

METROPOLITAN UTILITIES DISTRICT OF OMAHA
OMAHA, NEBRASKA

SPECIFICATION FOR MATERIALS

1. DISTRICT FURNISHED MATERIALS

A. Materials to be Furnished – The District will furnish all line valves, hydrant branch valves, tapping valves and sleeves, fire hydrants, chlorine tubes (except 6" and 8"), and plastic pipeline markers.

B. Availability – District furnished materials are available for Contractor inspection and loading at the District Service Yard at 3100 South 61st Avenue, Omaha, Nebraska from 8:30 a.m. to 3:00 p.m. weekdays, excluding holidays. The Contractor shall provide personnel to load material. The District will not deliver any material.

C. Inspection – The Contractor shall inspect District furnished material prior to loading and reject damaged or defective items.

D. Replacement – The District will replace damaged or defective materials rejected by the Contractor. Except as provided herein, materials accepted by the Contractor and found to be damaged or defective prior to project acceptance or during the warranty period shall be replaced by the Contractor at the Contractor's expense. This includes furnishing necessary material, supplies, labor and facilities.

E. Return of Defective Materials – The Contractor shall return damaged or defective District furnished materials. Material damaged by the Contractor will be exchanged and the Contractor will be charged for its replacement or repair, whichever is less. If material is determined to be factory defective, it will be exchanged without cost to the Contractor.

2. CONTRACTOR FURNISHED MATERIALS

A. Materials to be Furnished – The Contractor shall furnish all materials not supplied by the District but required for the work covered by these Specifications.

B. Inspection – Contractor furnished material is subject to inspection and approval by the District. The Engineer will reject material that is damaged, defective or does not meet specifications.

C. Replacement – The Contractor shall replace material rejected prior to project acceptance or during the warranty period. This includes furnishing all necessary material, supplies, labor, and facilities at Contractor expense.

3. HANDLING AND STORAGE OF MATERIALS – All material shall be delivered to, and unloaded at, the project site by the Contractor. The Engineer must approve all handling and hauling equipment. The Contractor is responsible for safely storing material until it is incorporated in the project. Material stored on-site shall be set on blocks or pallets to prevent runoff from flowing over it.

4. DISTRICT'S RIGHT TO REPLACE MATERIALS – When damaged, defective or unacceptable materials may cause damage to the District's system, or threatens service to a substantial number of District customers, and where the Contractor cannot take immediate action, the District will act immediately to replace those materials. The District will notify the Contractor of the action taken and deduct any costs from final payment. Costs will be computed on a time and material basis.

5. RETURN OF DISTRICT FURNISHED MATERIAL

A. Unused Material – The Contractor shall return unused District furnished material to the District Service Yard. The cost of any material not permanently installed and not returned, or returned damaged, will be deducted from final payment.

B. Chlorine Tubes – Chlorine tubes shall be returned to the District Service Yard no later than seven (7) calendar days after hydrostatic pressure testing and chlorination. The District will inspect chlorine tubes for damage, make necessary repairs, and deduct the cost of repairs from final payment. The cost will be computed on a time and material basis. Final payment and release of taps to the main will not be processed until all chlorine tubes have been returned.

6. REQUIREMENTS FOR CONTRACTOR FURNISHED MATERIALS

A. Bituminous Paving Mixtures shall meet the requirements of the agency having jurisdiction of the affected pavement.

B. Bolts

* Tee Head Bolts and Hexagonal Nuts for use with mechanical joint pipe and fittings shall conform to ANSI/AWWA C111/ A21.11 and shall be manufactured by Birmingham Fastener, Inc.

Steel Machine Bolts shall be in accordance to ASTM A307. Bolts smaller than ¾” shall be Grade B and feature heavy hexagonal heads per ASME B18.2.1. Bolts ¾” and larger shall be Grade A and feature hexagonal heads per ASME B18.2.1. Nuts shall be in accordance to ASTM A563 Grade A and be heavy hexagonal per ASME B18.2.2. Threads shall conform to ASME B1.1 with Class 2A for bolts and Class 2B for nuts. Bolt size shall conform to ASME B16.1 for Class 125 flanges. Bolts shall extend ¼” to ½” beyond the nut after assembly of the joint.

