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J:\PROJECTS\2015\15010\10622_COW_REUSE_WATER_SUPPLY_SYSTEM\15 ISSUED\02 DWGS\2016-04-18_IFC PLANS\MECHANICAL\NOT SEALED\M6.0 EQUIPMENT AND PIPING NOTES.DWG

GENERAL PROCESS EQUIPMENT AND PIPING NOTES

NOTES ON THIS SHEET ARE APPLICABLE TO WORK RELATED TO PROCESSES, PIPING, AND EQUIPMENT WITHIN THE REUSE PUMP STATION.

GENERAL NOTES

A. CONSTRUCTION OF THE REUSE PUMP STATION FACILITIES, INCLUDING, BUT NOT LIMITED TO, PROCEDURES, MATERIALS, CLEANING AND DISINFECTION, SHALL BE IN ACCORDANCE WITH KDHE STANDARDS AND THE PROJECT PLANS AND SPECIFICATIONS.
B. ANY DISCREPANCIES OR CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
C. THE CONTRACTOR SHALL MAINTAIN AS-BUILT PLANS THROUGHOUT CONSTRUCTION AND SUBMIT THESE PLANS TO ENGINEER UPON COMPLETION OF WORK.
D. CONTRACTOR SHALL NOT START WORK ON THE PROJECT UNTIL THE PROJECT INSPECTOR IS ASSIGNED TO THE PROJECT AND IS PRESENT ON THE SITE.
E. SEE MECHANICAL AND ELECTRICAL SHEETS FOR GAS, COMMUNICATION, LIGHTING, FACILITY POTABLE WATER, SANITARY SEWER, AND ELECTRICAL INFORMATION.
F. UNLESS SHOWN OR STATED OTHERWISE ON THESE DRAWINGS AND SPECIFICATIONS, MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF WICHITA STANDARD SPECIFICATIONS.

SPECIFICATIONS

DIVISION 40: PROCESS INTEGRATION

40 05 13 COMMON WORK RESULTS FOR PROCESS PIPING

40 05 13 1.01 GENERAL

A. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL PIPING SYSTEMS SHOWN AND SPECIFIED, IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND INDUSTRY PRACTICES. EACH SYSTEM SHALL BE COMPLETE WITH ALL NECESSARY FITTINGS, HANGERS, SUPPORTS, ANCHORS, EXPANSION JOINTS, FLEXIBLE CONNECTORS, VALVES, ACCESSORIES, TESTING, AND DISINFECTION, TO PROVIDE A PROFESSIONAL AND FUNCTIONAL INSTALLATION.

40 05 13 1.02 REFERENCES

A. ANSI/NSF-14 – PLASTIC PIPING COMPONENTS AND RELATED MATERIALS
B. ASTM D1784 – RIGID POLY(VINYL CHLORIDE) (PVC) COMPOUNDS AND CHLORINATED POLY(VINYL CHLORIDE) (CPVC) COMPOUNDS
C. ASTM D1785 – POLY(VINYL CHLORIDE) (PVC) PLASTIC PIPE, SCHEDULES 40, 80, AND 120
D. ASTM D2464 – THREADED POLY(VINYL CHLORIDE) (PVC) FITTINGS, SCHEDULE 80
E. ASTM D2467 – POLY(VINYL CHLORIDE) (PVC) PLASTIC PIPE FITTINGS, SCHEDULE 80
F. ASTM D2564 – SOLVENT CEMENTS FOR POLY(VINYL CHLORIDE) PLASTIC PIPING SYSTEMS
G. ASTM D2855 – MAKING SOLVENT-CEMENTED JOINTS WITH POLY(VINYL CHLORIDE) (PVC) PIPE AND FITTINGS
H. AWWA C110 – DUCTILE & GRAY IRON FITTINGS
I. AWWA C111 – RUBBER-GASKET JOINTS FOR DUCTILE-IRON PRESSURE PIPE AND FITTINGS
J. AWWA C153 – DUCTILE-IRON COMPACT FITTINGS FOR WATER SERVICE
K. AWWA C509 – RESILIENT SEATED GATE VALVES FOR WATER SUPPLY SERVICE
L. AWWA C518 – DUAL-DISC SWING-CHECK VALVES FOR WATERWORKS SERVICE
NOTE: LATEST VERSION OF EACH STANDARD APPLIES.

