1.1. INTRODUCTION
   1.1.1. Section Includes
   1.1.1.1. The purpose of this section is to define the design approach upon which the mechanical design/build is to base his bid and establish the design criteria, and design submittals, which will be required in the preparation and execution of the design.
   1.1.1.2. All work under this section shall comply with the requirements of general conditions, supplemental conditions, special conditions, and Division 1 - general requirements, and shall include all mechanical sections specified herein.

1.2. APPLICABLE CODES & STANDARD
   1.2.1. Design and installation shall comply with rules and regulations of the following:
   1.2.1.1. Current Local Energy Code
   1.2.1.2. Current Local Mechanical code
   1.2.1.3. Current Local Fuel gas code
   1.2.1.4. Current Local Fire code
   1.2.1.5. Current Local Building Code
   1.2.1.6. 2012 Uniform Plumbing Code (UPC) with Washington State
   1.2.1.7. ASHRAE 90.1-2007 Mandatory Provisions
   1.2.1.8. Evergreen Standard Version 2.2
   1.2.1.9. Local and State Fire Marshal Requirements
   1.2.1.10. National Fire Protection Association (NFPA)
   1.2.1.11. 2008 WAC 296-46B Electrical Safety Standards, Administration, and Installation
   1.2.1.12. 2008 National Electrical Code
   1.2.1.13. National Electrical Manufacturers Association (NEMA)
   1.2.1.14. 2006 RCW Chapter 19.28 Electricians and Electrical Installations
   1.2.1.15. State & Local Boiler and Pressure Vessel Code
   1.2.1.16. All other applicable jurisdictional amendments
   1.2.1.17. WA State Underground Damage Prevention Act ('Call Before you Dig') - RCW 19.122
   1.2.1.18. Federal Americans With Disabilities Act (ADA)
   1.2.1.19. All applicable local jurisdiction amendments.

1.3. PROJECT DELIVERY
   1.3.1. This project is to be delivered design build. The design build contractor responsible for all Plumbing systems shall be the plumbing contractor (PC) and will be the engineer of record and create and stamp fully coordinated design documents for the project.
   1.3.2. The PC is encouraged to provide voluntary alternates beyond the specific scope outlined in this narrative and the accompanying drawings.
   1.3.3. The PC will provide bid response that covers the complete scope of work required to deliver a fully functional and code compliant project.
   1.3.4. Contractor shall attend design coordination meetings as needed.
   1.3.5. The architectural floor plans provided are not final. Pricing shall allow for equipment relocations due to minor interior layout modifications.
   1.3.6. The design build bid package will be utilized as a basis of design through the completion of design and construction. As the design proceeds deviations from this package are to be clearly noted for the architect, owner, and peer review team for acceptance prior to design completion.
   1.3.7. Owner’s representative will continue in a peer review / owner advocacy role after the design build contractor takes over drawing production (post 100% DD). The Permit Set or 90% CD Set will be reviewed by Owner’s representative and a comment resolution process will followed through to completion.
1.3.8. The PC will provide budget/estimate response that covers the complete scope of work required to deliver a fully functional and code compliant project. Request for proposal (RFP). If there is a conflict between design documents and the RFP, the contractor will identify the discrepancy and request a clarification prior to RFP response.

1.3.9. Design drawings, submittals, and shop drawings will be reviewed for conformance with the bid package as well as conformance with codes and accepted practice. Discrepancies will be noted for team review prior to acceptance.

1.3.10. Complete equipment and materials submittals shall be provided in both printed and electronic format submitted per the time schedule issued by the Owner/GC. Submittals shall be complete with all components included, installation manuals, and customized to this project's requirements. All submittals require Owner and design team approval prior to purchase. The project specific equipment model numbers, options, and features are to be clearly marked within the literature. Electronic submittals with original PDF's (avoid scanning) are requested for consultant review. Additionally, conformance with Division 1 specifications including hard copy requirements apply.

1.3.11. Shop drawings will be submitted for design team review prior to construction. The PC shall coordinate their shop drawings with other trades prior to shop drawing approval and construction.

1.3.12. Construction Administration: The selected Contractor will perform construction administration, including RFI responses, attendance at periodic meetings, formal review and approval of shop drawings and submittals, coordination with other trades, preparation of final punchlist.

1.3.13. All work contracted for must be accepted by all applicable inspectors including Site Superintendent, GC Quality Control Personnel, AHJ's, Owner's Representative or their assignees.

1.3.14. Warranty period to extend for one year from date the project is occupied by the Owner, not from the date of completion of the work. Warranty not applicable to defective items due to faulty work of subsequent trades.