C. Brass Pipe and Fittings shall conform to ANSI B43.66 and ANSI B16.15, respectively.

D. Casing shall be steel pipe conforming to ASTM A139, Grade B and the drawings.

E. Casing Spacers

Steel Casing Spacers shall have minimum 10-gauge steel risers welded to minimum 14-gauge steel bands. Bands and risers shall have a minimum 10-mil (dry film thickness) fusion-bonded epoxy or fusion bonded PVC coating, or shall be 304 stainless steel. All risers shall be the same height and equally spaced around the pipe. A flexible inner liner shall protect the polyethylene encasement and prevent slippage. Runners shall have a low friction coefficient and be non-conductive, abrasion resistant, and at least 1-1/2” wide.

HDPE (High Density Polyethylene) Casing Spacers shall be totally non-metallic and assembled on-site by fitting one reusable element into another. Spacers shall be capable of carrying the filled weight of the pipeline without deformation of the supports.

F. Concrete shall conform to the City of Omaha’s “Standard Specifications for Public Works Construction” for streets and roads within city limits and all subdivisions within Omaha’s zoning jurisdiction. Provide State of Nebraska Class 47B Concrete in all other areas.

G. Corporation Stops

Air Tap Corporations shall be 1” threaded outlet ball valves with AWWA Standard inlet threads per AWWA C800 and female iron pipe outlet threads.

Sample Tap Corporations shall be 3/4" threaded outlet ball valves with AWWA Standard inlet threads per AWWA C800 and female iron pipe outlet threads.

Acceptable Air Tap and Sample Tap Corporations

Mueller B-20045
A.Y. McDonald 3148B
Ford FB1600

Pitometer Tap Corporations shall be 1" Mueller H-9992 ground key corporation stops.

H. Flange Insulating Sets shall consist of one (1) Type E gasket with a phenolic retainer and nitrile sealing element, a double set of reinforced phenolic insulating washers, steel washers, and full length 1/32" wall Mylar Insulating Sleeves. Insulating sets shall be Pipeline Seal and Insulator, Inc. "Linebacker", Advance Products and Systems, Inc. "Trojan", or Central Plastics "Jock".

I. Gaskets

Mechanical Joint and Push Joint Gaskets shall meet AWWA C111. In the event organic chemicals (gasoline, diesel, oil, etc.) are encountered in the soil during construction, the gasket shall be Nitrile (NBR).

Flange Gaskets shall be 1/8" thick and full-faced with inside diameter, outside diameter, and bolt holes meeting ANSI B16.1 for Class 125. Gaskets shall be Garlock Rubber Technologies Baystate 22, or approved equal.

J. Gate Valves (small) 2-1/2" and smaller gate valves shall be bronze-bodied with threaded ends, union bonnet solid wedge discs, rising stems and handwheels. Minimum pressure ratings shall be 125 psi steam and 200 psi WOG. Bronze for the body, bonnet and disc shall conform to ASTM B62. Bronze for the packing nut shall conform to ASTM B62, B584 or B16. Acceptable valves are:

Hammond IB 617
Milwaukee 1152
Nibco T-124
Powell 2700
Stockham B-105

K. Geotextile Fabric shall be Mirafi 500X, Synthetic Industries 200ST, or approved equal.

L. Grass Seed shall be City of Omaha Type "A", except in areas under County or State jurisdiction where a mixture of equal parts of orchard grass, brome grass and K-31 fescue shall be used.

Grass seed used to restore disturbed areas within the Papio-Missouri River Natural Resources District's channel levee right-of-way shall be as follows: 20 lbs. pure live seed (PLS) per acre Smooth Brome, 20 lbs. PLS per acre Tall Fescue (K31), 4 lbs. PLS per acre Switchgrass, 2 bushel per acre oats.

M. Joint Lubricant shall be supplied by the pipe manufacturer and conform to AWWA C111 and be NSF 61 certified.

N. Manholes

Rings and Covers - 24" manhole rings and covers shall conform to District Drawings 416206 or 416207. 36" manhole rings and covers shall conform to District Drawing 416232. Approved

*Denotes change.

manufacturers are Deeter Foundry, Inc., Neenah Foundry Company, East Jordan Iron Works (Product # NCR06-0074B and NCR06-0074C) and GCI Castings, Inc.