40 05 13 1.03 CONTRACTOR SUBMITTALS

A. THE CONTRACTOR SHALL SUBMIT COMPLETE SHOP DRAWINGS AND CERTIFICATES, TEST REPORTS, AFFIDAVITS OF COMPLIANCE, FOR ALL PIPING SYSTEMS, IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT PLANS AND SPECIFICATION AND CITY STANDARD SPECIFICATION.
B. CERTIFICATIONS: PRIOR TO INSTALLATION, THE CONTRACTOR SHALL FURNISH AN AFFIDAVIT OF COMPLIANCE CERTIFIED BY THE PIPE MANUFACTURER THAT THE PIPE, FITTINGS, AND SPECIALS FURNISHED UNDER THIS CONTRACT COMPLY WITH ALL APPLICABLE PROVISIONS OF AWWA, ASTM, NSF, AND THESE SPECIFICATIONS.
C. ALL EXPENSES INCURRED IN MAKING SAMPLES FOR CERTIFICATION OF TESTS SHALL BE BORNE BY THE CONTRACTOR.

40 05 13 1.04 MATERIAL DELIVERY, STORAGE, AND PROTECTION

A. ALL PIPING MATERIALS, FITTINGS, VALVES, ACCESSORIES, AND APPURTENANCES SHALL BE DELIVERED IN A CLEAN AND UNDAMAGED CONDITION AND STORED OFF THE GROUND AND PROTECTED FROM UV. ALL DEFECTIVE OR DAMAGED MATERIALS SHALL BE REPLACED WITH NEW MATERIALS AT THE CONTRACTOR'S EXPENSE.

40 05 13.73 PLASTIC PROCESS PIPING

40 05 13.73 1.01 PVC PIPE

A. PIPE: 3 INCH AND SMALLER PIPE SHALL BE DOMESTICALLY PRODUCED BY AN ISO 9001 MANUFACTURER OF TYPE I, GRADE I, PVC CELL CLASS 12454, ASTM D1784, ASTM D1785, SCHEDULE 80 MATERIAL.
B. FITTINGS: 3 INCH AND SMALLER FITTINGS SHALL BE DOMESTICALLY PRODUCED BY AN ISO 9001 MANUFACTURER OF TYPE I, GRADE I, PVC CELL CLASS 12454, ASTM D1784, ASTM D1785, SCHEDULE 80 MATERIAL, SCHEDULE 80, SOCKET WELD TYPE CONFORMING TO ASTM D2467. ALL THREADED CONNECTIONS SHALL UTILIZE SOCKET WELD BY THREADED ADAPTERS. THE PIPE SHALL NOT BE THREADED. FLANGE CONNECTIONS SHALL UTILIZE SOCKET WELD VAN STONE STYLE FLANGES WITH 1/8 INCH, FULL FACE, VITON GASKETS. DRY FIT OF FITTING SOCKETS MUST BE SNUG. LOOSE FITTINGS SHALL CAUSE REJECTION OF THE PIPE AND/OR FITTINGS AS FAULTY BECAUSE OF IMPROPER SIZE. BUILDING UP JOINT TO OVERCOME LOOSE FIT WILL NOT BE PERMITTED.
C. INSTALLATION: INSTALLATION SHALL COMPLY WITH THE LATEST INSTALLATION INSTRUCTIONS PUBLISHED BY THE MANUFACTURER AND SHALL CONFORM TO ALL PLUMBING, BUILDING, AND FIRE CODE REQUIREMENTS. SOLVENT CEMENT JOINTS SHALL BE MADE IN A TWO STEP PROCESS WITH PRIMER MANUFACTURED FOR THERMOPLASTIC PIPING SYSTEMS IN POTABLE WATER SERVICE AND SOLVENT CEMENT CONFORMING TO ASTM D2564. THE SYSTEM SHALL BE PROTECTED FROM CHEMICAL AGENTS, FIRE STOPPING MATERIALS, THREAD SEALANT, PLASTICIZED VINYL PRODUCTS, OR OTHER AGGRESSIVE CHEMICAL AGENTS NOT COMPATIBLE WITH PVC COMPOUNDS. SYSTEMS SHALL BE HYDROSTATICALLY TESTED AFTER INSTALLATION. WARNING! NEVER TEST WITH OR TRANSPORT/STORE COMPRESSED AIR OR GAS IN PVC PIPE OR FITTINGS.

