# PROJECT DRAWINGS **BUILDING-03 ADDITION & ALTERATIONS EVESHAM TOWNSHIP PUBLIC WORKS** 100 SHARP ROAD MARLTON, NEW JERSEY 08053 BURLINGTON COUNTY **APPLICABLE LIST OF CODES:** HABILITATION SUBCODE



# LOTS 5 & 5.03 / BLOCK 14



he following subcodes as adopted by the New Jersey Uniform Construction Code (NJAC 5:23 et seq.), shall apply to this Project.

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<u>SUBCODE</u>	NATIONAL MODEL CODE	UCC REFERENCE
Rehabilitation	Rehabilitation Subcode	NJAC 5:23-6
Building	International Building Code NJ Ed/2015	NJAC 5:23-3.14
Plumbing	National Standard Plumbing Code/2015	NJAC 5:23-3.15
Electrical	National Electrical Code (NFPA 70)/2014	NJAC 5:23-3.16
Energy	ASHRAE 90.1-2013 (Comm) International Energy Conservation Code/2015 (Res)	NJAC 5:23-3.18
Mechanical	International Mechanical Code/2015	NJAC 5:23-3.20
Fuel Gas	International Fuel Gas Code/2015	NJAC 5:23-3.22
Barrier-Free	Barrier-Free Subcode & ICC/ANSI A117.1-2009	Chapter 11 of IBC/20 & NJAC 5:23-7
Residential	International Residential Code NJ Ed/2015	NJAC 5:23-3.21
Elevator	American Society of Mechanical Engineers (ASME)	NJAC 5:23-12

# LIST OF DRAWINGS

All Contractors shall examine all drawings indicated herein for required coordination between different trades and/or for work included in other sections of the Project Manual that may pertain to their respective contract.

CS	COVER SHEET
CA	CODE ANALYSIS & CONSTRUCTION NOTES
C1	SITE PLAN
C2	SECTIONS & DETAILS
C3	SOIL EROSION & SEDIMENT CONTROL PLAN
C4	SOIL EROSION & SEDIMENT CONTROL DETAILS
A1.1	FLOOR PLANS & DETAILS
A2.1	ELEVATIONS & WALL SECTION
A3.1	WALL SECTIONS
A4.1	OWNER PROVIDED EQUIPMENT PLAN
S1	STRUCTURAL GENERAL NOTES
S2	FOUNDATION PLAN
S3	FOUNDATION DETAILS
PD-1	FLOOR & MEZZANINE PLANS - PLUMBING DEMOLITION
P-1	UNDERSLAB PLAN - PLUMBING
P-2	FLOOR & MEZZANINE PLANS - PLUMBING
P-3	SCHEDULES, SYMBOLS & DETAILS - PLUMBING
P-4	RISER DIAGRAM - PLUMBING
P-5	SPECIFICATIONS & DETAILS - PLUMBING
FP-1	FLOOR & MEZZANINE PLANS - FIRE PROTECTION
FP-2	SYMBOLS, SCHEDULES & DETAILS - FIRE PROTECTION
FP-3	SPECIFICATIONS - FIRE SUPPRESSION
H-1	FLOOR & MEZZANINE PLANS - HVAC
H-2	SYMBOLS, ABBREVIATIONS, SCHEDULES & NOTES - HVAC
H-3	DETAILS & SPECIFICATIONS - HVAC
H-4	SPECIFICATIONS (CONTINUED) - HVAC
ED-1	FLOOR & MEZZANINE PLANS - ELECTRICAL DEMOLITION
E-1	FLOOR & MEZZANINE PLANS - ELECTRICAL
E2	SINGLE LINE & SCHEDULES - ELECTRICAL
E-3	SPECIFICATIONS - ELECTRICAL



#### EVEBOE Building 03 Addition/Alterations **Building Code Synopsis**

#### 0100.0 Administration (Not Applicable)

#### 0200.0 NJUCC Excerpts

**5:23-2.1(c)** New Jersey Uniform Construction Code (NJUCC) shall control all matters concerning construction, alteration, addition, repair, removal, demolition, use, location, and occupancy of all buildings and structures and their service equipment, and shall apply to existing or proposed buildings and structures in the State of New Jersey.

**5:23-2.5** As the building is being increased in floor area, the increased portion of the structure shall conform to the *NJUCC* requirements applicable to new construction, while any related work within the existing structure shall conform with the NJUCC 5:23-6, Rehabilitation Subcode.

**5:23-2.15** Application for a Construction Permit shall be submitted by the Contractor(s) per NJUCC Section 5:23-2.15.

**5:23-2.16(h)** A true copy of the construction permit shall be kept on the site of operations open to inspection during the entire time of prosecution of the Work and until the completion of the same.

**5:23-2.16(i)** At least 24 hours notice of start of work under a construction permit shall be given to the Construction Official.

**5:23-2.16**(j) The issuance of the construction permit shall be conditioned upon payment of appropriate fees, the Contractor's & Owner's assurance that the Work will conform to the requirements of the Code applicable to the Work for which the permit has been issued, including prior approvals and any approved amendments thereto, that the permit is a license to proceed with the Work and shall not be construed as authority to violate, cancel, or set aside any of the provisions of the regulations, that the Owner & Contractor will assist the Enforcing Agency in its inspection work, and that all escrows required to by paid by the applicant in connection with the Work have been paid.

**5:23-2.18(b)** The Construction Official and appropriate Subcode Officials shall carry out periodic inspections during the progress of the Work to ensure that Work inspected conforms to the requirements of the Code.

**5:23-2.18(b)2** Inspections for all subcodes of construction shall be limited to those required for one- and two-family dwellings plus the following: fire suppression systems; heat producing devices; and any special inspections required by any subcode of the regulations. The mid-point inspection shall include a review for compliance with IBC/NJ Chapter 11.

**5:23-2.18(c)1** The Contractor shall notify the enforcing agency when the Work is ready for any required inspection specified by the NJUCC or required by the Construction Official or appropriate Subcode Official. This notice shall be given at least 24 hours prior to the time the inspection is desired. This notice shall represent an attestation on the part of the Contractor that the Work has been completed in conformance with the NJUCC and is ready for inspection.

5:23-2.18(c)2 The Contractor shall allow for Inspections to be performed within three business days of the time for which they are requested. The Work shall not proceed in a manner that will preclude the inspection until it has been made.

**5:23-2.18(d)** Upon completion of the Work, and before the issuance of a Certificate of Use and Occupancy required by the *NJUCC*, a final inspection shall be made, and any violations of the code shall be noted and the holder of the permit shall be notified of any discrepancies by the Construction Official.

**5:23-2.21(c)4** The Contractor shall perform the necessary services and be present on the construction site on a regular and periodic basis to determine that the Work is proceeding in accordance with the *NJUCC* and any conditions of the construction permit.

**5:23-2.21(d)** At the completion of the construction, the Contractor shall submit to the Construction Official a report as to the satisfactory completion and the readiness of the project for occupancy and shall certify that, to the best of his/her knowledge and belief. such has been done substantially in accordance with the *NJUCC* and with the plans and specifications, with any substantial deviations noted.

**5:23-2.21(e)** The actual construction of the Work shall be the responsibility of the Contractor(s) as identified on the approved construction permit, and shall involve execution of the Work in accordance with the regulations, execution & control of all methods of construction in a safe & satisfactory manner, and execution all Work in accordance with the *NJUCC* and those portions of the plans and specifications controlled by the *NJUCC*. The Contractor(s) shall render all such construction services as required to effect a safe & satisfactory installation of the project.

5:23-2.21(e)5 Upon completion of the construction, the Contractor(s) shall certify to the best of their knowledge & belief that such has been done substantially in accordance with the *NJUCC* and with those portions of the plans & specifications controlled by the *NJUCC*, with any substantially deviations specifically noted.

5:23-2.23(d) No Addition which increases the height or area of an existing building or structure shall be used until a Certificate of Occupancy shall have been issued by the Construction Official certifying that the Work has been completed in accordance with the provisions of the *NJUCC*, except as otherwise provided in their rules.

**5:23-2.29(a)** The Owner of any premises upon which a building or structure is to be constructed shall be deemed to have consented to inspection, by the Enforcing Agency, of the entire premises and of any and all construction being performed on it until a Certificate of Occupancy has been issued.

5:23-3.5(a) Every building and structure and part thereof designed for business, factory, and industrial, high hazard, mercantile, or storage use (Use Groups B, F, H, M, & S) as defined by the *IBC/NJ* shall be posted on all floors by the Owner with a suitably designed placard in a form designated by the Building Subcode official, which shall be securely fastened to the structure in a readily visible place, stating the Use Group, and the maximum allowable Live Load & Occupancy Load.

**5:23-3.5(c)** All posting signs shall be furnished by the Owner and shall be of permanent design; they shall not be removed, or defaced and, if lost, removed or defaced, shall be immediately replaced.

**5:23-3.14(a)1** The Building subcode for new construction is the *International Building Code*/2015, *New Jersey Edition (IBC/NJ)*, as adopted by *NJUCC*. 5:23-3.15(a)1 The Plumbing subcode for new construction is the National Standard

Plumbing Code/2015 (NPC), as adopted by NJUCC. **5:23-3.16(a)1** The Electrical subcode for new construction is the *National Electrical* 

Code/2014 (NEC), as adopted by NJUCC. **5:23-3.17(a)1** The Fire Protection Subcode shall be those portions of subcodes as adopted by NJUCC 5:23-3.17.

5:23-3.18(a)1 The Energy subcode for new construction is ASHRAE.IESNA Standard 90.1/2013 (ASHROE), as adopted by NJUCC.

**5:23-3.20(a)1** The Mechanical subcode for new construction is the *International* Mechanical Code/2015 (IMC), as adopted by NJUCC.

**5:23-3.22(a)1** The Fuel Gas subcode for new construction is the *International Fuel Gas* Code/2015 (IFGC), as adopted by NJUCC.

#### <u>Alterations</u>

**5:23-6.3(a)** Because the Work consists of the rearrangement of space by the construction of walls or partitions or by a change in ceiling height, the addition or elimination of a window or door, the extension & rearrangement of systems, the installation of additional equipment and fixtures, and imposes additional loads on primary structural components, the project shall be deemed an "Alteration".

**5:23-6.6(c)** The Work shall not cause any diminution of existing structural strength, system capacity, or mechanical ventilation below that which exists at the time of application for a permit, or that which is required by the applicable subcodes of the NJUCC, whichever is lower. The replacement or addition of fixtures, equipment, or appliances shall not increase loads on these systems unless the system is upgraded in accordance with the applicable subcode of the NJUCC to accommodate the increased load.

5:23-6.6(c)1 Newly introduced fixed loads shall not exceed the uniformly distributed live loads or concentrated live load criteria of IBC/NJ Table 1607.1, and shall not create deflection that exceeds the standards set forth in *NJUCC* Section 5:23-6.5(c)1.

5:23-6.6(c)1.ii For steel frame construction, deflection shall not exceed L/240 for roofs with a slope of 3 in 12 or less or L/180 for roofs with a slope of greater than 3 in 12 and for floors.

**5:23-6.6(c)2** Any fire projection system providing partial or redundant protection originally installed to protect a special hazard that no longer exists and that is not duired in accordance with the current NJUCC is allowed to be removed with the written approval of the Fire Subcode Official and Fire Official. All disconnected equipment and devices, such as pull stations, nozzles, detectors, sprinklers, sensors, panels, and hose connections, shall be removed so as not to give a false indication that the structure, area or space is protected.

5:23-6.6(c)3 No work shall be undertaken that diminishes accessibility below that which is required by the IBC/NJ Chapter 11, Accessibility.

**5:23-6.6(c)4** Construction materials used as part of an Alteration project shall be consistent with the existing construction type or the allowable construction type, whichever is less restrictive.

**5:23-6.6(d)1-3** The following products and practices shall not be used: 1) wood paneling as an interior finish not in conformance with NJUCC 5:23-6.11 Table 2, 2) carpeting that fails to meet the DOC FF-1 "Pill Test", 3) unlisted or unapproved electrical products, and, 4) plumbing materials listed under *NJUCC* 5:23-6.6(d)4.

**5:23-6.6(d)7** A mirror shall not be placed in or adjacent to any means of egress so as to confuse the direction of egress or give the appearance of a doorway, exit, or passageway. Draperies or similar hangings shall not obscure an exit.

**5:23-6.6(e)1** When any water closet is replaced, the replacement water closet shall require not more than 1.6 gallons of water per flush, as required by the Plumbing Code. **5:23-6.6(e)3** When a space is reconfigured, the altered space shall comply with the

IBC/NJ Chapter 11, Accessibility.

5:23-6.6(e)4,i When new door openings are created, existing door openings are enlar or door assemblies are replaced and the required door width can be achieved within the existing opening, the new door shall comply with ICC/ANSI A117.1, Section 404.

**5:23-6.6(e)7** Replacement glass shall comply with the "Safety Glazing" requirement the IBC/NJ and shall be installed in the "Hazardous Locations" as specified by IBC/N Sections 2406.4 and 2406.5.

5:23-6.6(e)8 Where a fireproofing material is removed that is integral to the rating of existing fire-rated assembly, the material shall be replaced so that the rating is preserv **5:23-6.6(e)9** Plug fuses of the Edison-base type shall be used only for replacements where there is no evidence of over-fusing or tampering per Section 240.51(B) of the National Electrical Code.

**5:23-6.6(e)15** When a new refrigerant is introduced, the requirements of the International Mechanical Code 2015 (IMC) applicable to that refrigerant shall be met This shall apply to the installation of new equipment, the replacement of existing equipment with equipment using a different refrigerant, or the replacement of the refrigerant in existing equipment with a different refrigerant.

**5:23-6.6(e)17** When the Work being performed creates or exposes the roof decking/sheathing or the framing of any wall, floor, ceiling, or roof assembly that is p of the building thermal envelope (enclosed conditioned space), any accessible voids i insulation shall be filled using insulation meeting the R-values of Table 5.5-4 or 5.5-5 the commercial energy code, as applicable.

5:23-6.6(e)18 When fenestration (windows, skylights, or doors) is newly installed or replaced, the U-factor (thermal transmittance) shall not exceed the U-factor of Table : 4 or 5.5-5 of the commercial energy code.

5:23-6.6(e)19 Ducts that are newly installed or replaced shall be installed with insula meeting the R-values of Section 6.4.4.1.2 of the commercial energy code, as applicable

5:23-6.6(e)20 The total replacement of a building lighting system or newly installed lighting system shall meet Section 9.1.2 of the commercial energy code, as applicable

5:23-6.6(e)21 When the work being performed results in an indoor or outdoor gas me related regulator, or piping becoming subject to vehicle impact, which work includes. is not limited to, new installation, relocation, or other construction, the gas meter, rela regulator, or piping shall be protected by barriers meeting the requirements of Section 312 of the International Fire Code. For the purpose of applying this provision, "subje to vehicle impact" shall mean located within three feet of any garage door opening, driveway, or designated parking area, and not separated by a building wall from the where the vehicle may be operated.

5:23-6.6(e)23 The work shall not cause an exit enclosure to be used for any purpose other than means of egress, except those penetrations permitted by IBC/NJ Section 1023.5.

**5:23-6.6(e)24** Existing openings that become part of an exit or exit access and newly created openings to be used as an exit or exit access shall meet IBC/NJ Sections 1008 & 1013 of the building Subcode when more than one exit or exit access is required. shall apply only to the portion of the building services by the new exit or exit access.

5:23-6.6(g) In buildings containing a fuel burning appliance or having an attached garage, carbon monoxide detection equipment shall be installed in accordance with IBC/NJ Section 915.

**5:23-6.6(h)** The work shall not make the building less conforming with the basic requirements of *IBC/NJ* 5:23-6.6 than it was when the Alteration was undertaken.

5:23-6.6(i) All materials and methods used shall comply with requirements specified *NJUCC* 5:23-6.8, Materials & Methods.

5:23-6.6(j) All new building elements, as listed in NJUCC 5:23-6.9 shall comply with the requirements of that section.

5:23-6.6(k) Where the space altered is a primary function space, an accessible path of travel to the altered space shall be provided up to the point at which the cost of provid accessibility is disproportionate to the cost of the overall alteration project. A cost is disproportionate if it exceeds 20% of the cost of the alteration work (minus IBC/NJ 5 6.6(k)2 deductions)

#### New Building Elements

**5:23-6.9(a)5** Newly created door openings shall comply with *IBC/NJ* Section 1010. Additionally, newly created door openings in walls which are fire-resistance rated sh comply with IBC/NJ Section 716.

**5:23-6.9(a)11** Newly created openings in fire resistance rated assemblies shall be protected in accordance with *IBC/NJ* Sections 714, 715, 716, and 717, as applicable. 5:23-6.9(a)15 Newly created corridors shall comply with IBC/NJ Sections 1020.1,

1020.3, 1020.4, 1020.5, 1023, and 1020.6. 5:23-6.9(a)24 Newly installed (not replacing an existing device) electrical service equipment, switchboards, panelboards, motor control centers, and other electrical

equipment containing overcurrent, switching or control devices likely to require examination, adjustment, servicing, or maintenance while energized shall conform with the requirements specified in NJUCC 5:23-6.8, Materials & Methods, and, in addition shall confirm with Sections 110.26 (Space About Electrical Equipment – 600 Volts, Nominal or Less), 110.32 (Work Space About Equipment - Over 6-Volts, Nominal 110.33 (Entrance and Access to Work Space), 404.8 (Accessibility & Grouping), and 408.18 (Clearances), as applicable, of the *National Electrical Code 2014*.

5:23-6.9(a)24.ii Newly installed panelboards (not replacement) shall comply with *ICC/ANSI* A117.1 Sections 309.2 & 309.3.

**5:23-6.9(a)25** Newly installed (not replacing an existing device) heating, air conditioning, or refrigeration equipment likely to require examination, adjustment, servicing, or maintenance shall conform with the requirements specified in NJUCC 6.8, Materials & Methods, and, in addition, shall confirm with Section 210.63 (Heatin Air Conditioning, & Refrigeration Equipment Outlet) and, if newly installed in an atti underfloor space, utility room, or basement, 210.70 (Lighting Outlets Required), as applicable, of the National Electrical Code 2014.

5:23-6.9(a)29 Newly installed heating, cooling, and ventilation systems shall have controls meeting Sections 6.4.3, 6.5, 7.4.4, and 7.4.6 of the commercial energy code. Systems include, but are not limited to, the heating & cooling of air or liquids and the ventilation or exhausting of spaces.

5:23-6.9(a)30 Newly installed systems that include piping carrying fluids shall meet Section 6.4.4.1.3 or Section 7.4.3 of the commercial energy code, and Section 1204 of the International Mechanical Code 2015.

**5:23-6.9(a)31** Newly installed heating and cooling equipment shall be sized in accordance with Sections 6.4.2.1 and 7.4.1 of the commercial energy code.

0300.0 Use & Occupancy Classification

**0302.1** The following Use Classifications apply to this project:

0304.1 Because this building will be used for office, professional or service-type transactions, its use shall be classified per the International Building Code/New Jerse

2015 (IBC/NJ), as Use Group B, Business. 0311.2 Because this building will also be used for a use similar to a motor vehicle re

garage, its use shall be classified per the International Building Code/New Jersey 201. (IBC/NJ), as Use Group S-1, Moderate-Hazard Storage.

0307.1 The building shall not manufacture, process, generate, or store materials that constitute a physical or health hazard in quantities in excess of those allowed in *IBC/A* Tables 307.1(1) and 307.1(2).

0400.0 Special Detailed Requirements Based on Use & Occupancy

0406.8 Repair garages shall be constructed in accordance with the International Fire Code and IBC/NJ Sections 406.8.1 thru 406.8.6. This occupancy shall not include mo

fuel-dispensing facilities, as regulation in *IBC/NJ* Section 406.7 0406.8.1 Mixed uses shall be allowed in the same building as a repair garage subject

the provisions of IBC/NJ Section 508.1.

**0406.8.2** Repair garages shall be mechanically ventilated in accordance with the International Mechanical Code 2015. The ventilation system shall be controlled at th entrance to the garage.

04606.8.3 Repair garage floors shall be of concrete or similar noncombustible and nonabsorbent materials.

**0408.8.4** Heating equipment shall be installed in accordance with the *International* Mechanical Code 2015.

0406.8.5 Repair garages used for the repair of vehicles fueled by nonodorized gases as hydrogen ad nonodorized LNG, shall be provided with a flammable gas detection

system per *IBC/NJ* 406.8.5.1 thru 406.8.5.3. **0406.8.6** A Repair Garage shall be equipped with an automatic sprinkler system in

0500.0 General Building Heights & Areas

Table 504.3 Allowable Building Height in Feet above Grade Plane

accordance with *IBC/NJ Section* 903.2.9.1

• Use Group B, Construction Type II-B, Sprinklered = 75' • Use Group S-1, Construction Type II-B, Sprinklered = 75' ! Proposed Building Height

Table 504.4 Allowable Number of Stories above Grade Plane -• Use Group B, Construction Type II-B, Sprinklered = 4 • Use Group S-1, Construction Type II-B, Sprinklered = 3

! Proposed Stories above Grade Plane

 
 Table 504.6.2
 Allowable Area Factor
 • Use Group B, Construction Type II-B, Sprinklered, 1-Story = 92,000 SF

irged, the	Use Group S-1, Construction Type II-B, Sprinklered, I-Story = 70,000      Proposed Areas     Existing First Floor: B, Business	Means of Egress, an emergency electrical sys exit access stairways & ramps, interior & exit passageways, vestibules on the level of discha that lead directly to the exit discharge.
ts of VJ	Addition First Floor: S-1, Repair Garage	<b>1008.3.4</b> The emergency power system shall than 90 minutes and shall consist of storage b generator. The installation of the emergency
of an ved.	<b>0505.2</b> A mezzanine in compliance with <i>IBC/NJ</i> Section 505.2 shall be considered a portion of the story below. Such a mezzanine shall not contribute to either the building area or number of stories as regulated by <i>IBC/NJ</i> Section 503.1. The area of the mezzanine shall be included in determining the fire area. The clear height above and below the mezzanine floor construction shall be not less than 7'.	<ul> <li>Internation of the energency <i>IBC/NJ</i> Section 2702.</li> <li>1008.3.5 Emergency lighting facilities shall that is not less than an average of 1 foot-candicandle measured along the path of egress at flippermitted to decline to 0.6 foot—candle average foot exercise and the end of the emergency lighting facilities is the end of the e</li></ul>
et.	<b>0505.2.1</b> The aggregate area of a mezzanine within a room shall be not greater than one- third of the floor area of that room or space in which it is located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the mezzanine is located. In determining the allowable mezzanine area, the area of the mezzanine shall not be included in the floor area of the room.	<b>1009.1</b> Accessible spaces shall be provided v Egress. Where more than one Means of Egre
part	<b>0505.2.3</b> A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42" in height, columns, & posts.	1006.3 from any accessible space, each access not less than two accessible means of egress.
in 5 of	<b>0508.3.1</b> Nonseparated mixed use occupancies shall be individually classified in accordance with <i>IBC/NJ</i> Section 302.1. Code requirements shall apply to each portion of	and shall consist of one or more of the compo
r 5.5-	restrictive provisions of <i>IBC/NJ</i> Chapter 9 that apply to the nonseparated occupancies shall apply to the total nonseparated Occupancy area.	stairway in a building equipped throughout w in accordance with <i>IBC/NJ</i> Section 903.3.1.1
ation ble.	<b>0508.3.2</b> The allowable building area & height of the building or portion thereof shall be based on the most restrictive allowances for the Occupancy groups under consideration for the type of construction of the building in accordance with <i>IBC/NJ</i> Section 503.1.	<b>1010.1.1</b> The required capacity of each door Load thereof and shall provide a minimum cle openings of doorways with swinging doors sh door and the stop, with the door open 90 degr minimum clear width of 32" and a door opening
e. neter.	<b>0509.4</b> The Incidental Uses listed on IBC/NJ Table 509 shall be separated from the remainder of the building or equipped with an automatic sprinkler system, or both, in	mullion, one leaf shall provide a clear opening swinging door leaf shall be 48" nominal. The
s, but ated n	accordance with the provisions of that table <b>Table 0509</b> , Incidental Uses	<b>1010.1.1.1</b> There shall not be projections into above the floor or ground. Projections into the above the floor or ground shall not exceed 4"
ject space	<ul> <li>Furnace Room where any piece of equipment is over 400,000 BTU per hour input</li></ul>	<b>1010.1.2</b> Egress doors shall be of the pivoted <b>1010.1.2.1</b> Pivot or side-hinged swinging doo travel where serving a room or area containin
y 8.3 This	<b>0509.4.2</b> Where <i>IBC/NJ</i> Table 509 permits an automatic sprinkler system without a Fire Barrier, the Incidental Uses shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or floor assembly below to the underside of the floor or roof sheathing, deck, or slab above. Doors shall be self- or automatic-closing upon detection of smoke in accordance with <i>IBC/NJ</i> Section 716.5.9.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80. Walls surrounding the Incidental Use shall not have air transfer openings unless provided with smoke dampers in accordance with <i>IBC/NJ</i> Section 710.8.	<ul> <li>1010.1.3 The force for pushing or pulling op Fire Doors, shall not exceed 5 pounds. These retract latch bolts or disengage other devices to other swinging doors, as well as sliding &amp; fol when subjected to a 15-pound force. The door 30-pound force. The door shall swing to a fur pound force. Forces shall be applied to the la</li> <li>1010.1.5 There shall be a floor or landing on shall be at the same elevation on each side of</li> </ul>
	<b>0600.0 Types of Construction</b> <b>0602.3</b> Proposed construction system for the Addition is classified as Type II-B, in	exterior landings, which are permitted to have 12 units horizontal (2% slope).
d in ith	<ul> <li>which the building elements listed on <i>IBC/NJ</i> Table 601 are of noncombustible materials, except as permitted in <i>IBC/NJ</i> Section 603 and elsewhere in the <i>IBC/NJ</i>.</li> <li><b>Table 0601</b>, Fire-Resistance Rating Requirements for Building Elements (hours)</li> <li>Primary Structural frame</li> </ul>	whichever is greater. Doors in the fully open dimension by more than 7". Where a landing doors in any position shall not reduce the land Landings shall have a length measured in the
of	Exterior Bearing walls	<b>1010.1.7</b> Thresholds at doorways shall not ex level changes greater than 0.25 at doorways s
ding 5:23-	Floor construction	<b>1010.1.9</b> Except as specifically permitted in the readily openable from the egress side with
	Table 0602       Required Fire-Resistance Rating for < 5' separation for A, B, R, & S-2 Use         Groups = 1 hour.       0603 1         Combustible materials shall be permitted in buildings of Type II in the following	effort. <b>1010.1.9.1</b> Door handles, pulls, latches, and o
1.1. all	applications: fire-treated wood shall be permitted in nonbearing partitions where the required fire-resistance rating is 2 hours or less, nonbearing exterior walls where fire-resistance rating is not required, and roof construction including girders, trusses, framing	twisting of the wrist to operate. <b>1010.1.9.2</b> Door handles, pulls, latches, locks
	& decking; millwork such as doors, door frames, window sashes, & frames; trim installed in accordance with <i>IBC/NJ</i> Section 806; platforms constructed in accordance with <i>IBC/NJ</i> Section 410.4; blocking such as for handrails, millwork, cabinets, & window/door frames; nailing or furring strips as permitted by <i>IBC/NJ</i> Section 803.11; and materials used to protect penetrations in fire-resistance-rated assemblies in accordance with <i>IBC/NJ</i> Section 714.	installed 34" minimum and 48" maximum ab security purposes and not used for normal ope <b>1010.1.9.4</b> Manually operated flush bolts or s Where a pair of doors serves a Group B, F or surface mounted bolts are permitted on the in
	0800.0 Interior Finishes	with an automatic sprinkler system in accord inactive leaf shall not contain doorknobs, pan
vith on,	<b>0803.1.1</b> Interior Wall and Ceiling Finishes shall be classified in accordance with ASTM E 84 or UL 723. Such interior finish materials shall be grouped in the following classes in accordance with their flame arread and arrely developed index.	<b>1010.1.9.5</b> The unlatching of any door or lea
1), 1	<ul> <li>Class A: flame spread 0-25; smoke developed 0-450</li> <li>Class B: flame spread 26-75; smoke developed 0-450</li> <li>Class C: flame spread 76-200; smoke developed 0-450</li> </ul>	<b>1010.1.10</b> Doors serving rooms or spaces with Group A occupancy shall not be provided with or fire exit hardware.
	<ul> <li>IBC/NJ Table 0803.11 - Interior Wall &amp; Ceiling Finish Requirements by Occupancy [in sprinklered building]:</li> <li>Use Group B, Corridors &amp; Enclosures for Exit Access Stairways</li></ul>	following: 1) Panic hardware shall be listed i hardware shall be listed in accordance with U portion of the releasing device shall extend no width; and 4) The maximum unlatching force
5:23- ing, tic,	<b>0804.1</b> Interior floor finish and floor covering materials shall comply with <i>IBC/NJ</i> Sections 804.2 thru 804.4.2, except for floor finishes and coverings of a traditional type, such as wood, vinyl, linoleum, or terrazzo, and resilient floor covering materials that are not comprised of fibers.	<b>1013.1</b> Exits and exit access doors shall be m visible from any direction of egress travel. Th exits shall be marked by readily visible exit si egress travel in cases where the exit or the par visible to the occupants. Intervening means of
e	<b>0808.1.1.1</b> Suspended acoustical ceiling systems shall be installed in accordance with the provisions of ASTM C635 and ASTM C636.	by exit signs. Exit sign placement shall be suce exit passageway is more than 100 feet (30 480 sign, whichever is less, from the nearest visib not required in rooms or areas that require on exit doors or gates that are obviously and clear
t of	<ul><li>0900.0 Fire Protection Systems</li><li>0901.2 Fire protection systems shall be installed, repaired, operated, and maintained in</li></ul>	signs where approved by the building officia <b>1013.5</b> Electrically powered, self-luminous a listed and labeled in accordance with LU 92
	accordance with <i>IBC/NJ</i> and the International Fire Code. <b>0901.8</b> Fire pump rooms and automatic sprinkler riser rooms shall have adequate space for all equipment necessary for the installation, as defined by the manufacturer, with	the manufacturer's instructions and the <i>Electr</i> signs shall be illuminated at all times.
	to elements of permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service repair, or replacement without removing such elements of permanent construction or disabling the function of a required fire-resistance-rated assembly. Fire pump and automatic sprinkler system riser rooms shall be provided with a door (s) and unobstructed passageway large enough to allow	less than 6" high with the principal strokes of "EXIT" shall have letters having a width not the minimum spacing between letters shall be minimum established in this section shall hav proportion to their height. The word "EXIT"
ey	removal of the largest piece of equipment. <b>0903.3</b> Automatic sprinkler systems shall be designed in accordance with <i>IBC/NJ</i> Sections 903.3.1 through 903.3.8	or is not energized. If a chevron directional in sign, the construction shall be such that the di chevron directional indicator cannot be readil
epair 15	<b>0903.4</b> Automatic sprinkler systems shall be monitored and alarmed per <i>IBC/NJ</i> Section 903.4.	<b>1013.6.2</b> The face of an exit sign illuminated intensity of not less than 5 footcandles.
z /NJ	<ul> <li>0906.1 Portable fire extinguishers shall be provided in occupancies and locations as required by <i>IBC/NJ</i> Section 906.</li> <li>0907.1 The application, installation, performance, and maintenance of Fire Alarm and Detection Systems shall comply with <i>IBC/NI</i> Section 907.</li> </ul>	<b>1013.6.3</b> Exit signs shall be illuminated at all a duration of not less than 90 minutes in case means shall be connected to an emergency po unit equipment or an on-site generator. The in
e notor	<b>0915.1</b> Carbon monoxide detection shall be installed in new buildings in accordance with IBC/NJ Sections 915.1.1 through 915.6.	<b>1016.1.2</b> Egress from a room or space shall ne rooms or areas, except where such adjoining accessory to one or the other, are not a Group
t to	<b>1000.0 Means of Egress</b> <b>1003.2</b> Means of Egress shall have a ceiling height of not less than 7', except as	<b>1016.1.3</b> An exit access shall not pass throug egress.
he	<ul><li>exempted by <i>IBC/NJ</i> Sections 1003.2.1 through 1003.2.8.</li><li><b>1003.3</b> Protruding objects on circulation paths shall comply with the requirements of</li></ul>	<b>1017.2</b> Exit access travel distance shall not e 1017.2.
	<ul><li><i>IBC/NJ</i> Sections 1003.3.1 through 1003.3.4.</li><li><b>1003.4</b> Walking surfaces of the Means of Egress shall have a slip-resistant surface and be securely attached.</li></ul>	<b>Table 1017.2</b> – Exit Access Travel Distance:• S-1, w/ Sprinkler• B, w/ Sprinkler
such	Table 1004.1.1 - Maximum Floor Area Allowances per Occupant:         • Business	<b>1017.3</b> Exit access travel distance shall be m story along the natural and unobstructed path the entrance to an exit.
	<ul> <li>Proposed Egress Occupancy</li> <li>Business, Exhibit/Museums</li></ul>	Table 1020.1 – Corridor Fire-Resistance Rati         • A, B, S w/ Sprinkler         Table 1020.2 – Minimum Corridor Width:         •
	<ul> <li>1005.3.2 – Means of Egress Sizing:</li> <li>Egress Components</li></ul>	<b>1020.4.2</b> In occupancies in Groups B and S, with an automatic sprinkler system in accorda
	<ul> <li>1006.2 Rooms, areas, or spaces, including mezzanines, within a story or basement shall be provided with the number of exits or access to exits in accordance with <i>IBC/NJ</i> 1006.</li> <li>1007.1.1 Where two exits, exit access doorways, exit access stairways, or ramps, or any combination thereof, are required from any portion of the avit access the web-like and the second statement of the avit access.</li> </ul>	length of the dead-end corridors shall not exc <b>1020.5.1.1</b> Use of the space between the corr above as a return air plenum is permitted whe
2'-6"	a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between them.	1100.0 Accessibility
1	that the room or space is occupied. <b>1008.2.1</b> The Means of Egress illumination level shall not be less than 1 foot-candle at	transportation stops, accessible parking, accessible streets or sidewalks to the accessible building
	the walking surface.	<b>1104.4.2</b> Large buildings defined as those w

**1008.3.2** In the event of power supply failure in buildings that require two or more stem shall automatically illuminate interior erior exit stairways & ramps, exit arge, and exterior landings for exit doorways

provide power for a duration of not less patteries, unit equipment, or an on-site power system shall be in accordance with

be arranged to provide initial illumination dle and a minimum at any point of 0.1 footloor level. Illumination levels shall be rage and a minimum at any point of 0.06 ing time duration. A maximum-to-minimum ll not be exceeded.

with not less than one accessible Means of ress is required by *IBC/NJ* Section 1006.2 or ssible portion of the space shall be served by

gress shall be continuous to a public way nents listed in *IBC/NJ* Section 1009.2

rails is not required on an accessible with an automatic sprinkler system installed or 903.3.1.2.

opening shall be sufficient for the Occupant lear width of not less than 32". Clear hall be measured between the face of the grees. Where IBC/NJ Section 1010 requires a ing includes two door leaves without a ng width of 32". The maximum width of a height of doors shall not be less than 80".

o the required clear width lower than 34" e clear opening width between 34" and 80" . Exception: Door closers & doorstops shall

or side-hinged swinging type.

ors shall swing in the direction of egress ing an occupant load of 50 or more persons.

ben interior swinging egress doors, other than forces do not apply to the force required to that hold the door in a closed position. For lding doors, the door latch shall release oor shall be set in motion when subjected to a ill-open position when subjected to a 15atch side of the door.

each side of a door. Such floor or landing the door. Landings shall be level except for e a slope not to exceed .25" unit vertical in

s than the width of the stairway or the door, position shall not reduce a required serves an Occupant Load of 50 or more, ding to less than on-half its required width. direction of travel of not less than 44".

ceed 0.5 inch. Raised thresholds and floor shall be beveled with a slope not greater than slope).

*IBC/NJ* Section 1010.1.9, egress doors shall nout the use of a key or special knowledge or

other operating devices on doors required to require tight grasping, tight pinching, or

s, and other operating devices shall be ove the finished floor. Locks used only for eration are permitted at any height.

surface bolts are not permitted. Exceptions: S occupancy, manually operated edge- or nactive leaf provided such inactive leaf is not and the building is equipped throughout lance with *IBC/NJ* Section 903.3.1.1. The nic bars or similar operating hardware.

af shall not require more than one operation. with an occupant load of 50 or more in a

th a latch or lock other than panic hardware

re is installed, it shall comply with the in accordance with UL 305; 2) Fire exit UL 10C and UL 305; 3) The actuating not less than one-half of the door leaf e shall not exceed 15 pounds.

narked by an approved exit sign readily he path of egress travel to exits and within gns to clearly indicate the direction of th of egress travel is not immediately f egress doors within exits shall be marked ch that no point in an exit access corridor or 0 mm) or the listed viewing distance for the ble exit sign. Exceptions: 1) Exit signs are only one exit or exit access; 2) Main exterior arly identifiable as exits need not have exit

and photoluminescent exit signs shall be 24 and shall be installed in accordance with rical Subcode (NJUCC 5:23-3.16). Exit

sign shall have plainly legible letters not the letters not less than 3/4" wide. The word less than 2" wide, except the letter "I," and not less than 3/8". Signs larger than the ve letter widths, strokes and spacing in shall be in high contrast with the

when the Means of Exit sign illumination is ndicator is provided as part of the exit irection of the ly changed.

from an external source shall have an

times. To ensure continued illumination for of primary power loss, the sign illumination ower system provided from storage batteries, nstallation of the emergency power system *bcode* (*NJUCC* 5:23-3.16).

not pass through adjoining or intervening cooms or areas and the area served are H occupancy and provide a discernible

ugh a room that can be locked to prevent

exceed the values given in *IBC/NJ* Table

.. 250'

. 300 easured from the most remote point within a of horizontal and vertical egress travel to

where the building is equipped throughout ance with *IBC/NJ* Section 903.3.1.1, the eed 50".

ridor ceiling and the floor or roof structure ere the corridor is not required to be of fire-

ne site shall be provided from public ssible passenger loading zones, and public entrance served.

**1104.4.2** Large buildings, defined as those with a total gross enclosed floor area of 10,000 SF or more, shall provide the accessible building features required of small buildings in *IBC/NJ* Section 1104.4.1. In addition, large buildings shall be required to have an elevator(s) to provide a vertical accessible route between floors; however, in such

1106.1 Accessible parking spaces shall be provided per *IBC/NJ* Section 1106.

**1109.2** Each toilet room and bathing room shall be Accessible

**1109.2.2** Where water closet compartments are provided in a toilet room or bathing room, at least 5 percent of the total number of compartments shall be wheelchair accessible. Where the combined total water closet compartments and urinals provided in a toilet room or bathing room is six or more, at least 5 percent of the total number of compartments shall be ambulatory accessible, provided in addition to the wheelchair accessible compartment.

**1109.2.3** Where lavatories are provided, at least 5 percent, but not less than one, shall be accessible. Where an accessible lavatory is located within the accessible water closet compartment at least one additional accessible lavatory shall be provided in the multicompartment toilet room outside the water closet compartment.

**1109.4** Where kitchens and kitchenettes are provided in accessible spaces or rooms, they shall be Accessible.

1109.5 Where drinking fountains are provided on an exterior site, on a floor or within a secured area, the drinking fountains shall be provided in accordance IBC/NJ with Sections 1109.5.1 and 1109.5.2.

**1109.5.1** No fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons. Exception: A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.

**1109.9** Where fixed or built-in storage elements such as cabinets, coat hooks, shelves, medicine cabinets, lockers, closets and drawers are provided in required accessible spaces, at least 5 percent, but not less than one of each type shall be accessible.

1109.13 Controls, operating mechanisms and hardware intended for operation by the occupant, including switches that control lighting and ventilation and electrical convenience outlets, in accessible spaces, along accessible routes or as parts of accessible elements shall be accessible. Exceptions: 1) Operable parts that are intended for use only by service or maintenance personnel shall not be required to be accessible. 2) Electrical or communication receptacles serving a dedicated use shall not be required to be accessible. 3) Where two or more outlets are provided in a kitchen above a length of countertop that is uninterrupted by a sink or appliance, one outlet shall not be required to be accessible. 4) Floor electrical receptacles shall not be required to be accessible. 5) HVAC diffusers shall not be required to be accessible.

1111.1 Assessible signage shall be provided per *IBC/NJ* Sections 1111.1, 1111.2 and

## 1300.0 Energy Efficiency

5:23-3.18(a)1 The Energy subcode for new construction is ASHRAE.IESNA Standard 90.1/2013 (ASHROE), as adopted by NJUCC.

#### 1400.0 Exterior Walls

**1403.2** Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing, as described in *IBC/NJ* Section 1405.4. The exterior wall envelope shall be designed & constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-resistive barrier behind the exterior veneer, per *IBC/NJ* Section 1404.2 and a means for draining water that enters the assembly to the exterior of the veneer. Protection against condensation in the exterior wall assembly shall be provided in accordance with

#### 1500.0 Roof Assemblies

the *IBC/NJ* Section 1405.3.

**1507.1** Roof coverings shall be designed, installed, and maintained in accordance with IBC/NJ Chapter 15 and the approved manufacturer's installation instructions such that the roof covering shall serve to protect the building.

**1503.1** Where roof drains are required, secondary (emergency overflow roof drains or scuppers shall be provided where the roof perimeter constructions extends above the roof in such a manner that water will be entrapped if the primary drain allows buildup for any reason. The installation and sizing of secondary emergency overflow drains, leaders, and conductors shall comply with the Plumbing Subcode, NJUCC 5:23-3.15.

#### 1600.0 Structural Design

! Occupancy Category .....

Roofs .....

1604.2 Building, structures, and parts thereof shall be designed & constructed to support safely the factored loads in load combinations defined in the *IBC/NJ* without exceeding the appropriate strength limit states for the materials of construction.

 Table 1604.5 – Occupancy Category of Buildings & Other Structures:

 Table 1607.1 - Minimum Uniform/Concentrated Floor Live Loads:

 Business Offices ..... ...50 PSF, 2000# concentrated

**1607.7** Floors and other surfaces that are intended to support vehicle loads greater than a 10,000-pound gross vehicle weight rating shall comply with IBC/NJ Sections 1607.7.1 thru 1607.7.5

.. 20 PSF

**1603.1.3** The minimum Roof Snow Load is based upon 25 PSF Ground Snow Load [per DCA Bulletin 94-8, revised December 2015].

**1603.1.4** The design Basic Wind Speed is 115 mph (per DCA Bulletin 03-4, revised December 2015).

#### 1800.0 Soils & Foundations

**1808.1** Foundations shall be constructed in accordance with *IBC/NJ* Sections 1808.2 thru 1808 9

#### <u>1900.0 Concrete</u>

**1901.2** Structural concrete shall be constructed in accordance with *IBC/NJ* Chapter 19 and ACI 318 as amended in IBC/NJ Section 1905.

#### 2100.0 Masonry

**2104.2** Masonry construction shall comply with the requirements of *IBC/NJ* Sections 2104.1.1 and 2104.1.2 and with TMS 602/ACI 530.1/ASCE 6.

#### <u>Plumbing Systems</u>

**5:23-3.15(a)1** Plumbing supply, drainage, venting, fixtures, devises, trim, & appliances shall be designed, installed, & tested in accordance with the requirements of the *National* Standard Plumbing Code/2015 (NPC), as adopted by NJUCC.

#### **P07.21.2** Plumbing Occupant Load:

!137 (IBC occupants) x .67 (IBC/NPC) x 50%. gender = 46 (NPC occupants/gender

 Table P07.21.1 – Min Number of Required Plumbing Fixtures/Gender:

• 2 WC, 2 Lav, 1 Emergency Shower, 1 Drinking Water Facility, 1 Service Sink/Fl.

## <u>Electrical Systems</u>

5:23-3.16(a)1 Electrical Power & Lighting panels, circuiting, grounding, receptacles, fixtures, devises, & appliances shall be designed, installed, & tested in accordance with the requirements of the National Electrical Code 2014 (NEC), as adopted by NJUCC.

## Mechanical Systems

Code 2015 (New Jersey edition).

M07.3 Heating, Ventilation, & Air Conditioning equipment, supply, exhaust, combustion air, & controls shall be designed, installed, & tested in accordance with the requirements of the *IMC* and the manufacturer's instructions and recommendations.

This code analysis is based upon NJAC 5:23, the New Jersey Uniform Construction Code. The most recent Update (19 November 2018) was received at RYEBREAD Architects on 02 January 2019. This Code adopts and amends the International Building

# **CONSTRUCTION NOTES:**

### SCOPE OF WORK:

Contractor(s) shall comply with the current NEW JERSEY UNIFORM CONSTRUCTION CODE (UCC) & all applicable subcodes, ordinances & regulations of federal, sta municipal, & other governing bodies.

