THE NAVAJO NATION

JONATHAN NEZ | PRESIDENT MYRON LIZER | VICE PRESIDENT

August 1, 2021

Hon. Seth Damon
Office of the Speaker
Post Office Box 3390
Window Rock, AZ 86515

RE: CJY-40-21, *An Action Relating to Resources and Development, Budget and Finance, Naabik'iyati' Committees, and Navajo Nation Council; Allocating $2,000,000 in Sihasin Funds to the Cañoncito Band of Navajos Health Center, Inc. for the Cañoncito Clinic Expansion Project; Approving and Adopting the Cañoncito Clinic Expansion Project Expenditure Plan Pursuant to 12 N.N.C. §§ 2501-2508*

Dear Speaker Damon,

We appreciate the Navajo Nation Council's action on CJY-40-21 in support of our Nation's health care system. Our Nation continues to face the ever-changing coronavirus and we will need every advantage we can summon to fight back. The To'Hajiilee community's health center provides an important and essential service to not only the community but those who live in the region. It is clear the health care center staff is very proud of the services they provide and we wish to support their effort to continue to provide excellent health care services. We are fortunate to have dedicated health care providers and we appreciate their professionalism and devotion to maintaining the Cañoncito Band of Navajos Health Center, Inc.

Thank you to Council Delegate Jamie Henio for moving this project forward; a project that will continue to benefit the community for years to come. In support of our frontline health care workers, the health care support staff, and the To'Hajiilee community, we sign CJY-40-21 into law.

Sincerely,

Jonathan Nez, President
THE NAVAJO NATION

Myron Lizer, Vice President
THE NAVAJO NATION

RESOLUTION OF THE
NAVAJO NATION COUNCIL
24th NAVAJO NATION COUNCIL - THIRD YEAR, 2021

AN ACTION
RELATING TO RESOURCES AND DEVELOPMENT, BUDGET AND FINANCE, NAABIK'ÍYÁTI' COMMITTEES, AND NAVAJO NATION COUNCIL; ALLOCATING $2,000,000 IN SÍHASIN FUNDS TO THE CAÑONCITO BAND OF NAVAJOS HEALTH CENTER, INC. FOR THE CAÑONCITO CLINIC EXPANSION PROJECT; APPROVING AND ADOPTING THE CAÑONCITO CLINIC EXPANSION PROJECT EXPENDITURE PLAN PURSUANT TO 12 N.N.C. §§ 2501 - 2508

BE IT ENACTED:

SECTION ONE. AUTHORITY

A. The Resources and Development Committee is the oversight committee for Navajo Nation Chapters. 2 N.N.C. § 501(C)(1).

B. The Budget and Finance Committee is empowered to "appropriate, allocate, cancel, re-appropriate and review the use of Navajo Nation funds received including but not limited to all grants, contracts, gifts and other funds from all sources." 2 N.N.C. § 301(B)(3).

C. The Naabik'íyáti' Committee is a standing committee of the Navajo Nation Council with the responsibility to hear proposed resolutions that require final action by the Navajo Nation Council. 2 N.N.C. § 164(A)(9).

D. The Navajo Nation Council is the governing body of the Navajo Nation. 2 N.N.C. § 102(A).

E. The Navajo Nation Code provides the purpose of the Navajo Nation Síhasin Fund ("Síhasin Fund") is as follows:

§ 2502 Purpose

A. The purposes of this Fund are to provide financial support and/or financing for:

1. The planning and development of economic development and regional infrastructure supporting economic development and community development, including such infrastructure as, but not limited to, housing, commercial and government buildings, waterline, solid waste management development, powerline projects, and transportation and communication systems, within the Navajo Nation; and

2. Education opportunities for members of the Navajo Nation.

B. For the Purpose in § 2502(A)(1), Fund expenditures for infrastructure shall not be limited by 12 N.N.C. § 1310(F) or TCDCJY-77-99.

C. Leveraging the Fund by way of guaranteeing loans, match funding, direct funding in part, and other weighted uses of the Fund, including loan financing from the Fund, for the purposes in § 2502(A)(1), shall be favored over direct funding in whole.

12 N.N.C. § 2502, as amended by CJA-03-18.

F. The Síhasin Fund provides that "Fund Principal" shall consist of all deposits made to the Síhasin Fund and that "Fund Income" shall consist of all earnings (interest, dividends, etc.) generated and realized by the Fund Principal, and that Fund Income shall be deposited in and added to Fund Principal until such time as a Fund Expenditure Plan is duly adopted. 12 N.N.C. §§ 2504 and 2505(C).

G. The Síhasin Fund provides that "Fund Principal and Income shall not be expended except pursuant to a Fund Expenditure Plan consistent with the purposes set forth in § 2502 of this Chapter and adopted by a two-thirds (2/3) vote of all members of the Navajo Nation Council." 12 N.N.C. § 2505(A).

SECTION TWO. FINDINGS

A. The Cañoncito Band of Navajos Health Center, Inc. ("CBN Health Center") is a 26 U.S.C. § 501(C)(3) non-profit Tribal Organization established in 2016 that provides health care services to the To'Hajiilee community (formerly Cañoncito) via a contract with the U.S. Department of Health and Human Services pursuant to Public Law 93-638.

B. The CBN Health Center has requested two-million-dollars ($2,000,000) in Síhasin funding for the Cañoncito Clinic Expansion Project. The CBN Health Center has prepared and submitted a detailed funding request and description of the Expansion Project, attached hereto as **Exhibit A.**

C. In its request the CBN Health Center explains that, in 2020, along with the To'Hajiilee Chapter it applied to the Navajo Nation for a $4,000,000 grant from the CARES Funds received by the Navajo Nation. However, their funding request for the

Expansion Project was not approved by the Navajo Nation Council. **Exhibit A.**

D. The CBN Health Center further explains that it subsequently appropriated $2,000,000 for the Expansion Project, and the Project is now approximately 60% complete. However, an additional $2,000,000 in funding is needed to finish the Project because of unforeseen costs due to COVID-19 building requirements, needed furniture and medical equipment, and unexpected infrastructure expenses. **Exhibit A.**

E. The CBN Health Center has submitted a detailed cost breakdown for the Expansion Project, attached as **Exhibit B**, as well as a floor plan, photographs, and drawings for the Project, all of which are attached as **Exhibit C.**

F. The allocation of the $2,000,000 for this Project meets the criteria for Síhasin expenditures because this Project involves "infrastructure" and "community development" such as "commercial and government buildings" as mentioned in 12 N.N.C. § 2502(A)(1).

G. The allocation of the $2,000,000 for this Project meets the preference for leveraging Síhasin funds, as mentioned in 12 N.N.C. § 2502(C), because the CBN Health Center has contributed $2,000,000 in funds, and the Indian Health Service previously provided a grant of $1,800,000 for the Project.

SECTION THREE. APPROVAL AND ADOPTION OF SÍHASIN FUNDING AND EXPENDITURE PLAN

A. The Navajo Nation hereby approves and appropriates funding for the Cañoncito Clinic Expansion Project in the amount of $2,000,000 from the Navajo Nation Síhasin Fund, in accordance with 12 N.N.C. § 2505(A).

B. The Navajo Nation hereby approves and adopts the Cañoncito Clinic Expansion Project Expenditure Plan, attached as **Exhibit B.**

C. The Síhasin Funds allocated for the Cañoncito Clinic Expansion Project may be further leveraged by bond or loan financing pursuant to the Navajo Nation Bond Financing Act, 12 N.N.C. § 1300 *et seq.*, as amended, using Síhasin Fund earnings for repayment and financing costs upon the recommendation of the Budget and Finance Committee and approval by a two-thirds (2/3) vote of all members of the Navajo Nation Council.

SECTION FOUR. APPROVAL AND ADOPTION OF EXPENDITURE PLAN ADMINISTRATION

The Navajo Nation Council hereby approves administration of the Cañoncito Clinic Expansion Project Expenditure Plan as follows:

A. The Navajo Nation Controller shall determine whether the source of the annual allocations from the total allocation of $2,000,000 will be Síhasin Fund Principal or Income or a combination of both.

B. The $2,000,000 in Síhasin funds shall be distributed to the Cañoncito Band of Navajos Health Center, Inc. within ten (10) days after the effective date of this legislation. The CBN Health Center shall be responsible for administering the Cañoncito Clinic Expansion Project, in accordance with the Cañoncito Clinic Expansion Project Expenditure Plan, attached as **Exhibit B**.

C. The $2,000,000 in Síhasin funds shall be used solely for design, planning, construction, furniture and equipment purchases, and infrastructure facilities for the Cañoncito Clinic Expansion Project as described in **Exhibits A**, **B** and **C**. Any and all cost-savings shall be returned to the Síhasin Fund once the Project is completed.

D. The $2,000,000 in Síhasin funds shall not lapse on an annual basis pursuant to 12 N.N.C. § 820(N), however, any funds not spent or encumbered within twenty-four (24) months of the date funds are made available to the CBN Health Clinic shall revert to the Síhasin Fund principal, unless recommended otherwise by the Resources and Development Committee of the Navajo Nation Council and approved by the Naabik'íyáti' Committee.

E. The Síhasin Fund shall be reimbursed, in the amount of the expenditure authorized in this legislation, from prospective funds available to the Navajo Nation from any and all appropriate state and federal sources, including Congressional appropriations under the American Rescue Plan Act of 2021 or other COVID-19 related relief.

F. The Cañoncito Clinic Expansion Project shall be operated and managed by the CBN Health Clinic, and maintenance and repairs for the Project shall be the responsibility of the CBN Health Clinic.

SECTION FIVE. DIRECTIVES

The CBN Health Clinic shall report the status of the Cañoncito Clinic Expansion Project to the Resources and Development Committee, and to the Naabik'íyáti' Committee, on a quarterly basis.

SECTION SIX. EFFECTIVE DATE

This legislation and the Cañoncito Clinic Expansion Project Expenditure Plan approved herein shall become effective pursuant to 12 N.N.C. § 2505.

SECTION SEVEN. SAVINGS CLAUSE

If any provision of this Act is determined invalid by the Supreme Court of the Navajo Nation, or by a Navajo Nation District Court without appeal to the Navajo Nation Supreme Court, the provision(s) not determined invalid shall remain as Navajo Nation law.

CERTIFICATION

I hereby certify that the foregoing resolution was duly considered by the 24th Navajo Nation Council at a duly called meeting in Window Rock, Navajo Nation (Arizona), at which a quorum was present and that the same was passed by a vote of 23 in Favor, and 00 Opposed, on this 22nd day of July 2021.

Honorable Seth Damon, Speaker
24th Navajo Nation Council

July 23, 2021
DATE

Motion: Honorable Edison J. Wauneka
Second: Honorable Pernell Halona

Speaker Seth Damon not voting

ACTION BY THE NAVAJO NATION PRESIDENT:

1. I, hereby, sign into law the foregoing legislation, pursuant to 2 N.N.C. § 1005 (C)(10), on this 01 day of August, 2021.

Jonathan Nez, President
Navajo Nation

2. I, hereby, veto the foregoing legislation, pursuant to 2 N.N.C. § 1005 (C)(11), on this _____ day of _____, 2021 for the reason(s) expressed in the attached letter to the Speaker.

_____
Jonathan Nez, President
Navajo Nation

3. I, hereby, exercise line-item veto pursuant to the budget line-item veto authority delegated to the President by vote of the Navajo People in 2009, on this _____ day of _____, 2021.

_____
Jonathan Nez, President
Navajo Nation

CANONCITO BAND OF NAVAJOS
HEALTH CENTER INC.
129 Medicine Horse Drive – To'Hajiilee, NM 87026
Phone (505) 908-2380 / Fax (505) 908-2316

EXHIBIT
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A

Honorable Jamie Henio,
To'Hajiilee Council Delegate

May 27, 2021

Re: Emergency Request for Navajo Nation Funding for the Canoncito Clinic Expansion Project

Honorable Council Delegate Henio:

The Canoncito Band of Navajos Health Center, Inc. (CBN Health Center) is a tribal non-profit corporation that provides community healthcare services to the Canoncito Band of Navajos (CBN) in To'Hajiilee Chapter. The CBN Health Center operates under a PL 93-638 Title I Master Contract under the Indian Self-Determination and Education Assistance Act with the Albuquerque Area Indian Health Service. In 2006 the Canoncito Band of Navajos/To'Hajiilee Chapter and the CBN Health Center built an 11,500 SF medical building known as the Canoncito Clinic financed by a CDBG grant and a USDA loan. After 14 years of operation and acquiring all tribal shares for Canoncito, the 11,500 SF Canoncito Clinic facility is now too small to operate all health programs and provide sufficient medical and office space for 37 health providers. In 2017 the CBN Health Center and the To'Hajiilee Chapter begin the planning and design of a 9,200 SF expansion for the Canoncito Clinic.

CBN Health Center applied for a Small Ambulatory Program (SAP) grant with the Indian Health Service in 2017 and was awarded a grant in the amount of $1.8 million, and in 2020 the CBNHC and To'Hajiilee Chapter applied for a $4.0m grant with the Navajo Nation's 2020 CARES funds however it was disapproved by the Navajo Nation Council. Thereafter, the CBNHC contributed $2.0m to complete the project budget in the total amount of $3.8m. The CBNHC advertised the project and awarded a construction contract to the Enterprise Builders Corporations to construct the 9,200 SF expansion. The construction of the expansion project is 60% complete, however the project has run into unexpected cost due to Covid-19 building requirements, the need for furniture and medical equipment for the expansion, and unexpected infrastructure problems concerning the To'Hajiilee domestic water system.

The Architect's estimate provided by Mr. Lee Gamelsky, Architect, to complete the 9,200 SF Canoncito Clinic Expansion is $2,0m (Attached) and it includes a fire protection system including pump station, water storage tank, water line extension, grading, structural foundation and electrical controls and instrumentation; design cost for the fire protection system; medical and office equipment for the clinic expansion; and other major unanticipated construction cost. Also attached is an overall Floor Plan for the Canoncito clinic showing the existing 11,500 SF facility and the new 9,200 SF clinic expansion.

The CBN Health Center hereby request the Navajo Nation for an Emergency Appropriation of $2.0 million from the Sihasin Fund or other Navajo Nation Fund to assist in completing the construction of a 9,200 SF expansion for the Canoncito Clinic.

The Canoncito Clinic Expansion project will include areas to provide medical services, behavioral health services, and areas to prevent and respond to Coronavirus Disease in To'Hajiilee, New Mexico. During this Navajo Nation and national emergency, CBN Health Center provided emergency preparedness and

response including conducting COVID-19 testing on site. The Canoncito Clinic conducted approximately 140 test per week during June and July 2020, and many of the people who were tested were To'Hajiilee community members, others Navajos living in Albuquerque who come from many different chapters, and many other Native American tribal members. The highest number of tests given for COVID-19 was 250 given the week of July 6th at the Canoncito Clinic. The To'Hajiilee community members experience a high burden of health issues, which leave them more vulnerable to death, chronic illness, suicide and other health risks related to the infectious COVID-19 disease.

The New Mexico DOH for May 2020 data for COVID – 19 ethnicity breakdown shows that 57.54% of the cases are American Indian compared to all other races and ethnicities. The health disparities that will contribute to the risks of COVID-19 include: type 2 diabetes, heart disease, kidney disease, stroke, asthma, influenza and pneumonia. The Canoncito Clinic expansion project when completed will strengthen our community capacity and support the expansion of critical public health activities to rapidly mobilize and respond to COVID-19 in To'Hajiilee. The CBN Health Center is also implementing a "Total Community Approach" to reinforce partnerships among our local tribal programs, and enhance collaboration with external partners at the State of New Mexico Departments of Health, the Indian Health Service, the Albuquerque Area Southwest Tribal Epidemiology Center, and the Navajo Nation Department of Health to assure the success of our COVID-19 response efforts.

The CBN Health Center and the Canoncito Band of Navajos/To'Hajiilee Chapter are requesting Councilman Henio and Navajo Nation President, Jonathan Nez to support and approve the Navajo Nation's legislation to provide financial assistance in the amount of $2.0 million to complete the construction of the 9,200 SF Canoncito Clinic Expansion Project. If you need additional information on this project, please email me at cindy.browning@cbnhc.org.

Respectfully submitted,

Cindy Browning, Chief Executive Officer
CBN Health Center, Inc.

Jacqueline Platero, Board Vice Chairwomen
CBN Health Center, Inc.

Attachments

XC: Jonathan Nez, Navajo Nation President
Jimmy R. Secatero, Chapter President
CBN Health Center Board of Directors

EXHIBIT
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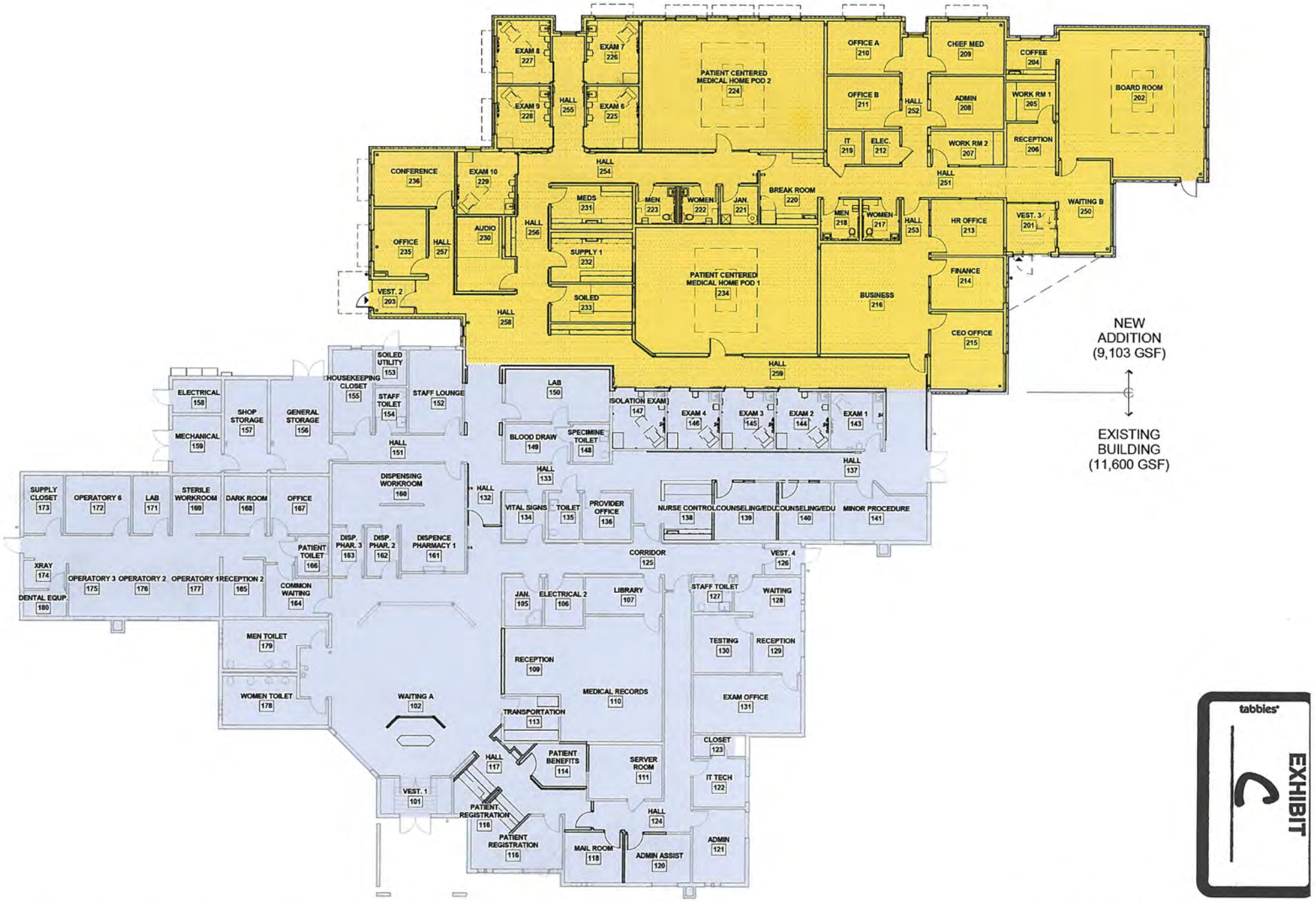
B

26 May 2021

CANONCITO BAND OF NAVAJOS HEALTH CENTER
CONCEPTUAL COST ESTIMATE for the
EMERGENCY APPROPRIATION REQUEST

Fire Protection System To provide required water flow volume and pressure to operate the existing buildings and the new additions fire sprinkler system. Fire water booster pump station Fire and domestic water storage tank Water line extensions Site grading, structural foundation Electrical controls and instrumentation	$1,052,898.00
Design and Engineering Civil Engineer Electrical Engineer Architectural Design	89,779.00
Fire Alarm System Replacement Special Systems Replacements and Upgrades Access Control Emergency Controls ADA Compliance	525,000.00
Medical Furnishings and Equipment for New Addition Medical equipment for exam rooms, medication storage, equipment sterilization, soiled materials and supply equipment.	198,323.00
Patient Centered Furnishings Administrative offices furnishings	134,000.00
Total Amount of Request	$2,000,000.00

2412 MILES ROAD SE ALBUQUERQUE, NM 87106 TEL 505.842.8865 FAX 842.1693 lee@lganm.com



OVERALL FLOOR PLAN • NEW ADDITION AND RENOVATION OF EXISTING BUILDING

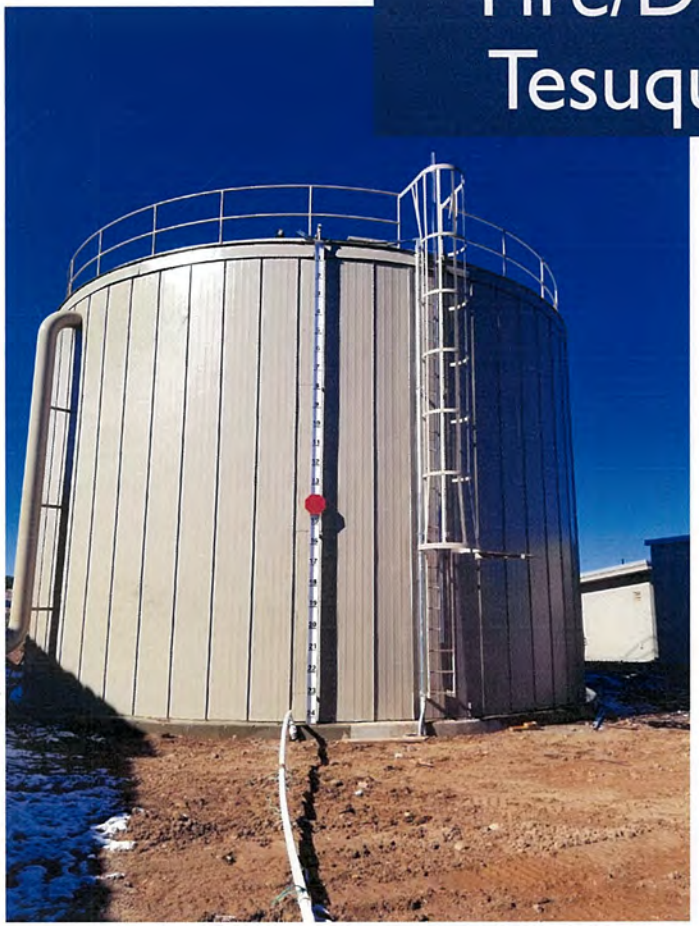
CANONCITO BAND OF NAVAJOS HEALTH CENTER

129 MEDICINE HORSE DRIVE. TO'HAJIILEE, NEW MEXICO

LEE GAMELSKY ARCHITECTS P.C.
2412 MILES ROAD S.E.
ALBUQUERQUE, NEW MEXICO 87106
505.842.8865

6/24/2019

Fire/Domestic Storage Tank
Tesuque Casino 2018/2019



- 200,000 Gallon Storage Tank
- 38' DIAMETER, 24' TALL

Bohannan Huston

Fire/Domestic Booster Station – Tesuque Casino 2018/2019

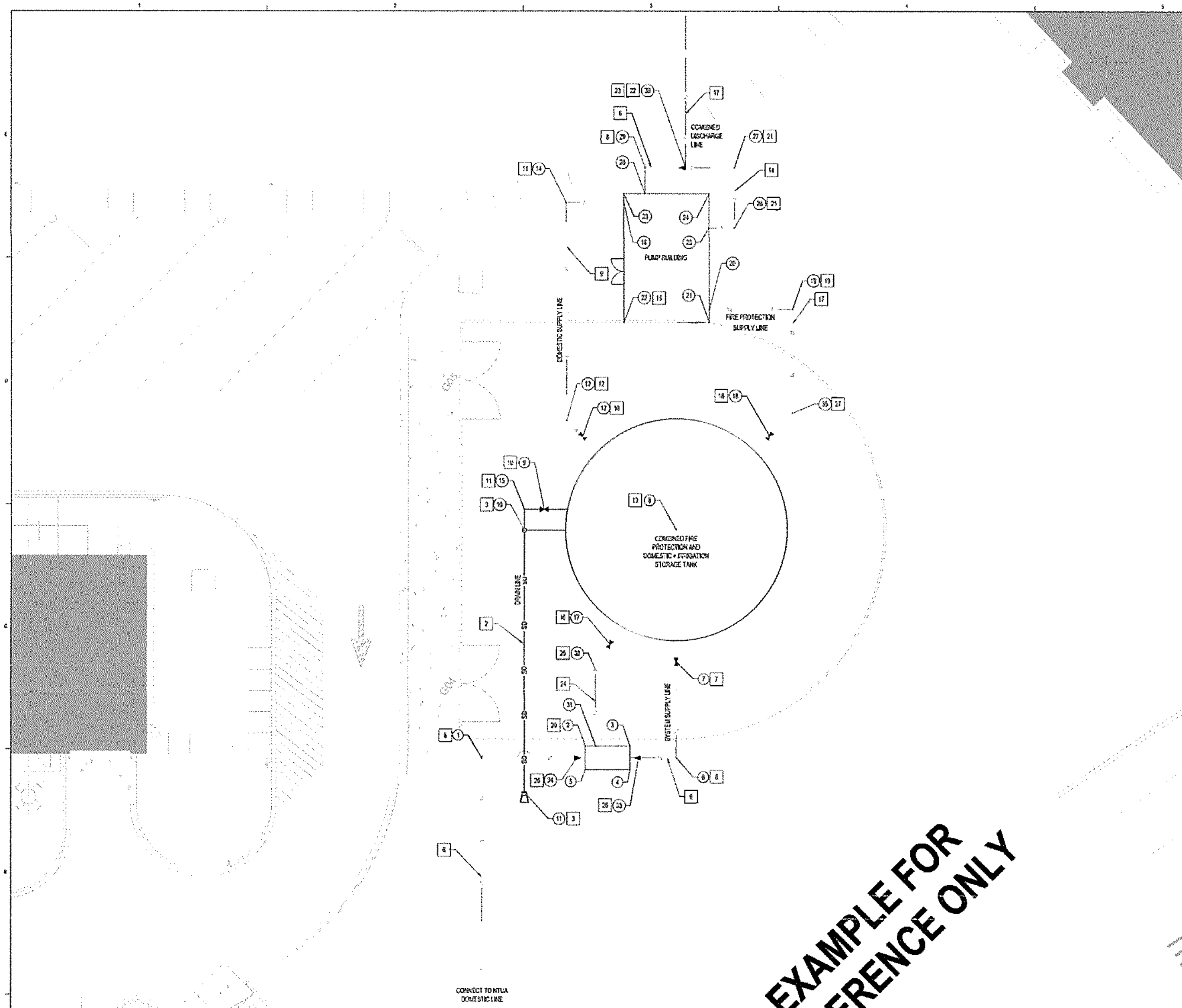
Fire Pump Skid inside building

Fire Pump House

Domestic Booster Skid

- 3,500 gpm Diesel Fire Pump
- 2+1 Domestic Pump Skid – 75 gpm/pump
- Building 28'X13', 10' Tall

Bohannan Huston



THE COMBINED DOMESTIC AND IRRIGATION SYSTEM HAS BEEN DESIGNED TO PROVIDE THE DEMANDS AND PRESSURES LISTED BELOW:

Building	Demand [gpd]	Minimum Pressure [psi]
K-8 Building	42,700	60
Dormitory	3,180	60
Gathering Facility	200	60
Teacherage	9,600	60
Fire Station	0	60
Irrigation	6,135	70

TOTAL DOMESTIC + IRRIGATION STORAGE DESIGN TO PROVIDE 3 DAYS OF PEAK DAY FLOWS:

- 55,000 GPD TOTAL DOMESTIC PEAK DAY FLOW.
- 6,135 GPD TOTAL IRRIGATION PEAK DAY FLOW.
- 3 DAYS X (55,000 + 6,135) GPD = 183,645 GAL DOMESTIC + IRRIGATION STORAGE REQUIRED.

THE FIRE PROTECTION SYSTEM HAS BEEN DESIGNED AS FOLLOWS:

PER INTERNATIONAL FIRE CODE, 2015 (IFC 15) APPENDIX B...

- 2B-TYPE CONSTRUCTION.
- 84,625 SF IN LARGEST BUILDING.
- 6,250 GPM FIREFLOW REQUIRED FOR NON-SPRINKLERED.
- 1,563 GPM FIRE FLOW REQUIRED FOR SPRINKLERED (25% OF NON-SPRINKLERED).
- 2-HOUR FIREFLOW DURATION.
- 1,563 GPM X 60 MIN/HR X 2 HR = 187,560 GAL FIRE STORAGE REQUIRED.

TOTAL ONSITE STORAGE REQUIRED:
183,645 GAL + 187,560 GAL = 371,205 GAL TOTAL STORAGE REQUIRED.

