		JUNCTION BOX - CEILING-MOUNTED
— —	CONDUIT - BELOW GRADE		METER BASE - UTILITY COMPANY APPROVED
— — —	CONDUIT - CONCEALED		OCCUPANCY SENSOR
— — — —	CONDUIT - EXPOSED		THERMOSTAT
~~~~~	CONDUIT - FLEXIBLE		TRANSFORMER
— — — — —	CONDUIT - STUB-DOWN		PANEL - 208Y/120V BRANCH CIRCUIT (SURFACE-MOUNTED)
— — — — —	CONDUIT - STUB-OUT		PUSH BUTTON TO OPERATE OVER-HEAD DOOR.
— — — — —	CONDUIT - STUB-UP		LIGHT FIXTURE - WALL-MOUNTED
	HOME RUN. HASH MARKS INDICATE 2#12 WIRE UNLESS NOTED OTHERWISE		LIGHT FIXTURE - FLUORESCENT
	CONDUCTORS IN CONDUIT, (2)#12 OR AS NOTED (QUANTITY AS INDICATED BY HASH MARKS)		LIGHT FIXTURE - ON EMERGENCY CIRCUIT
	GROUND WIRE		SERVICE WEATHER-HEAD
	GROUND CONNECTION		
	EQUIPMENT CONNECTION		
	EXIT SIGN - CEILING-MOUNTED		
	EXIT SIGN - WALL-MOUNTED		
	EXIT SIGN - DOUBLE FACED WITH DIRECTIONAL ARROWS		

FEEDER SCHEDULE	
TYPE	DESCRIPTION
202	(2) #12 CU THWN, (1) #12 CU GND., IN 1/2" C.
6003P2	(2) 2-1/2" C. EACH WITH (3) #350 CU THWN
6003P3	(3) 2" C. EACH WITH (3) #3/0 CU THWN, (1) #1 CU GND.

NOTE: FEEDER SCHEDULE APPLIES TO ALL ELECTRICAL DRAWINGS AND SCHEDULES.

HVAC/PLUMBING EQUIPMENT CONNECTION SCHEDULE							
TAG	DESCRIPTION	LOAD	VOLT/PH	CIRCUIT	DISCONNECT	FEEDER	NOTES
EF 1	EXHAUST FAN	1/2 HP	120V, 1Ø	2P-2.	MANUAL SWITCH	202	1
EF 2	EXHAUST FAN	1/2 HP	120V, 1Ø	2P-4.	MANUAL SWITCH	202	1
EF 3	EXHAUST FAN	1/2 HP	120V, 1Ø	2P-6.	MANUAL SWITCH	202	1

NOTE:  
1. CONTROL BY MECHANICAL.

3/11/13	0	BID SET	DRAWN: DH	DESIGNED: DH	CHECKED:
			SCALE: AS SHOWN	DATE: 1/23/2013	
DATE:	NO.	REVISION	PROJECT NO. 1179.003.001		



39065 PIONEER BLVD., SUITE 104  
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METRO; LYDIA NEILL  
600 NE GRAND AVENUE  
PORTLAND, OREGON 97232

ELECTRICAL SCHEDULES & LEGEND  
TOPOGRAPHIC SURVEY  
A PORTION OF GLENDOVEER GOLF COURSE

E1

7



9815 S.W. Alan Boulevard  
Suite 107  
Beaverton, Oregon 97005  
Phone: (503) 728-3317  
Fax: (503) 728-3326  
E-mail: rwang@rwang.com

Project No.: 1179.003.001 Contact: DENNIS HALL



EXPIRES: 6/30/14

PANEL: '2P' (Section 1)		BUS: 600A		VOLTAGE: 120/240V, 1PH, 3 WIRE						
FEEDER: SEE POWER RISER		MAIN BRKR: 600A, 2P, MCB		MOUNTING: SURFACE						
CKT NO.	CIRCUIT DESCRIPTION	CKT BREAKER AMPS/POLES	LOAD TYPE	LOAD VOLT-AMPS	PHASE	LOAD VOLT-AMPS	LOAD TYPE	CKT BREAKER AMPS/POLES	CIRCUIT DESCRIPTION	CKT NO.
1	CART CHARGER	20/1	Z	1296	A	1176	M	20/1	EF-1	2
3	CART CHARGER	20/1	Z	1296	M	1176	M	20/1	EF-2	4
5	CART CHARGER	20/1	Z	1296	A	1176	M	20/1	EF-3	6
7	CART CHARGER	20/1	Z	1296	A	187	L	20/1	EXTERIOR LTS	8
9	CART CHARGER	20/1	Z	1296	A	900	R	20/1	EQUIPMENT RECEPTACLES	10
11	CART CHARGER	20/1	Z	1296	C	1116	L	20/1	LIGHTS TO SWITCH A	12
13	CART CHARGER	20/1	Z	1296	A	1116	L	20/1	LIGHTS TO SWITCH B	14
15	CART CHARGER	20/1	Z	1296	C	200	Z	20/1	EXHAUST FAN CONTROL PANEL	16
17	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	SPARE	18
19	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	20
21	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	22
23	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	24
25	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	26
27	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	28
29	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	30
31	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	32
33	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	34
35	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	36
37	CART CHARGER TEMPORARY	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	38
39	CART CHARGER TEMPORARY	20/1	Z	1296	C	1296	Z	20/1	SPARE	40
41	CART CHARGER TEMPORARY	20/1	Z	1296	A	1296	Z	20/1	SPARE	42

CONNECTED LOAD		DEMAND LOAD		NOTES	
LOAD PER PHASE (VA)	A= 48432 B= 0 C= 22119	LIGHTING 2419 RECEPT. 900 KITCHEN 0 MOTOR 0	125% 125% 10K+50% 65% 100% 100%	3023.75 900 0 0	1. PROVIDE WEATHER PROOF GFI RECEPTACLE ON SIDE OF EACH RTU. SEE EQ.1 FOR RTU INFORMATION.
LOAD PER PHASE (AMPS)	A= 403.60 B= 0 C= 184.33	GENERAL 40376 HEAT 0 LG MOTOR 3528 EX. LOAD 0	125% 125% 100% 100% 125% 125%	40376 0 4410 0	
TOTAL LOAD (KVA)	70.55	TOTAL LOAD (KVA)		48.71	#1179.001.001
TOTAL AMPS	293.96	TOTAL AMPS		202.96	Glendoveer Golf
DATE 11-Mar-13					

LOAD SUMMARY							
LOAD SUMMARY 'MDP'							
PANEL	LIGHTING	RECEPTACLES	KITCHEN	MOTOR	GENERAL/MISC.	ELEC. HEAT	TOTAL
PANEL '2P1' (Sect 1) (208V)	2419	900	0	3528	40376	0	47223
PANEL '2P1' (Sect 2) (208V)	0	0	0	0	45360	0	45360
CONNECTED (VA)	2419	900	0	3528	86796	0	92593
LARGEST MOTOR (+1.25)				294			
CODE FACTOR	1.25	10K+50%	0.65	1.00	1.25	1.00	
CALCULATED (VA)	3024	900	0	3528	107170	0	114622
TOTAL CONNECTED	92593						
	●120/240V/1PH		385.76 AMPS				
TOTAL DEMAND	114622						
	●120/240V/1PH		477.59 AMPS				
DATE				11-Mar-13			
JOB#				#1179.001.001			
JOB NAME				Glendoveer Golf			

PANEL: '2P' (Section 2)		BUS: 600A		VOLTAGE: 120/240V, 1PH, 3 WIRE						
FEEDER: SEE POWER RISER		MLO		MOUNTING: SURFACE						
CKT NO.	CIRCUIT DESCRIPTION	CKT BREAKER AMPS/POLES	LOAD TYPE	LOAD VOLT-AMPS	PHASE	LOAD VOLT-AMPS	LOAD TYPE	CKT BREAKER AMPS/POLES	CIRCUIT DESCRIPTION	CKT NO.
43	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	44
45	CART CHARGER	20/1	Z	1296	B	1296	Z	20/1	CART CHARGER	46
47	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	48
49	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	50
51	CART CHARGER	20/1	Z	1296	B	1296	Z	20/1	CART CHARGER	52
53	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	54
55	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	56
57	CART CHARGER	20/1	Z	1296	B	1296	Z	20/1	CART CHARGER	58
59	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	60
61	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	62
63	CART CHARGER	20/1	Z	1296	B	1296	Z	20/1	CART CHARGER	64
65	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	66
67	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	68
69	CART CHARGER	20/1	Z	1296	B	1296	Z	20/1	CART CHARGER	70
71	CART CHARGER	20/1	Z	1296	C	1296	Z	20/1	CART CHARGER	72
73	CART CHARGER	20/1	Z	1296	A	1296	Z	20/1	CART CHARGER	74
75	CART CHARGER	20/1	Z	1296	B	1296	Z	20/1	SPARE	76
77	CART CHARGER TEMPORARY	20/1	Z	1296	C	1296	Z	20/1	SPARE	78
79	CART CHARGER TEMPORARY	20/1	Z	1296	A	1296	Z	20/1	SPARE	80
81	SPARE	20/1	Z	1296	B	1296	Z	20/1	SPARE	82
83	SPARE	20/1	Z	1296	C	1296	Z	20/1	SPARE	84

CONNECTED LOAD		DEMAND LOAD		NOTES	
LOAD PER PHASE (VA)	A= 23328 B= 0 C= 22032	LIGHTING 0 RECEPT. 0 KITCHEN 0 MOTOR 0	125% 125% 10K+50% 65% 100% 100%	0 0 0 0	1.
LOAD PER PHASE (AMPS)	A= 194.40 B= 0 C= 183.60	GENERAL 45360 HEAT 0 LG MOTOR 0 EX. LOAD 0	125% 125% 100% 100% 125% 125%	45360 0 0 0	2. 3. 4.