40 05 13.73 1.02 CPVC PIPE

A. PIPE: 3 INCH AND SMALLER PIPE SHALL BE DOMESTICALLY PRODUCED BY AN ISO 9001 MANUFACTURER OF TYPE I, GRADE I, CPVC CELL CLASS 12454, ASTM D1784, ASTM D1785, SCHEDULE 80 MATERIAL.
B. FITTINGS: 3 INCH AND SMALLER FITTINGS SHALL BE DOMESTICALLY PRODUCED BY AN ISO 9001 MANUFACTURER OF TYPE I, GRADE I, CPVC CELL CLASS 12454, ASTM D1784, ASTM D1785, SCHEDULE 80 MATERIAL, SCHEDULE 80, SOCKET WELD TYPE CONFORMING TO ASTM D2467. ALL THREADED CONNECTIONS SHALL UTILIZE SOCKET WELD BY THREADED ADAPTERS. THE PIPE SHALL NOT BE THREADED. FLANGE CONNECTIONS SHALL UTILIZE SOCKET WELD VAN STONE STYLE FLANGES WITH 1/8 INCH, FULL FACE, VITON GASKETS. DRY FIT OF FITTING SOCKETS MUST BE SNUG. LOOSE FITTINGS SHALL CAUSE REJECTION OF THE PIPE AND/OR FITTINGS AS FAULTY BECAUSE OF IMPROPER SIZE. BUILDING UP JOINT TO OVERCOME LOOSE FIT WILL NOT BE PERMITTED.
C. INSTALLATION: INSTALLATION SHALL COMPLY WITH THE LATEST INSTALLATION INSTRUCTIONS PUBLISHED BY THE MANUFACTURER AND SHALL CONFORM TO ALL PLUMBING, BUILDING, AND FIRE CODE REQUIREMENTS. SOLVENT CEMENT JOINTS SHALL BE MADE IN A TWO STEP PROCESS WITH PRIMER MANUFACTURED FOR THERMOPLASTIC PIPING SYSTEMS IN POTABLE WATER SERVICE AND SOLVENT CEMENT CONFORMING TO ASTM D2564. THE SYSTEM SHALL BE PROTECTED FROM CHEMICAL AGENTS, FIRE STOPPING MATERIALS, THREAD SEALANT, PLASTICIZED VINYL PRODUCTS, OR OTHER AGGRESSIVE CHEMICAL AGENTS NOT COMPATIBLE WITH PVC COMPOUNDS. SYSTEMS SHALL BE HYDROSTATICALLY TESTED AFTER INSTALLATION. WARNING! NEVER TEST WITH OR TRANSPORT/STORE COMPRESSED AIR OR GAS IN PVC PIPE OR FITTINGS.