Contractor(s) shall be solely responsible for & have control over construction mean methods, techniques, sequences & procedures, shoring & bracing, jobsite safety, for coordinating all portions of work.

Prior to submitting a bid, the Contractor(s) shall visit the site of the Work & sh thoroughly familiarize themselves w/ the exist'g conditions affecting the work & sha report any errors to the Arch't. By the act of submitting a bid, the Contractor(s) sh be deemed to have made such an examination, to have accepted such conditio and to have made allowance therefore in preparing their bid. No addition compensation will be granted on the account of extra work made necessary by Contractors' failure to investigate such exist'g conditions. Contractor(s) shall perform the Work in accordance with the documents, or assume responsibility for corrections

Contractor shall keep the premises & surrounding area free from accumulation of was mat'ls & rubbish caused by operations under the Contract. At completion of the Wo the Contractor shall remove from & about the Project waste mat'ls, rubbish,

Contractor's tools, construction equipment, machinery, & surplus mat'ls. Contractor shall provide proof of insurance coverage for General Liability, Automob Liability, Workers Compensation, & Excess Liability w/ the Owner & Architect listed "Additional Insured".

General Contractor shall be responsible for providing all necessary permits. Complete building permit application and file with authorities having jurisdiction with five days of the Notice to Proceed or the date of execution of the Contract whiches

#### Fees shall be paid for by the Owner.

DIMENSIONS Are to outside surface of finish mat'ls unless shown otherwise.

# All dimensions are nominal and shall be field verified.

DEMOLITION: Prior to commencement of the Work, the Contractor shall survey the exist'g conditions record them by use of preconstruction photographs &/or videotapes. Provi Architect with an electronic copy of the survey.

- Prior to the commencement of any underground excavation, the Contractor shall call obtain local identification of underground utilities & identification. Phone 1-800-27 1000. A copy of the approval notification shall be available for inspection at excavation site.
- Prior to the commencement of the Work, the Contractor shall verify through the Owne fire alarm vendor, FORTRESS PROTECTION, (856) 424-3000 the status of the ent exist'g fire alarm system & submit a written report indicating the status of the system & list all devices that are inoperative. Otherwise, the Contractor takes responsibility for all non-functioning devices.
- Do not proceed w/ any interruption of services w/o Owner's written permission. Gas water line work shall be completed after hours or on weekends. Windows & exterior doors and frames shall not be removed until replacements ha been delivered to the Project Site.
- Prior to the commencement of the Work, the Contractor shall review with the Owner mat'ls & equipment to be removed. Should the Owner opt to keep any items, Contractor shall salvage & deliver the items to the Owner on the site where directed & properly dispose of all other demolition & construction mat'ls. Remove all exterior structures, interior walls, flooring & clg finishes, fixtures & oth
- items as noted on dwgs. Support exist'g structural system before removing & replacing exist'g structu Temporarily brace & shore all areas where supporting structures are removed u new construction is securely in place.
- Maintain building envelope in a weathertight & secure condition for the duration of the Project Refer to Civil, Structural & MPE documents for additional requirements.

**REPAIR. PATCH & PAINT:** 

All areas disturbed during demolition & construction shall match adjacent mat'ls finishes at project completion.

#### **UNDER-SLAB VAPOR RETARDER**

Sheet Vapor Retarder, Class A: ASTM E1745, Class A, with maximum water-vap permeance of 0.05; not less than 10 mils thick. Install as per manuf'rs recommendation & include manuf'rs recommended adhesive or pressure-sensitive tape.

#### COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

Apply two brush or spray coats at not less than 1.5 gal./100 sq. ft. for first coat and gal./100 sq. ft. for second coat or one trowel coat at not less than 4 gal./100 sq. ft.

### PAINTING:

Basis-of-Design: Sherwin-Williams Company or Arch'ts approved equal. All paint shall be acquired from a single manuf'r.

Primer: 1 CoatProMar 200 Zero VOC Interior Latex Primer. Finish: 2 Coats ProMar 200 Zero VOC Interior Latex Eg-Sel.

Primer: 1 Coat Kem Cati-Coat HS Epoxy Filler. Finish: 2 Coats Macropoxy 646 Fast Cure.

Plywood Walls:

Primer: 1 Coat Premium Wall and Wood Primer. Finish: 2 Coats ProMar 200 Zero VOC Interior Latex Eg-Sel.

## Metal Doors & Frames:

Primer: 1 Coat Pro Industrial ProCryl Universal Primer. Finish: 2 Coats Pro Industrial Waterbased Alkyd Urethane (Lo Sheen or Semi-Gloss).

#### CASEWORK:

Provide laminate finish on all casework assemblies. Laminate shall be as manufactur by Formica, Wilsonart or Arch'ts approved equal. Color by Arch't. Casework design shall accommodate provisions set forth in ANSI A117.1, 2009 editi & the ADA.

Provide all required blocking & supports for wall and base cabinets.

Coordinate locations of all Mech equip't w/ the Metal Building Systems manuf'r s insure the proper structural supports are provided.

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<b>DANTE</b> PROFESSIONA	CULU, P.E. L ENGINEER N.J. LICENSE NO. 36455	2/11/2019 Datë	FILE	BURLING 100SHARP-SITE AS SHOWN	DATE PROJECT NO.	12/11/201 P-19-150	. <b>INE</b> 19 6













<u>LEGEND</u>

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FIRE HYDRAN UTILITY POLE SPOT ELEVATION LIGHT POLE WATER VALVE GAS VALVE INLET MANHOLE

CURBING

CONCRETE

PROPOSED CONCRETE STORM SEWER WATER MARKOUT -S-S-S-S-SANITARY MARKOUT -------------------------------EXISTING CONTOUR PROPOSED LIMIT OF DISTURBANCE **XXX** PROPOSED SILT FENCE PROPOSED SILT TRAP

THIS PLAN HAS BEEN PREPARED FOR THE EXPLICIT PURPOSE OF OBTAINING APPROVAL FOR CONSTRUCTION OF A BUILDING ADDITION. USE OF THIS PLAN FOR ANY OTHER PURPOSE WITHOUT PRIOR AUTHORIZATION FROM GUZZI ENGINEERING SHALL BE DONE SO AT THE OWNERS OWN RISK. GUZZI ENGINEERING ASSUMES NO RESPONSIBILITY FOR SUCH USE.



BR	Dante Guzzi Engineerin 418 Stokes Road, P.O. Box 1625, Medfor telephone (609) 654-4440 facsimile (609) 654-7792 NJ. Certificate of Aut	g Associates d, New Jersey 08055 horization No. 24GA27967500 w.guzziengineering.com		SOIL EROSIC BLO	ON & S 100 S CK 14, EVESHA	SEDIMENT SHARP RC LOTS 5 AM TOWNS	C DAE & SH
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ONTROL PLAN 5.03 P JERSEY DRAWN BY RV CHECKED BY DG 12/11/2019	DRAWING NO.	

# SOIL EROSION AND SEDIMENT CONTROL REQUIREMENTS

# GENERAL REQUIREMENTS:

- 1. THE SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED SEVENTY-TWO (72) HOURS PRIOR TO ANY LAND DISTURBANCE.
- 2. A CERTIFIED COPY OF THIS SOIL EROSION AND SEDIMENT CONTROL PLAN MUST BE MAINTAINED ON THE PROJECT SITE DURING CONSTRUCTION.
- 3. SOIL EROSION AND SEDIMENT CONTROL PRACTICES IN THIS PLAN SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.
- 4. ANY CHANGES TO THE SITE PLAN WILL REQUIRE THE SUBMISSION AND RECERTIFICATION OF A REVISED SOIL EROSION AND SEDIMENT CONTROL PLAN TO THE SOIL CONSERVATION DISTRICT. THE REVISED PLAN MUST BE IN ACCORDANCE WITH THE CURRENT NEW JERSEY STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL.
- NJSA 4: 24-39, et seq., REQUIRES THAT UPON PERMANENT STABILIZATION AND COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL APPLY TO THE SOIL CONSERVATION DISTRICT FOR A FINAL COMPLIANCE INSPECTION TO CHECK THAT ALL THE PROVISIONS OF THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN HAVE BEEN COMPLIED WITH FOR PERMANENT MEASURES.
- 6. NJSA 4: 24-39, et seq., REQUIRES THAT NO CERTIFICATE OF OCCUPANCY BE ISSUED BEFORE ALL THE PROVISIONS OF THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN HAVE BEEN COMPLIED WITH FOR PERMANENT MEASURES. ALL SITE WORK FOR THE PROJECT MUST BE COMPLETED PRIOR TO THE DISTRICT ISSUING THE REPORT OF COMPLIANCE AS A PREREQUISITE TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE MUNICIPALITY.
- . COMPLIANCE WITH THE CERTIFIED PLAN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR DURING AND IMMEDIATELY FOLLOWING THE CONSTRUCTION PHASE. UNLESS OTHERWISE SET FORTH BY CONTRACTUAL PROVISIONS, UPON ACCEPTANCE OF THE PROJECT BY THE OWNER THE RESPONSIBILITY SHALL TRANSFER TO THE OWNER.
- 8. ANY CONVEYANCE OF THIS PROJECT PRIOR TO ITS COMPLETION WILL TRANSFER FULL RESPONSIBILITY FOR COMPLIANCE WITH THE CERTIFIED PLAN TO ANY SUBSEQUENT OWNERS.

### GENERAL PROCEDURES:

- 1. THE CONTRACTOR SHALL COORDINATE ALL SOIL SEDIMENT RELATED MATTERS WITH THE SOIL CONSERVATION DISTRICT.
- 2. ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN PLACE PRIOR TO ANY GRADING OPERATIONS AND/OR INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES.
- 3. ALL APPLICABLE SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE LEFT IN PLACE UNTIL CONSTRUCTION IS COMPLETE AND/OR THE AREA IS STABILIZED.
- 4. ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED WHEN AND WHERE DIRECTED BY THE SOIL CONSERVATION DISTRICT. THIS MAY INCLUDE AREAS OF OFFSITE SOIL DISTURBANCE.
- 5. THE SITE SHALL BE GRADED AND MAINTAINED AT ALL TIMES SUCH THAT ALL STORMWATER RUNOFF IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL FACILITIES.
- 6. ALL SEDIMENTATION FACILITIES SHALL BE INSPECTED AND MAINTAINED ON A REGULAR BASIS AND AFTER EVERY STORM EVENT.
- 7. EXISTING STORMWATER INLETS SHALL BE PROTECTED WITH CRUSHED STONE OR HAYBALE FILTER. ALL NEW INLETS, OUTLETS, DITCHES, ETC., SHALL BE PROTECTED BY APPROVED MEASURES BEFORE THEY BECOME OPERATIONAL.
- 8. CONSTRUCTION TRAFFIC SHALL USE THE DESIGNATED INGRESS/EGRESS POINT(S). A STABILIZED CONSTRUCTION ACCESS (CRUSHED STONE TRACKING PAD) SHALL BE INSTALLED AND MAINTAINED WHENEVER CONSTRUCTION TRAFFIC ACCESS PAVED AREAS FROM UNPAVED AREAS. THE ACCESS SHALL BE THE FULL WIDTH OF THE INGRESS/EGRESS AND BE A MINIMUM LENGTH AS SPECIFIED ON THE PLANS. THE STONE MUST BE ANGULAR, 1.5" - 4" IN SIZE, PLACED NOT LESS THAN 12" THICK AND UNDERLAIN WITH A SUITABLE SYNTHETIC FILTER FABRIC.
- 9. ALL DRIVEWAYS AND ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES. 10. THE DOWNSLOPE PERIMETER OF ALL DISTURBED AREAS AND STOCKPILES
- SHALL BE PROTECTED BY A HAY BALE BARRIER OR SEDIMENT FENCE. 11. STOCKPILES SHALL NOT BE LOCATED WITHIN FIFTY (50) FEET OF A
- FLOOD PLAIN, WETLAND, SLOPE, ROADWAY OR DRAINAGE FACILITY.
- 12. IMMEDIATELY UPON COMPLETION OF STRIPPING AND STOCKPILING OF SOIL. STOCKPILES SHALL BE SEEDED WITH TEMPORARY VEGETATION. REFER TO STABILIZATION WITH TEMPORARY VEGETATIVE COVER
- 13. ALL DISTURBED AREA THAT WILL BE LEFT EXPOSED FOR MORE THAN SIXTY (60) DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC SHALL IMMEDIATELY BE SEEDED WITH TEMPORARY VEGETATION. REFER TO STABILIZATION WITH TEMPORARY VEGETATIVE COVER.
- 14. ALL CRITICAL AREAS SUBJECT TO EROSION SUCH AS SLOPES SHALL BE SEEDED WITH TEMPORARY VEGETATION AND THEN MULCHED AT A RATE OF 2 TONS PER ACRE IMMEDIATELY FOLLOWING ROUGH GRADING. REFER TO STABILIZATION WITH TEMPORARY VEGETATIVE COVER.
- 15. ALL DISTURBED AREAS SHALL BE SEEDED WITH PERMANENT VEGETATION IMMEDIATELY FOLLOWING FINAL GRADING. REFER TO STABILIZATION WITH PERMANENT VEGETATIVE COVER.
- 16. IF THE SEASON DOES NOT PERMIT THE ESTABLISHMENT OF SEED THE STOCKPILE AND/OR DISTURBED AREA SHALL BE PROTECTED WITH MULCH, OR AN APPROVED EQUIVALENT. MULCH SHALL BE SECURED BY AN APPROVED METHOD (LIQUID BINDER, CRIMPING, PEG AND TWINE). REFER TO STABILIZATION WITH MULCH ONLY.
- 17. ALL DEWATERING OPERATIONS MUST DISCHARGE INTO AN APPROVED SEDIMENT FILTRATION DEVICE SO PLACED AS NOT TO CAUSE EROSION OF THE DOWNSLOPE AREA. FIELD PLACEMENT AND USE OF STRUCTURES MUST BE APPROVED BY THE SOIL CONSERVATION DISTRICT PRIOR TO COMMENCEMENT OF THE DEWATERING OPERATION.
- 18. ALL DEBRIS CREATED AS A RESULT OF CONSTRUCTION IS TO BE STOCKPILED, PROPERLY CONTAINED, AND THEN REMOVED BY THE CONTRACTOR.
- 19. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE CONFIRMATION OF LIME. FERTILIZER AND SEED APPLICATION RATES AT THE REQUEST OF THE SOIL CONSERVATION DISTRICT.
- 20. MAXIMUM SIDE SLOPES OF ALL PROPOSED SURFACES SHALL NOT NOT BE CONSTRUCTED STEEPER THAN 4:1.
- 21. OFF SITE SEDIMENT DISTURBANCE MAY REQUIRE ADDITIONAL CONTROL MEASURES TO BE DETERMINED BY THE DISTRICT EROSION CONTROL INSPECTOR.

# INTERMEDIATE CONTROL STANDARDS DUST CONTROL

- A. APPLICABILITY
- EXCAVATION AND GRADING OPERATIONS BECAUSE OF LOW MOISTURE CONTENT IN THE SOIL ..
- B. MATERIAL AND METHODS
  - 1. ALL AREAS SUBJECT TO DUST MOVEMENT SHALL BE SPRINKLED WITH WATER UNTIL THE SURFACE IS MOIST. THIS PROCEDURE SHALL BE REPEATED AS REQUIRED TO MAINTAIN A MOISTURE CONTENT IN THE SOIL THAT IS SUFFICIENT TO PREVENT DUST MOVEMENT.
- 2. IF THE APPLICATION OF WATER BECOMES IMPRACTICAL OR INEFFECTIVE. THE USE OF CALCIUM CHLORIDE IS ACCEPTABLE, PROVIDED THAT THERE ARE NO LOCAL OR STATE REGULATIONS RESTRICTING ITS USE. CALCIUM CHLORIDE IN THE FORM OF LOOSE, DRY GRANULES OR FLAKES FINE ENOUGH TO FEED THROUGH A COMMON SPREADER SHALL SPREAD OVER THE SUSCEPTIBLE AREAS AT A RATE THAT WILL KEEP THE SURFACE MOIST BUT NOT CAUSE POLLUTION OR DAMAGE TO VEGETATION. IF USED ON STEEP SLOPES, OTHER PRACTICES SHALL BE IMPLEMENTED TO PREVENT WASHING IN TO STREAMS OR ACCUMULATION AROUND VEGETATION.

MANAGEMENT OF HIGH ACID PRODUCING SOILS

- A. APPLICABILITY
- 1. THIS PRACTICE IS APPLICABLE TO ANY HIGH ACID PRODUCING SOIL MATERIAL HAVING A pH OF 4.0 OR LESS OR CONTAINING IRON SULFIDE. THESE SOILS MAY BE PRESENT IN UNDISTURBED SOILS AT VARYING DEPTHS INCLUDING NEAR THE SURFACE TO EXCAVATIONS OR DEEP DISTURBANCES. ITS PRESENCE MAY BE SIGNIFICANT OR LIMITED IN THE SOIL PROFILE. HIGH ACID PRODUCING SOILS ARE COMMONLY BLACK, DARK BROWN, GRAY OR GREENISH WITH SILVERY PYRITE OR MARCASITE NUGGETS OR FLAKED.
- B. MATERIAL AND METHODS
- 1. LIMIT THE AREA OF DISTURBANCE AREA AND EXPOSURE TIME WHEN THESE SOILS ARE ENCOUNTERED.
- 2. TO PREVENT CROSS CONTAMINATION, TOPSOIL STRIPPED FROM THE SITE SHALL BE STOCKPILED SEPARATELY FROM HIGH ACID PRODUCING SOILS. STOCKPILES SHOULD BE LOCATED ON LEVEL LAND AND THEIR ENTIRE PERIMETER ENCLOSED BY A SILT FENCE TO MINIMIZE MOVEMENT. STOCKPILES STORED FOR MORE THAN 30 DAYS SHALL BE COVERED WITH A PROPERLY ANCHORED, HEAVY GRADE SHEET OF POLYETHYLENE.
- 3. IMMEDIATELY UPON COMPLETION OF ROUGH GRADING, THESE SOILS SHALL BE COVERED WITH A MINIMUM OF 12 INCHES OF SETTLED SOIL HAVING A pH OF 5.0 OR MORE.
- a. AREAS WHERE TREES AND SHRUBS ARE TO BE PLANTED SHALL BE COVERED WITH A MINIMUM OF 24 INCHES OF SETTLED SOIL HAVING A pH OF 5.0 OR MORE.
- b. DISPOSAL AREAS SHALL NOT BE LOCATED WITHIN 24 INCHES OF ANY SURFACE OF A SLOPE OR BANK SUCH AS BERMS, DITCHES STREAM BANKS AND OTHER WATERCOURSES TO PREVENT POTENTIAL LATERAL LEACHING DAMAGES.
- 4. ADDITIONAL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLACED WHEN SUCH SOIL IS ENCOUNTERED TO LIMIT ITS MOVEMENT FROM, AROUND OR OFF THE SITE.

STABILIZATION WITH TEMPORARY VEGETATIVE COVER A. APPLICABILITY

- 1. THIS PRACTICE IS APPLICABLE TO AREAS SUBJECT TO FROSION, WHERE TEMPORARY STABILIZATION OF EXPOSED SOILS IS NEEDED TO REDUCE DAMAGE FROM WIND AND RAIN, SLOW THE OVERLAND MOVEMENT OF RUNOFF AND INCREASE INFILTRATION AND RETAIN SOIL AND NUTRIENT ON SITE.
- B. MATERIAL AND METHODS
- 1. REFER TO PERMANENT VEGETATIVE COVER, ITEM B, #1, #2, #3 AND #6. 2. UNIFORMLY APPLY SWITCHGRASS AT A RATE OF 0.5 POUND PER 1.000
- SQUARE FEET.
- 3. REFER TO PERMANENT VEGETATIVE COVER, ITEM C, #2 AND #3.
- 4. REFER TO PERMANENT VEGETATIVE COVER, ITEM D, #1, #2, #3 AND #4.
- STABILIZATION WITH MULCH ONLY
- A. APPLICABILITY
  - 1. THIS PRACTICE IS APPLICABLE TO AREAS SUBJECT TO EROSION. WHERE THE SEASON AND OTHER CONDITIONS MAY NOT BE SUITABLE FOR GROWING AN EROSION-RESISTANT COVER OR WHERE STABILIZATION IS NEEDED FOR A SHORT PERIOD UNTIL MORE SUITABLE PROTECTION CAN BE APPLIED.
- B. METHODS AND MATERIALS
  - 1. MULCH MATERIALS SHALL BE UNROTTED SMALL GRAIN STRAW. HAY FREE OF SEEDS OR SALT HAY UNIFORMLY APPLIED AT A RATE OF 90 TO 115 POUNDS PER 1,000 SQUARE FEET. THE MULCH CHOPPER-BLOWERS MUST NOT GRIND THE MATERIAL.
- 2. SPREAD MULCH UNIFORMLY BY HAND OR MECHANICALLY SO THAT APPROXIMATELY 85% OF THE SOIL SURFACE WILL BE COVERED.
- 3. MULCH SHALL BE SECURED IMMEDIATELY AFTER PLACEMENT TO MINIMIZE LOSS BY WIND OR WATER BY AN APPROVED METHOD (LIQUID-MULCH BINDER, CRIMPER, PEG AND TWINE, OR NETTING).
- 4. OTHER SUITABLE METHODS MAY BE USED IF PREAPPROVED BY THE SOIL CONSERVATION DISTRICT SUCH AS:
- a. ASPHALT EMULSION OR CUTBACK ASPHALT IS RECOMMENDED AT A RATE OF 14 TO 28 GALLONS PER 1,000 SQUARE FEET. THIS IS SUITABLE A LIMITED PERIOD OF TIME WHERE CONSTRUCTION TRAFFIC IS NOT A PROBLEM.
- b. SYNTHETIC OR ORGANIC SOIL STABILIZERS MAY BE USED UNDER SUITABLE CONDITIONS AND IN QUANTITIES AS RECOMMENDED BY THE MANUFACTURER.
- POUNDS PER ACRE MAY BE APPLIED BY A HYDROSEEDER OR HYDROMULCHING.
- MAY BE USED, BUT SHALL NOT BE USED ON AREAS WHERE FLOWING WATER COULD WASH THEM INTO AN INLET AND PLUG IT.

1. THIS PRACTICE IS APPLICABLE IF DUST BECOMES A PROBLEM DURING

c. WOOD-FIBER OR PAPER-FIBER MULCH AT THE RATE OF 1,500

d. WOOD CHIPS APPLIED UNIFORMLY TO MINIMUM DEPTH OF 2 INCHES

# SOIL DE-COMPACTION AND TESTING REQUIREMENTS

## SOIL COMPACTION TESTING REQUIREMENTS

- 1. SUBGRADE SOILS PRIOR TO THE APPLICATION OF TOPSOIL (SEE PERMANENT CONTROL STANDARDS NOTES FOR TOPSOIL REQUIREMENTS) SHALL BE FREE OF EXCESSIVE COMPACTION TO A DEPTH OF 6.0 INCHES TO ENHANCE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER.
- 2. AREAS OF THE SITE WHICH ARE SUBJECT TO COMPACTION TESTING AND/OR MITIGATION ARE GRAPHICALLY DENOTED ON THE CERTIFIED SOIL EROSION CONTROL PLAN.
- 3. COMPACTION TESTING LOCATIONS ARE DENOTED ON THE PLAN. A COPY OF THE PLAN OR PORTION OF THE PLAN SHALL BE USED TO MARK LOCATIONS OF TESTS, AND ATTACHED TO THE COMPACTION REMEDIATION FORM, AVAILABLE FROM THE LOCAL SOIL CONSERVATION DISTRICT. THIS FORM MUST BE FILLED OUT AND SUBMITTED PRIOR TO RECEIVING A CERTIFICATE OF COMPLIANCE FROM THE DISTRICT.
- 4. IN THE EVENT THAT TESTING INDICATES COMPACTION IN EXCESS OF THE MAXIMUM THRESHOLDS INDICATED FOR THE SIMPLIFIED TESTING METHODS (SEE DETAILS), THE CONTRACTOR/OWNER SHALL HAVE THE OPTION TO PERFORM EITHER (1) COMPACTION MITIGATION OVER THE ENTIRE MITIGATION AREA DENOTED ON THE PLAN (EXCLUDING EXEMPT ARES), OR (2) PERFORM ADDITIONAL, MORE DETAILED TESTING TO ESTABLISH THE LIMITS OF EXCESSIVE COMPACTION WHEREUPON ONLY THE EXCESSIVELY COMPACTED AREAS WOULD REQUIRE COMPACTION MITIGATION. ADDITIONAL DETAILED TESTING SHALL BE PERFORMED BY A TRAINED, LICENSED PROFESSIONAL. COMPACTION TESTING METHODS
- A. PROBING WIRE TEST (SEE DETAIL)
- B. HAND-HELD PENETROMETER TEST (SEE DETAIL) C. TUBE BULK DENSITY TEST (LICENSED PROFESSIONAL ENGINEER
- REQUIRED) D. NUCLEAR DENSITY TEST (LICENSED PROFESSIONAL ENGINEER REQUIRED)

NOTE: ADDITIONAL TESTING METHODS WHICH CONFORM TO ASTM STANDARDS AND SPECIFICATIONS, AND WHICH PRODUCE A DRY WEIGHT, SOIL BULKY DENSITY MEASUREMENT MAY BE ALLOWED SUBJECT TO DISTRICT APPROVAL.

SOIL COMPACTION TESTING IS NOT REQUIRED IF/WHEN SUBSOIL COMPACTION REMEDIATION (SCARIFICATION/TILLAGE (6" MINIMUM DEPTH)

OR SIMILAR) IS PROPOSED AS PART OF THE SEQUENCE OF CONSTRUCTION.

PROCEDURES FOR SOIL COMPACTION MITIGATION

PROCEDURES SHALL BE USED TO MITIGATE EXCESSIVE SOIL COMPACTION PRIOR TO PLACEMENT OF TOPSOIL AND ESTABLISHMENT OF PERMANENT VEGETATIVE COVER.

RESTORATION OF COMPACTED SOILS SHALL BE THROUGH DEEP SCARIFICATION/TILLAGE (6" MINIMUM DEPTH) WHERE THERE IS NO DANGER TO UNDERGROUND UTILITIES (CABLES, IRRIGATION SYSTEMS, ETC.). IN THE ALTERNATIVE, ANOTHER METHOD AS SPECIFIED BY A NEW JERSE' LICENSED PROFESSIONAL ENGINEER MAYBE SUBSTITUTED SUBJECT TO DISTRICT APPROVAL.

# PERMANENT CONTROL STANDARDS

STABILIZATION WITH PERMANENT VEGETATIVE COVER

A. TOPSOIL

- 1. IMMEDIATELY BEFORE TOPSOIL APPLICATION, THE SUBGRADE SHALL BE SCARIFIED A MINIMUM DEPTH OF 6" TO PROVIDE A GOOD BOND WITH THE TOPSOIL. THIS PRACTICE IS PERMISSIBLE ONLY WHERE THERE IS NO DANGER TO UNDERGROUND UTILITIES. WITHIN DRAINAGE BASINS AND SWALES, THE SUBGRADE SHALL BE SCARIFIED A MINIMUM DEPTH OF 12" TO PROMOTE INFILTRATION.
- 2. TOPSOIL OBTAINED FROM STRIPPING WITHIN THE LIMITS OF THE SITE OR FURNISHED FROM OUTSIDE THE SITE SHALL CONTAIN NO STONES, LUMPS, ROOTS OR SIMILAR OBJECTS LARGER THAN TWO INCHES IN ANY DIMENSION, AND SHALL HAVE A pH OF NOT LESS THAN 5.0 NOR GREATER THAN 7.5.
- 3. WHEN THE pH VALUE OF THE TOPSOIL IS LESS THAN 5.0, IT SHALL BE INCREASED BY APPLYING GROUND LIMESTONE AT A RATE NECESSARY TO ATTAIN AN ACCEPTABLE pH LEVEL.
- 4. TOPSOIL FURNISHED FROM SOURCES OUTSIDE THE LIMITS OF THE SITE SHALL HAVE A MINIMUM ORGANIC CONTENT OF NOT LESS THAN 2.75%. ORGANIC MATTER CONTENT MAY NOT BE RAISED BY ADDITIVES.
- 5. THE TOPSOIL SHALL BE APPLIED TO A UNIFORM DEPTH OF 5 INCHES (FIRMED IN PLACE).

B. SEEDBED PREPARATION

- 1. APPLY LIMESTONE GROUNDED LIMESTONE AND FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS SUCH AS OFFERED BY RUTGERS COOPERATIVE EXTENSION. SOIL SAMPLE MAILERS ARE AVAILABLE FROM THE LOCAL RUTGERS COOPERATIVE EXTENSION OFFICE.
- 2. APPLY LIMESTONE (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDES) AT THE FOLLOWING RATE UNLESS SOIL TESTING INDICATES OTHERWISE:

SOIL TEXTURE

CLAY, CLAY LOAM &

HIGH ORGANIC SOIL

135 POUNDS PER 1,000 SQUARE FEET

APPLICATION RATE

SANDY LOAM, LOAN & SILT LOAM 90 POUNDS PER 1,000 SQUARE FEET LOAMY SAND & SAND

- 45 POUNDS PER 1,000 SQUARE FEET
- 3. APPLY FERTILIZER AT A RATE OF 11 LB. PER 1,000 SQ. FT USING 10-10-10 OR EQUIVALENT WITH 50% WATER INSOLUBLE NITROGEN UNLESS SOIL TESTING INDICATES OTHERWISE.
- 4. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OR DISCING OPERATION SHALL BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY OR SILTY SOILS AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
- 5. REMOVE FROM THE SURFACE ALL STONES TWO INCHES OR LARGER IN ANY DIMENSION, REMOVE ALL OTHER DEBRIS SUCH AS WIRE, CABLE, TREE ROOTS, PIECES OF CONCRETE, CLODS, LUMPS OR OTHER UNSUITABLE MATERIAL.
- 6. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT SOIL COMPACTED, THE AREA MUST BE RETILLED AND FIRMED AS ABOVE.

		-	
NO.	DATE	APPR.	REVISION

### C. SEEDING

1. SEED MIXTURE

MIX FOR LAWN AREAS	APPLICATION RATE
STRONG CREEPING RED FESCUE HARD FESCUE	1.4 POUNDS PER 1,000 SQUARE FEE 2.7 POUNDS PER 1,000 SQUARE FEE

2. ALL SEED MUST BE RAKED OR DRILLED INTO SOIL. NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH.

3. WHERE FEASIBLE, EXCEPT WHERE EITHER A CULTIPACKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHOULD BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER OR LIGHT DRAG. SEEDING OPERATIONS SHOULD BE ON THE CONTOUR. D. MULCHING

- 1. MULCH IS REQUIRED ON ALL SEEDED AREAS TO INSURE AGAINST EROSION BEFORE GRASS IS ESTABLISHED AND TO PROMOTE FASTER AND EARLIER ESTABLISHMENT.
- 2. MULCH MATERIALS SHALL BE UNROTTED SMALL GRAIN STRAW, HAY FREE OF SEEDS OR SALT HAY UNIFORMLY APPLIED AT A RATE OF 70 TO 90 POUNDS PER 1,000 SQUARE FEET. OTHER SUITABLE METHODS MAY BE USED IF PREAPPROVED BY THE SOIL CONSERVATION DISTRICT. MULCH CHOPPER-BLOWERS MUST NOT GRIND THE MATERIAL.
- 3. SPREAD MULCH UNIFORMLY BY HAND OR MECHANICALLY SO THAT APPROXIMATELY 85% OF THE SOIL SURFACE WILL BE COVERED.
- 4. MULCH SHALL BE SECURED IMMEDIATELY AFTER PLACEMENT TO MINIMIZE LOSS BY WIND OR WATER BY AN APPROVED METHOD (LIQUID-MULCH BINDER, CRIMPER, PEG AND TWINE, OR NETTING).

### E. IRRIGATION (WHERE FEASIBLE)

IF SOIL MOISTURE IS DEFICIENT, AND MULCH IS NOT USED. SUPPLY NEW SEEDING WITH ADEQUATE WATER (A MINIMUM OF 1/4 INCH TWICE DAILY UNTIL VEGETATION IS WELL ESTABLISHED). THIS IS ESPECIALLY TRUE WHEN SEEDING IN ABNORMALLY DRY OR HOT DROUGHTY SITES.

#### F. TOP DRESSING

SINCE SLOW RELEASE NITROGEN FERTILIZER IS PRESCRIBED UNDER SEEDBED PREPARATION, NO FOLLOW-UP TOP DRESSING IS MANDATORY. IF GROSS NITROGEN DEFICIENCY EXISTS TO THE EXTENT THE TURF FAILURE MAY DEVELOP, TOP DRESS WITH 10-10-10 OR EQUIVALENT AT 10 POUNDS PER 1,000 SQUARE FEET.

#### SOIL CLASSIFICATION:

SOILS MAP PROVIDED BY WEB SOIL SURVEY 2.0, NATIONAL COOPERATIVE SOIL SURVEY, USDA NATIONAL RESOURCES CONSERVATION SERVICE

PROJECT IS IN: Admma - ADELPHIA HIGH GLAUCONITE VARIANT FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES, MapA - MARLTON FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES, HoaB - HOLMDEL LOAMY SAND, 0 TO 5 PERCENT SLOPES. KreA - KRESSON FINE SANDY LOAM, O TO 2 PERCENT SLOPES.

POTENTIAL ENVIRONMENTAL RESTRICTIONS:

FLOOD PLAINS DO NOT OCCUR ON THE PROJECT LIMITS

# SEQUENCE OF CONSTRUCTION

#### DURATION OF CONSTRUCTION

ANTICIPATED COMMENCEMENT:

ANTICIPATED COMPLETION:

DESCRIPTION OF CONSTRUCTION ACTIVITY

1. PLACE APPLICABLE SOIL EROSION & SEDIMENT CONTROL MEASURES AT CONSTRUCTION ENTRANCE AND AROUND PERIMETER AS SHOWN ON THE PLANS. 2. SAWCUT AND REMOVE EXISTING PAVING.

FEBRUARY 2020

JUNE 2020

3. REROUTE EXISTING STORM SEWER AS SHOWN ON THE PLAN.

4. CONSTRUCT BUILDING

5. CONSTRUCT CONCRETE PADS.

6. FILL ALL DISTURBED SOIL AREAS TO A DEPTH OF 6" & ADD TOPSOIL PER SOIL CONSERVATION DISTRICT STANDARDS.

7. APPLY PERMANENT STABILIZATION TO THE SITE.

8. REMOVE REMAINING SOIL EROSION & SEDIMENT CONTROL MEASURES WHEN PERMANENT STABILIZATION IS ACQUIRED.





WEEK 1ST 2ND 3RD-4TH 5TH-14TH 15TH-16TH 17TH 18TH

WHEN STABILIZED







	Dante Guzzi Engineerin 418 Stokes Road, P.O. Box 1625, Medfor telephone (609) 654-4440 facsimile (609) 654-7792 NJ. Certificate of Aut ww	g Associates d, New Jersey 08055 horization No. 24GA27967500 w.guzziengineering.com		SOIL EROSION BLOG BURLING	& SEDIMENT CO 100 SHARP ROAD CK 14, LOTS 5 & EVESHAM TOWNSHI
 Gunt		12/11/2019	FILE	100SHARP-SESC	DATE 12/11/2019
 PROFESSION	AL ENGINEER N.J. LICENSE NO. 36455	DATE	SCALE	AS SHOWN	PROJECT NO. P-19-156

NTROL DETAILS RAWING NO. 5.03 JERSEY REV. NO. RV DATE 12/11/2019 DG



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DRAWING DATE: 11 DEC 19 **REVISION DATE:** DRAWN BY: COMMISSION NO .: 5596E

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# OWNER PROVIDED EQUIP'T MEZZANINE PLAN

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OWNER FURNISHED & INSTALLED EQUIPMENT

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![](_page_9_Picture_10.jpeg)

![](_page_9_Picture_11.jpeg)

![](_page_9_Picture_12.jpeg)

![](_page_9_Picture_13.jpeg)

![](_page_9_Picture_14.jpeg)

# **GENERAL NOTES**

<u>GENERAL NOTES</u>

- BUILDING CODE 2015 INTERNATIONAL BUILDING CODE (NJ EDITION)
   FLOOR LOAD 125/75 PSF ROOF LIVE LOAD 20 PSF PER NUCOR BUILDING SYSTEMS
- 3.WIND -115 MPHEXPOSURE B, I=1.04.SEISMIC -SDS=0.28USE GROUP IIDESIGN CAT BDESIGN CAT B

SD1=0.06

- SDT=0.00 SITE CLASS D
   USE PROPERLY DESIGNED SHORING, BRACING, UNDERPINNING, ETC. AS NECESSITATED BY CONDITIONS OR AS REQUIRED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE TO ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION.
- 6. NO FIELD REVISIONS TO ANY STRUCTURAL COMPONENTS SHALL BE MADE WITHOUT PRIOR APPROVAL BY THE ENGINEER. THIS INCLUDES (BUT IS NOT LIMITED TO) REVISIONS DUE TO MISLOCATION, MISFIT OR ANY OTHER CONSTRUCTION ERROR.
- BRACE ALL WALLS DURING CONSTRUCTION TO PREVENT DAMAGE FROM WIND, WATER, EARTH PRESSURE AND CONSTRUCTION LOADS UNTIL ALL SUPPORTING ELEMENTS ARE IN PLACE AND ARE OF SUFFICIENT STRENGTH.
- 8. NO OPENINGS SHALL BE PLACED IN ANY STRUCTURAL MEMBER (OTHER THAN AS INDICATED ON APPROVED SHOP DRAWINGS) UNTIL THE LOCATION HAS BEEN APPROVED BY THE STRUCTURAL ENGINEER.
- PROVIDE SLEEVE LAYOUTS FOR ALL PIPES AND ELECTRICAL PENETRATIONS THROUGH STRUCTURAL MEMBERS (ALL TRADES ARE INCLUDED). LAYOUTS ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
   STRUCTURAL DRAWINGS ARE TO BE COORDINATED AND USED IN CONJUNCTION WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL
- WITH THE ARCHITECTORAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS. SEE MECHANICAL DRAWINGS FOR EQUIPMENT PADS, BASES, SUPPORTS AND DUCT PENETRATIONS.
  11. SUPPORT AIR CONDITIONING UNITS, COMPRESSORS AND OTHER ROOF MOUNTED OR SUSPENDED EQUIPMENT ONLY ON JOISTS, TRUSSES OR BEAMS
- DESIGNATED FOR THAT PURPOSE. IF NO SUPPORT HAS BEEN DESIGNED (OR IF QUESTION ARISES) NOTIFY THE ARCHITECT PRIOR TO THE ERECTION OF EQUIPMENT AND BEFORE STRUCTURAL ERECTION IS COMPLETE.
  12. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE GOVERNING CODE AND ALL OTHER APPLICABLE FEDERAL, STATE AND
- LOCAL REGULATIONS. 13. WORK NOT INDICATED ON A PART OF THE DRAWINGS BUT REASONABLY
- IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING PLACES, SHALL BE REPEATED. 14. CONTRACTOR SHALL VERIFY AND/OR ESTABLISH ALL EXISTING CONDITIONS
- AND DIMENSIONS AT THE SITE.
  15. IF THE EXISTING FIELD CONDITIONS DO NOT PERMIT THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE DETAILS SHOWN, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER IMMEDIATELY AND PROVIDE A SKETCH OF THE CONDITION WITH HIS PROPOSED MODIFICATION OF THE DETAILS GIVEN ON THE CONTRACT DOCUMENTS.
- 16. CONTRACTOR SHALL PROVIDE FOR DEWATERING AS REQUIRED DURING EXCAVATION AND CONSTRUCTION.
- 17. WHERE ALTERATIONS INVOLVE THE EXISTING SUPPORTING STRUCTURE, THE CONTRACTOR SHALL PROVIDE SHORING AND PROTECTION REQUIRED TO INSURE THE STRUCTURAL INTEGRITY OF THE EXISTING STRUCTURE.
- BRACING, SHEETING, SHORING, ETC. REQUIRED TO SUPPORT UTILITIES, STRUCTURE, ETC. SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER ENGAGED BY THE CONTRACTOR; DETAILED SHOP DRAWINGS SHALL BE PREPARED INDICATING ALL WORK TO BE PERFORMED.
   IN NO CASE SHALL HEAVY EQUIPMENT BE PERMITTED CLOSER THAN 8 FEET
- FROM ANY PILE SUPPORTED STRUCTURE. IF THIS OCCURS, THE CONTRACTOR SHALL BE THE SOLELY RESPONSIBLE AND, AT HIS OWN EXPENSE, PROVIDE ADEQUATE SUPPORTS OR BRACE THE PILE SUPPORTED STRUCTURE TO WITHSTAND THE ADDITIONAL LOADS IMPOSED. 20. NO BLASTING SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL.
- 21. SPECIAL INSPECTION IS REQUIRED OF ALL STRUCTURAL CONSTRUCTION. THE CONTRACTOR SHALL EMPLOY A QUALIFIED TESTING/INSPECTING AGENCY THAT SHALL PROVIDE PERIODIC REPORTS TO ARCHITECT/ENGINEER DURING CONSTRUCTION. SUBMIT FINAL INSPECTION REPORT SUMMARY FOR EACH DIVISION OF WORK, CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER THAT SPECIAL INSPECTIONS WERE PERFORMED AND THAT WORK WAS PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- 22. THE NOTES ON THESE DRAWINGS DO NOT REPLACE THE SPECIFICATIONS. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. SHOULD A CONFLICT ARISE BETWEEN THESE NOTES AND SPECIFICATIONS, WRITTEN CLARIFICATIONS SHOULD BE REQUESTED BY THE CONTRACTOR TO THE ARCHITECT/ENGINEER. INCONSISTENCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
- 23. IF DURING THE PROGRESS OF THE WORK, THE CONTRACTOR MAY DISCOVER ANY INCONSISTENCY IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL REPORT THIS INCONSISTENCY TO THE ARCHITECT/ENGINEER. EXTRAS WILL NOT BE PERMITTED FOR CORRECTION OF DISCREPANCIES THAT COULD HAVE BEEN AVOIDED BY CAREFUL REVIEW AND THE MINOR ADJUSTMENT OF SIZE AND/OR LOCATION OF VARIOUS ITEMS.
- 24. SHOULD THE CONTRACTOR SEEK APPROVAL OF A PRODUCT OTHER THAN SHOWN OR WITHIN THE SPECIFICATIONS, THE CONTRACTOR SHALL FURNISH WRITTEN EVIDENCE THAT THE PROPOSED PRODUCT CONFORMS IN ALL RESPECTS TO THE SPECIFIED PRODUCT.
- 25. THE ENGINEER OF RECORD IS NOT AND SHALL NOT BE HELD LIABLE FOR SITE SAFETY ISSUES. THESE ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THEIR SUBCONTRACTORS. FOUNDATION
- 1. FOUNDATION STRUCTURE IS BASED ON THE USE OF SPREAD FOOTINGS AT A MAXIMUM SOIL PRESSURE OF 3000 POUNDS PER SQUARE FOOT. THE SUBGRADE IS TO BE VERIFIED BY A GEOTECHNICAL ENGINEER UNDER CONTRACT BY THE CONTRACTOR FOR SUITABILITY. IF FIELD CONDITIONS DO NOT PROVIDE THIS MINIMUM VALUE, THE ARCHITECT SHALL BE NOTIFIED IMMEDIATELY.
- SHOULD ORGANIC SILT, CLAY POCKETS OR OTHER UNSUITABLE BEARING CONDITIONS BE ENCOUNTERED DURING EXCAVATION, NOTIFY THE ARCHITECT BEFORE CONTINUING WITH CONSTRUCTION.
- UNLESS NOTED OTHERWISE OR REQUIRED BY CONDITIONS SHOWN ON THE DRAWINGS, EXCAVATION FOR THE FOOTINGS SHALL BE SUCH THAT THE TOP OF FOOTING MEASURES 2 FEET MINIMUM BELOW FINISHED ADJACENT GRADE.
- 4. THE CONTRACTOR MUST PROVIDE SURFACE DRAINAGE AND PUMPS TO PROTECT ALL EXCAVATION FROM FLOODING. FLOODING OF ANY EXCAVATION AFTER APPROVAL OF THE SUBGRADE WILL BE CAUSE FOR COMPLETE REPREPARTION AND RE-APPROVAL OF THE SUBGRADE.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MEASURES TO PREVENT ANY WATER FROM PENETRATING ANY FOOTING OR SLAB SUBGRADE BEFORE AND AFTER THE PLACING OF CONCRETE AND UNTIL SUCH SUBGRADES ARE FULLY PROTECTED BY THE PERMANENT BUILDING STRUCTURE.
   SLABS ON GROUND SHALL BEAR ON MECHANICALLY COMPACTED SOIL
- CAPABLE OF SUPPORTING 1000 POUNDS PER SQUARE FOOT. DRAINAGE FILL UNDER SLABS SHALL BE COMPACTED SAND AND GRAVEL OR CRUSHED STONE.
- 7. ALL ORGANIC MATERIALS, EXCESSIVELY SOFT OR LOOSE SOILS, TREES, ASPHALT, CONCRETE, DEBRIS AND OTHER DELETERIOUS MATERIALS SHOULD BE REMOVED WITHIN AND AT LEAST 5 FEET BEYOND THE BUILDING LIMIT.
- 8. PROOF ROLL ALL SUBGRADES, UNDER THE OBSERVATION OF THE GEOTECHNICAL ENGINEER. UNSUITABLE AREAS SHALL BE REMOVED AND REPLACED AS DIRECTED BY GEOTECHNICAL ENGINEER. NO FILL FOR BUILDING SUPPORT SHALL BE PLACED UNTIL SUBGRADES AND FILL MATERIAL HAVE BEEN APPROVED BY THE GEOTECHNICAL ENGINEER.
- 9. COMPACTED STRUCTURAL FILL BENEATH ALL FOUNDATIONS, SLABS ON GRADE AND ADJACENT TO FOUNDATION WALLS SHALL BE PLACED IN LIFTS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS AND BE COMPACTED TO 95 PERCENT OF MAXIMUM DRY DENSITY PER ASTM D-1557, MODIFIED PROCTOR TEST.
- 10. THE EXCAVATION FOR PLACEMENT OF COMPACTED STRUCTURAL FILL SHOULD EXTEND BEYOND THE EDGE OF FOOTINGS A MINIMUM DISTANCE EQUAL TO THE DEPTH OF THE FILL.