TOTAL LOAD (KVA)	45.36	TOTAL LOAD (KVA)		45.36	#1179.001.001
TOTAL AMPS	189.00	TOTAL AMPS		189.00	Glendoveer Golf
DATE 11-Mar-13					

K:\WP1\1179_Firewood Design Group\003_Glendoveer Golf Course Storage Bldg\001_Mechanical Design\DWG\E-02.dwg - Mar 11, 2013 - 1:03pm

3/11/13	0	BID SET	DRAWN: DH	DESIGNED: DH	CHECKED:
			SCALE: AS SHOWN	DATE: 1/23/2013	
DATE:	NO.	REVISION	PROJECT NO. 1179.003.001		

**FDG**  
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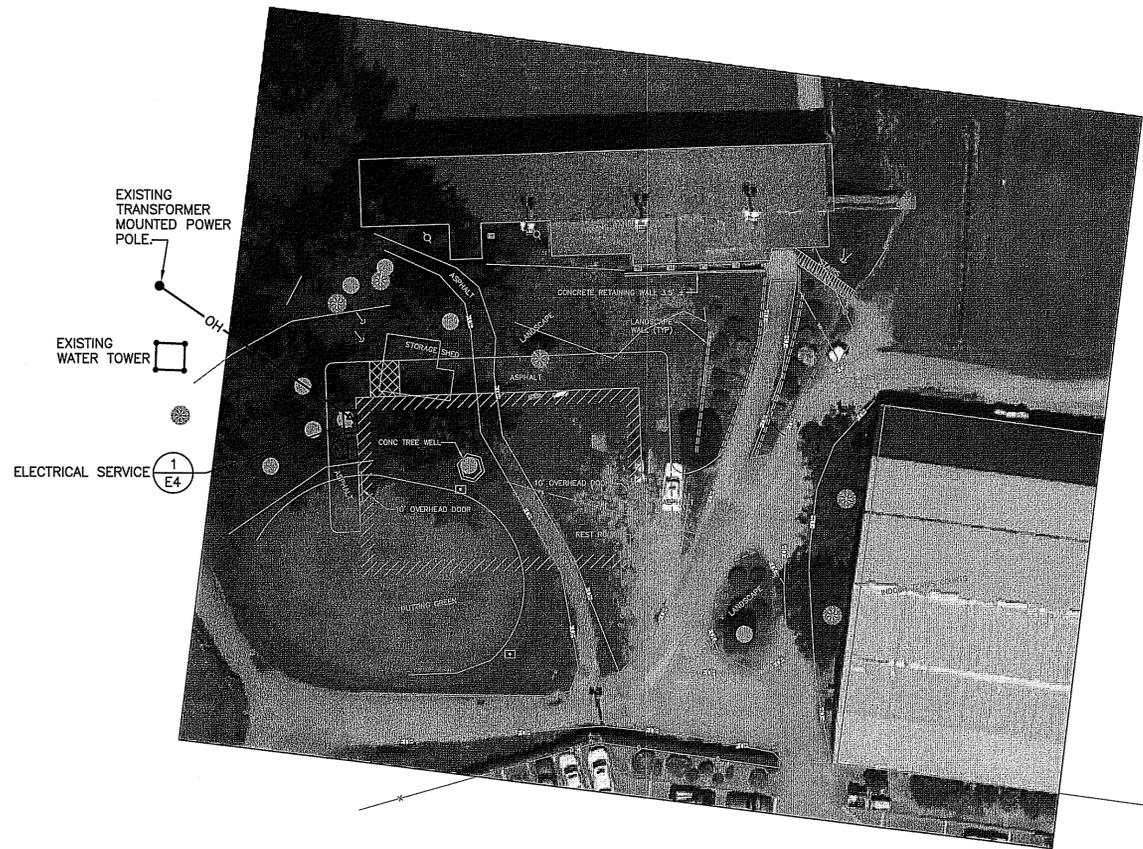
**METRO; LYDIA NEILL**  
 600 NE GRAND AVENUE  
 PORTLAND, OREGON 97232

**ELECTRICAL PANEL SCHEDULES**  
 TOPOGRAPHIC SURVEY  
 A PORTION OF GLENDOVEER GOLF COURSE

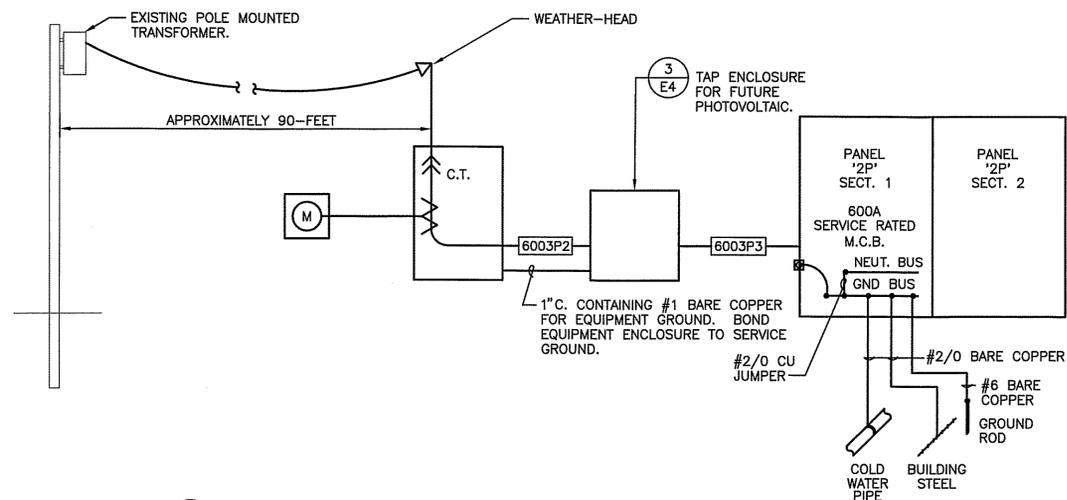
**E2**  
**7**

**R&W**  
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 E-mail: rweng@rweng.com  
 Project No.: 1179.003.001 Contact: DENNIS HALL

**REGISTERED PROFESSIONAL ENGINEER**  
 9785  
 Douglas D. Shaw  
 JULY 14, 1978  
 OREGON  
 DOUGLAS D. SHAW  
 EXPIRES: 6/30/14



**1 ELECTRICAL SITE PLAN**  
 E3 1" = 30'-0"



**2 ELECTRICAL ONE-LINE DIAGRAM**  
 E3 SCALE: NONE 120/240V, 1P, 3W.

**GENERAL NOTES**

- A. SEE DRAWING E1 FOR FEEDER SCHEDULE.

INCOMING ELECTRICAL SERVICE DIVISION OF RESPONSIBILITY					
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PRIMARY CONDUCTORS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SECONDARY CONDUCTORS	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TRANSFORMER	<input type="checkbox"/>	<input checked="" type="checkbox"/>	C/T ENCLOSURE	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TRANSFORMER PAD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	C/T'S	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PRIMARY GROUNDING	<input type="checkbox"/>	<input checked="" type="checkbox"/>	METER BASE	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BOLLARDS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	METER	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TRANSFORMER CONNECTIONS	<input type="checkbox"/>	<input checked="" type="checkbox"/>	METER GROUNDING	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ELECTRIC ROOM DOOR LOCK BOX (OBTAIN FROM POWER COMPANY)	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

**NOTES:**

- CONTACT AND COORDINATE ALL REQUIREMENTS AND RESPONSIBILITIES WITH SERVING UTILITY COMPANIES PRIOR TO SUBMITTING BID.
- ALL SERVICE INSTALLATION WORK SHALL BE IN STRICT COMPLIANCE WITH THE REQUIREMENTS OF THE SERVING UTILITIES.

**POWER UTILITY CONTACT:**  
 SUSAN MULLENBURG  
 Portland General Electric  
 3700 SE 17th Avenue  
 Portland, OR 97202  
 PHONE: (503) 669-5220  
 FAX: (503) 736-5400

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3/11/13	0	BID SET
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SCALE: AS SHOWN	DATE: 1/23/2013	
PROJECT NO. 1179.003.001		

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**ELECTRICAL SITE PLAN**  
 TOPOGRAPHIC SURVEY  
 A PORTION OF GLENDOVEER GOLF COURSE

**E3**  
 7

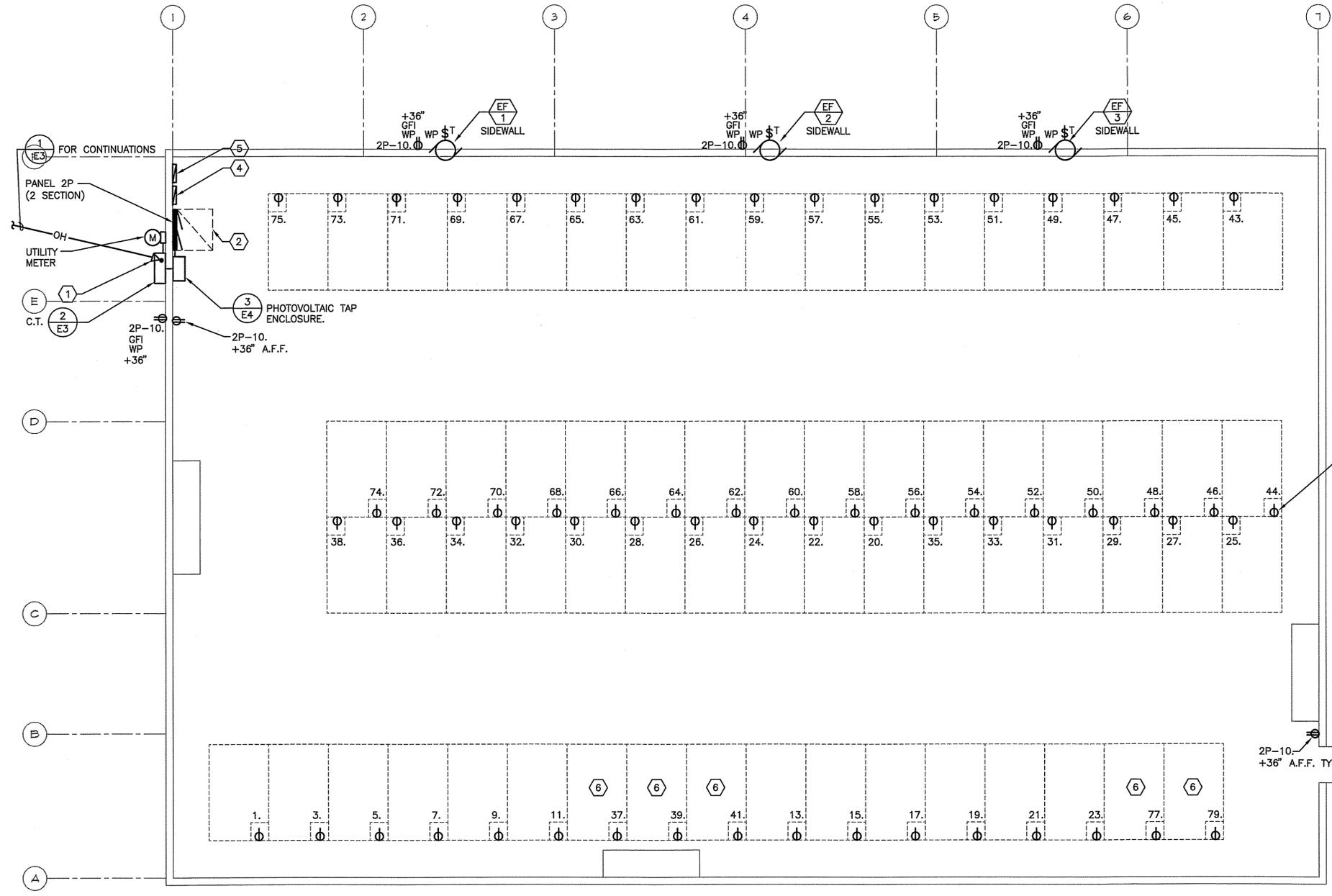
**R&W**  
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 DOUGLAS D. SHAW  
 EXPIRES: 6/30/14

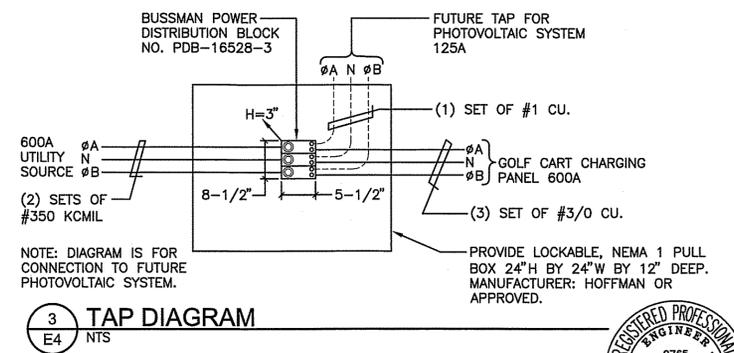
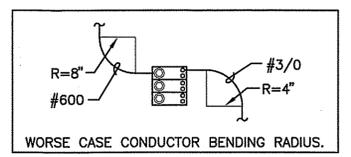
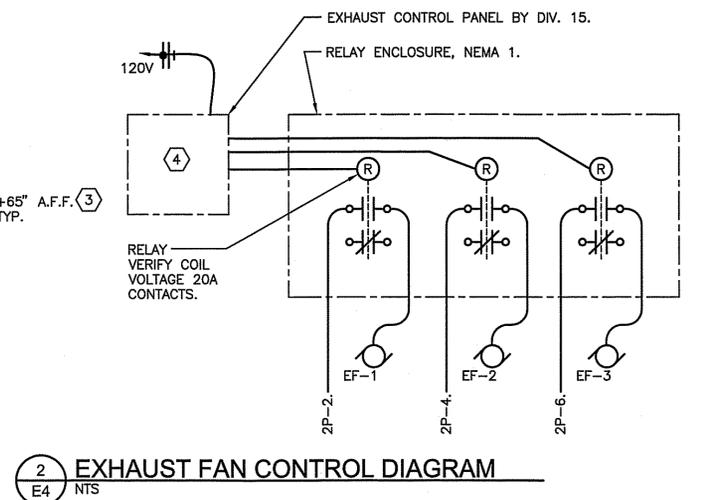
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**1 BUILDING FLOOR PLAN - POWER**  
 3/16" = 1'-0"

- GENERAL NOTES**
- A. ALL BRANCH CIRCUITS ARE CONNECTED TO PANEL 2P UNLESS NOTED.
