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**SOLICITATION AMENDMENT  
MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

**Comments - Commentaires**

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<b>Title - Sujet</b> Apartment Building Construction	
<b>Solicitation No. - N° de l'invitation</b> EW038-201920/A	<b>Amendment No. - N° modif.</b> 007
<b>Client Reference No. - N° de référence du client</b> PCA-EW038-201920	<b>Date</b> 2019-12-13
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$PWU-201-11726	
<b>File No. - N° de dossier</b> PWU-9-42151 (201)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2019-12-18</b>	<b>Time Zone</b> <b>Fuseau horaire</b> Mountain Standard Time MST
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Ho (RPC), Hector	<b>Buyer Id - Id de l'acheteur</b> pwu201
<b>Telephone No. - N° de téléphone</b> (780) 901-0989 ( )	<b>FAX No. - N° de FAX</b> (780) 497-3510
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

**Instructions: See Herein**

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<b>Name and title of person authorized to sign on behalf of Vendor/Firm</b> <b>(type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/</b> <b>de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

Solicitation No. - N° de l'invitation  
EW038-201920/A

Amd. No. - N° de la modif.  
007

Buyer ID - Id de l'acheteur  
pwu201

Client Ref. No. - N° de réf. du client  
PCA-EW038-201920

File No. - N° du dossier  
PWU-9-42151

CCC No./N° CCC - FMS No./N° VME

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**This amendment has been raised to include Addendum #006**

# JASPER STAFF HOUSING CONSTRUCTION

## 5 PLEX

### *ADDENDUM No. 6*

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#### ***CLARIFICATIONS***

- A.** Add Specification Section 23 21 13 Hydronic Piping.
  - B.** On Drawing M1.2 Mechanical Details, revise Detail 5 as per attached.
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#### ***QUESTIONS and ANSWERS***

- Q<sub>1</sub>** Is Type “L” copper permitted for the heating mains and primary boiler loop? I see a lot of references to welding pipe- but its uncommon to weld small sizes.
  - A<sub>1</sub>** L-type copper is not permitted on primary loop. L-type copper is only allowed at takeoffs from risers, runouts. Welding is not required for pipes 2 inches diameter and smaller.
  - Q<sub>2</sub>** On drawing # M1.2 detail 5; it shows 1-1/4” off boilers – increased to 2” for supply (which is normal) then the 2” increases to 4” into the air separator – then dropping back down to 2” after separator -is this correct ? based on the btu load – it not required
  - A<sub>2</sub>** See revised detail 5 on M1.2
  - Q<sub>3</sub>** On detail 5, M1.2 – the drawings show the secondary mains leaving to be 2” or 50mm but on the drawings (M4.1) they are reduced down to 30mm. Please advise which size we are to use.
  - A<sub>3</sub>** 30mm is correct.
- 

***END OF ADDENDUM No. 6***

(Total 1 pages)

**PART 1 - GENERAL**

**1.1. WORK INCLUDED**

- .1 Comply with Division 1, General Requirements and all documents referred to therein.
- .2 Provide all labour, materials, products, equipment and services to supply, install and test the heated water, chilled water and condenser water piping systems indicated on the Drawings and specified in this Section of the Specifications.

**PART 2 - PRODUCTS**

**2.1. PIPING, JOINTS AND FITTINGS**

- .1 Meet the following pipe provision requirements:
  - .1 Pipe: 12 mm to 50 mm
    - .1 ASTM A53, Standard wall steel electric resistance weld, threaded for 1035 kPa beaded malleable iron line joint couplings and 860 kPa threaded cast iron fittings.
- .2 Meet Section 20 05 00 requirements for pipe installation and equipment connection including union and flange provision.
- .3 Provide Type L copper takeoffs from risers, runouts and horizontal distribution systems.
- .4 Victaulic pipe joints may be used except for pipe enclosed in shafts. Meet the best practices described in current Victaulic literature. Victaulic pipe joints shall be Zero-Flex couplings with Grade E gaskets.

**2.2. VALVES**

- .1 Gate and globe valves shall be Crane, Jenkins or Kitz to the following Kitz figure numbers:

To 1400 kPa working pressure:

	Figure Numbers	
	Gate	Globe
50 mm and smaller: Soldered	44	10
Screwed	24	09
65 mm and larger Flanged	72	76

To 2100 kPa working pressure:

	Figure Numbers	
	Gate	Globe
50 mm and smaller - Soldered	43	10
Screwed	42	09
65 mm and larger Flanged, rising stem	300SCL	300SCJ