KEYED NOTES

1. NOT USED.
2. 8" RCP RESERVOIR OVERFLOW DRAIN LINE.
3. 8" RCP MANHOLE.
4. NOT USED.
5. NOT USED.
6. 6" C900 DR18 PVC PIPELINE.
7. 6" GATE VALVE.
8. 6" HORIZONTAL 90° BEND.
9. 8" C900 DR18 PVC PIPELINE.
10. 8" GATE VALVE.
11. 8" 90° BEND.
12. 6" 45° BEND.
13. 381,250 GALLON COMBINED FIRE PROTECTION AND DOMESTIC RESERVOIR, SEE DETAIL 2, DWG. C323.
14. 10" C900 DR18 PVC PIPELINE.
15. PUMP STATION, SEE DWG. 327.
16. 2" GATE VALVE.
17. 12" C900 DR18 PVC PIPELINE.
18. 12" GATE VALVE.
19. 12" 90° BEND.
20. 6" ALTITUDE VALVE VAULT.
21. 10" 90° BEND.
22. 12" X 10" TEE.
23. 6" X 10" REDUCER.
24. 1" PVC LINE.
25. 1" 30° BEND.
26. 4" X 6" REDUCER.
27. 12" 45° BEND.

POINT TABLE

POINT#	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1905318.5224	967870.1183	6439.822	SUPPLY LINE 90° BEND
2	1905304.2900	967856.0753	6445.442	ALTITUDE VALVE VAULT
3	1905293.5441	967862.4430	6446.017	ALTITUDE VALVE VAULT
4	1905293.7188	967808.0798	6445.579	ALTITUDE VALVE VAULT
5	1905298.5833	967801.8822	6445.003	ALTITUDE VALVE VAULT
6	1905233.2754	967906.6604	6442.020	SUPPLY LINE 90° BEND
7	1905296.9480	967924.7539	6442.154	SUPPLY LINE GATE VALVE
8	1205315.5267	967948.2373	6448.000	WATER STORAGE TANK
9	1905343.3497	967934.3283	6442.000	DRAIN LINE GATE VALVE
10	1905344.0547	967927.0280	6442.000	DRAIN LINE MANHOLE
11	1905300.7105	967878.8334	6442.000	DRAIN LINE OUTFALL TO DITCH
12	1905348.5400	967993.3895	6441.782	DOMESTIC LINE GATE VALVE
13	1905351.7310	967984.0718	6441.525	DOMESTIC LINE 45° BEND
14	1905382.0216	967984.4305	6442.251	DOMESTIC LINE 90° BEND
15	1905347.0035	967931.5128	6442.000	DRAIN LINE 90° BEND
16	1905371.9158	968002.8417	6441.477	DOMESTIC LINE CONN.
17	1905311.7781	967918.5943	6441.904	GAGE LINE GATE VALVE
18	1905311.7555	967930.0714	6441.045	FIRE PROTECTION LINE GATE VALVE
19	1905325.4151	968000.7420	6441.411	FIRE PROTECTION LINE 90° BEND
20	1905343.8447	967994.8770	6441.729	FIRE PROTECTION LINE CONN.
21	1905330.0300	967993.4978	6445.755	PUMP HOUSE
22	1905334.9343	967930.8704	6445.155	PUMP HOUSE
23	1905373.1341	968004.2203	6443.500	PUMP HOUSE
24	1905357.2193	968218.2534	6445.500	PUMP HOUSE
25	1905362.3779	968008.0920	6441.538	FIRE PROTECTION DISCHARGE CONN.
26	1905347.6116	968013.6404	6441.257	FIRE PROTECTION DISCHARGE 90% BEND
27	1905316.1580	968024.7829	6442.440	FIRE PROTECTION DISCHARGE 90% BEND
28	1905368.1581	968007.2524	6441.500	DOMESTIC DISCHARGE CONN.
29	1905372.0074	968012.0136	6443.377	DOMESTIC DISCHARGE 90° BEND
30	1905365.3654	968017.7976	6442.882	COMBINED DISCHARGE LINE
31	1905298.9823	967887.5498	6441.575	SENSING LINE CONN
32	1905318.8098	967911.8315	6441.725	SENSING LINE 30° BEND
33	1905309.2022	967801.4700	6441.904	SUPPLY LINE REDUCER
34	1905301.8112	967553.0650	6441.112	SUPPLY LINE REDUCER
35	1905310.7651	967987.5862	6442.121	FIRE PROTECTION LINE 45° BEND

ARCHITECT

ENGINEER

PROJECT

FIRE PROTECTION STORAGE TANK AND PUMP HOUSE EXAMPLE PROJECT

100% SUBMITTAL

REVISIONS

DRAWN BY

REVIEWED BY

DATE 09/15/2020

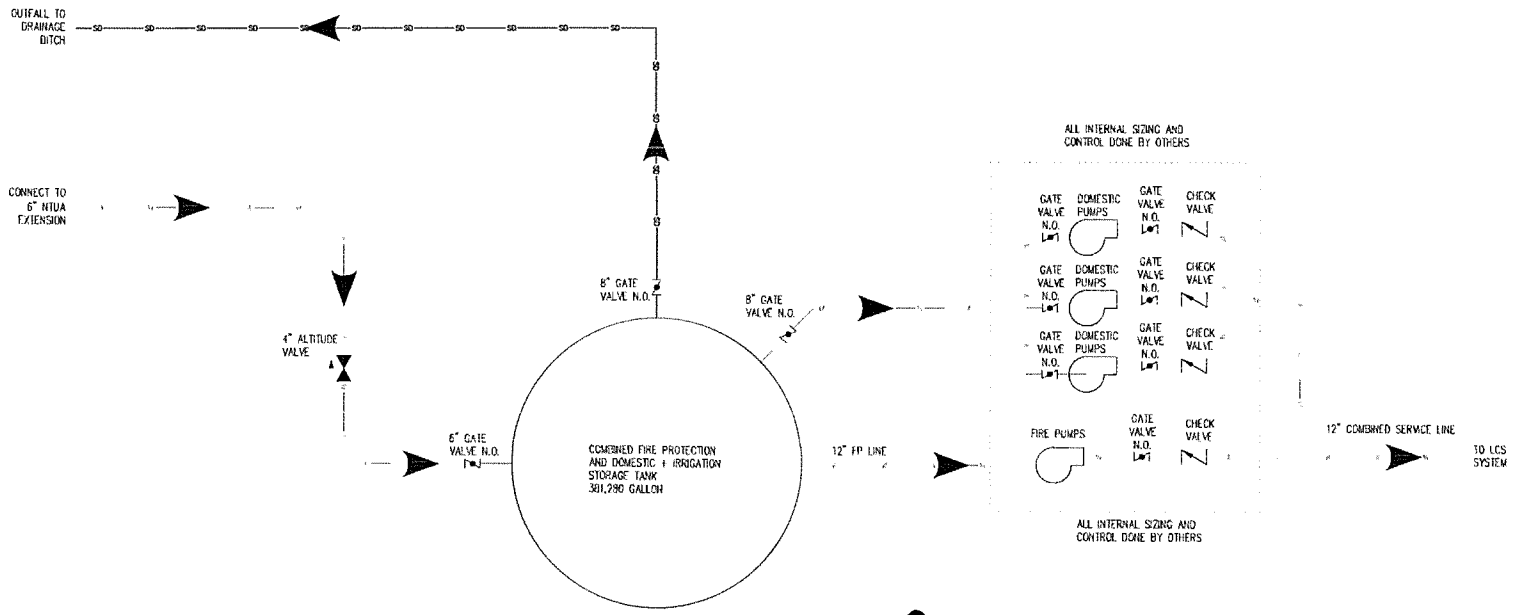
PROJECT NO. EXAMPLE PROJECT

DRAWING NAME

COMBINED FIRE, DOMESTIC, & IRRIGATION SYSTEM PUMP STATION & TANK SITE LAYOUT

SHEET NO.

C320 OF



EXAMPLE FOR REFERENCE ONLY

ARCHITECT

ENGINEER

PROJECT

FIRE PROTECTION STORAGE TANK AND PUMP HOUSE EXAMPLE PROJECT

100% SUBMITTAL

REVISIONS

DRAWN BY

REVIEWED BY

DATE 00/15/2020

PROJECT NO. EXAMPLE PROJECT

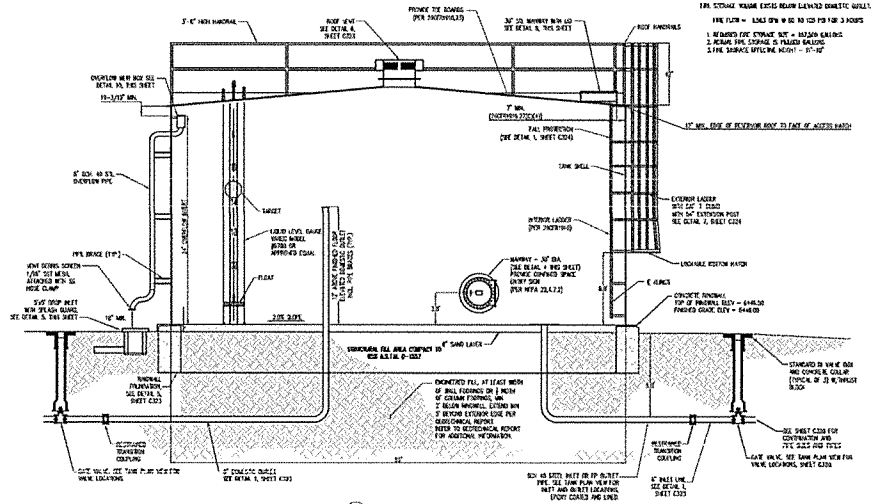
DRAWING NAME

COMBINED FIRE, DOMESTIC, & IRRIGATION SYSTEM FLOW DIAGRAM

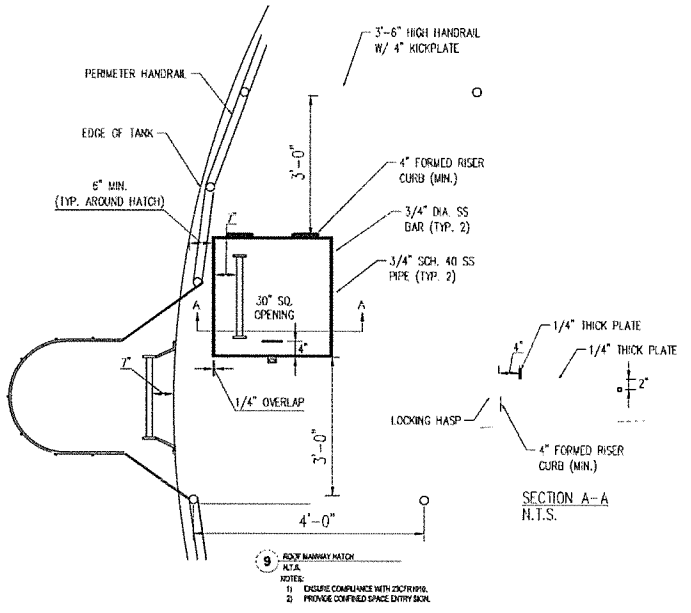
SHEET NO.

C321

OF



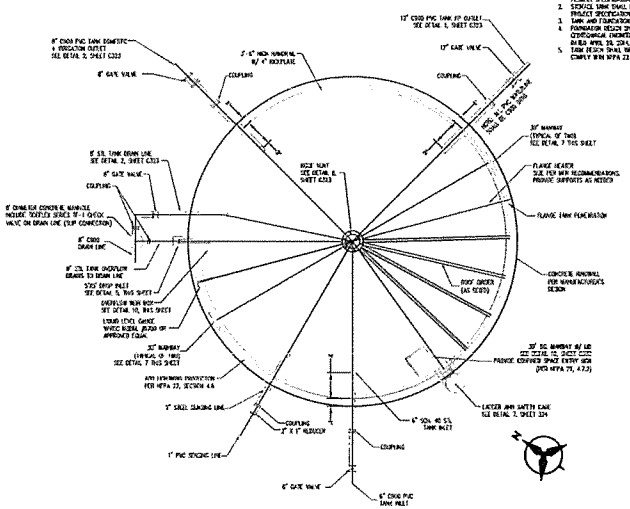
1 TANK PROFILE
N.T.S.
NOTES:
1) EXTERNAL COMPONENTS ROTATED FOR CLARITY.



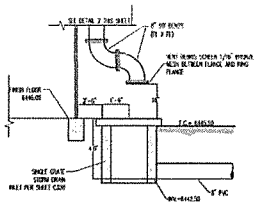
SECTION A-A
N.T.S.

9 ROOF MANWAY HATCH
N.T.S.
NOTES:
1) ENSURE COMPLIANCE WITH 29CFR1910.
2) PROVIDE CONFINED SPACE ENTRY SIGN.

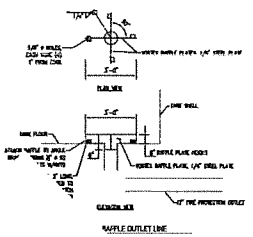
8 MANWAY HINGE DETAIL
N.T.S.



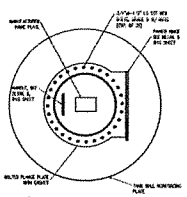
2 391,200 GALLON TANK PLAN
N.T.S.



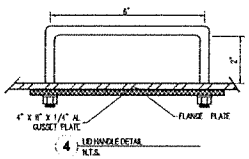
5 6" OVERFLOW DRAIN AND AIR GAP/DROP INLET
N.T.S.



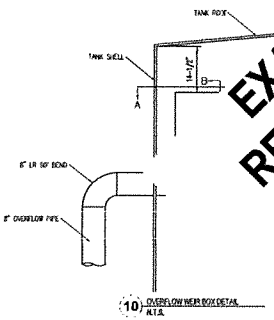
RAFFLE OUTLET LINE



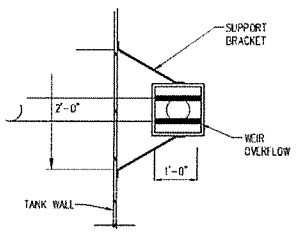
7 36" MANWAY DETAIL
N.T.S.



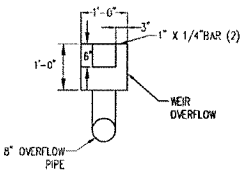
4 LID HANDLE DETAIL
N.T.S.



10 OVERFLOW WEIR BOX DETAIL
N.T.S.



SECTION A-A
NTS



SECTION B-B
NTS

EXAMPLE FOR REFERENCE ONLY

FIRE PROTECTION STORAGE TANK AND PUMP HOUSE EXAMPLE PROJECT

100% SUBMITTAL

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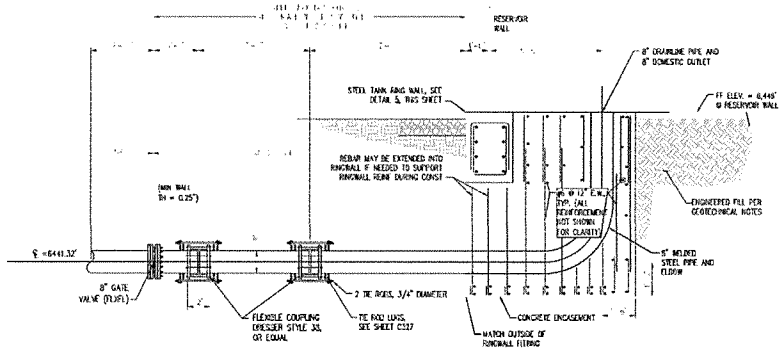
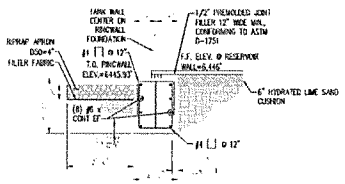
DRAWN BY
REVIEWED BY
DATE 03/15/2020
PROJECT NO. EXAMPLE PROJECT
DRAWING NAME
COMBINED FIRE, DOMESTIC, & IRRIGATION SYSTEM TANK DETAILS

SHEET NO.
C322
OF

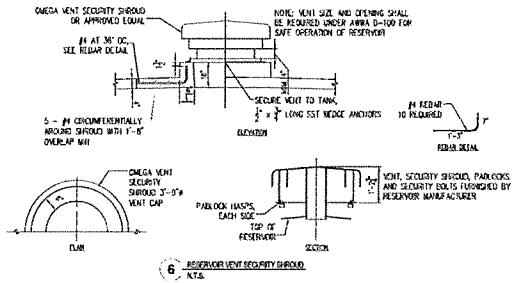


1 8" INLET, 8" DRAIN LINE, 8" DOMESTIC OUTLET, & 12" FIRE PROTECTION OUTLET (TYP.) N.T.S.



5 STEEL RESERVOIR CONCRETE RINGWALL N.T.S.

NOTE:
RINGWALL DETAIL IS FOR REFERENCE, TANK DESIGNER MUST PROVIDE FOUNDATION DESIGN THAT IS STAMPED AN SEALED BY A CERTIFIED ARIZONA PROFESSIONAL ENGINEER.



6 RESERVOIR VENT SECURITY SHROUD N.T.S.

EXAMPLE FOR REFERENCE ONLY

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ENGINEER

PROJECT

FIRE PROTECTION STORAGE TANK AND PUMP HOUSE EXAMPLE PROJECT

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DRAWN BY

REVIEWED BY

DATE 02/15/2020

PROJECT NO. EXAMPLE PROJECT

DRAWING NAME
COMBINED FIRE, DOMESTIC, & IRRIGATION SYSTEM CONCRETE ENCASEMENT

SHEET NO.
C323
OF

NOTES:
1. THIS SHEET FOR INFORMATION ONLY
2. CONTRACTOR TO PROVIDE SKID-MOUNTED, PACKAGED BOOSTER STATION WITH ENCLOSURE MEETING PERFORMANCE REQUIREMENTS OF THIS SHEET.
3. SUBMITTALS:
   - 3.1. PRODUCT DATA FOR ALL EQUIPMENT.
   - 3.2. SHOP DRAWINGS SHOWING DIMENSIONS, MATERIALS, SIZES, WEIGHTS, AND FINISHES.
   - 3.3. WIRING DIAGRAMS
   - 3.4. PRODUCT CERTIFICATES
4. FIRE PUMP - ENSURE ELECTRICAL SUPERVISION ACCORDANCE WITH NFPA 2000, 21.3.5.2, 21.3.5.3, 5.5.3.

LEGEND

1. FIRE PUMP: AURORA #5-481-15B 2000 GPM @ 112 PSI WITH SUCTION AND DISCHARGE GAUGES, AIR RELEASE VALVE, DIESEL ENGINE CLARKE #JU6H-UFAD0-D 224 HP
2. FIRE PUMP CONTROLLER: TORNATECH #CPD
3. JOCKEY PUMP WITH PIPING: AURORA #PVM3-17, 3 HP WITH TEFC MOTOR, NIBCO #KT-403-W 1.25" CHECK VALVE AND (2) NIBCO #T-104-0 1.25" GATE VALVES
4. JOCKEY PUMP CONTROLLER: TORNATECH #JP3
5. SUCTION VALVE: NIBCO #F-607-RW 10" DS&Y GATE VALVE WITH SUPERVISORY SWITCH
6. CHECK VALVE: NIBCO #KW-900-W 10" WAFER STYLE CHECK VALVE
7. DISCHARGE CONTROL VALVE: NIBCO #LD3510-8 10" BUTTERFLY VALVE WITH SUPERVISORY SWITCH (NO)
8. FLOW METER LOOP WITH GROOVED ENDS: 8" PIPING WITH (2) #LD3510C-8 8" BUTTERFLY VALVES WITH SUPERVISORY SWITCH (NC)
9. TEST MANIFOLD: 8" PIPING WITH (6) 2-1/2" NPT HOSE VALVES, NIBCO #LD3510C-8 8" BUTTERFLY VALVE WITH SUPERVISORY SWITCH (NC)
10. FIRE DEPARTMENT CONNECTION: 6" PIPING WITH NIBCO #KW-900-W 6" CHECK VALVE
11. MAIN RELIEF VALVE: 6" PILOT OPERATED VALVE WITH 6"X10" WASTE CONE
12. MUFFLER 6"
13. NEMA 1 BUILDING MAIN POWER DISTRIBUTION PANEL
14. NOT USED
15. 5KW HEATER WITH SAFETY SWITCH (QTY 2)
16. AUTOMATIC LOUVER FOR COMBUSTION AIR AND VENTILATION
17. EXHAUST FAN
18. INTERIOR LIGHTS
19. EXTERIOR LIGHT
20. EMERGENCY LIGHT
21. SPRINKLER SYSTEM WITH PENDANT TYPE HEADS, INCLUDES POTTER #VSR-SF FLOW SWITCH, NIBCO #KT-503-W-8 1.25" BALL VALVE WITH SUPERVISORY SWITCH
22. FUEL TANK: 300 GALLON DOUBLE WALL TANK WITH FUEL FILL AND VENT FITTINGS, SS PIPE, SCH. 40, SUPPORTS, HIGH/LOW FUEL LEVEL SENSORS
23. BATTERIES, RACK AND CABLES
24. TREADPLATE FLOOR: ¼" STEEL DIAMOND PATTERN TREADPLATE
25. DOMESTIC WATER BOOSTER SYSTEM: CANARIIS #DM-S61-80-4V3 WITH (2) NIBCO LD2060-3 6" BUTTERFLY VALVES
26. NOT USED
27. VALVES WITH SUPERVISORY SWITCH (NO)
28. 9070 DOUBLE DOOR
29. BUILDING ENCLOSURE
30. BLADDER TANK: WESSELS MODEL: FXA700, 185 GALLON
31. SUPERVISORY PANEL

NOTES:

1. ALL DRAIN PIPING TO TERMINATE IN THIS LOCATION. MAIN DRAIN LINE IS PIPED TO OUTER PERIMETER.

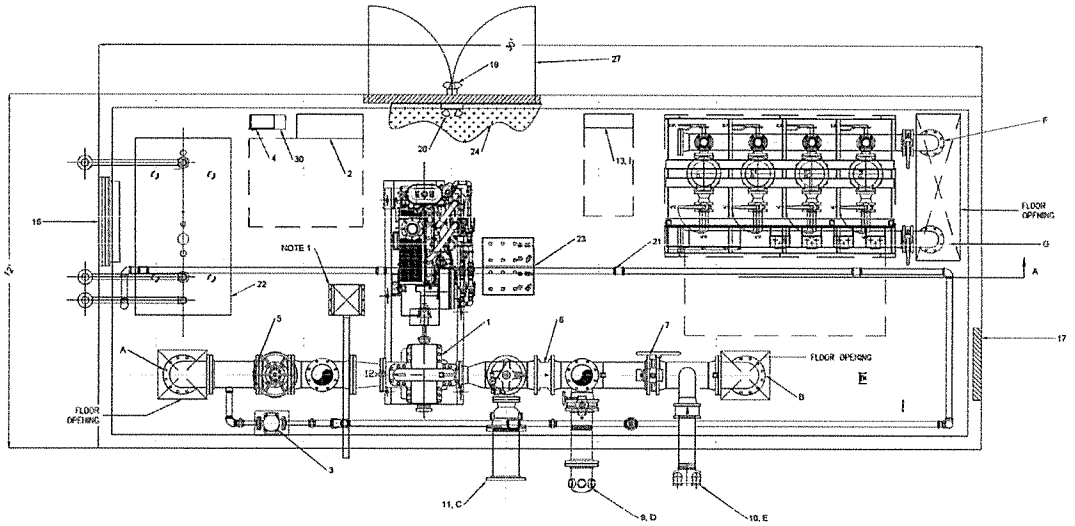
MAIN CUSTOMER CONNECTIONS:

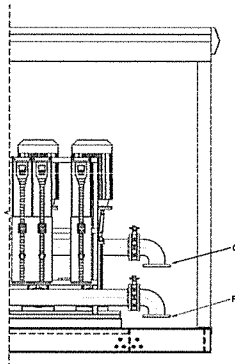
- A. FIRE SYSTEM SUCTION: 12" FLANGED CL150
- B. FIRE SYSTEM DISCHARGE: 10" FLANGED CL150
- C. FIRE SYSTEM MAIN RELIEF VALVE DISCHARGE: 10" FLANGED CL150
- D. FIRE SYSTEM TEST HEADER: 8" FLANGED CL150
- E. FIRE SYSTEM FIRE DEPARTMENT CONNECTION: 6" NPT
- F. DOMESTIC WATER SYSTEM SUCTION: 8" FLANGED CL150
- G. DOMESTIC WATER SYSTEM DISCHARGE: 6" FLANGED CL150
- H. NOT USED
- I. POWER: SINGLE POINT 200/3/60

ITEMS TO SHIP LOOSE:

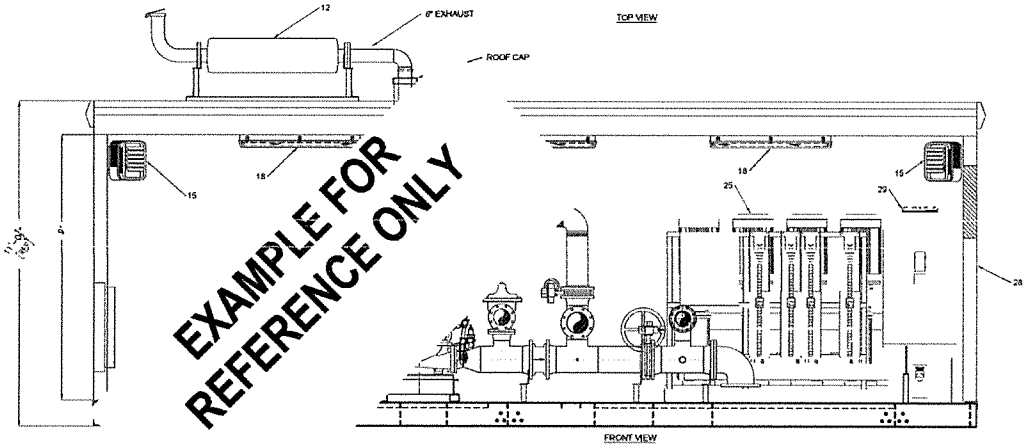
1. TEST HEADER AND HOSE VALVES
2. FUEL VENT AND FUEL FILL PIPING
3. MUFFLER, EXTERNAL PIPING AND HARDWARE
4. EXTERIOR LIGHTING
5. EXTERIOR PIPING CONNECTIONS
6. BATTERIES, RACK & CABLES
7. LIFTING BRACKETS

PRELIMINARY ENG: SYSTEM LAYOUT





SECTION A-A



EXAMPLE FOR REFERENCE ONLY

...e approximate and ...facturing tolerances. Do not ...ping until the system is proper... Canariis Corporation accepts no liabi..., ...xpenses incurred due to dimensional ...ariances.