  - B. SEE DRAWING E1 FOR HVAC/PLUMBING EQUIPMENT CONNECTION SCHEDULE AND SYMBOL LEGEND.
  - C. ALL TYPE 'A' AND 'B' FIXTURES TO HAVE INTEGRAL OCCUPANCY SENSOR. OCCUPANCY SENSOR TO TURN OFF LIGHTS 30 MINUTES AFTER.

- NOTES THIS SHEET**
- 1 SECURE WEATHER-HEAD TO SIDE OF BUILDING. COORDINATE INSTALLATION AND REQUIRED HEIGHT OF WEATHER-HEAD WITH PGE.
  - 2 WORKING CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT PER N.E.C. 110.26.
  - 3 ROUTE CONDUITS ON BACK OF SHELFING SYSTEM. COORDINATE INSTALLATION OF RECEPTACLES AND CONDUIT PRIOR TO ROUGH-IN.
  - 4 HYDROGEN EXHAUST CONTROL PANEL. CKT. 2P-16.
  - 5 EF-1, 2, 3 RELAY ENCLOSURE. SEE DETAIL 2/E4.
  - 6 TEMPORARY LOCATION OF CART CHARGING WHILE DOOR OR OPEN AREA IS NOT BEING USED.



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 E-mail: rwaeng@rwaeng.com  
 Project No.: 1179.003.001 Contact: DENNIS HALL  
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 Douglas D. Shaw  
 OREGON  
 JULY 14, 1978  
 DOUGLAS D. SHAW  
 EXPIRES: 6/30/14

3/11/13	0	BID SET
DATE:	NO.	REVISION

DRAWN: DH	DESIGNED: DH	CHECKED:
SCALE: AS SHOWN	DATE: 1/23/2013	
PROJECT NO. 1179.003.001		

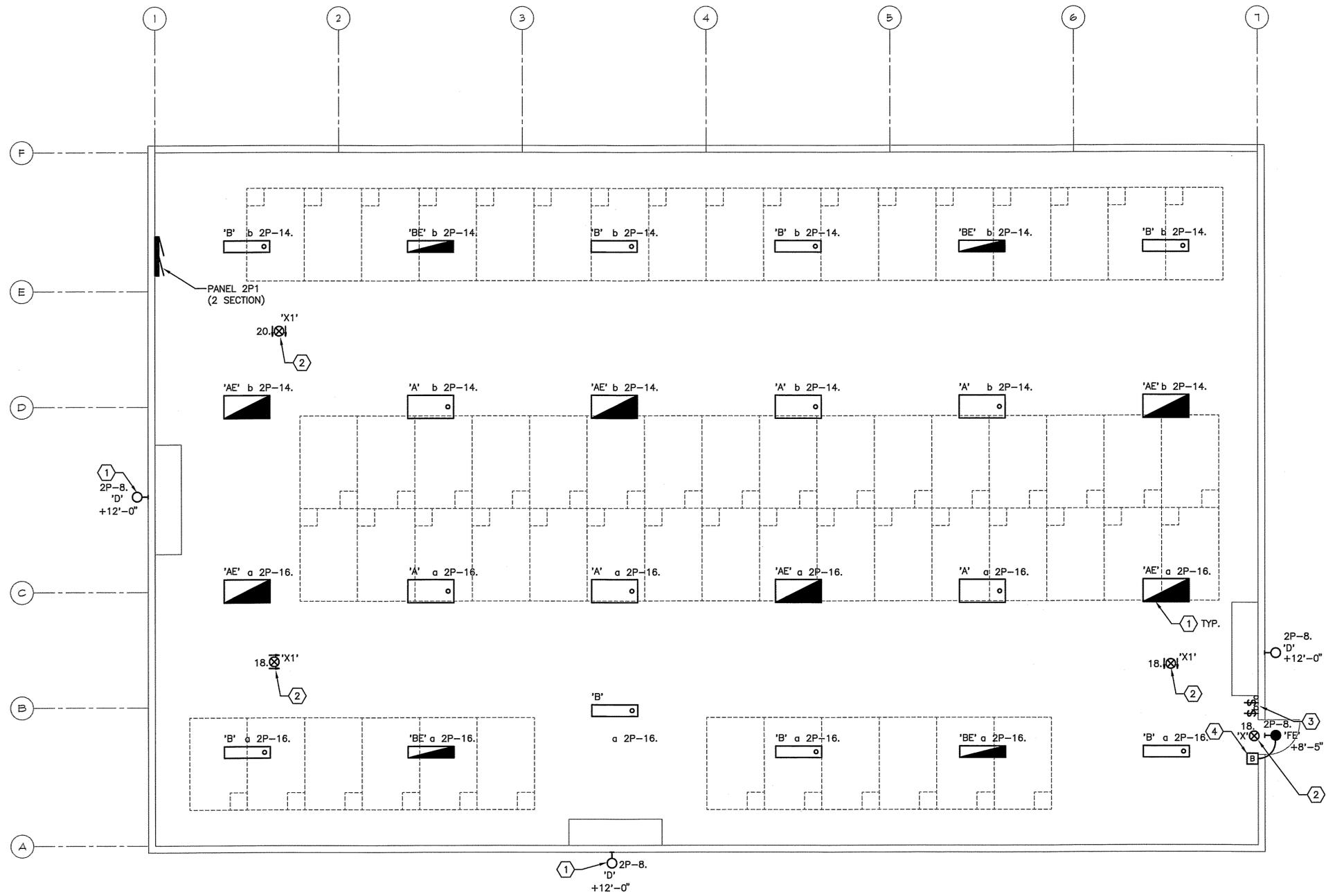
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 PORTLAND, OREGON 97232

**BUILDING FLOOR PLAN - LIGHTING & POWER**  
 TOPOGRAPHIC SURVEY  
 A PORTION OF GLENDOVEER GOLF COURSE

**E4**  
**7**

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**GENERAL NOTES**

- A. ALL BRANCH CIRCUITS ARE CONNECTED TO PANEL 2P.
- B. SEE DRAWING E1 FOR LUMINAIRE SCHEDULE AND SYMBOL LEGEND.
- C. ALL TYPE 'A' AND 'B' FIXTURES TO HAVE INTEGRAL OCCUPANCY SENSOR. OCCUPANCY SENSOR TO TURN OFF LIGHTS 30 MINUTES AFTER SPACE IS UNOCCUPIED.

**NOTES THIS SHEET**

- ① PROVIDE UNSWITCHED BRANCH CIRCUIT TO EMERGENCY EGRESS LIGHT FOR CONTINUOUS BATTERY CHARGING. LUMINAIRE TO OPERATE IN LOSS OF BUILDING POWER.
- ② PROVIDE UNSWITCHED BRANCH CIRCUIT TO EXIT SIGN FOR CONTINUOUS BATTERY CHARGING. EXIT SIGNS TO OPERATE AT ALL TIMES.
- ③ LIGHT SWITCHES FOR INTERIOR LIGHTS. LOWER CASE LETTER INDICATES WHICH LUMINAIRE GROUP IS TO BE CONTROLLED.
- ④ MOUNT REMOTE EMERGENCY BALLAST ON INTERIOR STRUCTURE OF BUILDING. PROVIDE UNSWITCHED BRANCH CIRCUIT TO BALLAST FOR CONTINUOUS BATTERY CHARGING.

1 BUILDING FLOOR PLAN - LIGHTING & POWER  
E5 3/16" = 1'-0"

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Project No.: 1179.003.001 Contact: DENNIS HALL

REGISTERED PROFESSIONAL ENGINEER  
Douglas D. Shaw  
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JULY 14, 1978  
DOUGLAS D. SHAW  
EXPIRES: 6/30/14

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**BUILDING FLOOR PLAN - LIGHTING & POWER**  
TOPOGRAPHIC SURVEY  
A PORTION OF GLENDOVEER GOLF COURSE

**E5**  
7

SECTION 16000  
ELECTRICAL

PART 1—GENERAL  
1.1 SUMMARY

- A. Electrical systems required for this work includes labor, materials, equipment, and services necessary to complete installation of electrical work shown on Drawings, specified herein or required for a complete operable facility and not specifically described in other Sections of these Specifications. Among the items required are:
1. Service and distribution equipment shown on Drawings.
  2. Feeders to switchboards, distribution panels, Heating-Ventilating and Air Conditioning (HVAC) equipment, Owner provided equipment and other equipment as detailed.
  3. Branch circuit wiring from the distribution panels for lighting, receptacles, motors, signal systems and other detailed circuit wiring.
  4. Luminaires, control switches, receptacles, relays, supports and other accessory items.
  5. Wiring and power connections for motors installed for heating, cooling and ventilation.

EDIT NOTE: MODIFY THE FOLLOWING IF THE OWNER IS PAYING FEES, COORDINATE WITH OWNER/ARCHITECT.

1. Pay fees levied by serving electric utility to provide service to this project.
2. Obtain fees from serving electric utility prior to submitting a bid.
3. Obtain and pay for electrical permits, [plan review,] and inspections from local authorities having jurisdiction (AHJs).

1.2 DEFINITIONS

- A. Provide: To furnish and install, complete and ready for the intended use.
- B. Furnish: Supply and deliver to the project site, ready for unpacking, assembly and installation.
- C. Install: Includes unloading, unpacking, assembling, erecting, installation, applying, finishing, protecting, cleaning and similar operations at the project site as required to complete items of work furnished by others.

1.3 SUBMITTALS

- A. Operation and Maintenance Documentation: Provide copies of certificates of code authority acceptance, test data, product data, warranties, and the like.
- B. Shop Drawings: Provide shop drawings which include physical characteristics, electrical characteristics, device layout plans, wiring diagrams, and the like.
- C. Record Drawings: Show changes and deviations from the Drawings. Include written Addendum and change order items. Make changes to Drawings in a neat, clean, and legible manner.

1.4 QUALITY ASSURANCE

- A. Conform to requirements of the National Electric Code (NEC), latest adopted version with amendments by local AHJs.
- B. Conform to latest adopted version of the Uniform Building Code (UBC) with amendments by local AHJs.
- C. Furnish products listed by Underwriters' Laboratories, Inc. (UL) or other testing firm acceptable to AHJ.
- D. Conform to requirements of the serving electric utilities.

1.5 SEQUENCING AND SCHEDULING

- A. For the proper execution of the work cooperate with other crafts and contracts as needed.
- B. To avoid installation conflicts, thoroughly examine the complete set of Contract Documents. Resolve conflicts prior to installation.
- C. Prior to installation of feeders to equipment requiring electrical connections, examine the manufacturer's shop drawings, wiring diagrams, product data, and installation instructions. Verify that the electrical characteristics detailed in the Contract Documents are consistent with the electrical characteristics of the actual equipment being installed.

1.6 WARRANTY

- A. Ballast Manufacturer's Warranty: Not less than 2 years for magnetic type ballasts and 5 years for electronic type ballasts, based on date of manufacturer embossed on ballast, current with installation date. Warranty includes normal cost of labor for replacement of ballast.
- B. Lamp Warranty: 30 days for incandescent, 6 months for compact fluorescent, 12 for fluorescent and HID lamps.

PART 2—PRODUCTS

2.1 MATERIALS

- A. Provide new electrical materials of the type and quality detailed, listed by UL, bearing their label wherever standards have been established. Indicated brand names and catalog numbers are used to establish standards of performance and quality. The description of materials listed herein governs in the event that catalog numbers do not correspond to materials described herein.
- B. Include special features, finishes, accessories, and other requirements as described in the Contract Documents regardless of the item's listed catalog number.
- C. Provide incidentals not specifically mentioned herein or noted on Drawings, but needed to complete the system or systems, in a safe and satisfactory working condition.

2.2 RACEWAYS

- A. Galvanized Rigid Steel Conduit (GRC): Federal Specification WWC-581 and American National Standards Institute (ANSI) C80.1.
- B. Intermediate Metal Conduit (IMC): Federal Specification WWC-581.