40 05 23.12 BALL VALVES

A. SPECIFICATION: UNLESS OTHERWISE SPECIFIED, 2 INCH AND SMALLER VALVES SHALL BE FULL PORT, SOCKET WELD, TRUE UNION STYLE. BALL VALVES SHALL BE APPROVED BY NSF FOR USE WITH POTABLE WATER.
B. MATERIALS: BODIES AND BALLS SHALL BE PVC WITH DOUBLE O-RING FPM/FKM SEALS AND PTFE SEATS.
C. OTHER FEATURES: THE VALVE SHALL INCORPORATE A SAFETY STEM WITH A PRE-DETERMINED BREAKING POINT ABOVE THE O-RINGS, PREVENTING ANY MEDIA LEAKING IN THE EVENT OF DAMAGE. ADJUSTABLE SEAT CARRIER SHALL BE REVERSE THREAD OPPOSITE THAT OF THE UNION NUT. ALL PTFE SEATS SHALL HAVE BACKING O-RINGS. FOR BALL VALVES IN HYPOCHLORITE SERVICE: BALL SHALL HAVE A PROVISION FOR VENTING THE CAVITY IN THE CLOSED POSITION TO THE UPSTREAM SIDE AND SHALL BE INSTALLED AS SUCH.
D. APPROVED MANUFACTURERS: HAYWARD AND ENGINEER APPROVED EQUAL.

40 05 59.26 FIBERGLASS-REINFORCED PLASTIC SLIDE GATE

A. GENERAL
1. GATE SHALL MEET AWWA C-563 REQUIREMENTS FOR LEAKAGE RATE AND SHALL SEAL ON ALL FOUR SIDES.
2. GATE SHALL BE HEAVY DUTY, TITESEAL SLUICE GATE AS MANUFACTURED BY PLASTI-FAB, INC. OR ENGINEER APPROVED EQUAL.
3. GATE BODY AND OPENING SHALL BE CENTERED ON PIPE CENTER.
4. A QUALIFIED MANUFACTURER'S REPRESENTATIVE SHALL:
a. PROVIDE MAINTENANCE AND OPERATION TRAINING FOR OWNER'S STAFF.
b. INSPECT INSTALLATION AND COMPLETE A CERTIFICATION OF PROPER INSTALLATION TO THE OWNER, ENGINEER, AND CONTRACTOR.
5. MANUFACTURER SHALL WARRANTEE GATE FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM SUBSTANTIAL COMPLETION OR EIGHTEEN MONTHS FROM DELIVERY, WHICH EVER IS EARLIER.
B. SUBMITTALS: CONTRACTOR SHALL SUBMIT THE FOLLOWING FOR ACCEPTANCE:
1. APPROVAL DRAWINGS SHOWING ALL CRITICAL DIMENSIONS, PRINCIPAL PARTS, AND MATERIALS.
2. SPARE PARTS LIST
C. CONSTRUCTION
1. GATE BODY
a. COMPOSITION OF THE SLUICE GATE LAMINATE SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS SHOWN IN THE QUALITY ASSURANCE REPORT FOR REINFORCED THERMOSET PLASTIC (RTP) CORROSION RESISTANT EQUIPMENT PREPARED UNDER THE SPONSORSHIP OF THE SOCIETY OF THE PLASTICS INDUSTRY, INC. (SPI), AND THE MATERIAL TECHNOLOGY INSTITUTE (MTI) OF THE CHEMICAL PROCESS INDUSTRY FOR "HAND LAY-UP LAMINATES", AND SHALL MEET THE SPECIFICATIONS FOR TYPE I, GRADE 10 LAMINATES SHOWN IN APPENDIX M-1 OF SAID REPORT.
b. INFUSION MOLDED TO CREATE A SEAMLESS CORROSION BARRIER IMPERVIOUS TO MOISTURE.
c. FRP RESIN SHALL BE VINYL ESTER RESIN.
d. INTERNAL STEEL REINFORCING SHALL BE CARBON STEEL AS NEEDED FOR DEFLECTION REQUIREMENTS AND SHALL BE FULLY ENCAPSULATED.
e. INTERNAL CORE FOAM SHALL BE 2 LB. POLYISOCYANURATE CLOSED CELL RIGID FOAM AND SHALL BE FULLY ENCAPSULATED. CORE MATERIALS MUST BE 100% RESISTANT TO DECAY AND ATTACK BY FUNGUS AND BACTERIA AND BE RESISTANT TO HYDROCARBONS.
f. GATE BODY SHALL HAVE UV STABILIZING PIGMENT IN THE RESIN TO PROVIDE LONG TERM UV PROTECTION.
g. THE SURFACE SHALL BE FREE OF EXPOSED REINFORCING FIBERS.
2. GATE FRAME, STEM, GATE HARDWARE, SEAL CLAMPING BAR AND FASTENERS, AND ANCHOR BOLTS SHALL ALL BE 304L STAINLESS STEEL.
3. SIDE, TOP, AND BOTTOM SEALS SHALL BE A HOLLOW BULB J SEAL OF EXTRUDED VIRGIN EPDM AND SHALL BE MOUNTED ON THE GATE COVER AND REPLACEABLE WITHOUT DEWATERING THE BASIN.
4. LIFT NUTS AND THRUST NUTS SHALL BE MANGANESE BRONZE (ASTM B-584, ALLOY 865).
5. STEM COVER SHALL BE BUTYRATE.
6. STEM GUIDES SHALL BE UHMW.
7. GATE SHALL UTILIZE AN ADJUSTABLE WEDGING ASSEMBLY TO ENSURE TIGHT SEAL AND EASE OF MANTENANCE.
8. GATE OPERATOR SHALL UTILIZE A RISING STEM OPERATOR WITH A TWO INCH AWWA NUT. A HAND CRANK SHALL BE SUPPLIED THAT FITS THE AWWA NUT.
9. FOR NON-SELF CONTAINED GUIDE FRAMES, A WALL MOUNTED PEDESTAL SHALL BE FURNISHED FOR MOUNTING THE OPERATOR. PEDISTAL AND WALL MOUNT HARDWARE AND BRACKETS SHALL BE 304L STAINLESS STEEL.
D. DIMENSIONS:
1. THE GATE SHALL BE THIRTY-SIX INCHES (36") BY THIRTY-SIX INCHES (36").
2. THE CENTERLINE OF THE GATE IN THE CLOSED POSITION SHALL MATCH THE CENTERLINE OF THE PIPE AND IS APPROXIMATELY 8.8 FEET TO THE TOP OF WALL.