CANARIIS CORPORATION
RIVERVIEW, FL.
PH: (813)621-8643 FAX: (813)626-2178
www.canariis.com

DWG TITLE: LUKACHUKAI

DWN BY: MK	DATE: 7/23/2020	SCALE:	REV. REV.C
APPV BY:	DATE:	DWG NO.: F-0053-20	PAGE 1 OF 1

ARCHITECT

ENGINEER

PROJECT

FIRE PROTECTION STORAGE TANK AND PUMP HOUSE EXAMPLE PROJECT

100% SUBMITTAL

REVISIONS
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DRAWN BY
REVIEWED BY
DATE 03/15/2020
PROJECT NO. EXAMPLE PROJECT
DRAWING NAME
COMBINED FIRE, DOMESTIC, & IRRIGATION SYSTEM PUMP HOUSE DETAILS
SHEET NO.
C324
OF

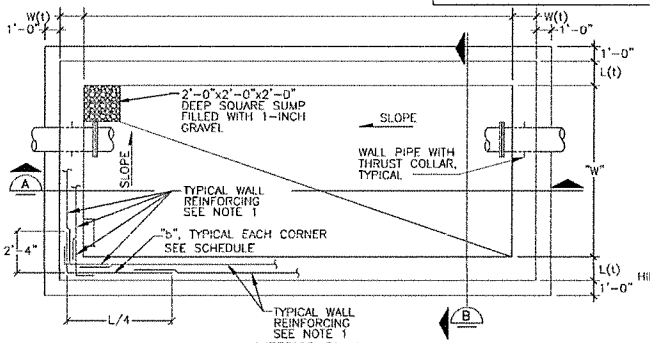
ALTITUDE VALVE VAULT DIMENSION AND REINFORCING SCHEDULE

"L"=VAULT LENGTH
"W"=VAULT WIDTH

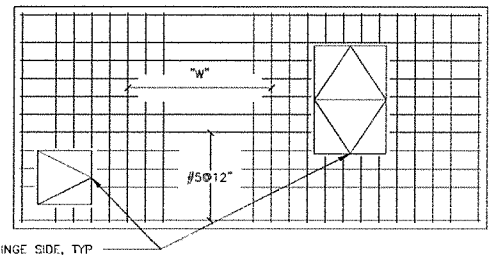
PIPE SIZE (IN)	STANDARD AV, NO METER, NO BYPASS "L"	STANDARD AV, NO METER, NO BYPASS "W"	STANDARD AV, NO METER, W/BYPASS "L"	STANDARD AV, NO METER, W/BYPASS "W"	WITH PROPELLER METER AND NO BYPASS "L"	WITH PROPELLER METER AND NO BYPASS "W"	WITH PROPELLER METER AND BYPASS "L"	WITH PROPELLER METER AND BYPASS "W"	WITH MAGNETIC FLOW METER AND BYPASS "L"	WITH MAGNETIC FLOW METER AND BYPASS "W"	WALL THICKNESS L(t)	WALL THICKNESS W(t)	TOP THICKNESS TRAFFIC T(t)	TOP THICKNESS NONTRAFFIC T(t)	WALL REINFORCING WITHOUT BYPASS "L" a	WALL REINFORCING WITHOUT BYPASS "W" a	WALL REINFORCING WITHOUT BYPASS b	WALL REINFORCING WITH BYPASS "L" a	WALL REINFORCING WITH BYPASS "W" a	WALL REINFORCING WITH BYPASS b
4/6	10'-6"	5'-6"	11'-8"	8'-0"	10'-6"	5'-6"	14'-6"	8'-0"	15'-8"	8'-6""	1'-0"	1'-0"	1'-0"	0'-8"	#6 @ 12"	TYPICAL	TYPICAL	#5 @ 6"	TYPICAL	#6 @ 12"
8	10'-6"	5'-8"	12'-0"	8'-2"	10'-6"	5'-8"	15'-4"	8'-2"	16'-2"	8'-8"	1'-0"	1'-0"	1'-0"	0'-8"	#6 @ 12"	TYPICAL	TYPICAL	#5 @ 6"	TYPICAL	#6 @ 12"
10	10'-6"	5'-10"	13'-0"	8'-4"	11'-4"	5'-10"	17'-4"	8'-4"	17'-4"	8'-10"	1'-0"	1'-0"	1'-0"	0'-8"	#6 @ 12"	#6 @ 12"	TYPICAL	#5 @ 6"	#6 @ 12"	#6 @ 12"
12	10'-6"	6'-0"	13'-8"	8'-6"	12'-8"	6'-0"	19'-0"	8'-6"	18'-4"	9'-0"	1'-0"	1'-0"	1'-0"	0'-8"	#6 @ 12"	#6 @ 12"	TYPICAL	#5 @ 6"	#6 @ 12"	#6 @ 12"
14	10'-6"	6'-2"	14'-9"	8'-8"	14'-3"	6'-2"	21'-6"	8'-8"	20'-2"	9'-2"	1'-0"	1'-2"	1'-0"	0'-8"	#5 @ 6"	#5 @ 6"	#6 @ 12"	#5 @ 6"	#5 @ 6"	#6 @ 12"
16	10'-6"	6'-4"	15'-4"	8'-10"	16'-6"	6'-4"	24'-2"	8'-10"	21'-0"	9'-4"	1'-0"	1'-2"	1'-0"	0'-8"	#5 @ 6"	#5 @ 6"	#6 @ 12"	#5 @ 6"	#5 @ 6"	#6 @ 12"

DIMENSIONAL NOTES:
"L" = VAULT LENGTH
"W" = VAULT WIDTH
L(t) = WALL THICKNESS(LENGTH)
W(t) = WALL THICKNESS(WIDTH)
T(t) = TOP SLAB THICKNESS

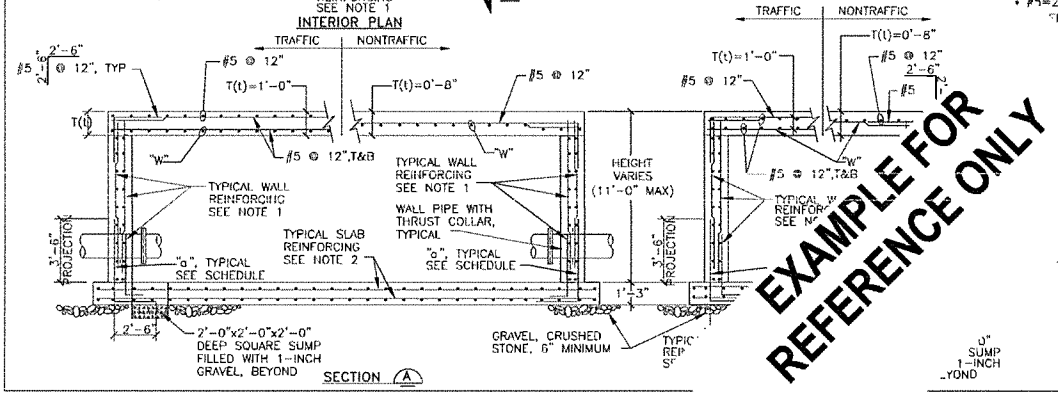
WALL REINFORCING NOTES:
1. "a" BAR DESIGNATION REPRESENTS WALL DOWELS PROTRUDING VERTICALLY FROM BASE SLAB ALONG LENGTHWISE DIMENSION "L" OR WIDTH DIMENSION "W".
2. "b" BAR DESIGNATION REPRESENTS ADDITIONAL HORIZONTAL WALL CORNER REINFORCING.



INTERIOR PLAN



TOP PLAN



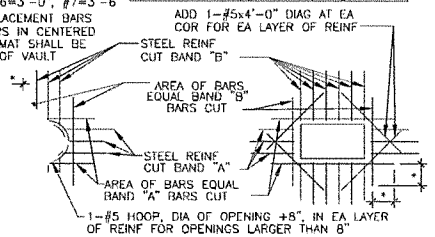
SECTION A

EXAMPLE FOR REFERENCE ONLY

GENERAL NOTES:
1. TYPICAL WALL REINFORCING SHALL BE #5 @ 12" O.C., EACH WAY, EACH FACE UNLESS SHOWN OTHERWISE ON THE SCHEDULE. PROVIDE BARS AS INDICATED ON THE SCHEDULE AND LAP W/ #5 @ 12" FOR REMAINDER OF WALL HT. OR LENGTH.
2. TYPICAL BASE SLAB REINFORCING SHALL BE #5 @ 12" EACH WAY, TOP AND BOTTOM OF SLAB.
3. CONCRETE SHALL BE IN ACCORDANCE WITH STD SPEC SEC. 510 AND SEC. 101 FOR HYDRAULIC CONCRETE f'c=4000 psi @ 28 DAYS. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. IF THE DEPTH OF VAULT EXCEEDS THE 11'-0" MAX. DEPTH SHOWN, THE ENGINEER/CONTRACTOR SHALL DESIGN THE REINFORCEMENT, WALL & FLOOR THICKNESS TO SUIT THE SPECIFIC CONDITIONS. ALL STRUCTURAL MODIFICATIONS SHALL BE DESIGNED AND STAMPED BY A LICENSED NEW MEXICO PROFESSIONAL ENGINEER.

VAULT DIMENSION	VAULT TOP REINFORCING T(t)=0'-8" CENTERED MAT "W"	VAULT TOP REINFORCING T(t)=1'-0" BOTTOM MAT "W"
≤6'-0"	#5 @ 12"	#5 @ 12"
>6'-0" ≤7'-0"	#5 @ 12"	#6 @ 12"
>7'-0" ≤9'-0"	#6 @ 12"	#7 @ 12"
>9'-0" ≤10'-0"	#7 @ 12"	#7 @ 12"

* #5=2'-6", #6=3'-0", #7=3'-6"
SPT REPLACEMENT BARS "W" BARS IN CENTERED TOM MAT SHALL BE H OF VAULT



OPENING NOTES:
1. TYPICAL FOR ALL OPENINGS IN CONCRETE WALLS AND SLABS.
2. DO NOT WELD REINFORCEMENT TO PIPE SLEEVES AND INSERTS.

REVISIONS	STANDARD ALTITUDE VALVE STATION STRUCTURAL DETAILS
	DWG. FEB. 2006

0" SUMP 1-INCH YOND

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FIRE PROTECTION STORAGE TANK AND PUMP HOUSE EXAMPLE PROJECT

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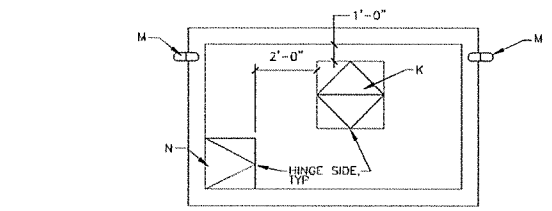
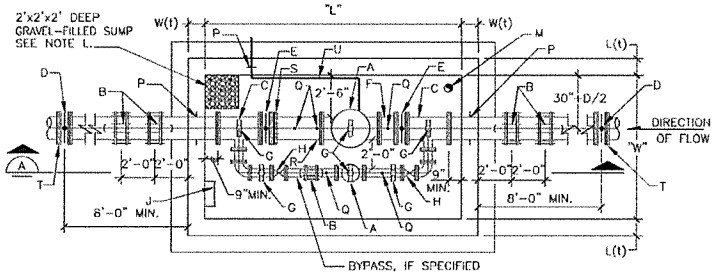
DRAWN BY
REVIEWED BY
DATE 03/15/2020
PROJECT NO. EXAMPLE PROJECT
DRAWING NAME

COMBINED FIRE, DOMESTIC, & IRRIGATION SYSTEM
ALTITUDE VALVE VAULT 1 OF 2

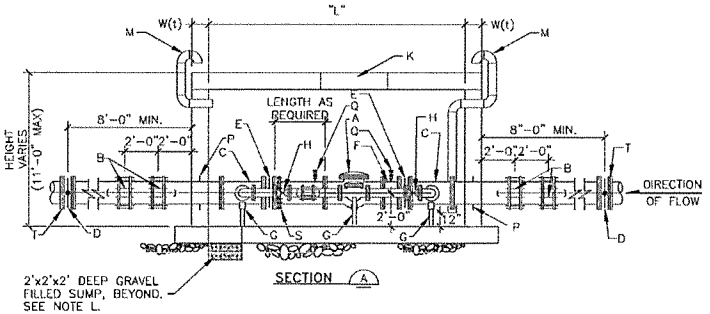
SHEET NO.
C325
OF



TOP PLAN



INTERIOR PLAN



SECTION (A)

GENERAL NOTES:

1. FOR STRUCTURAL DETAILS, VAULT DIMENSIONS AND REINFORCING SEE MANUFACTURER SPECIFICATIONS.

CONSTRUCTION NOTES:

1. ALTITUDE VALVE LOCATION, FINAL DESIGN AND LAYOUT SHALL BE APPROVED BY THE WATER UTILITY DIVISION TO CONFORM WITH SPECIFIC SYSTEM AND SITE REQUIREMENTS.
2. ALTITUDE VALVE STATION ACCESS OPENING COVERS SHOWN ON THIS STANDARD DETAIL ARE SUITABLE FOR LOCATIONS NOT EXPOSED TO CONTINUOUS HIGH DENSITY TRAFFIC. IF ALTITUDE VALVE STATION MUST BE LOCATED IN AREAS OF CONTINUOUS HIGH DENSITY TRAFFIC THE ACCESS OPENING COVERS SHALL BE SPECIFICALLY DESIGNED TO WITHSTAND THE CONDITIONS AND LOADINGS TO BE ENCOUNTERED.
3. ALUMINUM FLOOR DOORS AND FRAME FOR LOCATIONS SUBJECT TO INTERMITTENT AND LIGHT DENSITY TRAFFIC SHALL BE DESIGNED TO WITHSTAND A LIVE LOAD OF THE AASHTO H-20 DESIGNATION AND SHALL BE FLUSH WITH TOP OF VAULT.
4. ALUMINUM FLOOR DOORS AND FRAMES FOR LOCATIONS OUT OF ROADWAYS AND NOT SUBJECT TO TRAFFIC LOADINGS SHALL BE DESIGNED TO WITHSTAND A LIVE LOAD OF 300 POUNDS PER SQUARE FOOT AND SHALL EXTEND 3-INCHES MINIMUM ABOVE TOP OF VAULT.
5. 6-INCH VENT PIPING SHALL BE ROUTED SUCH THAT THE ABOVE GROUND GOOSENECK AND INSECT SCREEN ARE LOCATED OUT OF VEHICULAR OR PEDESTRIAN TRAFFIC AREAS.
6. BYPASS IS NOT REQUIRED FOR THIS PROJECT.

A 4" CLA-VAL ALTITUDE VALVE, MODEL NO. 210-0101BC2PRSVYKC-SST ALTITUDE VALVEM, ONE WAY FLOW, GLOBE STYLE, FULL PORT, FLANGED CLASS 150, DUCTILE IRON MAIN VALVE, WITH Buna-N DIAPHRAGM, FUSION BONDED EPOXY COATING INTERIOR/EXTERIOR, AND STAINLESS STEEL TRIM & FASTENERS. STAINLESS STEEL PILOT SYSTEM WITH BRAIDED FLEX TUBING, (3) BALL VALVES, (2) PRESSURE GAUGE & BLEEDER VALVE ASSEMBLIES (0-100PSI UPSTREAM AND DOWNSTREAM), Y-STRAINER WITH BLOWDOWN BALL VALVE, OPENING AND CLOSING SPEED CONTROLS, RESERVOIR GAUGE WITH TESTER, VALVE POSITION INDICATOR, ALTITUDE PILOT SPRING RANGE 5-40FT OF WATER.

B FLEXIBLE COUPLING WITH THRUST TIES, SEE THRUST TIE DETAIL ON SHEET C327

C FLANGED TEE, REQUIRED ONLY IF BYPASS SPECIFIED

D BURIED BUTTERFLY VALVE (GATE VALVE FOR SIZE < 14")

E BUTTERFLY VALVE WITH HAND WHEEL OPERATOR (GATE VALVE FOR SIZE < 8"), REQUIRED ONLY WHEN BYPASS IS SPECIFIED.

F FLANGED SPOOL, LENGTH = 1'-0"

G ADJUSTABLE PIPE SADDLE SUPPORT, GRINNELL FIG. 264, ELCEN FIG. 50 OR EQUAL, TYPICAL

H GATE VALVE WITH HAND WHEEL OPERATOR, REQUIRED ONLY IF BYPASS SPECIFIED

J 1'-6" WIDE ALUMINUM ...DDER W/LADDER UP SAFETY POST PER OSHA STANDARDS.

K ALUMINUM FLOOR ... RECESSED HASP COVERED BY A HINGED LID FLUSH WITH TOP SURFACE. ...LL BE 4'x4' DOUBLE LEAF (WITHOUT BYPASS) AND 4'x6' DOUBLE LEAF ...RDWARE AND HINGES SHALL BE 304 STAINLESS STEEL. BILCO TYPE

L GRAVEL

M 6" ...CREEN

N ...ESSED HASP COVERED BY A HINGED LID ...ND HINGES SHALL BE 304 STAINLESS STEEL.

...ENTER IN WALL

... VALVE AND CAP

... ADAPTER, AS MANUFACTURED ..., OR APPROVED EQUAL.

...E KIT.

...ENSING LINE.

EXAMPLE FOR REFERENCE ONLY

REVISIONS	
	STANDARD ALTITUDE VALVE STATION NO METER
	DWG. FEB. 2006

ARCHITECT

ENGINEER

PROJECT

FIRE PROTECTION STORAGE TANK AND PUMP HOUSE EXAMPLE PROJECT

100% SUBMITTAL

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DRAWN BY

REVIEWED BY

DATE 03/15/2020

PROJECT NO. EXAMPLE PROJECT

DRAWING NAME

COMBINED FIRE, DOMESTIC, & IRRIGATION SYSTEM
ALTITUDE VALVE VAULT 2 OF 2

SHEET NO.

C326

OF

*SEE NOTES TIE ROD SCHEDULE			
TEST PRESSURE		150 PSI	
PIPE DIA. (IN.)	MINIMUM PIPE WALL THICKNESS (IN.)*	TIE RODS	
		DIA. (IN.)	NO. REQ'D
6	3/16	5/8	2
8	3/16	5/8	2
10	3/16	5/8	2
12	3/16	5/8	2
14	3/16	3/4	2
16	3/16	7/8	2

NOTES:

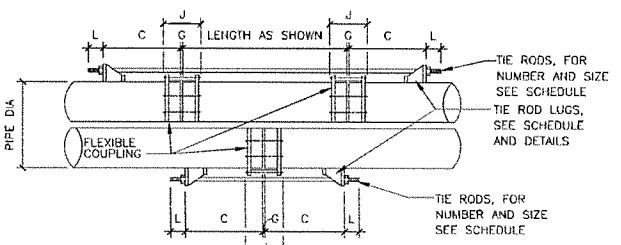
1. THE CONTRACTOR SHALL DETERMINE THE LENGTH "J" (COUPLING BOLT LENGTH) FROM MANUFACTURER'S CATALOGS USING THE SPECIFIED MIDDLE RING LENGTH.
2. "G" = MANUFACTURER'S RECOMMENDED SPACE BETWEEN ENDS OF PIPE.
3. "C" = J+Z+1 INCH, (ROUND THIS VALUE UP TO NEXT EVEN INCH), MINIMUM. (FOR Z DIMENSIONS, SEE LUG SCHEDULE.)
4. TIE ROD LENGTH = 2L+2C+G.

LUG SCHEDULE									
STUD DIA	T	W	X	Y	Z	HB	E	HF	L
5/8	3/8	1-3/8	4-1/16	4-1/2	3-3/8	3-7/8	3	1-3/4	3
3/4	3/8	1-1/2	5	4-1/2	5	4-1/8	3-1/8	1-3/4	3
7/8	1/2	1-5/8	5-1/2	4-1/2	5-1/8	4-1/4	3-1/8	1-3/4	4

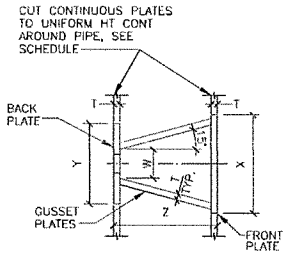
NOTES:

1. LUG SCHEDULE DIMENSIONS IN INCHES.
2. TIE RODS SHALL CONFORM TO ASTM A193 GRADE B7.
3. NUTS SHALL CONFORM TO ASTM A194 GRADE 2H.
4. PLATE SHALL CONFORM TO ASTM A283 GRADE D.
5. TIE ROD NUTS SHALL BE TIGHTENED GRADUALLY AND EQUALLY IN STAGES TO PREVENT UNEVEN ALIGNMENT AND TO ALLOW EQUAL STRESS ON ALL TIE RODS UNDER PRESSURE. TIGHTEN UNTIL SNUG. THREADS SHALL PROTRUDE FROM NUTS. PEEN THREADS AFTER TIGHTENING NUTS.
6. TIE ROD LUGS SHALL BE SPACED EQUALLY AROUND PIPE.
7. FILLET WELDS SHALL MEET THE MINIMUM REQUIREMENTS OF THE AISC SPECIFICATION EXCEPT AS FOLLOWS: FILLET WELDS SHALL BE 1/4-INCH MINIMUM EXCEPT WHEN WELDING 3/16-INCH PLATE WHERE THEY SHALL BE 3/16-INCH.
8. TIE RODS SHALL NOT BE ATTACHED TO A PIPE WHEN THE WALL THICKNESS IS LESS THAN THE MINIMUM SHOWN ON THE TIE ROD SCHEDULE.
9. FOR ALL BURIED ASSEMBLIES, COAT ALL TIE RODS AND EXPOSED STEEL WITH 16 MILS BITUMASTIC.

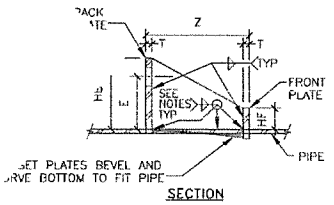
DOUBLE COUPLING



SINGLE COUPLING



PLAN



SECTION

EXAMPLE FOR REFERENCE ONLY

REVISIONS	
	WATER THRUST TIE DETAIL
	DWG. FEB. 2006

ARCHITECT

ENGINEER

PROJECT

FIRE PROTECTION STORAGE TANK AND PUMP HOUSE EXAMPLE PROJECT

100% SUBMITTAL

REVISIONS
△
△
△
△
△
△

DRAWN BY

REVIEWED BY

DATE 00/15/2020

PROJECT NO. EXAMPLE PROJECT

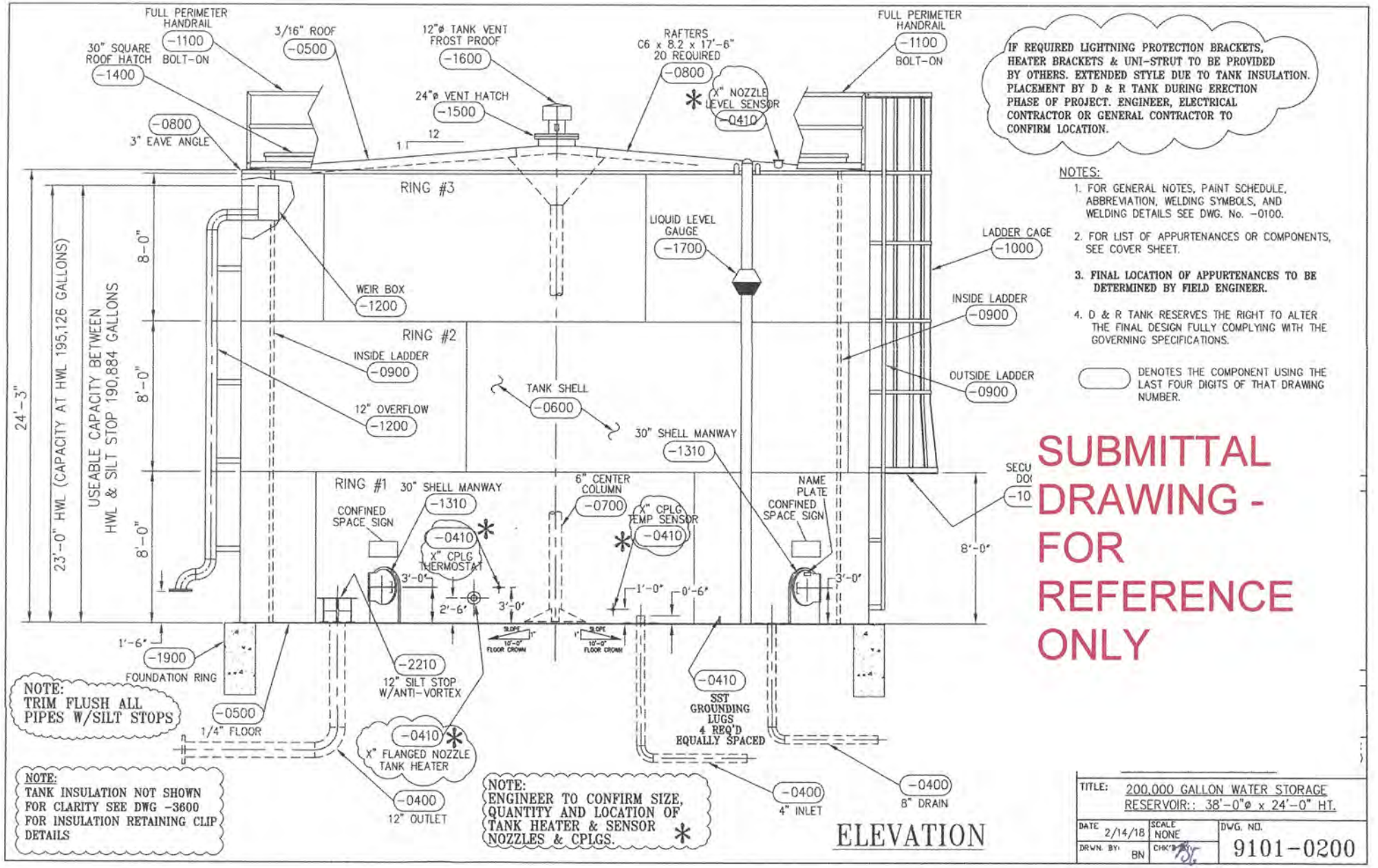
DRAWING NAME

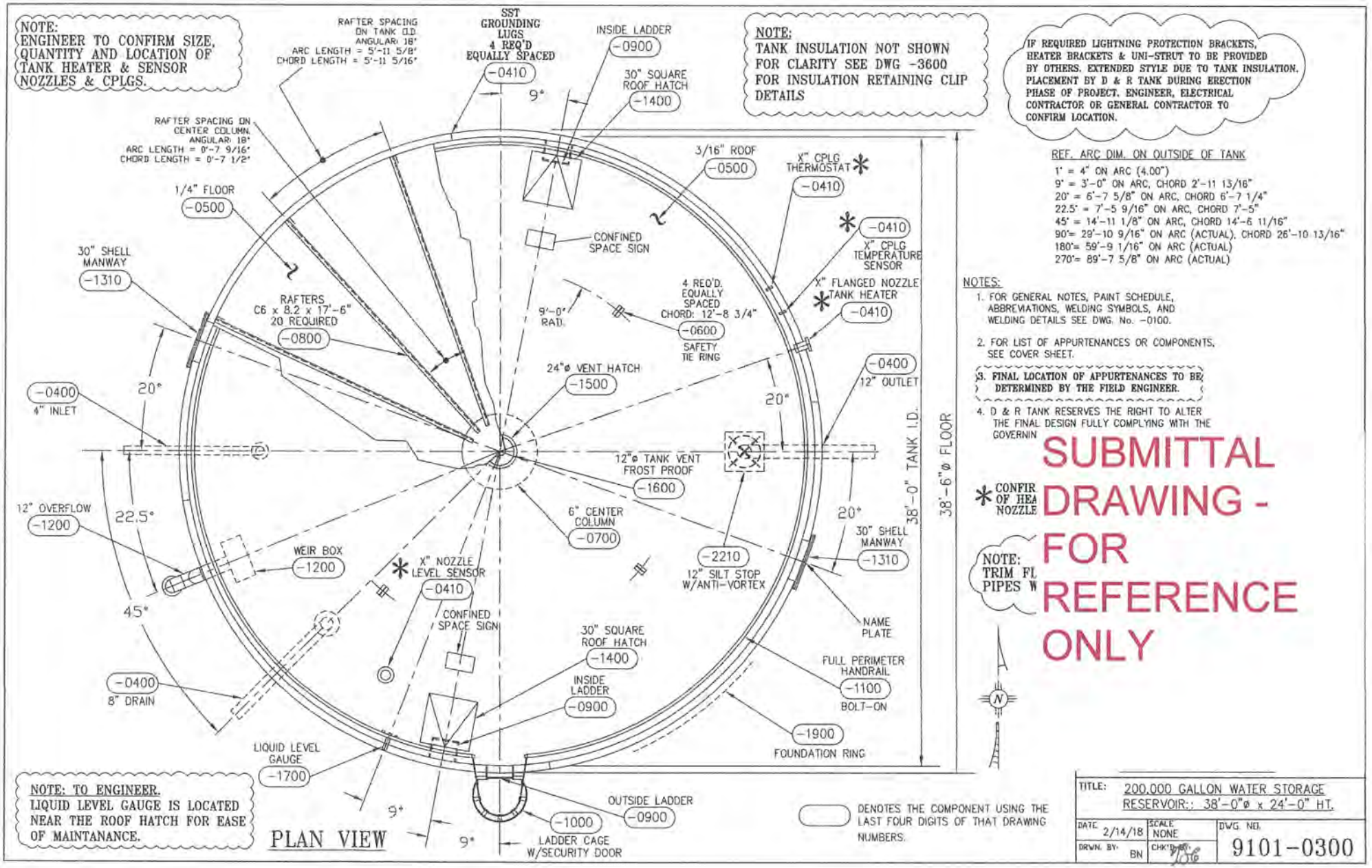
COMBINED FIRE, DOMESTIC, & IRRIGATION SYSTEM
THRUST TIE DETAIL

SHEET NO.