- C. Electrical Metallic Tubing (EMT): Federal Specification WWC-563 and ANSI C80.3.
- D. Flexible Conduit: Reduced wall flexible steel conduit. Federal Specification WWC-566.
- E. Flexible Conduit, PVC Coated: PVC chemical resistant jacket.
- F. PVC: Class 40 heavy wall rigid PVC, Federal Specification WC1094A and National Electrical Manufacturer's Association (NEMA) TC-2.

Conduit Fittings:

1. Bushings: Malleable iron with plastic insulator lining, 150C rated.
2. Ground Bushings: Malleable iron with plastic insulating liner and aluminum grounding lug rated for copper or aluminum conductor, 150C rated.
3. EMT Connectors and Couplings:
  - a. Set Screw Type: Zinc plated steel, insulated throat connectors, raintight up to 2-inch.
  - b. Compression Type: Zinc plated steel, insulated throat connectors, raintight up to 2-inch.

2.3 WIRES AND CABLES

- A. Copper, 600 volt rated throughout. Conductors 14AWG to 10AWG, solid or stranded. Conductors 8AWG and larger, stranded. Phase color to be consistent at feeder terminations; A-B-C, top to bottom, left to right, front to back. Conductors 3AWG and larger, minimum insulation rating of 75C. Insulation types THWN, THHN or XHHW. Minimum insulation rating of 90C for branch circuits.
- B. Service Entrance Cable: Copper conductor, 600 volt insulation, XHHW, Type SE.

2.4 BOXES

- A. Luminaire Outlet: 4-inch octagonal box, 1-1/2-inches deep with 3/8-inch luminaire stud if required. Provide raised covers on bracket outlets and on ceiling outlets.
- B. Device Outlet: Minimum 4-inch square, minimum 1-1/2-inches deep. Single or 2-gang flush device raised covers. Raco Series 681 and 686 or Bowers.
- C. Multiple Devices: Three or more devices at common location. Install 1-piece gang boxes with 1-piece device cover, one device per gang.
- D. Masonry Boxes: Outlets in concrete, Raco Series 690 or Bowers.

- A. Weatherproof Outlet Boxes: Corrosion-resistant cast metal weatherproof outlet wiring boxes, of the type, shape and size, including depth of box, with threaded conduit ends, cast metal face plate with spring-hinged waterproof cap suitably configured for each application, including face plate gasket, blank plugs and corrosionproof fasteners and gray finish.
- F. Junction and Pull Boxes: Galvanized sheet steel junction and pull boxes, with screw-on covers; of the type shape and size, to suit each respective location and installation; with welded seams and equipped with steel nuts, bolts, screws and washers.

2.5 WIRING DEVICES

- A. Finish: White finish. Verify color with Architect.
- B. Wall Switches: Toggle type, quiet acting, 20 amp, 120/277 volt, UL listed for motor loads up to 80 percent of rated amperage. Arrow-Hart 1221, Leviton 1221, Pass & Seymour 20ACI, Bryant 4901, Hubbell 1221.
- C. Pilot Light Switches: Lighted handle, toggle type, red, neon pilot lamp. Pilot lamp energized when load is energized. 20 amp/120 volt, Arrow-Hart 1991-PL, Leviton 1221-PL, Pass & Seymour 20A0-PL, Bryant 4901-PL, Hubbell 1221-PL.
- D. Receptacles: Straight parallel blade 15 amp, 125 volt, 2-pole - 3 wire grounding. Arrow-Hart 5352, Leviton 5352, Pass & Seymour 5352, Bryant 5352, Hubbell 5352.
- E. Ground Fault Interrupter Receptacle: Feed through type, 20 amp, 125VAC. Hubbell IG-5362, Arrow-Hart IG-5362, Leviton, Pass & Seymour, Bryant.
- F. Finish Plates: Smooth thermoplastic, same finish as device.

2.6 SAFETY DISCONNECTS

- A. Toggle Type Disconnect Switches: 120 volt, 1-pole, 20 amp, 1 HP maximum. NEMA 1 enclosure for indoors, NEMA 3R enclosure for outdoors.
- B. Manual Motor Starters: Quick-make, quick-break. Thermal overload protection. Device labeled with maximum voltage, current and horsepower. Square-D Class 2510, Siemens, General Electric, or Cutler-Hammer/Westinghouse. Provide NEMA 1 enclosure for indoors, NEMA 3R enclosure for outdoors.
- C. Safety Switches: Heavy duty, fused type, dual rated, quick-make, quick-break with fuse rejection feature for use with Class R fuses only. Provide NEMA 1 enclosure for indoors, NEMA 3R enclosure for outdoors. Manufacturers: Cutler-Hammer/Westinghouse, Square-D, or Siemens.

2.7 SUPPORTING DEVICES

- A. Hangers: Kindorf B-905-2A channel, H-119-D washer, C105 strap, 3/8-inch rod with ceiling flange.
- B. Pipe Straps: Two-hole galvanized or malleable iron.

2.8 ELECTRICAL IDENTIFICATION

- A. Engraved Labels: Melamine plastic laminate, white with black core, 1/16-inch thick, manufactured by Lamicoid. Engravers standard letter style, minimum 3/16-inch high letters. Drill or punch labels for mechanical fastening except where adhesive mounting is necessary because of substrate. Use self tapping stainless steel screws.
- B. Conductor Numbers: Manufacturers standard vinyl-cloth self-adhesive cable and conductor markers of the wraparound type.
- C. Branch Circuit Schedules: Provide branch circuit identification schedules, typewritten, clearly filled out, to identify load connected to each circuit and location of load.

2.9 GROUNDING MATERIALS

- A. Ground Rods: Copperclad steel, 3/4-inch diameter, [10]-feet long, tapered point, chamfered top.
- B. Grounding Connectors: Hydraulic compression tool applied connectors or exothermic welding process connectors or powder actuated compression tool applied connectors. Mechanical type of connectors are not acceptable. Manufacturers: Burndy Hyground Compression System, Erico/Cadweld, Amp Ampact Grounding System or approved.
- C. Pipe Grounding Clamp: Mechanical ground connector with cable parallel or perpendicular to pipe.
- D. Telecommunications Grounding Bar: 1/4-inch thick by 4-inch high by 20-inch long copper ground bar with insulators.

2.10 METERING EQUIPMENT

- A. Meter Base: [Surface]-mounted meter socket enclosure. Provide meter base(s) for energy/demand and reactive energy/demand bases as required by serving electric utility.
- B. C.T. Enclosure: Meet serving utility company's requirements. Provide separate C.T. cabinet as detailed.
- C.

2.11 SWITCHBOARD AND DISTRIBUTION PANELBOARD CONSTRUCTION

- A. Manufacturers: Siemens, Square-D, Cutler-Hammer, General Electric, or approved.
- B. Standards: Comply with requirements of UL 891, NEMA PB2 and NEC 384 in construction of switchboards. Provide short circuit current rating (Integrated Equipment Rating, IER) for panelboards.
- C. Lugs: Compression type.
- D. Switchboard:
  1. Enclosure: Free standing, dead front with front accessibility. Framework constructed of formed, code gauge steel, rigidly welded and bolted together to support cover plates, bussing and component devices during shipment and installation bolt steel base channels to the frame to rigidly support the entire shipping section for moving on rollers and floor mounting.
  2. Bussing: Extruded aluminum plated by ALTIM 70 or 80 process. Bus supports, connections and joints bolted together with hex-head bolts and Belleville washers. Full length of switchboard ground bus, 50 percent of phase bus capacity.
  3. Provide fully rated integrated equipment rating greater than the available fault current. Series rated switchboards are not acceptable. See Drawings for available fault current, if Drawings do not have the available fault currents then coordinate with serving electric utility.
- E. Distribution Panelboards:
  1. Enclosure: Flush panelboards rated 600 amp or less provide maximum enclosure depth of 5-3/4-inches. Provide galvanized metal finish.
  2. Bussing: Copper bar with suitable electroplating (tin) for corrosion control at connection. Provide ground bar to accommodate specified terminal lugs.
  3. Provide fully rated integrated equipment rating greater than the available fault current. See Drawings for available fault current, if Drawings do not have the available fault currents then coordinate with serving electric utility. Minimum rating is 10,000 amps.
  4. Breakers: Bolt-on type.
  5. Cover: Hinged door, flush lift latch and lock, two keys per panel. Key branch circuit panelboards alike. Medium light grey finish suitable for field painting to match wall finish.
  - 6.

2.12 OVERCURRENT PROTECTIVE DEVICES

- A. Fuses: Dual element, time delay, current limiting, nonrenewable type, rejection feature. UL Class RK5, 1/10 to 600 amp, UL Class L, above 600 amps. Provide fuse pullers for complete range of fuses. Manufacturers: Busmann, Gould-Shawmut, Littelfuse, or approved.
- B. Molded Case Circuit Breakers: One, two or three-pole bolt on, single handle common trip, rated 15 to 800 amp, as indicated on Drawings. Overcurrent toggle-type mechanism, quick-make, quick-break action. Trip indication is by handle position. Calibrate for operation in 40C ambient temperature.

2.13 CONTROL DEVICES

- A. Lighting Contactors:
  1. Continuously rated 20 amp per pole for all types of ballast and tungsten lighting and resistance loads, do not derate for use on high-inrush loads.
  2. Contacts: Double break, silver-cadmium-oxide. Auxiliary arcing contacts not acceptable. Convertible Contacts, N.O. or N.C. Contact status, N.O. or N.C., clearly visible.
  3. Approved per UL 508. Design in accordance with NEMA ICS2-211B, rated for application to 600 volt.
  4. Electrically Held Contactor Call: Continuously rated and encapsulated.
  5. Contactor Enclosures: Provide NEMA enclosure suitable for location and use, flush or surface mount as indicated on Drawings.
- B. Electronic Time Switches: Double pole, single throw; one N.O. contact, one N.C. contact. 24-hour digital. Battery power source to provide minimum of 3 years of memory back-up. Eight event setpoints. Provide enclosure with separate hinged door, recessed or surface as indicated on Drawings. Intermatic, Paragon, Torq, Sangamo, or approved.
- C. Photoelectric Switches: Hermetically sealed light sensitive element installed in die-cast weatherproof enclosure. Adjustable external light level slide. Swivel adjustable enclosure. 20VAC, 1800VA, connected for pilot duty unless otherwise indicated. Paragon, Torq, Precision, or approved.

2.14 LUMINAIRES

- A. Luminaires: Refer to description and manufacturers in Luminaire Schedule.
- B. Where recessed luminaires are installed in cavities intended to be insulated, provide IC rated luminaires or other code approved installation.
- C. Recessed Luminaires: Frame compatible with the ceiling material installed at the particular luminaire location.
- D. Light Transmitting Components: Prismatic acrylic, extruded, flat diffusers, 0.125-inch overall thickness, unless otherwise noted.

2.15 BALLASTS

- A. Ballasts, General:
  1. Provide ballasts rated for specified lamps, i.e., T-8 rated ballasts where T-8 lamps specified.
  2. Thermal Protection: Internal UL Class P with automatic reset.
  3. Power Factors: Not less than 90 percent unless otherwise indicated.
  4. Sound Ratings: Rating A, except where not available as standard products from manufacturer. Provide the quietest ratings available.
  5. Input Voltage: Match branch circuit supply voltage; refer to Drawings.
- B. Fluorescent Electronic Ballasts:
  1. Provide ballasts which meet the requirements of UL 935 and bear the appropriate UL label.
  2. Electrical Characteristics:
    - a. Provide electronic ballasts which withstand input power line transients as defined in ANSI C62.41, Category-A and Institute of Electrical and Electronic Engineers (IEEE) 587.
    - b. Lamp Crest Factor: Not to exceed 1.7 or less for rapid start ballasts and 1.85 or less for instant start ballasts.
    - c. Total Harmonic Distortion: Not to exceed 10 percent of the input current.
  3. Manufacturer: Advance RCN/VCN Series, Motorola, or approved.
- C. HID Ballasts: Provide minus 20F minimum starting temperature. Constant wattage multi-tap autotransformer (CWA) types equal to Advance 73B Series except, high leakage-reactance high power factor (HX-HPF) equal to Advance 72C Series acceptable for use to 100 watt high pressure sodium lamp.