Joint Sealing Compound shall be preformed Butyl rubber in 1" rope form. Acceptable brands are K.T. Snyder Company RAM-NEK and Press Seal Gasket Corporation PRO-STIK.

O. Mechanical Couplings shall be rated for 150-psi water working pressure and 200-psi test pressure. Couplings shall feature carbon steel end rings, steel bolting, shop-coating (or epoxy-coating with stainless steel bolting) and meet AWWA C219 and the following:

<u>Pipe Size</u>	<u>Minimum Length of middle ring</u>	<u>Minimum Thickness of middle ring</u>
4" - 12"	5"	1/4"
14" - 24"	6"	3/8"
30" & larger	10"	1/2"

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Acceptable Straight Couplings for Ductile Iron Pipe Sizes:

<u>Pipe Size (O.D.)</u>	<u>Coupling</u>
4" (4.80")	Dresser 38 (steel w/ steel end rings) Ford FC3 (steel w/ steel end rings) Smith-Blair 411 (steel w/ steel end rings) Total Piping Solution Hymax #2000-0563-260 (steel)
6" (6.90")	Dresser 38 (steel w/ steel end rings) Ford FC3 (steel w/ steel end rings) Smith-Blair 411 (steel w/ steel end rings) Total Piping Solution Hymax #2000-0768-260 (steel)
8" (9.05")	Dresser 38 (steel w/ steel end rings) Ford FC3 (steel w/ steel end rings) Smith-Blair 411 (steel w/ steel end rings) Total Piping Solution Hymax #2000-0984-260 (steel)
10" (11.10")	Dresser 38 (steel w/ steel end rings) Smith-Blair 411 (steel w/ steel end rings)
12" (13.20")	Dresser 38 (steel w/ steel end rings) Romac 400 (steel w/ steel end rings) Smith-Blair 411 (steel w/ steel end rings) Total Piping Solution Hymax #2000-1366-260 (steel)
14" (15.30") and 16" (17.40")	Dresser 38 (steel w/ steel end rings) Ford FC4 (steel w/ steel end rings) Romac 400 (steel w/ steel end rings) Smith-Blair 411 (steel w/ steel end rings)
18" (19.50") and larger	Dresser 38 (with steel end rings) Ford FC4 (steel w/ steel end rings) JCM 201 (steel w/ steel end rings) Romac 400 (steel w/ steel end rings) Smith-Blair 411 (steel w/ steel end rings)

Mechanical joint solid sleeves are approved alternatives to straight couplings, provided the fittings (sleeves) meet MUD 111.

*Denotes change.

* Acceptable Transition Couplings for Ductile Iron Pipe Size to Cast Iron Pipe Size (Oversize):

<u>Pipe Size (D.I. O.D. to C.I. O.D.)</u>	<u>Coupling</u>
4" (4.80" to 5.00")	Dresser 38 (steel w/ steel end rings) Smith-Blair 413 (steel w/ steel end rings) Total Piping Solution Hymax #2000-0563-260 (steel)
6" (6.90" to 7.10")	Dresser 38 (steel w/ steel end rings) Smith-Blair 413 (steel w/ steel end rings) Total Piping Solution Hymax #2000-0768-260 (steel)
8" (9.05" to 9.30")	Dresser 38 (steel w/ steel end rings) Smith-Blair 413 (steel w/ steel end rings) Total Piping Solution Hymax #2000-0984-260 (steel)
10" (11.10" to 11.40")	Dresser 38 (steel w/ steel end rings) Smith-Blair 413 (steel w/ steel end rings) Total Piping Solutions Hymax #2000-1200-260 (steel)
12" (13.20" to 13.50")	Dresser 38 (steel w/ steel end rings) Smith-Blair 413 (steel w/ steel end rings) Total Piping Solution Hymax #2000-1366-260 (steel) Romac TC400 (steel w/ steel end rings)
14" (15.30" to 15.65")	Dresser 62 (steel w/ steel end rings) JCM 203 (steel w/ steel end rings) Romac TC400 (steel w/ steel end rings) Smith-Blair 413 (steel w/ steel end rings)
16" (17.40" to 17.80")	Dresser 62 (steel w/ steel end rings) JCM 203 (steel w/ steel end rings) Romac TC400 (steel w/ steel end rings) Smith-Blair 413(steel w/ steel end rings)
18" (19.50" to 19.92")	Dresser 62 (steel w/ steel end rings) JCM 203 (steel w/ steel end rings) Romac TC400 (steel w/ steel end rings) Smith-Blair 413 (steel w/ steel end rings)
20" (21.60" to 22.06"),	Dresser 62 (steel w/ steel end rings) JCM 203 (steel w/ steel end rings) Romac TC400 (steel w/ steel end rings) Smith-Blair 413(steel w/ steel end rings)
24" (25.80" to 26.32") and larger	Dresser 62 (steel w/ steel end rings) Ford FC6 (steel w/ steel end rings) JCM 203 (steel w/ steel end rings) Romac TC400 (steel w/ steel end rings) Smith Blair 413(steel w/ steel end rings)