C327

OF


FULL PERIMETER HANDRAIL -1100 BOLT-ON
30" SQUARE ROOF HATCH -1400
3/16" ROOF -0500
12"ø TANK VENT FROST PROOF -1600
RAFTERS C6 x 8.2 x 17'-6" 20 REQUIRED -0800
X" NOZZLE LEVEL SENSOR -0410
FULL PERIMETER HANDRAIL -1100 BOLT-ON
24"ø VENT HATCH -1500
-0800 3" EAVE ANGLE
12
1
RING #3
LIQUID LEVEL GAUGE -1700
LADDER CAGE -1000
WEIR BOX -1200
INSIDE LADDER -0900
RING #2
INSIDE LADDER -0900
TANK SHELL -0600
12" OVERFLOW -1200
OUTSIDE LADDER -0900
30" SHELL MANWAY -1310
RING #1
30" SHELL MANWAY -1310
6" CENTER COLUMN -0700
NAME PLATE
CONFINED SPACE SIGN
CONFINED SPACE SIGN
X" CPLG TEMP SENSOR -0410
X" CPLG THERMOSTAT -0410
24'-3"
23'-0" HWL (CAPACITY AT HWL 195,126 GALLONS)
USEABLE CAPACITY BETWEEN HWL & SILT STOP 190,884 GALLONS
8'-0"
8'-0"
8'-0"
8'-0"
3'-0"
2'-6"
3'-0"
1'-0"
0'-6"
3'-0"
1'-6"
-1900 FOUNDATION RING
-2210 12" SILT STOP W/ANTI-VORTEX
-0410 SST GROUNDING LUGS 4 REQ'D EQUALLY SPACED
-0500 1/4" FLOOR
-0410 X" FLANGED NOZZLE TANK HEATER
-0400 12" OUTLET
-0400 4" INLET
-0400 8" DRAIN
NOTE: TRIM FLUSH ALL PIPES W/SILT STOPS
NOTE: TANK INSULATION NOT SHOWN FOR CLARITY SEE DWG -3600 FOR INSULATION RETAINING CLIP DETAILS
NOTE: ENGINEER TO CONFIRM SIZE, QUANTITY AND LOCATION OF TANK HEATER & SENSOR NOZZLES & CPLGS. *
IF REQUIRED LIGHTNING PROTECTION BRACKETS, HEATER BRACKETS & UNI-STRUT TO BE PROVIDED BY OTHERS. EXTENDED STYLE DUE TO TANK INSULATION. PLACEMENT BY D & R TANK DURING ERECTION PHASE OF PROJECT. ENGINEER, ELECTRICAL CONTRACTOR OR GENERAL CONTRACTOR TO CONFIRM LOCATION.
NOTES:
1. FOR GENERAL NOTES, PAINT SCHEDULE, ABBREVIATION, WELDING SYMBOLS, AND WELDING DETAILS SEE DWG. No. -0100.
2. FOR LIST OF APPURTENANCES OR COMPONENTS, SEE COVER SHEET.
3. FINAL LOCATION OF APPURTENANCES TO BE DETERMINED BY FIELD ENGINEER.
4. D & R TANK RESERVES THE RIGHT TO ALTER THE FINAL DESIGN FULLY COMPLYING WITH THE GOVERNING SPECIFICATIONS.
DENOTES THE COMPONENT USING THE LAST FOUR DIGITS OF THAT DRAWING NUMBER.
SUBMITTAL DRAWING - FOR REFERENCE ONLY
ELEVATION
TITLE: 200,000 GALLON WATER STORAGE RESERVOIR:: 38'-0"ø x 24'-0" HT.
DATE 2/14/18
SCALE NONE
DWG. NO. 9101-0200
DRWN. BY: BN
CHK'D BY:


NOTE:
ENGINEER TO CONFIRM SIZE, QUANTITY AND LOCATION OF TANK HEATER & SENSOR NOZZLES & CPLGS.
RAFTER SPACING ON TANK O.D. ANGULAR: 18° ARC LENGTH = 5'-11 5/8" CHORD LENGTH = 5'-11 5/16"
SST GROUNDING LUGS 4 REQ'D EQUALLY SPACED -0410
INSIDE LADDER -0900
30" SQUARE ROOF HATCH -1400
9°
RAFTER SPACING ON CENTER COLUMN ANGULAR: 18° ARC LENGTH = 0'-7 9/16" CHORD LENGTH = 0'-7 1/2"
1/4" FLOOR -0500
3/16" ROOF -0500
X" CPLG THERMOSTAT -0410
-0410 X" CPLG TEMPERATURE SENSOR
X" FLANGED NOZZLE TANK HEATER -0410
CONFINED SPACE SIGN
30" SHELL MANWAY -1310
RAFTERS C6 x 8.2 x 17'-6" 20 REQUIRED -0800
9'-0" RAD.
4 REQ'D. EQUALLY SPACED CHORD: 12'-8 3/4"
-0600 SAFETY TIE RING
24"ø VENT HATCH -1500
-0400 12" OUTLET
-0400 4" INLET
20°
12"ø TANK VENT FROST PROOF -1600
38'-0" TANK I.D.
38'-6"ø FLOOR
12" OVERFLOW -1200
22.5°
6" CENTER COLUMN -0700
-2210 12" SILT STOP W/ANTI-VORTEX
30" SHELL MANWAY -1310
WEIR BOX -1200
X" NOZZLE LEVEL SENSOR -0410
45°
CONFINED SPACE SIGN
NAME PLATE
30" SQUARE ROOF HATCH -1400
FULL PERIMETER HANDRAIL -1100 BOLT-ON
-0400 8" DRAIN
INSIDE LADDER -0900
-1900 FOUNDATION RING
LIQUID LEVEL GAUGE -1700
OUTSIDE LADDER -0900
-1000 LADDER CAGE W/SECURITY DOOR
9°
9°
NOTE: TANK INSULATION NOT SHOWN FOR CLARITY SEE DWG -3600 FOR INSULATION RETAINING CLIP DETAILS
IF REQUIRED LIGHTNING PROTECTION BRACKETS, HEATER BRACKETS & UNI-STRUT TO BE PROVIDED BY OTHERS. EXTENDED STYLE DUE TO TANK INSULATION. PLACEMENT BY D & R TANK DURING ERECTION PHASE OF PROJECT. ENGINEER, ELECTRICAL CONTRACTOR OR GENERAL CONTRACTOR TO CONFIRM LOCATION.
REF. ARC DIM. ON OUTSIDE OF TANK
1° = 4" ON ARC (4.00")
9° = 3'-0" ON ARC, CHORD 2'-11 13/16"
20° = 6'-7 5/8" ON ARC, CHORD 6'-7 1/4"
22.5° = 7'-5 9/16" ON ARC, CHORD 7'-5"
45° = 14'-11 1/8" ON ARC, CHORD 14'-6 11/16"
90°= 29'-10 9/16" ON ARC (ACTUAL), CHORD 26'-10 13/16"
180°= 59'-9 1/16" ON ARC (ACTUAL)
270°= 89'-7 5/8" ON ARC (ACTUAL)
NOTES:
1. FOR GENERAL NOTES, PAINT SCHEDULE, ABBREVIATIONS, WELDING SYMBOLS, AND WELDING DETAILS SEE DWG. No. -0100.
2. FOR LIST OF APPURTENANCES OR COMPONENTS, SEE COVER SHEET.
3. FINAL LOCATION OF APPURTENANCES TO BE DETERMINED BY THE FIELD ENGINEER.
4. D & R TANK RESERVES THE RIGHT TO ALTER THE FINAL DESIGN FULLY COMPLYING WITH THE GOVERNIN
SUBMITTAL DRAWING - FOR REFERENCE ONLY
* CONFIR OF HEA NOZZLE
NOTE: TRIM FL PIPES W
N
NOTE: TO ENGINEER.
LIQUID LEVEL GAUGE IS LOCATED NEAR THE ROOF HATCH FOR EASE OF MAINTANANCE.
PLAN VIEW
DENOTES THE COMPONENT USING THE LAST FOUR DIGITS OF THAT DRAWING NUMBERS.
TITLE: 200,000 GALLON WATER STORAGE RESERVOIR:: 38'-0"ø x 24'-0" HT.
DATE 2/14/18
SCALE NONE
DWG. NO. 9101-0300
DRWN. BY: BN
CHK'D BY:

LEGEND

1. FIRE PUMP: AURORA #10-481-18D 3500 GPM @ 88 PSI WITH SUCTION AND DISCHARGE GAUGES, AIR RELEASE VALVE, DIESEL ENGINE CLARK #JW6H-UFADJ0, 350 HP
2. FIRE PUMP CONTROLLER: TORNA TECH #GPD
3. JOCKEY PUMP: AURORA #PVM5-11, 5 HP, WITH CHECK VALVE AND ISOLATION GATE VALVES
4. JOCKEY PUMP CONTROLLER: TORNA TECH #JP3
5. SUCTION VALVE: NIBCO #F-607-RW 12" GATE VALVE
6. CHECK VALVE: NIBCO #KW-900-W 12" WAFER STYLE CHECK VALVE
7. DISCHARGE CONTROL VALVE: NIBCO #LD3510-8 12" BUTTERFLY VALVE WITH TAMPER SWITCH
8. FLOW METER WITH GROOVED ENDS: 10" PIPING WITH (2) #LD3510-8 10" BUTTERFLY VALVES WITH TAMPER SWITCH
9. TEST MANIFOLD: 12" HOSE HEADER WITH (2) 2-1/2" NPT HOSE VALVES, NIBCO #LD3510-8 12" BUTTERFLY VALVE WITH TAMPER SWITCH
10. MAIN RELIEF VALVE: 8" PILOT OPERATED VALVE WITH 12" WASTE CONE
11. MUFFLER, 6"
12. NEMA 12 BUILDING MAIN POWER DISTRIBUTION PANEL
13. NEMA 12 LOW VOLTAGE POWER DISTRIBUTION PANEL
14. NEMA 12 SUPERVISORY PANEL
15. NOT USED
16. ENCLOSURE HEATER: (1) 5KW HEATER WITH SAFETY SWITCH
17. AUTOMATIC LOUVER FOR COMBUSTION AIR AND VENTILATION
18. EXHAUST FAN
19. INTERIOR LIGHTS
20. EXTERIOR LIGHT
21. EMERGENCY LIGHT
22. ALARM LIGHT (RED)
23. SPRINKLER SYSTEM WITH PENDANT TYPE HEADS SIZED FOR ORDINARY HAZARD
24. FUEL TANK, 359 GALLON DOUBLE WALL WITH FUEL VENT AND FILL FITTINGS
25. BATTERIES, RACK AND CABLES
26. DOMESTIC WATER SYSTEM, #TE-120-100-3VS
27. HYDROPNEUMATIC TANK: WESSELS #FXA500 132 GALLON 125# ASME
28. TREADPLATE: ¼" STEEL DIAMOND PATTERN TREADPLATE
29. 6070 DOUBLE DOOR
30. SYSTEM ENCLOSURE: PARKLINE, DESERT TAN EXTERIOR WALLS WITH ARCTIC WHITE TRIM
31. SYSTEM FRAME WITH 2" SPRAY-ON FOAM INSULATION
32. AC UNIT BARD 2-1/2 TON WITH 6kW HEATER.

NOTES:

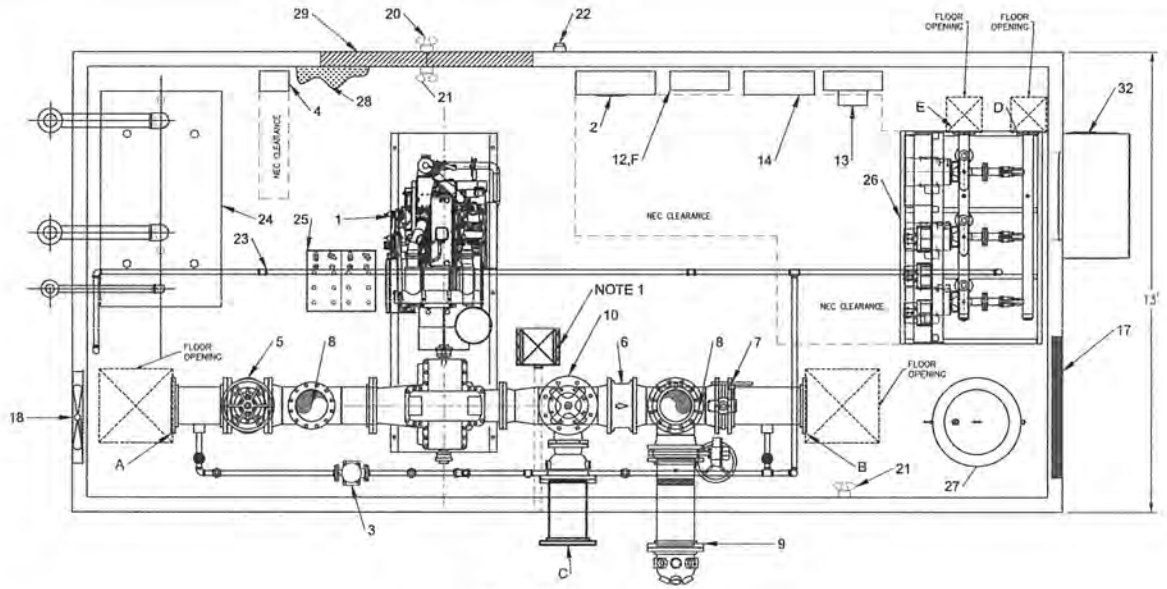
1. ALL DRAIN PIPING TO TERMINATE IN THIS LOCATION. MAIN DRAIN LINE IS PIPED TO OUTER PERIMETER.

MAIN CUSTOMER CONNECTIONS:

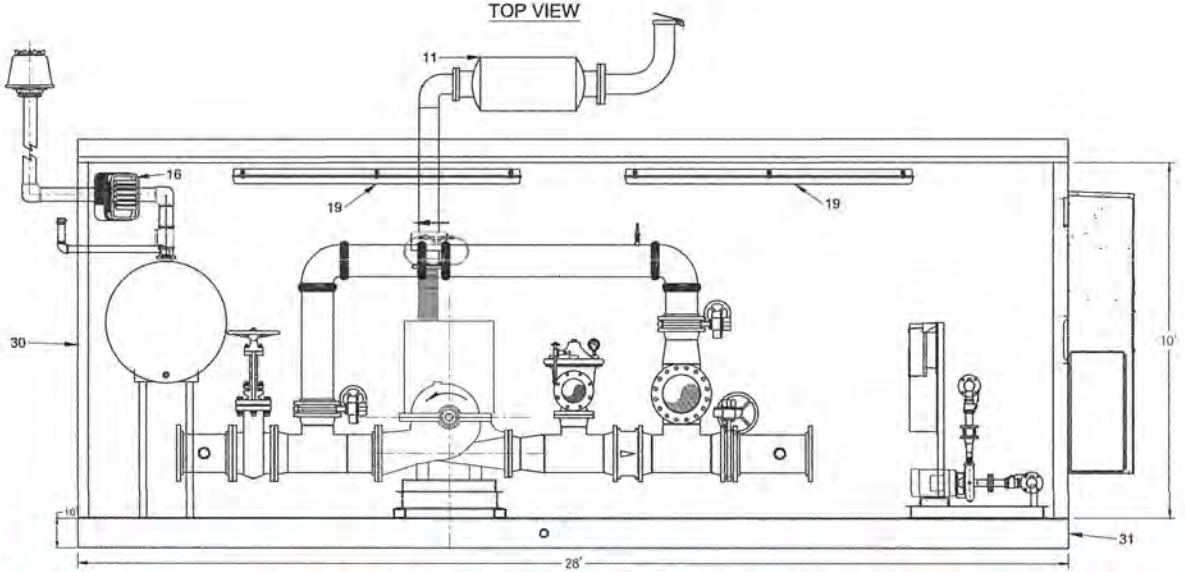
A. SUCTION: 12" FLANGED CL150
B. DISCHARGE: 12" FLANGED CL150
C. MAIN RELIEF LINE: 12" FLANGED CL150
D. DOMESTIC SUCTION: 3" FLANGED CL150
E. DOMESTIC DISCHARGE: 3" FLANGED CL150
F. POWER: SINGLE POINT 460/3/60

ITEMS TO SHIP LOOSE:

1. HOSE HEADER AND HOSE HEADER VALVES
2. FUEL VENT AND FUEL FILL PIPING
3. MUFFLER, EXTERNAL PIPING AND HARDWARE
4. EXTERIOR LIGHTING
5. EXTERIOR PIPING CONNECTIONS
6. BATTERIES, RACK & CABLES
7. LIFTING BRACKETS



TOP VIEW

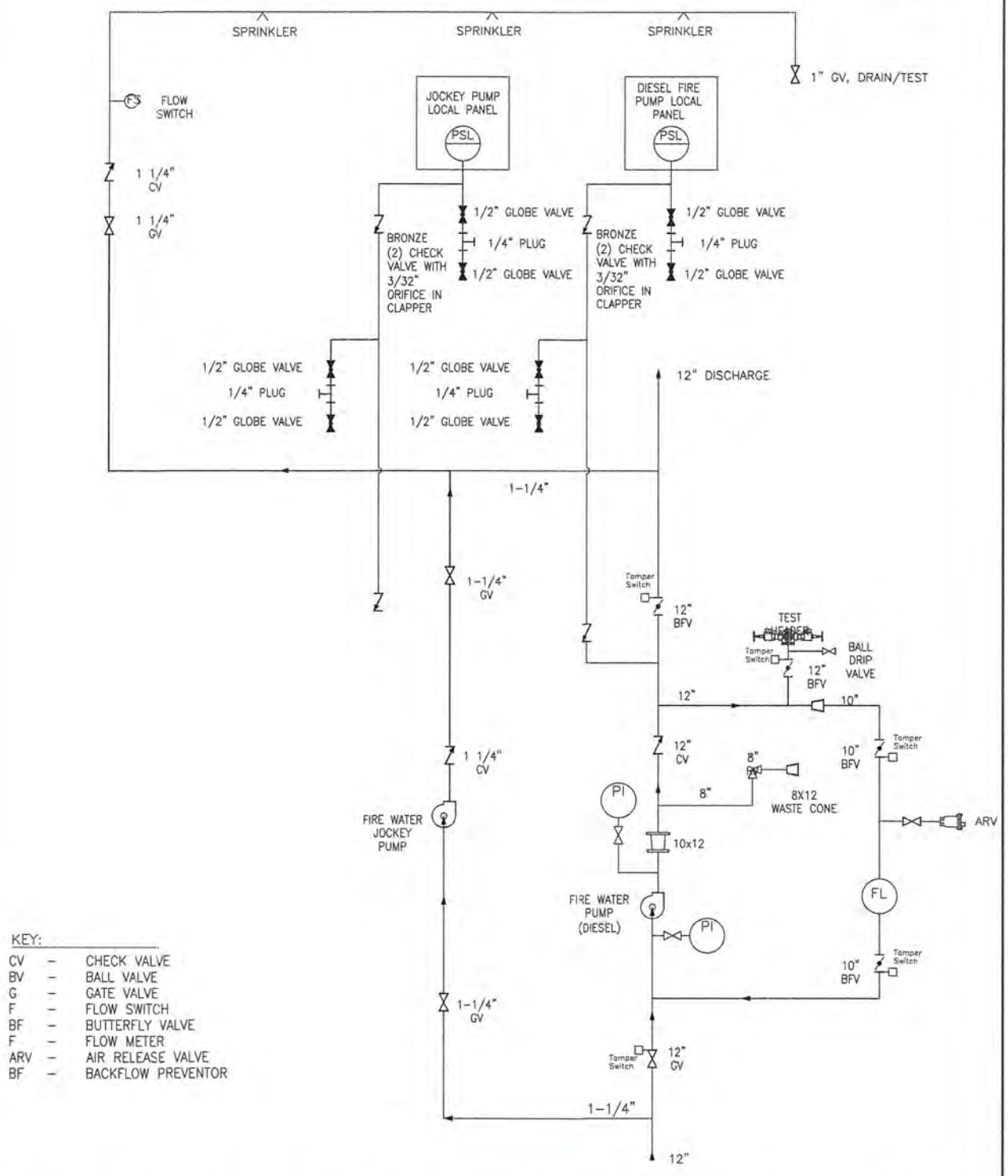


PLEASE NOTE

All dimensions indicated are approximate and will vary due to manufacturing tolerances. Do not complete field piping until the system is properly installed. Canariis Corporation accepts no liability for expenses incurred due to dimensional variances.

SUBMITTAL DRAWING - FOR REFERENCE ONLY

P&ID



KEY:

CV	–	CHECK VALVE
BV	–	BALL VALVE
G	–	GATE VALVE
F	–	FLOW SWITCH
BF	–	BUTTERFLY VALVE
F	–	FLOW METER
ARV	–	AIR RELEASE VALVE
BF	–	BACKFLOW PREVENTOR

VARIABLE SPEED BOOSTER SYSTEM DATA SHEET

SUBMITTAL DRAWING - FOR REFERENCE ONLY

DISTRIBUTOR James, Cooke & Hobson, Inc.

SYSTEM INFORMATION

SYSTEM MODEL NO.	TE-150-100-3VS	
SYSTEM CAPACITY	150	GPM
SYSTEM PRESSURE	95	PSIG
MINIMUM SUCTION PRESSURE	0	PSIG
MAXIMUM SUCTION PRESSURE	5	PSIG
SYSTEM DIFFERENTIAL PRESSURE	95	PSI

SYSTEM POWER 460 VOLTS 3 PHASE 60 HERTZ

PUMP INFORMATION	**PUMP NO. 1**	**PUMP NO. 2**	**PUMP NO. 3**
PUMP TYPE	END SUCTION	EQUAL TO #1	EQUAL TO #1
PUMP SIZE (Aurora)	#341 1.5x2x9C		
VARIABLE / CONSTANT SPEED	VARIABLE		
MOTOR HP / FLA	15		
MOTOR ENCLOSURE	ODP		
DESIGN RPM	3500		
DUTY POINT GPM	75		
TDH	231		
PRV OR CHECK VALVE SIZE	2"		
PUMP SHUTOFF PSIG	103		
MAX WORKING PRESS PSIG	108		

MAX. WORKING PRESSURE IS THE TOTAL OF THE MAXIMUM SUCTION PRESSURE PLUS PUMP SHUT OFF HEAD AT MAX. SPEED AND MUST NOT EXCEED THE ALLOWABLE WORKING PRESSURE OF THE COMPONENTS.

STANDARD SYSTEM FEATURES
- ■ COMPLETELY PREFABRICATED
- ☐ GALVANIZED MANIFOLDS
- ■ INDIVIDUAL PUMP ISOLATION VALVES
- ■ CHECK VALVE ON EACH PUMP
- ■ THERMAL PURGE VALVES
- ■ SYSTEM AND SUCTION PRESSURE GAUGES
- ■ FACTORY TEST

SYSTEM OPTIONS
- ☐ TYPE "L" COPPER MANIFOLDS
- ■ 304L STAINLESS STEEL MANIFOLDS
- ☐ PRV'S IN PLACE OF CHECK VALVES
- ☐ PUMP PRESSURE GAUGES
- ■ Mounted Inside Fire System Enclosure
- ☐ _____
- ☐ _____

SYSTEM CONSTRUCTION
- ■ MANIFOLD SIZE 3" CONNECTIONS ☐ GROOVED ■ FLANGED
- ■ CONFIGURATION ☐ RIGHT HAND ■ LEFT HAND ☐ CUSTOM _____
- ■ SYSTEM DIMENSIONS AND DRY WEIGHT L 74 " x W 58 " x H 67 " WT 2000 #

HYDRO-PNEUMATIC TANK
- ☐ MODEL FX300V 80 GALLONS 150#
- ☐ MODEL FX500V 132 GALLONS 150#
- ☐ MODEL FX750V 198 GALLONS 150#
- ☐ MODEL FXA400 106 GALLONS 125# ASME
- ■ MODEL FXA500 132 GALLONS 125# ASME
- ☐ MODEL FXA600 158 GALLONS 125# ASME
- ☐ MODEL FXA800 211 GALLONS 125# ASME
- ☐ MODEL FXA700 185 GALLONS 200# ASME
- ☐ _____

TANK LOCATION
- ☐ ADJACENT TO SYSTEM
- ■ ON PUMP SKID
- ☐ REMOTE MOUNTED

FOR UL LISTING TANK ON PUMP SKID MUST BE ASME

- ☐ TANK CONNECTED PER PAGE _____
- ☐ TANK STORAGE CAPACITY_____ GAL.

*NOTE: ALSO PAGE 9.60.05 OF I.O.& M. MANUAL

PUMP OPERATING AND SEQUENCE CONTROLS

- ■ INTERMITTENT LEAD PUMP OPERATION
- ☐ CONTINUOUS RUN LEAD PUMP
- ■ SUCTION & DISCHARGE PRESSURE SENSORS
- ☐ FLOW SENSOR(REMOTE MOUNTED)
- ■ Remote System Enable Switch

PUMP SEQUENCE

■	0	to	75	GPM	PUMP	Any One
■	75	to	150	GPM	PUMPS	Any Two
■	150	to	+	GPM	PUMPS	All Three
☐		to		GPM	PUMPS	

VARIABLE FREQUENCY DRIVES

MANUFACTURER / MODEL ABB / ACH550 QUANTITY 3

☐ NEMA 1 ENCLOSURE ■ NEMA 12 ENCLOSURE ☐ NEMA 3R ENCLOSURE

- ☐ FULL SPEED ELECTRICAL BYPASS (MANUAL)
- ☐ _____
- ☐ _____

STANDARD CONTROL PANEL FEATURES

- ■ UL LISTED ENCLOSED INDUSTRIAL CONTROL PANEL
- ☐ NEMA 1 ENCLOSURE
- ■ INDIVIDUAL DISCONNECTS WITH EXTERNAL HANDLES
- ■ FUSE BLOCKS WITH FUSES
- ■ CONTROL POWER (ON-OFF) SWITCH AND LIGHT
- ■ PROGRAMMABLE LOGIC CONTROLLER (PLC) With Touchscreen Display
- ■ PUMP RUNNING LIGHTS
- ■ H/O/A SELECTOR SWITCHES
- ■ 115 VOLT FUSED CONTROL CIRCUIT TRANSFORMER
- ■ PUMP MINIMUM RUN TIMING
- ■ AUTO ALTERNATE EQUAL PUMPS
- ■ MOUNTED AND WIRED ON SKID
- ■ PUMP OPERATING AND SEQUENCE CONTROLS
- ■ LOW SUCTION PRESSURE ALARM AND SHUTDOWN WITH AUTO RESET AND INDICATION
- ■ LOW SYSTEM PRESSURE ALARM WITH MANUAL RESET AND INDICATION
- ■ HIGH SYSTEM PRESSURE ALARM AND SHUTDOWN WITH MANUAL RESET AND INDICATION
- ■ PUMP RUNTIME INDICATION

CONTROL PANEL OPTIONS

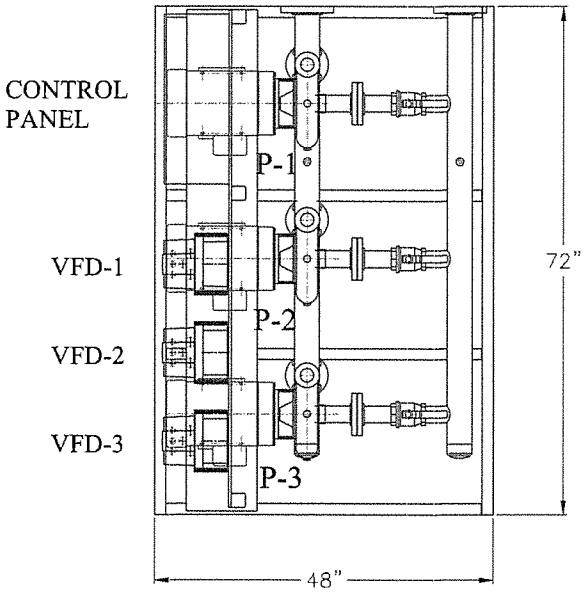
■ NEMA 12 ENCLOSURE ☐ NEMA 3R ENCLOSURE ☐ NEMA 4 ENCLOSURE

- ☐ LOW SUCTION LEVEL ALARM AND SHUTDOWN WITH AUTO RESET AND INDICATION – (SIGNAL BY OTHERS)
- ☐ HIGH SUCTION PRESSURE SHUTDOWN WITH AUTO RESET AND INDICATION
- ■ AUDIBLE ALARM WITH SILENCE PUSH BUTTON
- ☐ 24 HOUR TIME CLOCK - ALTERNATE EQUAL PUMPS
- ■ 7 DAY TIME CLOCK FOR CONTINUOUS SYSTEM OPERATION
- ☐ FLOW SWITCH TO LIMIT LEAD PUMP ON-OFF CYCLING
- ☐ REMOTE ALARM PANEL WITH SILENCE PUSH BUTTON AND LIGHT
- ■ AUXILIARY RELAY ALARM CONTACTS
- ■ AUXILIARY RELAY PUMP STATUS CONTACTS
- ☐ LOCKABLE ENCLOSURE
- ☐ LIGHTNING ARRESTER
- ☐ EMERGENCY POWER ALARM TO PREVENT LAG PUMP(S) OPERATION (SIGNAL BY OTHERS)
- ☐ EMERGENCY POWER ALARM TO PREVENT SYSTEM OPERATION (SIGNAL BY OTHERS)
- ■ Analog Output, Discharge Pressure (PSI)
- ■ Auxiliary Contact, Indication System is in Remote
- ☐ _____

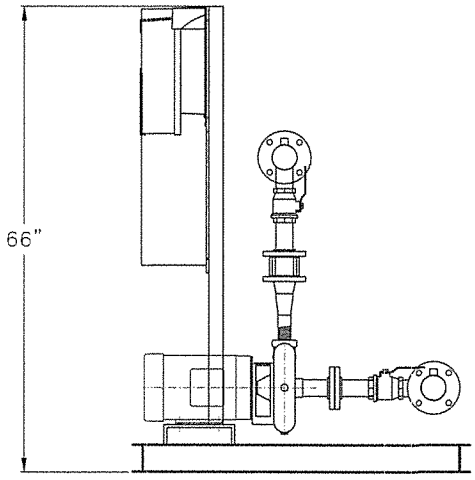
NOTES & COMMENTS:

NOTE: ALSO PAGE 9.60.06 & 9.60.07 OF I.O.& M. MANUAL

DOMESTIC WATER SYSTEM
#TE-120-100-3VS (ITEM #26)



TOP VIEW

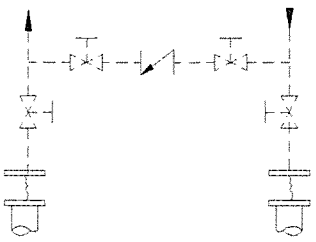


ELEVATION VIEW

CANARIIS CORPORATION
RIVERVIEW, FL.
PH: (813)621-8643 FAX: (813)626-2178
www.canariis.com

