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ITALIAN GUIDE SPECIFICATIONS

Use for ITALIAN projects only

SECTION 11312

PACKAGE [GRINDER PUMP][LIFT] STATION
04/02

NOTE: This guide specification is issued by the
Atlantic Division, Naval Facilities Engineering
Command for regional use in Italy.

NOTE: This specification covers requirements for
Package Lift Stations and Grinder Pump Stations
including alarm requirements, station piping, and
O&M data packages.

Comments and suggestion on this specification are
welcome and should be directed to the technical
proponent of the specification. A listing of the
technical proponents, including their organization
designation and telephone number, is on the Internet.

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer
choices or locations where text must be supplied by
the designer.

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the
extent referenced. The publications are referred to in the text by the
basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C478/C478M (1999; Rev. A) Precast Reinforced Concrete
Manhole Sections

ITALIAN NATIONAL ASSOCIATION FOR UNIFICATION OF STANDARDS (UNI)

NOTE: A UNI Norm is a technical normative recognized as Italian Law, submitted by a private organization "Ente Nazionale Italiano di Unificazione" for Italy and is available only in the Italian language. It is the National Standard.

- UNI 7125 (1972) Flanged gate valves for water pipelines - Technical conditions of delivery
- UNI 7685 (1977) Threaded tubes and fittings for cable conduits for explosion proof electrical installations - Iron couplings, galvanized
- UNI 8863/FA-1 (1987/89) Unalloyed steel seamless and welded tubes suitable for screwing in accordance with UNI ISO 7/1
- UNI 10269 (1995) Gate valves for water distribution - Materials and requirements for buried service

ITALIAN/EUROPEAN HARMONIZATION STANDARDS (UNI EN)(UNI ENV)(CEI EN)
(UNI EN ISO)(UNI ISO)

NOTE: A UNI EN, UNI ENV, CEI EN, UNI EN ISO or UNI ISO is a European Standard with a coincident Italian National Standard or International Standard. The two standards are identical, with most (but not all) EN's available in the English language and the UNI available only in the Italian language.

- UNI ISO 7-1 (1984) Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation
- UNI EN 545 (1995) Ductile iron, pipes, fittings, accessories and their joints for water pipelines - Requirements and test methods
- UNI EN 681-1/A1 (1997/98) Elastomeric seals - Materials requirements for pipe joint seals used in water and drainage applications - Part 1: Vulcanized rubber
- UNI EN 809 (2000) Pumps and pump units for liquids - Common safety requirements

UNI EN 1092-2	(1999) Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 2: Cast iron flanges
UNI EN 1401-1	(1998) Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticized poly(vinyl chloride)(PVC-U) - Part 1: Specifications for pipes, fittings and the system
UNI EN 1452-2	(2001) Plastics piping systems for water supply - Unplasticized poly(vinyl chloride)(PVC-U) - Part 2: Pipes
UNI EN 1452-3	(2001) Plastics piping systems for water supply - Unplasticized poly(vinyl chloride)(PVC-U) - Part 3: Fittings
UNI EN 1514-4	(1998) Flanges and their joints - Dimensions of gaskets for PN-designated flanges - Part 4: Corrugated, flat or grooved metallic and filled metallic gaskets for use with steel flanges
UNI EN 1561	(1998) Founding - Grey cast irons
UNI EN 1564	(1999) Founding - Austempered ductile cast irons
UNI ISO 4179	(1987) Ductile iron pipes for pressure and non-pressure pipelines - Centrifugal cement mortar lining - General requirements
UNI ENV 10080	(1997) Steel for the reinforcement of concrete - Weldable ribbed reinforcing steel B 500 - Technical delivery conditions for bars, coils and welded fabric
UNI EN 10142	(1992) Continuously hot-dip zinc coated low carbon steels strip and sheet for cold forming - Technical delivery conditions
CEI EN 60034-1	(2000) Rotating electrical machines - Part 1: Rating and performance
CEI EN 60529/A1	(1997/00) Degrees of protection provided by enclosures (IP Code)

1.2 DESCRIPTION OF WORK

The work includes providing submersible sewage[grinder] pump station and

related work. Provide system complete and ready for operations. [Grinder] pump station system including equipment, materials, installation, and workmanship shall be as specified herein.

1.3 SUBMITTALS

NOTE: Where a "G" in submittal tags follows a submittal item, it indicates Government approval for that item. Add "G" in submittal tags following any added or existing submittal items deemed sufficiently critical, complex, or aesthetically significant to merit approval by the Government. Submittal items not designated with a "G" will be approved by the QC organization.