1.3.14.1. The PC shall submit final CAD as-built drawings to the General Contractor for submittal to Owner within two weeks of project completion or unless alternative timing is agreed to. Drawings shall be submitted in PDF and original AutoCAD formats.

1.3.14.2. O&Ms: Provide hard copy and electronic copies (PDF) of O&Ms for ALL systems within TWO weeks of substantial completion.

2. Codes, Permits, Inspections, and Fees:

2.1. The PC shall obtain all permits and inspections and pay all fees required by State and Local authorities, except as noted.

2.2. All work and materials shall be in accordance with requirements of all applicable local and state codes, statues, standards and other regulations. Date of regulations shall be as adopted by local authorities at the time of permit intake, unless indicated otherwise.

2.3. The codes shall be construed as establishing a minimum or base level of requirements. Contract Documents shall not be construed to permit or direct work not in conformance with codes, statues, standards and other regulations. Where provisions of the various regulations conflict with each other, or with the Contract Documents, the more stringent provisions shall be included in contract pricing. Conflict shall be resolved with the Architect and Authorities Having Jurisdiction (AHJ) prior to completing the design.

2.4. Where the Contract Documents call for material or construction of a better quality or higher capacity than required by the codes, statues, standards, and other regulations, the provisions of the Contract Documents shall take precedence over the requirements of the codes and standards.

2.5. Material and equipment within the scope of the UL Testing Laboratory Service shall be listed by the Underwriters Laboratories for the purpose for which they are used and shall bear their listing mark. ETL or CSA shall be allowed if acceptable to the Authorities Having Jurisdiction (AHJs).
2.6. PC shall call for all inspections by the local code authorities when they become due and shall not cover any work until approved by these authorities.

3. MISCELLANEOUS SCOPE ITEMS:
   3.1. The PC is to review the Div 23 narrative for scope impacts including all split system condensate piping, condenser section drain pans. Piping in retail and amenities will all be plenum rated.
   3.2. Property line acoustic calculations, for the domestic hot water plant will be by the architectural design team's acoustician prior to permit submittal.
   3.3. It is the responsibility of the project acoustical engineer to provide the requisite analysis to assure the team of acceptable acoustical performance of each system.
   3.4. The structural engineer is responsible for all structural calculations required for the supporting structure for permit intake.
   3.5. PC shall include structural tie-down calculations for all equipment as required by the ASCE 7-05. This will be a deferred permit submittal.
   3.6. PC is to provide and install fire stopping of all through and membrane penetrations as required by the applicable codes. Floor penetrations to include watertight seal where noted on plans and/or details.
   3.7. All ductwork, piping, plumbing, and equipment are to be seismically restrained as required per local codes.
   3.8. All code required access panels in walls and/or ceilings are provided and installed by the plumbing contractor. PC to coordinate required locations and sizes with the architect and GC.
   3.9. The contractors will provide and install phenolic tags identifying each specific piece of equipment.
   3.10. All exposed piping in mechanical rooms will be labeled in compliance with accepted industry standards and building standards.

4. COORDINATION
   4.1. All pipe routing and equipment locations shall be coordinated with full design team including but not limited to architect, interior designer, and acoustical engineer.
   4.2. No cutting or drilling of joists or beams will occur without Structural Engineer approval.
   4.3. PC shall coordinate with the architect a minimum 36" clearance or more in front of equipment access panels for servicing as required by applicable code, NEC, and the AHJ.
   4.4. Cutting, framing, patching and painting of wall, ceiling and floor openings shall be by others.
   4.5. Sump Pump control panels are provided by the PC and are installed (mounted) and wired by the electrical contractor.
   4.6. Electrical contractor shall furnish and install magnetic motor starters for all equipment % hp and greater unless a VFD is provided. Provide service and disconnect per code, and do all power wiring, including connecting to equipment. Holding coil circuit shall be powered by electrical contractor (120/1 unless indicated otherwise). All starters shall be provided with H-O-A switch.
   4.7. VFD's (where required) are provided by the PC and are installed (mounted) and wired by the electrical contractor. Disconnects will be provided integral with the VFD's. VFD's will not be provided with manual or automatic bypass.