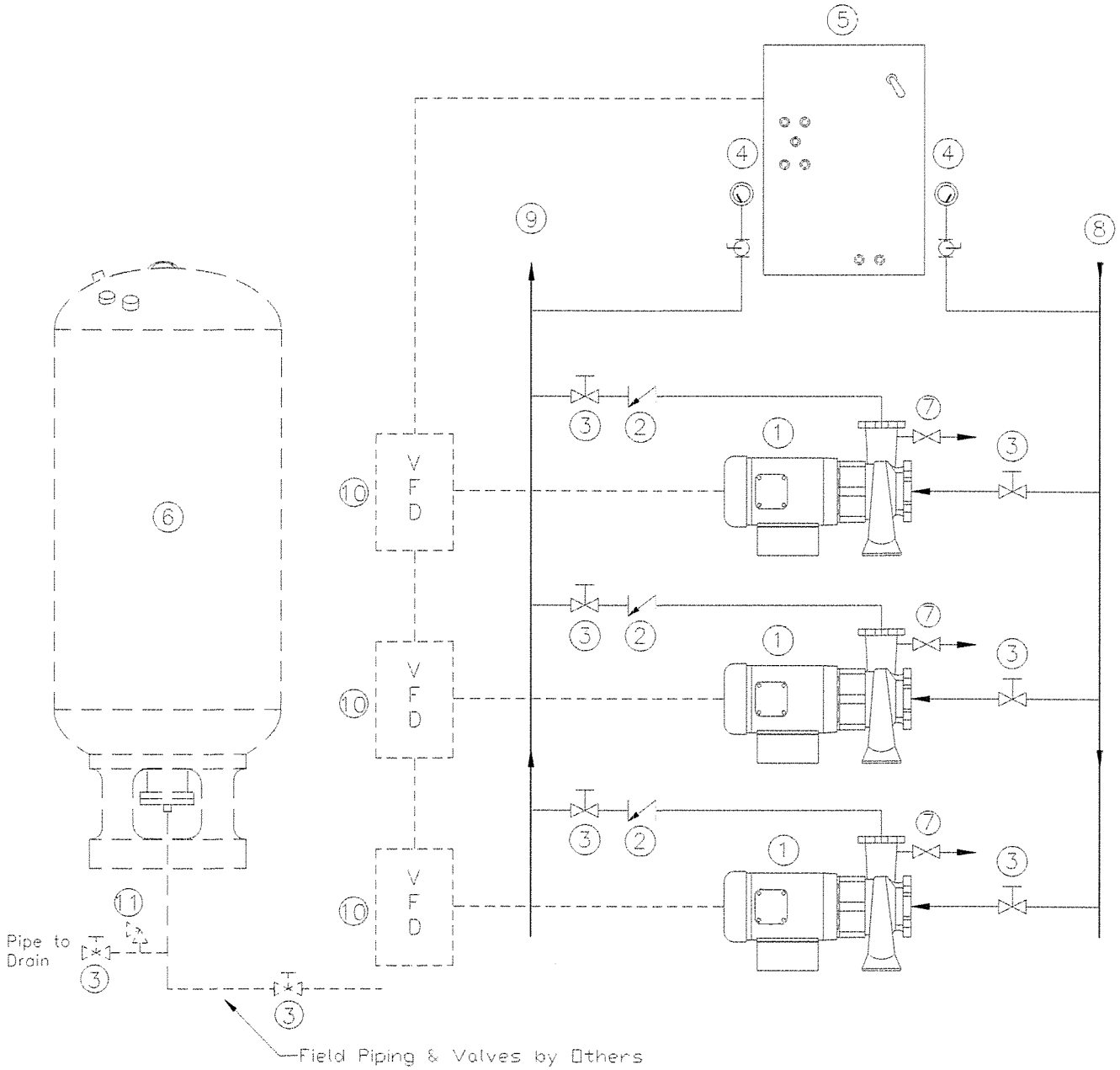
DWG TITLE: PUEBLO OF TESUQUE CASINO RESORT			
DWN BY: MK	DATE: 03/14/18	SCALE:	REV.
APPV BY:	DATE:	DWG NO.: F-0028-17	PAGE 1 of 1

PIPING SCHEMATIC



RECOMMENDED FIELD INSTALLED SYSTEM CONNECTORS, ISOLATION VALVES AND OPTIONAL BY-PASS

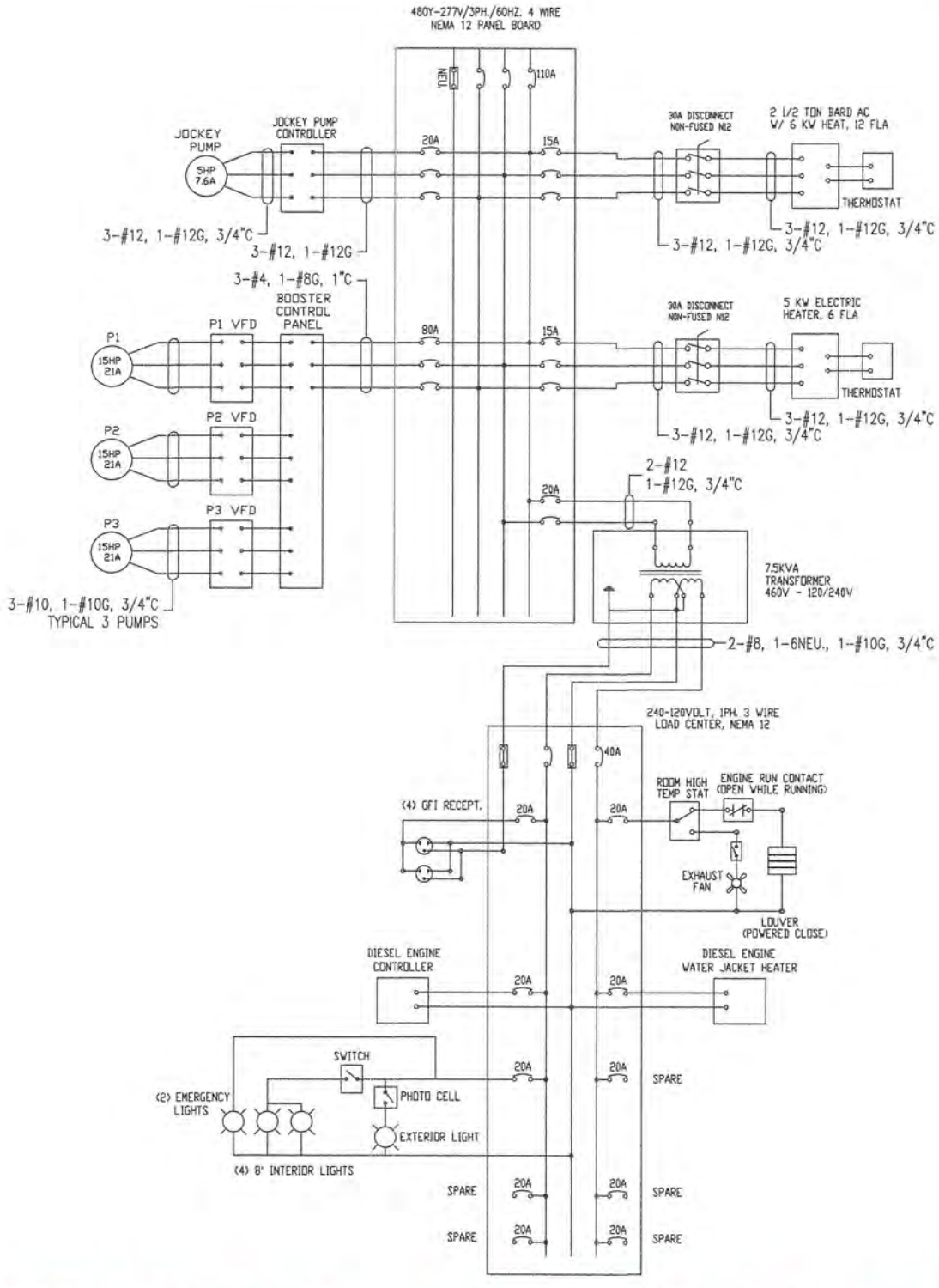
1. PUMP AND MOTOR
2. CHECK VALVE
3. ISOLATION VALVES
4. PRESSURE GAUGES (MOUNTED ON CONTROL PANEL)
5. CONTROL PANEL
6. REMOTE HYDRO-PNEUMATIC TANK (OPTIONAL)
*7. THERMAL PURGE VALVES
8. SUCTION MANIFOLD
9. DISCHARGE MANIFOLD
10. VARIABLE FREQUENCY DRIVE (ELECTRICAL BYPASS OPTIONAL)
11. PRESSURE RELIEF VALVE (BY OTHERS IF REQUIRED)



* REFER TO PAGES 6.40 & 6.41 FOR DETAILS.

TRIPLEX VARIABLE SPEED WITH CHECK VALVES	CANARIIS CORPORATION		
REMOTE TANK OPTIONAL	DATE: 02/14/06	SCALE: NTS	www.canariis.com

BUILDING POWER WIRING DIAGRAM



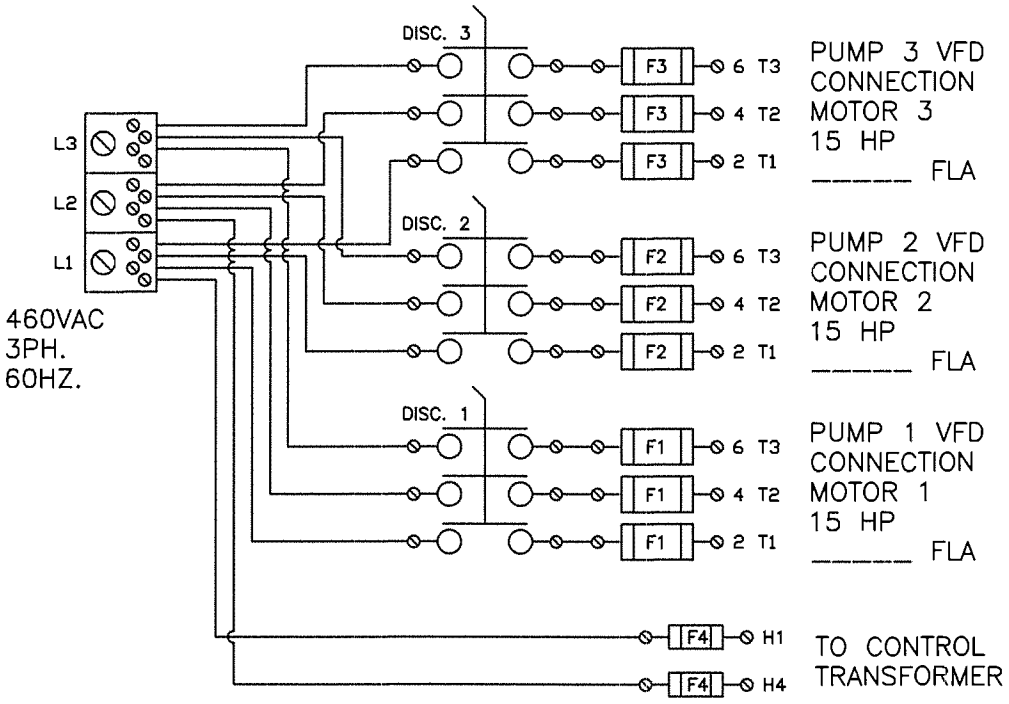
SUBMITTAL DRAWING - FOR REFERENCE ONLY

PLC SETPOINT:

SYSTEM PRESSURE SETPOINT _____ PSI
STOP PRESSURE SETPOINT _____ PSI
LOW SUCTION PRESSURE SETPOINT _____ PSI
LOW SYSTEM PRESSURE SETPOINT _____ PSI
HIGH SYSTEM PRESSURE SETPOINT _____ PSI
LOW SUCTION ON DELAY _____ SEC.
LOW SYSTEM ON DELAY _____ SEC.
HIGH SYSTEM ON DELAY _____ SEC.
STAGE 1 ON DELAY _____ SEC.
STAGE 1 OFF DELAY _____ SEC.
STAGE 2 ON DELAY _____ SEC.
STAGE 2 OFF DELAY _____ SEC.
STAGE 3 ON DELAY _____ SEC.
STAGE 3 OFF DELAY _____ SEC.

SEC. SETPOINT:

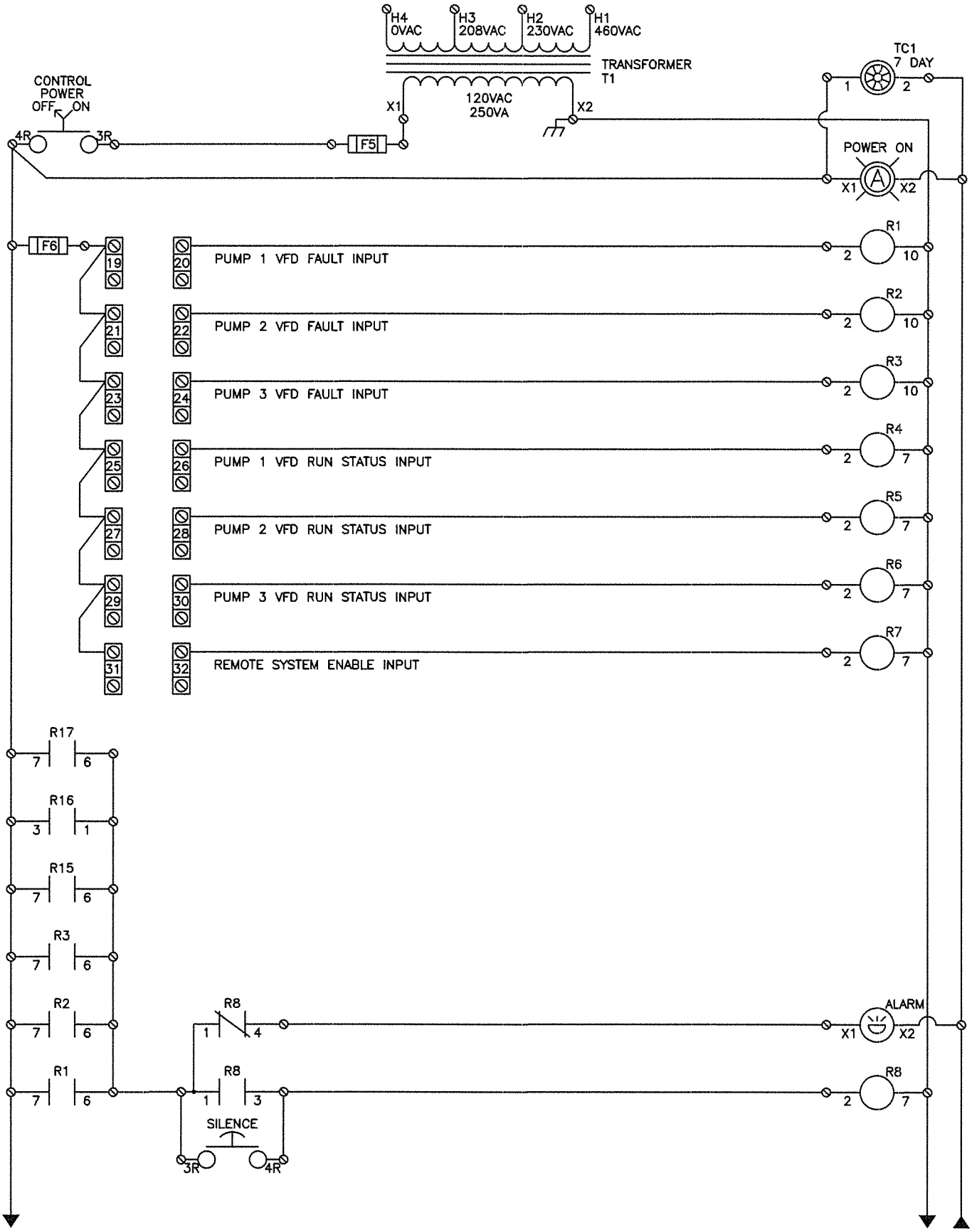
CALL ON DEADBAND _____ PSI
CALL OFF DEADBAND _____ PSI
STOP OFF DELAY (TANK CHARGE) _____ SEC.
CALL RESET DELAY _____ SEC.
PID 1 GAIN _____
PID 1 TI _____
PID 1 CYCLE _____



MCA = 70 AMPS.
MOCP = 80 AMPS.
Branch Circuit Protection To Be Provided By Others.
By Inverse-Time Circuit Breaker or Dual Element Time Delay Fuses.
Use Copper Conductor Only.
60 Deg C For Less Than 100 Amps.
75 Deg C For 100 Amps. And Greater.
Adjust O/L Setting For Motor FLA.

CAUTION: WITH DISCONNECTS TURNED OFF TRANSFORMER STILL HAS POWER ON PRIMARY AND SECONDARY. TO REMOVE POWER FROM TRANSFORMER OPEN PRIMARY FUSE BLOCK.
Additional Disconnecting Device(s) Supplied by Others As Required per NEC
Short Circuit Current: 10kA rms symmetrical, 600V maximum with 460V supply
250V maximum with 208-230V supply.

CANARIIS CORPORATION RIVERVIEW, FL. PH (813)621-8643 FAX (813)626-2178	DRAWN BY:	PAGE: 1 OF 6	REV. NO.: A
	DWG. NO.: 0028-17	SCALE: NTS	DATE: 3-13-18
DWG. NAME: TRIPLEX VFD CONTROL PANEL			APPROVED BY:



CANARIIS CORPORATION RIVERVIEW, FL. PH (813)621-8643 FAX (813)626-2178	DRAWN BY:	PAGE: 2 OF 6	REV. NO.: A
	DWG. NO.: 0028-17	SCALE: NTS	DATE: 3-13-18
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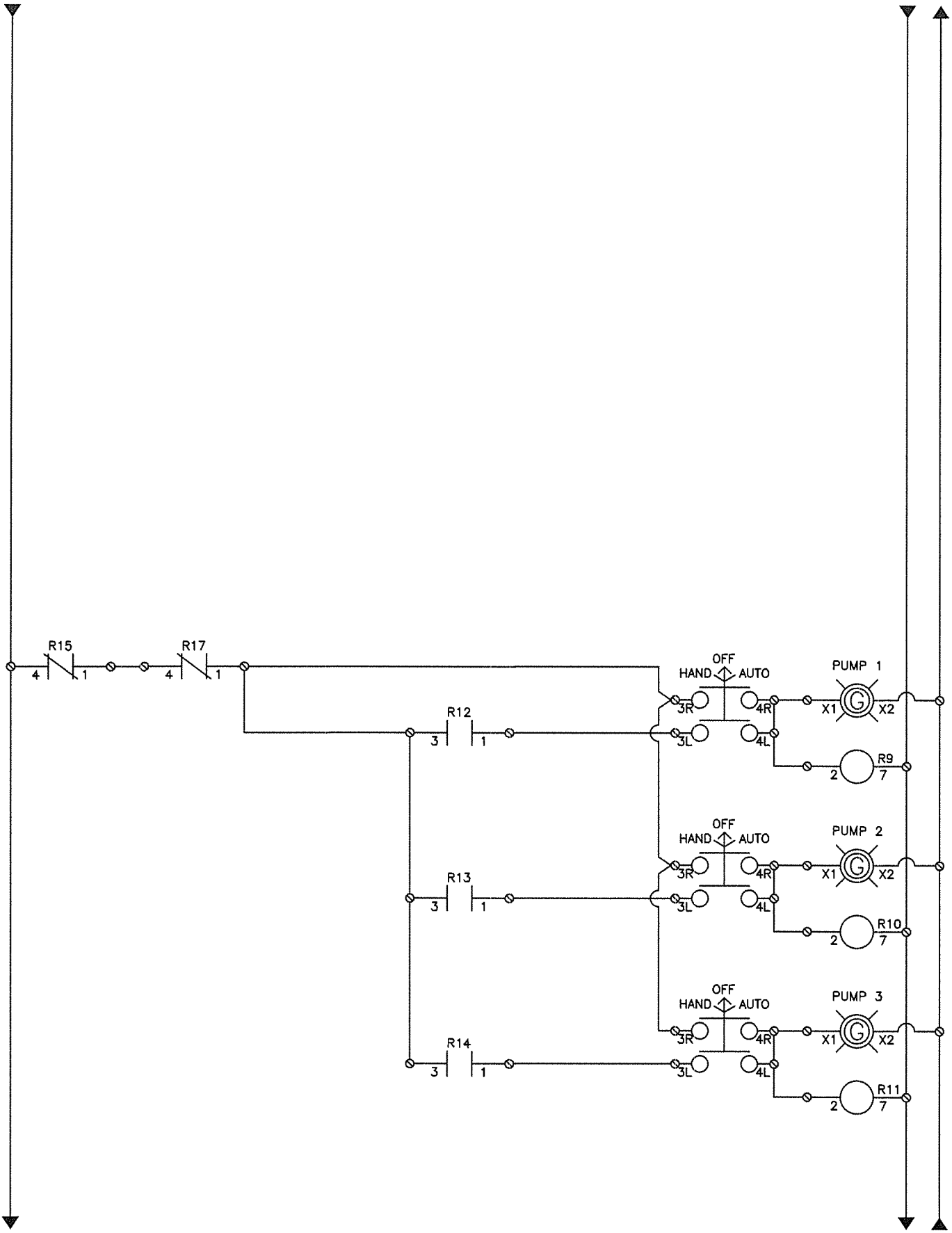


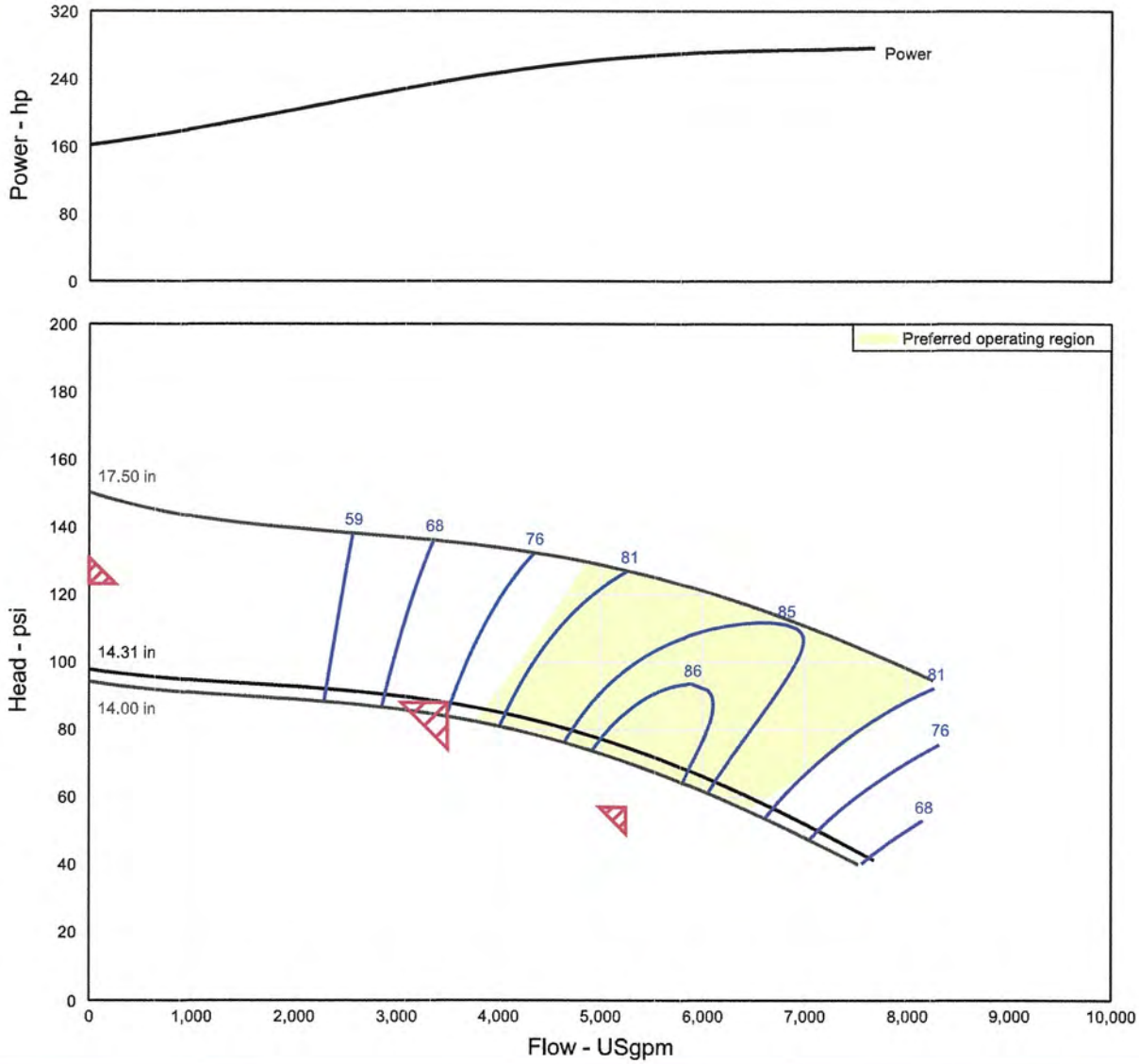
CANARIIS CORPORATION RIVERVIEW, FL. PH (813)621-8643 FAX (813)626-2178	DRAWN BY:	PAGE: 3 OF 6	REV. NO.: A
	DWG. NO.: 0028-17	SCALE: NTS	DATE: 3-13-18
DWG. NAME: TRIPLEX VFD CONTROL PANEL			APPROVED BY:

Diesel Driven				
Flow GPM	Pressure		Speed	Pump Size
	PSI	TDH	(RPM)	& Model
3500 GPM	59	136	1470	10-481-18D
	60	139	1470	10-481-18D
	62	143	1470	10-481-18
	65	150	1470	10-481-18
			1470	10-481-18D
	70	162	1470	10-481-18
			1470	10-481-18D
	75	173	1470	10-481-18
			1470	10-481-18D
	80	185	1470	10-481-18
			1470	10-481-18D
	85	196	1470	10-481-18
	88	203	1760	10-481-18D
	90	208	1470	10-481-18D
			1760	10-481-18D
	92	213	1470	10-481-18D
	94	217	1470	10-481-18D
	95	219	1470	10-481-18
			1760	10-481-18D
	96	222	1470	10-481-18
	100	231	1760	10-481-18
			1760	10-481-18D
			1760	10-492-18
	105	242	1760	10-481-18
			1760	10-481-18D
			1760	10-492-18
	110	254	1760	10-481-18
			1760	10-481-18D
			1760	10-492-18
	115	265	1760	10-481-18
			1760	10-481-18D
			1760	10-492-18
	120	277	1760	10-481-18
			1760	10-481-18D
			1760	10-492-18
	125	289	1760	10-481-18
			1760	10-481-18D
			1760	10-492-18
	130	300	1760	10-481-18
			1760	10-481-18D
			1760	10-492-18
	134	310	1760	10-481-18D
	135	312	1760	10-481-18
			1760	10-481-18D
			1760	10-492-18
	140	323	1760	10-481-18
			1760	10-492-18
	145	335	1760	10-492-18
	150	347	1760	10-492-18
	151	349	1760	10-492-18

PENTAIR

Customer :
Project name : Default

Pump Performance Curve
Encompass 2.0 - 17.5.2.0



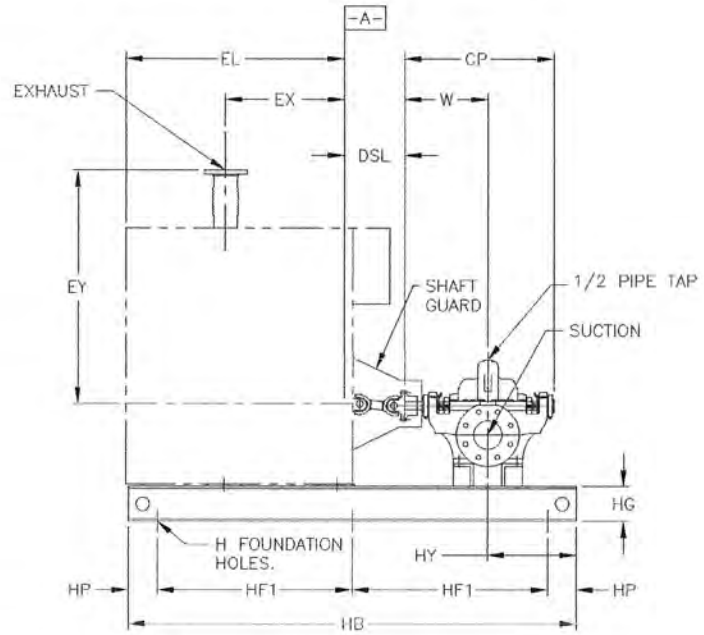
Item number	: 033	Size	: 10-481-18D
Service	:	Stages	: 1
Quantity	: 1	Driver type	: Engine
Quote number	: 332065	Frequency	: 0 Hz
Date last saved	: 02 Jan 2018 2:54 PM	Speed, rated	: 1760 rpm
Flow, rated	: 3,500.0 USgpm	Based on curve number	: 184-10X12X18D-1770
Differential head / pressure, rated	: 88.00 psi	Efficiency	: 75.68 %
		Max working pressure, allowable	: 175.0 psi.g
Flange rating (suction / discharge)	: 125/125	Max Shutoff Head (Calculated)	: 96.90 psi
		Max suction pressure, allowable	: 78.10 psi.g
		Suction pressure, max (user specified)	: 0.00 psi.g
		Pump shutoff w/ suction pressure	: 96.90 psi.g
		Power driver, minimum	: 268 hp

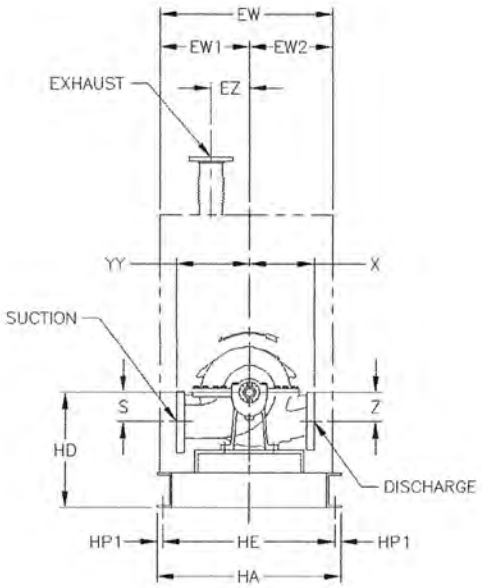
SUBMITTAL DRAWING - FOR REFERENCE ONLY

General Arrangement

⚠ WARNING

DO NOT OPERATE THIS MACHINE WITHOUT PROTECTIVE GUARD IN PLACE. ANY OPERATION OF THIS MACHINE WITHOUT PROTECTIVE GUARD CAN RESULT IN SEVERE BODILY INJURY.