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-03 Product Data

- Pipe and fittings; G
- Check valves; G
- Gate valves; G
- Submersible sewage[grinder] pumps; G
- Pump motor; G
- Flexible flanged coupling; G

SD-10 Operation and Maintenance Data

- Submersible Sewage[Grinder] Pumps Data Package 3; G
- Include pumps, alarms, and motors. Include all information on all equipment, alarm panel and controls, pumps and pump performance curves, and station layout in data for submersible sewage[grinder] pump station.

1.4 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

1.4.1 Delivery and Storage

Inspect materials delivered to site for damage. Unload and store with minimum handling. Store materials in enclosures or under protective covering. Store rubber gaskets not to be installed immediately under cover, out of direct sunlight. Do not store materials directly on the ground. Keep interior of pipes and fittings free of dirt and debris.

1.4.2 Handling

Handle pipe, fittings, valves, and other accessories in such manner as to ensure delivery to the trench in sound, undamaged condition. Avoid injury to coatings and linings on pipe and fittings; make satisfactory repairs if coatings or linings are damaged. Carry pipe to the trench; do not drag it.

1.5 EXCAVATION, TRENCHING, AND BACKFILLING

Provide in accordance with Section 02315 "Excavation and Fill," except as specified herein.

PART 2 PRODUCTS

2.1 SOURCE MANUFACTURERS

2.1.1 Pipe and Fittings

The following manufacturers provide pipe and pipe fitting materials that generally comply with these specifications:

DALMINE

Piazza Caduti 6 Luglio 1944, 1
24044 Dalmine (BG) Italy
Tel: +39 035560.1111
Fax: +39 0355603827
www.dalmine.it

SIREA S.p.A.

Via Corriera, 25
48010 Barbiano di Cotignola (Ravenna)
Tel: 0545/78008
Fax: 0545/78790
www.paginegialle.it

2.1.2 Valves

The following manufacturers provide pipe system valves that generally comply with these specifications:

CALEFFI

SS229
28010 Fontaneto D'Agogna (NO)
Tel: 0322/8491
Fax: 0322/863723
www.caleffi.com

RIP S.p.A.

Via Reycend 10
10148 Torino
Tel: 011/2203444
Fax: 011/2165981

2.1.3 Piping Accessories

The following manufacturers provide piping accessories such as identification tags, pipe supports, vents and similar items that generally comply with these specifications:

PROSYSTEM
Via dell'Industria, 2
30031 Arino di Dolo (VE)
Tel: 041/5101622
Fax: 041/5131351
www.prosystemitalia.com

FCR S.p.A.
Via Enrico Fermi, 3
20092 Cinisello Balsamo (MI)
Tel: 02/617981
Fax: 02/61798300
www.fcr.it

2.1.4 Submersible Sewage Pumps and Grinder Pumps

The following manufacturers provide submersible sewage pump and grinder pump equipment that generally comply with these specifications:

CAPRARI S.p.A.
Via Emilia Ovest, 900
41100 Modena
Tel: 059/897611
Fax: 059/897897

KSB Italia S.p.A.
Viale Tunisia, 46
20124 Milano
Tel: 02/6274
Fax: 02/66983272

GRUNDFOS POMPE ITALIA s.r.l.
Via Gran Sasso, 4
20060 Truccazzano (MI)
Tel: 39-02-95838112
Fax: 39-02-95309290

ABS POMPE s.r.l.
I-40050 Center Gross Bologna Blocco 33
Tel: 39-051-861007
Fax: 39-051-861848

FLYGHT ITALIA S.p.A.
Via A. Volta, 54
20090 Cusago (MI)
Tel: 39-02-9019721
Fax: 39-029019771

2.1.5 Pump Motors

The following manufacturers provide pump motors for submersible pump equipment that generally comply with these specifications:

CAPRARI S.p.A.
Via Emilia Ovest,900
41100 Modena
Tel: 059/897611
Fax: 059/897897

KSB Italia S.p.A.
Viale Tunisia, 46
20124 Milano
Tel: 02/6274
Fax: 02/66983272

GRUNDFOS POMPE ITALIA s.r.l.
Via Gran Sasso, 4
20060 Truccazzano (MI)
Tel: 39-02-95838112
Fax: 39-02-95309290

ABS POMPE s.r.l.
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Fax: 39-051-861848