11.	EXCAVATION SHALL BE PERFORMED SO AS NOT TO DISTURB EXISTING ADJACENT BUILDINGS, STREETS AND UTILITY LINES. VERIFY LOCATION OF ALL UTILITIES PRIOR TO COMMENCEMENT OF WORK. HAND EXCAVATE AROUND UTILITIES AS REQUIRED.
12.	BACKFILL SHALL BE BROUGHT UP EQUALLY ON EACH SIDE OF GRADE BEAMS, FOUNDATION WALLS, ETC.
13.	DO NOT BACKFILL UNTIL CONCRETE HAS ATTAINED 75% OF SPECIFIED 28 DAY STRENGTH.
14.	ALL SHEETING, SHORING AND EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH OSHA GUIDELINES.
15.	SOILS EXPOSED AT THE BASES OF ALL APPROVED FOUNDATION EXCAVATIONS SHOULD BE PROTECTED AGAINST ANY DETRIMENTAL CHANGE IN CONDITIONS SUCH AS FROST, RAIN, ETC. EXCAVATIONS SHOULD BE PROTECTED FROM RAINFALL OR FREEZING.
1.	CONCRETE SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH AND DENSITY, IN
	ACCORDANCE WITH THE FOLLOWING:
	EXTERIOR SLABS, CURBS, SIDEWALKS & 4000 145 ALL OTHER CONCRETE (U.N.O.) 3000 145
2.	SLUMP OF CONCRETE SHALL NOT EXCEED 4" UNLESS A HIGH RANGE WATER-REDUCING ADMIXTURE IS USED. THE SLUMP OF CONCRETE PRIOR TO ADDITION OF A HIGH RANGE WATER-REDUCING ADMIXTURE SHALL NOT EXCEED 4".
3.	CONCRETE EXPOSED TO WEATHER SHALL BE AIR-ENTRAINED. AIR CONTENT SHALL BE BETWEEN 4 AND 8 PERCENT.
4.	THE NOMINAL MAXIMUM AGGREGATE SIZE SHALL BE A MINIMUM OF 3/4".
5.	THE MINIMUM PORTLAND CEMENT CONTENT PER CUBIC YARD (ASTM C150) OF ALL CONCRETE SHALL CONFORM TO THE FOLLOWING TABLE. (FLYASH NOT PERMITTED).
	SPECIFIED MINIMUM CEMENT CONTENT (POUNDS PER CUBIC YARD)
	STRENGTH NON-AIR ENTRAINED AIR ENTRAINED (PSI) CONCRETE CONCRETE 3000 495 517
6	4000 564 611
0.	ADVANCE OF CONCRETE PLACEMENT. CONCRETE MIX DESIGN SHALL INCLUDE ALL STRENGTH DATA NECESSARY TO SHOW COMPLIANCE WITH THE PROJECT SPECIFICATIONS FOR EITHER THE TRIAL BATCH OR FIELD EXPERIENCE METHOD AND SHALL BE CERTIFIED BY AN ENGINEER REGISTERED IN THE STATE WHERE THE STRUCTURE IS LOCATED.
7.	REINFORCING SHALL CONFORM TO ASTM A615, GR60, UNLESS NOTED OTHERWISE.
8.	WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
9.	ALL REINFORCING SHALL BE DETAILED, FABRICATED AND PLACED, IN ACCORDANCE WITH ACI DETAILING MANUAL 1988 (SP-66).
10.	ALL REINFORCING SHALL BE SUPPORTED IN FORMS, SPACED WITH NECESSARY ACCESSORIES AND SHALL BE SECURELY WIRED TOGETHER, IN ACCORDANCE WITH CRSI "MANUAL OF STANDARD PRACTICE" (1986).
11.	MINIMUM CONCRETE COVER, UNLESS NOTED OTHERWISE:
	UNFORMED SURFACE IN CONTACT WITH THE GROUND. 3 IN.
	FORMED SURFACES EXPOSED TO EARTH OR WEATHER. #6 BARS AND LARGER 2 IN. #5 BARS AND SMALLER 1–1/2 IN.
	FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER: BEAMS, GIRDERS, AND COLUMNS 1 1/2 IN. SLARS WALLS AND JOISTS
	#11 BARS AND SMALLER 3/4 IN #14 AND #18 BARS 1 1/2 IN.
12.	LAP SPLICES SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE, UNLESS NOTED OTHERWISE. WHERE CLASSES ARE NOT CALLED OUT ON DRAWINGS, USE CLASS "B" SPLICES.
	TENSION SPLICES (INCHES) COMPRESSION SPLICES (INCHES)
	BAR TOP BARS OTHER BARS SIZE A B A B
	#3 16 21 12 16 12 #4 21 28 16 21 15
	#5 27 35 21 27 19 #6 35 46 27 35 23 #7 48 62 37 48 26
	#8 63 82 48 63 30 #9 80 104 61 80 34
	#10 101 131 78 101 38 #11 125 162 96 125 42
	COMPRESSION DOWEL EMBEDMENT: 22 BAR DIAMETERS LAP WELDED WIRE FABRIC ONE SPACING OF CROSS WIRES PLUS 2".
13.	BASE PLATES, ANCHOR BOLTS, SUPPORT ANGLES, ETC., BELOW GRADE SHALL BE COVERED WITH A MINIMUM OF 3" OF CONCRETE.
14.	CONCRETE WORK SHALL BE SUBJECT TO QUALITY ASSURANCE TESTING AND INSPECTIONS. SEE QUALITY ASSURANCE GENERAL NOTES AND PROJECT SPECIFICATIONS.
15.	CONCRETE MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH

- 15. CONCRETE MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH ACI 318-89 (REVISED 1992) BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE AND ACI 301-89 SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
   16. BAR SUPPORTS IN CONTACT WITH EXPOSED SURFACES SHALL BE PLASTIC
- TIPPED. ALL ACCESSORIES SHALL BE GALVANIZED.17. PROVIDE SPACERS, CHAIRS, BOLSTERS, ETC. AS REQUIRED AND NECESSARY TO ASSEMBLE, PLACE AND SUPPORT ALL REINFORCING STEEL IN PLACE.
- USE WIRE BAR TYPE SUPPORTS COMPLYING WITH CRSI RECOMMENDATIONS. 18. NO CALCIUM CHLORIDE SHALL BE USED IN ANY CONCRETE. NO WATER
- SHALL BE ADDED AT THE JOB SITE TO CONCRETE MIX. 19. THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER DESIGN AND
- CONSTRUCTION OF ALL FORM WORK, SHORING AND RESHORING. PROVIDE COMMERCIAL FORM COATING COMPOUNDS THAT WILL NOT BOND, STAIN OR ADVERSELY AFFECT CONCRETE SURFACES.
  20. ALL CONCRETE SHALL BE CONSOLIDATED IN PLACE USING INTERNAL VIBRATOR. DO NOT USE VIBRATORS TO TRANSPORT CONCRETE WITHIN
- FORMS. 21. PLACEMENT OF CONCRETE SHALL NOT START UNTIL THE PLACEMENT OF
- REINFORCING STEEL HAS BEEN APPROVED BY OWNER'S INSPECTING AGENCY. 22. BONDING AGENT SHALL BE USED WHERE NEW CONCRETE IS PLACED AGAINST
- 23. CONCRETE SHALL NOT BE PLACED IN WATER OR ON FROZEN GROUND.
- 24. COMPLETE SHOP DRAWINGS AND SCHEDULES OF ALL REINFORCING STEEL SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR REVIEW.
- 25. WELDING OF REINFORCEMENT IS NOT PERMITTED.26. FOR ALL OPENINGS IN CONCRETE WALLS AND SLABS, PROVIDE
- SUPPLEMENTAL REINFORCING AROUND OPENINGS.
  27. CONTROL JOINTS IN SLABS ON GRADE SHALL NOT EXCEED 20 FEET ON CENTERS NOR 15 FEET FROM ANY CORNER. CONTROL JOINTS SHALL BE SAW CUT (1/4 x SLAB DEPTH +1/4 INCH DEEP) AND FILLED WITH JOINT SEALER. CUT JOINTS AS SOON AS POSSIBLE WITHOUT FRAYING THE CONCRETE SURFACE. CONSTRUCTION JOINTS SHALL INCLUDE A ONE INCH BY TWO INCH SHEAR KEY AT MID HEIGHT OF SLAB.

- 28. THE FINISH TOLERANCE OF ALL SLABS SHALL BE IN ACCORDANCE WITH ACI 302 AND THAT SPECIFIED ON THE CONTRACT DOCUMENTS.
- 29. ANCHOR BOLTS SHALL CONFORM TO ASTM A307 UNLESS NOTED OTHERWISE.30. LAP ALL BARS A MINIMUM OF 40 BAR DIAMETERS. LAP ALL WWF A MINIMUM OF 6 INCHES.
- SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF DEPRESSED SLAB AREAS, DRAINS, AND DIMENSIONS.
   PROVIDE GALVANIZED STEEL SLEEVES WHERE PIPES PASS THROUGH EXTERIOR CONCRETE WALLS, BEAMS OR SLABS. PROVIDED PVC SLEEVES
- WHERE PIPES PASS THROUGH INTERIOR CONCRETE WALLS, BEAMS OR SLABS.
   33. DO NOT PLACE UNDERGROUND UTILITIES OR PIPES BELOW FOOTINGS. IF ANY SUCH CONDITIONS OCCUR, NOTIFY THE ENGINEER IMMEDIATELY AND DROP THE BOTTOM OF FOOTING ELEVATION IN ACCORDANCE WITH THE TYPICAL STEP FOOTING DETAIL TO CLEAR PIPE.
   <u>MASONRY</u>:
- REINFORCED MASONRY SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH, f'm, OF 1500 PSI. MASONRY UNITS SHALL BE NORMAL WEIGHT BLOCK CONFORMING TO ASTM C90, GRADE N, TYPE 1, AND SHALL HAVE A MINIMUM NET AREA COMPRESSIVE STRENGTH OF 2000 PSI. MORTAR SHALL CONFORM TO ASTM C270, TYPE S. GROUT SHALL CONFORM TO ASTM C476.
   REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS NOTED OTHERWISE.
- CONTINUOUS WIRE REINFORCING (JOINT REINFORCING) SHALL BE GALVANIZED TRUSS TYPE FABRICATED UNITS WITH A SINGLE PAIR OF 9 GAUGE SIDE RODS AND 9 GAUGE CONTINUOUS DIAGONAL CROSS RODS FABRICATED FROM COLD-DRAWN STEEL WIRE COMPLYING WITH ASTM A82. JOINT REINFORCING SHALL BE SPACED AT 16" O.C. VERTICALLY IN ALL MASONRY WALLS.
   SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF VERTICAL CONTROL
- JOINTS. HORIZONTAL BOND BEAM AND LINTEL REINFORCING SHALL BE CONTINUOUS ACROSS VERTICAL CONTROL JOINTS. JOINT REINFORCING SHALL BE STOPPED EITHER SIDE OF VERTICAL CONTROL JOINTS.
   ALL REINFORCED CELLS, ALL CELLS BELOW GRADE AND ALL CELLS BELOW FINISH FLOOR SHALL BE GROUTED SOLID WITH HIGH SLUMP (6" = 1" SUPER P)- 3000PSI PEA GRAVEL CONCRETE. GROUT LIFTS TO BE
- (6" = 1" SUPER P) 3000PSI PEA GRAVEL CONCRETE. GROUT LIFTS TO BE COMPLETED IN 4 FOOT LIFTS.
  6. WHEN A FOUNDATION DOWEL DOES NOT LINE UP WITH A VERTICAL BLOCK CORE, IT SHALL NOT BE SLOPED MORE THAN ONE HORIZONTAL IN 6
- VERTICAL. DOWELS MAY BE GROUTED INTO A CELL IN VERTICAL ALIGNMENT, EVEN THOUGH IT IS IN AN ADJACENT CELL TO THE VERTICAL WALL REINFORCING. 7. REINFORCING STEEL SHALL BE SECURED IN PLACE BEFORE GROUTING
- KEINFORCING SHALL BE LAPPED 48 BAR DIAMETERS OR 24 INCHES, WHICHEVER IS GREATER. SPLICED BARS SHALL BE WIRED TOGETHER.
- VERTICAL BARS SHALL BE HELD IN POSITION AT TOP AND BOTTOM AND AT INTERVALS NOT EXCEEDING 200 DIAMETERS OF THE REINFORCING, NOR 10 FEET.
- 10. VERTICAL REINFORCING BARS SHALL HAVE A MINIMUM CLEARANCE OF 3/4 OF AN INCH FROM THE MASONRY AND NOT LESS THAN ONE BAR DIAMETER BETWEEN BARS.
- 11. VERTICAL CELLS THAT WILL BE GROUTED SHALL HAVE A VERTICAL ALIGNMENT TO MAINTAIN A CONTINUOUS UNOBSTRUCTED CELL AREA NOT LESS
- 12. GROUTING SHALL BE STOPPED 1-1/2" BELOW THE TOP OF A COURSE SO AS TO FORM A KEY AT THE POUR JOINT.
- 13. GROUTING OF MASONRY BEAMS OVER OPENINGS SHALL BE DONE IN ONE CONTINUOUS OPERATION.
- 14. ALL BOLTS, ANCHORS, ETC., INSERTED IN THE WALLS, SHALL BE GROUTED SOLID INTO POSITION.
- REINFORCED MASONRY HAS BEEN DESIGNED USING VALUES FOR CONSTRUCTION WITH SPECIAL INSPECTION.
   REINFORCED MASONRY WORK SHALL BE SUBJECT TO QUALITY ASSURANCE
- PROJECT SPECIFICATIONS. 17. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN & IMPLEMENTATION OF ALL SHORING & BRACING TO ASSURE STABILITY OF WALLS DURING
- ALL SHORING & BRACING TO ASSORE STABILITY OF WALLS DURING CONSTRUCTION.
  18. PROVIDE HORIZONTAL JOINT REINFORCING AT 8 INCHES ON CENTERS FOR TWO COURSES ABOVE AND BELOW ALL WALL OPENINGS.
  19. MORTAR JOINT THICKNESS=3/8 INCHES.
- 20. DOVETAIL ANCHORS, WALL PLUGS, ACCESSORIES AND OTHER MISCELLANEOUS ITEMS SHALL BE INSTALLED AS THE MASONRY WORK PROGRESSES.
- 21. STORE BLOCKS ON PALLETS AND COVER WITH VISQUEEN.
- 22. USE ALL MORTAR WITHIN 2 HOURS OF MIXING AT TEMPERATURES OF 80 DEGREES F. USE ALL MORTAR WITHIN 2-1/2 HOURS AT TEMPERATURES BELOW 50 DEGREES F.
- 23. PROVIDE VERTICAL CONTROL JOINTS AT 25 FEET MAXIMUM HORIZONTAL SPACING AT CHANGES OF WALL HEIGHT OR THICKNESS, AT CONSTRUCTION JOINTS IN FOUNDATION, ROOF OR FLOORS, AT CHASES AND RECESSES FOR PIPING, COLUMNS, FIXTURES, ETC. AT ABUTMENT OF WALLS AND COLUMNS, AT RETURN ANGLES OF "L", "T" OR "U" SHAPED STRUCTURES, AT ONE OR BOTH SIDES OF WALL OPENINGS.
- 24. MASONRY HAS BEEN DESIGNED IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (ACI 530) AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS FOR MASONRY
- 25. GROUT PLACEMENT SHALL NOT START UNTIL THE PLACEMENT OF REINFORCING HAS BEEN APPROVED BY THE INSPECTION AGENCY.
- 26. FILL ALL BEAM, GIRDER, JOIST, ETC. BEARING PLATES SOLID WITH GROUT.
- 27. ALLOW GROUT IN REINFORCED CMU WALLS TO CURE A MINIMUM OF 48 HOURS BEFORE IMPOSING CONCENTRATED OR OTHER LOADS.
- 28. CMU PLACED BELOW GRADE SHALL BE FILLED SOLID.

STRUCTURES (ACI530.1).

- CMU SHALL BE LAID IN RUNNING BOND UNLESS OTHERWISE NOTED IN ARCHITECTURAL DRAWINGS. BOND CORNERS AND INTERSECTIONS OF WALLS.
   ALL CMU JOINTS SHALL BE FULLY BEDDED AND STRUCK SMOOTH.
- MISCELLANEOUS: 1. THESE GENERAL NOTES SUPPLEMENT THE PROJECT SPECIFICATIONS. REFER
- TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. 2. STRUCTURAL DRAWINGS ARE INTENDED TO BE USED WITH ARCHITECTURAL
- SIND MECHANICAL DRAWINGS ARE INTERNED TO BE OSED WITH ARCHITECTORAL AND MECHANICAL DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING SUCH REQUIREMENTS INTO THEIR SHOP DRAWINGS AND WORK.
   NO OPENINGS SHALL BE MADE IN ANY STRUCTURAL MEMBER WITHOUT THE WRITTEN APPROVAL OF THE PROFESSIONAL OF RECORD.
- 4. NO CHANGE IN SIZE OR DIMENSION OF STRUCTURAL MEMBERS SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE PROFESSIONAL OF RECORD.

- OPENINGS 1'-4" AND LESS ON A SIDE ARE GENERALLY NOT SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS FOR SUCH OPENINGS.
- 6. THE CONTRACTOR IS RESPONSIBLE FOR LIMITING THE AMOUNT OF CONSTRUCTION LOAD IMPOSED UPON STRUCTURAL FRAMING. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN CAPACITY OF THE FRAMING AT THE TIME THE LOADS ARE IMPOSED.
- 7. THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES.
- DO NOT SCALE THESE DRAWINGS, USE DIMENSIONS.
   CONTRACTOR'S CONSTRUCTION AND/OR ERECTION SEQUENCES SHALL RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF
- STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD. 10. THE CONTRACTOR SHALL INFORM THE PROFESSIONAL OF RECORD IN WRITING OF ANY DEVIATION FROM THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL NOT BE RELIEVED OF THE RESPONSIBILITY OF SUCH DEVIATION BY THE PROFESSIONAL OF RECORD REVIEW OF SHOP DRAWINGS, PRODUCT DATA, ETC., UNLESS THE CONTRACTOR HAS SPECIFICALLY INFORMED THE PROFESSIONAL OF RECORD OF SUCH DEVIATION AT THE TIME OF SUBMISSION, AND THE PROFESSIONAL OF RECORD HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION. QUALITY ASSURANCE:
- 1. THE CONTRACTOR WILL EMPLOY AND PAY FOR THE SERVICES OF AN INDEPENDENT TESTING AGENCY ACCEPTABLE TO THE OWNER TO PROVIDE QUALITY ASSURANCE TESTING AND INSPECTIONS FOR WORK. THE TESTING AGENCY SHALL BE LICENSED WHERE THE STRUCTURE IS LOCATED AND ALL TESTING AND INSPECTIONS SHALL BE PERFORMED UNDER THE SUPERVISION OF AN ENGINEER REGISTERED WHERE THE STRUCTURE IS LOCATED.
- FAILURE OF QUALITY ASSURANCE TESTING AND INSPECTIONS TO DETECT ANY DEFECTIVE WORK OR MATERIAL SHALL NOT IN ANY WAY PREVENT LATER REJECTION WHEN SUCH DEFECT IS NOTED NOR SHALL IT OBLIGATE THE OWNER'S REPRESENTATIVE FOR FINAL ACCEPTANCE.
   SEE SPECIFICATIONS FOR SPECIFIC REQUIREMENTS FOR OUTLUTY ASSURANCE
- SEE SPECIFICATIONS FOR SPECIFIC REQUIREMENTS FOR QUALITY ASSURANCE TESTING AND INSPECTIONS.
   THE TESTING AGENCY AND ITS REPRESENTATIVES ARE NOT AUTHORIZED TO
- REVOKE, ALTER, RELAX, ENLARGE OR RELEASE ANY PORTION OF THE WORK, PERFORM ANY DUTIES OF THE CONTRACTOR, OR BE A PARTY TO SCHEDULING OF WORK.
  5. THE CONTRACTOR SHALL NOTIFY THE TESTING AGENCY AND THE OWNER'S
- REPRESENTATIVE A MINIMUM OF 24 HOURS IN ADVANCE OF ALL WORK REQUIRING QUALITY ASSURANCE TESTING AND INSPECTIONS AND ALL REASONABLE FACILITIES SHALL BE MADE AVAILABLE FOR TECHNICIANS. RECORDS OF INSPECTIONS SHALL BE KEPT AVAILABLE TO THE BUILDING
- RECORDS OF INSPECTIONS SHALL BE KEPT AVAILABLE TO THE BUILDING OFFICIAL DURING PROGRESS OF THE WORK AND FOR TWO YEARS AFTER COMPLETION OF THE PROJECT. RECORDS SHALL BE PRESERVED BY THE INDEPENDENT TESTING AGENCY.

NOTE: ALL SUB-CONTRACTORS SHALL BE RESPONSIBLE FOR REVIEWING ALL DRAWINGS AND ALL SECTIONS OF THE SPECIFICATIONS FOR THE COORDINATION OF THEIR WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ARCHITECT BEFORE FINALIZING THEIR BIDS. CONTRACTOR SHOULD FIELD VERIFY ALL DIMENSIONS.

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SE2 ENGINEERING, LLC.	- PROFESSIONAL ENGINEERS - 1705 BUTLER PIKE; CONSHOHOCKEN, PA. 19428	TEL: (610) 828-1550 E-MAIL: OFFICE@SE2ENG.NET			THEN ANOLI UNAL UENENAL INUIES	N I EINAINCE BUILDING - U3 ADDI I I UN 100 SHARP ROAD MARLTON, NJ. 08053	
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	FOOTING SCHEDULE								
	FOOTING IN	FORMATION							
МАКК	SIZE	REINFORCEMENT							
F4.0	4'-0"x4'-0"x1'-0"	(5) #4 EACH WAY BOTT.							
F4.0B	4'-0"x4'-0" (BULK)	(5) #4 EACH WAY BOTT.							
F5.0	5'-0"x5'-0"x1'-0"	(7) #4 EACH WAY BOTT.							
F5.0B	5'-0"x5'-0" (BULK)	(7) #4 EACH WAY BOTT.							
F6.5	6'-6"x6'-6"x1'-2"	(7) #5 EACH WAY BOTT.							
F7.0	7'-0"x7'-0"x1'-2"	(8) #5 EACH WAY BOTT.							
NOTE:									

NOTE: P1 = PIER 18x18 W/(4) #6 VERT. & #4 TIES @ 12" C/C P2 = PIER 18x36 W/(10) #8 VERT. & (2)#4 TIES @ 12" C/C

	LINTEL SCHEDULE	
MARK	TYPE	
L1	(3) PCS. 4x8 PRECAST CONC. LINTEL W/ (1)#4 TOP & BOT.	

![](_page_11_Figure_6.jpeg)

![](_page_11_Figure_7.jpeg)

2 HAIRPIN DETAILS S2 SCALE: 3/4"=1'-0" <u>NOTE:</u> HAIRPINS TO WRAP AROUND ANCHOR BOLTS

					REVISION DESCRIPTION	ANY REUSE ON PROJECT EXTENSIONS, ANY X'S SOLE RISK AND WITHOUT LIABILITY TO AL SEAL SHALL BE CONSIDERED AS VALID.							
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					REV DATE								
SE2 ENGINEERING, LLC.	- PROFESSIONAL ENGINEERS - 1705 BUTLER PIKE; CONSHOHOCKEN, PA. 19428	TEL: (610) 828-1550 E-MAIL: OFFICE@SE2ENG.NET				VIENANCE BUILDING - 03 ADDITION 100 Sharp road Marlton, NJ. 08053							
SEAL	SEZ SEZ		Description:		Project: 7 F A FR								
Dwn t <b>S</b>	oy: LD		D	ate: 12/	11/2	.019							
Scale: Job#:		AS	N	OTE	D								
Sheet	1 #:	9	CLINICO	41	.2								
		S	52	2		Sheet#: S2							

![](_page_12_Figure_0.jpeg)

![](_page_12_Figure_1.jpeg)

![](_page_12_Figure_2.jpeg)

![](_page_12_Figure_3.jpeg)

![](_page_12_Figure_4.jpeg)

\_\_(SOFT-CUT METHOD)  $\frac{1}{8}$ " WIDE x 1" DEEP (DO NOT INTERRUPT MESH) 

**TYP SLAB** 11 CONTROL JOINT S3 SCALE: 3/4" = 1'-0" INDICATED AS (CNJ) ON PLAN

						REVISION DESCRIPTION	LC. ANY REUSE ON PROJECT EXTENSIONS, ANY USER'S SOLE RISK AND WITHOUT LIABILITY TO JONAL SEAL SHALL BE CONSIDERED AS VALID.
						LEV DATE	<sup>4</sup> SE2 ENGINEERING, I MLL BE MADE AT THE OR BLUE INK PROFES
						R	THE PROPERTY OF THIS PROJECT SHA N EMBOSSED AND/(
						REVISION DESCRIPTION	THIS DRAWING IS COPYRIGHTED AND SHALL REMAIN OTHER PROJECT, OR ALTERATIONS OR ADDITIONS TO SE2 ENGINEERING LLC. ONLY DRAWINGS BEARING AN
						EV DATE	
SE2 ENGINEERING, LLC.	- PROFESSIONAL ENGINEERS - 1705 BUTLER PIKE; CONSHOHOCKEN, PA. 19428	TEL: (610) 828-1550 E-MAIL: OFFICE@SE2ENG.NET			FOUNDATION DETAILS		N I EINAINCE BUILDING - U3 AUUI I IUN 100 SHARP ROAD MARLTON, NJ. 08053
QF 47	SEZ		Description:			Project: TA TA	
SEAL			T	<b>94</b> -			
Dwn b Scale:	oy: LD	AS		ate: 12 <b>OT</b> .	2/1 EE	1/2 )	019
Job#: Sheet	1	9	) 	4	1	2	
1		S	).	3		:	<b>3</b> of 3

![](_page_13_Picture_0.jpeg)

![](_page_13_Figure_1.jpeg)

![](_page_13_Figure_2.jpeg)

![](_page_13_Figure_3.jpeg)

3. EXISTING 1" COPPER WATER SERVICE SHALL BE TURNED OFF IN METER ROOM OF BUILDING 2, AND THE EXISTING 1" COPPER PIPE SHALL BE CUT BACK AND CAPPED WATER TIGHT ON DISCHARGE SIDE OF SHUT-OFF VALVE; EXISTING 1" COPPER PIPE SHALL BE CUT BACK TIGHT TO EXISTING FLOOR SLAB, CAPPED, AND SEALED LIQUID & GAS TIGHT. REMAINING WATER SERVICE PIPING SHALL BE ABANDONED IN PLACE.

![](_page_13_Picture_5.jpeg)

![](_page_13_Picture_6.jpeg)

![](_page_13_Picture_7.jpeg)

![](_page_14_Figure_0.jpeg)

![](_page_14_Picture_2.jpeg)

NORTH

![](_page_15_Figure_0.jpeg)

![](_page_15_Picture_5.jpeg)

![](_page_15_Picture_6.jpeg)

		PLUMBING	SYMBOL	LIST	
BBREVIATION	SYMBOL	DESCRIPTION	ABBREVIATION	SYMBOL	DESCRIPTION
cw		COLD WATER PIPING	GV	×	- GATE VALVE
нพ		HOT WATER PIPING	НВ		HOSE BIBB W/VACIIIIM BREAKER
HWR		HOT WATER RETURN PIPING			
(E) CW		(E) COLD WATER PIPING		J	BRANCH – TOP CONNECTION
(E) HW		(E) HOT WATER PIPING		§	BRANCH - BOTTOM CONNECTION
(E) HWR	·	(E) HOT WATER RETURN PIPING		a <b></b>	TRAP
w	——— W ———	SITE WATER SUPPLY			
v		VENT	PV	♥	- GAS PLUG VALVE
(E) V		(E) VENT	cv		- CHECK VALVE
SAN, S		SOIL, WASTE, OR SANITARY SEWER	FD	0	FLOOR DRAIN
SAN, S		UNDERGROUND/BELOW SLAB SOIL, WASTE, OR SANITARY SEWER	тр		TRENCH DRAIN
CA	CA	COMPRESSED AIR			
G	G	NATURAL GAS	CODP	©	CLEAN OUT DECK PLATE
(E) G	(E) G	(E) NATURAL GAS	со		CLEANOUT
		CAPPED OUTLET	м	M	WATER METER & VALVE ASSEMBLY
		VALVED & CAPPED OUTLET		•	NEW CONNECTION TO EXISTING
		REDUCER	RPZ	RPZ	REDUCED PRESSURE ZONE
BV		BALL VALVE			
		PIPING DROP	0.S.&Y.	Q	OUTSIDE STEM & YOKE VALVE
	O	PIPING RISE	WH	<b></b> ⊃ <b>-</b> ∎	NON-FREEZE WALL HYDRANT
EX	$\times \times \times \times \times \times$	EXISTING PIPING TO BE REMOVED		X	GAS PRESSURE REGULATOR

 Δ	COMPRESSED AIR	DN	DOWN	MS	MOP SINK	
(A)	ABANDONED	DP	DROP	OD	OVERFLOW DRAIN	
AFF	ABOVE FINISHED FLOOR	DW	DOMESTIC WATER	S	SANITARY	
CA	COMPRESSED AIR	DWG	DRAWNG	SAN	SANITARY	
CI	CAST IRON	(E)	EXISTING	SP	SPRINKLER PIPE	
CO	CLEANOUT	FD	FLOOR DRAIN	TYP	TYPICAL	
CODP	CLEANOUT WITH DECK PLATE	G	GAS	UR	URINAL	
CW	COLD WATER	HW	HOT WATER SUPPLY	WC	WATER CLOSET	
DF	DRINKING FOUNTAIN	IW	IRRIGATION WATER			
DFU	DRAINAGE FIXTURE UNITS	LAV	LAVATORY			

	PLUMBING SPECIALTIES SCHEDULE									
MARK	DESCRIPTION	MANUFACTURER MODEL	REMARKS							
<u>WH-1</u>	NON-FREEZE WALL HYDRANT	ZURN Z-1300-4	BRONZE BODY, ENCASED, ANTI-SIPHON, AUTOMATIC DRAINING, INTEGRAL BACKFLOW PREVENTOR & 3/4" HOSE CONNECTION							
<u>HB–1</u>	HOSE BIBB	ZURN Z-195	BRONZE BODY, ENCASED, ANTI-SIPHON, AUTOMATIC DRAINING, INTEGRAL BACKFLOW PREVENTOR & 3/4" HOSE CONNECTION							
<u>NFGH</u>	NON-FREEZE GROUND HYDRANT	MURDOCH MODEL M-NP75	CAST IRON AND CAST BRASS CONSTRUCTION, ASSE 1057 CERTIFIED, VALVE BURIAL DEPTH SHALL BE 4'-0"							
	AIR GAP FITTING	ZURN Z-1024 OR Z-1025	DURA-COAT CAST IRON FIXED AIR GAP FITTING (SELECT SIZE AS REQUIRED BY INDIRECT WASTE PIPING)							
<u>TG</u>	WATERLESS TRAP GUARD	PROVENT TRAP GUARD	ELASTOMERIC, NORMALLY CLOSED TRAP GUARD DEVICE WHICH OPENS WHEN IN CONTACT WITH LIQUID, COMPLIES WITH ANSI/ASME A112.6.3							
<u>RPDA</u>	REDUCED PRESSURE ZONE VALVE	WATTS MODEL 909LF	SIZE REDUCED PRESSURE ZONE VALVE ASSEMBLY WITH SWEAT ENDS FOR IRRIGATION SYSTEM, COORDINATE SIZE WITH VENDOR							
<u>TMV-1</u>	THERMOSTATIC MIXING VALVE	GUARDIAN MODEL G3600LF	BLENDS HOT AND COLD WATER TO DELIVER TEPID WATER AS REQUIRED BY ANSI Z358.1-2014							
<u>TMV-2</u>	THERMOSTATIC MIXING VALVE	LEONARD MODEL 270-LF	INSTALL BELOW SINK; SET OUTLET TEMPEATURE TO 105° (F).							

![](_page_16_Figure_3.jpeg)

					PLUMBING FIXTU	JRE & CONNE	CTIOI
MARK	FIXTURE	MOUNTING	MANUFACTURER	MODEL NO.	TRIM NO.	SUPPORT NO.	TRAP
<u>P–1</u>	SINK	COUNTER MOUNTED	ELKAY	LRAD222255	ELKAY LK800GN04T6	N/A	1-1/2" x 2

			PLU	MBING	EQUIPMI	ENT S	SCHI	EDU	LE						PL	UMBING FLO	OR DRA	IN SCHEDULE
MARK		GENERAL			DESIGN [	DATA		ELEC	CTRICAL		1	GAS	REMARKS	MARK	DESCRIPTION	MANUFACTURER MODEL	LOCATION	REMARKS
	DESCRIPTION	MANUFACTURER	MODEL NUMBER	LOCATION	CAPACITY	PUMP HEAD	HP	RPM	VOLTS	PH	HZ	СЕН						
<u>HWH-1</u>	ELECTRIC HOT WATER HEATER	A.O. SMITH	BTH-120	MEZZANINE-02 E201	60 GALLONS	N/A	N/A	N/A	-	-	-	120	60 GALLON STORAGE WITH 138 GPH RECOVERY WITH INTEGRAL 3" FORCED DRAFT FLUE VERTICAL EXHAUST & 3" VERTICAL AIR INTAKE MOUNTED ON 4" CONCRETE PAD	<u>FD-1</u>	FLOOR DRAIN	ZURN INDUSTRIES INC ZN-415-P-Y	SEE FLOOR PLANS	C.I. BODY, SEDIMENT BUCKET, 3" OUTLET, FLASHING COLLAR, 5" SQUARE NICKEL BRONZE STRAINER, PROVIDE DEEP SEAL TRAP, AND ELASTOMETRIC TRAP SEAL <u>TG</u> (SEE PLUMBING SPECIALTIES SCHEDULE)
<u>AC-1</u>	TANK MOUNTED AIR COMPRESSOR	SEE REMARKS	SEE REMARKS	MEZZANINE-02 E201	-	-	7.5	-	208	3	60	N/A	AIR COMPRESSOR AND ACCESSORIES ARE EXISTING AND WILL BE FURNISHED BY OWNER AND INSTALLED UNDER THIS CONTRACT	<u>1</u>	TRENCH DRAIN	WATTS DEAD LEVEL S	SEE FLOOR PLANS	6" X 48" DUCTILE IRON WITH INTEGRAL 4" IPS THREADED BOTTOM OUTLET.
<u>AC-2</u>	TANK MOUNTED AIR COMPRESSOR	SEE REMARKS	SEE REMARKS	MEZZANINE-02 E201	_	_	7.5		208	1	60	N/A	AIR COMPRESSOR AND ACCESSORIES ARE EXISTING AND WILL BE FURNISHED BY OWNER AND INSTALLED UNDER THIS CONTRACT	<u>FFD–1</u>	FUNNEL FLOOR DRAIN	ZURN INDUSTRIES INC Z1019	SEE FLOOR PLANS	C.I. BODY, 3" OUTLET, 4" X $3-3/4$ " FUNNEL, DOME STRAINER, BRONZE CLEAN OUT PLUG IN BASE OF P-TRAP, PROVIDE ELASTOMETRIC TRAP SEAL <u>TG</u> (SEE PLUMBING SPECIALTIES SCHEDULE)
<u>AC-3</u>	TANK MOUNTED AIR COMPRESSOR	SEE REMARKS	SEE REMARKS	MEZZANINE-02 E201	_	_	5		208	1	60	N/A	AIR COMPRESSOR AND ACCESSORIES ARE EXISTING AND WILL BE FURNISHED BY OWNER AND INSTALLED UNDER THIS CONTRACT					
<u>0WS-1</u>	OIL/SAND INTERCEPTOR	HIGHLAND TANK	0SI-2000-2	outside on site	2,000 GALLONS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	STEEL DOUBLE-WALL TANK WITH LEAK MONITORING, 4" INLET/OUTLET AND TWO 24" MANWAY WITH STEEL ROADWAY COVERS					

# PLUMBING GENERAL NOTES

- 1. THE PLUMBING INSTALLATIONS SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE STATE AND LOCAL BUILDING AND PLUMBING CODES, SUBSEQUENT AMENDMENTS, DEPARTMENT OF HEALTH REQUIREMENTS AND AUTHORITIES HAVING JURISDICTION.
- 2. PIPING LAYOUTS ARE DIAGRAMMATIC AND INTENDED TO SHOW GENERAL ARRANGEMENT, SIZE, AND CAPACITY. ALL OFFSETS ARE NOT NECESSARILY SHOWN. THE CONTRACTOR SHALL ARRANGE AND COORDINATE THE WORK, FURNISH NECESSARY OFFSETS, VALVES AND FITTINGS TO AVOID CONFLICTS WITH MECHANICAL, ELECTRICAL SYSTEMS, STRUCTURAL AND ARCHITECTURAL ELEMENTS.
- 3. THE CONTRACTOR SHALL PERFORM ALL CUTTING AND PATCHING. PATCH ALL WALL OPENINGS AS NECESSARY TO MATCH EXISTING CONDITIONS.
- 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING ALL WALL PENETRATIONS WITH FIRE RATED SEALANT.
- 5. THE CONTRACTOR SHALL RUN ALL PIPING TO AVOID REINFORCING AT ALL COLUMN LINES.
- 6. THE CONTRACTOR SHALL INSTALL PIPING SO AS NOT TO ENCROACH ON REQUIRED CLEARANCES ABOVE ANY ELECTRIC PANEL. NO PIPING SHALL BE INSTALLED DIRECTLY OVER ELECTRICAL PANELS AND NO PIPING SHALL BE INSTALLED WITH THE BOTTOM AT LESS THAN 66" ABOVE THE 4'-0" SPACE DIRECTLY IN FRONT OF ANY ELECTRIC PANELS.
- 7. ALL PIPING AND INSTALLATION SHALL BE IN COMPLIANCE WITH NEW JERSEY INTERNATIONAL BUILDING CODE 2015, NATIONAL STANDARD PLUMBING CODE 2015, INTERNATIONAL FUEL GAS CODE 2015 AND ANY APPLICABLE LOCAL CODES AND STANDARDS.

![](_page_16_Figure_14.jpeg)

![](_page_16_Figure_15.jpeg)

![](_page_16_Figure_16.jpeg)

#### N SCHEDULE WASTE VENT MIN. CW HW REMARKS ADA COMPLIANT, 18 GAUGE STAINLESS STEEL SINK, SINGLE BOWL, 3-HOLE ON 8" CENTERS; PROVIDE DRAIN LK500, CHROME PLATED P-TRAP 2" | 1-1/2" | 3/4" 3/4" & TAILPIECE, ANGLE STOPS AND BRAIDED STEEL SUPPLIES

![](_page_16_Figure_26.jpeg)

-----

CLEANOUT WITH ------

COVER FOR

SCHEDULE 40 PVC LONG ------SWEEP/BEND COMB., OR "Y" AND 1/8" BEND.

TO BUILDING GAS; REFER TO PLUMBING DRAWINGS FOR LOCATIONS & SIZING

\_\_\_\_\_

DUTY REQUIRED.

FINISHED FLOOR ------

SAME SIZE AS SANITARY UP TO 4" DIA.