EY	EL	EX	DSL	CP	W	EW	EW1	EW2	EZ	YY	X
51.10	51.70	24.10	20.38	43.00	24.25	N/A	N/A	17.10	7.20	24.00	20.00

S	Z	HD	HG	HP	HF1	HY	HB	HP1	HE	HA	H
12.25	12.25	31.00	6.00	5.00	49.00	15.75	108	1.00	34.00	36.00	(6) 1.00" DIA. Holes

SUBMITTAL DRAWING - FOR REFERENCE ONLY

Pump Data	
Series	Horizontal Splitcase
Model	10-481-18D
Size	10x12x18D
Flow	3,500.0 USgpm
Rated Pressure	88.00 psi.g
RPM	1760 rpm
Rotation	Right handed
Liquid Type	Water
Discharge Size	10.00 in
Suction Size	12.00 in
Impeller Diameter	14.31 in
Connection Type	Flanged
Base Type	Structural steel base
-	-
Pump Materials of Construction	
Pump	Bronze fitted with Cast Iron casing
Shaft	High Strength Alloy Steel e.t.d.-1.50
Engine Data	
Engine Model	JW6H-UFADJ0
Power Rated	350 hp
Power Available	280 hp
Speed	1760 rpm
Tier	T3
Manufacturer	Clarke
Cooling Type	Heat exchanger
Heater Voltage	115 Volt
Muffler Type	Critical Grade, 6" (Qty 1)
Exhaust Connection	Flanged
Battery Type	Lead acid
Battery Voltage	12 Volt DC
Site Information	
Elevation	7,000.0 ft
Temperature	77.00 deg F
Estimated Weights	
Pump	1,425.0 lb
Driver	2,094.0 lb

Quote Information	
Customer	
Customer Quote	332065
Job Name	Default
Market	-

PENTAIR

Quote Item	033
Quote Date	14 Dec 2017

CLARKE

Fire Protection Products, Inc.

Engine Selection / De-rate Calculator / Speed Interpolator

USA Purchased, Heat Exchanger Cooled, US-EPA (NSPS)

SELECTION TYPE:
Date: 1/8/2018
Clarke Engine Enclosure: None

PUMP REQUIREMENTS:
Pump Max Power: 268 BHP
RPM(s): 1800

DERATE PARAMETERS:
Altitude: 7000 feet
Ambient Temperature: 77 °F
Right Angle Gear Loss: 0%
Derate Percent: 20.1

APPLICATION INFO:
Customer:
Job Name:
Job Number:
Run By:

RESULTS:

Model	RPM	Rated HP (KW)	Ventilation Fan Loss HP (KW)	Available HP (KW)	Derate HP (KW)	Emissions Tier	Interpolation Data (RPM, HP)
JW6H-UFADJ0	1760	350 (261)	-	-	279.7 (208.5)	NSPS T3-Certified	Not used

NOTE:
Derated HP takes into account all the input derates for altitude, temperature and Right Angle Gearbox. When no derates are input, this column will be blank and engine selection(s) will be based upon Rated HP. When the Derated HP column is filled in, then the engine selection(s) are based upon this value.

DEFINITIONS:

- UL/FM - Engine that is Underwriters Laboratories Listed and Factory Mutual Approved
- LPCB - Engine that is Loss Prevention Council Board Approved
- NL - Non-Listed Engine has no private agency certification, like UL, or insurance company certification, like FM. It applies to any engine that is not UL Listed or FM Approved, and is built t

CLARKE®

FIRE PUMP ENGINES

MODELS

JW6H-UFADF0 JW6H-UFAD80
JW6H-UFADJ0 JW6H-UFAA60
JW6H-UFAD70 JW6H-UFAA80

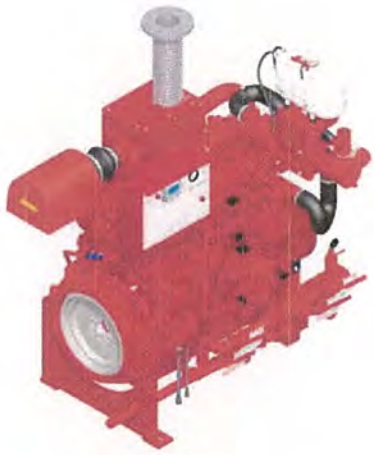
FM-UL-cUL APPROVED RATINGS BHP/*KW*

JW6H MODEL ♦	RATED SPEED 1760		1900		2100		2350		US-EPA (NSPS) Available until ●
~~UFADF0~~	~~327~~	~~244~~			311	232			*No Expiration*
UFADJ0	350	261			332	247.5			*No Expiration*
~~UFAD70~~	~~376~~	~~280~~			399	297.5			*No Expiration*
UFAD80	422	315	400	298	400	298			*No Expiration*
UFAA60							360	268	*NA λ*
UFAA80	422	315			400	298			*NA λ*

● USA EPA (NSPS) Tier 3 Emissions Certified Off-Road (40 CFR Part 89) and NSPS Stationary (40 CFR Part 60 Sub Part IIII). Meet EU Stage IIA emission level

λ N/A = Not Applicable / Non-Emissionized

♦ All Models are available for Export



Picture represents JW6H-TRWA Power Tech E Engine Series

SPECIFICATIONS

ITEM	JW6H MODELS UFADF0	UFADJ0	UFAD70	UFAD80	UFAA60	UFAA80
Number of Cylinders	6					
Aspiration	TRWA					
Rotation*	CW					
Overall Dimensions – in. (mm)	66.9 (1699) H X 61.1 (1553) L X 38.2 (971) W					
Crankshaft Centerline Height – in. (mm)	17.7 (449)					
Weight – lb (kg)	2094 (948)					
Compression Ratio	16.0:1					
Displacement – cu. in. (L)	549 (9.0)					
Engine Type	4 Stroke Cycle – Inline Construction					
Bore & Stroke – in. (mm)	4.66 x 5.35 (118 x 136)					
Installation Drawing	D627					D636
Wiring Diagram AC	C07651					
Wiring Diagram DC	C072146, C071361, C071369					
Engine Series	John Deere 6090 Series Power Tech E					
Speed Interpolation	N/A					

Abbreviations: CW – Clockwise TRWA – Turbocharged with Raw Water Aftercooling N/A – Not Available L – Length W – Width H - Height

*Rotation viewed from Heat Exchanger / Front of engine

CERTIFIED POWER RATING

- Each engine is factory tested to verify power and performance.
- FM-UL power ratings are shown at specific speeds, Clarke engines can be applied at a single rated RPM setting ± 50 RPM.

ENGINE RATINGS BASELINES

- Engines are to be used for stationary emergency standby fire pump service only. Engines are to be tested in accordance with NFPA 25.
- Engines are rated at standard SAE conditions of 29.61 in. (752.1 mm) Hg barometer and 77°F (25°C) inlet air temperature [approximates 300 ft. (91.4 m) above sea level] by the testing laboratory (see SAE Standard J 1349).
- A deduction of 3 percent from engine horsepower rating at standard SAE conditions shall be made for diesel engines for each 1000 ft. (305 m) altitude above 300 ft. (91.4 m)
- A deduction of 1 percent from engine horsepower rating as corrected to standard SAE conditions shall be made for diesel engines for every 10°F (5.6°C) above 77°F (25°C) ambient temperature.

c UL us

Meets NFPA 20 Requirements

FM C US APPROVED

CLARKE®

FIRE PUMP ENGINES

MODELS

JW6H-UFADF0 JW6H-UFAD80
JW6H-UFADJ0 JW6H-UFAA60
JW6H-UFAD70 JW6H-UFAA80

ENGINE EQUIPMENT

EQUIPMENT	STANDARD	OPTIONAL
Air Cleaner	Direct Mounted, Washable, Indoor Service with Drip Shield	Disposable, Drip Proof, Indoor Service Outdoor Type, Single or Two Stage (Cyclonic)
Alarms	Overspeed Alarm & Shutdown, Low Oil Pressure, Low & High Coolant Temperature, Low Raw Water Flow, High Raw Water Temperature, Alternate ECM Warning, Fuel Injection Malfunction, ECM Warning and Failure with Automatic Switching	Low Coolant Level, Low Oil Level, Oil Filter Differential Pressure, Fuel Filter Differential Pressure, Air Filter Restriction
Alternator	12V-DC, 42 Amps with Poly-Vee Belt and Guard	24V-DC, 40 Amps with Poly-Vee Belt and Guard
Coupling	Bare Flywheel	UL Listed Driveshaft and Guard, UFADD0/F0/J0/70-CDS50-SC; UFAD80 – CDS50-SC AT 2100 RPM only
Electronic Control Module	12V-DC, Energized to Stop, Primary ECM always Powered on	24V-DC, Energized to Stop, Primary ECM always Powered on
Engine Heater	115V-AC, 2500 Watt	230V-AC, 2500 Watt
Exhaust Flex Connection	SS Flex, 150# ANSI Flanged Connection, 6"	SS Flex, 150# ANSI Flanged Connection, 8"
Exhaust Protection	Metal Guards on Manifolds and Turbocharger	
Flywheel Housing	SAE #3	
Flywheel Power Take Off	11.5" SAE Industrial Flywheel Connection	
Fuel Connections	Fire Resistant, Flexible, USA Coast Guard Approved, Supply and Return Lines	SS, Braided, cUL Listed, Supply and Return Lines
Fuel Filter	Primary and Secondary Filter with Priming Pump	
Fuel Injection System	High Pressure Common Rail	
Governor, Speed	Dual Electronic Control Modules	
Heat Exchanger	Tube and Shell Type, 60 PSI (4 BAR), NPT(F) Connections – Sea Water Compatible	
Instrument Panel	Multimeter to Display English and Metric, Tachometer, Hourmeter, Water Temperature, Oil Pressure and One (1) Voltmeter with Toggle Switch, Front Opening	
Junction Box	Integral with Instrument Panel; For DC Wiring Interconnection to Engine Controller	
Lube Oil Cooler	Engine Water Cooled, Plate Type	
Lube Oil Filter	Full Flow with By-Pass Valve	
Lube Oil Pump	Gear Driven, Gear Type	
Manual Start Control	On Instrument Panel with Control Position Warning Light	
Overspeed Control	Electronic, Factory Set, Not Field Adjustable	
Raw Water Cooling Loop w/Alarms	Galvanized	Seawater, All 316SS, High Pressure
Raw Water Cooling Loop Solenoid Operation	Automatic from Fire Pump Controller and from Engine Instrument Panel (for Horizontal Fire Pump Applications)	Not Supplied (for Vertical Turbine Fire Pump Applications)
Run – Stop Control	On Instrument Panel with Control Position Warning Light	
Starters	One (1) 12V-DC with Two (2) Start Contactors	One (1) 24V-DC with Two (2) Start Contactors
Throttle Control	Adjustable Speed Control by Increase/Decrease Button, Tamper Proof in Instrument Panel	
Water Pump	Centrifugal Type, Gear Driven	

Abbreviations : DC – Direct Current, AC – Alternating Current, SAE – Society of Automotive Engineers, NPT(F) – National Pipe Tapered Thread (Female), NPT(M) – National Pipe Tapered Thread (Male), ANSI – American National Standards Institute, SS – Stainless Steel

MODEL NOMENCLATURE (10 Digit Models)

JW6H-UFADF0

- JW6H: John Deere Base Engine J, 450 Series, 6 Cylinder, Heat Exchanger Cooled
- UF: UL Listed and FM Approved
- A: Built in USA
- D: EPA Tier 3 Certified
- F0: Power Curve Number

CLARKE

CLARKE Fire Protection Products, Inc.
100 Progress Place, Cincinnati, Ohio 45246
United States of America
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www.clarkefire.com

CLARKE UK, Ltd.
Grange Works, Lomond Rd., Coatbridge, ML5-2NN
United Kingdom
Tel +44-1236-429946 Fax +44-1236-427274
www.clarkefire.com

C133422 revS
19JUN15

CLARKE

Fire Protection Products, Inc.

JW6H-UFADJ0

INSTALLATION & OPERATION DATA (I&O Data)

USA Produced

Basic Engine Description

Engine Manufacturer	John Deere Co.
Ignition Type	Compression (Diesel)
Number of Cylinders	6
Bore and Stroke - in (mm)	4.66 (118) X 5.35 (136)
Displacement - in^3 (L)	549 (9)
Compression Ratio	16.0:1
Valves per cylinder	
Intake	2
Exhaust	2
Combustion System	Direct Injection
Engine Type	In-Line, 4 Stroke Cycle
Fuel Management Control	Electronic, High Pressure Common Rail
Firing Order (CW Rotation)	1-5-3-6-2-4
Aspiration	Turbocharged
Charge Air Cooling Type	Raw Water Cooled
Rotation, viewed from front of engine, Clockwise (CW)	Standard
Engine Crankcase Vent System	Open
Installation Drawing	D627
Weight - lb (kg)	2094 (950)

Power Rating	**1760**	**2100**
Nameplate Power - HP (kW)[1]	350 (261)	332 (247.5)

Cooling System - [C051387]	**1760**	**2100**
Engine Coolant Heat - Btu/sec (kW)	79 (83.4)	84 (88.6)
Engine Radiated Heat - Btu/sec (kW)	23.6 (24.9)	22.3 (23.5)
Heat Exchanger Minimum Flow		
60°F (15°C) Raw H_20 - gal/min (L/min)	23 (87.1)	23 (87.1)
100°F (37°C) Raw H_20 - gal/min (L/min)	28 (106)	28 (106)
Heat Exchanger Maximum Cooling Raw Water		
Inlet Pressure - psi (bar)	60 (4.1)	
Flow - gal/min (L/min)	80 (303)	
Typical Engine H_20 Operating Temp - °F (°C)	180 (82.2) - 195 (90.6)	
Thermostat		
Start to Open - °F (°C)	180 (82.2)	
Fully Opened - °F (°C)	201 (93.9)	
Engine Coolant Capacity - qt (L)	27 (25.6)	
Coolant Pressure Cap - lb/in^2 (kPa)	15 (103)	
Maximum Engine Coolant Temperature - °F (°C)	221 (105)	
Minimum Engine Coolant Temperature - °F (°C)	160 (71.1)	
High Coolant Temp Alarm Switch - °F (°C)	235 (113) - 241 (116)	

Electric System - DC	**Standard**		**Optional**	
System Voltage (Nominal)	12		24	
Battery Capacity for Ambients Above 32°F (0°C)				
Voltage (Nominal)	12	{C07633}	24	{C07633}
Qty. Per Battery Bank	1		2	
SAE size per J537	8D		8D	
CCA @ 0°F (-18°C)	1400		1400	
Reserve Capacity - Minutes	430		430	
Battery Cable Circuit, Max Resistance - ohm	0.0017		0.0017	
Battery Cable Minimum Size				
0-120 in. Circuit Length[2]	00		00	
121-160 in. Circuit Length[2]	000		000	
161-200 in. Circuit Length[2]	0000		0000	
Charging Alternator Maximum Output - Amp,	40	{C071363}	55	{C071365}
Starter Cranking Amps, Rolling - @60°F (15°C)	440	{RE520634}	326	{C07820}

NOTE: This engine is intended for indoor installation or in a weatherproof enclosure. [1]Derate 3% per every 1000 ft. [304.8 m] above 300 ft. [91.4 m] and derate 1% for every 10 °F [5.55 °C] above 77° [25°C]. [2]Positive and Negative Cables Combined Length.

CLARKE

Fire Protection Products, Inc.

JW6H-UFADJ0

INSTALLATION & OPERATION DATA (I&O Data)

USA Produced

Exhaust System (Single Exhaust Outlet)	**1760**	**2100**
Exhaust Flow - ft.³/min (m³/min)	1867 (52.9)	2214 (62.7)
Exhaust Temperature - °F (°C)	842 (450)	826 (441)
Maximum Allowable Back Pressure - in H_20 (kPa)	30 (7.5)	30 (7.5)
Minimum Exhaust Pipe Dia. - in (mm)[3]	6 (152)	6 (152)

Fuel System	**1760**	**2100**
Fuel Consumption - gal/hr (L/hr)	16.1 (60.9)	17.6 (66.6)
Fuel Return - gal/hr (L/hr)	48.9 (185)	47.4 (179)
Fuel Supply - gal/hr (L/hr)	65 (246)	65 (246)
Fuel Pressure - lb/in² (kPa)	2 (13.8) - 9 (62.1)	
Minimum Line Size - Supply - in.	.50 Schedule 40 Steel Pipe	
Pipe Outer Diameter - in (mm)	0.848 (21.5)	
Minimum Line Size - Return - in.	.375 Schedule 40 Steel Pipe	
Pipe Outer Diameter - in (mm)	0.675 (17.1)	
Maximum Allowable Fuel Pump Suction Lift with clean Filter - in H_20 (mH_20)	80 (2)	
Maximum Allowable Fuel Head above Fuel pump, Supply or Return - ft (m)	6.6 (2)	
Fuel Filter Micron Size	2 (Secondary)	

Heater System	**Standard**	**Optional**
Engine Coolant Heater		
Wattage (Nominal)	2500	2500
Voltage - AC, 1 Phase	115 (+5%, -10%)	230 (+5%, -10%)
Part Number	{C122191}	{C122195}

Air System	**1760**	**2100**	
Combustion Air Flow - ft.³/min (m³/min)	734 (20.8)	954 (27)	
Air Cleaner	**Standard**		**Optional**
Part Number	{C03244}		{C03330}
Type	Indoor Service Only, with Shield		Canister, Single-Stage
Cleaning method	Washable		Disposable
Air Intake Restriction Maximum Limit			
Dirty Air Cleaner - in H_20 (kPa)	14 (3.5)		14 (3.5)
Clean Air Cleaner - in H_20 (kPa)	7 (1.7)		7 (1.7)
Maximum Allowable Temperature (Air To Engine Inlet) - °F (°C)<*>	130 (54.4)		

Lubrication System	
Oil Pressure - normal - lb/in² (kPa)	37 (255) - 41 (283)
Low Oil Pressure Alarm Switch - lb/in² (kPa)	21 (145) to 41 (283)
In Pan Oil Temperature - °F (°C)	190 (87.8) - 220 (104)
Total Oil Capacity with Filter - qt (L)	30.1 (28.5)

Lube Oil Heater	**Optional**	**Optional**
Wattage (Nominal)	150	150
Voltage	120V (+5%, -10%)	240V (+5%, -10%)
Part Number	C04430	C04431

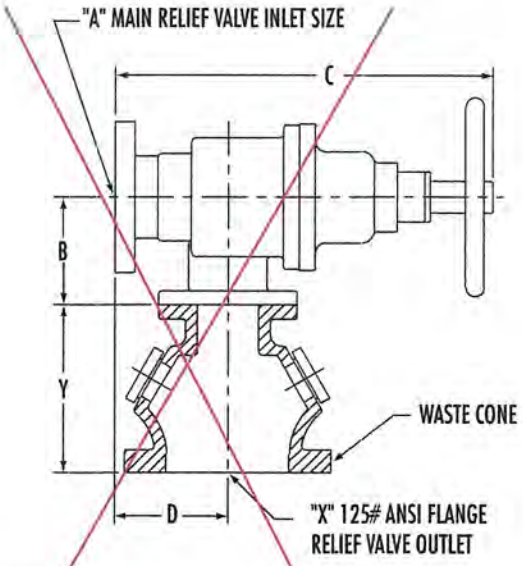
Performance	**1760**	**2100**
BMEP - lb/in² (kPa)	287 (1980)	228 (1570)
Piston Speed - ft/min (m/min)	1569 (478)	1873 (571)
Mechanical Noise - dB(A) @ 1m	C133384	
Power Curve	C132972	

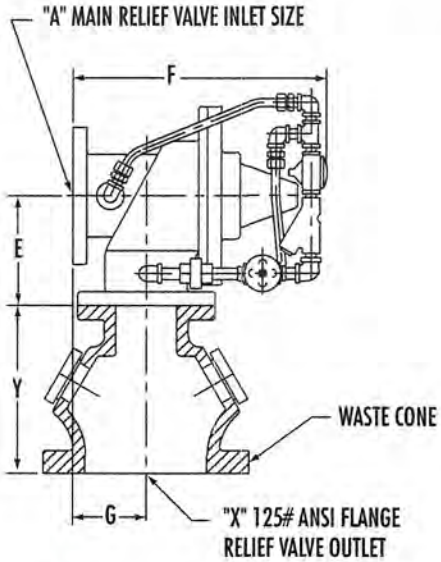
[3]Minimum Exhaust Pipe Diameter is based on: 15 feet of pipe, one 90° elbow, and one Industrial silencer. A Back-pressure flow analysis must be performed on the actual field installed exhaust system to assure engine maximum allowable back pressure is not exceeded. See Exhaust Sizing Calculator on www.clarkefire.com.

{ } indicates component reference part number.

AURORA® FIRE PUMPS

OPTION 79 - MAIN RELIEF VALVE
OPTION 80 - WASTE CONE





❑ Spring-Operated Main Relief Valve
- ❑ 125# INLET FLANGE
- ❑ 250# INLET FLANGE

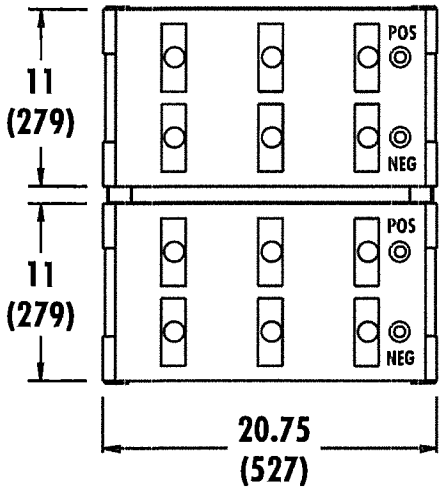
❑ Enclosed Waste Cone

☑ Pilot-Operated Main Relief Valve
- ☑ 125# INLET FLANGE
- ❑ 250# INLET FLANGE

☑ Enclosed Waste Cone

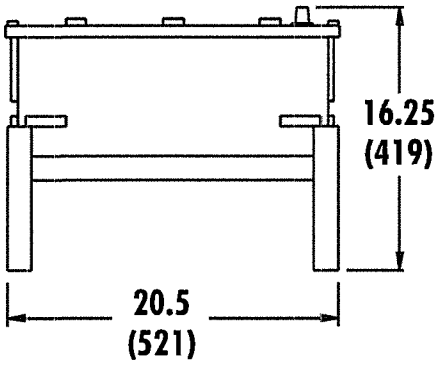
PUMP RATING G.P.M.	A	INLET FLANGE RATING	SPRING-OPERATED MAIN RELIEF VALVE B	C	D	PILOT OPERATED MAIN RELIEF VALVE E	F	G	WASTE CONE X	Y
250 500	3	125#	5-7/8 (149)	21-1/4 (540)	6-1/8 (155)	6 (152)	14-7/8 (378)	4 (102)	5	11 (279)
		250#				6 (152)	15-1/4 (387)	4-3/8 (111)		
750	4	125#	6-7/16 (163)	22-5/8 (575)	6-5/8 (168)	7-5/8 (194)	16-15/16 (430)	5-1/16 (129)	6	11 (279)
1000		250#				7-15/16 (202)	17-1/4 (438)	5-3/8 (137)	8	11-1/2 (292)
1250 1500	6	125#	8-1/2 (216)	36 (914)	9-3/8 (238)	10 (254)	19-7/8 (505)	6 (152)	8	14 (356)
2000 2500		250#				10 (254)	20-3/8 (518)	6-1/2 (195)	10	11-1/2 (292)
3000 3500	8	125#	Not Available			12-3/4 (324)	22-7/8 (581)	8 (203)	12	12 (305)
		250#				12-3/4 (324)	22-7/8 (581)	8-1/2 (216)		
4000 4500 5000	8	125#	Not Available			12-3/4 (324)	22-7/8 (581)	8 (203)	14	22-1/4 (565)
		250#				12-3/4 (324)	22-7/8 (581)	8-1/2 (216)		

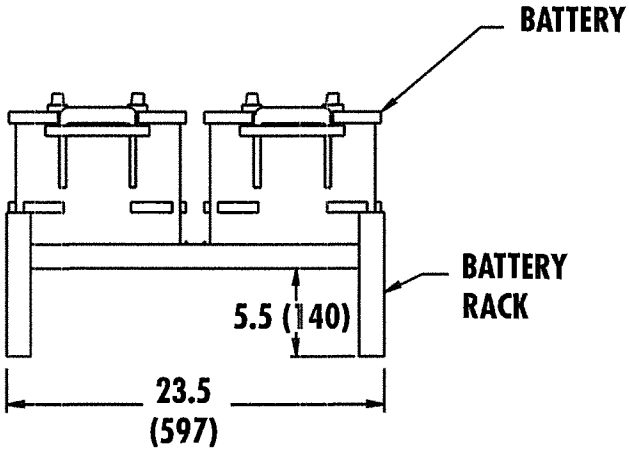
NOTES:
1. All dimensions are in inches (mm) and may vary ± 1/4 (6).
2. Valves are available with inlet flange ratings of 125# or 250#. All waste cones have 125# flange ratings.
3. Dimensions for conventional relief valves are not affected by flange rating.
4. Relief valve discharge is intended to be piped to waste. Refer to factory if discharge is to be piped to a line where back pressure is present.
5. Maximum operating pressure for valves rated for 125# is 175 PSI.
6. Maximum operating pressure for valves rated for 250# is 300 PSI.



NOTES:

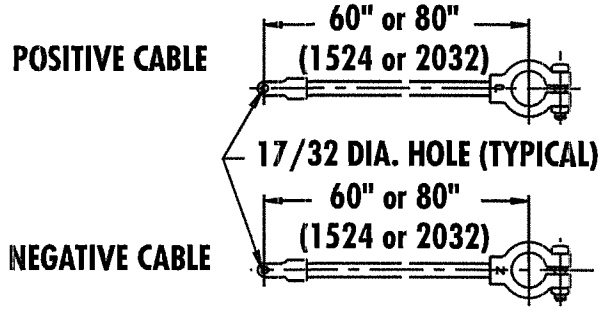
1. Dimensions are in inches (mm) and may vary ± 1/4" (6).
2. Batteries are 12 volt, lead-acid type D-8D, approximately 95 lbs. each, dry.
3. Batteries are shipped dry. Electrolyte (approx.19 quarts per battery) must be procured locally.
4. Refer to Section 916 page 252 for exact number of batteries & cables to be furnished based on the diesel engine manufacturer and model used.
5. Battery racks are fabricated steel, approximately 20 lbs. each.
6. Each rack holds 2 batteries. Racks are not to be stacked.

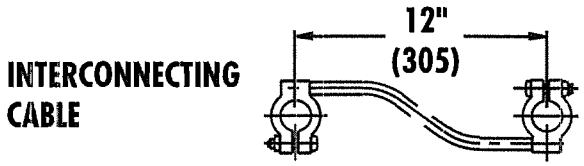




NOTES:

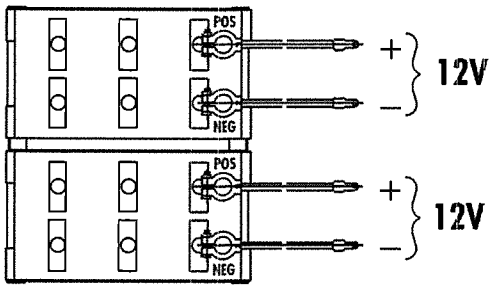
1. All cables are SAE J55BA type SGT with tensile attachment of 700-800 lbs.
2. Positive & negative cables 60" (1524) long are 2/0 gauge; positive & negative cables 80" (2032) long are 3/0 gauge.
3. Terminal clamps have steel reinforced inserts.
4. Not all cable types are required for every engine. Refer to Section 916 page 252 for cable applicability.





AURORA® MODEL 481 & 485 PUMPS

DIESEL BATTERY CABLE DIAGRAMS

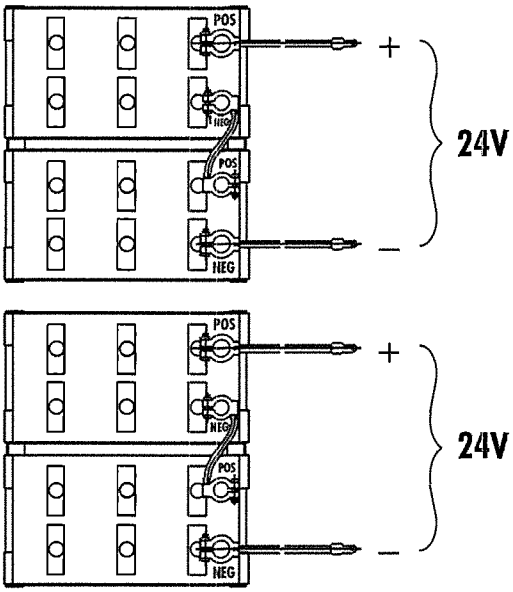


☐ **12 VOLT SYSTEM**

REQUIRED COMPONENTS	ENGINE APPLICABILITY
(1) BATTERY RACK (2) BATTERIES (2) POSITIVE CABLES (2) NEGATIVE CABLES	CUMMINS: ALL "CFP" MODELS CLARKE: ALL "JU4H" MODELS ALL "JU64" MODELS ALL "JW6H" MODELS EDWARDS: ALL MODELS

NOTES:

1. Clarke "VMFP," "JU4H" & "JU6H" Engines require cable sets of different lengths. On these engine models, a 2/0 guage postive and negative cable set 60" (1524 mm) long, and a 3/0 guage positive and negativecable set 80" (2032 mm) long are furnished.
2. Refer to Section 916, Page 251 for details of batteries, racks and cables.