5. EVERGREEN STANDARD
   5.1. The Evergreen Standard certification shall be achieved for the project as outlined below. The following table provides the Design Build scope of work associated with each point. These are the only points expected to impact the contractor scope of work.
   5.2. Water-conserving fixtures are mandatory
       5.2.1. In new construction and when fixtures are replaced in rehabilitation, install WaterSense labeled water-conserving fixtures with the following specifications:
           5.2.1.1. Toilets - 1.28 gpf (gallons per flush) or less, WaterSense labeled with MaP test performance at minimum 500g.
           5.2.1.2. Showerheads - 2.0 gpm (gallons per minute) or less, WaterSense labeled
           5.2.1.3. Kitchen faucets - 2.0 gpm or less
5.2.1.4. Bathroom faucets - 1.5 gpm or less, WaterSense labeled

5.3. Water heaters, condensing boilers, furnaces, and air conditioning - mold prevention Mandatory for new construction and must include Drain pans will be included for all water heaters as required by UPC section 508.3.

5.4. Piping will be insulated per the WSEC and UPC.
   5.4.1. Insulate all hot water pipes from the hot water heater to point of use. Insulate exposed cold water pipes in climates and building conditions susceptible to moisture condensation. Insulate all cold water pipes in locations where freezing is a possibility including exterior walls and unheated attics or crawl spaces.
   5.4.2. Insulate domestic hot water pipes between the water heater and fixtures per the code tables.
   5.4.3. Insulate copper (if used) domestic cold water mains.
   5.4.4. Insulate all domestic cold water exposed to ambient conditions including within wall cavities and within roof joist space to minimum R-3 (minimize occurrences).

5.5. CURRENT LOCAL ENERGY CODE C409.1 ENERGY METERING AND ENERGY CONSUMPTION MANAGEMENT

5.6. SEC C409.1 General. Buildings with a gross conditioned floor area over 20,000 square feet shall comply with Section C409. Buildings shall be equipped to measure, monitor, record and display energy consumption data for each energy source and end use category per the provisions of this section, to enable effective energy management. For Group R-2 multi-family buildings, the floor area of dwelling units shall be excluded from the total conditioned floor area. Alterations and additions to existing buildings shall conform to Section C409.5.

6. PRODUCTS

6.1. 2.1 PLUMBING SYSTEMS GENERAL
   6.1.1. All plumbing products in contact with potable water shall be certified Lead Free and NSF 61/NSF 6.1.2. 372 compliant
   6.1.3. All plumbing in areas that contain plenums are to be plenum compatible. No plastic material will be utilized unless noted otherwise.
   6.1.4. Plumbing materials are per the materials matrix.
   6.1.5. Where PVC materials are provided, PC shall provide solid wall piping. Cellular (foam) core piping is not allowed.
   6.1.6. All plastic piping installed underground shall be installed in accordance with ASTM D 2321 and ASTM F 1668 as well as all manufacturer guidelines.
   6.1.7. PVC & CPVC piping is not allowed in plenum spaces unless it is specifically listed for such use.
   6.1.8. Plastic piping is not acceptable where water discharge temperatures exceed 140° F.
   6.1.9. Provide cleanouts on sanitary sewer system as required by code.
   6.1.10. Plumbing is to be insulated per 2012 WSEC & SEC requirements.
   6.1.11. Trap primers shall be installed to serve all floor drains. Trap seal protection devices such as "Sure-Seal" or other approved alternates may be utilized to serve floor drains in normally unoccupied rooms (boiler rooms, mechanical rooms, etc.). Mechanical trap seal devices shall not be utilized at drains conveying food particulates or other debris (i.e. trash rooms). Electronic or flow activated trap primers (PPP Prime Pro) shall be used in lieu of the pressure drop activated type due to inadequate pressure fluctuations within the domestic water distribution piping. Tailpiece trap primers may be used from other than coffee kitchen sinks.
   6.1.12. All plumbing is to be pressure tested in accordance with code and accepted standards.
   6.1.13. All isolation valves are to be installed in accessible locations. Plumbing contractor is to provide access panels and coordinate installation by others as required for access to valves.
   6.1.14. All fixtures shall be provided and installed to comply with Washington state accessibility codes or per other architectural directions.
6.1.16. All fixtures to be provided and installed to comply at a minimum with Washington state water conservation performance standards and UPC maximum flow rate standards.

6.1.17. The plumbing contractor shall route plumbing vents so as to maintain minimum 20 feet of clearance from outside air intakes.

6.1.18. All water supply and waste and vent piping shall be secured in place with 3/16” neoprene strips wrapped around the pipe at stud penetrations or point of support to prevent direct contact with framing and resultant rattling and vibration.