![](_page_16_Picture_30.jpeg)

![](_page_16_Figure_31.jpeg)

![](_page_16_Picture_32.jpeg)

![](_page_16_Picture_33.jpeg)

![](_page_17_Figure_0.jpeg)

![](_page_17_Figure_5.jpeg)

![](_page_17_Figure_6.jpeg)

![](_page_17_Picture_7.jpeg)

![](_page_17_Picture_8.jpeg)

	<u>E OF WORK</u>							d. U-BOLT:
A. B	DOMESTIC	WATER PIPING.						1. C&P – F
B. C. D	SANITARY NATURAL (	AND VENT PIPING. GAS PIPING. I						2. F&M – F
E. F.	HANGERS A	and supports.						3. GRINNELL
G. H.	CUTTING A EQUIPMENT	ND ROUGH PATCHING.						e. RISER CLAMP: 1. C&P – F
и. J. K.	PERMITS	5						2. F&M – F
L. M. N	SUPERVISIO RIGGING							3. GRINNELL
0.	SITE RESTO	DRATION						f. DOUBLE-BOLT
2. <u>STANI</u>	NEW IERSE	<u>ODES</u>						2. F&M – F
А. В. С.	INTERNATIONAL	NAL BUILDING CODE 20 STANDARD PLUMBING C	D15, NEW JERSE CODE 2015	Y EDITION				3. GRINNELL
D. E. F	INTERNATIO	NAL FUEL GAS CODE 2 NICIPAL UTILITY AUTHOR TER COMPANY RULES A	2015 RITY ND RECULATION	\$				g. WELDING BEAM
G.	OTHER STA	TE AND LOCAL AUTHO	RITIES HAVING J	URISDICTION				1. C&P – F 2. F&M – F
<u>3. MATE</u>	RIALS:	EITTINOS						3. GRINNELL
<u>A.</u>	1. PIPE	FITTINGS						g. ROOFTOP ROLL
<u>SERVI</u>	<u>CE</u>	MATERIAL	SCHE	DULE	DESIGNATION			3" AND I W/ MEAD
SOIL, & VEI	WASTE NT ABOVE	NO-HUB CAST IRON	STAN	DARD WEIGHT	CISPI-30-7B			2. MIRO – ( FROM 3"
SOIL,	WASTE	CAST IRON HUB &	STAN	DARD WEIGHT	ASTM A-74			W/ MEAD 3. MIRO – 8
& VE GROU	NT BELOW ND	SPIGOT						GREATER LESS TH/
COLD WATEI	& HOT R ABOVE	COPPER	TYPE	"L"	ASTM B-88			W/ MEAL
GROU	ND						В.	PIPE INSERTS 1. INSERTS SHALL BE P
COLD BELO	WATER W GROUND	CEMENT LINED DUCTILE IRON	PRES	SURE CLASS 350	AWWA C151 AWWA C104/A21.4			REINFORCED RODS TI OVER THE REINFORCE
NATU ABOV	RAL GAS E GROUND	BLACK STEEL	40		ASTM A-53			FOR REMOVABLE NUT PERMITTING LATERAL
LOW I	PRESSURE	HDPE	DF 3/	08	ASTM D2513			INDIVIDUAL INSERTS AND CONDUIT, FIG. 2
BELO	W GROUND		1 234	-	ASTM D3350			152 ABOVE 8" AND 282 AND 152, THEY TO ALLOW REINFORCI
COMP AIR	RESSED	BLACK STEEL	40		ASTM A-53			THROUGH THE INSER 4" ON EITHER SIDE (
	2. FITTI	NGS					C.	BE SUSPENDED FROM
<u>SERVI</u>	<u>CE</u>	<u>SIZE</u>	MATERIAL	WEIGHT			5.	1. FOR ALL INSULATED SHIELDS AND FOLIA
SOIL, & VEI GROU	WASTE NT ABOVE ND	ALL	UAST IRON	STANDARD WEIGHT	NUTHUB ASIM A-48 MG COUPLING ASSEMBLY OR STAINLESS STEEL	5.	<u>SU</u> BMITT	ALS:
	WACTE	A1 1	1001 ID01		EQUAL TO CLAMP-ALL	<u>v</u> .	A. :	SHOP DRAWINGS SHALL BE RE
SOIL, & VEI GROU	WASTE NT BELOW ND	ALL	UAST IRON	STANDARD WEIGHT	ASIM C-565 65T COMPRESSION GASKET		1.	ALL EQUIPMENT, FIXTURES, FOR USE UNDER THIS CON
COLD	AND HOT	ALL	WROUGHT	STANDARD	SOLDERED 95/5 TIN		2.	CONTRACTOR SHALL BE RE
GROU	ND		CUPPER		& AN IIMON I			PRIOR TO SUBMISSION OF
COLD BELOV	WATER W GROUND	ALL	CEMENT LINED DUCTILE IRON	PRESSURE CLASS 350	MECHANICAL JOINT AWWA C111/A21.11	<u>6.</u>	PERMITS	& FEES:
NATU ABOV	RAL GAS E GROUND	LESS THAN 2–1/2" 3" & LARGER	BLACK STEEL BLACK STEEL	SCHED. 40 SCHED. 40	THREADED WELDED		A.	REFER TO CONSTRUCTION NOT
LOW I	PRESSURE	3" & LARGER	BLACK STEEL	SCHED. 40 PE3408	WELDED	<u>7.</u>	WARRAN	CONTRACTOR SHALL
BELOV LOW	W GROUND PRESSURE						1.	UNCONDITIONALLY WARRAN
	3. DISSI	MILAR METALS: PIPE,	FITTINGS, HANG	ERS, ETC. IF			2.	ALL EQUIPMENT SHALL CA
<u>B.</u>	3. DISSI DISSI CONT OF D <u>VALVES</u> 1. BALL	MILAR METALS: PIPE, MILAR METALS SHALL E ACT WITH EACH OTHER IELECTRIC MATERIAL. VALVES SHALL BE AP	FITTINGS, HANG BE INSULATED A R, BY USING A H OLLO, 77-200 S	ERS, ETC. IF GAINST DIRECT IIGH QUALITY OR GRA	ADE SOLDER END		2.	ALL EQUIPMENT SHALL CAI WARRANTY AS SPECIFIED I DOCUMENTATION PROVIDED PERIOD SHALL BE CALCUL/ ACCEPTANCE BY THE OWN a. ANY DEFECTS SHALL THE DISCRETION OF
<u>B.</u>	3. DISSI DISSI CONT OF D <u>VALVES</u> 1. BALL WITH 2. LUBR	MILAR METALS: PIPE, MILAR METALS SHALL E ACT WITH EACH OTHER IELECTRIC MATERIAL. VALVES SHALL BE AP TFE TEFLON SEATS AN	FITTINGS, HANG BE INSULATED A R, BY USING A H OLLO, 77–200 S ND SEALS WITH	ERS, ETC. IF GAINST DIRECT HGH QUALITY OR GRA SERIES, FULL PORT, S STEEL LEVER HANDLE STROM FIGURE 142:	ADE SOLDER END S WITH STOPS.	<u>8.</u>	2. EXECUTIO	ALL EQUIPMENT SHALL CAI WARRANTY AS SPECIFIED I DOCUMENTATION PROVIDED PERIOD SHALL BE CALCUL/ ACCEPTANCE BY THE OWNI a. ANY DEFECTS SHALL THE DISCRETION OF
<u>B.</u>	3. DISSI DISSI CONT OF D <u>VALVES</u> 1. BALL WITH 2. LUBR COVE	MILAR METALS: PIPE, MILAR METALS SHALL E ACT WITH EACH OTHER IELECTRIC MATERIAL. VALVES SHALL BE AP TFE TEFLON SEATS AN ICATED PLUG VALVES S R TYPE VALVE, WITH B	FITTINGS, HANG BE INSULATED A R, BY USING A H OLLO, 77–200 S ND SEALS WITH SHALL BE NORD BUNA-N SEALS,	ERS, ETC. IF GAINST DIRECT HIGH QUALITY OR GRA SERIES, FULL PORT, S STEEL LEVER HANDLE STROM FIGURE 142; <sup>-</sup> OPERATING LEVER, A	ADE SOLDER END IS WITH STOPS. TWO BOLT ND STOPS.	<u>8.</u>	2. <u>EXECUTIC</u> A.	ALL EQUIPMENT SHALL CAI WARRANTY AS SPECIFIED I DOCUMENTATION PROVIDED PERIOD SHALL BE CALCUL ACCEPTANCE BY THE OWN a. ANY DEFECTS SHALL THE DISCRETION OF <u>ON:</u> CONCEALED PIPING
<u>B.</u>	<ol> <li>DISSI DISSI CONT OF D</li> <li>VALVES</li> <li>1. BALL WITH</li> <li>2. LUBR COVE</li> <li>3. COMF ENDS</li> </ol>	MILAR METALS: PIPE, MILAR METALS SHALL E ACT WITH EACH OTHER IELECTRIC MATERIAL. VALVES SHALL BE AP TFE TEFLON SEATS AN CATED PLUG VALVES S R TYPE VALVE, WITH B PRESSED AIR VALVES S APPROVED FOR USE I	FITTINGS, HANG BE INSULATED A R, BY USING A H OLLO, 77-200 S ND SEALS WITH SHALL BE NORD BUNA-N SEALS, HALL BE FULL F IN LABORATORY	ERS, ETC. IF GAINST DIRECT IIGH QUALITY OR GRA SERIES, FULL PORT, S STEEL LEVER HANDLE STROM FIGURE 142; OPERATING LEVER, A PORT BALL VALVES W AND MEDICAL GAS P	ADE SOLDER END IS WITH STOPS. TWO BOLT ND STOPS. WITH THREADED IPING SYSTEMS.	<u>8.</u>	2. <u>EXECUTIC</u> A. 1.	ALL EQUIPMENT SHALL CAI WARRANTY AS SPECIFIED I DOCUMENTATION PROVIDED PERIOD SHALL BE CALCUL/ ACCEPTANCE BY THE OWNI a. ANY DEFECTS SHALL THE DISCRETION OF <u>N:</u> CONCEALED PIPING ALL PIPING INSTALLED IN F CONCEALED WITHIN HUNG O SPACES, ETC.
<u>B.</u> <u>C.</u>	<ol> <li>DISSI DISSI CONT OF D</li> <li>VALVES</li> <li>1. BALL WITH</li> <li>2. LUBR COVE</li> <li>3. COMP ENDS</li> <li>INSULATIO</li> </ol>	MILAR METALS: PIPE, MILAR METALS SHALL E ACT WITH EACH OTHER IELECTRIC MATERIAL. VALVES SHALL BE AP TFE TEFLON SEATS AN ICATED PLUG VALVES S R TYPE VALVE, WITH B PRESSED AIR VALVES S APPROVED FOR USE I	FITTINGS, HANG BE INSULATED A R, BY USING A H OLLO, 77-200 S ND SEALS WITH SHALL BE NORD BUNA-N SEALS, HALL BE FULL F IN LABORATORY	ERS, ETC. IF GAINST DIRECT HIGH QUALITY OR GRA SERIES, FULL PORT, S STEEL LEVER HANDLE STROM FIGURE 142; <sup>-1</sup> OPERATING LEVER, A PORT BALL VALVES W AND MEDICAL GAS P	ADE SOLDER END S WITH STOPS. TWO BOLT ND STOPS. //TH THREADED IPING SYSTEMS.	<u>8.</u>	2. <u>EXECUTIO</u> A. 1. 2.	ALL EQUIPMENT SHALL CAI WARRANTY AS SPECIFIED I DOCUMENTATION PROVIDED PERIOD SHALL BE CALCULA ACCEPTANCE BY THE OWNI a. ANY DEFECTS SHALL THE DISCRETION OF N: CONCEALED PIPING ALL PIPING INSTALLED IN F CONCEALED WITHIN HUNG O SPACES, ETC.
<u>В.</u> С.	<ul> <li>J. DISSI DISSI CONTOF D</li> <li>VALVES</li> <li>1. BALL WITH</li> <li>2. LUBR COVE</li> <li>3. COMFENDS</li> <li>INSULATIO</li> <li>1. INSUL</li> </ul>	MILAR METALS: PIPE, MILAR METALS SHALL E TACT WITH EACH OTHER IELECTRIC MATERIAL. VALVES SHALL BE AP TFE TEFLON SEATS AN ICATED PLUG VALVES S R TYPE VALVE, WITH B PRESSED AIR VALVES S APPROVED FOR USE I N LATE ALL DOMESTIC WA	FITTINGS, HANG BE INSULATED A R, BY USING A F OLLO, 77-200 S ND SEALS WITH SHALL BE NORD SUNA-N SEALS, HALL BE FULL F IN LABORATORY	ERS, ETC. IF GAINST DIRECT HIGH QUALITY OR GRA SERIES, FULL PORT, S STEEL LEVER HANDLE STROM FIGURE 142; <sup>-</sup> OPERATING LEVER, A PORT BALL VALVES W AND MEDICAL GAS P TINGS AND VALVES.	ADE SOLDER END IS WITH STOPS. TWO BOLT ND STOPS. WITH THREADED IPING SYSTEMS.	<u>8.</u>	2. <u>EXECUTIO</u> A. 1. 2.	ALL EQUIPMENT SHALL CAI WARRANTY AS SPECIFIED II DOCUMENTATION PROVIDED PERIOD SHALL BE CALCUL/ ACCEPTANCE BY THE OWNI a. ANY DEFECTS SHALL THE DISCRETION OF NI: CONCEALED PIPING ALL PIPING INSTALLED IN F CONCEALED WITHIN HUNG O SPACES, ETC. WHERE COMPLETE CONCEAL OBSTRUCTIONS SUCH AS E DO NOT INSTALL ANY WOR ARCHITECT, AND HIS INSTR
<u>В.</u> С.	<ul> <li>J. DISSI DISSI CONTOF D</li> <li>VALVES</li> <li>1. BALL WITH</li> <li>2. LUBR COVE</li> <li>3. COMFENDS</li> <li>INSULATION</li> <li>1. INSULATION</li> <li>2. PIPE</li> <li>A.</li> </ul>	MILAR METALS: PIPE, MILAR METALS SHALL E ACT WITH EACH OTHER IELECTRIC MATERIAL. VALVES SHALL BE AP TFE TEFLON SEATS AN ICATED PLUG VALVES S R TYPE VALVE, WITH B PRESSED AIR VALVES S APPROVED FOR USE I N LATE ALL DOMESTIC WA INSULATION 0.4 LB DENSITY FIBRO	FITTINGS, HANG BE INSULATED A R, BY USING A F OLLO, 77-200 S ND SEALS WITH SHALL BE NORD SUNA-N SEALS, HALL BE FULL F IN LABORATORY	ERS, ETC. IF GAINST DIRECT HIGH QUALITY OR GRA SERIES, FULL PORT, S STEEL LEVER HANDLE STROM FIGURE 142; <sup>-</sup> OPERATING LEVER, A PORT BALL VALVES W AND MEDICAL GAS P TINGS AND VALVES.	ADE SOLDER END IS WITH STOPS. TWO BOLT ND STOPS. WITH THREADED IPING SYSTEMS.	<u>8.</u>	2. EXECUTIO A. 1. 2.	ALL EQUIPMENT SHALL CAI WARRANTY AS SPECIFIED I DOCUMENTATION PROVIDED PERIOD SHALL BE CALCULA ACCEPTANCE BY THE OWNI a. ANY DEFECTS SHALL THE DISCRETION OF M: CONCEALED PIPING ALL PIPING INSTALLED IN F CONCEALED WITHIN HUNG O SPACES, ETC. WHERE COMPLETE CONCEAL OBSTRUCTIONS SUCH AS E DO NOT INSTALL ANY WOR ARCHITECT, AND HIS INSTR DRAWINGS) SHALL BE FOLL
<u>В.</u> С.	<ol> <li>JISSI DISSI CONT OF D</li> <li>VALVES</li> <li>BALL WITH</li> <li>LUBR COVE</li> <li>LUBR COVE</li> <li>SULATIO</li> <li>INSULATIO</li> <li>INSUL</li> <li>PIPE A.</li> </ol>	MILAR METALS: PIPE, MILAR METALS SHALL E ACT WITH EACH OTHER IELECTRIC MATERIAL. VALVES SHALL BE AP TFE TEFLON SEATS AN ICATED PLUG VALVES S R TYPE VALVE, WITH B PRESSED AIR VALVES S APPROVED FOR USE I N LATE ALL DOMESTIC WA INSULATION 0.4 LB DENSITY FIBRO SECTIONAL PIPE COVE 75'F MEAN TEMPERATION	FITTINGS, HANG BE INSULATED A R, BY USING A H OLLO, 77–200 S ND SEALS WITH SHALL BE NORD BUNA-N SEALS, HALL BE FULL F IN LABORATORY ATER PIPING, FIT OUS GLASS, ONE RING, MAXIMUM URE. OWENS-C	ERS, ETC. IF GAINST DIRECT HIGH QUALITY OR GRA SERIES, FULL PORT, S STEEL LEVER HANDLE STROM FIGURE 142; OPERATING LEVER, A PORT BALL VALVES W AND MEDICAL GAS P TINGS AND VALVES. PIECE MOLDED K FACTOR 0.26 AT ORNING CORP. OR	ADE SOLDER END S WITH STOPS. TWO BOLT ND STOPS. ATH THREADED IPING SYSTEMS.	<u>8.</u>	2. EXECUTIC A. 1. 2. 3.	ALL EQUIPMENT SHALL CAI WARRANTY AS SPECIFIED II DOCUMENTATION PROVIDED PERIOD SHALL BE CALCUL/ ACCEPTANCE BY THE OWNI a. ANY DEFECTS SHALL THE DISCRETION OF MI: CONCEALED PIPING ALL PIPING INSTALLED IN F CONCEALED WITHIN HUNG O SPACES, ETC. WHERE COMPLETE CONCEAL OBSTRUCTIONS SUCH AS E DO NOT INSTALL ANY WOR ARCHITECT, AND HIS INSTR DRAWINGS) SHALL BE FOLL ALL PIPING, ETC. SHALL BI BY ALL AUTHORITIES HAVIN CONCEALMENT BEGINS.
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B. C.	<ul> <li>JISSI DISSI CONTOF D</li> <li>VALVES</li> <li>1. BALL WITH</li> <li>2. LUBR COVE</li> <li>3. COMPENDS</li> <li>INSULATIO</li> <li>1. INSUL</li> <li>2. PIPE</li> <li>A.</li> <li>B.</li> <li>C.</li> <li>D.</li> </ul>	MILAR METALS: PIPE, MILAR METALS SHALL E ACT WITH EACH OTHER IELECTRIC MATERIAL. VALVES SHALL BE AP TFE TEFLON SEATS AN ICATED PLUG VALVES S R TYPE VALVE, WITH B PRESSED AIR VALVES S APPROVED FOR USE I N LATE ALL DOMESTIC WA INSULATION 0.4 LB DENSITY FIBRO SECTIONAL PIPE COVE 75°F MEAN TEMPERATI APPROVED EQUAL. REPLACE NORMAL INS WITH INCOMPRESSIBLE OR USE LONGER SHIEI JACKETS: FIRE RETA TYPE. LAMINATE OF GLASS REINFORCING A ADHESIVES AND COAT AS FOLLOWS: 1. ADHESIVES: LA BE USED. 2. FITTING, VALVE WATER, 30–35;	FITTINGS, HANGI BE INSULATED A R, BY USING A F OLLO, 77–200 S ND SEALS WITH SHALL BE NORD BUNA–N SEALS, HALL BE FULL F IN LABORATORY ATER PIPING, FIT DUS GLASS, ONE RING, MAXIMUM URE. OWENS–C ULATION INSIDE INSULATING BLG LDS AT HANGER RDANT ALL SER VINYL COATED V IND ALUMINUM F INGS: FOSTER C INSS, 85–75; SEI AND EQUIPMENT HOT WATER, 30	ERS, ETC. IF GAINST DIRECT HIGH QUALITY OR GRA SERIES, FULL PORT, S STEEL LEVER HANDLE STROM FIGURE 142; <sup>-</sup> OPERATING LEVER, A PORT BALL VALVES W AND MEDICAL GAS P TINGS AND VALVES. PIECE MOLDED K FACTOR 0.26 AT ORNING CORP. OR HANGER SHIELDS DCK INSIDE JACKET,  VICE OR PURPOSE WHITE KRAFT FACING, FOIL. IR APPROVED EQUAL F SEALING LAPS MA COATINGS: COLD D36.	ADE SOLDER END IS WITH STOPS. TWO BOLT ND STOPS. ATH THREADED IPING SYSTEMS.	<u>8</u> . 9.	2. EXECUTION A. 1. 2. 3. EXCAVAT A.	ALL EQUIPMENT SHALL CA WARRANTY AS SPECIFIED I DOCUMENTATION PROVIDED PERIOD SHALL BE CALCUL ACCEPTANCE BY THE OWN a. ANY DEFECTS SHALL THE DISCRETION OF M: CONCEALED PIPING ALL PIPING INSTALLED IN I CONCEALED WITHIN HUNG SPACES, ETC. WHERE COMPLETE CONCEA OBSTRUCTIONS SUCH AS E DO NOT INSTALL ANY WOR ARCHITECT, AND HIS INSTF DRAWINGS) SHALL BE FOLI ALL PIPING, ETC. SHALL B BY ALL AUTHORITIES HAVII CONCEALMENT BEGINS. ION, BACKFILLING & COVER EACH CONTRACTOR SHALL PRI AND APPLIANCES REQUIRED TO AND PUMPING REQUIRED TO AND PUMPING REQUIRED FOR HEREINAFTER. UNCLASSIFIED EXCAVATION SH MATERIALS ENCOUNTERED IN T ROCK, SHALE, RUBBLE, MASON AND ALL MATERIALS WITHOUT TRENCHING AND BACKFILLING I COMPLETE THE UTILITY AND A EXCAVATION SHALL BE MADE NO TUNNELING WILL BE ALLOW THE OWNER. PROVIDE ALL NEO CARE SHALL BE TAKEN TO AN
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2. GRINNELL – STD. 45

#### C. TEST E 283 1. DRAINAGE AND VENT PIPING: TEST WITH WATER AT 10 FT. HD. E 176 2. DOMESTIC WATER: TEST WITH WATER AT 125 PSI. 3. NATURAL GAS (UP TO AND INCLUDING 1/2 PSIG [14" W.C.]) FIGURE 137 a. COMPLETED PIPING IS TO BE TESTED WITH AIR OR INERT GAS AT 3 PSIG FOR A MINIMUM OF 1 HOUR. E 89 OR 126 b. FOR EXCEPTIONALLY LONG PIPING RUNS, LONGER TEST PERIODS MAY BE REQUIRED. E 241 4. NATURAL GAS (FROM 1/2 PSIG [14" W.C.] TO 3 PSIG) FIGURE 261 a. COMPLETED PIPING IS TO BE TESTED WITH AIR OR INERT CLAMP: GAS AT 50 PSIG FOR A MINIMUM OF 1 HOUR. 5. COMPRESSED AIR 304 a. ENGAGE QUALIFIED TESTING AGENCY TO PERFORM TESTS E 261 AND INSPECTIONS OF COMPRESSED AIR SYSTEM, AND TO PREPARE TEST AND INSPECTION REPORTS. FIGURE 295 b. PROCEDURE ACHMENT: 1. PIPING LEAK TESTS FOR COMPRESSED AIR PIPING E 113B a) CAP AND FILL COMPRESSED AIR PIPING SYSTEM WITH OIL FREE DRY NITROGEN TO A PRESSURE OF 50 PSIG E 751 ABOVE SYSTEM OPERATING PRESSURE, ISOLATE TEST SOURCE, ALLOW TO STAND FOR FOUR (4) HOURS TO FIGURE 66 EQUALIZE TEMPERATURE, REFILL SYSTEM TO TEST PRESSURE SUPPORTS AS REQUIRED, AND HOLD FOR TWO (2) HOURS WITH NO LOSS OF PRESSURE. AH-7 b) REPAIR ALL IDENTIFIED LEAKS AND RETEST UNTIL NO LEAKS EXIST. BOARDS SUPPORT PAD c) INSPECT OWNER-PROVIDED PRESSURE REGULATING \H-7 VALVES, VAPOR TRAPS AND FILTERS FOR PROPER LOSS OF PRESSURE. BOARDS SUPPORT PAD 2. ALL COMPONENTS THAT DO NOT PASS TESTS AND INSPECTIONS AH-18 SHALL BE REPLACED. AN 6" BOARDS SUPPORT PAD 11. DISINFECTION OF DOMESTIC WATER PIPING A. SHALL CONFORM WITH NATIONAL PLUMBING CODE 2015 12. PIPE INSTALLATION ET CONCRETE INSERTS WITH STEEL UGH THE INSERT AND BOTH ENDS HOOKED A. MODIFY PIPING INSTALLATION TO SUIT BUILDING CONDITIONS ESH. INSERTS SHALL BE OF INDIVIDUAL AND TO AVOID INTERFERENCES WITH OTHER TRADES, MAINTAINING CONSTRUCTION WITH ACCOMMODATION ACCESS TO ALL PARTS OF THE PIPING SYSTEMS AND DUCTWORK ND THREADED RODS UP TO 3/4" DIAMETER, USTMENT, EXCEPT AS OTHERWISE NOTED. AND TO MAINTAIN PROPER PITCH. BE GRINNELL FIG. 282 UP TO 5" PIPE B. RUN PIPING GENERALLY PARALLEL TO THE AXIS OF THE BUILDING, " AND UP TO 8" PIPE AND CONDUIT, F ARRANGED TO CONFORM TO THE BUILDING REQUIREMENTS AND O 12" PIPE AND CONDUIT. FOR FIGURES

- LL COME WITH AN OPENING AT THE TIP RODS UP TO 1/2" DIAMETER TO BE PASSED DY. RODS SHALL EXTEND A MINIMUM OF HE INSERT. PIPES LARGER THAN 12" SHALL EEL MEMBERS ONLY.
- FURNISH CLEVIS HANGERS WITH WELDED C&P, INC., FIG. 100 SH.
- RED FOR: MS, MATERIALS, MEANS & METHODS INTENDED
- NSIBLE TO ENSURE THAT ANY SUBSTITUTIONS E SAME PERFORMANCE AS THE SPECIFIED ITEMS,
- ON SHEET CA.

DRAWINGS.

- IS WORK TO BE FREE OF DEFECTS IN FOR A PERIOD TWO (2) YEARS FROM
- MPLETION. REPAIRED OR REPLACED AS AT NO ADDITIONAL COST.
- THE ORIGINAL MANUFACTURER'S E MANUFACTURER'S WARRANTY THE EQUIPMENT. WARRANTY
- FROM THE DATE OF FINAL REPAIRED OR REPLACED AT
- MANUFACTURER.
- HED AREAS SHALL BE COMPLETELY NGS, FURRING, SOFFITS, PIPE
- IT IS IMPOSSIBLE BECAUSE OF DUCTS, LIGHTS, PIPING, ETC FORE FIRST CONSULTING WITH THE ONS (WRITTEN OR ON REVISED
- MPLETELY TESTED AND APPROVED URISDICTION BEFORE ANY
- ALL LABOR, MATERIALS, EQUIPMENT MPLETE THE EXCAVATING, BACKFILL WORK, TO THE EXTENT SPECIFIED
- INCLUDE THE EXCAVATION OF ALL WORK, SUCH AS EARTH, BOULDERS OR TIMBER FOUNDATIONS, STUMPS
- SSIFICATION. DO ALL EXCAVATION, SSARY TO CONSTRUCT AND S APPURTENANCES. ALL PEN CUT FROM THE SURFACE XCEPT BY WRITTEN CONSENT OF
- ARY SHORING AND BRACING. UNDERMINING OF ALL EXISTING NS. THE CONTRACTOR SHALL TAKE DITIONAL WORK RESULTING FROM
- TS, CABLES, ETC., SHOWN ARE ISTALLATION OF WORK: HOWEVER, OSELY AS POSSIBLE, GROUND CATIONS OF ALL UNDERGROUND
- JOB. IPE OR CONDUIT OR INSTALI TRENCHES FREE FROM WATER G AS REQUIRED TO KEEP NO ADDITIONAL COST TO THE
- T FILL MATERIAL APPROVED BY THE THE WATER SERVICE PIPE AND OF PIPE.
- BE FILLED WITH MATERIAL EXCAVATED ROVED BY THE ARCHITECT/ENGINEER.
- TAMPED IN 1'-0" INCREMENTS AND
- A MINIMUM COVER OF 4'-0" FOR OJECT MANUAL FOR ADDITIONAL
- TS, GAUGES, PUMPS, AND ALL PERFORM TESTS.
- PRESENCE OF THE REPRESENTATIVES ND THE PLUMBING INSPECTOR.

- TO SUIT THE NECESSITIES OF CLEARANCE OF DUCTS, FLUES, CONDUITS AND WORK OF OTHER TRADES AND CLOSE TO CEILING OR OTHER CONSTRUCTION AS PRACTICAL, FREE OF TRAPS OR BENDS.
- PROVIDE ADDITIONAL OFFSETS, FITTINGS, VALVES, DRAINS, ETC. WHERE REQUIRED BY CONSTRUCTION AND WORK OF OTHER TRADES.
- D. RUN IN CHASES, RECESSES, SHAFTS, HUNG CEILINGS AND BEAM CUTS WHERE APPLICABLE. DO NOT COVER BEFORE EXAMINATION AND TESTING. NO PIPING IN FLOOR FILL UNLESS NOTED OR APPROVED.
- RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS AND OTHER PIPING, NEATLY SPACED AND WITH PLUMB RISERS. MAINTAIN MAXIMUM HEADROOM.
- PROVIDE REDUCING FITTINGS FOR CHANGES IN PIPE SIZE. NO BUSHINGS ARE PERMITTED.
- G. RUN WATER PIPING FREE OF TRAPS. GRADE AND VALVE FOR COMPLETE CONTROL AND DRAINAGE OF SYSTEM.
- H. VALVES SHALL NOT BE INSTALLED WITH THE OPERATING HANDLE POINTING DOWNWARD.
- MANUFACTURER'S NAMEPLATE, NAME OR TRADEMARK, SHALL BE PERMANENTLY AFFIXED TO ALL EQUIPMENT AND MATERIAL FURNISHED UNDER THIS SPECIFICATION. WHERE SUCH EQUIPMENT IS IN A FINISHED OCCUPIED SPACE, THE NAMEPLATE SHALL BE IN A CONCEALED BUT ACCESSIBLE LOCATION. THE NAMEPLATE OF A SUBCONTRACTOR OR DISTRIBUTOR WILL NOT BE ACCEPTABLE.
- PROVIDE FOR EACH ITEM OF EQUIPMENT, INCLUDING HEATERS, TANKS, COMPRESSORS, ETC., A PERMANENTLY ATTACHED NAMEPLATE MADE OF A WHITE CORE WITH BLACK SURFACE. NAMEPLATES SHALL BE A MINIMUM OF 3" LONG BY 1-1/2" HIGH AND BEAR THE EQUIPMENT NAME AND MARK NUMBER AS DESIGNATED IN THE EQUIPMENT SCHEDULES IN 1/2" HIGH LETTERS. MOUNTING SCREWS SHALL HAVE CHROME PLATED ACORN HEADS.
- FURNISH AND ATTACH TO EACH VALVE AS HEREINAFTER SPECIFIED, A 1-1/2" DIAMETER BRASS TAG WITH 1/2" INDENTED NUMERALS FILLED WITH DURABLE BLACK COMPOUND. TAGS SHALL BE SECURELY ATTACHED TO STEMS OF VALVES WITH COPPER WIRE AND "S" HOOKS.
- 1. VALVE TAG SCHEDULE <u>SERVICE</u> TAG DESIGNATION COLD WATER CW HOT WATER HW \_ DEG. F NATURAL GAS COMPRESSED CA
  - SAFETY VALVE S.V.D. DISCHARGE
- VALVE CHARTS SHALL CONSIST OF SCHEMATIC DRAWINGS OF PIPING LAYOUTS, SHOWING AND IDENTIFYING EACH VALVE AND DESCRIBING THE FUNCTION. UPON COMPLETION OF THE WORK, ONE (1) COPY OF EACH CHART, SEALED TO RIGID BACKBOARD WITH CLEAR LACQUER PLACED UNDER GLASS AND FRAMED, SHALL BE HUNG IN A CONSPICUOUS LOCATION IN THE MAIN EQUIPMENT ROOM, UNLESS OTHERWISE DIRECTED BY THE ARCHITECT. TWO (2) ADDITIONAL UNMOUNTED COPIES IN 8-1/2" X 11" 3-RING BINDERS SHALL BE DELIVERED TO THE ARCHITECT. ALSO FURNISH THREE (3) COPIES OF SCHEMATIC FLOW CHART WITH CORRESPONDING VALVE NUMBERS NOTED ON CHART.
- M. PROVIDE TAGS FOR THE FOLLOWING VALVES:

AIR

- 1. ZONE CONTROL, BYPASS, SHUT OFF, CHECK AND BALANCING VALVES. 2. BUILDING AND AREA SHUT OFF AND BALANCING VALVES.
- 3. CONTROL, BY PASS, SHUT OFF, BALANCING AND DRAIN VALVES FOR MAJOR PIECES OF EQUIPMENT SUCH AS BOILERS, DOMESTIC HOT WATER HEATERS, HEAT EXCHANGERS, REFRIGERATION MACHINES, PUMPS, HEATING, VENTILATING AND AIR CONDITIONING UNITS, COOLING TOWERS, ETC.
- 4. SYSTEM DRAIN VALVES, SAFETY AND RELIEF VALVES.
- IDENTIFICATION SHALL BE IN ACCORDANCE WITH "SCHEME FOR N IDENTIFICATION OF PIPING SYSTEM ANSI A13.1" AND OSHA SAFETY COLOR REGULATION.
- MARKERS SHALL BE SNAP ON TYPE AS MANUFACTURED BY SETON NAMEPLATE CORP., NEW HAVEN, CONN. (SETMARK SYSTEM), BUNTING STAMP CO. INC., PITTSBURGH, P.A. OR APPROVED EQUAL. MARKERS SHALL COMPLETELY ENCIRCLE THE PIPE WITH A SUBSTANTIAL OVERLAP. NO ADHESIVE SHALL BE USED. THEY SHALL BE MANUFACTURED OF U.L. APPROVED, SELF EXTINGUISHING PLASTIC. WHEN THE PIPE INCLUDING INSULATION (IF ANY) IS LARGER THAN 6" DIAMETER AND LARGER, MARKERS SHALL BE STRAP ON TYPE.
- WHERE PIPE IS TO BE LEFT BARE IT SHALL BE PAINTED WITH TWO (2) COATS OF SELF-PRIMING, MARINE-GRADE SILOXANE EPOXY PAINT IN GLOSS COLORS AS REQUIRED BY ITEM Q, BELOW, AND STENCIL AND VALVE TAG SCHEDULE.
- 1. COLOR SPECIFICATIONS:

COLOR	NAME	FEDERAL STANDARD NUMBER
WHITE	INSIGNIA WHITE	17875
BLACK	OSHA SAFETY BLACK	17038
RED	OSHA SAFETY RED	11120
YELLOW	OSHA SAFETY YELLOW	13591
GREEN	OSHA SAFETY GREEN	14120
BLUE	OSHA SAFETY BLUE	15102
DRANGE	OSHA SAFETY ORANGE	12300
PURPLE	OSHA SAFETY PURPLE	17142
BROWN	NASA SAFETY BROWN	10080
GREY	MECHANIC GREY	16187

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![](_page_18_Figure_57.jpeg)

# PIPE BRACKET DETAIL

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— JAM NU1

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			EDC -4' SP DP -4' SP DP -	$\frac{2JAINIINL}{8"} = 1'-0"$

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![](_page_19_Picture_95.jpeg)

4" PA DP-

→ 6" INCOMING FIRE SERVICE; REFER TO PLUMBING DWGS. AND CIVIL DRAWINGS FOR CONTINUATION AND ADDITIONAL

AND ADDITIONAL INFORMATION

![](_page_19_Figure_98.jpeg)

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$\mathbb{X}$	-4"	ds		<b></b> a	
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└─6" SP UP

└─\_4" SP UP

![](_page_19_Picture_103.jpeg)

F,1	RE PROTECTI	ON SYMBOL LIST
ABBREVIATION	SYMBOL	DESCRIPTION
w	w	SITE WATER SUPPLY
SP		SPRINKLER PIPING MAIN
PA	PA	DOUBLE-INTERLOCK PREACTION SYSTEM PIPING
	<b></b>	PIPING DROP
	o	PIPING RISE
	Ų	BRANCH - TOP CONNECTION
	ţ	BRANCH - BOTTOM CONNECTION
RPDA	RPDA	REDUCED PRESSURE ZONE DETECTOR ASSEMBLY
FDC	<b>;</b>	WALL MOUNTED FIRE DEPARTMENT SIAMESE CONNECTION
0.S.&Y.		OUTSIDE STEM & YOKE VALVE WITH TAMPER SWITCH
cv	Ţ	CHECK VALVE
ACV		ALARM CHECK VALVE (WITH ALL RELATED APPURTENANCES)
DPV		DRY PIPE VALVE (WITH ALL RELATED APPURTENANCES)
		WET SYSTEM, LIGHT HAZARD
		WET SYSTEM, ORDINARY HAZARD I
		WET SYSTEM, ORDINARY HAZARD II

# FIRE PROTECTION ABBREVIATIONS

AC	AIR COMPRESSOR
AFF	ABOVE FINISHED FLOOR
ASTM	AMERICAN SOCIETY FOR TESTING & MATE
BLDG	BUILDING
DN.	DOWN
DWG.	DRAWING
(E)	EXISTING
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FH	FIRE HYDRANT
GPM	GALLONS PER MINUTE
NC	NORMALLY CLOSED (VALVE)
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
PA	PRE-ACTION
PSI	POUNDS PER SQUARE INCH
SP	SPRINKLER PIPING

TYP. TYPICAL W/ WITH

![](_page_20_Figure_4.jpeg)

![](_page_20_Figure_5.jpeg)

![](_page_20_Figure_6.jpeg)

NOT TO SCALE

![](_page_20_Figure_7.jpeg)

![](_page_20_Figure_8.jpeg)

![](_page_20_Figure_9.jpeg)

![](_page_20_Figure_10.jpeg)

![](_page_20_Figure_11.jpeg)

I	PIPE	HAN	GER	SCHEDULE				
PIPE	SHI	ELD	ROD	MAX.	PIPE SUPPO	RT SPAN		
DIA.	LENGTH	THICKNESS	DIA.	STEEL	COPPER	CAST IRON		
1/2"	12"	.048"	3/8"	8'-0"	6'-0"	_		
3/4"	12"	.048"	3/8"	8'-0"	6 <b>'</b> -0"	_		
1"	12"	.048"	3/8"	8'-0"	6' <b>-</b> 0"	_		
1-1/4"	12"	.048"	3/8"	8'-0"	6 <b>'</b> -0"	_		
1-1/2"	12"	.048"	1/2"	10'–0"	8'-0"	5'-0"		
2"	12"	.048"	1/2"	10'-0"	8'-0"	5'-0"		
2-1/2"	12"	.048"	1/2"	10'-0"	8'-0"	-		
3"	12"	.048"	1/2"	12'-0"	10'-0"	5'-0"		
4"	12"	.060"	5/8"	12'-0"	10'-0"	5'-0"		
5"	18"	.060"	5/8"	12'-0"	10'-0"	5'-0"		
6"	18"	.060"	3/4"	12'-0"	10'-0"	5'-0"		
8"	24"	.075"	3/4"	12'-0"	_	5'-0"		
10"	24"	.075"	3/4"	12'-0"	-	5'-0"		
12"	24"	.075"	1"	12'-0"	-	5'-0"		

CLEVIS HANGER DETAIL 9 FP-2 not to scale

![](_page_20_Picture_14.jpeg)

![](_page_20_Picture_15.jpeg)

2 OF 3

![](_page_20_Picture_17.jpeg)