FLYGHT ITALIA S.p.A.
Via A. Volta, 54
20090 Cusago (MI)
Tel: 39-02-9019721
Fax: 39-029019771

2.1.6 Pump Control System

The following manufacturers provide pump control system components that generally comply with these specifications:

CAPRARI S.p.A.
Via Emilia Ovest,900
41100 Modena
Tel: 059/897611
Fax: 059/897897

KSB Italia S.p.A.
Viale Tunisia, 46
20124 Milano
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FLYGHT ITALIA S.p.A.
Via A. Volta, 54
20090 Cusago (MI)
Tel: 39-02-9019721
Fax: 39-029019771

2.1.7 Underground Equipment Enclosure

The following manufacturers provide underground equipment enclosure materials and components that generally comply with these specifications:

CAPRARI S.p.A.
Via Emilia Ovest, 900
41100 Modena
Tel: 059/897611
Fax: 059/897897

KSB Italia S.p.A.
Viale Tunisia, 46
20124 Milano
Tel: 02/6274
Fax: 02/66983272

GRUNDFOS POMPE ITALIA s.r.l.
Via Gran Sasso, 4
20060 Truccazzano (MI)
Tel: 39-02-95838112
Fax: 39-02-95309290

ABS POMPE s.r.l.
I-40050 Center Gross Bologna Blocco 33
Tel: 39-051-861007
Fax: 39-051-861848

FLYGHT ITALIA S.p.A.
Via A. Volta, 54
20090 Cusago (MI)
Tel: 39-02-9019721
Fax: 39-029019771

2.2 PIPE AND FITTINGS

Provide pressure piping, air release valves, and related accessories for force main piping outside the sewage wet well and valve vault in accordance with Section 02530 "Sanitary Sewerage".

2.2.1 Ductile-Iron Pipe

UNI EN 545.

2.2.1.1 Flanged Pipe

Ductile iron, UNI EN 545.

2.2.1.2 Fittings

UNI EN 545, flanged. Provide flanged joint fittings within wet well and valve vault as indicated. Provide mechanical joint fittings outside valve vault enclosure as indicated. Use fittings with pressure rating at least equivalent to that of the pipe.

2.2.1.3 Joints

Use bolts, nuts, and gaskets for flanged connections recommended by joint manufacturer. Flange for setscrewed flanges shall be of ductile iron, UNI EN 1564, conforming to the applicable requirements of UNI EN 1092-2. Setscrews for setscrewed flanges shall be 1310 MPa tensile strength, heat treated, and zinc-coated steel. Gasket for setscrewed flanges shall conform to the applicable requirements for mechanical-joint gaskets specified in UNI EN 1514-4. Use setscrewed gasket designed to provide for confinement and compression of gasket when joint to adjoining flange is made.

2.2.2 PVC Plastic Pressure Pipe and Associated Fittings

2.2.2.1 Pipe and Fittings Less Than 100 mm Diameter

Use pipe, couplings and fittings manufactured of materials conforming to UNI EN 1452-2.

- (1) Screw-Joint: Use pipe conforming to dimensional requirements of UNI EN 1452-2 Schedule 80, with joints meeting requirements of 1.03 MPa working pressure, 1.38 MPa hydrostatic test pressure, unless otherwise shown or specified. Use threaded pipe fittings conforming to requirements of UNI EN 1452-3, threaded to conform to the requirements of UNI ISO 7-1 for use with Schedule 80 pipe and fittings.
- (2) Push-On Joint: UNI EN 681-1/A1, with gaskets. Fittings for push-on joints: UNI EN 545 or UNI EN 1514-4. Iron fittings and specials: cement-mortar lined (standard thickness) in accordance with UNI ISO 4179.
- (3) Solvent Cement Joint: Use pipe conforming to dimensional requirements of UNI EN 1452-2 with joints meeting the requirements of 1.03 MPa working pressure and 1.38 MPa hydrostatic test pressure. Use fittings for solvent cement jointing conforming to UNI EN 1401-1 or UNI EN 1452-3.

2.2.3 Insulating Joints

Provide between pipes of dissimilar metals a rubber gasket or other

approved type of insulating joint or dielectric coupling to effectively prevent metal-to-metal contact between adjacent sections of piping.

2.2.4 Accessories

Provide flanges, connecting pieces, transition glands, transition sleeves, and other adapters as required.

2.2.5 Flexible Flanged Coupling

Provide flexible flanged coupling applicable for sewage as indicated. Use flexible flanged coupling designed for a working pressure of 2.41 MPa.