6.1.19. Piping and fittings at all water outlets shall be rigidly fastened to structure to prevent movement.

6.1.20. All piping systems shall be installed with provisions for expansion and contraction as required.

6.1.21. The PC is to provide expansion loops, offsets, or other compensation devices in combination with guides and anchors as required to accommodate expected expansion and movement for operating temperatures between 40 and 145 F for the domestic hot water system. Provide professionally stamped expansion compensation design based on final shop drawings.

6.1.22. All piping systems shall be installed with provisions to accommodate wood structure settling. Floor movement parameters will be identified by the structural engineer and GC. Design for a minimum of 1” settling. Include in shop drawings.

6.1.23. All piping systems shall be installed with provisions for expansion and contraction as required by applicable codes. Include in shop drawings.

6.1.24. The air gap between party walls is to mitigate sound transference. Pipes placed within this air space are to be isolated from the studs they pass through. Pipes serving any specific unit must be placed within the stud depth of the wall serving that unit only.

6.1.25. Run all water lines in warm areas where possible, avoiding exterior walls and blind corners.

6.1.26. The plumbing subcontractor is responsible to review plans to determine which walls, if any, should be increased in depth from that shown on the plans to accommodate the subcontractor’s piping. The plumbing subcontractor shall meet with the superintendent and framer to coordinate this sizing with the requirements of other trades.

6.1.27. The plumbing subcontractor will supply lead boot roof flashings for pipe penetrations prior to roofing as scheduled by the superintendent. Roof flashings mopped in by roofing contractor.

6.1.28. P.C. shall provide adequate expansion compensation in accordance with UPC Section 313.2.

6.1.29. All HVAC condensate is provided by the PC. Review HVAC deliverables for fan coils with condensate.

7. LEVEL / LOBBY AND COMMON ROOM:

7.1. PC to provide cold water, hot water, waste, vent, and fixtures for areas that are completely built out (include all common areas and all fixtures shown on Architectural drawings).

7.2. Refer to plumbing fixture schedule for public lavatories, water closets, and other plumbing fixture types and flow rates.

7.3. DHW for public fixtures will be served from a central water heater or local instantaneous point of use electric heater (see Drawings). Provide ASSE 1070 mixing valve at public lavatories.

7.4. Provide appropriately sized condensate trap and condensate lines as required by code for all HVAC units.

7.5. HVAC Condensate systems will be installed complete to an approved indirect drain connection by the plumbing contractor. Condensate trap depth will be per manufacturer requirements and sized per plumbing code criteria. Horizontal condensate piping shall be insulated copper or plenum rated CPVC (Charlotte Pipe plenum rated Flowguard CPVC or equivalent). Vertical copper condensate requires insulation. Vertical CPVC condensate does not require insulation.

7.6. Elevator control room will be provided with a ductless heat pump by the MC. The PC will provide condensate piping. Provide hot water connection and reduced pressure backflow assembly for trash chute wash down at highest floor. Contractor shall provide an indirect drain for RPBA discharge.
8. WASTE AND VENT

8.1. Per 2012 UPC section 709.0 Plumbing fixtures shall be drained to the public sewer by gravity. Sanitary sewer inverts provided by the Civil Engineer indicate all sanitary drainage will be able to exit the building by gravity. No sump pumps will be required.

8.2. Per 2012 UPC section 708.0 "Horizontal drainage piping shall be run in practical alignment and a uniform slope of not less than %" per foot or 2% toward the point of disposal provided that, where it is impractical due to the depth of the street sewer, to the structural features, or to the arrangement of a building or structure to obtain a slope of %" per foot or 2%, such pipe or piping 4" or larger in diameter shall be permitted to have a slope of not less than 1/8" per foot or 1%, where first approved by the Authority Having Jurisdiction." Final approval for any piping to be sloped at 1% shall be the responsibility of the plumbing contractor.

8.3. 2012 UPC section 710.1: "Fixtures installed on a floor level that is lower than the next upstream manhole cover of the public or private sewer shall be protected from backflow of sewage by installing an approved type of backwater valve. Fixtures on such floor level that are not below the next upstream manhole cover shall not be required to be protected by a backwater valve. Fixtures on floor levels above such elevation shall not discharge through the backwater valve." Contractor to provide backwater valve(s) downstream of any fixture draining to the public sewer by gravity and installed on a floor that is lower than the next upstream manhole. Preliminary evaluation is that fixtures on level 1 will be required to route through a backwater valve. Final determination TBD.

8.4. 2012 UPC Section 711: "Suds Relief. Drainage connections shall not be made into a drainage piping system within 8' of a vertical to horizontal change of direction of a stack containing suds-producing fixtures" unless the "Stacks are receiving the discharge from less than three stories of plumbing fixtures".