#### FIRE PROTECTION SPECIFICATIONS "REVIEWED WITH COMMENT" MEANS, UNLESS OTHERWISE NOTED ON THE DRAWINGS, <u>1.</u> <u>SCOPE OF WORK</u> TO APPROVE FOR CONSTRUCTION, FABRICATION, AND/OR MANUFACTURE SUBJECT WET SPRINKLER PIPING. TO THE PROVISION THAT THE WORK SHALL BE CARRIED OUT IN COMPLIANCE WITH DRY SPRINKLER PIPING. ALL ANNOTATIONS AND/OR CORRECTIONS INDICATED ON THE SHOP DRAWINGS AND MANUAL/AUTOMATIC WET/DRY STANDPIPE PIPING. IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. HANGERS AND SUPPORTS. WHERE THE COMMENT "REVIEWED WITH COMMENT" INCLUDES DIRECTION FOR VALVES AND SWITCHES. THE CONTRACTOR TO RESUBMIT CORRECTED SHOP DRAWING FOR RECORD, CUTTING AND ROUGH PATCHING. HYDRANT FLOW TESTS. FAILURE TO COMPLY WITH THE INSTRUCTION TO RESUBMIT RECORD COPY SHALL RENDER THE APPROVAL NULL AND VOID. DETAILED LAYOUT DRAWINGS. REMOVALS. SUBMITTALS. PERMITS. 6. PERMITS & FEES: WARRANTY A. REFER TO CONSTRUCTION NOTES ON SHEET CA. SUPERVISION. RIGGING. EXCAVATION AND BACKFILL. <u>WARRANTY:</u> SITE RESTORATION. A. CONTRACTOR SHALL: 2. <u>STANDARDS AND CODES</u> UNCONDITIONALLY WARRANTY HIS WORK TO BE FREE OF DEFECTS IN 1. NEW JERSEY UNIFORM CONSTRUCTION CODE MATERIALS AND WORKMANSHIP FOR A PERIOD OF TWO (2) YEARS NEW JERSEY UNIFORM FIRE CODE FROM THE DATE OF SUBSTANTIAL COMPLETION. INTERNATIONAL BUILDING CODE 2015, NEW JERSEY EDITION a. ANY DEFECTS SHALL BE REPAIRED OR REPLACED AS DIRECTED NFPA-13, 2013 BY THE OWNER AT NO ADDITIONAL COST. NFPA-14, 2013 ALL EQUIPMENT SHALL CARRY THE ORIGINAL MANUFACTURER'S NFPA-20, 2013 WARRANTY AS SPECIFIED IN THE MANUFACTURER'S WARRANTY LOCAL MUNICIPAL UTILITY AUTHORITY DOCUMENTATION PROVIDED WITH THE EQUIPMENT. WARRANTY H. LOCAL WATER COMPANY RULES AND REGULATIONS PERIOD SHALL BE CALCULATED FROM THE DATE OF FINAL LOCAL FIRE DEPARTMENT REQUIREMENTS ACCEPTANCE BY THE OWNER. OTHER STATE AND LOCAL AUTHORITIES HAVING JURISDICTION a. ANY DEFECTS SHALL BE REPAIRED OR REPLACED AT THE L. OWNER'S INSURANCE UNDERWRITER'S REQUIREMENTS DISCRETION OF THE MANUFACTURER. <u>3. MATERIALS:</u> <u>A.</u> <u>GENERAL REQUIREMENTS</u> 8. EXECUTION: A. FIRE PROTECTION SYSTEM COMPONENTS SHALL BE UL LISTED OR FM APPROVED (AS APPLIES) FOR FIRE PROTECTION SERVICE. A. SYSTEM B. UNLESS OTHERWISE SPECIFIED, SPRINKLER SYSTEM EQUIPMENT SHALL BE BY CONTRACTOR SHALL PROVIDE SYSTEM THAT IS FULLY COMPLIANT WITH CENTRAL, GRINNELL, RELIABLE, VIKING OR APPROVED EQUAL. ALL APPLICABLE CODES AND STANDARDS PERTAINING TO THIS PROJECT WETHER OR NOT SPECIFICALLY CITED IN THE CONTRACT DOCUMENTS. B. PIPE AND FITTINGS B. EXPOSED PIPING PIPE 1. ALL PIPING INSTALLED IN FINISHED AREAS EXPOSED TO VIEW SHALL <u>SERVICE</u> <u>MATERIAL</u> BE PAINTED AS REQUIRED IN THIS SPECIFICATION. <u>SCHEDULE</u> **DESIGNATION** BLACK STEEL SCHEDULE 40 ASTM A 795 WET SPRINKLER 2. SPRINKLER HEADS SHALL NOT BE PAINTED. ANSI/ASTM A 53 C. CONCEALED PIPING GALVANIZED SCHEDULE 40 ASTM A 795 PRE-ACTION ANSI/ASTM A 53 1. ALL PIPING INSTALLED IN FINISHED AREAS CONCEALED FROM VIEW SHALL BE CONCEALED WITHIN HUNG CEILINGS, FURRING, SOFFITS, 2. FITTINGS PIPE SPACES, ETC. 2. WHERE SUCH CONCEALMENT IS REQUIRED, PIPING SHALL REMAIN <u>SERVICE</u> <u>SIZE</u> <u>MATERIAL</u> <u>WEIGHT</u> <u>TYPE</u> ACCESSIBLE ABOVE HUNG CEILINGS, VIA ACCESS DOORS, ETC. FORGED ASME B16.11 DO NOT INSTALL ANY WORK BEFORE FIRST CONSULTING WITH THE LESS THAN 2-1/2" BLACK STEEL SCHED. 40 WET SPRINKLER ARCHITECT. AND HIS INSTRUCTIONS (WRITTEN OR ON REVISED " & LARGER BLACK STEEL SCHED. 40 WELDED ASME B16.11 DRAWINGS) SHALL BE FOLLOWED. PRE-ACTION LESS THAN 2-1/2" GALVANIZED SCHED. 40 FORGED ASME B16.11 ALL PIPING, ETC. SHALL BE COMPLETELY TESTED AND APPROVED 3"& LARGER GALVANIZED SCHED. 40 WELDED ASME B16.11 BY ALL AUTHORITIES HAVING JURISDICTION BEFORE ANY CONCEALMENT BEGINS. 3. JOINTS A. SCREWED JOINTS SHALL BE MADE UP WITH ACCEPTABLE PIPE JOINT COMPOUND. 9. EXCAVATION, BACKFILLING & COVER GROOVED JOINT FLEXIBLE COUPLINGS SHALL BE VICTAULIC 75 WITH GRADE E GASKETS ALL EXTERIOR EXCAVATION AND BACKFILL IS PROVIDED FOR UNDER MAY BE USED WHERE APPROVED BY CODE AND CONTROLLING AUTHORITIES FOR FIRE SITE/CIVIL SPECIFICATIONS. PROTECTION SYSTEMS. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT 4. DISSIMILAR METALS: AND APPLIANCES REQUIRED TO COMPLETE INTERIOR EXCAVATING, BACKFILL AND PUMPING TO THE EXTENT REQUIRED FOR PROPER A. DISSIMILAR METALS SHALL BE INSULATED AGAINST DIRECT CONTACT WITH EACH OTHER INSTALLATION AND COMPLETION OF THE WORK. BY USING A HIGH QUALITY OR GRADE OF DIELECTRIC MATERIAL. UNCLASSIFIED EXCAVATION SHALL INCLUDE THE EXCAVATION OF ALI 5. PROHIBITED MATERIALS: MATERIALS ENCOUNTERED IN THE WORK, SUCH AS EARTH, BOULDERS ROCK. SHALE, RUBBLE, MASONRY OR TIMBER FOUNDATIONS, STUMPS A. SCHEDULE 10 "LIGHTWALL" PIPING IS NOT PERMITTED. AND ALL MATERIALS WITHOUT CLASSIFICATION. DO ALL EXCAVATION TRENCHING AND BACKFILLING NECESSARY TO CONSTRUCT AND COMPLETE THE UTILITY AND ALL ITS APPURTENANCES. ALL C. SPRINKLER HEADS: EXCAVATION SHALL BE MADE BY OPEN CUT FROM THE SURFACE. NO TUNNELING WILL BE ALLOWED EXCEPT BY WRITTEN CONSENT OF 1. ONLY NEW SPRINKLER HEADS SHALL BE EMPLOYED IN THE INSTALLATION OF SPRINKLER SYSTEMS THE OWNER. PROVIDE ALL NECESSARY SHORING AND BRACING. AS PER NFPA 13, 2013, SECTION 6.2.1. CARE SHALL BE TAKEN TO AVOID UNDERMINING OF ALL EXISTING UTILITIES, FOOTINGS OR FOUNDATIONS. THE CONTRACTOR SHALL TAKE 2. IN ALL FINISHED AREAS, NEW SPRINKLER HEADS SHALL BE CONCEALED TYPE STANDARD RESPONSE, FULL RESPONSIBILITY FOR ANY ADDITIONAL WORK RESULTING FROM WITH A 165°F TEMPERATURE RATING WITH 1/2" ORIFICE. HIS EXCAVATING AND TRENCHING. 3. IN AREAS WITHOUT CEILINGS, NEW SPRINKLER HEADS SHALL BE UPRIGHT STANDARD RESPONSE, LOCATIONS OF PIPE LINES, CONDUITS, CABLES, ETC., SHOWN ARE WITH A 165°F TEMPERATURE RATING WITH 1/2" ORIFICE. NOT TO BE USED AS FINAL FOR INSTALLATION OF WORK; HOWEVER, THEY ARE TO BE FOLLOWED AS CLOSELY AS POSSIBLE. GROUND 4. FURNISH SIX SPARES OF EACH STYLE AND TYPE OF HEAD; FURNISH SPRINKLER WRENCH AND CONDITIONS PERMITTING. EXACT LOCATIONS OF ALL UNDERGROUND STORAGE CABINET. UTILITIES SHALL BE DETERMINED ON JOB. UNDER NO CIRCUMSTANCES, LAY PIPE OR CONDUIT OR INSTALL <u>D. VALVES</u> APPURTENANCES IN WATER. KEEP TRENCHES FREE FROM WATER. PERFORM ALL NECESSARY PUMPING AS REQUIRED TO KEEP OS&Y VALVES SHALL BE WATTS, SERIES 408-OSYRW, RESILIENT WEDGE, FLANGED GATE VALVE TRENCHES FREE FROM WATER AT NO ADDITIONAL COST TO THE WITH POWDER COATED ASTM A 126 CLASS B CAST IRON BODY. OWNER 2. BALL VALVES SHALL BE WATTS, SERIES G4000, 2-PIECE, FULL PORT, CAST IRON, FLANGED. A BED OF SAND OR OTHER SELECT FILL MATERIAL APPROVED BY THE DIVSION SHALL BE PLACED AROUND THE WATER SERVICE PIPE AND EXTENDED 1'-O" ABOVE THE TOP OF PIPE. 4. HANGERS AND SUPPORTS REMAINDER OF EXCAVATION SHALL BE FILLED WITH MATERIAL EXCAVATED FROM DITCH IF SUITABLE AND APPROVED BY THE ARCHITECT/ENGINEER. A. HANGERS AND SUPPORTS SHALL CONFORM TO NATIONAL STANDARD PLUMBING CODE 2015, WITH SEISMIC RESTRAINTS H. BACKFILL SHALL BE PLACED AND TAMPED IN 1'-0" INCREMENTS AND AS REQUIRED FOR NEW CONSTRUCTION UNDER 2015 IBC. COMPACTED TO 95% DENSITY. B. PIPE INSERTS ALL FIRE PROTECTION SERVICES SHALL HAVE A MINIMUM COVER OF 4'-0" FOR PROTECTION AGAINST FREEZING. INSERTS SHALL BE PRESET CONCRETE INSERTS WITH STEEL REINFORCED RODS THROUGH THROUGH THE INSERT AND BOTH ENDS HOOKED OVER THE REINFORCED MESH. INSERTS REFER TO DIVISION 31 OF THE PROJECT MANUAL FOR ADDITIONAL SHALL BE OF INDIVIDUAL TYPE OF MALLEABLE IRON CONSTRUCTION WITH ACCOMMODATION INFORMATION. FOR REMOVABLE NUTS AND THREADED RODS UP TO 3/4" DIAMETER, PERMITTING LATERAL ADJUSTMENT, EXCEPT AS OTHERWISE NOTED. 10. ALTERATION WORK 2. INDIVIDUAL INSERTS SHALL BE GRINNELL FIG. 282 UP TO 5" PIPE AND CONDUIT, FIG. 282, A. ALL EQUIPMENT, PIPING, PLUMBING FIXTURES, ETC. TO BE REMOVED SHALL 6" AND UP TO 8" PIPE AND CONDUIT, FIG. 152 ABOVE 8" AND UP TO 12" PIPE AND CONDUIT. FOR FIGURES 282 AND 152, THEY SHALL COME WITH AN OPENING AT THE TIP BE DISPOSED OF, TURNED OVER TO OWNER OR SALVAGED AS DIRECTED. TO ALLOW REINFORCING RODS UP TO 1/2" DIAMETER TO BE PASSED THROUGH THE INSERT BODY. RODS SHALL EXTEND A MINIMUM OF 4" ON EITHER SIDE OF THE INSERT. PIPES B. ALL PIPING TO BE REMOVED SHALL BE PROPERLY PLUGGED OR CAPPED SO LARGER THAN 12" SHALL BE SUSPENDED FROM STEEL MEMBERS ONLY. THAT, UPON COMPLETION OF ALL NEW WORK, THERE SHALL BE NO ABANDONED PIPING IN THE SYSTEM. <u>5.</u> <u>SUBMITTALS:</u> C. NO DEAD BRANCHES SHALL BE LEFT ON ANY PIPING UPON COMPLETION OF THE JOB. A. SHOP DRAWINGS SHALL BE REQUIRED FOR: EXISTING EXPOSED PIPING NOT REMAINING IN SERVICE AND NOT 1. HYDRAULIC CALCULATIONS SPECIFICALLY NOTED OR SHOWN ON DRAWING TO BE ABANDONED SHALL BE COMPLETELY REMOVED. 2. SPRINKLER LAYOUT THE EXISTING SYSTEM SHALL BE LEFT IN PERFECT WORKING ORDER UNTIL 3. SPRINKLER PIPING COMPLETION OF ALL NEW WORK. IF REQUIRED, CONTRACTOR TO PROVIDE TEMPORARY FIRE PROTECTION DURING CONSTRUCTION, INCLUDING 4. SPRINKLER HEADS TEMPORARY FITTINGS, ETC., UNTIL SUCH TIME AS PERMANENT SYSTEM CAN BE ACTIVATED. 5. VALVES LOCATIONS AND SIZES OF EXISTING PIPING, VALVES, SPRINKLER HEADS, 6. EQUIPMENT ETC. ARE APPROXIMATE. EXACT SIZES AND LOCATIONS OF ALL EXISTING ITEMS SHALL BE VERIFIED IN THE FIELD. 7. ACCESSORIES G. NO REMOVED EXISTING PIPING, ETC. SHALL BE REUSED. MEANS & METHODS INTENDED FOR USE UNDER THIS CONTRACT. THIS CONTRACT. H. NO REMOVED SPRINKLER HEADS SHALL BE REUSED. PRIOR TO DELIVERY TO JOB SITE, BUT SUFFICIENTLY IN ADVANCE OF REQUIREMENTS DO NOT INTERRUPT ANY OF THE SERVICES OF THE EXISTING NECESSARY TO ALLOW ARCHITECT AMPLE TIME FOR REVIEW, SUBMIT SHOP DRAWINGS BUILDING, NOR INTERFERE WITH THE SERVICES IN ANY WAY OF ALL EQUIPMENT, FIXTURES, MATERIALS, PIPING, SLEEVES, WIRING DIAGRAMS, ETC. WITHOUT EXPRESS PERMISSION OF THE OWNER. SUCH AND FURTHER OBTAIN WRITTEN COMMENTS OF "REVIEWED" OR "REVIEWED WITH INTERRUPTIONS AND INTERFERENCES SHALL BE MADE AS BRIEF COMMENT" FOR SAME FROM ARCHITECT BEFORE INSTALLING ANY OF THESE ITEMS. AS POSSIBLE AND ONLY AT THE DESIGNATED TIMES. SHOP DRAWINGS SHALL CONSIST OF MANUFACTURER'S CERTIFIED SCALE DRAWINGS, UNDER NO CIRCUMSTANCES SHALL WORKMEN BE PERMITTED TO USE CUTS, OR CATALOGS, INCLUDING DISCRIPTIVE LITERATURE AND COMPLETE ANY PART OF THE BUILDING AS A SHOP, EXCEPT PARTS DESIGNATED CERTIFIED CHARACTERISTICS OF EQUIPMENT, FIXTURES, ETC. SHOWING DIMENSIONS, FOR SUCH PURPOSES. CAPACITY, CODE REQUIREMENTS, MOTOR AND DRIVE TESTING, AS INDICATED IN THE CONTRACT DOCUMENTS. REROUTE OR REMOVE ALL EXISTING PIPING EXPOSED TO VIEW WHERE NECESSARY TO AVOID NEW EQUIPMENT, STRUCTURAL OR SAMPLES, DRAWINGS, SPECIFICATIONS, CATALOGS, ETC., SUBMITTED FOR REVIEW MASONRY WORK AS REQUIRED BY THE PROPOSED ALTERATIONS. SHALL BE PROPERLY LABELED INDICATING PROJECT NAME, AND SPECIFIC SERVICE FOR WHICH MATERIAL OR EQUIPMENT IS TO BE USED. FIRE PROTECTION SYSTEMS SHALL PROVIDE COMPLETE COVERAGE FAILURE TO SUBMIT SHOP DRAWINGS IN AMPLE TIME FOR CHECKING SHALL NOT AS REQUIRED BY NEPA IS AND UWNER'S INSURANCE AGENCY ENTITLE AN EXTENSION OF CONTRACT TIME, AND NO CLAIM FOR EXTENSION OR M. PROVIDE COMPLETE LAYOUT DRAWING PER NFPA 13. ADDITIONAL COMPENSATION BY REASON OF SUCH DEFAULT SHALL BE ALLOWED. SUBMIT SYSTEM LAYOUT DRAWINGS FOR REVIEW, SHOWING LOCATION AND FUNCTION <u>11. TESTING</u> OF EACH PIECE OF EQUIPMENT, EACH SPRINKLER HEAD AND EACH ALARM, PRIOR TO SUBMITTAL OF DRAWINGS, OBTAIN APPROVAL OF SYSTEM LAYOUT DRAWINGS FROM A. EACH SYSTEM SHALL BE FUNCTIONALLY TESTED AS REQUIRED BY LOCAL OWNER'S INSURANCE AGENCY AND LOCAL FIRE MARSHAL LAYOUT DRAWINGS AND FIRE DEPARTMENT AND OWNER'S INSURANCE COMPANY. TESTS SHALL HYDRAULIC CALCULATIONS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL INCI UDF ENGINEER CURRENTLY LICENSED IN THE STATE OF NEW JERSEY. 1. TESTING OF VALVES, EQUIPMENT AND ACCESSORIES FOR PROPER 1. FINISHED CEILINGS ARE INTENDED TO PRESENT UNIFORM COORDINATED OPERATION. APPEARANCES WITH REGARD TO LOCATION AND SPACING OF LIGHT FIXTURES. AIR SYSTEM DIFFUSERS AND GRILLES AND SPRINKLER HEADS. 2. SETTING AND ADJUSTING OF PRESSURE SWITCHES AND CONTROLS. CAREFULLY REVIEW REFLECTED CEILING PLANS BEFORE PREPARING SPRINKLER 3. PERFORM NEW FIRE HYDRANT FLOW TEST SYSTEM LAYOUT DRAWINGS. NEW SPRINKLERS SHALL BE LOCATED IN THE 4. SUBMIT WRITTEN CERTIFICATION OF ACCEPTANCE OF ALL TESTS CENTER OF NEW CEILING TILES. IN ACCORDANCE WITH NFPA-13. WHERE NECESSARY TO ACCOMPLISH DESIRED APPEARANCE, ADDITIONAL FURNISH ALL TESTING INSTRUMENTS, GAUGES, PUMPS, AND ALL SPRINKLER HEADS (BEYOND MINIMUM NUMBER) MAY BE REQUIRED. OTHER EQUIPMENT NECESSARY TO PERFORM TESTS. PRIOR TO SUBMISSION OF SHOP DRAWINGS CONTRACTOR SHALL THOROUGHLY CHECK EACH SHOP DRAWING. REJECT THOSE NOT CONFORMING TO THE SPECIFICATIONS.

AND INDICATE BY SIGNED, WRITTEN DECLARATION THAT THE SHOP DRAWINGS SUBMITTED MEET CONTRACT REQUIREMENTS. H. THE COMMENT "REVIEWED" OR "REVIEWED WITH COMMENT" RENDERED ON SHOP DRAWINGS SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR

BUILDING CONDITIONS, WHERE DRAWINGS ARE REVIEWED, SAID REVIEW DOES NOT IN ANY WAY RELIEVE THE RESPONSIBILITY. OR NECESSITY. OF FURNISHING MATERIAL OR PERFORMING WORK AS REQUIRED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS.

ALL TESTS SHALL BE MADE IN THE PRESENCE OF THE REPRESENTATIVES OF THE ARCHITECT, THE OWNER AND THE PLUMBING INSPECTOR. GIVE NOT LESS THAN 5 DAYS NOTICE.

12. PIPE INSTALLATION

- A. MODIFY PIPING INSTALLATION TO SUIT BUILDING CONDITIONS AND TO AVOID INTERFERENCES WITH OTHER TRADES, MAINTAINING ACCESS TO ALL PARTS OF THE PIPING SYSTEMS AND DUCTWORK AND TO MAINTAIN PROPER PITCH.
- RUN PIPING GENERALLY PARALLEL TO THE AXIS OF THE BUILDING. ARRANGED TO CONFORM TO THE BUILDING REQUIREMENTS AND TO SUIT THE NECESSITIES OF CLEARANCE OF DUCTS, FLUES, CONDUITS AND WORK OF OTHER TRADES AND CLOSE TO CEILING OR OTHER CONSTRUCTION AS PRACTICAL, FREE OF TRAPS OR BENDS.
- PROVIDE ADDITIONAL OFFSETS, FITTINGS, VALVES, DRAINS, ETC. WHERE REQUIRED BY CONSTRUCTION AND WORK OF OTHER TRADES.
- D. RUN IN CHASES, RECESSES, SHAFTS, HUNG CEILINGS AND BEAM CUTS WHERE APPLICABLE. DO NOT COVER BEFORE EXAMINATION AND TESTING. NO PIPING IN FLOOR FILL UNLESS NOTED OR APPROVED.
- RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS AND OTHER PIPING, NEATLY SPACED AND WITH PLUMB RISERS. MAINTAIN MAXIMUM HEADROOM.
- F. PROVIDE REDUCING FITTINGS FOR CHANGES IN PIPE SIZE. NO BUSHINGS ARE PERMITTED.
- G. IN HUNG CEILING AREAS, LOCATE SPRINKLER HEADS TO FALL IN CENTER OF CEILING PANELS AND TO FORM COORDINATED UNIFORM PATTERN WITH LIGHT FIXTURES, AIR SUPPLY OR RETURN DIFFUSERS, REGISTERS, ETC. PROVIDE NECESSARY OFFSETS IN BRANCH PIPES TO ACCOMPLISH DESIRED RESULTS. COORDINATE WORK CLOSELY WITH CEILING INSTALLER.
- HORIZONTAL OR DOWNFEED BRANCH CONNECTIONS TO SPRINKLER HEADS SHALL BE MADE ABOVE CENTERLINE OF HORIZONTAL MAINS. SPRINKLER HEADS SHALL NOT BE INSTALLED UNTIL BRANCH LINES TO HEADS HAVE BEEN CLOSED.
- SPRINKLER PIPING 3" AND LARGER MAY HAVE WELDED. THREADED OR GROOVED FITTINGS. WELDING MUST BE DONE IN SHOP ONLY AND MAY ONLY BE DONE IF APPROVED BY LOCAL AUTHORITY.
- K. LAYOUT SHOWN ON CONTRACT DRAWINGS IS INTENDED TO SHOW GENERAL LAYOUT, AREAS TO BE COVERED AND BASIC REQUIREMENTS. PREPARE DETAILED WORKING DRAWINGS OF PIPING FOR REVIEW AND APPROVAL BY PROPER AUTHORITIES BEFORE ANY WORK IS PERFORMED
- RUN WATER PIPING FREE OF TRAPS. GRADE AND VALVE FOR COMPLETE CONTROL AND DRAINAGE OF SYSTEM.
- M. VALVES SHALL NOT BE INSTALLED WITH THE OPERATING HANDLE POINTING DOWNWARD.
- N. MANUFACTURER'S NAMEPLATE, NAME OR TRADEMARK, SHALL BE PERMANENTLY AFFIXED TO ALL EQUIPMENT AND MATERIAL FURNISHED UNDER THIS SPECIFICATION. WHERE SUCH EQUIPMENT IS IN A FINISHED OCCUPIED SPACE, THE NAMEPLATE SHALL BE IN A CONCEALED BUT ACCESSIBLE LOCATION. THE NAMEPLATE OF A SUBCONTRACTOR OR DISTRIBUTOR WILL NOT BE ACCEPTABLE.
- PROVIDE FOR EACH ITEM OF EQUIPMENT, INCLUDING PANELBOARDS DISCONNECTS, BREAKERS, STARTERS, SWITCHES, AND ALL CONTROL DEVICES, PUMPS, FANS, COMPRESSORS, BOILERS, ETC., A PERMANENTLY ATTACHED NAMEPLATE MADE OF BLACK SURFACE, WHITE CORE FURNISHING EQUIPMENT SHALL PROVIDE NAMEPLATE. PNEUMATIC, ELECTRIC AND MECHANICALLY ACTUATED GAUGES SHALL HAVE A BRIEF, BUT COMPLETE DESCRIPTION OF THEIR FUNCTION. STATING THE AIR PRESSURE OR VOLTAGE RANGE ALONE IS NOT ACCEPTABLE. NAMEPLATES SHALL BE A MINIMUM OF 3" LONG BY 1-1/2" WIDE AND SHALL BEAR THE EQUIPMENT NAME AND ITEM NUMBER OF 1/2" HIGH WHITE LETTERS AS DESIGNATED IN THE EQUIPMENT SCHEDULE. MOUNTING SCREWS SHALL HAVE CHROME PLATED ACORN HEADED SCREWS.
- P. FURNISH AND ATTACH TO EACH VALVE AS HEREINAFTER SPECIFIED. A 1-1/2" DIAMETER BRASS TAG WITH 1/2" INDENTED NUMERALS FILLED WITH DURABLE BLACK COMPOUND. TAGS SHALL BE SECURELY ATTACHED TO STEMS OF VALVES WITH COPPER WIRE AND "S" HOOKS
- Q. VALVE CHARTS SHALL CONSIST OF SCHEMATIC DRAWINGS OF PIPING LAYOUTS, SHOWING AND IDENTIFYING EACH VALVE AND DESCRIBING THE FUNCTION. UPON COMPLETION OF THE WORK. ONE (1) COPY OF EACH CHART, SEALED TO RIGID BACKBOARD WITH CLEAR LACQUER PLACED UNDER GLASS AND FRAMED, SHALL BE HUNG IN A CONSPICUOUS LOCATION IN THE MAIN EQUIPMENT ROOM, UNLESS OTHERWISE DIRECTED BY THE ARCHITECT. TWO (2) ADDITIONAL UNMOUNTED COPIES IN 8-1/2" X 11" LEATHER RING BINDERS SHALL BE DELIVERED TO THE ARCHITECT. ALSO FURNISH THREE (3) COPIES OF SCHEMATIC FLOW CHART WITH CORRESPONDING VALVE NUMBERS NOTED ON CHART.
- R. PROVIDE TAGS FOR THE FOLLOWING VALVES: 1. ZONE CONTROL AND BYPASS VALVES
- 2. SYSTEM DRAIN VALVES, SAFETY AND RELIEF VALVES. IDENTIFICATION SHALL BE IN ACCORDANCE WITH "SCHEME FOR
- IDENTIFICATION OF PIPING SYSTEM ANSI A13.1" AND OSHA SAFETY COLOR REGULATION. MARKERS SHALL BE SNAP ON TYPE AS MANUFACTURED BY SETON
- NAMEPLATE CORP., NEW HAVEN, CONN. (SETMARK SYSTEM), BUNTING STAMP CO. INC., PITTSBURGH, P.A. OR APPROVED EQUAL, MARKERS SHALL COMPLETELY ENCIRCLE THE PIPE WITH A SUBSTANTIAL OVERLAP. NO ADHESIVE SHALL BE USED. THEY SHALL BE MANUFACTURED OF U.L. APPROVED, SELF EXTINGUISHING PLASTIC. WHEN THE PIPE INCLUDING INSULATION (IF ANY) IS LARGER THAN 6" DIAMETER AND LARGER, MARKERS SHALL BE STRAP ON TYPE.
- WHERE PIPE IS TO BE LEFT BARE IT SHALL BE PAINTED WITH TWO (2) COATS OF SELF-PRIMING, MARINE-GRADE SILOXANE EPOXY PAINT IN GLOSS COLORS AS REQUIRED BY ITEM Q, BELOW, AND STENCIL AND VALVE TAG SCHEDULE.

1. COLOR SPECIFICATIONS:

<u>COLOR</u>	<u>NAME</u>	FEDERAL STANDARD NUMBE
BLACK	OSHA BLACK	17038
WHITE	INSIGNIA WHITE	17875
RED	OSHA SAFETY RED	11120
YELLOW	OSHA SAFETY YELLOW	13591

PIPE SHALL BE LETTERED AND VALVES TAGGED IN ACCORDANCE WITH THE SCHEDULE BELOW. LETTERING SHALL BE LOCATED NEAR EACH VALVE AND BRANCH CONNECTION AND AT INTERVALS OF NOT OVER 40' (10' ON FIRE LINES) ON STRAIGHT RUNS OF PIPE. PROVIDE FLOW ARROWS FOR ALL PIPING AT EACH MARKER. ADJACENT TO

THE LEGEND, STENCIL THE SIZE OF THE PIPE. LETTER COLORS ARE AS FOLLOWS: RED WITH WHITE LETTERS, AND YELLOW WITH BLACK LETTERS.

1. STENCIL AND VALVE TAG SCHEDULE

SERVICE	STENCIL DESIGNATION	<u>COLOR</u>	TAG DESIGNATION
WET SPRINKLER	SPRINKLER	RED	SPK
DRY SPRINKLER	DRY SPRINKLER	RED	D SPK
WET STANDPIPE	STANDPIPE	RED	SPIPE
DRY STANDPIPE	DRY STANDPIPE	RED	DRY SPIPE
COMPRESSED AIR	AIR	YELLOW	AIR
NITROGEN	NITROGEN	YELLOW	Ν

CONTRACTOR TO PROVIDE (3) COPIES OF OWNER & OPERATIONS MANUALS FOR ALL MATERIALS & EQUIPMENT PROVIDED UNDER THIS CONTRACT TO OWNER. OWNER & OPERATIONS MANUALS ARE TO BE FURNISHED IN 8-1/2" X 11" LEATHER 3 RING BINDER. PROVIDE ALPHABETIC TABLE OF CONTENTS WITH EACH ENTRY TABULATED, INCLUDE LABELED BINDER TABS AT EACH ENTRY. INCLUDING BUT NOT LIMITED TO: FIRE PUMP, JOCKEY PUMP, STORAGE TANKS, VALVES, ETC.

![](_page_21_Picture_68.jpeg)

![](_page_21_Picture_69.jpeg)

![](_page_22_Figure_0.jpeg)

![](_page_22_Picture_1.jpeg)

![](_page_22_Picture_2.jpeg)

NORTH

TYPICAL DUCTWORK DETAILS	ABBREVIATIONS	SYMBOLS LIST
MAIN SUPPLY AR DUCT OR BRANCH UP TO 24% OF MAIN       Image: Constrained by the second supply return or broken of the second up to 24% of MAIN       Image: Constrained by the second supply return or broken of the second to 12". 12" for all branch Ducts larger than 12".       Image: Constrained by the second supply return or to 12". 12" for all branch Ducts larger than 12".       Image: Constrained by the second supply return or to 12". 12" for all branch Ducts larger than 12".         Image: Constrained by the second Constrained by the second Constrained by the second constrained by the second to 12". 12" for all branch Ducts larger than 12".       Image: Constrained by the second to 12". 12" for all branch Ducts larger than 12".         Image: Constrained by the second Constrained by the second constrained by the second to 12". 12" for all branch Ducts larger than 12".       Image: Constrained by the second to 12". 12" for all branch Ducts larger than 12".         Image: Constrained by the second constrained by the second manufactor of the second manufactor of the second to 12". 12" for all branch to 12". 12". 12" for all branch to 12". 12". 12". 12". 12". 12".	↓ MI       ADJ       ADJUSTABLE       IN       INCH         ↓ MI       AFF       ABOVE FINISHED FLOOR       INCH       INCHES         ↓ VANES:       AMPS AMPERES       AND       INCH       INCHES	Image: Supply and Supply
TYPE       CEILING MO         CAPACITY       MBH         CAPACITY       KW         AIRFLOW       CFM         POWER       V/PH/HZ         DIMENSIONS       IN (D × W × H)         WEIGHT       LBS         PROVIDE THE FOLLOWING:       130	INTED       DIFFOSERC & REGISTERCOULT       ON TITL         NO.       MARK       RE         1.       CSR/CRR SHALL BE PRICE INDUSTRIES MODEL SDGE OR APPROVED "EQUAL".       (4)         2.       SR SHALL BE TITUS MODEL 300-FL OR APPROVED "EQUAL".       (1)         28       3.       CG/TG, CR/ER/RR SHALL BE TITUS MODEL 350-FL OR APPROVED "EQUAL".       (2)         (1)       PROVIDE OPPOSED BLADE VOLUME DAMPER.       (2)       (2)         (2)       COLOR SHALL BE SELECTED BY ARCHITECT.       (3)       ALUMINUM RETURN/EXHAUST REGISTER WITH BLADES AT 3/4" SPACING AND 35' FIXED DEFLECTION. REFER TO DRAWINGS FOR CORRECT MOUNTING STYLE.         (4)       EXTRUDED ALUMINUM CONSTRUCTION WITH AIR SCOOP. END FRAMES TO MATCH DUCT CURV DOUBLE DEFLECTION CORE WITH INDIVIDUALLY ADJUSTABLE AIRFLOW BLADES. 3/4" BLADE S	MARKS       HEATING & VENTILATING UNIT SCHEDULE         MANUFACTURER       REZ         INDOOR UNIT:       MARK NO.         MARK NO.       HV-         MODEL NO.       SSC         SUPPLY FAN DATA:       AIRFLOW         ARFLOW       CFM       5,00         MINIMUM OUTSIDE AIR       CFM       5,00         TURE.       MOTOR SIZE       IWC       1         MOTOR SIZE       HP/BHP       3.00         ELECTRICAL DATA:       POWER       V-PH-HZ       208         FLA       MURS       9.5
MARK NO.       UH-1, 2         LOCATION       SEE FLOOR PLANS         MANUFACTURER       REZNOR         MODEL SIZE       UDAS-300         TYPE       CEILING MOUNTED         CAACITY       INPUT:         BTUH       300,000         KW/H       87.9         OUTPUT:       BTUH         KW/H       73.0         COMBUSTION AIR INLET #       IN         GAS CONNECTION #       IN         VENT CONNECTION #       IN         GAS CONNECTION       IN         GAS CONNECTION       IN         See FLOOR PLANS       REZNOR         WW/H       73.0         COMBUSTION AIR INLET #       IN         GAS CONNECTION #       IN         GAS CONNECTION #       IN         GAS CONNECTION       IN         GAS CONNECTION       IN         GAS CONNECTION       IN         GAS CONNECTION       IN         JUNIT MOTOR:       HP         IN       00         MOTOR:       HP         IN       00         APPROX.WEIGHT       LBS         JUNIT MOUNTED THERMOSTAT.       Soveriteat protection.         OU	MANUFACTURER       WATTS RADIANT         TOTAL AREA       FT <sup>2</sup> 6964         RADIANT PANEL – EMBEDDED SLAB DETAILS:       IN       6         SLAB THICKNESS       IN       2.5         SLAB THICKNESS       IN       2.5         SLAB THICKNESS       IN       2.5         SLAB TRICKNESS       IN       0.15         SPACING       TXFT <sup>2</sup> XHR/BTUXIN       0.15         SPACING       IN       12         FASTENERS       CABLE TIES         TOTAL HEATING LOAD       BTU/HR       105,397         TOTAL RH CIRCUITS       14         TUBING SIZE       IN       (14) 3/4"         TOTAL ANNIFOLDS       1       1         TOTAL ANNIFOLDS       1       1         TOTAL FLOW VOLUME       GAL       131.64         TOTAL FLOW VOLUME       GAL       131.64         TOTAL HEAD LOSS       FT.       4.1         PROVIDE THE FOLLOWING:         ① 1* STAINLESS STEEL MANIFOLD. (2) M-7 - MODEL # D38030075S	FURNACE DATA:         NAT           FUEL TYPE         MBH         600           OUTPUT HEAT         MBH         480           eFFICIENCY (AFUE)         %         80           EAT/LAT         T         0/8           APPOX. WEIGHT         LBS         120           SIZE: (LENGTHXWDTHXHEIGHT)         IN         110:           FILTER:         SIZE/MERV         2 <sup>7</sup> /           PIPING CONNECTIONS:         GAS PIPE         IN           GAS PIPE         IN         1-1           COMBUSTION AIR         IN         6           FLUE VENT         IN         6           PONIDE:         (1)         TOTALLY ENCLOSED INVERTER DUTY MOTOR WITH VFD.         (1)         ELECTRONIC MODULATION -           (2)         120V GFI OUTLET.         (1)         FIRESTAT.         (2)         AIRFLOW PROVING SWITCH.           (3)         DIRTY FILTER PRESSURE SWITCH.         (1)         SPRING VIBRATION ISOLATOF         (1)           (4)         DOUBLE WALL CABINET CONSTRUCTION.         (1)         SPRING VIBRATION ISOLATOF         (1)           (5)         FM, GAS MANIFOLD ARRAGEMENTS.         (1)         ELECTRONIC 7-DAY PROGRAM           (5)         GAS PRESSURE SAFETY SWITCHES.         (1
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><text><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></text></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	CONDENSATE PUMP SCHEDULE MARK No. MARK NO.	Motor Interlocked W/ Bullong EXAMSTER)

	<b></b>														
	EXH	IAUST	FAN	SCHE	DUL	Æ									
	NO.	MFR	MODEL	TYPE	RPM	CFM	SP	HP	BHP	TYPE	V/Ph/Hz	SONES	SERVICE	LOCATION	WEIGH
LL VALVE	FF_1 2		DOU 36		770	6500	0.50	1_1/2	1.00		208/3/60	10 7	CARACE 02-100	WALL	(LBS
ECK VALVE	EF-3	PENN BARRT	SX115SC	INLINE	1300	1000	0.50	1/3	1.25	DIRECT	208/1/60	6.7	GARAGE 02-100	CEILING	100
TO FLOW BALANCING/SHUT-OFF	REMA	RKS:						<u> </u>			1 .				
NTRY)		DE MOTOR W/ T	HERMAL OVE	ERLOAD PROTE	CTION, DIS	CONNECT	& ALUMI	NUM BAC	CK DRAFT	DAMPER.					
ION	2 PROVI	DE HERESITE VR	-500 COATI	NG FOR EXHAU	JST FAN /	AND ALL A	ACCESSOR	ES.							
WAY CONTROL VALVE	3 PROVI	de inverter du	TY MOTOR	AND VFD.											
RAINER WITH BLOW OFF VALVE	4 PROVI	DE WALL MOUNT	ING SLEEVE,	REAR GUARD,	MOTORIZ	ed dampe	R, WEATH	er shiel	LD & WEA	THER SHIELD	GUARD.				
	5 PROVI	DE SPEED CONT	ROLLER												
INE PUMP					<b>.</b>							<u></u>			
ERMOMETER		SON M	UNUX	ADE č	¢ NJ	IRC	GEN		ΙΟΧΠ	DE M	IONII	JRII	NG SIAI	ION	
						BRASCH	H MANUFA	CTURING,	, LLC						
ED TO DRAIN	MODEL	NO.				72-210	08RK								
INT OF NEW CONNECTION	VENTILA	TION ZONES				1									
	CO TRANS MODEL	SMITTER NO.				GSE-CI	M-TRA								
INT OF REMOVAL	QUANTI COVERA	TY \GE				2 UP TO	7,500 SF,	/SENSOR	2						
	NO2 TRAI	NSMITTER NO				GSF-NI	)—TR∆								
	QUANTI <sup>-</sup>	TY GF				2 11P TO	7 500 SE	/SENSOR	)						
HV	ACCESSO	RIES				STROBE	LIGHT WI	TH HORN	N						
	PROVIDE														
REZNOR		IG BETWEEN CON		0/NO2 TRANS	AITTERS &	STROBE		ISY CHA	IN WIRING	RETWEEN A		FRS			
HV-1		GRAMMING, STAR	T-UP AND F	PERSONNEL TR	AINING.							LING.			
SSCBL-600	G	· · · · ·													
5.000	TTTAT		ATENT		<u> </u>					aatt		<b>—</b>			
5,000	HIGF	1 E.F.F.I	CIEN	CY, H	ΟT	WAT	ER .	BOI	LER	SCH	EDUL	E			
3.00/2.42 3600	MARK No	р.										B-1			
												MEZ PAC	ZANINE—01 KAGED, CONDENSING	;	
208–3–60 8.5		CTURER										91.5 NTI	∕₀ 5.4		
	BOILER (	CAPACITY:					мвн					154	54		
NATURAL GAS	NET FUEL	OUTPUT					MBH					141 NATI	JRAL GAS		
480 80	BURN	IER TURNDOWN F	RATIO									10:1			
0/87	WATER F WATER T	ENPERATE	SE				GPM F					14 20 5 3			
110x48x41		INLET GAS PRES	SSURE				гі. I.W.C. I.W.C					5.5 4.0 10.5			
2 /8	PIPING C	ONNECTIONS AT	BOILER:									10.0			
1-1/4	HOT WA	ATER SUPPLY (NI ATER RETURN (NI	PT) PT)				IN IN					1 (M 1 (M	IALE) IALE)		
6 6		CAL DATA:					IIN					1/2	(MALE)		
	POWER FLA						V-PH AMPS	-HZ				120, 12	/1/60		
N – 20–100% TURNDOWN.	ASME WO	ORKING PRESSUR					PSIG					30			
	SAFETT	COMBUSTION/DIR	RECT VENT:				PSIG					30			
сн.	SEALED FLUE G	AIR INTAKE AS VENT					IN IN					3 3			
	MAXIMUM DEPTH	I OVERALL DIMEN	NSIONS:				IN					19			
VERTICAL VENT	WIDTH HEIGHT	()					IN IN					20 34			
	WEIGHT ( WEIGHT (	(DRY) (WET)					LBS					140			
RAMMING, START-UP &															
	NOTES:														
	1. PRO	VIDE AND FIELD	INSTALL NTI	FLOOR STAND	(#84630	).									
#	2. CON	TRACTOR SHALL	PROVIDE BO	DILER MANUFAC	TURER LE	TTER OF	GUARANTE	E FOR /	AS-BUILT	FLUE AND C	OMBUSTION	AIR INTAK	E INSTALLATION.		
P-2	3. PRO	VIDE SMART CON	ITROLLER FC	OR SMART SEQ	UENCING.	PROVIDE	INTERFACE	CARD F	FOR FULL	INTEGRATION	INTO BMS.				
BUILDING LOOP	4. PRO	VIDE SEALED CO	MBUSTION A	IR.											
ECOCIRIC XL 36-45	5. PRO DRA	VIDE CONDENSAT	TE NEUTRALIS FLER MODEL	ZER SERIES JM . #A562 PIPE	I MANUFA COVER OV	CTURED B ER COMPI	Y JJM BO ETE EXTE	ILER WOF	rks for e Loor pipii	BOILER COME NG.	BUSTION CHAI	/IBER & F	LUE. PIPE TO NEAR	EST FLOOR	
11 20	6. PRO	VIDE FIELD INSTA	ALLED MOTO	RIZED ISOLATIC	N VALVES	ON BOIL	ER. PROVI	DE ALL (	CONTROLS,	, WIRING, TR	ANSFORMERS	ETC., AS	S REQUIRED FOR SA	TISFACTORY	
WATER 16															
2950		TRACTOR SHALL		UTSIDF ATMOS	HERF TH			ON THE	GAS TRAIN		G TO THE INT	ERNATION	AL FUEL GAS CODE	& THF	
0.152 115/1/60		AL GAS COMPAN	Y'S REQUIRE	MENTS.			#10								
	9. PRO	VIDE I.R.I GAS TI	RAIN WITH P	RESSURE REGU	JLATOR.										

10. PROVIDE UL LISTED POLYPROPYLENE POSITIVE PRESSURE VENT SYSTEM.

11. PROVIDE CONCENTRIC ADAPTOR VERTICAL VENT TERMINATION KIT.

EF #	
GHT REMARKS	
0         1234           0         1235	
B	
<u> </u>	
)RTH	
NC	

![](_page_23_Picture_7.jpeg)

![](_page_24_Figure_0.jpeg)

#### 1.0 GENERAL

- A. GOVERNING CODES AND STANDARDS
- a. NJ UNIFORM CONSTRUCTION CODE
- b. 2015 INTERNATIONAL BUILDING CODE, NJ EDITION c. 2015 INTERNATIONAL MECHANICAL CODE
- d. NFPA STANDARDS 90A
- e. ALL APPLICABLE ASHRAE STANDARDS
- f. ALL APPLICABLE SMACNA STANDARDS
- g. 2014 NATIONAL ELECTRICAL CODE
- h. UL (ALL EQUIPMENT MUST BE LABELED)
- i. NEBB. B. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH RECOGNIZED INDUSTRY STANDARDS, GOVERNING CODES, APPROVED SHOP DRAWINGS AND MANUFACTURER'S INSTRUCTIONS.
- C. PERMITS: ACQUIRE ALL PERMITS FOR THIS WORK. OWNER WILL PAY. D. WARRANTY: THE EQUIPMENT SHALL HAVE A MANUFACTURER'S WARRANTY FOR A PERIOD OF TWO (2) YEAR FROM DATE OF SUBSTANTIAL COMPLETION. IF DURING THIS PERIOD, ANY PART SHOULD FAIL TO FUNCTION PROPERLY DUE TO DEFECTS IN WORKMANSHIP OR MATERIAL, IT SHALL BE REPLACED OR REPAIRED AT THE
- DISCRETION OF THE MANUFACTURER. E. BEFORE SUBMITTING BIDS, CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND BECOME THOROUGHLY FAMILIAR WITH THE OBSERVABLE EXISTING CONDITIONS AFFECTING HIS WORK. NO ADDITIONAL COMPENSATION WILL BE GRANTED ON ACCOUNT OF EXTRA WORK MADE NECESSARY BY THE CONTRACTOR'S FAILURE TO
- INVESTIGATE EXISTING CONDITIONS. F. SUBMIT COMPOSITE COORDINATION SHOP DRAWINGS THAT SHOW ALL EXISTING AND NEW DUCTWORK, HVAC PIPING, PLUMBING PIPING, CONDUITS, LIGHTING FIXTURES, BUILDING STRUCTURE, CEILING MOUNTED EQUIPMENT, ETC. EXACT ELEVATION OF ALL COMPONENTS SHALL BE INDICATED
- G. CONTRACTOR SHALL SUBMIT MARKED UP HVAC DRAWINGS TO ENGINEER TO SHOW "AS-BUILT" CONDITIONS AFTER SATISFACTORY COMPLETION OF PROJECT
- H. CONTRACTOR SHALL PROVIDE OWNER WITH FIVE (5) COPIES OF OPERATION AND MAINTENANCE MANUALS PRIOR TO ACCEPTANCE OF FINAL PAYMENT.
- I. SPARE PARTS: THE CONTRACTOR SHALL FURNISH A MINIMUM OF TWO COMPLETE SPARE FILTER SETS AND FAN BELTS FOR H&V UNIT.

#### 2.0 SUBMITTALS

- A. SHOP DRAWINGS SHALL BE REQUIRED FOR: ALL EQUIPMENT, MATERIALS, MEANS & METHODS INTENDED FOR USE UNDER THIS CONTRACT. B. PRIOR TO DELIVERY TO THE JOB SITE, BUT SUFFICIENTLY IN ADVANCE OF REQUIREMENTS NECESSARY TO
- ALLOW ARCHITECT AMPLE TIME FOR REVIEW, SUBMIT SHOP DRAWINGS OF ALL EQUIPMENT, FIXTURES, MATERIAL, PIPING, DUCTWORK, SLEEVES, WIRING DIAGRAMS, ETC. AND FURTHER OBTAIN WRITTEN COMMENTS OF "APPROVED" OR "APPROVED AS NOTED" FOR THE SAME FROM ARCHITECT BEFORE INSTALLING ANY OF THESE ITEMS. C. SHOP DRAWINGS SHALL CONSIST OF MANUFACTURER'S CERTIFIED SCALE DRAWINGS, CUTS, OR CATALOGUES,
- INCLUDING DESCRIPTIVE LITERATURE AND COMPLETE CERTIFIED CHARACTERISTICS OF EQUIPMENT, FIXTURES, ETC. SHOWING DIMENSIONS, CAPACITY, CODE REQUIREMENTS, MOTOR AND DRIVE TESTING, AS INDICATED IN THE CONTRACT DOCUMENTS.
- D. CERTIFIED PERFORMANCE CURVES FOR ALL MECHANICAL EQUIPMENT SHALL BE SUBMITTED FOR REVIEW. E. SAMPLES, DRAWINGS, SPECIFICATIONS, CATALOGUES, ETC., SUBMITTED FOR REVIEW SHALL BE PROPERLY LABELED INDICATED PROJECT NAME, AND SPECIFIC SERVICE FOR WHICH MATERIAL OR EQUIPMENT IS TO BE
- F. FAILURE TO SUBMIT SHOP DRAWINGS IN AMPLE TIME FOR CHECKING SHALL NOT ENTITLE AN EXTENSION OF CONTRACT TIME, AND NO CLAIM FOR EXTENSION BY REASON OF SUCH DEFAULT SHALL BE ALLOWED.
- G. PRIOR TO SUBMISSION OF SHOP DRAWINGS CONTRACTOR SHALL THOROUGHLY CHECK EACH SHOP DRAWING, REJECT THOSE NOT CONFORMING TO THE SPECIFICATIONS, AND INDICATE BY SIGNED, STAMPED, & WRITTEN DECLARATION THAT THE SHOP DRAWINGS SUBMITTED MEET CONTRACT REQUIREMENTS.
- H. THE COMMENT "APPROVED" OR "APPROVED AS NOTED" RENDERED ON SHOP DRAWINGS SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR BUILDING CONDITIONS. WHERE DRAWINGS ARE REVIEWED. SAID REVIEW DOES NOT IN ANY WAY RELIEVE THE RESPONSIBILITY, OR NECESSITY, OF FURNISHING MATERIAL OR PERFORMING WORK AS REQUIRED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS
- I. "APPROVED AS NOTED" MEANS, UNLESS OTHERWISE NOTED ON THE DRAWINGS, TO APPROVE FOR CONSTRUCTION, FABRICATION, AND/OR MANUFACTURE SUBJECT TO THE PROVISION THAT THE WORK SHALL BE CARRIED OUT IN COMPLIANCE WITH ALL ANNOTATIONS AND/OR CORRECTIONS INDICATED ON THE SHOP DRAWINGS AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

- 1. WHERE THE COMMENT "APPROVED AS NOTED" INCLUDES DIRECTION TO THE CONTRACTOR TO RESUBMIT CORRECTED SHOP DRAWINGS FOR RECORD; FAILURE TO COMPLY WITH THE INSTRUCTION TO RESUBMIT RECORD COPY SHALL RENDER ALL APPROVALS NULL AND VOID.
- 3.0 IDENTIFICATION

4.0 AIR BALANCING

- WHITE CORE LAMINATED BAKELITE WITH INCISED LETTERS. SUBCONTRACTOR FURNISHING EQUIPMENT SHALL PROVIDE NAMEPLATE. NAMEPLATES SHALL BE A MINIMUM OF 3" LONG BY 1 1/2" WIDE AND SHALL BEAR THE EQUIPMENT NAME AND ITEM NUMBER OF 1/2" HIGH WHITE LETTERS AS DESIGNATED IN THE EQUIPMENT SCHEDULE. MOUNTING SCREWS SHALL HAVE CHROME PLATED ACORN HEADED SCREWS.
- A. NEBB CERTIFIED BALANCING COMPANY MUST BE A COMPANY WHICH IS INDEPENDENT OF THE CONTRACTOR AND BE APPROVED FOR USE BY THE OWNER PRIOR TO BALANCING THE SYSTEM.
- B. BALANCE AIR SYSTEMS TO QUANTITIES INDICATED AND FURNISH A REPORT INDICATING DIFFUSER SIZES, LOCATIONS, AND CFM VALUES, INCLUDING HEATING AND VENTILATING UNIT CFM ACTUAL FAN PERFORMANCE DATA.
- D. THE FOLLOWING DATA SHALL BE OBTAINED AND RECORDED AT THE HEATING & VENTILATING UNIT SUPPLY 1. FAN AND MOTOR RPM.
- 2. MOTOR AND CURRENT VOLTAGE. 3. FAN, COIL AND FILTER STATICS.
- 4. NAMEPLATE DATA ON FAN AND MOTOR. 5. MOTOR SHEAVE, FAN PULLY AND BELT SIZES. E. MAKE PRELIMINARY OUTLET READINGS AND BALANCE THE OUTLETS TO DESIGN CFM AND RECORD ALL

#### 5.0 SHEET METAL WORK

READINGS.