2.16 LAMPS

- A. HID Lamps: Specified in Luminaire Schedule, General Electric, Osram/Sylvania, Philips, Venture.
- B. Fluorescent Lamps: 4100K minimum CRI [80.] [ ], length and wattage as noted in Luminaire Schedule, General Electric, Osram/Sylvania, Philips.
- C. Incandescent: 130 volt rated. General Electric, Osram/Sylvania, Philips.

PART 3—EXECUTION

3.1 EXAMINATION

- A. Drawings are diagrammatic with symbols representing electrical equipment, outlets, luminaires, and wiring. Examine the entire set of Drawings to avoid conflicts with other systems. Determine exact route and installation of electrical wiring and equipment with conditions of construction.
- B. Clarification:
  1. The Drawings govern in matters of quantity, the Specification in matters of quality. In event of conflict on Drawings or in the Specifications, the greater quantity and the higher quality apply.
  2. Should the Electrical Documents indicate a condition conflicting with the governing codes and regulations, refrain from installing that portion of the work until clarified by Architect.

3.2 MOTORS/APPLIANCE/UTILIZATION BRANCH CIRCUIT WIRING

- A. Electrical Connections: Connect equipment, whether furnished by Owner or other Divisions of the Contract, electrically complete.
- B. Connect motor branch circuits complete from panel to motor as required by code and manner herein described.
- C. Appliance/Utilization Equipment: Provide appropriate cable and cord cap for final connection unless equipment is provided with same. Verify special purpose outlet NEMA configuration and ampere rating with equipment supplier prior to ordering devices and coverplates.

3.3 INSTALLATION

- A. Install electrical equipment complete as directed by manufacturer's installation instructions. Obtain installation instructions from manufacturer prior to rough-in of the electrical equipment, examine the instructions thoroughly.
- B. Earthwork: Perform excavation and backfill for the installation of electrical work.
- C. Noise Control: Do not place outlet boxes at opposite side of partitions or walls back to back. Do not place contactors, transformers, starters or similar noise producing devices on walls which are common to occupied spaces unless specifically called for on Drawings. Where such devices must be mounted on walls common to occupied spaces, mount or isolate in such a manner as to effectively prevent the transmission of their inherent noise to the occupied space.

Conduit:

1. Conceal conduits. Exposed conduits are permitted only in the following areas: Mechanical rooms, electrical rooms or spaces where walls, ceilings and floors will not be covered with finished materials. Existing walls that are concrete or block construction and where specifically noted on the Drawings.
  2. Do not install conduits on surface of building exterior, across roof, on top of parapet walls, or across floors.
  3. Below Grade Conduit and Cables: Place a minimum 3-inch cover of sand or clean earth fill around the cable or conduit on a leveled trench bottom. Lay conduit on a smooth level trench bottom, so that contact is made for its entire length. Remove water from trench before electrical conduit is installed.
  4. Conduit Terminations: Provide conduits shown on Drawings which terminate without box, panel, cabinet or conduit fitting with conduit connector or bushing.
  5. Conduit Size: Minimum trade size 1/2-inch.
  6. Provide pull cord in empty conduits.
  7. Conduit Use Locations:
    - a. Underground: PVC.
    - b. Cast-in-Place Concrete, Masonry, Damp Locations and Subject to Mechanical Damage: GRC or IMC.
    - c. Dry, Protected: GRC, IMC, EMT.
    - d. Sharp Bends and Elbows: GRC, EMT use factory elbows.
    - e. Motors, recessed luminaires and equipment connections subject to movement or vibration, use flexible metallic conduit.
    - f. Motors and equipment connections subject to movement or vibration and subjected to the following conditions: exterior location, moist or humid atmosphere, water spray, oil or grease use PVC coated liquid tight flexible metallic conduit.
  8. Branch Circuits: Do not change the intent of the branch circuits or controls without approval. Homeruns for 20 amp branch circuits may be combined to a maximum of six conductors in a homerun. Apply derating factors as required by NEC 310. Increase conductor size as needed.
- F. Wires and Cables:
    1. Conductor Installation: Install conductors with care to avoid damage to insulation. Do not apply greater tension on conductors than recommended by manufacturer during installation.
    2. Conductor Size and Quantity: Install no conductors smaller than 12AWG unless otherwise shown. Provide required conductors for a fully operable system.
    3. [MC Cable Allowed is not allowed.
  - G. Boxes:
    1. Anchoring: Secure boxes rigidly to the substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.
    2. Provide weatherproof outlets for locations exposed to weather or moisture.
    3. Code Compliance: Comply with NEC as applicable to construction and installation of electrical boxes and fittings and size boxes according to NEC 370, except as noted otherwise.
    4. Mount Center of Outlet Boxes as Required by Americans With Disabilities Act (ADA), or Noted on Drawings, the Following Distance above the Floor:
      - a. Control Switches: 48-inches.
      - b. Receptacles: 18-inches.
      - c. Telecom Outlets: 18-inches.
      - d. Other Outlets: As indicated in other Sections of Specifications or as detailed on Drawings.

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3/11/13	0	BID SET	DRAWN: DH	DESIGNED: DH	CHECKED:
			SCALE: AS SHOWN	DATE: 1/23/2013	
DATE:	NO.	REVISION	PROJECT NO. 1179.003.001		



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ELECTRICAL SPECIFICATION  
TOPOGRAPHIC SURVEY  
A PORTION OF GLENDOVEER GOLF COURSE

E6

7



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Project No.: 1179.003.001 Contact: DENNIS HALL



EXPIRES: 6/30/14

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- H. Provide NEC--required disconnect switches whether specifically shown on Drawings or not. Provide disconnect switch at each motor location within 5--feet unless otherwise noted. Coordinate fuse ampere rating with installed equipment. Fuse ampere rating variance between original design information and installed equipment, size in accordance with Bussmann Fusetron 40C recommendations.
- I. Supporting Devices:
1. Safety factor of 4 required for every fastening device or support for electrical equipment installed. Support to withstand four times weight of equipment it supports. Bracing to comply with Seismic Zone 3 requirements.
  2. Provide vertical support members for equipment and luminaires, straight and parallel to building walls. Provide independent supports to structural member for electrical luminaires, materials, or equipment installed in or on ceiling, walls or in void spaces or over furred or suspended ceilings.
- J. Electrical Identification:
1. Conductor Identification: Apply markers on each conductor for power, control, signaling and communications circuits.
  2. Provide an engraved label on each major unit of electrical equipment, including but not limited to the following items: Disconnect switches, relays, contactors, time switches, override switches, service disconnects, distribution switches, branch circuit panelboards, and central or master unit of each electrical system including communication/signal systems.
- K. Service and Distribution: Verify utility requirements prior to bidding and provide associated work required by local utility including but not limited to: Service underground primary including conduit, pull cord, excavation and backfill. Underground pull vaults. Pole risers. Transformer pads, vaults, and the like. Secondary service lateral including conduit, and conductors. Grounding of transformers. Service metering equipment.
- L. Grounding:
1. Performance Requirements: Supplement the grounded neutral of the secondary distribution system with an equipment grounding system to properly safeguard the equipment and personnel. Install equipment grounding such that metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items in close proximity with electrical circuits operate continuously at ground potential and provide a low impedance path for possible ground fault currents.
  2. Concrete Encased Ground Electrode: From the service equipment ground bus install grounding electrode conductor to footing foundation rebar. Bond the grounding electrode conductor to two independent steel rebars. Each rebar minimum length is 20--feet. Protect grounding electrode conductor extension from footing/foundation to service equipment with rigid PVC conduit.
  3. Ground Rod Electrode:
    - a. Coordinate placement of ground rods and interconnecting conductor in base of building footing prior to placement of concrete.
    - b. Install 40 feet of No. 3/0 stranded bare copper conductor in base of perimeter footing.
    - c. Layout conductor to provide maximum exposure to earth in the perimeter footing. Do not fold conductor.
    - d. Bond to driven ground rods at 20--feet o.c.
    - e. Tap at center ground rod and extend ground electrode conductor to service ground bus. Install ground electrode conductor extension in rigid PVC conduit for physical protection.
  4. Water Service Grounding: Bond building ground electrode and water service pipe to service ground bus. Connect to water pipe on utility side of isolating fittings or meters.
  5. Raceway Grounding: Ground metallic raceway systems. Bond to ground terminal with code size jumper except where code size or larger grounding conductor is included with circuit, use grounding bushing with lay--in lug. Install ground bushings on metallic raceway terminations in pull boxes, panelboards and the like for circuits with overcurrent protection set at 60 amp and greater.
  6. Install equipment grounding conductor, code size minimum in nonmetallic and metallic raceway systems.
  7. Telecommunications Backboard: Provide telecommunications grounding bar at each telecommunications backboard. Bond the grounding bar to service grounding bar in the main service equipment with a 6AWG copper equipment grounding conductor.
  8. Motors, Equipment and Appliances: Install code size equipment grounding conductor from outlet box to (motor) equipment frame or manufacturer's designated ground terminal.
  9. Receptacles: Connect ground terminal of receptacle to equipment ground system by No. 14 conductor bolted to outlet box. Self grounding nature of receptacle devices does not eliminate conductor bolted to outlet box.
- M. [Distribution Panelboards]:
1. Install equipment complete as directed by manufacturer's installation instructions.
  2. Install equipment in conformance with work space requirements of NEC 110--16. Locate equipment in rooms or spaces dedicated to such equipment, NEC 384--2. Coordinate with other Divisions of work.
  3. Flush Panels: Verify available recessing depth and coordinate wall framing with other Divisions. Provide one spare conduits from panel to accessible space above and below the panel. Maintain fire rating of wall.
- N. Fuses: For each class and ampere rating of fuse installed, provide three spare fuses.
- O. Control Devices:
1. Install time switches and other automatic control devices in accessible locations near the source of power or grouped at a common location in mechanical rooms or similar spaces.
  2. Install photoelectric control devices at such locations as necessary to be most effective. Avoid locating photoelectric devices in or at locations where they can be influenced by other than natural light or under eaves. Verify location of equipment with Architect.
- P. Lighting:
1. Install luminaire of types indicated where shown and at indicated heights; in accordance with manufacturer's written instructions and with recognized industry practices.
  2. Avoid interference with and provide clearance for equipment. Where the indicated locations for the luminaires conflict with the locations for equipment, change the locations for the luminaire as directed by Architect.
  3. Suspended Luminaires: Mounting heights indicate the clearances between the bottom of the luminaire and the finished floors.
  4. Support Luminaires: Anchor supports to the structural slab or to structural members within a partition, or above a suspended ceiling.
  5. Provide recessed fluorescent luminaires with two support wires as required by UBC.
  6. Provide lighting indicated on Drawings with a luminaire of the type designated and appropriate for the location. Where outlet symbols appear on Drawings without a type designation provide a luminaire the same as those used in similar or like locations.
- 3.4 FIELD QUALITY CONTROL
- A. Tests: Conduct tests of equipment and systems to demonstrate compliance with requirements specified in Division 16. Refer to individual Specification Sections for required tests. Document tests and include in Closeout Documents.
  - B. Verify electrical characteristics of equipment prior to installation of conduits and wiring for equipment.
  - C. Coordinate HVAC voltage requirements with Drawings and equipment submittals prior to rough in.
  - D. Wiring Device Tests: Test wiring devices to ensure electrical continuity of grounding connections, and after energizing circuitry, to demonstrate compliance with requirements. Test receptacles for line to neutral, line to ground and neutral to ground faults. Correct defective wiring.
  - E. Verification of Conditions: Verify ceiling construction, recessing depth and other construction details prior to release of luminaire for shipment.
- 3.5 CLEANING
- A. Remove dirt and debris caused by the execution of the electrical work. Leave the entire electrical system installed in clean, dust--free and proper working order.
  - B. Thoroughly clean the exterior and the interior of each switchboard and distribution panelboard in accordance with manufacturer's installation instructions.
  - C. Where finish of luminaires, or enclosures is damaged, touch up finish with matching paint in accordance to manufacturer's specifications and installation instructions.