8.5. Materials: Refer to materials matrix.

8.6. Waste piping shall be PVC for all waste piping in residences, retail, and amenity spaces. Wrap piping in acoustically sensitive areas with lagging material per acoustical report and specification section 098000. Vent piping shall be cast iron in all plenum space (above retail and amenity spaces) and ABS or PVC otherwise.

8.7. PVC and ABS may not be utilized in ceiling return air plenums (amenities or lobby).

8.7.1. PVC, where utilized, will be Schedule 40 Solid Wall Pipe and PVC DWV Fitting System. PVC Cellular Core product is not allowed. PVC Schedule 40 pipe shall be Iron Pipe Size (IPS) conforming to ASTM D 1785 and ASTM D 2665. Injection molded PVC DWV fittings shall conform to ASTM D 2665. Fabricated PVC DWV fittings shall conform to ASTM F 1866. Solvent cement joints shall be made in a two step process with primer manufactured for thermoplastic piping systems and solvent cement conforming to ASTM D 2564. Systems shall be hydrostatically tested after installation and before burial if below grade. Pipe and fittings shall conform to National Sanitation Foundation Standard 14.

8.7.2. All below grade PVC will be installed in strict adherence to ASTM D 2321 and ASTM F 1668 protocol. The plumbing contractor will be responsible for any and all below grade PVC failures within 5 years of burial.

8.8. PVC will not be utilized in any location where transport of 140°F water or greater can be expected now or in the future.

8.9. Expansion compensation for PVC is required per UPC 314.

8.10. All PVC piping will be supported with an approved hanger at intervals sufficiently close to maintain correct pipe alignment and to prevent sagging or grade reversal. Pipe will also be supported at all branch ends and at all changes of direction. Support trap arms as close as possible to the trap.

8.11. The PC is to wrap all waste lines adjacent to bedrooms and living spaces and all horizontal overhead waste lines in residences for acoustic purposes with soundseal B10 QFA-3 or equivalent. Cast iron is an acceptable alternative to wrapped PVC.

8.12. All waste pipes shall be isolated from the structure using 1/4" thick neoprene sleeve or strips. Resilient fire caulking may also be used at opening to meet this requirement per acoustical report. Openings shall be oversized for the full depth of the opening so that the pipe can be supported on both sides of the opening without contact.
8.12.1.1. Center all vertical waste lines in the interior walls. Route waste and vent lines in party walls where possible. Vertical waste and vent lines should share the same stud framing bay where possible to minimize cutting of framing studs.

8.13. Nail plates shall be installed wherever needed and when piping is within 1-1/2 inches of the edge of a framing member and as required by code. Leaks due to drywall nails/screws penetrating pipes due to omission of or incorrectly installed nail plates will be repaired at subcontractors’ expense.

8.14. Waste clean outs shall be installed in unfinished space whenever possible. Otherwise locate within wall and cover by an approved metal access cap. PC is responsible for verifying wall thickness prior to installing pipe.

8.15. All plumbing shall be plugged and capped during installation and kept free of contamination and debris.

8.16. Sewer connections shall be coordinated with the civil engineer per superintendents’ direction. The utility contractor is to make all side sewer connections. A new 6” sanitary sewer connection has been coordinated, see drawings for location. Final location and elevations to be verified and coordinated by PC.

8.17. Provide hub drains for sprinkler system blow down, standpipe drains, and trapped low points of sprinkler system as needed.

8.18. Provide floor drains in the common area bathrooms, mechanical rooms, and trash rooms. Drains to be installed with trap primers.

8.19. Trap primers shall be installed to serve all floor drains. Trap seal protection devices such as “Sure-Seal” or other approved alternates may be utilized to serve floor drains in normally unoccupied rooms (boiler rooms, mechanical rooms, etc.). Mechanical trap seal devices shall not be utilized at drains conveying food particulates or other debris (i.e. trash rooms). Electronic or flow activated trap primers (PPP Prime Pro) shall be used in lieu of the pressure drop activated type due to inadequate pressure fluctuations within the domestic water distribution piping. Tailpiece trap primers may be used from other than coffee kitchen sinks.

9. STORM DRAINAGE

9.1. A code compliant rain leader and overflow rain leader system will be provided from all drains to the exterior of the building by PC.