* P. Polyethylene Encasement shall be linear low-density polyethylene (LLDPE) film per AWWA C105 supplied by the pipe manufacturer. Plastic tape shall be at least 2" wide with a pressure sensitive adhesive. Use Polyken 900, Scotchwrap No. 50, or approved equal.

*Denotes change.

Q. Retainer Glands

Set Screw Retainer Glands shall be ductile iron per ASTM A536 with cup-point, square head set screws. Acceptable glands are:

For ductile iron pipe:

EBA Iron Series 1200
 Ford Uni-Flange Model B
 SIGMA RMG
 Tyler Pipe/Union Foundry

Wedge Action Retainer Glands shall be ductile iron with heat-treated ductile iron wedges and twist-off torque nut bolts. Ductile iron shall be per ASTM A536 grade 65-45-12. Wedges shall have a minimum hardness of 370 BHN. The gland shall allow for a minimum deflection of 3° and allow joint movement after installation. Glands 16" and smaller shall have a pressure rating of 350 psi with a safety factor of at least 2:1. Glands larger than 16" shall have a pressure rating of 250 psi with a safety factor of at least 2:1. The gland shall be provided with torque limiting twist-off nuts with an additional fixed hex head to allow for removal and reinstallation of the gland. Twist-off torque nut bolts shall be coated or lubricated in a manner to prevent corrosion and pre-mature twist-off of the torque limiting twist-off nuts. Acceptable glands are:

* For ductile iron pipe:

EBA Iron Megalug Series 1100
 Ford Uni-Flange Series 1400
 STAR Stargrip 3000
 SIGMA One-Lok SLD
 TYLER UNION TUFGRIP DUCTILE IRON TLD

* For PVC pipe:

EBA Iron Megalug Series 2000PV
 STAR PVC Stargrip 4000
 TYLER UNION TUFGRIP PVC TLP

Split Wedge Action Retainer Glands shall comply with the specifications of wedge action retainer glands. The gland shall be in two halves allowing for installation on existing M.J. joints. Acceptable glands are:

For ductile iron pipe:

EBA Iron Megalug Series 1100SD

For PVC pipe:

EBA Iron Megalug Series 2000SV

R. Rock & Gravel

Hydrant Drainage Rock shall be as specified in Construction Standard 3.0.1.

Sand-Gravel for Trench Subgrade shall be State of Nebraska Department of Roads' fine aggregate for Class 47B Concrete.

Crushed Rock for Trench Subgrade shall be 1-1/2" dry, cleaned, crushed limestone.

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Crushed Rock and Gravel for Roads shall meet requirements of the agency having jurisdiction.

S. Sod shall match the type and variety of grass established and shall meet the quality requirements of the City of Omaha's "Standard Specifications for Public Works Construction".

T. Adjustable Valve Boxes (CC Boxes)

Cast Iron Valve Boxes shall conform to District Drawing No. 416128, and include base, middle section, top section, and deep skirt cover marked "Water". Provide Tyler 6860 CC, Bingham and Taylor No. 4906, East Jordan Iron Works 8560 Series, STAR Pipe Products dwg. A-1676 dated 12-10-2004.

Cast Iron Valve Box Alignment Device shall accept a #6 valve box base and shall center the valve box over the valve. The device shall be manufactured from 3/4" and 1/2" recycled rubber compound. Provide Adaptor Inc.'s Valve Box Adaptor II #6 Base or approved equal.