- A. FURNISH AND INSTALL ALL SHEET METAL DUCTWORK, PLENUMS, AND ITEMS OF METAL WORK AS NECESSAR TO COMPLETE THE VARIOUS AIR CONDITIONING, VENTILATING AND HEATING SYSTEMS OF THE BUILDING SO THEY ARE READY FOR SATISFACTORY OPERATION. WHILE THE INSTALLATION SHOULD ADHERE TO THE PLANS AND SPECIFICATIONS AS MUCH AS POSSIBLE, THE CONTRACTOR SHALL BE ENTITLED TO MODIFY THE RUNS AND SIZES OF THE DUCTWORK AND TO MAKE OFFSETS, WHERE NECESSARY TO ACCOMMODATE BUILDING CONDITIONS, ONLY AFTER RECEIPT OF WRITTEN APPROVAL FROM THE ENGINEER. ALL SUCH CHANGES OR OFFSETS SHALL BE INDICATED IN THE "AS-BUILT" DRAWINGS SUBMITTED AT THE END OF THE JOB.
- "HVAC DUCT CONSTRUCTION STANDARDS" PUBLISHED BY SMACNA. C. SHEET METAL GAUGES, TRANSVERSE JOINTS, LONGITUDINAL SEAMS AND INTERMEDIATE REINFORCING MUST BE IN CONFORMANCE WITH SMACNA STANDARDS FOR 6" W.G. AND SEAL CLASS A.
- D. ALL SUPPLY DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED STEEL OF U.S. D. STANDARD SHEET METAL GAUGE UNLESS NOTED OTHERWISE ON THE DRAWINGS. ALL JOINTS SHALL BE SEALED AIRTIGHT WITH 3MEC-800. CONNECTIONS TO FAN SHALL BE THRU ACID RESISTANT RUBBER NOT LESS THAN 4" LONG, FUME TIGHT AND SECURELY FASTENED WITH COPPER METAL BANDS.
- E. ALL CHANGES IN DIRECTION, HORIZONTAL OR VERTICAL, SHALL BE SHAPED TO PERMIT THE EASIEST POSSIBLE AIR FLOW, USING CENTERLINE RADIUS OF 1-1/2 X WIDTH. FOR ALL CASES WHERE 90 DEGREE SQUARE ELBOWS ARE USED, APPROVED DOUBLE THICKNESS TURNING VANES SHALL BE USED. HVAC CONTRACTOR SHALL SUBMIT DETAILS FOR APPROVAL.
- F. ALL DUCTWORK SHALL BE BUILT WITH APPROVED JOINTS AND SEAMS SMOOTH ON THE INSIDE WITH LAPS MADE IN THE DIRECTION OF THE AIR FLOW AND NO FLANGES PROJECTING INTO THE AIR STREAM. OUTSIDE SEAMS AND JOINTS SHALL BE AS NEAR TO AIR TIGHT AS POSSIBLE WITH A NEAT FINISH. THE CONTRACTOR SHALL CAULK ALL JOINTS WHICH ARE NOT MECHANICALLY TIGHT.
- G. LONGITUDINAL JOINTS SHALL BE PITTSBURGH LOCK AT CORNERS OR ACME LOCK ON FLAT SURFACES DOUBLE SEAMS HAMMERED TIGHT AND SHALL BE LOCATED ABOVE THE HORIZONTAL AXIS OF THE DUCT. A SNAP LOCK SEAM SHALL NOT BE PERMITTED AS A SUBSTITUTE FOR THE PITTSBURGH LOCK AT CORNERS OF DUCTS. H. TRAVERSE JOINTS SHALL BE MADE AIRTIGHT WITH ALL LAPS IN THE DIRECTIONS OF AIR FLOW.
- I. VOLUME DAMPERS AS SHOWN ON DRAWINGS AND AS REQUIRED FOR PROPER OPERATION SHALL BE INSTALLED IN THE VARIOUS BRANCHES FOR USE IN BALANCING THE SYSTEM. VOLUME DAMPERS SHALL BE OF MULTI-OPPOSED BLADE CONSTRUCTION WITH LOCKING QUADRANTS FOR ALL DUCTS OVER 12" IN DEPTH.
- MD35 OR APPROVED EQUAL WITH END BEARINGS, STAND OFF FOR INSULATED DUCTWORK AND CONTINUOUS AXLE & LOCKING QUADRANT. J. ALL DUCTWORK SHALL BE INSTALLED AS HIGH AS POSSIBLE TO MAXIMIZE HEADROOM.
- K. ALL DUCTWORK SHALL BE HUNG FROM THE BUILDING STRUCTURE.

A. PROVIDE FOR EACH ITEM OF EQUIPMENT A PERMANENTLY ATTACHED NAMEPLATE MADE OF BLACK SURFACE,

C. THE CONTRACTOR SHALL SUBMIT AN AIR BALANCE REPORT PRIOR TO SUBSTANTIAL COMPLETENESS.

B. DUCTWORK SHALL BE CONSTRUCTED ACCORDING TO THE "EQUIPMENT HANDBOOK" PUBLISHED BY ASHRAE AND

MOUNTED OUTSIDE OF THE DUCT IN AN ACCESSIBLE PLACE. VOLUME DAMPERS SHALL BE RUSKIN MODEL

#### L. ALL SUPPLY DUCTWORK SHALL BE WRAPPED WITH 1-1/2" THICK, 1-1/2 LB DENSITY FIBERGLASS WITH VAPOR BARRIER AND SHALL NOT EXCEED 25 FLAME SPREAD, 50 SMOKE DEVELOPMENT AND 50 FUEL CONTRIBUTED AS TESTED BY PROCEDURE ASTM-84, NFPA 255 AND UL 723, UNLESS NOTED OTHERWISE. 6.0 SUPPORTS

- A. ALL SUPPORTS AND HANGERS FOR EQUIPMENT, DUCTWORK AND PIPING UNDER THIS CONTRACT SHALL BE
- FURNISHED AND INSTALLED BY THE CONTRACTOR. B. ALL HANGERS, SUPPORTS, & HARDWARE SHALL BE GALVANIZED UNLESS OTHERWISE INDICATED.
- C. WHERE EXCESSIVE LOADING REQUIRES PROPER DISTRIBUTION OF THE WEIGHT, PROPER SUPPORTS MUST BE PROVIDED, SUBJECT TO THE ARCHITECT'S APPROVAL. ALL SUPPORTS SHALL BE OF STRUCTURAL STEEL. D. ALL SUPPORTS AND HANGERS AND METHOD OF ATTACHMENT TO THE STRUCTURE MUST BE APPROVED BY

# <u>7.0 PIPING</u>

# 7.1 HOT WATER AND MAKE-UP WATER PIPING

THE PRE-FABRICATED BUILDING MANUFACTURER.

- A. ALL PIPES SHALL BE NEW, FREE FROM SCALE OR RUST, OF THE MATERIAL AND WEIGHT SPECIFIED UNDER THE VARIOUS SERVICES. EACH LENGTH OF PIPE SHALL BE PROPERLY MARKED AT THE MILL FOR PROPER IDENTIFICATION WITH NAME OR SYMBOL OF MANUFACTURER. B. ALL COPPER TUBING SHALL BE OF WEIGHT AS REQUIRED FOR SERVICE SPECIFIED, WITH CONFORMANCE WITH
- ASTM B-88 FOR TYPES "L" AND "K" TUBING, AS MANUFACTURED BY CHASE, ANACONDA, REVERE, OR APPROVED EQUAL. TUBING AND FITTINGS SHALL BE THOROUGHLY CLEANED WITH SAND CLOTH AND TREATED WITH AN APPROVED NON-CORROSIVE FLUX BEFORE SOLDER IS APPLIED.

TYPE L (HARD)

COPPER	TUBING	JOINTS	SHALL	BE	MADE	WITH	95-5	SOLDER	FOR	WATER	APPLICA	TIONS
SERVICE	ier (he/	ATING)		MA <sup>-</sup> CC	IERIAL PPER		<u>SCHEI</u> TYPE	<u>DULE</u> L (HARI	))			

MAKE-UP WATER <u>7.2 FITTINGS</u>

- A. FITTINGS SHALL BE OF MATERIAL CONFORMING TO THE FOLLOWING SCHEDULE: SOLDER FITTINGS ASTM B-88, 150 LBS. FOR WATER SERVICE.
- B. ALL FITTINGS USED AT EXPANSION LOOPS OR BENDS SHALL BE EXTRA HEAVY. C. FLANGES SHALL BE RAISED FACE, OF THE SAME WEIGHT AS THE FITTINGS IN EACH SERVICE CATEGORY. ALL FLANGES SHALL BE DRILLED TO "US STANDARD" HEX NUTS AND WASHERS. BOLTING SHALL CONFORM TO ASTM 193 GRADE B-7, THREADS CLASS 7 FIT. NUTS SHALL BE SEMI-FINISHED HEXAGONAL, ANSI B18.2 ASTM

# 7.3 PIPE HANGERS AND SUPPORTS

A194 GRADE 2H.

COF

- A. PROVIDE NECESSARY STRUCTURAL MEMBERS, HANGERS AND SUPPORTS OF APPROVED DESIGN TO KEEP PIPING IN PROPER ALIGNMENT AND PREVENT TRANSMISSION OF INJURIOUS THRUSTS AND VIBRATIONS. IN ALL CASES WHERE HANGERS, BRACKETS, ETC., ARE SUPPORTED FROM CONCRETE CONSTRUCTION, CARE SHALL BE TAKEN NOT TO WEAKEN CONCRETE OR PENETRATE WATERPROOFING. ALL HANGERS AND SUPPORTS SHALL BE CAPABLE OF SCREW ADJUSTMENT AFTER PIPING IS ERECTED. HANGERS SUPPORTING PIPING EXPANDING INTO LOOPS, BENDS AND OFFSETS SHALL BE SECURED TO THE BUILDING STRUCTURE IN SUCH A MANNER THAT HORIZONTAL ADJUSTMENT PERPENDICULAR TO THE RUN OF PIPING SUPPORTED MAY BE MADE TO ACCOMMODATE DISPLACEMENT DUE TO EXPANSION. ALL SUCH HANGERS SHALL BE FINALLY ADJUSTED, BOTH IN THE VERTICAL AND HORIZONTAL DIRECTION. WHEN THE SUPPORTED PIPING IS HOT. OR CHILLED. AS REQUIRED. ALL PIPE HANGERS, SUPPORTS, & HARDWARE SHALL BE GALVANIZED UNLESS OTHERWISE
- INDICATED. METAL TO METAL CONTACT IS TO BE AVOIDED. HANGERS IN CONTACT WITH COPPER SHALL BE COPPER PLATED STEEL. B. PIPE HANGERS SHALL BE THE CLEVIS TYPE, EXCEPT WHERE OTHERWISE NOTED.

PIPE HANGER SCHEDULE:	

	MAKE AND MODEL	GRINNELL <u>FIG. NO.</u>	F&M <u>FIG.NO.</u>	CARPENTER& PATERSON FIG. NO.
2ER	ADJUSTABLE WROUGHT IRON	CT-65	364	100CT

C. HANGER RODS SHALL BE OF THE FOLLOWING DIAMETERS:

1 1/2"

<u>PIPE\_SIZE:</u> 1 1/4" & BELOW

- BEAM CLAMPS
- G. ALL WATER PIPING CONNECTED TO ROTATING EQUIPMENT WITHIN ALL MECHANICAL SPACES SHALL BE
- PCDNHS MADE BY MASON INDUSTRIES. SUBJECT TO THE APPROVAL OF THE ENGINEER.

# 8.0 PIPING INSULATION

- FOLLOWING THICKNESS:
- SERVICE HOT WATER SUPPLY AND RETURN
- THAN 3 LBS. PER CUBIC FOOT.
- INSULATION
- EQUAL E. DIRECT CONTACT BETWEEN PIPE AND HANGER SHALL BE AVOIDED.
- AND MATCHING HANGER SHALL BE USED.
- 8.1 PVC INSULATED FITTING COVERS

OR APPROVED EQUAL.

# 9.1 INSTALLATION

<u>9.0 – EXECUTION</u>

- COMPONENTS OF SYSTEMS.
- SPECIFICATIONS.

#### ROD DIAMETER: MAXIMUM SPACING 10' - 0"

D. BEAM CLAMPS - HANGERS SUPPORTED FROM FLOOR STEEL SHALL BE APPROVED I BEAM CLAMPS. I BEAM CLAMPS FOR HANGERS SUPPORTING PIPING 2" AND SMALLER SHALL BE C & P FIG. NO. 148 ADJUSTABLE E. ALL VERTICAL PIPING SHALL BE ANCHORED BY MEANS OF HEAVY STEEL CLAMPS SECURELY BOLTED OR WELDED TO THE PIPING, AND WITH END EXTENSION BEARING ON THE BUILDING. F. PIPING SHALL NOT BE HUNG FROM OTHER PIPING DUCTS, CONDUITS OR FROM EQUIPMENT OF OTHER TRADES AND NO VERTICAL EXPANSION SHIELDS WILL BE PERMITTED. HANGER RODS SHALL NOT PIERCE DUCTS.

ISOLATED FROM THE BUILDING STRUCTURE BY MEANS OF VIBRATION HANGERS INSERTED IN THE HANGER RODS. THE VIBRATION HANGERS SHALL CONSIST OF A STEEL SPRING IN COMBINATION WITH A DOUBLE DEFLECTION NEOPRENE ELEMENT WITHIN A RECTANGULAR STEEL HOUSING. COMBINED STATIC DEFLECTION SHALL BE 1.375" MINIMUM. HANGERS SHALL HAVE CAPABILITY OF SUPPORTING THE PIPING AT A FIXED ELEVATION DURING INSTALLATION AND SHALL INCORPORATE AN ADJUSTING DEVICE TO TRANSFER THE LOAD TO THE SPRING. DEFLECTION SHALL BE INDICATED BY MEANS OF SCALE. VIBRATION HANGERS SHALL BE TYPE H. WHERE ADDITIONAL STEEL IS REQUIRED FOR THE SUPPORT OF HANGERS, FURNISH AND INSTALL SAME

. PIPING RUNNING ON WALLS SHALL BE SUPPORTED BY MEANS OF HANGER SUSPENDED FROM HEAVY ANGLE IRON WALL BRACKETS. NO WALL HOOKS WILL BE PERMITTED. J. LATERAL BRACING OF HORIZONTAL PIPE SHALL BE PROVIDED WHERE REQUIRED TO PREVENT SIDE SWAY OR VIBRATION. THE LATERAL BRACING SHALL BE OF A TYPE APPROVED BY THE ENGINEER AND SHALL BE INSTALLED WHERE DIRECTED BY THE ENGINEER.

A. THE FOLLOWING PIPING SHALL BE COVERED WITH FIBERGLASS INSULATION WITH VAPOR BARRIER OF THE

#### <u>THICKNESS</u> 1-1/2"

B. INSULATION SHALL BE GLASS FIBER WITH A MAXIMUM K FACTOR OF 0.23 AT 75 DEGREES F. MEAN TEMPERATURE WITH FACTORY-APPLIED ALL SERVICE VAPOR BARRIER JACKET. DENSITY SHALL BE NOT LESS C. INSULATION SHALL BE HEAVY DENSITY FIBERGLASS SECTIONAL PIPE INSULATION AS MADE BY OWENS-CORNING FIBERGLAS CORP. OR CSG'S "SNAP-ON" OR MANVILLE "FLAME SAFE" FIBERGLASS

D. ALL FITTINGS, VALVES AND FLANGES FOR PIPE SIZES SMALLER THAN 4" SHALL BE INSULATED WITH MOLDED FIBER GLASS FITTINGS OF SAME THICKNESS AS THE ADJOINING PIPE INSULATION, SECURED WITH NO. 20 GAUGE GALVANIZED ANNEALED STEEL WIRE ZESTON 25/50 PVC AS MADE BY MANVILLE, OR APPROVED

F. AT PIPE SUPPORTS INSULATION SHIELD PROTECTION SADDLES, HIGH DENSITY INSULATION SUPPORT BLOCKS, G. ALL EXPOSED INSULATED PIPING IN BUILDING THAT IS WITHIN 7'-O" OF THE FINISHED FLOOR SHALL BE JACKETED WITH 0.016" THICK ALUMINUM WITH 1/2" ALUMINUM BARDS SPACED 18" O.C.

A. THE CONTRACTOR SHALL HAVE OPTION TO USE ZESTON 25/50 RATED PVC COVERS AS MADE BY MANVILLE

DOWN AND OFFSET TO MEET FIELD CONDITIONS AND TO PROVIDE ADEQUATE MAINTENANCE ROOM AND HEADROOM IN THE SERVICE CORRIDOR. D. ALL EXPOSED PIPING IN VIEW SHALL RUN PERPENDICULAR AND/OR PARALLEL TO FLOORS, INTERIOR WALLS,

- ETC. PIPING AND VALVES SHALL BE GROUPED NEATLY AND SHALL RUN SO AS TO AVOID REDUCING HEADROOM OR PASSAGE CLEARANCE. E. ALL PIPING SHALL BE ERECTED AS TO INSURE A PERFECT AND NOISELESS CIRCULATION THROUGHOUT THE
- SYSTEM. NO BULL HEAD TEES WILL BE PERMITTED. F. ALL VALVES AND SPECIALTIES SHALL BE PLACED SO AS TO PERMIT EASY OPERATION AND ACCESS. G. PROVIDE PROPER PROVISION FOR EXPANSION AND CONTRACTION IN ALL PORTIONS OF PIPE WORK, TO
- PREVENT UNDUE STRAINS ON PIPING OR APPARATUS CONNECTED THEREWITH. PROVIDE DOUBLE SWINGS AT RISER TRANSFERS AND OTHER OFFSETS WHEREVER POSSIBLE, TO TAKE UP EXPANSION. ARRANGE RISER BRANCHES TO TAKE UP MOTION OF RISER.
- H. ALL PIPING CONNECTIONS TO EQUIPMENT SHALL BE MADE WITH OFFSETS PROVIDED WITH SCREWED OR WELDED BOLTED FLANGES SO ARRANGED THAT THE EQUIPMENT CAN BE SERVICED OR REMOVED WITHOUT DISMANTLING THE PIPING. I. IF, AFTER FACILITY IS IN OPERATION, ANY COILS OR OTHER APPARATUS ARE STRATIFIED OR AIR BOUND (BY
- VACUUM OR PRESSURE), THEY SHALL BE REPIPED WITH NEW APPROVED AND NECESSARY FITTINGS, AIR VENTS, OR VACUUM BREAKERS AT NO EXTRA COST. IF CONNECTIONS ARE CONCEALED IN FURRING, FLOORS OR CEILINGS. BEAR ALL EXPENSES OF TEARING UP AND REFINISHING CONSTRUCTION AND FINISH, LEAVING SAME IN AS GOOD CONDITION AS BEFORE IT WAS DISTURBED.
- J. FITTINGS SHALL BE OF THE ECCENTRIC REDUCING TYPE, WHERE CHANGES OF SIZE OCCUR IN HORIZONTAL PIPING TO PROVIDE FOR PROPER DRAINAGE OR VENTING.
- K. TUBING SHALL BE ERECTED NEATLY IN A WORKMANLIKE MANNER. BENDS IN SOFT COPPER TUBING SHALL BE CREATED WITH BENDERS TO PREVENT DEFORMATION OF THE TUBING IN THE BENDS.
- L. THE ENDS OF ALL PIPE AND NIPPLES SHALL BE THOROUGHLY REAMED TO THE FULL INSIDE DIAMETER OF THE PIPE AND ALL BURRS FORMED IN THE CUTTING OF THE PIPES SHALL BE REMOVED. M. PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE ASME CODE FOR PRESSURE
- N. DISSIMILAR PIPING SHALL BE CONNECTED WITH DIELECTRIC FITTINGS BY THE PERFECTION CORPORATION (NO DIELECTRIC UNION).

9.2 TESTING OF PIPING

- A. ALL NEW PIPING SHALL BE TESTED AS HEREINAFTER SPECIFIED. TESTS SHALL BE MADE AFTER ERECTION AND BEFORE COVERING IS APPLIED OR PIPING CONCEALED.
- B. ALL NEW PIPING, UNLESS OTHERWISE SPECIFIED, SHALL BE TESTED TO A HYDROSTATIC PRESSURE OF AT LEAST 125 LBS. PER SQUARE INCH FOR 2 HOURS. AFTER TESTING ANY AND ALL LEAKS SHALL BE MADE 1GHT IN THE MOST APPROVED MANNER. TESTS SHALL BE REPEATED AFTER LEAKS AND DEFECTS HAVE BEEN REPAIRED. WHEN AUTOMATIC CONTROL VALVES, EQUIPMENT AND SIMILAR DEVICES WHICH ARE INCAPABLE OF WITHSTANDING TEST PRESSURES APPLIED TO PIPING SHALL BE REMOVED OR OTHERWISE PROTECTED DURING TESTS. AFTER APPROVAL OF SUCH TESTS, DEVICES SHALL BE INSTALLED AND TESTED WITH OPERATING
- MEDIUM TO OPERATING PRESSURES. LEAKS SHALL BE REMEDIED BY REPLACING DEFECTIVE WORK. C. LEAKS APPEARING DURING THE VARIOUS PRESSURE TESTS SHALL BE CORRECTED BY REPLACING ALL DEFECTIVE MATERIALS OR WELDS AND SUBSEQUENT TESTS SHALL BE MADE UNTIL THE PIPING IS FOUND PERFECT. CAULKING OF SCREWED JOINTS OR PENDING OF WELDS IS PROHIBITED. PROVIDE ALL OTHER TESTS REQUIRED BY THE BUILDING DEPARTMENT, FIRE DEPARTMENT AND ALL OTHER AUTHORITIES HAVING JURISDICTION.

10.0 COORDINATION

A. COORDINATE LOCATIONS OF ALL MECHANICAL EQUIPMENT WITH METAL BUILDING MANUFACTURER SO THAT THE PROPER STRUCTURAL SUPPORTS ARE PROVIDED.

A. COORDINATE WITH OTHER WORK AS NECESSARY TO INTERFACE INSTALLATION OF PIPING WITH OTHER

B. PROVIDE AND ERECT IN A WORKMANLIKE MANNER, ACCORDING TO THE BEST PRACTICES OF THE TRADE, ALL PIPING SHOWN ON THE DRAWINGS OR REQUIRED TO COMPLETE THE INSTALLATION INTENDED BY THESE

C. THE DRAWINGS INDICATE SCHEMATICALLY THE SIZE AND LOCATION OF PIPING. PIPING SHALL BE SET UP AND

- HEX NUT
- FLAT WASHER
- 1-5/8" X 1-5/8" STRUT CHANNEL
- FLAT WASHER
- LOCK WASHER
- TWO (2) HEX NUTS
1/2" THREADED ROD

- HEX NUT
- FLAT WASHER
- 1-5/8" X 1-5/8" STRUT CHANNEL
- FLAT WASHER
- LOCK WASHER
- TWO (2) HEX NUTS
- 1/2" THREADED ROD

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# HVAC SPECIFICATIONS (CONTINUED):

### 11.0 HVAC SPECIALTIES

### <u>11.1 AIR VENTS</u>

- A. IN INSTALLING WATER PIPING SYSTEMS AND ALL EQUIPMENT, CAREFULLY PLAN THE ACTUAL INSTALLATION IN SUCH A MANNER THAT HIGH POINTS AND AIR POCKETS ARE KEPT TO A MINIMUM AND ARE PROPERLY VENTED WHERE THEY ARE UNAVOIDABLE. ALL AIR ELIMINATION DEVICES CALLED FOR ON THE DRAWINGS AND IN THESE SPECIFICATIONS SHALL BE PROVIDED AND PROPERLY INSTALLED. IN ADDITION, FURNISH AND INSTALL ALL OTHER AIR ELIMINATION DEVICES THAT MAY BE REQUIRED DUE TO JOB CONDITIONS. ASSUME RESPONSIBILITY FOR A PROPER, CONTINUOUS AND AUTOMATIC AIR ELIMINATION TO ASSURE EVEN AND BALANCED DISTRIBUTION OF WATER
- TO ALL EQUIPMENT. B. FURNISH AND INSTALL AN ARMSTRONG NO. 1 AV OR SARCO 13W AUTOMATIC AIR VENT WITH TEST PETCOCK AT EACH HIGH POINT IN THE WATER PIPING MAINS AND WHERE INDICATED ON THE DRAWINGS. FURNISH AND INSTALL A 125 PSIG RATED VALVE ON THE SYSTEM SIDE OF EACH AUTOMATIC AIR VENT. VENTS ON HOT WATER LINES SHALL HAVE HOKE FIG. NO. PY-271 VALVES OR APPROVED EQUAL.
- C. FURNISH AND INSTALL A 125 PSIG RATED BALL VALVE ON THE SYSTEM SIDE OF EACH MANUAL AIR VENT. 11.2 STRAINERS FOR WATER SYSTEM
- A. FURNISH AND INSTALL A FULL SIZE Y-PATTERN STRAINER ON THE INLET OF EACH WATER PUMP, WHERE INDICATED ON THE DRAWINGS.
- B. THE STRAINERS SHALL BE AS MANUFACTURED BY SPENCE, SARCO, BARNES AND JONES, ELLIOTT, CRANE OR MUELLER. C. ALL STRAINERS, EXCEPT WHERE OTHERWISE NOTED, SHALL HAVE BRONZE BODY UP TO 2-1/2", SEMI-STEEL ABOVE 2-1/2", RATED AT 125 PSIG FOR ALL SYSTEMS WITH 50 PSIG MAX. PRESSURE AND 250 PSIG FOR ALL
- OTHERS. STRAINERS 2" DIAMETER AND SMALLER SHALL HAVE SCREWED ENDS. STRAINERS 2-1/2" DIAMETER AND LARGER SHALL HAVE FLANGED ENDS. D. ALL STRAINERS SHALL HAVE REMOVABLE CYLINDRICAL OR CONICAL SCREENS OF BRASS CONSTRUCTION. THEY SHALL BE DESIGNED TO ALLOW BLOWING OUT OF ACCUMULATED SEDIMENT AND TO FACILITATE REMOVAL AND
- REPLACEMENT OF THE SCREEN WITHOUT DISCONNECTING THE MAIN PIPING.
- E. SCREENS FOR WATER 1/16" FOR 3" INCLUSIVE, 1/8" FOR 4" AND ABOVE. F. AN APPROVED BLOW-OUT CONNECTION WITH BALL VALVE SHALL BE MADE TO EACH STRAINER. THE VALVES SHALL BE LOCATED NOT HIGHER THAN 8' ABOVE THE FLOOR. ALL DRAIN CONNECTIONS SHALL BE PIPED TO FLOOR DRAINS

### 11.3 INSPECTION

- A. CONTRACTOR SHALL EXAMINE LOCATION WHERE THESE SPECIALTIES ARE TO BE INSTALLED AND DETERMINE SPACE CONDITIONS AND NOTIFY ARCHITECT IN WRITING OF CONDITIONS DETRIMENTAL TO PROPER AND TIMELY COMPLETION
- OF THE WORK B. DO NOT PROCEED WITH THE WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

### 11.4 INSTALLATION

- A. INSTALL HVAC SPECIALTIES WHERE SHOWN, IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND WITH RECOGNIZED INDUSTRY PRACTICES, TO ENSURE THAT HVAC SPECIALTIES COMPLY WITH REQUIREMENTS AND
- SERVE INTENDED PURPOSES. B. COORDINATE WITH OTHER WORK AS NECESSARY TO INTERFACE INSTALLATION OF HVAC SPECIALTIES WITH OTHER COMPONENTS OF SYSTEMS.

## 11.5 FIELD QUALITY CONTROL

A. UPON COMPLETION OF INSTALLATION OF HVAC SPECIALTIES, TEST HVAC SPECIALTIES TO DEMONSTRATE COMPLIANCE WITH REQUIREMENTS. WHEN POSSIBLE, FIELD CORRECT MALFUNCTIONING UNITS, THEN RETEST TO DEMONSTRATE COMPLIANCE. REPLACE UNITS THAT CANNOT BE SATISFACTORILY CORRECTED.

#### 12.0 CLEANING OF PIPING SYSTEMS A. PRELIMINARY CLEANING:

- 1. CLEAN NEW PIPING INTERNALLY BY FLUSHING PRIOR TO THE APPLICATION OF PRESSURE TESTS AND BEFORE THE CHEMICAL CLEANOUT PROCEDURES SPECIFIED HEREIN. PROVIDE TEMPORARY STRAINERS AT THE INLET TO THE CHILLED WATER AND HOT WATER PUMPS BEFORE THE START OF CLEANING PROCEDURES.
- 2. BLOCK OFF AND ISOLATE CIRCULATING PUMPS, COOLING COILS, HEATING COILS AND STEAM TRAPS DURING THE PRELIMINARY FLUSHING AND DRAINING PROCESS.
- 3. THOROUGHLY FLUSH PIPING CLEAR OF FOREIGN MATTER WITH CITY WATER UNDER PRESSURE, AND THEN DRAIN REFORE PROCEEDING WITH PRESSURE TESTING BLOW DOWN ACCUMULATION IS OF GRIT, DIRT AND SEDIMENT AT EACH STRAINER AND EACH LOW POINT IN THE PIPING SYSTEMS.
- 4. PROVIDE BYPASS FLUSH VALVES AND REQUIRED PIPING TO PERMIT FULL CIRCULATION OF WATER DURING THE WASHOUT OF THE PIPING SYSTEMS. CLOSE SHUTOFF AND BALANCING VALVES ON BRANCH PIPING TO THE TERMINAL EQUIPMENT UNITS DURING THE WASHOUT OPERATION TO PREVENT WATER CIRCULATION THROUGH THE AUTOMATIC CONTROL VALVES.

### B. CHEMICAL CLEANOUT:

- 1. AFTER COMPLETION OF PRESSURE TESTING, CHEMICALLY CLEAN INTERNALLY EACH RECIRCULATING WATER SYSTEM (INCLUDING CHILLED WATER AND HOT WATER). 2. PROVIDE TEMPORARY CONNECTIONS WITH VALVES TO FILL THE PIPING AND REMAINING EQUIPMENT WITH WATER FOR THE PURPOSE OF DRAINING PIPING AND EQUIPMENT AFTER COMPLETION OF THE CHEMICAL
- CLEANOUT PROCEDURE. PROVIDE TEMPORARY BLIND FLANGES AND/OR CAPS TO ISOLATE THE PIPING AND EQUIPMENT NOTED HEREIN. 3. PROVIDE TEMPORARY PIPING CONNECTIONS, VALVES, STRAINERS, BYPASSES, AND BLANK CONNECTIONS
- WHERE REQUIRED TO CLEAN OUT SYSTEMS. LINE EACH STRAINER BASKET WITH A FINE MESH NYLON SCREEN AND REPLACE THE SCREENS AT THE END OF EACH DAY'S CIRCULATION UNTIL EACH SYSTEM IS THOROUGHLY CLEANED.

#### C. FILLING OF WATER SYSTEMS:

1. AFTER COMPLETION OF THE CHEMICAL CLEANOUT, FILL EACH WATER SYSTEM WITH FRESH WATER, AIR VENT AND ADD CHEMICAL TREATMENT. 2. IF THE OUTDOOR AMBIENT TEMPERATURE DROPS TO 32'F, AND THE DANGER OF FREEZE-UP EXISTS, DRAIN WATER SYSTEMS.

#### 13.0 VALVES FOR HVAC

<u>13.1 VALVES</u>

- A. GENERAL: ALL VALVES SHALL BE OF A DESIGN WHICH THE MANUFACTURER LISTS FOR THE SERVICE AND SHALL BE OF MATERIALS ALLOWED BY THE LATEST EDITION OF THE ASME CODE FOR PRESSURE PIPING FOR THE PRESSURE AND TEMPERATURE CONTEMPLATED, UNLESS A HIGHER GRADE OR QUALITY IS HEREIN SPECIFIED. ALL VALVES SHALL BE OF THE SAME MANUFACTURER, EXCEPT FOR SPECIAL APPLICATIONS.
- B. ALL VALVES SHALL BE INSTALLED WITH THE BEST WORKMANSHIP AND ARE TO HAVE NEAT
- APPEARANCE AND BE ARRANGED SO THAT THEY ARE EASILY ACCESSIBLE C. EACH VALVE SHALL HAVE THE MAKER'S NAME OR BRAND, THE FIGURE OR LIST NUMBER, AND THE GUARANTEED WORKING PRESSURE CAST ON THE BODY OR STAMPED ON THE BONNET, OR SHALL BE PROVIDED WITH OTHER MEANS OF EASY IDENTIFICATION
- D. CHECK VALVES INSTALLED IN THE HORIZONTAL POSITION SHALL BE SWING CHECKS; VALVES INSTALLED IN THE VERTICAL POSITION SHALL BE SILENT CHECKS FOR 2 1/2" AND ABOVE, AND LIFT CHECK FOR 2" AND SMALLER, EXCEPT THAT ALL CHECK VALVES IN PUMP DISCHARGES SHALL BE SILENT CHECKS.
- E. PROVIDE BLOW-OFF VALVES AT ALL STRAINERS, AND WHERE SHOWN ON THE DRAWINGS. F. PROVIDE VALVE OPERATING CHAIN ON ALL GATE, GLOBE, BUTTERFLY AND PLUG VALVES IN MECHANICAL EQUIPMENT ROOMS - 4" AND LARGER, WHICH ARE MORE THEN 7'-0" ABOVE THE OPERATING FLOOR. UNIT SHALL
- BE COMPLETE WITH ADJUSTABLE SPROCKET, CHAIN, AND GUIDE (CRANE "BABBIT" TYPE). PROVIDE HOOK TO KEEP CHAIN OUT OF THE WAY. G. GENERALLY, ALL VALVES ARE TO BE OF THE BALL TYPE, EXCEPT THAT GLOBE VALVES SHALL BE USED FOR THROTTLING SERVICES.
- H. ALL VALVES 2" IN DIAMETER AND SMALLER SHALL BE ALL BRONZE WITH BRONZE BODIES I. ALL FLANGED-END VALVES SHALL HAVE RENEWABLE METAL SEAT RINGS AND DISCS ON GATE VALVES, THESE PARTS SHALL BE OF BRONZE, ON ALL GLOBE VALVES THEY SHALL BE OF BRONZE AND SUITABLE FOR THROTTLING
- J. ALL SCREWED-END GLOBE VALVES SHALL BE OF THE UNION BONNET TYPE WITH RENEWABLE TEFLON DISCS. K. ALL VALVES SHALL HAVE THEIR BONNETS BACK-SEATED TO PROVIDE FOR PACKING UNDER PRESSURE. ALL GATE
- VALVES SHALL BE OF THE SOLID TAPERED WEDGE TYPE L. DRAIN VALVES SHALL BE PROVIDED ON TANKS, RECEIVERS, REQUIRED OR NECESSARY, FOR DRAINING THE LINES AND EQUIPMENT. DRAIN VALVES OR PLUG COCKS SHALL BE PROVIDED AT THE LOW POINTS FOR PROPER
- DRAINAGE. COCKS AND VALVES SHALL BE PROVIDED WITH THREADED ENDS FOR THOSE CONNECTIONS. M. ALL VALVES UP TO 2" IN DIAMETER SHALL HAVE SCREW ENDS, 2-1/2" IN DIAMETER AND OVER SHALL HAVE FLANGED ENDS. VALVES 2-1/2" IN DIAMETER AND LARGER WHICH ARE NON-RISING STEM, SHALL HAVE POSITION
- INDICATORS. N. ALL BRONZE AND IRON VALVES SHALL BE FURNISHED WITH TEFLON IMPREGNATED PACKING
- O. NO ASBESTOS SHALL BE USED IN CONSTRUCTION OF VALVES INCLUDING THE GASKETS
- P. DRAIN AND VENT VALVES DRAIN AND VENT VALVES SHALL BE ASA 600 LB. CLASS FORGED STEEL SAME AS GLOBE VALVES. DRAIN SHALL BE SIZED AS SHOWN ON THE DRAWINGS. UNLESS OTHERWISE NOTED, VENT VALVES
- SHALL BE 1/2" SIZE. DRAIN AND VENT VALVES SHALL BE TWO GLOBE VALVES IN SERIES. Q. THE CHECK VALVE SHALL BE SILENT TYPE CHECK VALVE WITH 300 LB. ASA CAST STEEL BODY, STAINLESS STEEL TRIM AND SPRING, FLANGED ENDS. CHECK VALVE SHALL BE AS MANUFACTURED BY MUELLER STEAM SPECIALTY COMPANY OR EQUAL

#### 13.2 BALL VALVES

- R. BALL VALVES UP TO 2" MAY BE USED FOR ALL WATER SERVICES AS AN ALTERNATE TO GATE VALVES, GLOBE
- VALVES AND BALANCING COCKS. S. BALL VALVES SHALL BE BRONZE BODY, BRONZE BALL AND STEM, TEFLON SEATS AND SEALS, THREADED ENDS, 400 PSIG COLD W.O.G. WORCHESTER NO. 411T-SE OR EQUAL. "APOLLO" 70 - 100 SERIES.

## 14.0 BOILER

- I. GENERAL
- A. SUPPLY AND INSTALL TFT154 MODULATING AND CONDENSING BOILER AS SPECIFIED HEREIN. B. BOILER SHALL BE FACTORY ASSEMBLED AND TESTED. BOILER SHALL BE SHIPPED SELF-CONTAINED AND READY FOR OPERATION EXCEPT FOR CONNECTION AT THE INSTALLATION SITE OF HEATING PIPING, FUEL, ELECTRICAL,
- COMBUSTION AIR, EXHAUST VENTING, CONDENSATE DRAINAGE AND RELIEF VALVE DISCHARGE PIPING. C. THE BOILER SHALL BE CAPABLE OF OPERATING ON NATURAL GAS. THE BOILER SHALL BE CAPABLE OF NORMAL
- OPERATION AND FULL RATED INPUT WITH NATURAL GAS SUPPLY PRESSURE BETWEEN 4 INCHES W.C. [1.0KPA] AND 10.5 INCHES W.C. [2.6KPA]. THE BOILER SHALL BE FACTORY SET FOR NATURAL GAS. D. THE BOILER SHALL HAVE AN AFUE RATING OF 95%, WITH A MINIMUM INPUT OF 154000 BTU/HR [46KW] AND A
- MAXIMUM INPUT OF 141000 BTU/HR [42 KW]. E. THE BOILER SHALL BE CERTIFIED TO THE ANSI Z21.13 / CSA 4.9 GAS-FIRED BOILER STANDARD.
- F. THE BOILER SHALL BE CERTIFIED FOR INSTALLATION WITH ZERO CLEARANCE TO COMBUSTIBLES, AND SHALL BE CERTIFIED FOR CLOSET AND ALCOVE INSTALLATION WHEN VENTED IN ACCORDANCE WITH THE MANUFACTURER'S
- INSTRUCTIONS. G. THE BOILER STAINLESS STEEL HEAT ENGINE SHALL BE DESIGNED AND CONSTRUCTED IN COMPLIANCE WITH THE ASME BOILER AND PRESSURE VESSEL CODE SECTION IV. A PERMANENT NAMEPLATE BEARING THE "H" STAMP AND NATIONAL BOARD REGISTRATION NUMBER SHALL BE ATTACHED TO THE HEAT ENGINE IN A READILY VIEWABLE LOCATION.
- H. THE HEAT ENGINE SHALL HAVE A LIMITED LIFETIME WARRANTY. ALL OTHER PARTS SHALL HAVE A FIVE YEAR LIMITED WARRANTY COVERING DEFECTS IN MATERIALS AND WORKMANSHIP. THE WARRANTY PERIOD IS BASED FROM

- II. PRODUCT
- A. ACCEPTABLE MANUFACTURERS 1. THE BOILER SHALL BE A TRINITY TFT154 MANUFAC B. BOILER CONSTRUCTION
- 1. HEAT ENGINE 2. THE HEAT ENGINE SHALL BE A VERTICAL FIRETUB FIRETUBES, TUBESHEETS AND SHELL SHALL BE CONS STAINLESS STEEL. THE HEAT ENGINE ASSEMBLY SHAI MODEL TFT154 SHALL BE RATED FOR 30PSI MAXIMU 3. THE HEAT ENGINE SHALL BE ABLE TO ACCEPT U ANTIFREEZE, WITHOUT DAMAGE TO THE HEAT ENGINE
- 4. THE HEAT ENGINE SHALL BE ACCESSIBLE FOR INS COVER. THE COVER SHALL INCLUDE A FLAME OBSER' 5. THE HEAT ENGINE SHALL BE PROVIDED WITH AN 6. A FACTORY-SUPPLIED FIELD-INSTALLED ANTI-SIF CHAMBER FOR COLLECTION AND REMOVAL OF COND
- INSPECTION AND SHALL BE EASILY DISASSEMBLED F C. GAS TRAIN AND COMBUSTION SYSTEM 1. THE COMBUSTION SYSTEM SHALL BE FULLY MODUL 2. THE COMBUSTION SYSTEM SHALL CONTAIN:
- A. ADJUSTABLE AIR/GAS RATIO VALVE WITH IN B. MIXING VENTURI
- C. VARIABLE SPEED BLOWER UTILIZING PULSE D. STAINLESS STEEL CYLINDRICAL PREMIX BURN E. DUAL-ELECTRODE SPARK IGNITER
- F. INDEPENDENT FLAME SENSING ELECTRODE.
- VENTING AND COMBUSTION AIR . THE BOILER SHALL BE DESIGNED FOR VENTING WI EXHAUST VENT LENGTH SHALL BE 150 EQUIVALENT 2. THE COMBUSTION CHAMBER EXHAUST OUTLET SHA REMOVABLE EPDM PLUG TO PERMIT INSERTION OF A
- E. CABINET 1. THE UNIT INTERNAL STRUCTURE SHALL BE CONSTI 2. THE CABINET JACKET SHALL BE CONSTRUCTED O WITH A DURABLE FACTORY APPLIED COATING ON B COMPROMISE SEALING OF THE COMBUSTION CHAMBER F. ELECTRICAL
- 1. THE BOILER SHALL OPERATE FROM A 120VAC/1 I 2. A LINE-VOLTAGE BARRIER STRIP SHALL BE PROVI (3) CIRCULATOR PUMPS. THE BOILER SHALL BE CAPA HP OR 3 AMPS @ 120VAC.
- 3. TWO (2) LOW-VOLTAGE BARRIER STRIPS SHALL B A. OUTDOOR TEMPERATURE SENSOR B. SYSTEM TEMPERATURE SENSOR
- C. DHW INDIRECT TANK AQUASTAT OR DHW TE
- D. 4–20MA SIGNAL FROM EXTERNAL CONTROL E. EIA-485 COMMUNICATION FOR LEAD-LAG ( 4. THE SECOND LOW-VOLTAGE BARRIER STRIP SHALL
- A. TWO (2) HEATING THERMOSTATS B. EXTERNAL SAFETY LIMIT
- C. ALARM SIGNAL TO A BUILDING AUTOMATION G. CONTROLS 1. THE BOILER CONTROL SYSTEM SHALL OPERATE ON
- 2. THE INTEGRATED MICROPROCESSOR-BASED CONTR CONTROL FUNCTIONS, INCLUDING: A. BURNER SPARK IGNITION
- B. FLAME DETECTION AND SUPERVISION
- C. BURNER FIRING RATE MODULATION D. HIGH TEMPERATURE LIMIT (UL353 RATED)
- 3. THE CONTROLLER SHALL INCORPORATE A PROPOR SEPARATE TEMPERATURE CONTROLS: TWO (2) FOR 4. THE CONTROLLER SHALL PERMIT FIELD SELECTION
- LIMIT EXCURSION TO EITHER LOCKOUT OR RECYCLE AND DELAY. 5. THE CONTROLLER SHALL PROVIDE:
- A. OPERATION OF UP TO TWO (2) PUMPS: BOIL B. FIELD-ADJUSTABLE OUTDOOR RESET TO AU OUTDOOR AIR TEMPERATURE. AN OUTDOOR SEN INSTALLATION
- C. MANUAL FIRING RATE CONTROL, ADJUSTABL D. WARM WEATHER SHUTDOWN TO DISABLE HEA E. PUMP EXERCISE FOR 10 SECONDS AT 24 HC
- F. FREEZE PROTECTION TO OPERATE THE BOIL TEMPERATURE FALLS BELOW 45°F, AND FIRE TEMPERATURE FALLS BELOW 38°F
- G. FIELD SETTING OF THE FOLLOWING:
- 1. LOW TEMPERATURE CENTRAL HEAT (CH 2. HIGH TEMPERATURE CENTRAL HEAT (
- 3. OUTDOOR RESET PARAMETERS LOW
- 4. OUTDOOR RESET PARAMETERS HIGH 5. BOILER PUMP OVERRUN TIME FROM 0
- 6. CH PUMP OVERRUN TIME FROM 0 TO
- 7. CH PUMP START DELAY FROM 0 TO 5 8. WARM WEATHER SHUTDOWN (WWSD) T
- 9. CH MODULATION SOURCE (INLET, OUTL
- 10. LEAD AND LAG SELECTION METHOD 11. LEAD ROTATION TIME FROM 0 TO 960
- 12. SLAVE ORDER PRIORITY METHOD (EQU

#### 13. ANTI SHORT-CYCLE INTERVAL FROM 14. TEMPERATURE UNITS, 'F OR 'C. 6. THE CONTROL SYSTEM SHALL INCLUDE A BUILT-I UNIT OPERATION AND FIELD ADJUSTMENT OF CONTROL LEVELS OF PASSWORD-PROTECTED ACCESS PERMISSI

- DISPLAY SHALL BE CAPABLE OF SHOWING: A. HEAT DEMAND SOURCE
- B. BURNER STATE
- C. DEMANDED FIRING RATE IN RPM D. ACTUAL BLOWER RPM
- E. CURRENT SETPOINT

H. TRIM KIT

I. MANUALS

III. INSTALLATION

15.0 RADIANT FLOOR HEATING

A. DESIGN REQUIREMENTS:

1. SYSTEM DESCRIPTION

- F. HEAT ENGINE ENTERING WATER TEMPERATUR
- G. HEAT ENGINE EXITING WATER TEMPERATURE H. EXHAUST GAS TEMPERATURE I. OUTDOOR TEMPERATURE

OF PIPE INCLUDING FITTINGS.