9.3. All horizontal rain leaders and overflow leaders will be insulated.

9.4. PVC, where utilized, will be Schedule 40 Solid Wall Pipe and PVC DWV Fitting System. PVC Cellular Core product is not allowed. PVC Schedule 40 pipe shall be Iron Pipe Size (IPS) conforming to ASTM D 1785 and ASTM D 2665. Injection molded PVC DWV fittings shall conform to ASTM D 2665. Fabricated PVC DWV fittings shall conform to ASTM F 1866. Solvent cement joints shall be made in a two step process with primer manufactured for thermoplastic piping systems and solvent cement conforming to ASTM D 2564. Systems shall be hydrostatically tested after installation and before burial if below grade. Pipe and fittings shall conform to National Sanitation Foundation Standard 14.

9.5. All below grade PVC will be installed in strict adherence to ASTM D 2321 and ASTM F 1668 protocol. The plumbing contractor will be responsible for any and all below grade PVC failures within 5 years of burial.

9.6. Expansion compensation for PVC is required per UPC 314.

9.7. All PVC piping will be supported with an approved hanger at intervals sufficiently close to maintain correct pipe alignment and to prevent sagging or grade reversal. Pipe will also be supported at all branch ends and at all changes of direction.

9.8. Slopes and cleanouts to be provided as code requires.

9.9. Roof drains and overflow roof drains will be provided and installed by the plumbing contractor. Coordinate with roofing contractor for proper installation details.

9.10. All roof drain bodies, deck drain bodies, horizontal rain leaders and overflow rain leaders through conditioned spaces will be insulated.

9.11. Overflow roof drains will be piped separately from horizontal rain leaders and will connect to vertical rain leader risers. Route all rain leaders to connections as indicated in the plumbing plans and coordinated with civil plans.
9.12. Provide drains and drainage system for courtyard areas and canopies and in planters.
9.13. Provide drains at each entry at grade in low spots created by sidewalk adjacencies.
9.14. P.C shall provide adequate expansion compensation in accordance with UPC section 313.2
9.15. Storm utility connections shall be coordinated with civil engineer and utility plans per
superintendents’ direction. The utility contractor is to make storm connections. Storm service
line sizes and locations on the drawings are provided for initial coordination.

10. DOMESTIC WATER METERING
10.1. This project will not have a central domestic hot water plant. Hot water meters are not
required.
10.2. Per owner direction, domestic cold water meters are not required for this project. Install a
standard manufacturer spool piece and couplings for a future domestic cold water meter in
each residence downstream of unit isolation valve.

11. DOMESTIC WATER
11.1. All valves, piping, and equipment used in the domestic water system will be certified Lead
Free and ANSI/NSF 61 & 372 approved per the 2012 UPC.
11.3. Individual residential unit DCW isolation valves shall be located with the water meters, and
be easily accessible after installation and provided with a pre-printed label “unit water shut
off”.
11.4. UPC-listed AA arresters shall be installed at the dishwasher and washing machine boxes in
all residences.
11.5. CPVC supply mains and risers through studs or supported from studs within units will utilize
3/16” neoprene strips to isolate the pipe from direct contact with studs.
11.6. Brass fittings for PEX piping shall be certified lead free and resistant to dezincification.
Provide Wirsbo or approved equal.
11.7. Plumbing insulation shall comply with current Energy Code. Per ESDS standard, DHW
insulation shall be provided complete from hot water source to the plumbing fixture.
Insulation shall be per WSEC and UPC code tables.
11.8. Insulate all metallic domestic cold water mains with minimum 12” glass fiber insulation to
prevent condensation.
11.8.1. Provide sectional DCW isolation valves at risers serving multiple units. Units to be located
per plumbing plans. Provide 18x18 access panel for each riser shutoff or group of shutoffs
where located above GWB ceilings in corridor.
11.9. Balance valves used in the system will be pressure independent with P/T ports and stainless
components. The balance valve locations will be coordinated with access panels by PC as
required.
11.10. Provide plenum rated materials for all plumbing systems exposed in areas that contain
plenums.
11.11. The water lines are to be connected to and coordinated with the service/supply lines at the
meter location, trenching is by others. PC to include all piping from the building to the
exterme meter box.
11.12. A water availability certificate dated 4/8/2011 indicates that static pressure for this site is 66
psi at an elevation of 278. A domestic water booster pump will be required for this project.
11.13. A duplex booster pump system is to be provided. Provide appropriately sized booster pump
on factory skid with listed VFD’s, alternator, and control panel. Provide and install a pressure
switch at an approved location which will provide adequate control without short cycling the
pumps.
11.15. Provide dual reduced pressure backflow assemblies (piped in parallel configuration) in water
service entry room on level 1 and install in compliance with applicable local and state codes.
Provide hub drain for backflow assembly relief discharge.
11.16. Non freeze hose bibs with isolation valve and removable keys are required in building
exteror locations at street levels as well as all public courtyards/ terraces and at roof level
where noted on the drawings. Provide Woodford Model B65 or equivalent. Provide stand alone roof hydrants where noted at the roof. Provide Woodford Model RHYS-1 or equivalent.