2.3 VALVES AND OTHER PIPING ACCESSORIES

2.3.1 Gate Valves in Valve Vault

UNI 10269 and UNI 7125. Valves conforming to UNI 10269 shall be outside-screw-and-yoke rising-stem type with double disc gates and flanged ends. Valves conforming to UNI 7125 shall be outside-screw-and-yoke rising-stem type with flanged ends. Provide valves with handwheels that open by counterclockwise rotation of the valve stem. Bolt and construct stuffing boxes to permit easy removal of parts for repair. Use valves from one manufacturer.

2.3.2 Check Valves Less Than 100 mm Diameter

Neoprene ball check valve with integral hydraulic sealing flange, designed for a hydraulic working pressure of 1.21 MPa.

[2.3.3 Check Valves 100 mm and Larger Diameter

Nonclogging swing check valve rated for not less than 175 psig working pressure capable of passing 76-mm diameter solids. Cast iron conforming to UNI EN 1561. Buna-N disc and integral seat. Flanged ends conforming to UNI EN 1092-2.

]2.3.4 Identification Tags and Plates

Provide valves with tags or plates numbered and stamped for their usage. Use plates and tags of brass or nonferrous material and mounted or attached to the valve.

2.3.5 Pipe Support

Use pipe support schedule 40 galvanized steel piping conforming to UNI 8863/FA-1. Provide either UNI 7685 or UNI EN 545 galvanized threaded fittings.

2.3.6 Miscellaneous Metals

Use stainless steel bolts, nuts, washers, anchors, and supports for installation of equipment.

2.3.7 Quick Disconnect System with Hydraulic Sealing Flange

Use quick disconnect system consisting of a steel base plate for supporting the pumps, a hydraulic sealing flange, pump guide rails and the discharge pipe supports. Use two guide rails of galvanized steel in accordance with UNI EN 10142. Provide a steel lifting chain for raising and lowering the pump in the basin. Build guides onto pump housing to fit the guide post to assure perfect alignment between pump and guide rails.

2.3.8 Wet Well Vent

Galvanized UNI 8863/FA-1 pipe with insect screening.

2.4 SUBMERSIBLE SEWAGE[GRINDER] PUMPS

NOTE: When Grinder Pumps are required select the first and third bracketed options and delete the second option.

Provide submersible sewage pumps[with grinder units] as shown on the drawings. Provide submersible, centrifugal sewage pumps [of the non-clogging type with passageways designed to pass [76][____] mm diameter spheres without clogging][and grinder units capable of grinding all materials found in normal domestic sewage, including plastics, rubber, sanitary napkins, disposable diapers, and wooden articles into a finely ground slurry with particle dimensions no greater than [6][____] mm]. Pump capacity and motor characteristics as [indicated][specified]. Design pump to operate in a submerged or partially submerged condition. Provide an integral sliding guide bracket and two guide bars capable of supporting the entire weight of the pumping unit.

2.4.1 Casing

Provide hard, close-grained cast iron casing which is free from blow holes, porosity, hard spots, shrinkage defects, cracks, and other injurious defects. Design casings to permit replacement of wearing parts. Design passageways to permit smooth flow of sewage and to be free of sharp turns and projections.

2.4.2 Impeller

Provide non-clogging type cast-iron[, or bronze] impeller. Make impeller with smooth surfaces, free flowing with the necessary clearance to permit objects in the sewage to pass. Fit and key, spline, or thread impeller on shaft, and lock in such manner that lateral movement will be prevented and reverse rotation will not cause loosening.

2.4.3 Shaft and Shaft Seals

Provide shaft of stainless steel. Provide mechanical seal of double carbon and ceramic construction with mating surfaces lapped to a flatness tolerance of one light band. Hold rotating ceramics in mating position

with stationary carbons by a stainless steel spring. Oil lubricate bearings.

2.4.4 Bearings

Provide heavy duty ball thrust bearing or roller type bearing of adequate size to withstand imposed loads. Oil lubricate bearings.

2.4.5 Pump and Motor

NOTE: When grinder pumps are required include the bracketed text.

Use pump and motor assembled on a single stainless steel shaft in a heavy duty cast-iron shell. Use free standing pump support legs of cast-iron[providing enough clearance for the solids to get into the grinder].