DIVISION 43: PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT

43 21 13 CENTRIFUGAL LIQUID PUMPS

A. SCOPE: PUMPS THAT ARE SUPPLIED UNDER THIS SPECIFICATION SHALL BE VERTICAL TURBINE OPEN LINESHAFT DESIGN WITH PRODUCT LUBRICATION, INCLUDING A BOWL ASSEMBLY, COLUMN ASSEMBLY, DISCHARGE HEAD AND DRIVER. THE DISCHARGE HEAD SHALL BE DESIGNED TO CARRY THE ENTIRE WEIGHT OF THE BOWL AND COLUMN ASSEMBLY ALONG WITH THE SPECIFIED DRIVER WITHOUT EXCESSIVE VIBRATION OR NOISE. ALL OF THE SUPPLIED EQUIPMENT SHALL CONFORM TO THIS SPECIFICATION.
B. QUALITY ASSURANCES
1. WARRANTY: THE MANUFACTURER SHALL WARRANT THEIR PUMPS TO BE FREE OF DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR AFTER THE PRODUCT IS PUT INTO OPERATION OR NOT LESS THAN EIGHTEEN MONTHS FROM THE DELIVERY DATE, WHICHEVER OCCURS FIRST.
2. CERTIFICATIONS:
a. THE PUMP MANUFACTURER SHALL BE CERTIFIED TO THE ISO 9001 STANDARD FOR DESIGN AND MANUFACTURE OF VERTICAL TURBINE PUMPS.
b. THE MANUFACTURER SHALL BE CAPABLE OF PRODUCING VERTICAL TURBINE PUMPS CERTIFIED TO NSF/ANSI 61 & 372.
c. PRESSURE CONTAINING FABRICATIONS SHALL BE WELDED ONLY BY THOSE WHOM ARE QUALIFIED ON ASME CODE SECTION IX. WELDER CERTIFICATION SHALL BE PROVIDED WITH THE SUBMITTAL PACKAGE.
3. FOUNDRY: THE MANUFACTURER SHALL OWN AND OPERATE ITS OWN U.S. BASED FOUNDRY PRODUCING VERTICAL TURBINE COMPONENTS.
4. TESTING STANDARDS: ALL VERTICAL TURBINE PUMPS SHALL CONFORM TO ANSI/AWWA E101-88 AND TO THE MOST CURRENT EDITION OF HYDRAULIC INSTITUTE STANDARDS.
C. SUBMITTALS
1. WITH THE PROPOSAL, THE CONTRACTOR SHALL SUBMIT COMPLETE FABRICATION AND ASSEMBLY DRAWINGS TOGETHER WITH DETAILED SPECIFICATIONS COVERING MATERIALS, PARTS, DEVICES, AND ACCESSORIES. THE DATA AND SPECIFICATIONS FOR EACH PUMPING UNIT SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
a. NAME OF MANUFACTURER
b. TYPE AND MODEL
c. DESIGN ROTATIONAL SPEED
d. NUMBER OF STAGES
e. TYPE OF BOWL BEARINGS
f. TYPE OF LINE SHAFT BEARINGS
g. SIZE OF SHAFTING
h. SIZE OF PUMP COLUMN
i. SIZE OF DISCHARGE OUTLET
j. OD OF PUMP BOWLS
k. WEIGHT
l. TYPE OF FINISH
m. TOTAL WEIGHT
n. TOTAL PUMP LENGTH
o. COMPLETE PERFORMANCE CURVES SHOWING CAPACITY VERSUS HEAD, NPSH REQUIRED, EFFICIENCY, AND BHP PLOTTED SCALES CONSISTENT WITH PERFORMANCE REQUIREMENTS