2) EXHAUST VENT MATERIAL SHALL BE (SELECT ONE):

i. 3 INCH DIAMETER SCHEDULE POLYPROPYLENE PIPE.

3) EXHAUST VENT LENGTH SHALL NOT EXCEED 150 EQUIVALENT FT

C. COMBUSTION AIR INLET

a. 200°F AT 80 PSI

b. 180°F AT 100 PSI

c. 73.4°F AT 160 PSI

1. CROSS-LINKED POLYETHYLENE TUBING (PEX):

a. SHOW COMPLIANCE WITH ASTM F877

THE DATE OF MANUFACTURE OR ONE YEAR FROM DATE OF INSTALLATION (WHICH EVER PERIOD IS LONGER).	c. SHOW COMPLIANCE WITH NFPA 90A REQUIREMENTS OF FLAME SPREAD/SMOKE DEVELOPMENT RATING OF 25/50 IN ACCORDANCE WITH ASTM E84 THROUGH CERTIFICATION LISTINGS WITH INTERTEK. d. SHOW COMPLIANCE WITH ASTM E119, UL 263, NFPA 251, AND CAN/ULC S101 THROUGH CERTIFICATION LISTINGS WITH INTERTEK:
ACCEPTABLE MANUFACTURERS 1. THE BOILER SHALL BE A TRINITY TFT154 MANUFACTURED BY NY THERMAL INC. (NTI).	2. SUBMITTALS A. GENERAL: SUBMIT LISTED SUBMITTALS IN ACCORDANCE WITH CONDITIONS OF THE CONTRACT AND DIVISION 1
BOILER CONSTRUCTION 1. HEAT ENGINE	SUBMITTAL PROCEDURES SECTION. B. PRODUCT DATA: SUBMIT MANUFACTURER'S PRODUCT SUBMITTAL DATA AND INSTALLATION INSTRUCTIONS FOR EACH
2. THE HEAT ENGINE SHALL BE A VERTICAL FIRETUBE DOWN-FIRED DESIGN. THE COMBUSTION CHAMBER, FIRETUBES, TUBESHEETS AND SHELL SHALL BE CONSTRUCTED OF TYPE 439 (ASME SA240, UNS S43932)	PRODUCT. C. SHOP DRAWINGS – HYDRONIC SYSTEM
STAINLESS STEEL. THE HEAT ENGINE ASSEMBLY SHALL BE OF ALL-WELDED CONSTRUCTION. THE HEAT ENGINE FOR MODEL TFT154 SHALL BE RATED FOR 30PSI MAXIMUM OPERATING PRESSURE.	1. PROVIDE ENGINEERING ANALYSIS USING MANUFACTURER'S PROPRIETY SOFTWARE.
3. THE HEAT ENGINE SHALL BE ABLE TO ACCEPT UP TO 35% MIXTURE OF INHIBITED PROPYLENE GLYCOL HVAC ANTIFREEZE, WITHOUT DAMAGE TO THE HEAT ENGINE OR OTHER COMPONENTS.	REQUIREMENTS, AND MANIFOLD SCHEDULES WITH DETAILS REQUIRED FOR INSTALLATION OF THE SYSTEM.
4. THE HEAT ENGINE SHALL BE ACCESSIBLE FOR INSPECTION AND CLEANING VIA A REMOVABLE BURNER ACCESS COVER. THE COVER SHALL INCLUDE A FLAME OBSERVATION PORT. 5. THE HEAT ENGINE SHALL BE PROVIDED WITH AN AUTOMATIC AIR VENT (FIELD INSTALLED)	E. DOCUMENTATION:
6. A FACTORY-SUPPLIED FIELD-INSTALLED ANTI-SIPHON TRAP SHALL BE CONNECTED TO THE COMBUSTION CHAMBER FOR COLLECTION AND REMOVAL OF CONDENSATE. THE TRAP SHALL BE TRANSLUCENT TO PERMIT VISUAL	1. PROVIDE MANUFACTURER'S DETAILED INSTRUCTIONS FOR SITE PREPERATION AND PRODUCT INSTALLATION. 2. PROVIDE MANUFACTURER'S ELECTRICAL POWER REQUIREMENTS AND HEAT OUTPUT IN WATTS DELIVERED TO
INSPECTION AND SHALL BE EASILY DISASSEMBLED FOR CLEANING. GAS TRAIN AND COMBUSTION SYSTEM	THE STRUCTURE. 3. PROVIDE DOCUMENTATION INDICATING THE INSTALLER IS TRAINED TO INSTALL THE MANUFACTURER'S
1. THE COMBUSTION SYSTEM SHALL BE FULLY MODULATING WITH A 10:1 TURNDOWN RATIO. 2. THE COMBUSTION SYSTEM SHALL CONTAIN:	PRODUCTS, AS NEEDED. F. QUALITY ASSURANCE AND CONTROL SUBMITTALS:
A. ADJUSTABLE AIR/GAS RATIO VALVE WITH INTEGRAL REGULATOR	1. UPON REQUEST, SUBMIT TEST REPORTS FROM RECOGNIZED TESTING LABORATORIES.
C. VARIABLE SPEED BLOWER UTILIZING PULSE WIDTH MODULATION	1. WARRANTY DOCUMENTS SPECIFIED
D. STAINLESS STEEL CTLINDRICAL PREMIX BURNER WITH WOVEN STAINLESS STEEL MESH COVERING E. DUAL-ELECTRODE SPARK IGNITER	2. OPERATION AND MAINTENANCE DATA 3. MANUFACTURER'S FIELD REPORTS AS SPECIFIED IN THIS DOCUMENT
F. INDEPENDENT FLAME SENSING ELECTRODE. /ENTING AND COMBUSTION AIR	4. FINAL AS-BUILT TUBING LAYOUT DRAWING 3. QUALITY ASSURANCE
1. THE BOILER SHALL BE DESIGNED FOR VENTING WITH 3 INCH DIAMETER POLYPROPYLENE PIPE. MAXIMUM EXHAUST VENT LENGTH SHALL BE 150 EQUIVALENT FT.	A. MANUFACTURER QUALIFICATIONS:
2. THE COMBUSTION CHAMBER EXHAUST OUTLET SHALL INCLUDE A 1/2" DIAMETER PORT WITH A REMOVABLE EPDM PLUG TO PERMIT INSERTION OF A COMBUSTION ANALYZER PROBE.	1. MANUFACTURER SHALL PROVIDE PRODUCTS OF CONSISTENT QUALITY IN APPEARANCE AND PHYSICAL PROPERTIES.
1. THE UNIT INTERNAL STRUCTURE SHALL BE CONSTRUCTED OF 16GA GALVANIZED STEEL.	2. MANUFACTURER SHALL USE THE HIGHEST QUALITY PRODUCTS IN THE PRODUCTION OF SYSTEMS AND COMPONENTS REFERENCED IN THIS DOCUMENT.
2. THE CABINET JACKET SHALL BE CONSTRUCTED OF REMOVABLE PANELS FABRICATED FROM 20GA STEEL FINISHED WITH A DURABLE FACTORY APPLIED COATING ON BOTH SIDES. REMOVAL OF JACKET PANELS SHALL NOT COMPROMISE SEALING OF THE COMPLISION CHAMBER	3. MATERIALS SHALL BE FROM A SINGLE MANUFACTURER TO ENSURE CONSISTENT QUALITY AND COMPATIBILITY.
LECTRICAL	B. INSTALLER QUALIFICATIONS: 1. USE AND INSTALLER WITH DEMONSTRATED EXPERIENCE ON PROJECTS OF SIMILAR SIZE AND COMPLEXITY
1. THE BOILER SHALL OPERATE FROM A 120VAC/1 PHASE/60HZ POWER SUPPLY WITH A CURRENT DRAW OF 12A. 2. A LINE-VOLTAGE BARRIER STRIP SHALL BE PROVIDED FOR CONNECTION OF SUPPLY POWER AND UP TO THREE	AND/OR DOCUMENTATION PROVING SUCCESSFUL COMPLETION OF FAMILIARIZATION TRAINING HOSTED/APPROVED IN WRITING BY THE SYSTEM MANUFACTURER.
(3) CIRCULATOR PUMPS. THE BUILER SHALL BE CAPABLE OF POWERING EACH PUMP UP TO A MAXIMUM OF 1/6 HP OR 3 AMPS @ 120VAC.	2. ELECTRICAL ROUGH-IN AND CONNECTIONS SHALL BE DONE BY A LICENSED ELECTRICIAN. C. CERTIFICATIONS: PROVIDE LETTERS OF CERTIFICATION AS FOLLOWS:
A. OUTDOOR TEMPERATURE SENSOR	1. INSTALLER EMPLOYS SKILLED WORKERS HOLDING A TRADE QUALIFICATION LICENSE OR EQUIVALENT, OR APPRENTICES UNDER THE SUPERVISION OF A LICENSED TRADES PERSON.
B. SYSTEM TEMPERATURE SENSOR C. DHW INDIRECT TANK AQUASTAT OR DHW TEMPERATURE SENSOR	D. REGULATORY REQUIREMENTS AND APPROVALS – HYDRONIC SYSTEMS: PROVIDE A RADIANT SYSTEM THAT COMPLIES WITH THE FOLLOWING REQUIREMENTS:
D. 4–20MA SIGNAL FROM EXTERNAL CONTROL FOR BURNER MODULATION E. EIA–485 COMMUNICATION FOR LEAD–LAG CASCADE CONTROL.	1. INTERNATIONAL CODE COUNCIL (ICC):
<ol> <li>THE SECOND LOW-VOLTAGE BARRIER STRIP SHALL BE FOR CONNECTION OF:</li> <li>A. TWO (2) HEATING THERMOSTATS</li> </ol>	a. INTERNATIONAL MECHANICAL CODE (IMC) b. INTERNATIONAL BUILDING CODE (IBC)
B. EXTERNAL SAFETY LIMIT	C. ICC EVALUATION SERVICE (ES) EVALUATION REPORT No. ESR 1155
CONTROLS	2. INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS (TAPMO): a. UNIFORM MECHANICAL CODE (UMC)
1. THE BOILER CONTROL SYSTEM SHALL OPERATE ON 24VAC PROVIDED BY AN INTERNAL 40VA TRANSFORMER. 2. THE INTEGRATED MICROPROCESSOR—BASED CONTROLLER SHALL INCORPORATE ALL OPERATIONAL AND SAFETY	E. PRE-INSTALLATION MEETINGS 1. VERIEX PROJECT REQUIREMENTS, SUBSTRATE CONDITIONS, EXCAVATION, CONDITIONS, SYSTEM PERFORMANCE
A. BURNER SPARK IGNITION	REQUIREMENTS, COVERINGS, MANUFACTURER'S INSTALLATION INSTRUCTIONS, AND WARRANTY REQUIREMENTS.
C. BURNER FIRING RATE MODULATION	Z. REVIEW PROJECT CONSTRUCTION TIMELINE TO ENSURE COMPLIANCE OF DISCUSS MODIFICATIONS AS REQUIRED. 3. COORDINATE WITH OTHER TRADE REPRESENTATIVES TO VERIEY AREAS OF RESPONSIBILITY.
D. HIGH TEMPERATURE LIMIT (UL353 RATED) 3. THE CONTROLLER SHALL INCORPORATE A PROPORTIONAL-INTEGRAL-DERIVATIVE (PID) ALGORITHM FOR TWO (2)	4. ESTABLISH THE FREQUENCY (DURING CONSTRUCTION PHASE OF THE PROJECT) THE ENGINEER INTENDS FOR
SEPARATE TEMPERATURE CONTROLS: TWO (2) FOR SPACE HEATING WITH INDEPENDENT SETPOINTS. 4. THE CONTROLLER SHALL PERMIT FIELD SELECTION OF THE BOILER CONTROL RESPONSE TO A HIGH TEMPERATURE	SITE VISITS AND INSPECTIONS BY THE MANUFACTURER'S REPRESENTATIVE. F. MOCK-UP: PROVIDE A MOCK-UP FOR EVALUATION OF SURFACE PREPARATION TECHNIQUES AND APPLICATION
LIMIT EXCURSION TO EITHER LOCKOUT OR RECYCLE AND DELAY. THE FACTORY SET RESPONSE SHALL BE RECYCLE AND DELAY.	WORKMANSHIP. 1. FINISH AREAS DESIGNATED BY ARCHITECT.
5. THE CONTROLLER SHALL PROVIDE: A. OPERATION OF UP TO TWO (2) PUMPS: BOILER AND CENTRAL HEATING.	2. DO NOT PROCEED WITH REMAINING WORK UNTIL WORKMANSHIP, COLOR AND SHEEN ARE APPROVED BY ARCHITECT.
B. FIELD-ADJUSTABLE OUTDOOR RESET TO AUTOMATICALLY SET SYSTEM WATER TEMPERATURE BASED ON OUTDOOR AIR TEMPERATURE. AN OUTDOOR SENSOR SHALL BE FACTORY-SUPPLIED FOR FIELD	3. REFINISH MOCK-UP AREAS AS REQUIRED TO PRODUCE ACCEPTABLE WORK. 4. DELIVERY STORAGE AND HANDLING
INSTALLATION C. MANUAL FIRING RATE CONTROL, ADJUSTABLE BETWEEN MINIMUM AND MAXIMUM FIRING RATE	A. GENERAL: COMPLY WITH DIVISION 1 PRODUCT REQUIREMENTS SECTION.
D. WARM WEATHER SHUTDOWN TO DISABLE HEATING, WITH FIELD ADJUSTABLE SETPOINT E. PUMP EXERCISE FOR 10 SECONDS AT 24 HOUR INTERVALS	B. COMPLY WITH MANUFACTURER'S ORDERING INSTRUCTIONS AND LEAD-TIME REQUIREMENTS TO AVOID CONSTRUCTION DELAYS.
F. FREEZE PROTECTION TO OPERATE THE BOILER AND CENTRAL HEAT PUMPS WHEN OUTLET WATER TEMPERATURE FALLS BELOW 45°F, AND FIRE THE BURNER AT MINIMUM MODULATION WHEN THE OUTLET	C. DELIVER MATERIALS IN MANUFACTURER'S ORIGINAL, UNOPENED, UNDAMAGED CONTAINERS WITH IDENTIFICATION LABELS INTACT.
G. FIELD SETTING OF THE FOLLOWING:	D. STORE MATERIALS PROTECTED FROM EXPOSURE TO HARMFUL ENVIRONMENTAL CONDITIONS AND AT TEMPERATURE AND HUMIDITY CONDITIONS RECOMMENDED BY THE MANUFACTURER:
1. LOW TEMPERATURE CENTRAL HEAT (CH1) SETPOINT FROM 60°F TO 190°F 2. HIGH TEMPERATURE CENTRAL HEAT (CH2) SETPOINT FROM 60°F TO 190°F	1. STORE TUBING IN CARTONS OR UNDER COVER TO AVOID DIRT OR FOREIGN MATERIAL FROM ENTERING THE TUBING.
3. OUTDOOR RESET PARAMETERS – LOW TEMPERATURE CENTRAL HEATING 4. OUTDOOR RESET PARAMETERS – HIGH TEMPERATURE CENTRAL HEATING	2. DO NOT EXPOSE TUBING TO DIRECT SUNLIGHT FOR MORE THAN 30 DAYS. IF CONSTRUCTION DELAYS ARE ENCOUNTERED, COVER THE TUBING THAT IS EXPOSED TO DIRECT SUNLIGHT.
5. BOILER PUMP OVERRUN TIME FROM 0 TO 30 MINUTES. 6. CH PUMP OVERRUN TIME FROM 0 TO 10 SECONDS.	5. PROJECT CONDITIONS A. MAINTAIN ENVIRONMENTAL CONDITIONS (TEMPERATURE, HUMIDITY, AND VENTILATION) WITHIN LIMITS RECOMMENDED
7. CH PUMP START DELAY FROM 0 TO 5 SECONDS. 8. WARM WEATHER SHUTDOWN (WWSD) TEMPERATURE FROM 50°F TO 90°F	BY MANUFACTURER FOR OPTIMUM RESULTS. DO NOT INSTALL PRODUCTS UNDER ENVIRONMENTAL CONDITIONS OUTSIDE MANUFACTURER'S ABSOLUTE LIMITS.
9. CH MODULATION SOURCE (INLET, OUTLET, OR SYSTEM WATER TEMPERATURE)	B. MORTAR-SET SYSTEMS: MORTAR SHALL CURE FOR 25 DAYS (OR TIME SPECIFIED BY MORTAR MANUFACTURER) PRIOR TO STARTING HEATING SYSTEMS.
10. LEAD AND LAG SELECTION METHOD (SEQUENCE ORDER OR MEASURED RUNTIME) 11. LEAD ROTATION TIME FROM 0 TO 960 HOURS	6. WARRANTY A DROJECT WARRANTY DEEED TO CONDITIONS OF THE CONTRACT FOR DROJECT WARRANTY DROVISIONS
12. SLAVE ORDER PRIORITY METHOD (EQUALIZE RUNTIME, USE FIRST OR USE LAST) 13. ANTI SHORT-CYCLE INTERVAL FROM 0 TO 60 MINUTES	B. MANUFACTURER'S WARRANTY - HYDRONIC SYSTEMS
14. TEMPERATURE UNITS, "F OR "C. 6. THE CONTROL SYSTEM SHALL INCLUDE A BUILT-IN COLOUR TOUCHSCREEN DISPLAY TO PERMIT MONITORING OF	1. SUBMIT, FOR OWNER'S ACCEPTANCE, MANUFACTURER'S STANDARD WARRANTY DOCUMENT EXECUTED BY AUTHORIZED COMPANY OFFICIAL.
UNIT OPERATION AND FIELD ADJUSTMENT OF CONTROL PARAMETERS. THE CONTROL SHALL SUPPORT THREE (3) LEVELS OF PASSWORD-PROTECTED ACCESS PERMISSION: USER (NO PASSWORD), INSTALLER, AND OEM. THE	2. MANUFACTURER'S WARRANTY IS IN ADDITION TO, AND NOT A LIMITATION OF, OTHER RIGHTS OWNER MAY HAVE UNDER CONTRACT DOCUMENTATION.
DISPLAY SHALL BE CAPABLE OF SHOWING: A. HEAT DEMAND SOURCE	a. WARRANTY COVERS THE REPAIR OR REPLACEMENT OF ANY TUBING OR FITTINGS PROVEN TO BE DEFECTIVE.
B. BURNER STATE C. DEMANDED FIRING RATE IN RPM	b. WARRANTY MAY TRANSFER TO SUBSEQUENT OWNERS.
D. ACTUAL BLOWER RPM E. CURRENT SETPOINT	DEFECT IN MATERIAL OR WORKMANSHIP, BEGINNING WITH DATE OF SUBSTANTIAL COMPLETION.
F. HEAT ENGINE ENTERING WATER TEMPERATURE	FAILURE DUE TO DEFECT IN MATERIAL OR WORKMANSHIP, BEGINNING WITH DATE OF SUBSTANTIAL COMPLETION.
H. EXHAUST GAS TEMPERATURE	e. WARRANTY PERIOD FOR CONTROLS AND ELECTRICAL COMPONENTS IS A 2-YEAR, NON-PRORATED WARRANTY AGAINST FAILURE DUE TO DEFECT IN MATERIAL OR WORKMANSHIP, BEGINNING WITH DATE OF
	SUBSTANTIAL COMPLETION. 7. SYSTEM START-UP
1 THE FOLLOWING SHALL BE FACTORY SUDDUED WITH FACH DOLLED FOR FIELD INSTALLATION.	A. DO NOT START THE SYSTEM FOR A MINIMUM OF 25 DAYS OR AS SPECIFIED BY MORTAR, CONCRETE AND/OR COVERING MANUFACTURER AS APPLICABLE.
A. OUTDOOR AIR TEMPERATURE SENSOR, 10K THERMISTOR	B. VERIFY ALL ELECTRICAL COMPONENTS ARE INSTALLED PER LOCAL AND NATIONAL ELECTRICAL CODE (NEC) PRIOR
B. PRESSURE GAUGE, 0-30PSI C. 3/4 INCH NPT ASME RELIEF VALVE, 30PSI	8. OWNER'S INSTRUCTIONS
ANUALS	A. INSTRUCT OWNER ABOUT OPERATION AND MAINTENANCE OF INSTALLED SYSTEM. B. PROVIDE OWNER WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR INSTALLED COMPONENTS WITHIN THE
1. EACH BOILER SHALL INCLUDE THE FOLLOWING MANUALS:	SYSTEM. C. PROVIDE OWNER WITH ALL OPERATING INSTRUCTIONS/DOCUMENTS FOR SENSORS AND CONTROLS.
A. INSTALLATION AND OPERATING (I&O) MANUAL B. CONTROLLER AND DISPLAY REFERENCE MANUAL	D. PROVIDE OWNER WITH COPIES OF ANY DETAILED LAYOUT DRAWINGS AND PHOTOS OF INSTALLED PRODUCT BEFORE COVERINGS ARE INSTALLED.
C. APPLICATION MANUAL	9. MANUFACTURERS
NSTALLATION	A. ACCEPTABLE MANUFACTURER: WATTS RADIANT, INC.
A. BOILER SHALL BE INSTALLED AND VENTED IN ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS.	(SUBSIDIARY OF WATTS WATER TECHNOLOGIES, INC.)
B. VENTING 1. THE BOILER SHALL BE VENTED AS SHOWN ON THE PLANS AND SPECIFIED BELOW:	SPRINFIELD, MO 65803
A. VENTING METHOD: 1) VERTICAL DIRECT VENT WITH TERMINATION BY MANUFACTURER SPECIFIED CONCENTRIC VENT	(800) 276–2419; (417) 864–6108, FAX: (417) 864–8161 WEB: HTTP://WWW.WATTSRADIANT.COM
TERMINATION KIT OF SEPARATE EXHAUST AND COMBUSTION AIR PIPES B. EXHAUST VENTING	B. SUBSTITUTIONS: APPROVED EQUAL
1) FOAM CORE PIPE IS NOT AN APPROVED EXHAUST VENT MATERIAL AND SHALL NOT BE USED.	

1) COMBUSTION AIR INLET MATERIAL SHALL BE (SELECT ONE): i. 3 INCH SCHEDULE 40 PVC PIPE.

2) COMBUSTION AIR INLET LENGTH SHALL NOT EXCEED 150 EQUIVALENT FT.

1. CROSS LINKED POLYETHYLENE TUBING (PEX): STANDARD GRADE HYDROSTATIC PRESSURE RATINGS FROM PLATICS PIPE INSTITUTION IN ACCORDANCE WITH TR-3 AS LISTEN IN TR-4. THE FOLLOWING THREE STANDARD-GRADE HYDROSTATIC RATINGS ARE REQUIRED:

B. PERFORMANCE REQUIREMENTS: PROVIDE HYDRONIC SYSTEM THAT IS MANUFACTURED, FABRICATED AND INSTALLED TO COMPLY WITH REGULATORY AGENCIES AND AUTHORITIES WITH JURISDICTION. AND MAINTAIN PERFORMANCE CRITERIA STATED BY THE TUBING MANUFACTURER WITHOUT DEFECTS, DAMAGE, OR FAILURE.

b. SHOW COMPLIANCE WITH DIN 4726 REGARDING OXYGEN DIFFUSION CONCERNS WHERE APPLICABLE.

2. USE THE TUBING MANUFACTURER'S BEND SUPPORTS IF RADIUS IS LESS THAN STATED. F. BARRIER TUBING TYPE: WATTS RADIANT RADIANTPEX+ AND WATTS RADIANT RADIANTPEX

1. MANUFACTURED IN ACCORDANCE WITH ASTM F876 AND ASTM F877

2. TESTED FOR COMPLIANCE BY AN INDEPENDENT THIRD-PARTY AGENCY

A. MATERIAL:

PROTECTIO B. MATERIAL STANDARD:

C. PRESSURE RATINGS:

1. CROSS-LINKED POLYETHYLENE (PEX)

1. STANDARD GRADE HYDROSTATIC DESIGN

1. NO LESS THAN SIX TIMES THE OUTSIDE DIAMETER.

THE PLASTICS INDUSTRY (SPI)

1. 73.4°F AT 160 PSI

2. 180°F AT 100 PSI

3. 200°F AT 80 PSI

E. MINIMUM BEND RADIUS (COLD BENDING)

1. OXYGEN DIFFUSION BARRIER

D. TEMPERATURE/PRESSURE RATINGS: SHALL BE CAPABLE OF WITHSTANDING TEMPERATURES OF:

a. TUBING HAS AN OXYGEN DIFFUSION BARRIER THAT SHALL NOT EXCEED AN OXYGEN DIFFUSION RATE OF 0.10 G/CUBIC METER (0.000062 LB/CU. FT) PER DAY AT 104'F WATER TEMPERATURE IN

ACCORDANCE WITH GERMAN DIN 4726.

b. TUBING ALSO ADDS A PROTECTIVE POLYPROPYLENE LAYER TO THE OUTSIDE OF THE EVOH BARRIER.

2. MANUFACTURED BY PEX-b OR SILANE METHOD TO ENSURE THE HIGHEST LEVEL OF OXIDATION

2. PRESSURE RATINGS AS ISSUED BY THE PLASTICS PIPE INSTITUTE (PPI), A DIVISION OF THE SOCIETY OF

F876, AS INDICATED ON DRAWINGS. G. NON-BARRIER TUBING TYPE: WATTS WATERPEX

1. WATTS WATERPEX TUBING DOES NOT FEATURE AN OXYGEN DIFFUSION BARRIER. 2. NOMINAL INSIDE DIAMETER: PROVIDE TUBING WITH NOMINAL INSIDE DIAMETER IN ACCORDANCE WITH ASTM

F876, AS INDICATED ON DRAWINGS. 3. AN OXYGEN DIFFUSION BARRIER TUBING IS NOT REQUIRED IF ONE OF THE FOLLOWING DESIGN STRATEGIES IS USED:

a. ISOLATE THE FERROUS MATERIALS IN THE BOILER AND OTHER COMPONENTS WITHIN THE PRIMARY SIDE OF THE MECHANICAL SYSTEM WITH A HEAT EXCHANGER. i. USE NON-FERROUS COMPONENTS WITHIN THE SECONDARY SYSTEM SIDE (PUMPS, EXPANSION

TANK, ETC.)

b. USE NON-FERROUS COMPONENTS WITHIN THE ENTIRE FLUID PATHWAY H. USE WATTS RADIANT RADIANTPEX OR RADIANTPEX+ TUBING WHEN OXYGEN DIFFUSION BARRIER TUBING IS

REQUIRED. USE WATTS WATERPEX WHEN NON-BARRIER TUBING IS REQUIRED. 11. MANIFOLDS AND FITTINGS

A. MANIFOLDS (STAINLESS STEEL)

1. FOR SYSTEM COMPATIBILITY, USE 1" STAINLESS STEEL MANIFOLDS OFFERED BY THE RESPECTIVE TUBING MANUFACTURER.

2. MANIFOLDS SHALL PROVIDE INDIVIDUAL FLOW CONTROL FOR EACH LOOP OF THE MANIFOLD THROUGH VALVE ACTUATORS AVAILABLE FROM THE MANIFOLD SUPPLIER. 3. MANIFOLDS SHALL FEATURE MANUAL FLOW BALANCING CAPABILITY WITHIN THE MANIFOLD BODY FOR

BALANCING UNEQUAL LOOP LENGTHS ACROSS THE MANIFOLD. BALANCE VALVES SHALL NOT BE BALL VALVES. 4. MANIFOLDS ACCOMMODATE 3/8 - 3/4" RADIANTPEX+ TUBING. 5. EACH MANIFOLD LOCATION SHALL HAVE THE ABILITY TO VENT AIR MANUALLY FOR THE SYSTEM.

B. STAINLESS STEEL 1" MANIFOLDS 1. HEAVY DUTY, DIN STANDARD, 304 STAINLESS STEEL

2. MATCHING FITTINGS AND ACCESSORIES ARE MADE OF SOLID BRASS AND ARE HEAVILY PLATED WITH NICKEL TO MATCH THE APPEARANCE OF THE MANIFOLD TRUNK.

3. INTERNAL BALANCING VALVES

4. 0-2.5 GPM FLOW METERS

5. MANIFOLD BRACKETS 6. ALL CONNECTIONS ARE BSP (BRITISH STANDARD PIPE) OR STRAIGHT THREAD AND REQUIRE THE USE OF THE INCLUDED GASKET.

7. 2.125" OC CIRCUIT SPACING 8. 12 GPM MAXIMUM FLOW RATE

C. FITTINGS

B. ACCESSORIES

14. EXAMINATION

A. SITE TESTS:

18. CLEANING

20. PROTECTION

9. 194°F MAXIMUM OPERATING TEMPERATURE

10. 87 PSI MAXIMUM OPERATING PRESSURE

11. 2.5 GPM PER CIRCUIT MAXIMUM FLOW RATE

1. FOR SYSTEM COMPATIBILITY, USE FITTINGS OFFERED BY THE TUBING MANUFACTURER.

a. THE FITTING ASSEMBLY SHALL COMPLY WITH ASTM F877 AND CAN/CSA B137.5 REQUIREMENTS b. FITTINGS SHALL BE DESIGNED TO WORK WITH EITHER ASTM F1807 CRIMPRINGS OR ASTM F2098 CINCHCLAMPS OR A COMPRESSION FERRULE, AND ARE DESIGNATED TO BE USED WITH ASTM F876 (SDR-9) RATED PEX TUBING.

c. AVAILABLE CONNECTIONS: SWEAT, NPT, BSP d. MATERIAL: UNS 31400 COPPER ALLOY, UNS 36000 COPPER ALLOY, UNS 37700 COPPER ALLOY

12. SUPPLY AND RETURN PIPING A. SUPPLY-AND-RETURN PIPING TO THE MANIFOLDS (ABOVE GROUND PIPING): . PROPERLY SIZE SUPPLY AND RETURN DISTRIBUTION PIPING FOR THE GIVEN VOLUME AND VELOCITIES

A. ROOM TEMPERATURE CONTROLS:

REQUIRED AT SYSTEM DESIGN. 13. ROOM TEMPERATURE CONTROLS

1. THERMOSTAT: DIGITAL, PROGRAMMABLE, AIR, 24V

2. ALL THERMOSTATS SHALL OPERATE WITHIN A ONE DEGREE DIFFERENTIAL TEMPERATURE INCORPORATING PULSE-WIDTH MODULATION ACTION. 3. INSTALL A WATTS RADIANT THERMOSTAT (HEAT ONLY) WITH DIGITAL DISPLAY IN EACH ROOM OR ZONE AS REQUIRED. a. THE WATTS RADIANT DUALTEMP THERMOSTAT SHALL HAVE THE ABILITY TO SENSE THE TEMPERATURE OF THE AIR, FLOOR, OR A COMBINATION OF AIR AND FLOOR.

1. STAPLES: WATTS RADIANT FOAMBOARD STAPLES 2. TERMINAL 90-DEGREE EXIT BEND: TERMINAL BEND SUPPORTS

A. SITE VERIFICATION OF CONDITIONS: . VERIFY THAT SIT CONDITIONS ARE ACCEPTABLE FOR INSTALLATION OF THE SYSTEM. REFER TO MANUFACTURER'S INSTALLATION MANUAL FOR INFORMATION.

2. DO NOT PROCEED WITH INSTALLATION OF THE SYSTEM UNTIL UNACCEPTABLE CONDITIONS ARE CORRECTED. 15. INSTALLATION OF FLOOR HEATING SYSTEMS A. COMPLY WITH MANUFACTURER'S PRODUCT DATA, INCLUDING PRODUCT TECHNICAL BULLETINS, INSTALLATION

INSTRUCTIONS AND DESIGN DRAWINGS, INCLUDING THE FOLLOWING: 1. INSTALLATION MANUALS

2. DESIGN SOFTWARE ENGINEERING AND ANALYSIS B. SLAB-ON-GRADE INSTALLATION:

1. FASTEN THE TUBING TO THE FLAT MESH OR REINFORCING BAR IN ACCORDANCE WITH THE TUBING MANUFACTURER'S INSTALLATION RECOMMENDATIONS. 2. USE CLOSER TUBING ON-CENTER DISTANCES ALONG EXTERIOR WALLS. INCREASE TUBING ON-CENTER DISTANCES AS THE INSTALLATION MOVES AWAY FROM THE EXTERIOR WALL AS DETERMINED BY

MANUFACTURER ANALYSIS 3. STABLE THE TUBING TO THE INSULATION BOARD. INSULATION SHALL BE PROVIDED BY THE GENERAL

CONTRACTOR 4. INSTALL EDGE INSULATION WHERE THE HEATED PANEL DIRECTLY CONTACTS AN EXTERIOR WALL OR PANEL. 5. INSTALL TUBING AT A CONSISTENT DEPTH BELOW THE SURFACE ELEVATION. ENSURE SUFFICIENT

CLEARANCE TO AVOID CONTROL JOINT SAW CUTTING 6. WHERE TUBING CROSSES METAL EXPANSION JOINTS IN THE CONCRETE, ENSURE THE TUBING PASSES BELOW THE JOINTS OR IS SLEEVED THROUGH THE JOINT. 16. FIELD QUALITY CONTROL AND TESTING

1. TO ENSURE SYSTEM INTEGRITY, PRESSURE TEST THE SYSTEM BEFORE COVERING TUBING IN CONCRETE OR WHEN OTHER TRADES ARE WORKING IN THE VICINITY OF THE TUBING. 2. TEST ALL ELECTRICAL CONTROLS IN ACCORDANCE WITH RESPECTIVE INSTALLATION MANUALS.

3. SYSTEM SHALL BE CHECKED AFTER 3 YEARS OF OPERATION AND EVERY YEAR THEREAFTER. SYSTEM SHALL BE CHECKED FOR PH LEVELS TO ENSURE THAT IT IS OPERATING WITHIN SUGGESTED GUIDELINES. 17. SYSTEM ADJUSTING

A. BALANCING ACROSS MANIFOLD: BALANCE ALL LOOPS ACROSS EACH MANIFOLD FOR EQUAL FLOW RESISTANCE BASED ON ACTUAL LOOP LENGTHS AND TOTAL MANIFOLD FLOW. B. BALANCING BETWEEN MANIFOLDS IS ACCOMPLISHED WITH A FLOW CONTROL DEVICE INSTALLED ON THE RETURN PIPING LEG FROM EACH MANIFOLD WHEN DIRECT RETURN PIPING IS USED FOR THE SUPPLY AND RETURN MAINS OR THE CIRCUITS DEVIATE BY MORE THAN 10%.

A. REMOVE TEMPORARY COVERINGS AND PROTECTION OF ADJACENT WORK AREAS. B. REPAIR OR REPLACE DAMAGED INSTALLED PRODUCTS.

C. CLEAN INSTALLED PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS PRIOR TO OWNER'S ACCEPTANCE.

D. REMOVE CONSTRUCTION DEBRIS FROM PROJECT SITE AND LEGALLY DISPOSE OF DEBRIS.

19. DEMONSTRATION A. DEMONSTRATE OPERATION OF SYSTEM TO OWNER OR OWNER'S PERSONNEL

B. PROVIDE OWNER OR OWNER'S PERSONNEL WITH MANUFACTURER'S INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS FOR INSTALLED COMPONENTS WITHIN THE SYSTEM.

A. PROTECT INSTALLED WORK FROM DAMAGE CAUSED BY SUBSEQUENT CONSTRUCTION ACTIVITY ON THE SITE. PROVIDE OWNER WITH COPY OF PHOTOS AND DRAWINGS OF PRODUCT LOCATIONS TO ASSIST.

![](_page_25_Picture_161.jpeg)

![](_page_25_Picture_162.jpeg)

![](_page_26_Figure_0.jpeg)

# DEMOLITION NOTES:

- 1. THESE DEMOLITION PLANS ARE INTENDED TO BE USED AS A GUIDE TO THE CONTRACTOR. ALL DEMOLITION WORK REQUIRED, OR NECESSARY FOR THE INSTALLATION OF NEW WORK OR THE REMOVAL OF EXISTING EQUIPMENT, IS HEREBY INCLUDED, WHETHER SHOWN ON THESE PLANS OR NOT. REFER TO DRAWINGS OF ALL TRADES FOR ADDITIONAL WORK, AND COORDINATE IN THE FIELD.
- 2. THE CONTRACTOR SHALL VERIFY ACTUAL SITE CONDITIONS PRIOR TO SUBMITTING HIS BID. THE CONTRACTOR SHALL INCLUDE ALL DEMOLITION WORK NECESSARY FOR THE EFFECTIVE INSTALLATION AND PERFORMANCE OF NEW SYSTEMS. THE CONTRACTOR SHALL ALSO INCLUDE TEMPORARY REMOVAL AND REINSTALLATION OF EXISTING WORK WHEREVER NECESSARY. THE OWNER SHALL NOT ACCEPT EXTRA COSTS ASSOCIATED WITH THE DEMOLITION AND/OR TEMPORARY REMOVAL/REINSTALLATION WORK FROM THE CONTRACTOR.
- 3. THIS CONTRACTOR SHALL REMOVE ALL LIGHTING FIXTURES AND ELECTRICAL DEVICES AS INDICATED ON THE DEMOLITION PLANS, OR THAT ARE NO LONGER NEEDED BY THE OWNER. ALL EXISTING WIRING AND CONDUIT WHERE NO LONGER REQUIRED SHALL BE REMOVED BACK TO EXISTING PANEL. ALL EXISTING DISCONNECTED CIRCUITS NOT BEING REUSED SHALL BE TURNED OFF AND LABELED "SPARE". WHERE CONDUITS ARE INACCESSIBLE, REMOVE WIRE AND ABANDON CONDUITS.
- 4. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY POWER IS BEING PROVIDED TO ALL EXISTING EQUIPMENT REQUIRED TO REMAIN IN SERVICE. RECONNECT ALL DISTURBED FACILITIES WHICH ARE EXISTING TO REMAIN AND PLACE THEM IN OPERATIONAL CONDITION.
- 5. REMOVE ALL WIRING DEVICES FROM WALLS TO BE DEMOLISHED. REMOVE EXISTING LIGHT SWITCHES WHERE NO LONGER REQUIRED. REUSE ALL EXISTING CONCEALED CONDUIT AND RECESSED DEVICE BOXES WHERE POSSIBLE. ABANDON BOXES IF THEY ARE IN EXISTING WALLS TO REMAIN. PATCH WALLS OVER ABANDONED BOXES TO MATCH ADJACENT SURFACES.
- 6. REMOVE ABANDONED OUTLET BOXES, SURFACE METAL RACEWAY AND CONDUIT THAT WOULD BE EXPOSED, AND REPAIR DISTURBED SURFACES TO MATCH ADJACENT AREAS.
- 7. MAJOR PIECES OF EQUIPMENT ARE TO BE TURNED OVER TO THE OWNER FOR HIS USE, OR AT THE OWNER'S DISCRETION, REMOVED FROM THE SITE AND DISPOSED OF, IF NO LONGER REQUIRED.
- 8. PATCH ALL WALLS TIGHT AT REMOVALS. MAINTAIN FIRE RATINGS AS REQUIRED.
- 9. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL DRAWINGS FOR THE EXTENT OF WALL FINISHES AND CEILINGS TO BE REPLACED. ALL EXISTING DEVICES TO REMAIN SHALL BE TEMPORARILY DISCONNECTED AND REINSTALLED. WHERE TEMPORARY REMOVAL IS NOT POSSIBLE THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT OF EXISTING EQUIPMENT IN PLACE.