2.5 PUMP MOTOR

Provide submersible sewage pumps in wet well CEI EN 60034-1, [____] RPM, [____] volt, [____] phase, and [____] Hz cycle and for submersible pumps. Motor horsepower shall be not less than pump horsepower at any point on the pump performance curve. Fit motors with lifting "eyes" capable of supporting entire weight of pump and motor.

2.6 PUMP CONTROL SYSTEM

Provide a sealed mercury float switch control system as indicated. Automatically alternate operation from one pump to the other and start second pump in the event first pump cannot handle incoming flow. Provide manual "on-off" switch for each pump. Provide independent adjustable high and low water level switches. Provide floats, supports, and alarm. Metal parts, if used, shall be of bronze or equivalent corrosion resistant material.

2.6.1 Float Assembly Description

Use a direct acting float switch consisting of a normally-open mercury switch enclosed in a float. Use pipe mounted float assembly. Use float molded of rigid high-density polyurethane foam, color-coded and coated with a durable, water and corrosion-resistant jacket of clear urethane. Provide connecting cable and support pole in accordance with manufacturers recommendations. Provide a cast aluminum junction box type IP65 per CEI EN 60529/A1, to connect float assembly. Use box with a gasketed cover with tapped float fitting and conduit entrance pipe threaded opening. Mount floats at fixed elevations as shown. Use floats designed to tilt and operate their switches causing sequential turn-on turn-off of the pump, when the liquid level being sensed rises or falls past the float.

2.6.2 Alternator

Provide an alternator control switch to operate in connection with each

float. Use alternator control switch to alternate the operation of the pumps and operate both pumps if the water level rises above the second high water level. Incorporate time delay function and devices in the alternator controls such that both sewage pumps cannot be started simultaneously for an adjustable period of 10 to 120 seconds after shutdown. Use delay function designed to operate in any condition of start-up in either normal or emergency operational mode.

2.6.3 Sewage Pump Alarm and Control Panel

Enclose alarm panel in enclosure type IP65 per CEI EN 60529/A1, and with a flashing red light with long life bulb in guarded enclosure and 15 mm diameter horn. Horn shall emit 120 DB at 3 meters. Power alarm horn and light from 12V DC power supply with battery backup. Provide a rechargeable battery rated to power both the horn and light for a minimum of two hours upon loss of main power. Provide circuitry to automatically recharge the battery after main power is restored. Full charge of battery shall take no more than 20 hours. Use panels with power on light, push to test button for horn and light and push to silence button for horn and light with automatic reset for next alarm. Use alarm designed to activate under the following conditions:

- a. High liquid level as sensed by float switch
- b. Loss of main power
- c. No flow light as sensed by limit switch on the check valve

2.6.4 Electrical Requirements

Furnish motors with their respective pieces of equipment. Motors, controllers, contactors, and disconnects shall be as specified in Section 16402 "Interior Distribution System." Furnish internal wiring for components of packaged equipment as an integral part of the equipment. Provide power wiring and conduit for field installed equipment.

2.6.5 Electric Motor

Use hermetically sealed electric motor. The power cable shall be sealed inside the motor end bell. The cable shall be neoprene covered with a flexible metal cover over it for its full length.

2.7 UNDERGROUND EQUIPMENT ENCLOSURE

2.7.1 Access Hatch Cover

Provide [aluminum][_____] access hatch cover as indicated. The access hatch shall include lifting mechanism, automatic hold open arm, slam lock with handle, and flush lift handle with red vinyl grip. Use automatic hold open arm that locks in the 1.57 rad position. Use cover that is 6 mm diamond plate with 6 mm channel frame and continuous anchor flange. Use access hatch cover capable of withstanding a live load of 1500 kg/sq. meter. Provide stainless steel cylinder lock with two keys per lock. Key all the locks the same.

2.7.2 Wet Well[and Valve Vault]

Provide [fiberglass reinforced polyester resin basin][concrete wet well [and Valve Vault]] with inside diameter [as indicated][of [_____] mm].[Precast structures may be provided in lieu of cast-in-place structures.]

[2.7.2.1 Cast-In-Place Concrete Structures

Provide wet well[and valve vault] with a compressive strength of 25 MPa at 28 days as specified in Section 03300 "Cast-In-Place Concrete."

]2.7.2.2 Precast Concrete Structures

ASTM C478/C478M, except as specified herein. Provide precast concrete structures with a compressive strength of 30 MPa at 28 days and an air entrainment of 6 percent, plus, or minus 2 percent and a minimum wall thickness of 125 mm. UNI ENV 10080 reinforcing bars. UNI EN 681-1/A1 gaskets for joint connections. Use monolithic base and first riser.