  - D. Clean paint splatters, dirt, dust, fingerprints, and debris from luminaires.

END OF SECTION

3/11/13	0	BID SET	DRAWN: DH	DESIGNED: DH	CHECKED:
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**ELECTRICAL SPECIFICATION**  
 TOPOGRAPHIC SURVEY  
 A PORTION OF GLENDOVEER GOLF COURSE

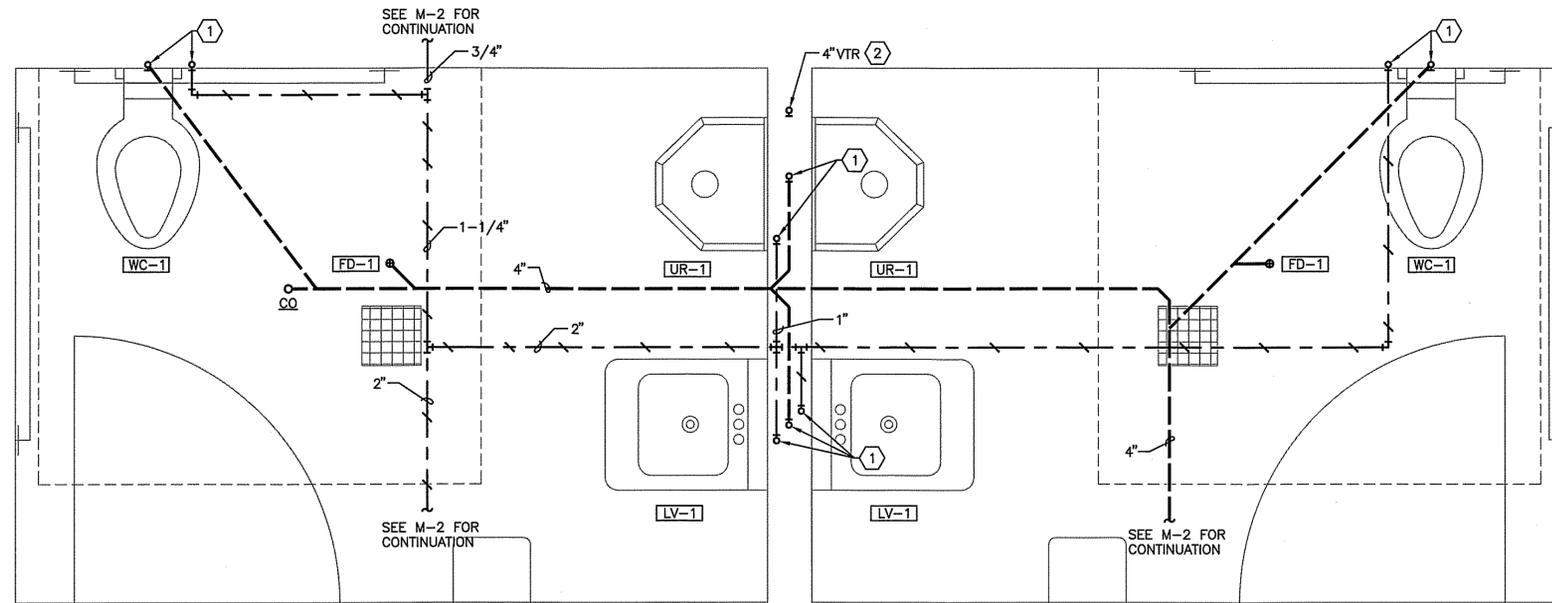
**E7**  
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**R&W**  
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 "Engineering Integrated Solutions"

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Project No.: 1179.003.001 Contact: DENNIS HALL

**REGISTERED PROFESSIONAL ENGINEER**  
 9785  
 Douglas D. Shaw  
 OREGON  
 JULY 14, 1978  
 DOUGLAS D. SHAW  
 EXPIRES: 6/30/14



PLUMBING LEGEND	
	CW COLD WATER, BELOW GRADE
	V VENT
	W SANITARY WASTE (BELOW GRADE)
B.G. BELOW GRADE	
DS DOWN SPOUT	
(E) EXISTING	
(N) NEW	
(R) REMOVE	
VTR VENT THRU ROOF	
	CO FLOOR CLEANOUT
	COTG CLEANOUT TO GRADE
	WCO WALL CLEANOUT
	B BALL VALVE
	Z CHECK VALVE
	H HOSE BIBB
	WH-1 PLUMBING FIXTURE MARK NO. SEE PLUMBING FIXTURE CONNECTION SCHEDULE.
	1 SHEET NOTE
	1 CONNECT TO EXISTING AT THIS POINT. VERIFY EXACT LOCATION, SIZE AND CONDITION.

MECHANICAL LEGEND	
ABBREVIATIONS	
AFF	ABOVE FINISHED FLOOR
BDD	BACKDRAFT DAMPER
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
(E)	EXISTING
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST AIR
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
MA	MAKE-UP AIR
MBH	1000 BTU PER HOUR
MFR	MANUFACTURER
(N)	NEW
OSA	OUTSIDE AIR
PSI	POUNDS PER SQUARE INCH
RA	RETURN AIR
SA	SUPPLY AIR
REFERENCE	
	1 SHEET NOTE
	VAV 1 EQUIPMENT MARK NUMBER SEE SCHEDULES
	1 REVISION

1 M1 RESTROOM FLOOR PLAN - MECHANICAL 1" = 1'-0"

NOTES THIS SHEET

- 1 EXTEND WASTE AND WATER PIPING ABOVE GRADE 3" AND CAP FOR FUTURE CONNECTION.
- 2 EXTEND VTR THRU ROOF. CAP PIPING AT 18" BELOW ROOF FOR FUTURE CONNECTION.

EXHAUST FAN SCHEDULE

MARK NUMBER	EF		
	1	2	3
	4	3	1
SYSTEM	BLDG.		
TYPE	SIDEWALL		
AIR FLOW (CFM)	2000		
ESP ("H2O)	0.10"		
MOTOR	1/4		
ELECTRICAL (V-PH)	120V, 1P		
DESIGN WEIGHT (LBS)	90#		
MANUFACTURER/MODEL	COOK/165W10D		

- 1 FAN SPEED CONTROLLER.
- 2 PROVIDE WALL EXHAUST CAP.
- 3 SPARK-RESISTANT FAN BLADE.
- 4 GRAVITY BACKDRAFT DAMPER ON FAN INLET.

PLUMBING FIXTURE CONNECTION SCHEDULE 1

MARK	FIXTURE	W	V	CW	HW	TW	MANUFACTURER	REMARKS
WC-1	WATER CLOSET HANDICAP 2	4	2	1			AMERICAN STANDARD 3351.160 OPTIMA 8111-1.28 FLUSH VALVE	WALL HUNG, 1.28 GPF VALVE, VALVE, CHAIR CARRIER, WALL SUPPORT, ELONGATED, ADA HEIGHT, WHITE W/ WHITE OPEN FRONT SEAT
UR-1	URINAL HANDICAP 2	2	2	3/4			AMERICAN STANDARD 6210.010 OPTIMA 8186 FLUSH VALVE	WALL HUNG, WALL HANGER, 1.0 GPF VALVE, ADA HEIGHTS; FLOOR MOUNTED SUPPORT
LV-1	LAVATORY 2	1-1/2	1-1/4	1/2	1/2		AMERICAN STANDARD 9141.011 SLOAN OPTIMA EBF-85 FAUCET	WALL HUNG, ADA, CHROME GRID STRAINER, P-TRAP, SUPPLIES & STOPS, WHITE, CARRIER CONCEALED ARMS CARRIER, 4" CENTERS
FD-1	FLOOR DRAIN	3	2				SMITH 2005-A NICKEL - BRONZE STRAINER	PRIME
HB-1	HOSE BIBB			3/4			SMITH 5810-N-H-PB	NON-FREEZE RECESSED GROUND BOX

- 1 BRANCH PIPE SIZE TO FIXTURE SAME AS CONNECTION SIZE SHOWN ABOVE UNLESS INDICATED OTHERWISE ON DRAWINGS.
- 2 FIXTURE NOT TO BE PROVIDED AT THIS TIME. MODEL NUMBERS GIVEN FOR ROUGH-IN DIMENSIONS.

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3/11/13	0	BID SET	DRAWN:	DESIGNED: DCP	CHECKED: DCP
			SCALE: AS SHOWN	DATE: 1/23/2013	
DATE:	NO.	REVISION	PROJECT NO. 1179.003.001		

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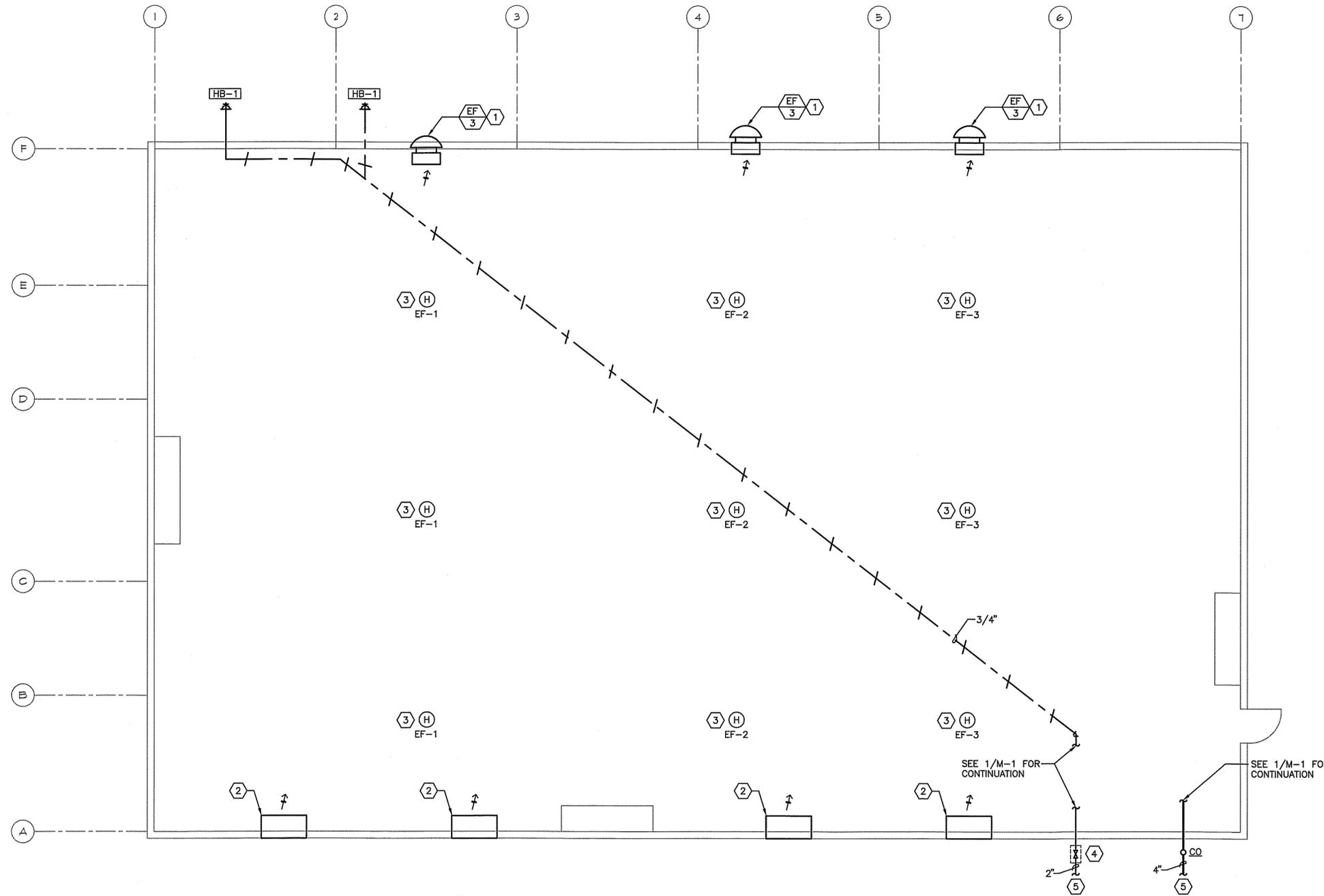
**RESTROOM FLOOR PLAN - MECHANICAL**  
 TOPOGRAPHIC SURVEY  
 A PORTION OF GLENDOVEER GOLF COURSE

**M1**  
 4

**R&W**  
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 Project No.: 1179.003.001 Contact: DON PFAFF

**REGISTERED PROFESSIONAL ENGINEER**  
 10,802  
 OREGON  
 JULY 18, 1980  
 DONALD C. PFAFF  
 EXPIRES 12/31/14

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- NOTES THIS SHEET**
- ① MOUNT FAN ON SIDE WALL AS HIGH AS POSSIBLE. SEAL WALL PENETRATION WATER TIGHT.