- .2 For pipe sizes 50 mm and smaller, ball valves may be substituted for the above gate and globe valves. Provide ball valves with brass or bronze body, chrome plated solid ball, PTFE seats and seals and full port:
  - .1 soldered - Kitz Figure 59
  - .2 screwed - Kitz Figure 58
- .3 Check valves shall be non-slam type, Check Rite or Centre Line manufacture, selected for system operating pressures and temperatures. Victaulic 716 check valves may be substituted in Victaulic grooved end piping systems.
- .4 Butterfly valves shall be DeZurik manufacture, full lug body style, with stainless steel shaft, supported by 3 bearings (top, bottom and actuator), replaceable EPDM seat to the following schedule. All flanges shall be ANSI rated, weld neck. Install spool pieces between valves and adjacent equipment. Equip valves to 100 mm with 10 position lever operator. Equip valves 150 mm and larger with gear box and handwheel operator. Each valve type shall hold line pressure with downstream flange removed to the full shutoff rating of the valve. Vic-300 grooved end valves may be substituted in Victaulic piping systems up to 2100 kPa.
  - .1 To 1225 kPa working pressure, use Fig. 660L.
  - .2 To 1575 kPa working pressure, use Fig. 632-L648.
  - .3 To 1750 kPa working pressure, use Fig. Bhp-L1 meeting ANSI B16.5 as follows:
    - .1 1995 kPa to 38°C
    - .2 1885 kPa to 100°C
    - .3 1750 kPa to 121°C
  - .4 To 2100 kPa working pressure, use Bhp-L2 meeting ANSI B16.5 as follows:
    - .1 5180 kPa to 38°C

- .2 3500 kPa to 193°C
- .3 2100 kPa to 440°C
- .5 Provide DeZurik plug valves for balancing applications except where circuit balancing valves are specified.
  - .1 To 1225 kPa provide Series 425/118 eccentric plug valve. Equip sizes 12 mm to 100 mm with memory stop and drip cap. Equip valves over 100 mm with handwheel gear.
  - .2 To 1575 kPa provide Series 118SX or 118FX eccentric plug valves. Equip sizes 12 mm to 65 mm with lever and memory stop. Equip valves over 65 mm with handwheel gear.
  - .3 To 1995 kPa provide Series 128 eccentric plug valves. Equip sizes 12 mm to 65 mm with lever and memory stop. Equip valves over 65 mm with handwheel gear. Meet ANSI B16.5 temperature and pressure requirements.
  - .4 To 2100 kPa provide Series Bhp-L2 high performance butterfly valves meeting previous specification.
  - .5 Provide Toyo 5046A, 3/4 ball drain valves with cap and chain at base of all hydronic risers. Valve rating- 1750 kPa at 121°C.
  - .6 Victaulic Series 377 "VIC-PLUG valves may be substituted in Victaulic piping systems up to 1225 kPa.

### 2.3. CIRCUIT BALANCING VALVES

- .1 Provide Armstrong Model CBV circuit balancing valves:
  - .1 on the common return pipe from each coil bank, heat exchanger, boiler and chiller
  - .2 on each return riser
  - .3 where shown on the Drawings
  - .4 for all locations where balancing valves are shown in pipe less than 65 mm in size
- .2 For valves to 50 mm provide Model CBVI, Y pattern style, all metal, with soldered or screwed connections, builtin drain connection with shut off valve and protective caps, and integral valve insulation.
- .3 For valves from 65 mm to 300 mm provide Model CBVII, Y pattern style, cast iron body, flat face flanges, or grooved end connections for grooved piping systems.
- .4 Provide, for each valve:

- .1 vernier type handwheel settings for precision flow balancing
- .2 positive shut off valve with no drip seat and plug type stem with teflon disc
- .3 tamper proof hidden memory feature
- .4 positive shut off metering valves with connections for portable meter
- .5 Have the same manufacturer supply two portable differential pressure meters for the project and, following their use by the balancing technician, turn over to Owner in good condition.
- .6 Select circuit balancing valve size to give a pressure drop at 100% open between 3.0 kPa and 21 kPa. Select valves located remote from the pumps in the circuit near minimum pressure drop and those located near the pumps at higher pressure drops.

#### 2.4. SAFETY AND RELIEF VALVES

- .1 Provide safety and relief valves for all closed water systems. Pipe relief to nearest floor drain.
- .2 Provide Watts 174A valves rated at 1035 kPa at 99°C ASTM rated, cast iron body bronze disc and seat, steel spindle assembly, carbon steel spring.

#### 2.5. HYDRONIC TERMINAL UNIT VALVES

- .1 Provide Dahl bronze ball valves at inlet and outlet of each hydronic terminal unit.

#### 2.6. AIR VENTS

- .1 Select air vents to suit system operating pressures.
- .2 Provide automatic air vents, Spirax Type 13W to 1035 kPa and 13WH to 2070 kPa complete with isolating gate valves at all high points where mains are trapped, where shown in the Drawings and where shown on Typical Detail Sheets. Pipe outlet from each vent to a service sink, drip pan or floor drain.
- .3 Provide manual air vents, screwdriver or key type at each unit heater, cabinet unit heater, convactor, wallfin section and fan coil unit.