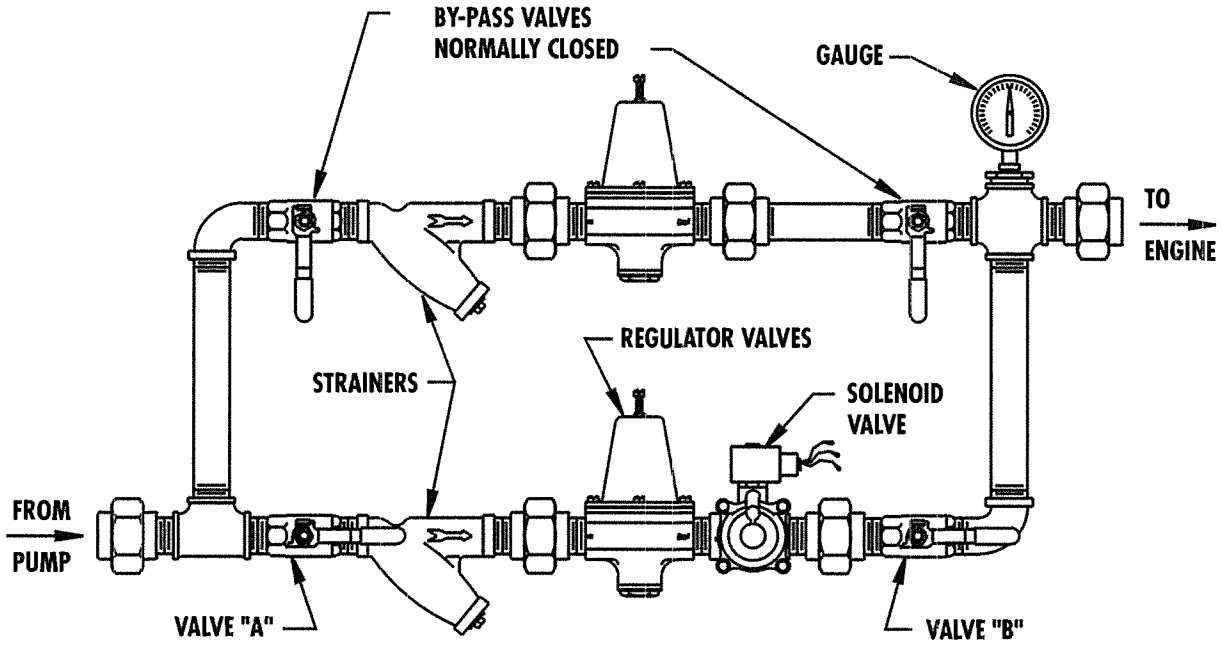


☐ **24 VOLT SYSTEM**

REQUIRED COMPONENTS	ENGINE APPLICABILITY
(2) BATTERY RACKS (4) BATTERIES (2) POSITIVE CABLES (2) NEGATIVE CABLES (2) INTERCONNECTING CABLES	CLARKE: ALL "JX6H" MODELS CATERPILLAR: ALL MODELS

AURORA® MODEL 481 & 485

DIESEL ENGINE DRIVEN FIRE PUMP
COOLING WATER PIPING DATA



This instructional data explains the installation and operation of the cooling system for UL listed, FM approved Fire Pump engines equipped with heat exchangers.

Engines equipped with heat exchangers use an engine mounted water pump to circulate jacket water around the tubes of the heat exchanger to maintain proper jacket water temperatures. Cooling water, supplied by the Fire Pump, is piped through the tubes and discharged to waste.

REQUIREMENTS

The loop portion of the cooling water supply piping, shown above, incorporates all components required by NFPA and is sized to provide the required volume of water at the proper pressure for the heat exchangers of the engine models listed in Table A.

Model 481 & 485 pumps are shipped from the plant with the loop piped between the pump and engine. The pipe and loop sizes are determined by the engine model.

COMPONENTS

1. A flushing type strainer is used to protect the regulator valve, solenoid valve and the tubes of the heat exchanger from foreign material.

2. The regulator valve is used to control the volume and pressure of the cooling water.

3. The solenoid valve opens automatically when the engine is started and closes automatically on engine shutdown to prevent the waste of cooling water. (One red wire must be connected to terminal #1 of the engine junction box, the other red wire to terminal #11 of the engine junction box, and the green wire grounded to the engine block. Refer to applicable wiring diagrams.)

4. The valves in the BYPASS line of the loop are normally CLOSED. They should ONLY be opened to provide cooling water to the engine if the regulator valve or solenoid valve require repair.

5. Valves "A" and "B" are normally OPEN. They should ONLY be closed if repair is required to the regulator valve or solenoid valve.

6. The gauge indicates back pressure on the cooling water discharge. The recommended back pressure to assure adequate flow is 15-20 PSI and should not exceed the allowable pressure shown in Table A.

7. Since cooling loop components are subject to bumps and movement during shipping. all components must be checked for pipe strain and leakage prior to initial startup.

INSTALLATION -COOLING WATER OUTLET

The cooling water outlet piping from the engine heat exchanger must be at least the size listed in Table A. The piping must be short, have no valves and discharge into an open waste cone. If deviations from the requirement of discharge to an open waste cone are permitted by the authority having jurisdiction, the proposed plumbing must be reviewed to assure that the back pressure created will not reduce the cooling water flow to below that required for the engine.

AURORA® MODEL 481 & 495
DIESEL ENGINE DRIVEN FIRE PUMP
COOLING WATER PIPING DATA

If the outlet piping from two or more engines is connected to a common manifold, the manifold piping should be sized such that the velocity resulting from the combined flow is the same as that in the outlet piping between the manifold and heat exchanger.

Adequate pipe supports must be provided for the loop and outlet piping to minimize vibration and prevent excessive strain at the heat exchanger, pump and engine connections.

Engine coolant should be added in accordance with the engine manufacturer's recommendations.

OPERATION

The regulator valve is adjusted during operational tests at the plant and set between 15 and 20 PSI back pressure. If additional adjusting is necessary, see the following procedure:

With the pump operating at the rated duty, the adjustment is made after the engine block temperature has risen to the level required to open the engine thermostat. The thermostat opens at approximately 170°F. The temperature will stabilize and then decrease slightly. At this point, the regulator is adjusted between 15 and 20 PSI by turning the regulator screw clockwise to increase the pressure and counterclockwise to reduce the pressure. The regulator screw is then locked into place with the locknut provided.

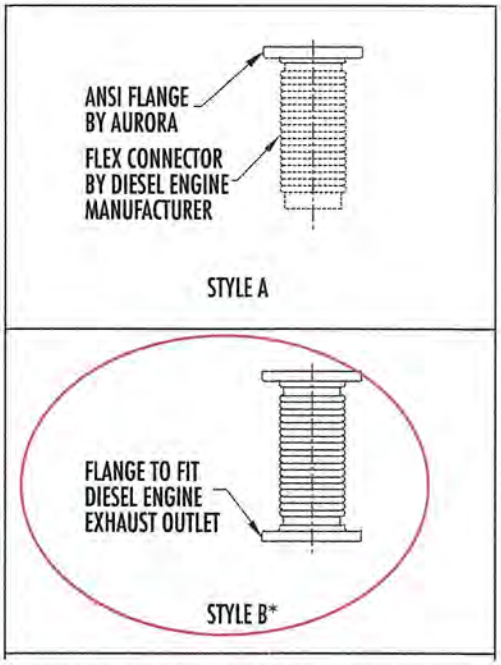
MAINTENANCE

1. Strainers must be inspected frequently and kept clean.

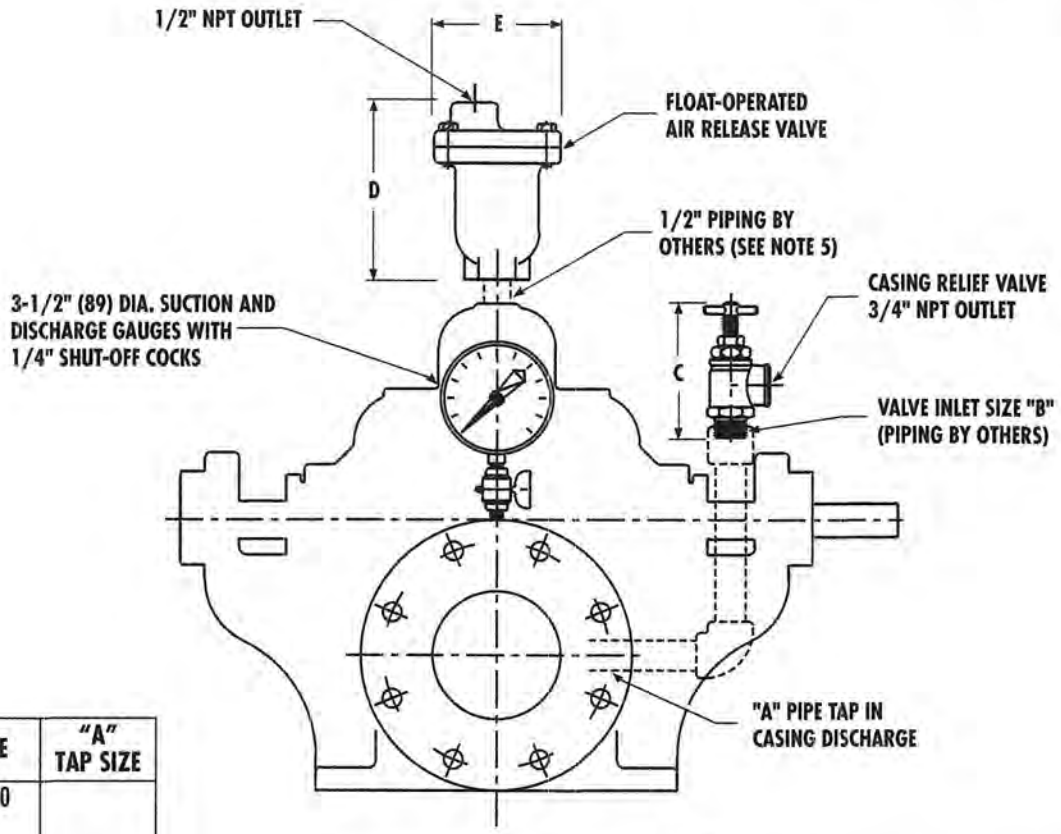
2. If cooling water temperature changes, the regulator valve may require adjustment.

AURORA® FIRE PUMPS
EXHAUST FLEX CONNECTORS

ENGINE MODEL	MUFFLER CONNECTION SIZE	FLEX CONNECTOR STYLE
CATERPILLAR		
3406C	6" FLANGED	B
3412C*, 3508C, C18*	8" FLANGED	B
CLARKE FIRE PROTECTION		
JU4H-UF10, -UF12, -UF14, -UF20, -UF22, -UF24, -UFAB26, -UFAEA0, -UFAEE8, -UFAEF2, -UFADJ2, -UFADJ8	3" NPT	A
JU4R-UF09, -UF11, -UF13, -UF19, -UF21, -UF23, -UFAEA9, -UFAEE7, -UFAEF1		
JU4H-UF30, -UF32, -UF34, -UF40, -UF42, -UF 50, -UF52, -UF54, -UF58, -UFADJG, -UFADP0, -UFADR0, -UFADW8, -UFADY8, -UFAD5G	4" FLANGED	A
JU4R-UF40, -UF49, UF51 -UF53		
JU6H-UF30, -UF32, -UF34, -UF 50, -UF52, -UF54, -UF58, -UF60, -UF62, -UF62, -UF68, -UF84, -UFAAPG, -UFAAQ8, -UFAARG, -UFAAS0,-UFAB76, -UFABL0, -UFABL8, -UFD0, -UFD2, -UFG8, -UFM0, -UFM2, -UFM8, -UFAD58, -UFAD88, -UFADM0, -UFADM8, -UFADN0, -UFADNG, -UFADP8	5" FLANGED	B
DP6H SERIES		
JW6H-UF30, -UF40, UF48		
DS0H SERIES*	5" FLANGE	B
DR8H SERIES*		
JW6H-UF50, -UF58, -UF60, -UF8, -UFAAM8, -UFAA80, -UFADD0, -UFADB0, -UFADF0, -UFADJ0, -FAD70, -UFAD80		
JU6H-UFAD98, -UFADP0, -UFADQ0, -UFADR0, -UFADR8, -UFADS0, -UFADS8, -FADT0, -UFADW8 -UFADX8	6" FLANGED	B
DQ6H SERIES		
DT2H SERIES*		
JX6H SERIES	8" FLANGED	B
CUMMINS		
CFP5E, CFP59, CFP7E Series	3" NPT, FLANGED, CUFF	A, B
CFP83 Series	4" NPT, FLANGED, CUFF	A, B
CFP9E Series	4" NPT, FLANGED, CUFF	A, B
CFP11E Series	5" NPT, FLANGED, CUFF	A,B
CFP15E Series	6" FLANGED	B
CFP23E Series	6" FLANGED	B
CFP30E Series	6" FLANGED	B
DEUTZ		
DFP4-2011 Series	3" NPT	A
DFP4-2012 Series	4" FLANGED	B
DFP6 Series	6" FLANGED	B



*FLANGED FLEX CONNECTOR PROVIDED BY DIESEL ENGINE MANUFACTURER. NO ADDITIONAL FLEX CONNECTOR OR ADAPTOR FITTING IS REQUIRED OR PROVIDED BY AURORA.



PIPE SIZE	"A" TAP SIZE
2-1/2-481-10 3-481-10 4-481-11 4-481-15 5-481-11 5-481-15 5-481-17 6-481-11 6-481-11HH 6-481-14HH 6-481-15 6-481-18 6-481-20 8-481-12 8-481-21 10-481-15 10-481-18D	1-1/4"
8-481-17 10-481-18 12-481-18	2"
ALL VERTICAL (483) MODELS	3/4"
ALL 2-STAGE (485) MODELS	1-1/4"
490 MODELS	3/4"

CASING RELIEF VALVE

SYSTEM G.P.M.	VALVE INLET SIZE - "B"	"C"
250 500 750 1000 1250 1500 2000 2500	3/4"	4-1/2" (114)
3000 3500 4000	1"	5-1/2" (140)

NOTES:

1. Dimensions are in inches (mm) and may vary ± 1/4" (6).
2. Accessories shown are shipped loose for field installtion.
3. Casing relief valve is to be adjusted to appropriate pressure upon field installtion
4. Casing relief valve is furnished on electric motor driven units only.
5. Two stage pumps require both vent taps piped to air release valve.
6. Suction guage range is 30"-0-150 PSI for suction pressures up to 75 PSI, or 30"-0-300 PSI for suction pressures over 75 PSI.
7. Discharge gauge range is 0-300-PSI for pumps with rated discharge pressures up to 150 PSI, or 0-600 PSI for pumps with rated discharge pressures over 150 PSI.

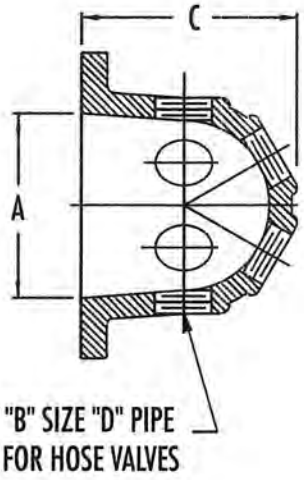
FLOAT OPERATED AIR RELEASE VALVE

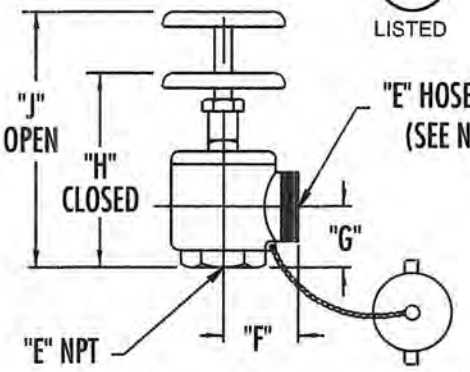
SYSTEM OPERATING PRESSURE	"D"	"E"
UP TO 175 P.S.I.	5-7/8" (149)	3-3/4" (95)
OVER 175 P.S.I.	6-11/16" (170)	5-5/8" (143)

AURORA® FIRE PUMPS

OPTION 75 - TEST MANIFOLD
OPTION 76 - HOSE VALVES
OPTION 77 - BALL DRIP VALVE

UL LISTED FM APPROVED





VALVE SIZE "E"	"F"	"G"	"H"	"J"
1-1/2	2.25 (57)	2.00 (51)	6.50 (165)	7.50 (191)
2-1/2	3.5 (89)	2.75 (70)	9.50 (241)	11.00 (297)

OPTION 75 - TEST MANIFOLD

STD. 125# ASA FLANGES | OPT. 250# ASA FLANGES

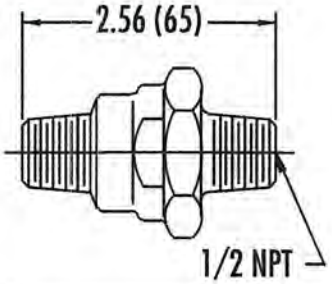
OPTION 76 - HOSE VALVE(S)

WITH CAPS AND CHAINS | WITHOUT CAPS AND CHAINS

PUMP RATING G.P.M.	50	100 150 200	250 300	400 450 500	750	1000	1250 1500 2000	2500	3000	3500	4000 4500	5000
"A" MANIFOLD SUPPLY SIZE	1.5"	2.5"	3"	4"	6"	6"	8"	10"	10"	12"	12"	12"
"B"	1	1	1	2	3	4	6	8	12	12	16	20
"C"	1.00 (25)	1.13 (29)	1.31 (33)	8.50 (216)	10.62 (270)	10.62 (270)	11.75 (298)	12.50 (318)	25.63 (651)	31.63 (803)	31.63 (803)	43.75 (1111)
"D"	1-1/2	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2	2-1/2

NOTES:

1. **Dimensions are in inches (mm) and may vary ±1/4 (6).**
2. **Components shown are shipped loose for field installation and assembly.**
3. **Manifold supply size "A" and the number of hose valves ("B") meets or exceeds the minimums specified by N.F.P.A. 20 for the pump ratings indicated.**
4. **Manifolds for 3000 through 5000 GPM ratings consist of multiple sections and may require support (by others).**
5. **1-1/2" Hose valves furnished with 1-1/2" National Standard Fire Hose Thread: 1.9900 (50.55) O.D. (max.), 6 threads per inch. 2-1/2" Hose valves are furnished with 2-1/2" National Standard Fire Hose Thread: 3.0686 (77.94) O.D. (max.), 7-1/2 threads per inch. Refer to factory for other thread conventions or adaptors.**

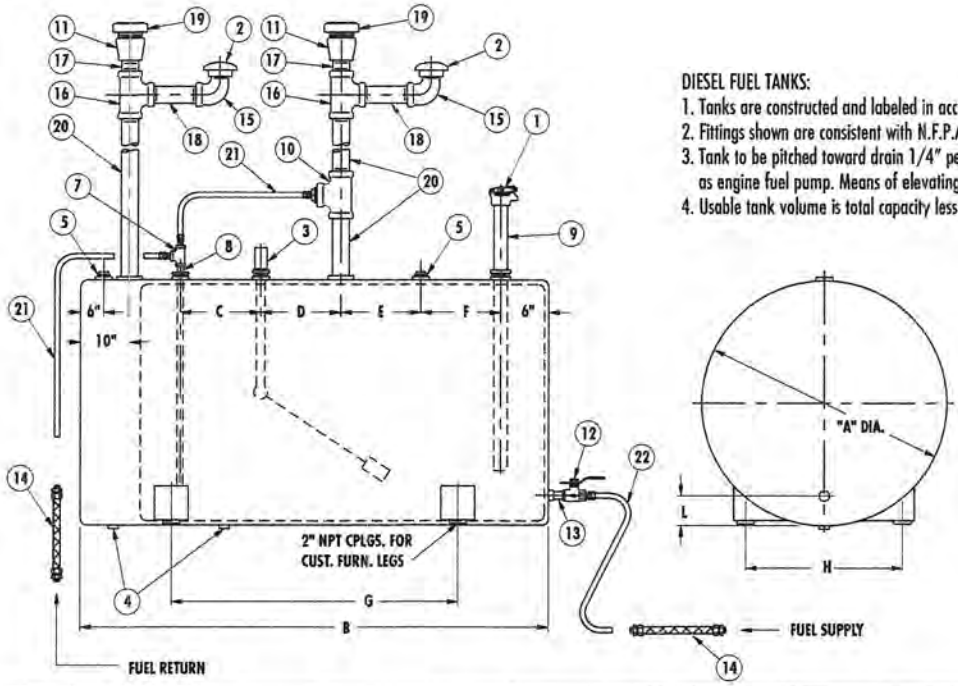


OPTION 77 - BALL DRIP VALVE

Designed to drain a branch line leading to an outside test manifold where danger of freezing exists. Opens at zero flow.

AURORA® FIRE PUMPS

DOUBLE WALL FUEL TANKS WITH FITTINGS



DIESEL FUEL TANKS:
1. Tanks are constructed and labeled in accordance with UL-142.
2. Fittings shown are consistent with N.F.P.A. 30 and UL-142.
3. Tank to be pitched toward drain 1/4" per foot with outlet on the same elevation as engine fuel pump. Means of elevating tank (by others) may be required.
4. Usable tank volume is total capacity less 5% for sump and 5% for expansion.

NOMINAL TANK SIZE IN GALLONS	USABLE VOLUME IN GALLONS	A	B	C	D	E	F	G	H	L	Z
119	105	24.5 (622)	73 (1853)	6 (152)	6 (152)	6 (152)	19 (482)	44 (1118)	14 (355)	3 (76)	4
187	165	31 (787)	73 (1853)	6 (152)	6 (152)	6 (152)	19 (482)	44 (1118)	16 (406)	3 (76)	4
~~300~~	~~270~~	~~39 (990)~~	~~73 (1853)~~	~~6 (152)~~	~~6 (152)~~	~~6 (152)~~	~~19 (482)~~	~~44 (1118)~~	~~22-7/8 (581)~~	~~3-3/4 (95)~~	~~4~~
359	320	41 (1041)	73 (1853)	6 (152)	6 (152)	6 (152)	31 (787)	44 (1118)	22-7/8 (581)	4 (102)	4
~~572~~	~~515~~	~~51 (1294)~~	~~73 (1853)~~	~~6 (152)~~	~~6 (152)~~	~~6 (152)~~	~~31 (787)~~	~~44 (1118)~~	~~30 (761)~~	~~5 (127)~~	~~4~~
849	766	65 (1651)	72 (1829)	6 (152)	6 (152)	6 (152)	19 (482)	44 (1118)	30 (761)	4-3/4 (121)	4
1100	993	65 (1651)	84 (2134)	6 (152)	6 (152)	6 (152)	37 (940)	44 (1118)	30 (761)	4-3/4 (121)	6

COMPONENTS FURNISHED BY OTHERS*		
ITEM NO.	QTY. REQ'D	DESCRIPTION
20	2	"Z" Diameter Piping for Vent
21	1	1/2" Black Pipe
22	1	3/4" Black Pipe

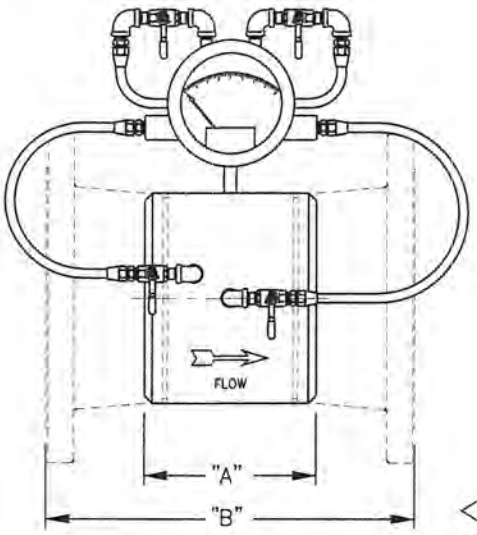
NOTES
1. All dimensions are in inches (mm) and may vary ± 1/4".
2. Components shown are shipped loose for field assembly.
3. Illustration is for component identification only. Actual installation must meet local codes and all applicable standards.
4. Item 10 may consist of a combination of fittings.
5. Refer to Section 916 page 259 for details of Aurora-furnished components.
6. Items 11 & 17 not required for 515 gallon tanks.

*Included with fire pump package systems.

COMPONENTS FURNISHED BY AURORA PUMP		
ITEM NO.	QTY. REQ'D	DESCRIPTION
1	1	2" NPT Lockable Fuel Cap
2	2	2" Screened Tank Vent
3	1	Fuel Gauge 1-1/2" NPT
4	2	1" NPT Drain Plug
5	2	2" NPT Pipe Plug
7	1	1/2" Tee
8	1	1/2" Close Nipple
9	1	2" Fuel Fill Pipe
10	1	"Z" x "Z" x 2" Tee
11	2	"Z" Coupling
12	1	3/4" NPT Lockable Fuel Valve
13	1	3/4" Close Nipple
14	2	Fuel Hoses for Supply & Return (Furnished by Engine Mfr.)
15	2	2" Street Elbow
16	2	"Z" x "Z" x 2" Tee
17	2	"Z" Close Nipple
18	2	2" Nipple
19	2	"Z" Emergency Vent

AURORA FIRE PUMPS

OPTION 91 - FLOW METERING SYSTEM



NOTES:
1. Accuracy is approximately ± 1%.
2. Flow meter is Gerand Model K Venturi type rated for 500 PSI with butt-weld or grooved connections and for 275 PSI with Class 150 flanged connections.
3. Proper operation requires that minimum distances of straight pipe runs be maintained both upstream and downstream from flowmeter. Refer to manufacturer's instructions before attempting installation.
4. Meter range is 50% to 200% of nominal rated flow. Dial is direct reading in G.P.M. for the specified range.

GERAND VENTURI FLOW METERS

NOMINAL FLOW RATE G.P.M.	PIPE SIZE	BUTT-WELD OPTION NUMBER	BUTT-WELD "A" DIM.	BUTT-WELD AURORA PART NUMBER	GROOVED OPTION NUMBER	GROOVED "A" DIM.	GROOVED AURORA PART NUMBER	CLASS 150 FLANGES OPTION NUMBER	CLASS 150 FLANGES "B" DIM.	CLASS 150 FLANGES AURORA PART NUMBER
100	2.5	91MP	3	366-0377-649	91LN	4	366-0337-649	91PL	9.5	366-0244-649
150	3	91MR	3.5	366-0378-649	91LP	4.38	366-0338-649	91PM	9	366-0245-649
200	3	91MT	3.5	366-0379-649	91LR	4.38	366-0339-649	91PN	9	366-0246-649
	4	91MW	3.5	366-0380-649	91LT	5	366-0340-649	91PP	9.5	366-0247-649
250	4	91NA	3.5	366-0381-649	91M	3.75	366-0154-649	91PR	9.5	366-0248-649
	5	91ND	5	366-0384-649	91MB	5	366-0343-649	91RA	12	366-0251-649
300	4	91NB	3.5	366-0382-649	91LW	3.75	366-0341-649	91PT	9.5	366-0249-649
450	4	91NC	3.5	366-0383-649	91MA	3.75	366-0342-649	91PW	9.5	366-0250-649
	5	91NE	5	366-0385-649	91MC	5	366-0344-649	91RB	12	366-0252-649
500	5	91NF	5	366-0386-649	91N	5	366-0155-649	91RC	12	366-0253-649
	6	91NH	6	366-0388-649	91ME	6	366-0346-649	91RE	13	366-0255-649
750	5	91NG	5	366-0387-649	91MD	5	366-0345-649	91RD	12	366-0254-649
	6	91NJ	6	366-0389-649	91P	6	366-0156-649	91RF	13	366-0256-649
1000	6	91NK	6	366-0390-649	91R	6	366-0157-649	91RG	13	366-0257-649
	8	91NP	7	366-0392-649	91MF	7	366-0347-649	91RJ	15	366-0359-649
1250	6	91NL	6	366-0391-649	91T	6	366-0158-	Should be 10 inch		366-0258-649
	8	91NR	7	366-0393-649	91MG	7	366-0348-649	91RK	15	366-0360-649
1500	8	91NT	7	366-0394-649	91W	7	366-0159-649	91RL	15	366-0361-649
	10	91PC	8	366-0398-649	91MH	8	366-0349-649	91RR	16	366-0355-649
2000	8	91NW	7	366-0395-649	91AA	7	366-0160-649	91RM	15	366-0362-649
	10	91PD	8	366-0399-649	91MJ	8	366-0350-649	91RT	16	366-0366-649
2500	8	91PA	7	366-0396-649	91AB	7	366-0161-649	91RN	15	366-0363-649
	10	91PE	8	366-0400-649	91MK	8	366-0351-649	91RW	16	366-0367-649
3000	8	91PB	7	366-0397-649	91AC	7	366-0162-649	91RP	15	366-0364-649
	10	91PF	8	366-0401-649	91ML	8	366-0352-649	91TA	16	366-0368-649
3500	10	91PG	8	366-0402-649	91AD	8	366-0163-649	91TB	16	366-0369-649
	12	91PJ	12	366-0406-649	91MM	12	366-0355-649	91TD	21	366-0373-649
4000	10	91PH	8	366-0403-649	91AE	8	366-0164-649	91TC	16	366-0370-649
	12	91PK	12	366-0407-649	91MN	12	366-0356-649	91TE	21	366-0374-649

Project:_____

Customer:_____

Engineer:_____

Pump Manufacturer:_____

Technical Data
Submittal Documents

Model GPD
Diesel Engine Driven Fire Pump Controller

Contents:

- Data Sheets
- Dimensional Data
- Wiring Schematics
- Field Connections

Note: The drawings included in this package are for controllers covered under our standard offering. Actual AS BUILT drawings may differ from what is shown in this package.