  - ② INSTALL 24x48 LOUVER IN WALL OF METAL BUILDING AT 24" ABOVE FINISHED FLOOR. PROVIDE BACKDRAFT DAMPER ON INTERIOR FACE OF LOUVER. SEAL WALL PENETRATION WATER TIGHT.
  - ③ INSTALL HYDROGEN SENSOR. SUSPEND DOWN 1'-0" FROM ROOF STRUCTURE. SENSOR TO START/STOP ASSOCIATED EXHAUST FAN. SET PPM AT OWNERS DIRECTION.
  - ④ INSTALL SHUT-OFF VALVE IN VALVE BOX. OLD CASTLE FL SERIES OR EQUAL WITH COVER.
  - ⑤ SEE CIVIL DRAWING FOR CONTINUATION.

1 BUILDING FLOOR PLAN - MECHANICAL  
 M2 3/16" = 1'-0"

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 DONALD C. PFAFF  
 JULY 18, 1980  
 OREGON  
 EXPIRES 12/31/14

3/11/13	0	BID SET
DATE:	NO.	REVISION

DRAWN:	DESIGNED: DCP	CHECKED: DCP
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PROJECT NO. 1179.003.001		

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**BUILDING FLOOR PLAN - MECHANICAL**  
 TOPOGRAPHIC SURVEY  
 A PORTION OF GLENDOVEER GOLF COURSE

**M2**  
 4

SECTION 15050 - BASIC MATERIALS AND METHODS

1 GENERAL

1.1 WORK INCLUDED:

- A. Provide all equipment, material and labor to install complete and operable mechanical systems.
- B. Drawings are diagrammatic. They do not show every offset, bend, tee, or elbow which may be required to install work in the space provided. Do not scale drawings for roughing-in measurements, nor use as shop drawings. Make field measurements and prepare shop drawings as required. Coordinate work with shop drawings of other trades. Provide any bends, offsets and elbows where required by local conditions from measurements taken at the Building (subject to approval) and without additional cost to the Project. The right is reserved to make any reasonable changes in outlet location prior to roughing-in.
- C. Obtain and pay for all permits, licenses, fees and taxes applicable to this project as required by law and governing authorities.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements:
  - 1. All work, installations, materials and equipment shall comply with the provision of the following codes, standards and regulations, except where more stringent requirements are shown or specified:
    - a. State of Oregon International Mechanical Code.
    - b. State of Oregon Plumbing Specialty Code.
    - c. State of Oregon Structural Specialty Code.
    - d. National Electrical Code.
    - e. All City, County, State and Federal applicable laws and regulations.
    - f. Regulations and standards set forth by ASME, ASHRAE, SMACNA, AGA and ARI.
  - 2. Where two or more codes or regulations apply, the more stringent of the two shall be exercised.
  - 3. Electrical products shall bear the U.L. label.
- B. Work shall be of good quality, free of faults and defects and in conformance with the Contract Documents.
- C. Workmanship: All materials shall be installed in a neat and workmanlike manner.

1.3 SUBMITTALS

- A. Shop Drawings and Product Data: Submit all equipment drawings and product data for Work of Division 15 together in a group in a 3-ring loose leaf binder, with each item filed under a tab, and labeled with its respective specification section number, article and paragraph, and mark if applicable.

1.4 OPERATING AND MAINTENANCE MANUAL AND PARTS LISTS:

- A. Submit five bound copies of manufacturer's operation and maintenance instruction manuals and parts lists for each piece of equipment or item requiring servicing. Include in the manual manufacturer's service data, wiring diagrams and parts lists for all major items of equipment, valve charts, balancing data, final control diagrams showing final set points and any additional equipment added by contract modification.

1.5 PROJECT RECORD (AS-INSTALLED) DRAWINGS:

- A. Keep Drawings clean, undamaged and up to date.
- B. Make Drawings available when requested by Architect for his review.

1.6 PROJECT CONDITIONS:

- A. Existing Conditions: Prior to bidding, verify and become familiar with all existing conditions by visiting the site and include all factors which may affect the execution of this work. Include all related costs in the initial bid proposal.
- B. Coordinate exact requirements governed by actual job conditions. Check all information and report any discrepancies before fabricating work. Report changes in time to avoid unnecessary work. Make changes as directed by Owner.

1.7 WARRANTY:

- A. Provide a written warranty covering the work of this Division for a period of one calendar year from the date of acceptance of the entire project as required by the General Provisions.

2 PRODUCTS

2.1 QUALITY ASSURANCE

- A. Provide products which are compatible with other portions of the work and provide products with the proper and correct power and fuel burner characteristics and similar adaptations for the project.

2.2 PIPE SLEEVES

- A. Interior Floor Sleeves: 12 gage galvanized steel and extend 2-inches above finished floor.

2.3 STARTERS AND SWITCHES

- A. General: Provide each motor with starter or switch as approved and recommended by manufacturer of motor or equipment of which motor is a part.
- B. Magnetic Starters: Provide for 1/2 horsepower and larger motors, and for smaller motors on automatic control or with interlock switch. Include pilot lights, reset, trip-free relay on each phase, Hand-Off-Auto switch in cover, and devices for coordination with control system (including transformer for control circuit, verify holding coil voltage requirements with control system design). Provide automatic ambient temperature compensation for starter heaters.
- C. Manual Switches: Provide on motors 1/3 horsepower and smaller except where automatic control or interlock is indicated. Include pilot light. Provide overload protection where not protected by panelboard circuit breaker or fused disconnect switch.
- D. Manufacturers: General Electric, ITE, Allen Bradley, Arrow-Hart, Cutler-Hammer, Square D or accepted substitute.

3 EXECUTION

3.1 MECHANICAL EQUIPMENT WIRING

- A. Provide all mechanical equipment motors, automatic temperature, limit, float and similar control devices required, with wiring complete from power source indicated on Electrical Drawings.
- B. Equipment and systems shown on the Drawings and/or specified, are based upon requirements of specific manufacturers which are intended as somewhat typical of several makes which may be approved. Provide all field wiring and/or devices necessary for a complete and operable system including controls for the actual selected equipment/system.
- C. Provide all starters for mechanical motors. Review Electrical Specifications and Drawings to determine which mechanical motor starters will be provided under the Electrical Specification Sections and provide all others.

3.2 CLEANING

- A. General: Clean mechanical and plumbing equipment, fixtures, piping and ductwork of stampings and markings (except those required by codes), iron cuttings, and other refuse.

3.3 LAYOUT AND COORDINATION

- A. Site Examination: Before starting work, carefully examine site and all contract Drawings so as to become thoroughly familiar with conditions governing work on this project. Verify all indicated elevations, building measurements, roughing-in dimensions and equipment locations before proceeding with any of the work.
- B. The existence of any wires, conduits, pipes, ducts or other service facilities are shown in a general way only. It will be the duty of the Contractor to visit the site and make exact determination of the existence of any such facilities prior to submitting a bid. It is understood that the Contractor will be responsible for making the exact determination of the location and condition of these facilities.
- C. Sleeves, Inserts, Cast-in-Place Work: provide sleeves, inserts, anchoring devices, cast-in-place work, etc. which must be set in concrete sequenced at the proper time for the project schedule.
- D. Discrepancies: Report immediately any error, conflict or discrepancy in Plans, Specifications and/or existing conditions.

3.4 MECHANICAL WORK CLOSEOUT

- A. Record Drawings - Submit record set of drawings and Submittals as previously specified in this Section.
- B. Closeout Equipment/Systems Operations: Operate each item of equipment and each system in a test run of appropriate duration with the Architect present, and with the Owner's operating personnel present, to demonstrate sustained, satisfactory performance. Adjust and correct operations as required for proper performance. Clean and lubricate each system, and replace dirty filters, excessively worn parts and similar expendable items of the work.
- C. Operation and Instruction: Provide four (4) hours of on-site training to Owner's personnel on all mechanical systems and equipment. Training shall include maintenance, lubrication, troubleshooting and repair. Contractor shall provide necessary written manuals and training aides explaining operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety and similar features of the installed system.

SECTION 15060- PIPE AND PIPE FITTINGS

1 GENERAL

1.1 WORK INCLUDED

- A. Provide all pipe, piping fittings and all related components required for complete piping system.

2 PRODUCTS

2.1 SANITARY SEWER AND VENT PIPING, WITHIN 5 FEET OF BUILDING

- A. Cast Iron Pipe: ASTM A74, hubless, service weight. Fittings: Cast iron. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies. Husky SD4000 or accepted substitute. ABS piping on acceptable alternate.

2.2 WATER PIPING, BURIED

- A. Copper Tubing: ASTM B88, Type K, hard drawn. Fittings: ANSI/ASME B16.22, wrought copper. Joints: ANSI/ASTM B16.22, solder, Grade 95TA. Type "A" PEX piping on acceptable alternate.

2.3 PRIMING LINES

- A. Copper Tubing: ASTM B88, Type L annealed. Fittings: ANSI/ASTM B16.22, wrought copper. Joints: ANSI/ASTM B16.22, solder, Grade 95TA.

3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs or bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

- A. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- B. Route piping in orderly manner, maintain gradient and conceal all piping unless otherwise indicated.
- C. Provide clearance for installation of insulation and access to valves and fittings.
- D. Slope water piping and arrange to drain at low points and provide drain valve.
- E. Establish invert elevations, slopes for drainage to 1/4 inch per foot minimum. Maintain gradients.
- F. Pitch vent piping at 1/4 inch per 10 feet minimum.

3.3 EXCAVATION

- A. Excavated Materials: Store excavated material (temporarily) near the excavation, in a manner which will not interfere with or damage the excavation or other work. Retain excavated material which complies with the requirements for backfill material. Dispose of excavated material which is either in excess of quantity needed for backfilling or does not comply with requirements for backfill material.

3.4 BASE PREPARATION

- A. Subbase Installation: Install subbase material to receive mechanical work, and compact by tamping to form a firm base for the work. For 4 inches and larger piping, horizontal cylindrical tanks and similar work, shape and subbase to fit the shape of the bottom 90 degrees of the cylinder, for uniform continuous support. Provide finely-graded subbase material for wrapped, coated and plastic pipe and tank. Shape subbases and bottoms of excavation with recesses to receive pipe bells, flanges connections, valves and similar enlargements in the piping systems and set bottom of trench at proper pitch and correct elevations with subbase material.

3.5 BACKFILLING

- A. Do not backfill until installed mechanical work has been tested and accepted wherever testing is indicated. Install drainage fill where indicated, and tamp to a uniform firm density. Backfill with finely-graded subbase material to 6 inches above wrapped, coated and plastic piping and tanks, and to center line of other tanks (where recommended by tank manufacturer, use "pea gravel" backfill). Condition backfill material by either drying or adding water uniformly, to whatever extent may be necessary to facilitate compaction to the required densities. Do not backfill with frozen materials.

3.6 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, verify system is complete, flushed and clean.
- B. Comply with all applicable code requirements including procedure outlined by Health Department.

3.7 CLEANING

- A. General: Clean all dirt and construction dust and debris from all mechanical piping systems and leave in a new condition. Touch up paint where necessary.

3.8 TEST

- A. General: Minimum duration of two hours or longer, as directed for all tests. Furnish report of test observation signed by qualified inspector. Make all tests before applying insulation, backfilling, or otherwise concealing piping or connecting fixtures or equipment. Where part of the system must be tested to avoid concealment before the entire system is complete, test that portion separately, same as for entire system.