#### 2.7. DIAPHRAGM TYPE EXPANSION TANKS

- .1 Provide a diaphragm type expansion tank, suitable for the system operating pressures, for each closed circulation system. Each tank shall have an heavy duty Butyl rubber diaphragm suitable for a 50% solution of inhibited propylene glycol. Refer to Schedules for capacity and size information.
- .2 Stamp each expansion tank with ASME pressure rating.

#### 2.8. AIR SEPARATORS

- .1 Furnish and install an Armstrong Vortex series VAS air separator complete with strainer and flanged connections as indicated on the mechanical drawings and schematics; air separator size to match incoming pipe size. Separator shall suitable for 1140 kPa at 190°C operating conditions.
- .2 Separator shall be designed and built in accordance with the latest revisions of ASME pressure vessel code.

## 2.9. GLYCOL FILL STATIONS

- .1 Heating System
  - .1 Hydronic system feeder shall be AXIOM INDUSTRIES LTD. Model MF200. System shall include 25 litre storage/mixing tank with molded-in level gauge, 125 mm fill/access opening and cover; pump suction hose with inlet strainer and check valve; pressure pump with fuse protection; low fluid level pump cut-out float switch; manual diverter valve for purging air and agitating contents of storage tank; pressure switch with snubber and two sets of SPST dry contacts, each individually
  - .2 adjustable from 70 kPa to 170 kPa cut-out pressure; factory cut-out pressure set to 104 kPa ; and liquid filled pressure gauge. Unit to be c/w fused power supply adapter with LED power indicator light, 115/60/1 to 24 VDC 50 watts AC, supplied loose for field installation.
  - .3 Feeder shall be compatible with glycol solutions of up to 50% concentration. Pump shall be capable of running dry without damage. Unit shall be completely assembled.
  - .4 Provide RIA10-1-SAA – Low Level Alarm Panel c/w Remote Monitoring Dry Contacts for connection to BAS.
- .2 Energy Recovery System
  - .1 Hydronic system feeder shall be AXIOM INDUSTRIES LTD. Model SF100. System shall include manual diverter valve for purging air and agitating contents of storage tank; pressure regulating valve adjustable (35– 380 KPa) complete with pressure gauge; integral replaceable strainer; built-in check valve; union connection; 12 mm x 900 mm long flexible connection hose with check valve; low level pump cut-out.
  - .2 Pressure pump shall be capable of running dry without damage. Power supply 115/60/1 0.7 A. Unit shall be completely pre-assembled and certified by a recognized testing agency to CSA standard C22.2 No 68.
  - .3 Provide RIA10-1-SAA – Low Level Alarm Panel c/w Remote Monitoring Dry Contacts for connection to BAS.

## PART 3 - EXECUTION



**3.1. INSTALLATION**

- .1 Meet Section 20 05 00 requirements.
- .2 Use valves and strainers of the same size as pipe in which it is installed, unless otherwise indicated.
- .3 Provide globe, ball or plug valves for throttling or controlling flow in accordance with article 2.2.
- .4 Provide gate, ball or butterfly valves for shutoff in accordance with article 2.2.
- .5 Install reducing fittings so as not to trap air.
- .6 Provide long radius elbows.
- .7 Provide flanges or unions at connections to all equipment.
- .8 Provide screwed or flanged joints only in accessible locations. Provide access doors as required.
- .9 Do not use field fabricated fittings.
- .10 Equip low points with 20 mm drain valve piped to floor drain. Provide, at high points on lines and on equipment connections, collection chambers and high capacity float operated automatic air vents.
- .11 Connect branch pipe runouts to top of main distribution pipe.

**3.2. TESTING**

- .1 Meet testing requirements of all authorities having jurisdiction. Obtain certification and certify tests not required by authorities. Perform not less than the following tests.
- .2 Prove hydronic piping tight under a hydrostatic test of 150% of design working pressure but not less than 700 kPa. Test without pressure drop for a period of not less than 4 hours.
- .3 Perform tests before piping is covered or concealed.
- .4 Remove all components which will not withstand test pressure and replace after tests.
- .5 Eliminate leaks or remove and refit defective parts. Do not caulk threaded or welded joints.
- .6 After work is completed, adjust and put all parts of the system into proper working order. Adjust all valves to achieve specified heating capacities. Leave the complete job ready for regular operation, all to the satisfaction of the Consultant.
- .7 After the testing period, drain the system, and before water treatment is introduced into the system, clean out all dirt pockets and strainers.

- .8 Provide lubricating oils, packing, and other accessories, for proper operation of the system.
- .9 The final test and acceptance shall not be made until the work is finally completed.

**3.3. INSTALLATION OF CONTROL DEVICES AND INSTRUMENTATION**

- .1 Install all control devices and instrumentation for the hydronic systems as shown on the drawings, specified in Section 25 30 00 and supplied by the controls supplier.

END OF SECTION

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WASPER STAFF HOUSING CONSTRUCTION

5 PLEX

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Designed by	CHUNG
Drawn by	D. GREGG
Approved by	F. HRES
Project Manager	W. HRES

## MECHANICAL DETAILS

R.100429.001	M1.2 OF	5
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