D. MANUFACTURER: GOULDS WATER TECHNOLOGY, A XYLEM BRAND OR ENGINEER APPROVED EQUAL.
1. ALL PUMPS AND PUMP COMPONENTS SPECIFIED IN THIS SPECIFICATION SHALL BE SUPPLIED BY A SINGLE PUMP MANUFACTURER. THE PUMP MANUFACTURER SHALL BE REQUIRED TO SUPPLY THE PUMPS AND DRIVERS, AND SHALL BE RESPONSIBLE FOR THEIR COMPATIBILITY ONLY.
2. A FACTORY AUTHORIZED SERVICE FACILITY SHALL HAVE TRAINED SERVICE TECHNICIANS AND BE ABLE TO SHOW EVIDENCE OF PARTS INVENTORY FOR ROUTINE MAINTENANCE ITEMS SUCH AS BEARINGS, GASKETS, SHAFTS, AND SLEEVES.

E. OPERATION SELECTION
1. STATED TOTAL DYNAMIC HEAD (TDH) INCLUDES LIFT AND ALL SYSTEM PRESSURE. PUMP MANUFACTURER SHALL INCLUDE PUMP'S INTERNAL LOSES.

a. PUMP ITEM NUMBERS:	SPR-P001, SPR-P002, SPR-P003
b. NUMBER OF REQUIRED UNITS:	3
c. CONDITION "A" (DESIGN POINT),	
CAPACITY, GPM:	700
TDH, HEAD IN FEET:	330
d. MAXIMUM DRIVER HORSEPOWER:	100
e. MINIMUM BOWL EFFICIENCY,PERCENT (DESIGN POINT):	80%
f. MAXIMUM PUMP OPERATING SPEED:	1,800

2. CONDITION "A" AS LISTED ABOVE IS THE DESIGN POINT AND WILL BE USED FOR ANY PERFORMANCE EVALUATION IN ACCORDANCE WITH THE SET TOLERANCE GRADE STANDARDS OF THE HYDRAULIC INSTITUTE.
3. THE PUMP HORSEPOWER REQUIREMENTS FOR ANY POINT ON THE CURVE SHALL NOT UTILIZE THE SERVICE FACTOR NOR EXCEED THE MOTOR NAMEPLATE HORSEPOWER RATING.