![](_page_26_Picture_15.jpeg)

![](_page_26_Picture_16.jpeg)

# ELECTRICAL SYMBOL LIST

<b>□</b> 2	LIGHT FIXTURE - SEE LIGHT FIXTURE SCHEDULE
$\square$	EMERGENCY BATTERY PACK - SEE LIGHT FIXTURE SCHEDULE
ً⊗	EXIT SIGN - SEE LIGHT FIXTURE SCHEDULE
42	REMOTE HEAD - SEE LIGHT FIXTURE SCHEDULE
	208/120 VOLT PANELBOARD
Φ <sup>G</sup> FI	DUPLEX RECEPTACLE, 20A, 125V, 2 POLE, 3 WIRE, GROUNDED GFI INDICATES GROUND FAULT INTERRUPTION Q INDICATED DOUBLE DUPLEX (QUAD) RECEPTACLE
Ħ	DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER HEIGHT
φ	SPECIAL PURPOSE RECEPTACLE, COORDINATE NEMA CONFIGURATION WITH EQUIPMENT
$\mathbf{\nabla}$	VOICE/DATA OUTLET
S	SINGLE POLE LIGHT SWITCH
S <sub>3</sub>	THREE WAY LIGHT SWITCH
٥	MOTOR
-	UNFUSED DISCONNECT
<b>⊠</b> ⊦	COMBINATION STARTER CIRCUIT BREAKER
D	MOTORIZED DOOR OPERATOR
T	TRANSFORMER
$\frown$	WIRE & CONDUIT, EXPOSED INSIDE BUILDING
$\frown$	HOMERUN TO PANEL, NUMERAL INDICATES CIRCUIT NUMBER
$\frown$	CONNECTION TO EQUIPMENT
Е	EXISTING TO REMAIN
ER	EXISTING TO BE RELOCATED, CAREFULLY REMOVE AND STORE AND SAFE-OFF ALL WIRING FOR FUTURE EXTENSION TO NEW
RL	RELOCATE EXISTING TO THIS LOCATION, COORDINATE EXACT PROVIDE NEW WIRING TO EXTEND EXISTING WIRING AS REQUIF WIRING TYPE AND SIZE
WP	WEATHERDRAAF

			LIGHTING FIXT	UR
ID	LAMPS	MANUF.	CAT. NO.	мо
A	88W LED SPX 35	FAILSAFE	HDF-4-LDF-2-STD-35-120- EDC1 (OR APPROVED EQUAL)	PE
AE	88W LED SPX 35	FAILSAFE	HDF-4-LDF-2-STD-35-120- EDC1-EL10W (OR APPROVED EQUAL)	PEI
В	53W LED SPX 35	METALUX	SNLED-LD1-52-UNV-LW- L835-CD2-U	PEI
BE	53W LED SPX 35	METALUX	SNLED-LD1-52-UNV-EL14W-LW- L835-CD2-U	PEI
CE	29W LED SPX 35	LUMARK	LD-WP-FC-3B-120-EMLED-CD (OR APPROVED EQUAL)	SUI
x	LED	EMERGI-LITE	WW-PDN-1R	SUI
X1	LED	EMERGI-LITE	WW-SVXN-1R-4X	SU

![](_page_27_Figure_7.jpeg)

![](_page_27_Figure_9.jpeg)

/8"	=	1'-0"	

ATHERPRC	OF	' L(	DADCENTER	ίL	C'			
/277V, 3ø, 4W, S/N, SUR	FACE,	60A MA	IN LUGS ONLY, 42 KAIC					
WIRE & CONDUIT	ØA	ØB ØC	WIRE & CONDUIT	CIR. B AMP	REAKER POLES	LOAD KVA	DESCRIPTION	скт#
#10 & 1 #10 GRD-3/4"C	-+-		3 #10 & 1 #10 GRD-3/4"C	30	3	20	HOIST	2
		┥┼╴						4
		┼┿╴						6
	_+_	++	-	-	1	-	SPACE	8
		┥┼-	-	-	1	-	SPACE	10
		┼┿╴	-	-	1	-	SPACE	12
						20.0	SUB TOTAL KVA	
ONNECTED LOAD								-

![](_page_27_Picture_14.jpeg)

![](_page_28_Figure_0.jpeg)

				ł	EXISTING PA	łΝ	ΙE	LB	OARD 'N3'						
	208/120V, 3Ø, 4W, S/N, SURFACE, 400A MAIN CIRCUIT BREAKER, 42 KAIC														
CKT#	DESCRIPTION	LOAD KVA	cir. Br Poles	EAKE	WIRE & CONDUIT	ø	A ØE	3 øC	WIRE & CONDUIT	CIR. B	REAKEI POLES	LOAD KVA	DESCRIPTION	скт#	
1	HIGH BAY LTG.	-	1	20	EXISTING	-			EXISTING	20	1	-	MEZZ. LIGHTING	2	
3	HIGH BAY LTG.	-	1	20	EXISTING	]—	┼╺┥		EXISTING	20	1	-	OFFICE LIGHTING	4	
5	HIGH BAY RECEPTACLE	-	1	20	EXISTING	]—		-+-	EXISTING	20	1	-	MEZZ. LIGHTING	6	
7	OFFICE RECEPTACLE	-	1	20	EXISTING	]—	┥┤		EXISTING	20	1	-	OFFICE RECEPTACLE	8	
9	OFFICE RECEPTACLE	-	1	20	EXISTING	]–	┼╺┥		EXISTING	20	1	-	BATHRM RECEPTACLE	10	
11	MEZZ. RECEPTACLE	-	1	20	EXISTING	]—		-+-	EXISTING	20	1	-	COMM RM/HIGH BAY RECEP. DATA 3W	12	
13	HOT WATER	-	1	20	EXISTING	]—	┥┤		EXISTING	20	1	-	HIGH BAY RECEP.	14	
15	FAN COMM. ROOM	-	1	20	EXISTING	]_	┼╺┥		EXISTING	20	1	-	HIGH BAY RECEP.	16	
17	A/C UNIT	-	2	60	EXISTING	]_		-+-	EXISTING	20	1	-	COOLERS RECEP.	18	
19						-	┥┤		EXISTING	20	1	-	DOOR OPERATOR	20	
21	A/C UNIT	-	2	20	EXISTING	]_	┼╺┥		EXISTING	20	3	-	LARGE EXHAUST FAN	22	
23						-	$\left  \right $	-+-						24	
25	AIR COMPRESSOR	-	2	20	EXISTING	]_	┥┤							26	
27						-	┼╺┥		EXISTING	20	1	-	TRUCK RECEP.	28	
29	TRUCK RECEP.	-	1	20	EXISTING	]_		-+-	EXISTING	20	1	-	TRUCK RECEP.	30	
31	TRUCK RECEP.	-	1	20	EXISTING	]_	┥┤		EXISTING	20	1	-	TRUCK RECEP.	32	
33	TRUCK RECEP.	-	1	20	EXISTING	]_	┼╺┥		EXISTING	20	1	-	TRUCK RECEP.	34	
35	TRUCK RECEP.	-	1	20	EXISTING	]_		-+-	EXISTING	20	1	-	FRONT GFI RECEP.	36	
37	TRUCK RECEP.	-	1	20	EXISTING	1–	┥┤		EXISTING	20	1	-	TRUCK RECEP.	38	
39	TRUCK RECEP.	-	1	20	EXISTING	1–	┤┥		EXISTING	20	1	-	TRUCK RECEP.	40	
41	SPACE	-	1	-	-	1–	$\left  \right $	_	· _	-	1	-	SPACE	42	
	SUB TOTAL KVA	_										_	SUB TOTAL KVA		
		_	TOTAL	CONN										_	

				F	XISTING P.	ANE	LBC	OARD 'EDP'										EXISTING	PAN	١E	LB	DARD 'E3'					
	208/120V, 3Ø, 4W, S/N, SURFACE, 400A MAIN CIRCUIT BREAKER, 42 KAIC																	208/120V, 3ø, 4W, S	/N, SU	RFAC	CE, 250	A MAIN LUGS ONLY					
скт#	DESCRIPTION	LOA KV/	D CIR. I POLE	BREAKE	R WIRE & CONDUIT	ØA	øB øC	WIRE & CONDUIT	CIR. BRI AMP P	POLES	LOAD KVA DESCRIPTION	скт#	c	CKT#	DESCRIPTION	LOAD KVA	R. BREA	KER WIRE & CONDUIT	¢	ØA Ø	B ØC	WIRE & CONDUIT	IR. BF	REAKE	LOAD KVA	DESCRIPTION	скт#
1	PANEL E5	-	3	100	EXISTING			4 #1 & 1 #6 GRD - 2"C	125	3	29.4 PANEL E3A	2	*	1	HIGH BAY LIGHTING	_	1 2	0 EXISTING	-	•	$\square$	EXISTING	20	1	_	EXTERIOR LIGHTING	2
3												4		3	OFFICE RECEP.	-	1 2	0 EXISTING		+	<mark>∳ -   -  </mark>	EXISTING	20	1	-	OFFICE RECEP.	4
5							┼┿╴					6		5	HIGH BAY RECEP.	-	1 2	0 EXISTING			╎╌┿╌╽	EXISTING	20	2	-	HEATER UNIT	6
7	SPACE	-	1	-	-			_	-	1	– SPACE	8		7	GENERATOR RECEP.	-	1 2	0 EXISTING		+							8
9	SPACE	-	1	-	-	$\Box +$		-	-	1	– SPACE	10		9	DATA SWITCH RECEP.	-	1 2	0 EXISTING		+	<mark>∳ -   -  </mark>	EXISTING	20	1	-	IGNITORS & PUMP H	T. 10
11	SPACE	-	1	-	-	$\square$ +	++	_	-	1	– SPACE	12		11	-	-	1 2	0 EXISTING		_	╎╌┿╌╽	EXISTING	20	1	-	IGNITOR HEAT	12
13	PANEL E2	-	3	125	EXISTING	+	+ +	_	-	1	– SPACE	14		13	BATH/OFF/LOB. LTG.	-	1 2	0 EXISTING		+		EXISTING	20	1	-	OFFICE RECEP.	14
15							+	-	-	1	– SPACE	16		15	OFFICE RECEP.	-	1 2	0 EXISTING		+	<mark>∳ </mark>	EXISTING	20	1	-	OFFICE RECEP.	16
17							++	-	-	1	– SPACE	18		17	HEATER UNIT	-	1 2	0 EXISTING		_	╎╌┿╌╽	EXISTING	20	1	-	OFFICE RECEP.	18
19	SPACE	-	1	-	-	]+		-	-	1	– SPACE	20		19	ELEC/COMM/OFF. LTG.	-	1 2	0 EXISTING		┥	<b>├</b> ─	EXISTING	20	1	-	TRUCK RECEP.	20
21	SPACE	-	1	-	-	$\Box +$		-	-	1	– SPACE	22		21	ELEC. RM RECEP.	-	1 2	0 EXISTING		+	<mark>∳ -   -  </mark>	EXISTING	20	1	-	TRUCK RECEP.	22
23	SPACE	-	1	-	-	$\Box +$	++	-	-	1	– SPACE	24		23	LIGHTING ADDITION	-	1 2	0 2 #12 & 1 #12 GRD - 3	/4"C —	_	╎╌┿╌╽	EXISTING	20	3	-	LIFT	24
25	SPACE	-	1	-	-	]+		-	-	1	– SPACE	26		25	LIGHTING ADDITION	-	1 2	0 2 #12 & 1 #12 GRD - 3	/4"C —	┥	$\left  - \right $						26
27	SPACE	-	1	-	-		+	_	-	1	– SPACE	28		27	SPARE	-	1 2	0 –		+	┝───┃						28
29	SPACE	-	1	-	-			_	-	1	– SPACE	30		29	SPARE	-	1 2	0 –		_	╎─┿─│	EXISTING	60	3	-	10 HP	30
		-			225A/3	3P SUBFE	ED TO P	ANEL 'E1'		-				31	LIFT	-	2 2	0 EXISTING		┥	$\left  - \right $					AIR COMPRESSOR	32
					225A/3	3P SUBFE	ED TO P	ANEL 'E3'						33					-	+	┝─┼─┃						34
31	SPACE	-	1	_	_			_	-	1	– SPACE	32		35	SPACE	-	1 .		<b>-</b>  -		╎╌┿╌┃	2 #12 & 1 #12 GRD - 3/4"C	20	1	-	FACP	36
33	SPACE	-	1	_	_			_	-	1	– SPACE	34		37	SPACE	-	1 .		<b>-</b>  -	+	<b>├ </b>	-		1	-	SPACE	38
35	SPACE	_	1	_	_			_	-	1	– SPACE	36		39	SPACE	-	1 .		<b>-</b>  -	+	<mark>∳ -   -  </mark>	-		1	-	SPACE	40
	SUB TOTAL K	VA –									- SUB TOTAL KVA			41	SPACE	-	1 .		- -	+	╎─┿─┃	-	_	1	-	SPACE	42
		_	TOTA	L CON	NECTED LOAD								Ŀ		SUB TOTAL KVA	_		•			<u> </u>			4	-	SUB TOTAL KVA	+
														1		_ ·	TOTAL CO	DNNECTED LOAD									-

\* PROVIDE NEW CIRCUIT BREAKER, IN EXISTING SPACE, TYPE AND AIC RATING TO MATCH EXISTING IN PANELBOARD

NEW	PANELBOARD	'N3A'	

					208/120V, 3ø, 4W, S/N, SL	JRF	ACE	., 22	25A	M	AIN LUGS	ON	ILY, 42 KAIC				
скт#	DESCRIPTION	LOAD KVA	cir. Br Poles	EAKER AMP	WIRE & CONDUIT		øA	∧ øE	3 Ø(	с	WIR	εð	& CONDUIT	CIR. I AMP	BREAKER POLES	LOAD KVA	DESCRI
1	WELDER	8.0	2	50	2 #6 & 1 #10 GRD - 1"C		_			_	2 #6 8	& 1	#10 GRD - 1"C	50	2	8.0	WELDER
3																	
5	TIRE BALANCER RECEP.	1.0	1	20	2 #12 & 1 #12 GRD - 3/4	."С			-	-	2 #12 &	1	#12 GRD - 3/4"(	20	1	1.0	MOTORIZED
7	TIRE MOUNTER RECEP.	1.0	1	20	2 #12 & 1 #12 GRD - 3/4	."С					2 #12 &	1	#12 GRD - 3/4"(	20	1	1.0	MOTORIZED
9	TIRE BALANCER	3.0	3	20	3 #12 & 1 #12 GRD - 3/4	."С		┝─┥	-		2 #12 &	1	#12 GRD - 3/4"(	20	1	1.0	MOTORIZED
11									-	<b>)</b>	2 #12 &	1	#12 GRD - 3/4"(	20	1	1.0	MOTORIZED
13							-				2 #12 &	1	#12 GRD - 3/4"(	20	1	0.7	RECEP. BAC
15	TIRE BALANCER	3.0	3	20	3 #12 & 1 #12 GRD - 3/4	."С		┝─┥			2 #12 &	1	#12 GRD - 3/4"(	20	1	0.1	LIGHTS IN W
17									-	<b>)</b>	2 #12 &	1	#12 GRD - 3/4"(	20	1	0.7	RECEP. BAC
19							-				3 <b>#</b> 12 &	1	#12 GRD - 3/4"(	15	2	0.7	EF-3
21	HV–1	3.06	3	20	3 #12 & 1 #12 GRD - 3/4	"С		┝─┥									
23									-	<b>)</b>			-	20	1	-	SPARE
25							-				2 #12 &	1	#12 GRD - 3/4"(	20	1	0.3	LIGHTING WA
27	RECEPTACLES	0.7	1	20	2 #12 & 1 #12 GRD - 3/4	"С		┝─┥					-	20	1	-	SPARE
29	LOAD CENTER LC	30.0	3	125	3 #1 & 1 #6 GRD - 2"C					-			-	20	1	-	SPARE
31							-						-	20	1	-	SPARE
33								┝─┥					-	20	1	-	SPARE
35	SPARE	١	1	20	-					-			-	20	1	-	SPARE
37	SPARE	١	1	20	-		-						-	-	1	-	SPACE
39	SPARE	١	1	20	-			┝─┥					-	-	1	-	SPACE
41	SPARE	١	1	20	-					<u> </u>			-	-	1	-	SPACE
	SUB TOTAL KVA	49.76														14.5	SUB TOTAL
		64.2	26 KVA	TOTAL	L CONNECTED LOAD												

\* PROVIDE NEW CIRCUIT BREAKER, IN EXISTING SPACE, TYPE AND AIC RATING TO MATCH EXISTING IN PANELBOARD

# ADDRESSABLE MONITOR

PTION	скт#
	2
	4
DOOR	6
DOOR	8
DOOR	10
DOOR	12
CK WALL	14
WASH BAY	16
CK WALL	18
	20
	22
	24
ASH BAY	26
	28
	30
	32
	34
	36
	38
PTION DOOR DOOR DOOR COR DOOR K WALL ASH BAY ASH BAY	40
	42
KVA	

					208/1200, 30, 4W, S/N, SURF	ACE, ZZOA M/	AIN LUGS UNLT, 42 KAIC	-				
CKT#	DESCRIPTION	LOAD KVA	cir. Br Poles	EAKER AMP	WIRE & CONDUIT	ØA ØB ØC	WIRE & CONDUIT	CIR. B	REAKER POLES	LOAD KVA	DESCRIPTION	СКТ#
1	AIR COMPRESSOR	8.7	2	100	2 #6 & 1 #8 GRD - 1"C	+++-	3 #1 & 1 #6 GRD - 1-1/2"C	125	3	30.0	EUH—1	2
3	7.5 HP											4
5	AIR COMPRESSOR	6.4	2	70	2 #8 & 1 #8 GRD - 1"C							6
7	ING. RAND 2340 (5HP)					+++-	2 #10 & 1 #10 GRD - 3/4"C	30	2	5.0	LIFT	8
9	SPARE	_	1	20	_							10
11	SPARE	_	1	20	_		2 #10 & 1 #10 GRD - 3/4"C	30	2	5.0	LIFT	12
13	SPARE	_	1	20	-	+++-						14
15	REFRIGERATOR	1.0	1	20	2 #12 & 1 #12 GRD - 3/4"C		2 #10 & 1 #10 GRD - 3/4"C	30	2	5.0	LIFT	16
17	HWH—1	2.5	2	20	2 #12 & 1 #12 GRD - 3/4"C							18
19						+++-	2 #12 & 1 #12 GRD - 3/4"C	20	1	-	RECEP.	20
21	KITCHEN RECEPTACLE	_	1	20	2 #12 & 1 #12 GRD - 3/4"C		2 #12 & 1 #12 GRD - 3/4"C	20	1	-	RECEP.	22
23	SPARE	_	1	20	-		-	20	1	-	SPARE	24
25	SPARE	_	1	20	-	+++-	-	20	1	-	SPARE	26
27	SPARE	_	1	20	-		-	20	1	-	SPARE	28
29	SPARE	_	1	20	-		-	20	1	_	SPARE	30
31	SPACE	_	1	-	-	+++-	-	-	1	-	SPACE	32
33	SPACE	_	1	-	-		-	-	1	-	SPACE	34
35	SPACE	_	1	-	-		-	-	1	-	SPACE	36
37	SPACE	_	1	-	-	+++-	-	-	1	-	SPACE	38
39	SPACE	_	1	-	-		-	-	1	-	SPACE	40
41	SPACE	_	1	-	-		-	-	1	-	SPACE	42
	SUB TOTAL KVA	16.7								45.0	SUB TOTAL KVA	

\* PROVIDE CIRCUIT BREAKER WITH GFI PROTECTION.

					208/120V,	3ø, 4W, S/N, SURI	FACE	E, 125	A M/	AIN LUGS ONLY, 42 KAIC					
CKT#	# DESCRIPTION	LOAD CIR. BREAKER		WIRE & CONDUIT		ØA ØB ØC			WIRE & CONDUIT	CIR. BREAKER LO		LOAD KVA	DAD DESCRIPTION	СКТ	
1	AIR COMPRESSOR	8.8	2	50	3#6&1	#10 GRD-1"C	-		+	2 #12 & 1 #12 GRD-3/4"C	20	2	3.0	UH-1	2
3	ING. RAND T30 (7.5HP)						-	┝╺┝	+						4
5									+	2 #12 & 1 #12 GRD-3/4"C	20	2	3.0	UH-2	6
7	DOOR OPERATOR	1.0	1	20	2 #12 &	1 #12 GRD-3/4"C	]–		_						8
9	WELDER	8.0	2	50	2 #6 & 1	#10 GRD-1"C	]—	┝╺┝	-	-	20	1	-	SPARE	10
11									+	2 #12 & 1 #12 GRD-3/4"C	20	1	0.2	CO/NO2 CONT. PNL	12
13	FRONT QUAD	1.0	1	20	2 <b>#12 &amp;</b> 1	1 #12 GRD-3/4"C	]⊸		+	2 #12 & 1 #12 GRD-3/4"C	20	1	1.1	LIGHTING	14
15	EF—2 (1.5 HP)	2.1	3	15	3 <b>#12 &amp;</b> 1	1 #12 GRD-3/4"C	1—	┝╺┝	+	2 #12 & 1 #12 GRD-3/4"C	20	1	0.2	EXTERIOR LIGHTING	16
17									┿	2 #12 & 1 #12 GRD-3/4"C	20	1	1.0	DOOR OPERATOR	18
19									+	2 #12 & 1 #12 GRD-3/4"C	20	1	1.0	DOOR OPERATOR	20
21	EF—1 (1.5 HP)	2.1	3	20	<b>3 #12 &amp;</b> 1	1 #12 GRD-3/4"C	1—	┝─┥	_	2 #12 & 1 #12 GRD-3/4"C	20	1	1.0	DOOR OPERATOR	22
23									┿_	2 #6 & 1 #10 GRD-1"C	50	2	-	WELDER	24
25									_						26
27	BOILER	1.4	1	20	2 #12 & 1	#12 GRD - 3/4"C	1—	┝╺┝	+	2 #12 & 1 #12 GRD-3/4"C	20	1	-	RECEP.	28
29	P-1, P-2	1.0	1	20	2 #12 & 1	#12 GRD - 3/4"C	1—		┿_	2 #12 & 1 #12 GRD-3/4"C	20	1	-	RECEP.	30
31	SPARE	20	1	-	-		1-		-	-	-	1	-	SPACE	32
33	SPARE	20	1	-	-		1—	┝╺┝	_	-	-	1	-	SPACE	34
35	SPARE	20	1	-	-		1—			-	-	1	-	SPACE	36
37	SPACE	_	1	-	-		1–		+	-	-	1	_	SPACE	38
39	SPACE	-	1	-	-		1—	┝╺┝	+	-	-	1	_	SPACE	40
41	SPACE	_	1	-	-		1—		┢	-	-	1	_	SPACE	42
	SUB TOTAL KVA	21.7							-	•			7.7	SUB TOTAL KVA	

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#### GENERAL REQUIREMENTS

This Section is coordinate with and complementary to the General Conditions and Special Requirements. Drawings are diagrammatic. Sizes and locations of equipment are shown to scale where possible, but may

be distorted for clarity on the Drawings. Final locations shall be as required or directed. Light and power and system riser diagrams and schematic diagrams generally indicate equipment and

connections to be used for various systems. System conduit and wiring shall be as required. Provide all work shown on diagrams whether or not it is duplicated on the plans.

#### SCOPE OF WORK

In general the work includes, but is not limited to the following:

- 1. Raceways and installation components.
- 2. Wire and Cable.
- 3. Panelboards
- 4. Wiring Devices
- 5. Safety and disconnect switches.
- 6. Manual motor starters.
- 7. Buck-Boost Transformers
- 8. Grounding.
- 9. Lighting fixtures.
- 10. Fire Alarm System.
- 11. Testing.
- 12. Furnishing and setting of all sleeves through the floors, roof, and walls where required, including waterproofing, and fireproof sealing, and cap flashing.
- 13. Cutting, drilling and boring associated with electrical work.
- 14. Prime painting, where required for electrical equipment and installation.

# 15. Final connection of all equipment unless otherwise noted.

#### QUALITY ASSURANCE AND STANDARDS

The complete installation shall be in accordance with NJUCC (The State Building Code).

Contractor to be responsible for securing all necessary permits and obtaining all necessary approvals. He shall complete all necessary forms and pay all necessary fees, to be reimbursed by Owner.

SUBMITTALS

The Contractor shall submit shop drawings for all systems and components with such promptness as to cause no delay in his own work or that of another contractor.

EXAMINATION OF EXISTING CONDITIONS ON PREMISES

Before submitting his bid, this Contractor shall visit the site of the work and shall thoroughly familiarize himself with the existing conditions affecting the work. By the act of submitting a bid, the Contractor shall be deemed to have made such an examination, to have accepted such conditions, and to have made allowance therefore in preparing his bid. No additional compensation will be granted on account of extra work made necessary by the Contractor's failure to investigate such existing conditions. Verify all grades, elevations, dimensions, and clearances at the site.

COORDINATION OF WORK WITH OTHER TRADES

The contractor shall coordinate the work of this Section with the work of all other Contracts and all the Utility Companies. It shall be so arranged that there will be no delay in the proper installation and completion of all work.

#### INSPECTION AND TESTS

The entire wiring system must test free from short and open circuits. Every ground shall be tested for compliance with standards listed below.

PROTECTION. MAINTENANCE AND PRODUCT HANDLING OF ELECTRICAL EQUIPMENT Electrical equipment shall be delivered and stored at the site, properly packed and crated until finally

Provide effective protection against damage for all material and equipment during shipment and storage at the Project Site.

This Contractor shall be responsible for the maintenance of all installed equipment and systems until final acceptance by the Owner. <u>GUARANTEE</u>

This Contractor shall guarantee in writing to the Owner that all work installed by him shall be free of defects in workmanship and materials and that all apparatus will develop the capacities and characteristics as indicated, and that, if during a period of two years from date of substantial completion, any defects in workmanship, materials or performance appear, he will remedy them without any cost to the

#### ACCESSIBILITY AND MEASUREMENTS

All work shall be installed so as to be readily accessible for operation, maintenance, and repair. Minor deviations from the plans may be made to accomplish this, subject to approval.

Before ordering any material or doing any work, the Contractor shall verify all measurements at the Building, and shall be responsible for the correctness of same as related to the work under this Contract.

TEMPORARY LIGHT AND POWER

Electric services for temporary light and power shall be extended from existing as required. Provide all required material and work.

The Electrical Contractor shall furnish, install, and maintain the temporary lighting and power system for all Contractors. Provide temporary power for all areas of work as required. The use of electricity shall be kept to a minimum.

Provide all wiring, supports, lamp sockets, receptacle sockets and any other materials, supplies or equipment necessary for temporary light and power system.

Ground fault protection required by OSHA.

Install separate stringer circuits for lighting and receptacles. Provide one lamp socket and one duplex receptacle for every 400 square feet of new general construction area. (Approximately 20 feet on centers).

Provide sufficient supplementary temporary lighting to permit proper execution of the work.

Keep the temporary lighting and power system operational commencing fifteen (15) minutes before the established starting time of that trade which starts work earliest in the morning and ending fifteen (15) minutes after the established quitting time of that trade which stops work latest in the evening.

#### IDENTIFICATION NAMEPLATES

minimum 3/4 inch.

Identify and mark all electrical equipment to meet OSHA standards and as specified herein.

Unless otherwise noted, nameplates shall be black laminate with white letters of uniform size consisting of reasonably large capital letters, 3/16 inch minimum.

#### RACEWAYS AND INSTALLATION COMPONENTS

The requirements of this Section apply to raceway work specified elsewhere in these specifications. The work includes the providing of completely coordinated grounded raceway systems complete with boxes, fittings, flexible connections to vibrating equipment and accessories, as specified and as required for a complete system.

The work permits the use of metal-clad cable in conjunction with conduit. See below.

Raceways and fittings shall be manufactured by Triangle or approved equal by Allied or Republic. Rigid steel conduit shall be full weight steel pipe, hot dip galvanized inside and outside, threaded,

Intermediate metal conduit (IMC) shall be intermediate steel pipe, hot dip galvanized, threaded, minimum 3/4 inch.

Electric metallic tubing (EMT) shall be steel thin wall pipe, galvanized, threadless, minimum 3/4 inch. maximum 2 inch.

Flexible steel conduit (Greenfield) shall be continuous single strip, galvanized, minimum 3/4 inch.

Liquid-tight flexible steel conduit (Seal-tite) shall be zinc coated, consist of flexible galvanized steel tubing over which is extruded a liquid—tight sheathing of polyvinyl chloride (PVC). Conduit shall be provided with a continuous copper bonding conductor would spirally between the convolutions. Rigid steel and IMC conduit fittings shall be standard threaded couplings, locknuts, bushings, and elbows. Material shall be steel or malleable iron only.

Electrical metallic tubing fittings shall be compression waterproof connection type. Set screw or indent type connectors are not permitted.

Flexible steel conduit (Greenfield) fittings shall be multiple point type, threading into the internal wall of the conduit convolutions, and shall have insulated throat.

Liquid-tight flexible metal conduit fittings shall incorporate a threaded grounding cone, a steel or plastic compression ring, and a gland for tightening. Connectors shall have insulated throats.

Expansion and deflection couplings shall be manufactured by 0-Z/Gedney, Crouse-Hinds, Appleton or approved equal.

Individual conduit hangers, shall be designed for the purpose, and have pre-assembled closure bolt and nut, and provisions for receiving hanger rod.

Provide and assume responsibility for locating and maintaining in proper position all sleeves required for the work.

Openings through floors and walls in which cables, conduits, or pipe pass shall be sealed by U.L. classified smoke and fire stop fittings, and have an hourly rating equal to the fire rating of the floor or wall. Fittings shall be similar to O-Z/Gedney Type "CFS" or "CAFS".

Penetrations through fire—rated floors in which wiring for floor service outlets are routed shall be sealed by U.L. classified smoke and fire-stop fittings, and shall have an hourly rating equal to the floor rating. Fittings shall be similar to 0-Z/Gedney Type "PTFS".

Outlet boxes shall be manufactured by Raco, RussellStoll, Steel City, Thomas & Betts or Crouse Hinds.

Outlet boxes for concealed work shall be galvanized steel, 4 in. square or octagon (except as otherwise required by construction, devices or wiring). Provide sufficient depth for application. Outlet boxes located outdoors and in damp locations shall be weatherproof.

Offset back-to-back outlets shall have minimum 6 in. separation between them. In rated walls, they are to be separated by a stud

Junction, splice and pull boxes shall be made of code gauge sheet steel with removable covers fastened with brass or stainless steel screws, except as noted, and will include insulated supports for cables. Box dimensions shall conform to N.E.C. requirements.

Provide junction, splice and/or pull boxes as noted or as required to facilitate pulling of conductors or in raceway runs that have more than three (3) 90-degree bends. For indoor applications, boxes shall have a gray enamel finish. For outdoor and damp locations,

boxes shall be galvanized. Wireways shall be as manufactured by Square D, General Electric, or approved equal.

Wireways shall be square, brake-formed of code gauge steel, furnished in standard 10-foot sections with knockouts as required. Wireways shall be of the screw cover type and all necessary offset and elbow fittings. They shall have a gray enamel finish. Size shall be as required for proper cable fill.

Install raceway and installation components as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and in accordance with the recognized industry practices, to ensure that products serve intended function.

Raceway supports shall be provided by means of ceiling trapeze, strap hangers, or wall brackets. Use structural steel angles or channels, or manufactured steel support system. Spacing of supports shall be as per NEC and per manufacturer's recommendations but in no case shall exceed 8'-0" on centers. Provide U-bolts at each floor level for riser raceways and anchor to acceptable supports. Secure raceways to supports with pipe straps or U-bolts.

Mechanically join all metal raceways, enclosures and junction boxes to assure continuity. Branch circuit conduits shall be supported by the building structure.

Provide expansion-deflection fittings at expansion joints in accordance with manufacturer's recommendations. Expansion-deflection fittings shall be used for all trade sizes 1-1/4" or larger. For trade sizes up to 1" in size, a suitable length of flexible conduit (or liquid—tight flexible conduit) with sufficient slack for movement and grounding conductor fastened on each side of joint shall be permitted.

Rigid steel conduit shall be used for underground installation; in wet, damp or wash down locations; for exposed runs on the exterior of the building; embedded in concrete or masonry or below concrete that is in contact with earth.

Intermediate metal conduit (IMC) may be used in place of rigid steel in dry locations only.

EMT is to be used for feeders and branch circuits in dry locations such as hung ceilings, interior hollow block walls and furred spaces. Flexible steel conduit shall be used in dry locations for short connections where rigid conduits or

tubing is impracticable, and for final connections to lights and equipment other than motors and transformers.

Liquid-tight flexible steel conduit shall be used in damp locations for final connections to motor terminal boxes, transformers, and other vibrating equipment in damp and dry locations.

In general, cutting and core drilling is to be avoided. Where it becomes necessary, locations are to be coordinated with other trades, the Owner and the structural engineer. There is to be no cutting or core drilling without prior approval.

Provide an outlet box for each lighting fixture and device shown, or required, in the wiring system. Provide galvanized steel extension rings (depth as required) and raised cover plates in plaster, dry

wall, masonry and tile walls. Mount outlet boxes for similar equipment at uniform height within same or similar areas.

Outlet boxes for fixtures recessed in non-accessible ceilings shall be accessible through the opening created by the removal of the fixture or through access doors provided by this contractor.

All outlet boxes in finished areas for convenience receptacles or local switches shall be 4" square and 1-5/8" deep minimum. Provide with regular deep switch extension cover. Boxes for use with surface mounted raceways shall be of the same construction and manufacture

Provide junction, splice and pull boxes where required to facilitate installation of wiring, whether or not shown on Drawings. Size boxes according to code, and provide interior partitions, insulated supports, hot dip galvanized angle iron braces, screw—on one—piece or split covers, ground connectors, and other accessories as required.

All outdoor installations shall be weatherproof.

Support all material from the building structure in an approved manner.

Where electrical equipment is mounted in suspended ceiling panels, provide support members to span between runners of ceiling suspension system. Do not support electrical equipment from acoustical panels or other ceiling material; attach to this material for alignment only.

Where electrical outlet boxes, lighting fixtures, and other equipment is installed on tee bars of suspended ceilings, use independent support clips with threaded studs. Do not attach to tee bar except for alignment; use clip similar to Caddy "IDS" that snaps around tee bar and has provisions for independent support wire. Attach a suitable anchor in the structure above ceiling, and suspend a minimum No. 12 support wire to engage the clip.

Do not exceed manufacturer' load rating for mounting devices.

At drywall partitions, provide support members to carry weight of equipment; do not use drywall material to carry any weight.

WIRE AND CABLE

as the raceway.

The work includes providing wire and cable complete with all accessories in accordance with Drawings and Specifications and as required for a complete system. Wiring size referenced in this Section shall be AWG, except as noted

This project has been designed for copper conductors. Aluminum conductors are not acceptable and shall not be used. Cable shall be manufactured by Triangle or approved equal by Carol or Guardian Products.

No. 10 and smaller conductors shall be ASTM Standard, solid, copper; and, No. 8 and larger conductors shall be ASTM standard, stranded copper.

Minimum conductor size shall be No. 12 for lighting and power and No. 14 for control and alarm. Increase wire sizes as required for long runs to overcome voltage drop. Communications and signal wiring shall conform to the recommendations of the manufacturer's

communication and signal systems and shall be specified in respective Sections of these Specifications.

"THWN" or "XHHW" insulation shall be used for interior branch circuit and feeder wiring. Rating shall be 90°C in dry locations and 75°C in wet locations.

Green colored insulated wire shall be used for all grounding applications.

Phase wires shall be color-coded as follows:

1. 120/208 volt system: Black for A phase Red for B Phase Blue for C Phase

Neutral conductors shall be white for 120/208 volts.

Provide O-Z/Gedney Type "CSB" series or approved equal seal fittings between the wire and conduit for all cable and wire entering the building from underground, including service cables. Not more than 3 current carrying conductors shall be in one (1) conduit unless otherwise indicated.

Provide one neutral conductor for each 3 phase 4 wire homerun to a panelboard unless otherwise noted.

Make wire splices electrically and mechanically secure. Install small wire connectors so that no bare conductor is exposed. Tighten bolts on large conductor connectors so that conductor is deformed. but do not break strands of wire. Use compression tool with proper die for compression connectors in accordance with manufacturer's recommendations, so that conductors are deformed but not broken. Apply insulation over splice so that insulation thickness is at least 1-1/2 times that on conductor. Lap applied insulation at least 1" over conductor insulation so that no bare conductor is exposed.

In general, all feeders No. 8 and larger shall be continuous from point of origin to equipment being served. Splices shall only be used where necessary and with prior written approval of the Engineer.

Terminate conductors on terminal strips in equipment where terminal strips are used. Provide appropriate connectors, or hook conductors around terminal screws as required.

Provide encapsulated splice kits (3-M type 85 series or approved equal) for all splices in areas subject to moisture, including wet locations inside buildings and underground handholes, manholes, and buried junction boxes. Install splice kit in accordance with manufacturer's recommendations, and make splice waterproof. Apply sealing putty to surround each cable. Install mold body so that resin covers each cable sheath by a minimum of one inch.

All copper conductors No. 8 & larger shall be terminated, spliced, and tapped with color-keyed compression connectors, as manufactured by Thomas & Betts Co., Series 54000, Ideal Industries Series 87000, or approved equal. The manufacturer's recommended tooling shall be used. Mechanical type connectors shall not be used.

All copper conductors No. 10 AWG & smaller shall be terminated and spliced with Ideal Industries wing-nut wire connectors or approved equal compression connectors. The flame-retardant thermoplastic insulated type shall be used to isolate the terminal from other metal parts and equipment.

Use insulating boots supplied for compression connectors or fill joint with "Scotchfill" insulating putty and serve (3) 1/2 lap layers of "Scotch" #33 electrical tape.

WIRING DEVICES AND INSTALLATION COMPONENTS

All local switches near doors shall be located at strike side of door as finally huna. whether so indicated on the Drawings or not.

Height of outlets from finished floor to centerline of outlet shall be as follows: Receptacle outlets: 1'-6", unless otherwise noted

Wall switch outlet: 3'-8''

Motor controllers: 5'-0"

Safety and disconnect switches: 5'-0''

Panelboards (Lighting and Power): 6'-6" above finished floor to top Exit Lights, where wall mounted: 2" above door frame to bottom of light

Wiring devices and installation components shall be manufactured by Hubbell, Bryant Electric, Pass & Seymour, Leviton, Cooper Industries—Arrow Hart, or General Electric. Switches shall be heavy-duty specification grade, toggle, quiet type, fully enclosed in composition cases, color as selected by Architect at shop drawing stage. They shall be rated 20 amp, 120 volt, AC.

Receptacles shall be the grounding type, composition base, meeting NEMA standards, publication WD-1-1971, color as selected by Owner. Duplex Convenience Receptacles shall be 20 amps, 125 volts, 2 pole, 3 wire, U ground

slot type, Hubbell No. BR20. Ground Fault Interrupter Duplex Receptacles: 20 amps, 125 volts, 2 pole, 3 wire, Hubbell No. GF-5352, with weatherproof cover, Hubbell No. 5221.

Where more than one switch or receptacle is being installed, provide multiple gang plates for number of devices as required.

Plates shall be beveled stainless steel satin chrome finish #302, of minimum .035" thickness. Manual motor starters shall be Allen Bradley Bulletin 600 or approved equal by Square D or General Electric and shall be horsepower rated, and voltage rated for the motor load.

Wallboard and masonry shall fit snuggly to all sides of outlet boxes, grout and patch as required. Local wall switches and receptacles shall be mounted vertically unless otherwise indicated.

SAFETY AND DISCONNECT SWITCHES

Switches shall be heavy-duty and service rated. They shall be General Electric Type "TH" or equal by Square D, Cutler Hammer, or Siemens. Switches shall include solid neutral where required. Provide auxiliary contacts where required to break motor control circuit power. Interior enclosures shall be NEMA 1. Enclosures shall have interlocked doors and be capable of being positively padlocked in ON and OFF positions. For exterior installations, the enclosures shall be NFMA 4.

MOTOR INSTALLATION

Run all power feeds and connections from power panels to all motor starters or control panel locations. Where shown on Drawings connect the motor starting devices for motors, supplying and installing all necessary connections between starters and control devices and motors, in conduit, and leave motors ready to start. The power supply leads to the motors from the starters or control panels shall be of the same size and number of the other leads required for the proper operation of each motor. Provide (6) wires from starters to two speed motors.

Check motor nameplates for full-load current rating and allowable temperature rise to determine overload heater elements. Install correct heater element in the corresponding starter. Verify proper rotation.

Furnish motor safety disconnect switches for all motors except where such switches are specified to be furnished in other divisions or are included in the equipment control panel. Install all motor safety disconnect switches furnished under this Division or other Divisions of the Specification. Install manually-operated devices, such as push-buttons and manual starters, to permit convenient operation and be readily accessible.

Install "Sealtite" flexible conduit for final connections to all motors and vibrating equipment including transformers. Individual starters furnished by others shall be received and erected under this Section. Starters

shall be individually or group mounted plumb and level, on freestanding angle iron frames, supplied under this Section.

Provide manual motor starters for all fractional horsepower motors as shown on the Drawings or otherwise required.

PANELBOARDS

The interior distribution system, in general, shall consist of 3-phase, 4-wire mains at 208/120 volts. The contractor shall balance the load on all feeders as nearly as possible on the three phases after the system is fully energized and all components are functioning. Panelboards and distribution panels shall be General Electric "A" Series and CCB or approved equal by Square D, Cutler Hammer, or Siemens.

In multi-section panels, install suitable terminating lugs in one of the sections to permit the termination of the incoming feeder conductors as well as the extension of jumpers to the lugs of the other sections.

Panel circuit breaker overcurrent protective devices shall be as scheduled on the Drawings and as specified. All breakers shall be bolted—on thermal magnetic type.

Panel circuit breakers shall be rated for 10,000 RMS symmetrical amperes minimum interrupting rating at 120/208 volts. Provide higher ratings as required or as scheduled on the Drawings. Provide handle-locking attachments for all circuit breakers serving emergency lights, exit lights, clocks, and other functions indicated.

Cabinets and trim shall be fabricated of code gauge steel, with hinged door, lock and catch, and directory pocket covered with clear plastic shield over directory. Furnish and install a typewritten circuit directory for all new and modified panels. Hand written will not be accepted.

<u>FUSES</u>

Fused safety and disconnect switches shall be provided with fuses of class, type, and rating as reauired or shown on Drawings. Install disconnect switches used with motor-driven appliances, and motors and controllers within

sight of the controller position unless otherwise indicated. Fuses sizes 0 to 600 Amperes shall be Buss Fusetron Type FRS-R or equal by Chase Shawmut or Cefco. They shall be U.L. Class "RK-5" Time-Delay dual element.

BUCK-BOOST TRANSFORMERS

Self-cooled, two-winding dry type, rated for continuous duty and with wiring terminal suitable for connection as autotransformer. Transformers shall comply with NEMA ST 1 and shall be listed and labeled as complying with UL 506 and UL 1561. Enclosure to be ventilated, NEMA 250, Type 2.

#### <u>GROUNDING</u>

Ground rods shall be copper clad steel not less than 3/4" diameter and 10 foot long. Provide at least two per location separated by at least 24". Ground clamps shall be bronze, solderless type with bronze screws suitable for receiving required or noted conductors.

Grounding equipment shall be manufactured by Chance, Burndy, Cadweld, Thomas & Betts, Blackburn, or 0-Z/Gedney. The complete electrical installation shall be permanently and effectively grounded in accordance with all

code requirements, whether or not such connections are specifically shown or specified. Measured resistance to ground shall be 5 ohms, maximum. All parts of the electrical installation shall be arounded. Ground conductors shall be sized in accordance with the National Electrical Code. Ground conductors shall be continuous without splices.

Ground rods shall be vertically driven with tops below grade. Where required to obtain the specified ground resistance, install multiple rods

Where ground connections will be permanently concealed, make the connections by the exothermic process to form solid metal joints. Make accessible ground connections with mechanical pressure type ground connections.

LIGHTING FIXTURES

Refer to Lighting Fixture Schedule on Drawings for manufacturer specified for each type of fixture. Manufacturers and catalog numbers indicated constitute the type and quality of equipment to be furnished. However, they shall be considered only as a guide. Similar equipment of equal guality may be submitted for review. Fixtures shall be suitable for application and environment where they are being installed. Fixtures shall have proper labels; i.e. 'hazardous', 'damp locations', 'dust tight', etc., whether or not specifically indicated in the specified catalog number or fixture description.

Suspended fixtures shall be supported by chains, conduit, or 1/8 inch galvanized steel aircraft cable or manufactured stems. Outlet box canopy shall be the swivel, self-aligning type.

Pendant mount fixtures where indicated, and provide all mounting hardware. Suspend fixtures with self-aligning components.

Hang all fixtures plumb, with continuous rows in alignment except as noted.

FIRE ALARM SYSTEM

Furnish and install all necessary fire alarm system equipment as required to be wired, connected, and left in first class operating condition. The fire alarm system shall be fully addressable. The System shall include all necessary control panels, manual pull stations, smoke detectors, heat detectors, speakers, strobe lights, horns, all wiring, outlet boxes, and all other necessary material for a complete operating Class "A" svstem.

The fire alarm system equipment shall be designed, assembled, and tested in accordance with applicable standards of NFPA #72, New Jersey Uniform Construction Code requirements, Life Safety Code 101, NEMA, and UL wiring criteria.

Manual Stations shall be surface mounted, dual action type with control arrangements necessary to accomplish the operation described. Reset of station shall require a special key. Station shall be constructed of high-impact red lexan. Mount at 3'-8" above finished floor.

The combination detector head and twist-lock base shall be UL listed in accordance with UL 268 and compatible with the Fire Alarm Panel. Detectors shall be listed for the purpose by Underwriters' Laboratories. Smoke detectors shall be of the solid state photoelectric type.

Heat detectors shall be combination rate-of-rise and fixed temperature type. Detectors shall be low profile with double screw terminals for supervised connections. Where noted on plans, they shall be fixed temperature only and rated for the noted temperature.

Audio/Visual Alarm Indicatina devices shall be in a common enclosure for the fire alarm audible and visual alarm devices. The unit shall be complete with a tamper resistant, Pvramidal shaped lexan lens with "Fire" lettering visible from a 180 field of view. Integral Xenon strobe shall provide 8000 peak candle power and be adjustable from 1 to 3 flashes per second. Mount at 8'-0" above finished floor.

Actuation of any alarm initiating device shall cause annunciation of the alarm condition, and location on the main control panel. This alarm condition will continue to flash on the panel and an audible signal shall sound until acknowledged.

Each zone initiation circuit and each audio/visual alarm circuit shall be individually supervised and shall be provided with a discrete amber "Trouble" LED to indicate disarrangement conditions per circuit.

All auxiliary manual controls shall be supervised by the system so that all switches must be returned to a normal position to clear system trouble. Provide and install the system in accordance with all applicable codes, the

manufacturers written instructions and with recognized industry practices. All junction boxes shall be sprayed red and labeled "Fire Alarm" for easy identification.

All wiring shall be in conduit or signal grade "MC" cable labeled for alarm use. Wiring color code shall be maintained throughout the installation. Flexible connections shall be used for all devices mounted in suspended lay-in ceiling panels. The manufacturer's authorized representative shall provide on-site supervision of

installation. The completed fire alarm system shall be fully tested by the Contractor in the presence of the Owner's representative, Fire Marshal, and the manufacturer's technical representative to the satisfaction of the Owner and authorities having jurisdiction.

Acceptance of the system shall also require a demonstration of the stability of the system. This shall be separately demonstrated if the system operates for a ninety (90) day period without any unwarranted alarms. Should any unwarranted alarm(s) occur, the Contractor shall readjust or replace the detector(s) and begin another ninety (90) day test period.

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