Plastic Valve Boxes shall feature ABS (Acrylonitrile-Butadrene-Styrene) plastic middle and base sections. The top section shall be cast iron, or an ABS plastic tube bonded to a cast iron ground rim, and shall accept the cast iron cover specified above. The middle section and extensions shall interchange with cast iron top sections. Provide Bingham and Taylor No. P-600-A or 8750.

U. Plastic Test Boxes shall feature a 2-1/2" or 2-3/8" I.D. x 15" long ABS (Acrylonitrile-Butadrene-Styrene) plastic body with cast iron lid. The body shall be flared at the base to prevent pull-out or settling. The cast iron lid shall be marked "Test" or "Test Station". Acceptable test boxes are: Bingham and Taylor 2-1/2"x15" test box, C.P. Test Services Mini Box, or Handley Industries Model T2.

V. Service Saddle for Sample Taps and Air Taps on PVC Mains shall have a CC (AWWA) outlet sized for the mating corporation. The saddle shall be 85-5-5-5 cast bronze per ASTM B62. The saddle shall feature straps for use on PVC pipe. Strap(s), nuts, and washers shall be 18-8 Type 304 Stainless Steel. Acceptable saddles are:

- Ford 202BS
- Mueller BR 2 S Series
- Smith Blair 325

W. 6" and 8" Chlorine Tubes shall conform to drawings MUD 125-06 6" CHLORINE TUBE FOR CONTRACTED PROJECTS and 8" CHLORINE TUBE FOR CONTRACTED PROJECTS. Drawings are available through MUD Engineering.

X. Silt Fence

Filter Fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0° - 120° Fahrenheit. Filter fabric shall conform to the following specifications:

<u>Properties</u>	<u>Minimum Requirement</u>	<u>Test Method</u>
Grab Tensile Strength (lbs)	130	ASTM D4632
Elongation @ Failure (%)	8	ASTM D4632
Mullen Burst Strength (psi)	175	ASTM D3786
Flow Rate (gal/min/ft)	90	ASTM D4751
Ultraviolet Radiation Stability (%)	80	ASTM D4355

Acceptable silt fence fabrics are:

*Denotes change.

- FabTex SCF1300 manufactured by FabTex Solutions Inc. and distributed by ASP Enterprises
- Style 1215 Silt Fence manufactured by Willacoochee Industrial Fabrics and distributed by Lumbermen's

Post shall be a minimum of 4' long. Post shall be steel and be a standard "T" or "U" post weighing not less than 1.25 pounds per lineal foot.

Ties shall be 7" long black plastic zip ties.

Y. Curb Inlet Filters shall be the Silt-Saver SS-300 or approved equal.

Z. Soil Stabilization Blankets and Matting

Combination Material Blanket/Matting shall consist of photo-degradable polypropylene net stitched with a biodegradable thread to 100% straw. The straw shall be evenly distributed over the blanket for a consistent thickness. The straw shall interlock or entwine to form a dense layer which resists raindrop impact, but allows vegetation to penetrate the blanket. The blanket shall be non-toxic to vegetation and to the germination of seed and shall not be harmful to the unprotected skin of humans. At a minimum, a polypropylene net shall cover the top side of the blanket and possess high web strength. The netting shall be entwined with the straw to maximize strength and provide for ease of handling.

Approved soil stabilization blankets are:

- S31 manufactured by Erosion Control Blanket and distributed by Lumbermen's
- S75 manufactured by North American Green and distributed by ASP Enterprises
- S32 manufactured by Erosion Control Blanket and distributed by Lumbermen's
- S150 manufactured by North American Green and distributed by ASP Enterprises

Staples shall be #13 gauge wire or heavier. The length shall be a minimum of 6" with a distance of 1" to 2" between the legs of the staple. Wood or bio-degradable plastic staples that provide proper embedment and support may be used.

AA. 1" Automatic Air Release Valves shall be the S-050 Automatic Air Release Valve "SEGEV" as manufactured by A.R.I Flow Control Accessories or approved equal. The valve shall feature a male 1" NPT end with a strainer and a vacuum check valve. The valve shall be for potable water and have a working pressure range of 3 – 250 psi.