F. SERVICE CONDITIONS

1. LIQUID TO BE PUMPED:	MUNICIPAL WWTP EFFLUENT
2. PUMPING TEMPERATURE (PT):	AMBIENT
3. SPECIFIC GRAVITY AT PT:	1.0
4. AVAILABLE LIQUID LEVEL FROM SUMP FLOOR:	41" MIN.
5. DISTANCE FROM CENTERLINE OF DISCHARGE FLANGE TO THE BOTTOM OF SUMP:	16'11"

G. MATERIALS AND CONSTRUCTION:
1. THE VERTICAL TURBINE LINESHAFT WETWELL PUMP SHALL CONFORM TO THE MATERIALS OF CONSTRUCTION FOR OPEN LINESHAFT DESIGN.

DISCHARGE HEAD ASSEMBLY

DESCRIPTION	MATERIAL DESCRIPTION	ASTM
DISCHARGE HEAD	STEEL	A53
COUPLING ASSEMBLY	SST 416	A582 S41600
SEAL HOUSING	CAST IRON	A48 CL30
SEAL HOUSING BEARING	BRONZE	B584 C90300
SEAL HOUSING GASKET	ACRYLIC GASKET	GARLOCK BLUE GUARD

COLUMN AND LINESHAFT ASSEMBLY

COLUMN PIPE (FLG)	STEEL	A53
COLUMN BOLTING	GRADE 8	SAE J429 GR8
LINESHAFT	SST 416	A582 S41600
LINESHAFT COUPLING	SST 416	A582 S41600
BEARING RETAINER	SST 304	A744 C30400
LINESHAFT BEARING	RUBBER EPDM	D3568

BOWL ASSEMBLY

BOWL SHAFT	SST 416	A582 S41600
INTERMEDIATE BOWL	COATED CAST IRON	A48 CL30
INTER BOWL BEARING	BRONZE	B584 C90300
IMPELLER	SST 316	A744 C31600
IMPELLER TAPER LOCK	STEEL 1018	A108 G10180
SUCTION BOWL / BELL	COATED CAST IRON	A48 CL30
SUCTION BEARING	BRONZE	B584 C90300
SAND COLLAR	SST304	A744 S30400
PLUG	MAL IRON	A197
HEX BOLT	GRADE 8	SAE J429 GR8