December 2016

c UL us FM APPROVED N.Y.C. APPROVED CE OPTIONAL SEISMIC COMPLIANT

Model GPD Diesel Fire Pump Controller

Standard, Listings, Approvals and Certifications	Built to NFPA 20 (latest edition)	
	Underwriters Laboratory (UL)	• UL218 - Fire Pump Controllers • CSA C22.2 No. 14 Industrial Control Equipment
	FM Global	Class 1321/1323
	New York City	Accepted for use in the City of New York by the Department of Buildings
	Seismic Certification	See page 5 for details
	Optional	
	☐ CE Mark	Various EN, IEC & CEE directives and standards
Enclosure	**Protection Rating** ☑ Standard: NEMA 2 (IP31) **Optional** ☐ NEMA 12 ☐ NEMA 3 ☐ NEMA 3R ☐ NEMA 4 ☐ NEMA 4X-304 sst painted ☐ NEMA 4X-304 sst brushed finish ☐ NEMA 4X-316 sst painted ☐ NEMA 4X-316 sst brushed finish ☐ IP54 ☐ IP55 ☐ IP65 ☐ IP66	
	Accessories • Bottom entry gland plate • Lifting Lugs • Keylock handle	**Paint Specifications** • Red RAL3002 • Powder coating • Glossy textured finish

Ambient Temperature Rating	**Standard** ☑ 5°C to 40°C / 41°F to 104°F **Optional** ☐ 5°C to 55°C / 41°F to 131°F

General	AC	☑ 120V / 1ph / 60hz ☐ 208V to 240V / 1ph / 50-60hz
	DC	☐ 12VDC ☐ 24VDC
	Grounding system	• Negative
	Battery chargers	• Two independent fully automatic • 10A continuous charge • 500mA trickle charge
Electrical Reading	• Battery 1 & Battery 2 voltage • Battery 1 & Battery 2 charging amperage • Charging mode	
Pressure Reading	• Continuous system pressure display • Cut-in and cut-out pressure setting	
Pressure and Event Recorder	• Pressure readings with date stamp • Event recording with date stamp • Under regular maintained operation, events are stored in memory for the life of the controller. • Data viewable on operator interface display screen • Downloadable by USB port to external memory device	

Model GPD Diesel Fire Pump Controller

Pressure sensing	• Pressure transducer and run test solenoid valve assembly for fresh water application • Pressure sensing connection 1/2" Female NPT • Drain connection 3/8" • Rated and calibrated for 0-500psi working pressure • Externally mounted with protective cover
Audible Alarm	4" alarm bell - 85 dB at 10ft. (3m)
Visual Indications	• Engine run • Main switch AUTO • Main switch in OFF • Main switch in HAND • Periodic test • Cranking Cycle • AC Power available • Pump room temperature (°F or °C)
Visual & Audible Alarms	Visual only • Pump on demand • Loss of continuity with contactor 1 • Battery 1 overvoltage • Overpressure • Loss of continuity with contactor 2 • Battery 2 overvoltage • Underpressure • Weekly test cut-in not reached • High raw water temperature • Service required • Engine ECM warning • Low raw water flow Visual and Audible • AC Failure • Weak battery 1 • Low fuel level • DC Failure • Weak battery 2 • High fuel level • Battery fail 1 • Engine fail when running • Engine ECM in alternate position • Battery fail 2 • Engine fail to start • Engine fuel injection malfunction • Charger fail 1 • Engine overspeed • Engine high temperature • Charger fail 2 • Low ambient temperature • Engine low temperature • Engine trouble • Water reservoir low • Engine ECM fault • Pump room trouble • Water reservoir high • Engine low oil pressure • Controller trouble • Fuel tank leak • Low suction pressure
Remote Alarm Contacts	DPDT-8A-250V.AC • Engine run • Common controller trouble • Charger #1 & Charger #2 failure • Pressure line failure • Common engine trouble • High engine temperature • Battery #1 & battery #2 failure • Overspeed • Fail to start • DC failure • Fail when running • Fuel injection malfunction** • Loss of continuity (starter) #1 and/or #2 • Low oil pressure • ECM selector switch in alternate position*** • Common pump room alarm (field re-assignable)* • Low fuel level • Low suction pressure • Water reservoir low • High fuel level • Low pump room temperature • Water reservoir empty • Fuel tank leak • High pump room temperature • AC Failure • H-O-A selector switch in OFF or HAND • Free (field programmable)*

*Except if option C13 is ordered. Tornatech reserves the right to use any of these four alarm points for special specific application requirements
**Applicable to electronic engines only.
*** Applicable to electronic engines only. Alarms when ECM selector switch on the engine is in alternate mode.

Model GPD Diesel Fire Pump Controller

Terminals for Field Connections for External Devices	• Low fuel level • Remote AUTOMATIC start • Deluge valve start (re-assignable) • Fuel tank leak (re-assignable) • High fuel level (re-assignable)		
ViZiTouch V2 Operator Interface	• Embedded microcomputer with software PLC logic • 7.0" color touch screen (HMI technology) • Upgradable software • Multi-language		
Operation	**Selector Switch**	• Hand-Off-Auto • Behind lockable and breakable cover	
	Automatic Start	• Start on pressure drop • Remote start signal from automatic device	
	Manual Start	• Crank 1 and Crank 2 start pushbuttons • Run test pushbutton • Deluge valve start • Remote start from manual device	

	Crank Cycle	• 6 consecutive cycle attempts
		  • 3 X 15s crank from battery 1 or 2 alternatively
		  • 15s rest in between each crank attempt	

	Stopping	• Manual with Stop pushbutton • Automatic after expiration of minimum run timer ****	
	Timers	**Field Adjustable & Visual Countdown**	• Minimum run timer ****(off delay) • Sequential start timer (on delay) • Periodic test timer
	Actuation	**Visual Indication**	• Pressure • Non-pressure
	Mode		• Automatic • Non-automatic
Communication Protocol Capability	• Protocol: Modbus • Connection type: Shielded female connector RJ45 • Frame Format: TCP/IP • Addresses: See bulletin MOD-GPD		

Alarm and shutdown schedule		Automatic Start	Manual or Remote Start	Run Test or Periodic Test
	High Coolant	Alarm only	Alarm only	Shutdown
	Low Oil Pressure	Alarm only	Alarm only	Shutdown
	Overspeed	Shutdown	Shutdown	Shutdown

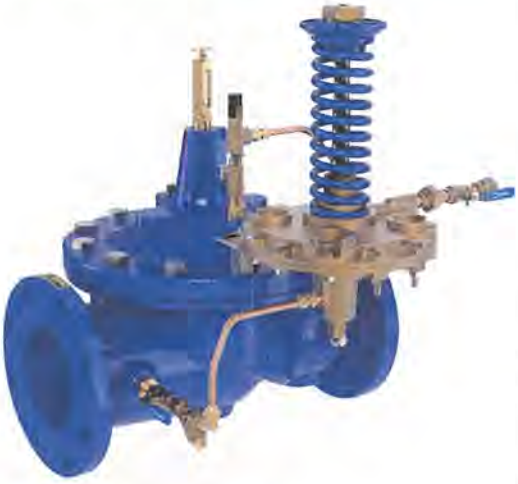
	Wall Mount		**Floor Mount**	
Starting Voltage	Approx. shipping dimensions in inches (mm)	Approx. Shipping Weight in Lbs (kg)	Approx. shipping dimensions in inches (mm)	Approx. Shipping Weight in Lbs (kg)
12V.DC	32" l x 29" w x 16" h (813 x 737 x 407)	85 (39)	32" l x 29" w x 26" h (813 x 737 x 661)	115 (52)
24V.DC				

**** Automatic shutdown shall be approved by the AHJ.

CLA-VAL™

MODEL 210-01

Altitude Valve For One-Way Flow



- **Accurate and Repeatable Level Control**
- **Drip-Tight, Positive Shut-Off**
- **Reliable Hydraulic Operation**
- **Easily Adjustable Control**
- **Completely Automatic Operation**

The Cla-Val Model 210-01 Altitude Valve controls the high water level in reservoirs without the need for floats or other devices. It is a non-throttling valve that remains fully open until the shut-off point is reached. This valve is designed for one-way flow only.

This valve is hydraulically operated and pilot controlled. The pilot control operates on the differential in forces between a spring load and the water level in the reservoir. The desired high water level is set by adjusting the spring force. The pilot control measures the reservoir head through a customer supplied sensing line* connected directly to the reservoir.

This valve can also be furnished with auxiliary controls to meet the need for multiple functions, such as: pressure sustaining, pressure reduction, rate of flow control, solenoid override, etc.

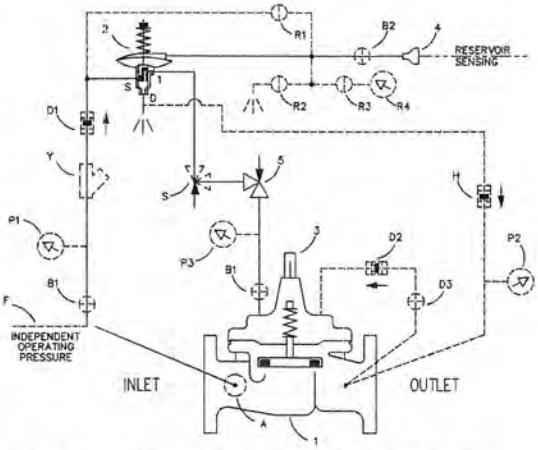
If the check feature option is added and a pressure reversal occurs, the downstream pressure is admitted into the main valve cover chamber and the valve closes to prevent return flow.

Schematic Diagram

Item	Description
1	100-01 Hytrol Main Valve
2	CDS6A Altitude Control
3	X101 Valve Position Indicator
4	Bell Reducer
5	CV Flow Control (Closing)

Optional Features

Item	Description
A	X46A Flow Clean Strainer
B	CK2 Isolation Valve
D	Check Valve with Isolation Valve
F	Independent Operating Pressure
H	Dry Drain
P	X141 Pressure Gauge
R	Reservoir Gauge with Tester
S	CV Flow Control (Opening)
Y	X43 "Y" Strainer



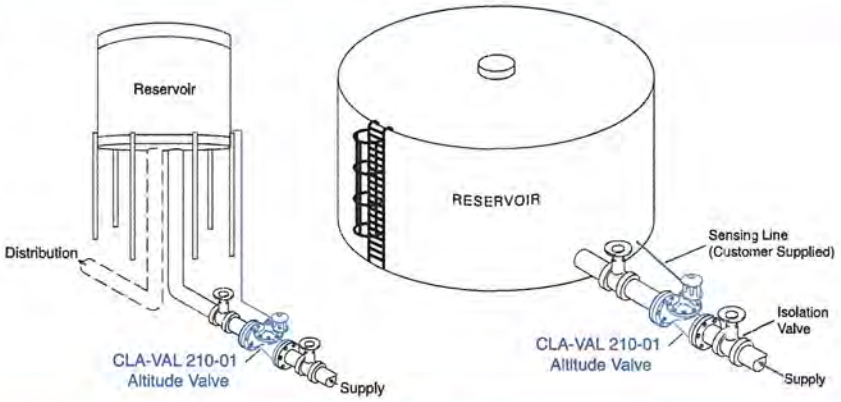
Note: When "D" check feature is ordered, the "H" feature is required.

Typical Applications

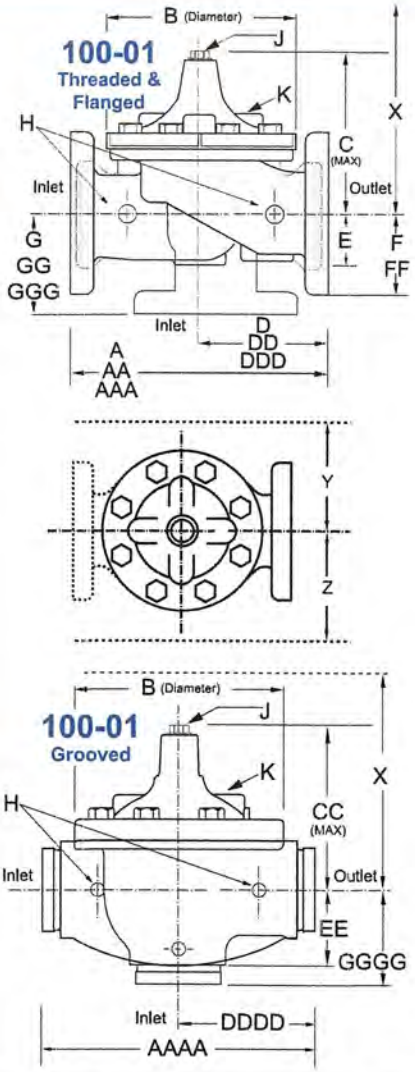
Used on reservoirs where the water is withdrawn through a separate line or through a bypass equipped with a check valve. The valve opens to refill the reservoir when the water lowers below the shut-off level. For more information see page 4 or data sheet E-CDS6A.

Note: Pilot sensing connected to drain line or to the reservoir directly (completed by others) if not possible contact factory or connect to fill pipe if no more than 10 pipe diameters away from the tank. Sensing line minimum recommended size is 3/4 in installed with a 2 degree slope to avoid air pockets.

Note: We recommend protecting tubing and valve from freezing temperatures.



Model 210-01 (Uses Main Valve Model 100-01)



Pressure Ratings (Recommended Maximum Pressure - psi)

Valve Body & Cover		Pressure Class				
		Flanged			Grooved	Threaded
Grade	Material	ANSI Standards*	150 Class	300 Class	300 Class	End‡ Details
ASTM A536	Ductile Iron	B16.42	250	400	400	400
ASTM A216-WCB	Cast Steel	B16.5	285	400	400	400
UNS 87850	Bronze	B16.24	225	400	400	400

Note: * ANSI standards are for flange dimensions only.
Flanged valves are available faced but not drilled.
‡ End Details machined to ANSI B2.1 specifications.
Valves for higher pressure are available; consult factory for details

Cover Capacity

Liquid Volume Displaced from Diaphragm Chamber When Valve Opens or Closes

Valve Size	Displacement
2"	.032 gal
2 1/2"	.043 gal
3"	.080 gal
4"	.169 gal
6"	.531 gal
8"	1.26 gal
10"	2.51 gal
12"	4.00 gal
14"	6.50 gal
16"	9.57 gal
18"	11.00 gal
20"	12.00 gal
24"	29.00 gal
36"	90.00 gal

Materials

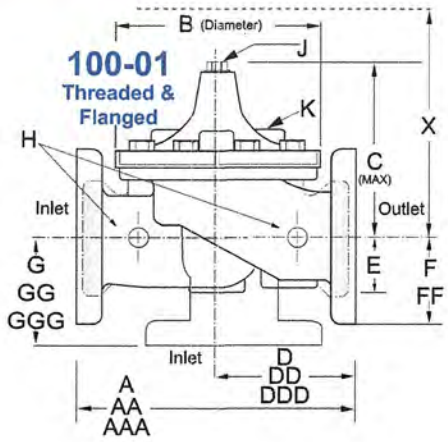
Component	Standard Material Combinations		
Body & Cover	Ductile Iron	Cast Steel	Bronze
Available Sizes	2" - 36" 50 - 900 mm	2" - 16" 400 - 900 mm	2" - 16" 400 - 900 mm
Disc Retainer & Diaphragm Washer	Cast Iron	Cast Steel	Bronze
Trim: Disc Guide, Seat & Cover Bearing	Bronze is Standard Stainless Steel is Optional		
Disc	Buna-N® Rubber		
Diaphragm	Nylon Reinforced Buna-N® Rubber		
Stem, Nut & Spring	Stainless Steel		

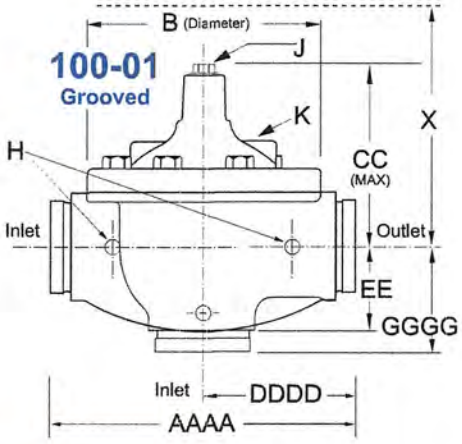
For material options not listed, consult factory.
Cla-Val manufactures valves in more than 50 different alloys.

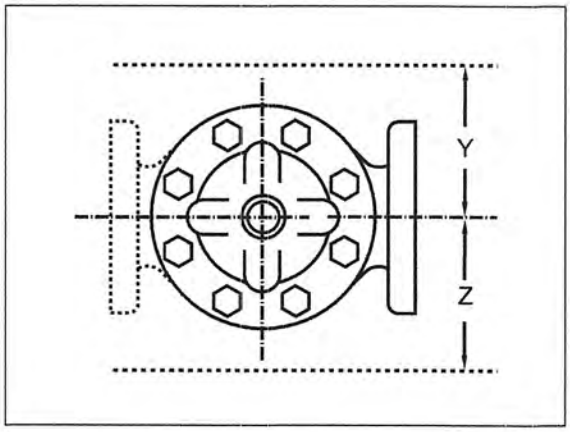
Model 210-01 Dimensions (In Inches)

Valve Size (Inches)	2	2½	3	4	6	8	10	12	14	16	18	20	24	30	36
A Threaded	9.38	11.00	12.50	—	—	—	—	—	—	—	—	—	—	—	—
AA 150 ANSI	9.38	11.00	12.00	15.00	20.00	25.38	29.75	34.00	39.00	41.38	46.00	52.00	61.50	63.00	72.75
AAA 300 ANSI	10.00	11.62	13.25	15.62	21.00	26.38	31.12	35.50	40.50	43.50	47.64	53.62	63.24	64.50	74.75
AAAA Grooved End	9.00	11.00	12.50	15.00	20.00	25.38	—	—	—	—	—	—	—	—	—
B Diameter	6.62	8.00	9.12	11.50	15.75	20.00	23.62	28.00	32.75	35.50	41.50	45.00	53.16	56.00	66.00
C Maximum	6.50	7.56	8.19	10.62	13.38	16.00	17.12	20.88	24.19	25.00	39.06	41.90	43.93	54.60	59.00
CC Maximum Grooved End	5.75	6.88	7.25	9.31	12.12	14.62	—	—	—	—	—	—	—	—	—
D Threaded	4.75	5.50	6.25	—	—	—	—	—	—	—	—	—	—	—	—
DD 150 ANSI	4.75	5.50	6.00	7.50	10.00	12.69	14.88	17.00	19.50	20.81	—	—	30.75	—	—
DDD 300 ANSI	5.00	5.88	6.38	7.88	10.50	13.25	15.56	17.75	20.25	21.62	—	—	31.62	—	—
DDDD Grooved End	4.75	—	6.00	7.50	—	—	—	—	—	—	—	—	—	—	—
E	1.50	1.69	2.06	3.19	4.31	5.31	9.25	10.75	12.62	15.50	12.95	15.00	17.75	21.31	24.56
EE Grooved End	2.50	2.88	3.12	4.25	6.00	7.56	—	—	—	—	—	—	—	—	—
F 150 ANSI	3.00	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.50	11.75	15.00	16.50	19.25	22.50	28.50
FF 300 ANSI	3.25	3.75	4.13	5.00	6.25	7.50	8.75	10.25	11.50	12.75	15.00	16.50	19.25	24.00	30.00
G Threaded	3.25	4.00	4.50	—	—	—	—	—	—	—	—	—	—	—	—
GG 150 ANSI	3.25	4.00	4.00	5.00	6.00	8.00	8.62	13.75	14.88	15.69	—	—	22.06	—	—
GGG 300 ANSI	3.50	4.31	4.38	5.31	6.50	8.50	9.31	14.50	15.62	16.50	—	—	22.90	—	—
GGGG Grooved End	3.25	—	4.25	5.00	—	—	—	—	—	—	—	—	—	—	—
H NPT Body Tapping	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
J NPT Cover Center Plug	0.50	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00	1.00	1.00	1.00	2.00	2.00
K NPT Cover Tapping	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Stem Travel	0.60	0.70	0.80	1.10	1.70	2.30	2.80	3.40	4.00	4.50	5.10	5.63	6.75	7.50	8.50
Approx. Ship Weight (lbs)	35	50	70	140	285	500	780	1165	1600	2265	2982	3900	6200	7703	11720
Approx. **X** Pilot System	13	14	15	17	29	31	33	36	40	40	43	47	68	79	85
Approx. **Y** Pilot System	9	10	11	12	20	22	24	26	29	30	32	34	39	40	45
Approx. **Z** Pilot System	9	10	11	12	20	22	24	26	29	30	32	34	39	42	47

Model 210-01 Metric Dimensions (Uses Main Valve Model 100-01)







210-01 Dimensions (mm)

Valve Size (mm)	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900
A Threaded	238	279	318	—	—	—	—	—	—	—	—	—	—	—	—
AA 150 ANSI	238	279	305	381	508	645	756	864	991	1051	1168	1321	1562	1600	1848
AAA 300 ANSI	254	295	337	397	533	670	790	902	1029	1105	1210	1326	1606	1638	1899
AAAA Grooved End	228	279	318	381	508	645	—	—	—	—	—	—	—	—	—
B Diameter	168	203	232	292	400	508	600	711	832	902	1054	1143	1350	1422	1676
C Maximum	165	192	208	270	340	406	435	530	614	635	992	1064	1116	1387	1499
CC Maximum Grooved End	146	175	184	236	308	371	—	—	—	—	—	—	—	—	—
D Threaded	121	140	159	—	—	—	—	—	—	—	—	—	—	—	—
DD 150 ANSI	121	140	152	191	254	322	378	432	495	528	—	—	781	—	—
DDD 300 ANSI	127	149	162	200	267	337	395	451	514	549	—	—	803	—	—
DDDD Grooved End	121	—	152	191	—	—	—	—	—	—	—	—	—	—	—
E	38	43	52	81	110	135	235	273	321	394	329	381	451	541	624
EE Grooved End	64	73	79	108	152	192	—	—	—	—	—	—	—	—	—
F 150 ANSI	76	89	95	114	140	171	203	241	267	298	381	419	489	572	724
FF 300 ANSI	83	95	105	127	159	191	222	260	292	324	381	419	489	610	762
G Threaded	83	102	114	—	—	—	—	—	—	—	—	—	—	—	—
GG 150 ANSI	83	102	102	127	152	203	219	349	378	399	—	—	560	—	—
GGG 300 ANSI	89	110	111	135	165	216	236	368	397	419	—	—	582	—	—
GGGG Grooved End	83	—	108	127	—	—	—	—	—	—	—	—	—	—	—
H NPT Body Tapping	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
J NPT Cover Center Plug	0.50	0.50	0.50	0.75	0.75	1.00	1.00	1.25	1.50	2.00	1.00	1.00	1.00	2.00	2.00
K NPT Cover Tapping	0.375	0.50	0.50	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Stem Travel	15	18	20	28	43	58	71	86	102	114	130	143	171	190	216
Approx. Ship Weight (kgs)	16	23	32	64	129	227	354	528	726	1027	1353	1769	2812	3494	5316
Approx. **X** Pilot System	331	356	381	432	737	788	839	915	1016	1016	1093	1194	1728	2007	2159
Approx. **Y** Pilot System	229	254	280	305	508	559	610	661	737	762	813	864	991	1016	1143
Approx. **Z** Pilot System	229	254	280	305	508	559	610	661	737	762	813	864	991	1067	1194

210-01 Valve Selection	100-01 Pattern: Globe (G), Angle (A), End Connections: Threaded (T), Grooved (GR), Flanged (F) Indicate Available Sizes															
	Inches	2	2½	3	4	6	8	10	12	14	16	18	20	24	30	36
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900
Main Valve 100-01	Pattern	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G, A	G	G	G, A	G	G
	End Detail	T, F, Gr	T, F, Gr*	T, F, Gr	F, Gr	F, Gr*	F, Gr*	F	F	F	F	F	F	F	F	F
Suggested Flow (gpm)	Maximum	210	300	460	800	1800	3100	4900	7000	8400	11000	14000	17000	25000	42000	50000
	Maximum Intermittent	260	370	580	990	2250	3900	6150	8720	10540	13700	17500	21700	31300	48000	62500
Suggested Flow (Liters/Sec)	Maximum	13	19	29	50	113	195	309	442	530	694	883	1073	1577	2650	3150
	Maximum Intermittent	16	23	37	62	142	246	387	549	664	863	1104	1369	1972	3028	3940

100-01 Series is the full internal port Hytrol.

*Globe Grooved Only

Pilot System Specifications

Adjustment Ranges

5 - 40 ft.
30 - 80 ft.
70 - 120 ft.
110 - 160 ft.
150 - 200 ft.

Temperature Range

Water: to 180°F

If flowing line pressure is less than 10 psi, consult factory for full details.

If inlet pressure is above 150 psi, consult factory for recommendations.

Materials

Standard Pilot System Materials
Pilot Control: Low Lead Bronze
Trim: Stainless Steel Type 303
Rubber: Buna-N® Synthetic Rubber

Optional Pilot System Materials
Pilot Systems are available with optional Aluminum, Stainless Steel, or Monel materials. Valve position indicator is standard

When Ordering, Specify:

1. Catalog No. 210-01
2. Valve Size
3. Pattern - Globe or Angle
4. Pressure Class
5. Threaded or Flanged
6. Trim Material
7. Adjustment Range
8. Desired Options
9. When Vertically Installed
10. When "D" ffeatured is ordered, the "H" feature is required.

Valve Options

X141 Pressure Gauge

X101AR Valve Position Indicator with Air Release

X101 Valve Position Indicator

X144 e-FlowMeter

X43H Strainer

Stainless Steel Pilot

For a comprehensive overview of Cla-Val Altitude Control Valves, please vist www.cla-val.com and use. keyword search "Altitude".

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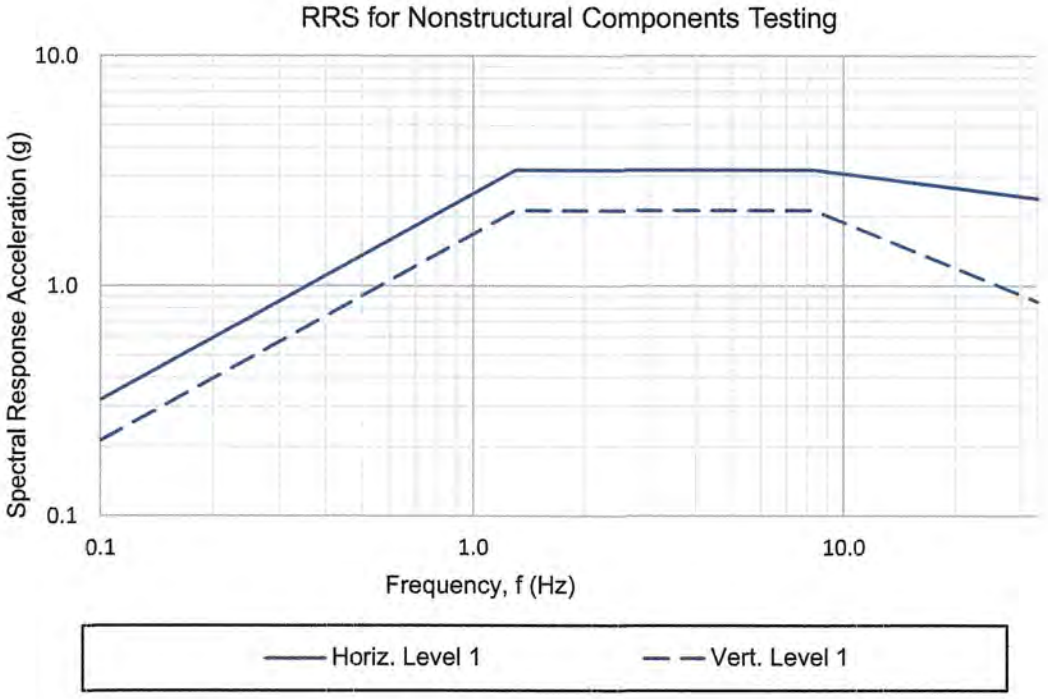
E-210-01 (R-03/2021)

visit www.cla-val-latinamerica.com for Spanish literature

Seismic Certification	Seismic Certification Company	TRU Compliance, LLC A Tobalski Watkins Affiliate					TWEI Project No.: 15014				
	Mounting details	Rigid wall mounting									
	Seismic Information	Building Code	Test Criteria	Seismic Parameters	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
		IBC 2015, CBC 2016	ICC-ES AC156	ASCE 7-10 Chapter 13	2.0	1.0	1.5	3.20	2.40	1.33	0.53
					3.2	0.0	1.5	3.20	1.28	2.13	0.85



Notes:
- Components are tested in accordance with ICC-ES AC156, IBC 2015 & CBC 2016.
- OSHPD Special Seismic Certification Preapproval (OSP)

NAVAJO NATION

840 7/22/2021

Navajo Nation Council Summer Session 11:59:27 AM

Amd# to Amd#	Legislation 0091-21: Allocating	PASSED
MOT Wauneka, E	$2,000,000 in Sihasin Funds to	
SEC Halona, P	the Canoncito Band of Navajos Health Center, Inc. for the...	

Yeas : 23 **Nays : 0** **Excused : 0** **Not Voting : 0**

Yea : 23

Begay, E	Daniels	Slater, C	Tso, E
Begay, K	Freeland, M	Smith	Walker, T
Begay, P	Halona, P	Stewart, W	Wauneka, E
Brown	Henio, J	Tso	Yazzie
Charles-Newton	James, V	Tso, C	Yellowhair
Crotty	Nez, R	Tso, D	

Nay : 0

Excused : 0

Not Voting : 0

Presiding Speaker: Damon