11.17. Provide hot and cold water hose bibb at trash room and north rooftop penthouse.
11.18. Provide capped 1" DCW connection with isolation valve in water entry room for future installation of backflow and connection to serve future liquid composting system.
11.19. Provide hot water connection and reduced pressure backflow assembly for trash chute wash down at highest floor. Contractor shall provide an indirect drain for RPBA discharge. Backflow assembly shall be rated for continuous use at 140°F.

12. DOMESTIC HOT WATER
12.1. Domestic hot water with the units is to be supplied by electric water heaters located in each individual residential unit. Provide 30 gallon, 4.0 KW lowboy electric tank water heaters as scheduled in the drawings. Basis of design is Bradford White. Final quantity and locations yet to be determined by architect and owner.
12.2. Domestic hot water for the laundry washing is to be 80 gallon electric tank water heater at each laundry area. Provide all accessories included in the plumbing details.
12.3. Domestic hot water for the lavatory in the common restrooms, and the Common area is to be provided by point of use instantaneous hot water heaters. Heaters are to be sized to provide 100°F water at the full flow rate of the fixtures served.
12.4. All tank-type water heaters located in unconditioned spaces or on concrete floors shall be placed on an incompressible, insulated surface with thermal resistance of R-10 per SMC Section C404.5. Install seismic tie-down straps per UPC 507.2 on each heater.
12.5. Tank heaters to include glass lining and be NSF 372 certified. Provide appropriately sized drain pan for each tank heater.
12.6. Water heaters shall be piped per all manufacturer recommendations. Contractor to include isolation valves, unions, and pete's plugs on inlet and outlet of heater. Pipe ASME temperature and pressure relief valve to indirect drain. Install temperature gauge on outlet of each heater.

13. IRRIGATION SYSTEM
13.1. The PC will provide a double check backflow preventer (DCVA) in the bike room to serve the irrigation system. Irrigation piping and valves inside the building is by the PC. Irrigation piping system is to be routed to level 1 POC, rooftop POC, and all other planned planting areas. See Landscape plans for additional scope notes. Piping is to be plenum rated in all commons / amenities areas. Insulate metallic piping installed within conditioned areas. Irrigation water is to be metered separately from the domestic water in the street. Meter to be located and installed per civil drawings
13.2. Size irrigation piping to provide required flow and pressure at the point of connection. PC to verify required pressure and flow rate at each connection with landscape architect.
13.3. Route all irrigation piping in Type L copper sized for no more than 5 ft/ sec flow rate. Other materials may be used if pipe sizing is calculated to meet the flow and pressure requirements for the irrigation system.

14. PLUMBING FIXTURES AND APPLIANCES
14.1. Garbage disposals will be provided and installed by the PC (1/2 hp).
14.2. Dishwasher rough in and hook-up is to be provided including UPC-listed AA arrester.
14.3. Provide laundry boxes including UPC-listed AA arresters and isolation valves. Laundry boxes will be appropriately rated for the wall in which they are installed. Coordinate accessible location in laundry closet.
14.4. All water closets to be low flow single flush fixtures in both residential and public/ amenity spaces.
14.5. All plumbing fixtures are to be low-flow. Final required flow rates to be determined. See the plumbing fixture schedule in the plumbing drawings for preliminary fixtures and flow rates.
14.6. Low flow fixtures shall be Water Sense certified.
14.7. Plumbing fixtures and trim are to be provided and installed by PC.
14.8. Provide a wall box above counter with isolation valve for coffee maker connection in common kitchens and staff break areas.
14.9. Provide under-counter DCW connection for refrigerators at all accessible (ADA) residential units. Connection is not required at standard residential units.
14.10. Check tub/shower rough openings to make sure they are plumb, square, are the proper size to allow for true and proper installation according to manufacturer's recommended installation instructions and provide adequate support and backing prior to installation of product.
14.11. Fasten all tub/shower valves etc. securely to backing. Loose valves, gooseneck or tub spouts will be deemed unacceptable and shall be subcontractor's responsibility to repair.
14.12. Plumber is responsible for verifying finish floor elevations and setting all floor drains to the appropriate correct elevation.
14.13. Spigot, gooseneck and valve escutcheon rings shall be caulked to the tubs/showers/countertop/wall as applicable. Sinks and deck mount tubs shall be caulked to the decks using white silicone caulk. Showerhead goosenecks shall be set at 80 inches off the finished floor unless otherwise specified.
14.14. Contractors are to provide rough in and final connections to all appliances and fixtures.