2. BOWL ASSEMBLY
a. THE SUCTION BELL SHALL BE DESIGNED TO PROVIDE CONSERVATIVE ENTRANCE VELOCITIES AND DIRECT THE FLOW TO THE FIRST STAGE IMPELLER. THE INNER SURFACE OF THE SUCTION BELL SHALL BE SMOOTH AND FREE OF SHARP PROJECTIONS WHICH COULD CAUSE TURBULENCE OR CAVITATION. THE SUCTION CASING SHALL BE DESIGNED TO HOUSE THE SUCTION BELL BEARING BY MEANS OF FOUR VANES.
b. THE BOWLS SHALL BE SMOOTH AND FREE OF SHARP PROJECTIONS AND SHALL HAVE REGISTER FITS FOR ALIGNMENT AND BE CONNECTED BY FLANGED AND BOLTED CONSTRUCTION. BOWL SIZES 6" TO 15" SHALL BE GLASS ENAMELED ON THE BOWL INTERIOR.
c. THE IMPELLERS SHALL BE MACHINED AND FINISHED SMOOTH TO INSURE PROPER PERFORMANCE. THEY ARE TO BE BALANCED PRIOR TO ASSEMBLY. THE IMPELLERS SHALL BE CONNECTED TO THE BOWL SHAFT BY MEANS OF COLLET DESIGN.
d. THE SUCTION STRAINER SHALL BE A THREADED BASKET DESIGN AND HAVE A FREE INLET AREA OF AT LEAST 3-4 TIMES THE IMPELLER EYE AREA. THE SUCTION STRAINER SHALL BE CONNECTED TO THE BOWL ASSEMBLY SUCTION CASING.
3. COLUMN ASSEMBLY
a. THE COLUMN SHALL INCLUDE FLANGED CONNECTIONS AND SHALL BE OF OPEN DESIGN WITH PRODUCT LUBRICATION.
b. THE BEARING SPACING SHALL BE SELECTED TO INSURE OPERATION AT A MINIMUM OF 25% ABOVE OR BELOW THE FIRST CRITICAL SPEED. BEARING SPACING SHALL NOT EXCEED 10 FEET.
c. FOR 3"-12" PRODUCT LUBRICATED COLUMN ASSEMBLIES, THE COLUMN SHALL BE DESIGNED WITH DROP-IN STEEL OR CAST-IRON BEARING RETAINERS. THE INTERIOR OF THE COLUMN SHALL BE FREE OF OFFSETS, BURRS, DISCONTINUITIES AND IRREGULARITIES.
d. THE LINESHAFT SHALL BE OF ADEQUATE SIZE TO TRANSMIT THE FULL POWER OF THE PUMP WITHOUT SLIP, EXCESSIVE VIBRATION OR ELONGATION, AND SHALL HAVE THREADED JOINTS. LINESHAFT LENGTHS SHALL NOT EXCEED 10 FEET. THE LINESHAFT SHALL HAVE LEFT HAND THREADS THAT TIGHTEN DURING PUMP OPERATION.
4. DISCHARGE HEAD ASSEMBLY
a. THE DISCHARGE HEAD SHALL BE FITTED WITH A FLANGED DISCHARGE CONNECTION. THE FLANGES SHALL BE A 150 LB RF ANSI FLANGE FOR FABRICATED STEEL HEADS. THE DISCHARGE HEAD SHALL BE DESIGNED TO CARRY THE ENTIRE WEIGHT OF THE COMPLETE PUMP AND DRIVER WITHOUT DISTORTION WHEN SPANNING AN OPENING OF SUFFICIENT SIZE TO PERMIT REMOVAL OF THE COMPLETE PUMP ASSEMBLY. THE DISCHARGE HEAD SHALL BE PROVIDED WITH A COUPLING GUARD. LIFTING LUGS SHALL BE PROVIDED AS STANDARD.
b. THE SEAL HOUSING SHALL BE DESIGNED TO ACCEPT A DOUBLE MECHANICAL SEAL WITH FRESH WATER BARRIER FLUID FLUSH.
5. DRIVER
a. THE DRIVER WILL BE A VERTICAL HOLLOW SHAFT ELECTRIC MOTOR THAT IS INVERTER-DUTY RATED, PREMIUM EFFICIENT, AND CONTAINED IN A WPI ENCLOSURE. THE MOTOR SHALL INCLUDE APPROPRIATE BEARING GROUNDING TO PREVENT CIRCULATING BEARING CURRENTS.
b. THE DRIVER AND ANY RELATED EQUIPMENT WILL SHIP UNMOUNTED FROM THE PUMP.
6. COATING: THE EXTERIOR OF THE BOWL, COLUMN, AND DISCHARGE HEAD ASSEMBLIES AS WELL AS THE INTERIOR OF THE COLUMN AND DISCHARGE HEAD ASSEMBLIES SHALL BE COATED WITH TNEMEC 141; MINIMUM DRY FILM THICKNESS: 16 MILS. COLORS TO BE SELECTED BY OWNER DURING SUBMITTAL PROCESS.

MKEC
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CITY OF WICHITA, KANSAS

RE-USE WATER PUMP STATION

TO SERVE SPIRIT AEROSYSTEMS

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EQUIPMENT AND PIPING NOTES

PROJECT NO.	468-85112
DATE	04/18/16
SCALE	NONE

DESIGNED	DRAWN	CHECKED
ALF	ALF	KTS

NO.	REVISION	DATE
0	ISSUED FOR CONSTRUCTION	04/18/16

SHEET NO.

M6.0

KEITH T. SCARBROUGH LICENSED 21496 04/18/2016 KANSAS PROFESSIONAL ENGINEER