]2.7.3 Wet Well Base Material

Provide crushed stone as indicated and specified in Section 02315 "Excavation and Fill." Provide polyethylene vapor barrier as indicated and specified in Section 03300 "Cast-In-Place Concrete."

PART 3 EXECUTION

3.1 INSTALLATION

Provide pump station in accordance with drawings and requirements of the respective equipment manufacturers. Dampen and isolate equipment vibration.

3.1.1 Installation of Ductile-Iron Pressure Lines

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled, "General Requirements for Installation of Pipelines" of Section 02530 "Sanitary Sewerage," and with the requirements of UNI EN 545 for pipe installation, joint assembly, and valve-and-fitting installation.

- a. Make flanged joint with gaskets, bolts, and nuts specified for this type joint. Make flanged joints up tight, taking care to avoid undue strain on flanges, fittings, and other accessories. Align bolt holes for each flanged joint. Use size bolts for the bolt holes; use of undersized bolts to make up for misalignment of bolt holes or for any other purpose will not be permitted. Do not allow adjoining flange faces to be out of parallel to such degree that the flanged joint cannot be made watertight without overstraining the flange.

3.1.2 Installation of PVC Plastic Pressure Pipe and Fittings

Unless otherwise specified, install pipe and fittings in accordance with paragraph entitled "General Requirements for Installation of Pipelines" of

this section and with the recommendations for pipe joint assembly and appurtenance installation in UNI EN 1452-2 and UNI EN 1452-3.

a. Pipe Less than 100 mm Diameter:

(1) Make threaded joints by wrapping the male threads with joint tape or by applying an approved thread lubricant, than threading the joining members together. Tighten joints with strap wrenches that will not damage the pipe and fittings. Do not tighten joint more than 2 threads past hand-tight.

(2) Push-On Joints: Bevel ends of pipe for push-on joints to facilitate assembly. Mark pipe to indicate when the pipe is fully seated. Lubricate gasket to prevent displacement. Exercise care to ensure that the gasket remains in proper position in the bell or coupling while making the joint.

(3) Solvent-weld joints shall comply with the manufacturer's instructions.

3.1.3 Valves

Installation of Valves: Install gate valves conforming to UNI 10269 in accordance with UNI EN 545 for valve-and-fitting installation and with the recommendations of valve manufacturer to UNI 10269. Install gate valves conforming to UNI 7125 in accordance with UNI EN 545 for valve-and-fitting installation and with the recommendations of valve manufacturer to UNI 7125.

[Install check valves in accordance with the applicable requirements of UNI EN 545 for valve-and-fitting installation [, except as otherwise indicated].][Make and assemble joints to gate valves [and check valves] as specified for making and assembling the same type joints between pipe and fittings.]

3.1.4 Steel Piping

Install steel piping in accordance with UNI 8863/FA-1. Use PTFE pipe thread paste or PTFE powder and oil for jointing compound for pipe threads.

3.1.5 Force Main

Provide in accordance with Section 02530 "Sanitary Sewerage."

3.1.6 Equipment Installation

Install equipment in accordance with UNI EN 809, these specifications and the manufacturer's installation instructions. Grout equipment mounted on concrete foundations before installing piping. Install piping to avoid imposing stress on any equipment. Match flanges accurately before securing bolts.

3.2 FIELD TESTS AND INSPECTIONS

Perform all field tests, and provide all labor, equipment, and incidentals required for testing, except that water and electric power needed for field

tests will be furnished as set forth in Division 01. Produce evidence, when required, that any item of work has been constructed in accordance with contract requirements. Allow concrete to cure a minimum of 5 days before testing any section of piping where concrete thrust blocks have been provided.

3.2.1 Testing Procedure

Test piping in accordance with the Section 02530 "Sanitary Sewerage". Test in operation all equipment to demonstrate compliance with the contract requirements.

3.2.2 Sewage [Grinder Pump][Lift] Station

Test pumps and controls, in operation, under design conditions to insure proper operation of all equipment. Provide all appliances, materials, water, and equipment for testing, and bear all expenses in connection with the testing. Conduct testing after all equipment is properly installed, electrical services and piping are installed, liquid is flowing, and the pump station is ready for operation. Correct all defects discovered to the satisfaction of the Contracting Officer, and all tests repeated, at the expense of the Contractor, until the equipment is in proper working order.

-- End of Section --