15. PREPARATION & INSTALLATION
15.1. All work contracted for must be accepted by all applicable inspectors including site superintendent, GC quality control personnel, owner's representative or their assignees.
15.2. Piping shall be run concealed in all areas with finished ceilings and locations must be coordinated with architect and interiors drawings.
15.3. Design build plumbing contractor is to coordinate pipe routing with the architect, interiors architect, design team, and construction team with special attention to interior reflected ceiling and acoustical plans. Shop drawings shall be submitted with the above information for review and coordination prior to construction.
15.4. In areas open to structure, piping shall be routed tight to structure. Piping shall not be run in front of windows or beneath skylights. Contractor to pay special attention to routing in lobby areas.
15.5. As-builts: provide owner with electronic as-built drawings within two weeks of substantial completion. As-builts will reflect all changes from the construction drawing set and will comply with 2012 Washington State Energy Code project completion requirements. As-builts will also comply with architectural specification sections.
15.6. O&Ms: provide hard copy and electronic copies of O&Ms for all systems within two weeks of substantial completion. O&M's will also comply with architectural specification sections.

16. 3.2 TESTING & INSPECTION
16.1. The Plumbing Contractor is responsible for all Div 22 test, balance, commissioning and startup of plumbing systems.
16.2. All plumbing systems are to be tested by the PC as required by the AHJ and UPC.
16.3. All commissioning will be in compliance with the methodologies of current industry standard.
16.4. The PC will execute all pre and final functional testing of plumbing systems to identify and resolve deficiencies prior the final testing.
16.5. The PC will document deficiencies and provide equipment, materials, and labor necessary to correct deficiencies found during the commissioning process to fulfill contract and warranty requirements.
16.6. Owner training will be provided by the installing contractor.
16.6.1. Water heaters
16.6.2. Circulation Pumps and hot water recirculation system.
16.6.3. Domestic hot water mixing valves

17. Alternates
17.1. Install water-conserving fixtures with the following specifications:
17.1.1. Toilets (2 points) - 1.1 gpf (maximum gallons per flush) or less, or a toilet with dual flush, one of the options being less than 1 gpf, WaterSense labeled.
17.1.2. Showerheads (2 points) - 1.75 gpm (gallons per minute) or less, WaterSense labeled.
17.1.3. Kitchen faucets (1 point) - 1.5 gpm or less
17.1.4. Bathroom faucets (1 point) - 0.5 gpm or less, WaterSense labeled
17.1.5. Electric (12 KW or less): Tank water heaters less than 70 gal must have an energy factor of 0.93 or greater. Tank water heaters more than 70 gal must have an energy factor of 0.92 or greater.

17.2. Supply and install individual water meter system for each resident:
17.2.1. Install one domestic cold water meter in each residence by PC. Meter will be furnished by PC. Meter to be Master Meter FAM or equivalent. The meters and meter bases are to be provided and installed by PC. Meters are to utilize wireless technology. Installation of wireless routers, central data logger, and phone line to central monitoring is by the EC.
17.2.1.1. The PC will install a meter spool piece and couplings for each meter prior to final installation of the meter. After pressure testing and initial system startup to eliminate debris, the meters and meterbases will be installed by the PC to replace the spool pieces.
17.2.1.2. The meters and spool pieces shall be located accessibly within the residential units. Meters and isolation valves shall be installed in the ceiling above an access panel. Final location to be coordinated with the architect.
17.2.1.3. Meter data procurement hardware and software is to be provided by the owner. EC is to provide receptacles for routers and central data logger.
17.2.1.4. The owner is to provide an Automated Meter Reading system (AMR) to collect the data from the meters. The AMR will be an Innovonics Tapwatch System or equivalent.

IT IS SPECIFICALLY UNDERSTOOD THAT SHOULD COST OF PROJECT CHANGE MORE THAN 5% FROM THE INITIAL BUDGET TO FINAL BID, CONTRACTOR RESERVES THE RIGHT TO BID OUT AND AWARD INSTALLATION TO ANOTHER PLUMBING CONTRACTOR USING STAMPED DRAWINGS PREPARED UNDER THIS AGREEMENT.

END OF SECTION