- B. Sewer: Furnish all facilities and personnel for conducting the test. Test in accord with the requirements of State Plumbing Inspector and local authorities.
- C. Plumbing Waste and Vent Piping: Hydrostatic test by filling to highest point, but not less than 10 foot water column on major horizontal portion.
- D. Water Piping: Hydrostatic pressure of 100 psig without loss for four hours.

SECTION 15100 - VALVES

1 GENERAL

1.1 WORK INCLUDED

- A. The requirements of this Section apply to the valving for the system specified elsewhere in Division 15.

2 PRODUCTS

2.1 BALL, CHECK, STOP CHECK, NON SLAM CHECK, BUTTERFLY, GATE, GLOBE, LUBRICATED PLUG VALVE TYPES

- A. Acceptable Manufacturers: Crane, Damco, Grinnell, Hammond, Jenkins, Kennedy, Lunkenheimer, Milwaukee, Nibco Scott, Powell, Stockham and Walworth. Grooved end valves Victaulic, Gustin-Bacon or accepted substitute. Grinnell numbers are given except as noted.

3 EXECUTION

3.1 INSTALLATION

- A. Provide clearance for installation of insulation and access to valves and fittings.
- B. Application: Valve type and style as shown on the Drawings. Where style is not indicated, use the following:
  - 1. Domestic Water: Ball valves for 2 inches and smaller and butterfly for 2 inches and over.
  - 2. Natural Gas: 5 psig or less, 2 inches and smaller ball valves, Watts 6000UL Threaded, 250 psi, 2 piece, bronze.

SECTION 15260 - MECHANICAL INSULATION

1 GENERAL

1.1 WORK INCLUDED

- A. Provide piping, ductwork and equipment insulation including jacketing, adhesive and all related accessories for complete insulated system.

2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Insulating Manufacturers: JohnsManville, Knaut, Armstrong, Owens-Corning, or Certain Teed.
- B. Adhesive Manufacturers: Benjamin Foster, JM, Borden, Kingco or Armstrong.
- C. JohnsManville products are listed unless indicated otherwise.

2.2 PIPING INSULATION, JACKETING AND ACCESSORIES

- A. Insulation:
  - 3. Pipe system to minus 10 to 55 deg. F: Flexible, preformed, pre-slit, self-sealing elastomeric, thermal conductivity of 0.27 Btu/hr. sq. ft./in. at 75 deg. F and vapor transmission rating of 0.2 perms/inch. Apply in thickness necessary to prevent condensation on the surface. JohnsManville "AEROTUBE".
  - 4. Piping Systems 55 to 600 deg. F: Glass fiber preformed pipe insulation with a minimum K-value of 0.23 at 75 deg. F, a minimum density of 3.5 pounds per cubic foot. JohnsManville "Micro-Lok."
- B. Jackets:
  - 1. Interior Applications:
    - a. Vapor Barrier Jackets: Kraft reinforced foil or vinyl vapor barrier with self-sealing adhesive joints or pressure sensitive seal. JohnsManville "Micro-Lok."
    - b. PVC Jackets: One piece, preformed type. JohnsManville "Zeston 1200." 2 Exterior Applications:
      - c. Aluminum Jackets: ASTM B209; 0.016 inch thick; smooth finish. JohnsManville weatherproof "Micro-Lok."

3 EXECUTION

3.1 PREPARATION

- A. Install materials after piping, ductwork and equipment has been tested and approved.

3.2 PIPING INSULATION INSTALLATION

- A. Install materials in accordance with manufacturer's instructions.
- B. Continue insulation with vapor barrier through penetrations.
- C. In exposed piping, locate insulation and cover seams in least visible locations.
- D. Provide an insert, not less than 6 inches long, of same thickness and contour as adjoining insulation, between support shield and piping, but under the finish jacket, on piping 2 inches diameter or larger, to prevent insulation from sagging at support points. Inserts shall be cork or other heavy density insulating material suitable for the planned temperature range. Factory fabricated inserts may be used.

PIPING	PIPE SIZE (IN.)	INSULATION THICKNESS (IN.)
Domestic Hot and Cold, above grade	2" and Smaller	1-1/2

SECTION 15400 - PLUMBING

1 GENERAL

1.1 WORK INCLUDED

- A. The requirement of this section applies to the plumbing system.

2 PRODUCTS

2.1 INTERIOR PLUMBING MATERIALS

- A. Cleanouts: Manufacturer: J.R. Smith, Jonespec, Zurn, Wade, or accepted substitute.
- B. Flashing: Minimum 4# sheet lead; to extend horizontally 10" from edge of vent penetrations or rain drain body and vertically 12" minimum up from roof turned over and down into hub of vent or finished with bronze cap providing counterflashing for screwed pipe.
- C. Shock Arrester: Precharged bellows or sealed piston type manufactured to meet PDI WH-201 and ASSE 1010 Standards. Size in accordance with PDI procedures. Jonespec, J.R. Smith, PPP, Wade, Zurn, or accepted substitute.
- D. Priming Valves: Smith 2699, Wade W8800T, Zurn Z1022, Ancon MSB10 or equivalent Precision Plumbing. Locate in closets, under counters or in walls behind Milcor or access panels as specified in Section 15050. Use copper specified in Section 15060, Pipe & Pipe Fittings, for all underground priming lines.
- E. Supplies and Stops: First quality, chrome plated with brass stems. Stops: loose key type. American Standard, Kohler, Chicago, Brasskraft, Eastman, Speedway, McGuire, or approved substitute.
- F. Natural Draft, Tank Type: AGA and serving utility approved commercial gas fired heater complying with State Energy Code requirements and of size and capacity shown on drawings. Glass lined steel tank equipped with sacrificial anode. 1-1/2" minimum of non-organic insulation, cold rolled enameled steel jacket to encase sides, top and combustion chamber. Adjustable automatic thermostat, safety pilot, main and pilot gas cocks, automatic gas pressure regulator, all brass hose bib drain, ASME Code pressure-temperature relief and draft diverter with Class "B" vent. Manufacturers: State, Ruud, Rheem, Bradford White, A.O. Smith or accepted substitute.

2.2 PLUMBING FIXTURES

- A. Stops: Furnish stop valves for all fixtures. Screwdriver style, in wall, angle or straight through pattern to fit installation. Kohler, Speedway, Chicago, Eastman, Brasskraft, or accepted substitute.
- B. Water Closet
  - 1. Install each listed water closet with a solid white molded plastic seat; open front less cover for elongated bowl with check and self-sustaining hinge. Olsonite 10CC-SS, Beneke 623-SS/CH-B, Bemis 1955 SS/C, or Church 5334.170.
  - 2. Provide with concealed hangers (J.R. Smith, Wade, Jonespec or Zurn).
  - 3. Manufacturers: American Standard, Kohler, or Zurn.
- C. Lavatories
  - 1. Install with 1-1/4" x 1-1/2" chrome plated cast brass "P" trap, faucet, Plumbing Software Inc. "PT7250," I&S Insulation Co. Inc., Brocor Products Inc. Kit 600R or accepted substitute handcap piping protector kit. Provide with concealed arm hangers and wall backing plate (J.R. Smith, Jonespec, Wade or Zurn).
  - 2. Manufacturers: American Standard, Kohler, or Zurn.
- D. Drains
  - 1. Numbers scheduled on drawings represent minimum acceptable standard for locations involved.
  - 2. Install 4 pound sheet lead flashing, extending not less than 10" from and clamped to all drains not completely cast-in-place in a homogeneous material.
  - 3. Manufacturers: Jonespec, Zurn, Jay R. Smith and Wade.
- F. Expansion Tank
  - 1. Shall be a diaphragm expansion tank with permanently sealed-in air cushion Butyl diaphragm. Outer shell shall be steel ASME rated. Inner liner shall be rigid polypropylene liner. Amtrol, Bell & Gossett, or accepted substitute.

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DATE:	NO.	REVISION	PROJECT NO. 1179.003.001		



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RESTROOM FLOOR PLAN - MECHANICAL  
TOPOGRAPHIC SURVEY  
A PORTION OF GLENDOVER GOLF COURSE

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3 EXECUTION

3.1 INSPECTION

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.
- B. Verify adjacent construction is ready to receive rough-in work of this Section.

3.2 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Install components level and plumb.
- C. Install and secure fixtures in place with wall carriers and bolts.
- D. Seal fixtures to wall and floor surfaces with sealant color to match fixture.
- E. Cleanouts
  - 1. Where required by code, at each change of sewer direction 45 degrees or greater and more than 10' long, at end of each branch or main and spaced not greater than 100' apart, as required by code and/or as shown on Drawings.
- F. Provide valves and shock arrestors where required by code and where otherwise indicated in specifications and on drawings.

3.3 ADJUSTING AND CLEANING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow
- B. At completion clean plumbing fixtures and equipment.
- C. Solidly attach water closets to floor with lag screws. Lead flashing is not intended to hold fixture in place.

SECTION 15800 - HEATING AND VENTILATING EQUIPMENT

1 GENERAL

1.1 DESCRIPTION

- A. The requirements of this section apply to the Heating, Cooling and Ventilating Equipment.

2 PRODUCTS

2.1 SIDEWALL EXHAUST FANS

- A. Centrifugal power wall ventilators, direct drive or belt drive. Aluminum covers. Motor and drive compartment positively externally ventilated. Design bearings for 200,000 hours operation. Furnish with electrical disconnect and birdscreen. 1-phase motors to have integral overload protection. Adjustable V-belt drives. Provide backdraft damper.
- B. Manufacturers: Greenheck, Carnes, Cook, Penn, ILG, Breidert, Acme, JennFan or accepted substitute.

3 EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. Install in accordance with manufacturer's instructions and applicable code.
- B. Lubricate all moving and rotating parts in accordance with manufacturer's recommendation prior to start-up.

SECTION 15890 - AIR DISTRIBUTION

1 GENERAL

1.1 WORK INCLUDED

- A. Provide air distribution equipment as specified herein and shown.
- B. Equipment capacity and size shall be as shown.

2 PRODUCTS

2.1 DUCTWORK

- A. Galvanized steel sheet metal: Metal gauges, joints and reinforcement in accordance with mechanical Code, ASHRAE and SMACNA tables and recommendations.

2.2 LOUVERS

- A. Frame and sill styles compatible with adjacent substrate, specifically manufactured to fit into construction openings with accurate fit and adequate support for weatherproof installation. Construct of aluminum extrusions, ASTM B221. On inside face of exterior louvers, provide aluminum screen mounted in frames. Blades on 4-inch centers with rain stop design.
- B. Manufacturers: American Warming and Ventilating, Inc., Pottorff, United Metal Products, Carnes, Cesco, Industrial Louvers, Inc., Louvers & Dampers, Inc., Ruskin, Greenheck or accepted substitute.

3 EXECUTION

3.1 INSTALLATION

- A. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.
- B. Provide backdraft dampers on toilet exhaust fans.

SECTION 15951 - CONTROLS

1 GENERAL

1.1 SYSTEM DESCRIPTION

- A. Provide a system of electrical controls.
- B. Wiring: Shall be as required for a complete operating control system, per state and National Electric Code. Provide necessary relays, transformers, fusing, switches and pilot lights. Interlocks and control power from nearest panel.

2 PRODUCTS

2.1 HYDROGEN DETECTOR

- A. General: Hung from structure, AC powered, 3led warning lights
- B. Range and Accuracy: up to 3% LEL.
- C. Output Signal: 1% concentration starts ef. 2% concentration activates built-in warning alarm.
- D. Calibration Interval: One year.
- E. Ambient Operating Conditions: 0°F to 105°F
- F. Manufacturer: SBS Model HGD1-DR, Honeywell/Manning model ED or equal.

3 EXECUTION

3.1 SEQUENCE OF OPERATION

- A. Bldg. exhaust fans: Operate from hydrogen sensors.



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