RICHMOND UTILITIES DISTRICT

SEWER MAIN GENERAL SPECIFICATIONS

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This specification outline is intended to guide the contractor in providing materials and workmanship consistent with the Richmond Utilities District's needs. Engineering specifications for a specific project will supersede these documents.

SECTION I
SUBMITTALS

I.1 GENERAL

Submit to the Richmond Utilities District four (4) copies of shop drawings, project data and samples for all products, materials and equipment proposed for the completed project. A 14 day review period will be required for all submittals. Review of submittals is for general compliance with the Utilities District specifications. No responsibility is assumed by the Richmond Utilities District for the correctness of dimensions or details.

Review of submittals by the District shall not relieve the Contractor from responsibility for any variation from the requirements of the Richmond Utilities District Specifications unless the Contractor has in writing called the District's attention to each such variation at the time of submission and the District has given written approval of each such variation by a specific written notation thereof. The District's review of submittals shall not relieve the Contractor from responsibility for errors or omissions in the shop drawings.

I.2 SHOP DRAWINGS, PROJECT DATA, SAMPLES

All submittals shall bear a note and signature indicating that they were reviewed by the Contractor and found to be in conformance with the contract documents.

Any material or equipment submitted for review which is arranged differently or is a different physical size from that shown or specified shall be accompanied by shop drawings indicating the different arrangements of size and the method of making the various connections to the equipment. The final result will be compatible with the system or structure as designed.

Submittals for minor materials and equipment may be waived with the written approval of Richmond Utilities District.

I.3 SCHEDULES

A. Schedule of Values:

When requested by Richmond Utilities District, submit a schedule of values for each bid item for use in determining partial payments for various bid items.

B. Construction Schedule:

Submit a time schedule, showing complete sequence of construction by activity, prior to commencement of work. Update the schedule monthly showing changes occurring since previous submission.

Distribute copies of reviewed schedules to subcontractors and other concerned parties. Instruct recipients to report any inability to comply and provide detailed explanation with suggested remedies.

SECTION II
QUALITY CONTROL

II.1 GENERAL

The Contractor shall at all times be responsible for maintaining all disturbed areas of the job site. This is to include periods of work suspended due to cold weather. When Richmond Utilities District recognizes defective conditions they shall notify the Contractor. The Contractor will be given a reasonable amount of time, depending on the degree of the problem, to correct the condition. Examples of defective conditions shall include, but not necessarily be limited to, trench settlement, erosion, pot holes, washouts, excessive dust, inadequate signage, etc.

II.2 CONSTRUCITON MATERIALS

It is the Contractor's sole responsibility to provide and use only new materials, new products and new equipment that meet the requirements of the plans and specifications and will result in a completed project that is durable and of high quality in all respects. Richmond Utilities District may request samples of any material that the contractor proposes to use. Such samples shall be of sufficient size and quantity to allow appropriate testing of the sample. The Richmond Utilities District shall bear all cost of testing the sample. However, if testing shows that a sample does not meet the requirements of the plans and specifications, the Contractor shall reimburse the Richmond Utilities District for all costs incurred by the District as a result of testing the sample.

The Contractor shall provide equipment and parts from a single manufacturer to the greatest extent possible. This is to facilitate ease of service, maintenance and parts replacement. Richmond Utilities District reserves the right to reject proposed equipment from various manufacturers if suitable materials are available from fewer manufacturers, and to require that source of materials be unified to the maximum extent possible.

II.3 CONSTRUCTION REVIEW

The Richmond Utilities District or their representative will provide whatever Construction Review that they feel is necessary. Such Construction Review in no way reduces the Contractor's responsibility for supervision or quality control. The Contractor shall cooperate fully in the District's Construction Review efforts. The Contractor shall keep Richmond Utilities District informed of work in progress as well as the schedule of work to be done. The Contractor shall allow complete access to the project. Richmond Utilities District will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

II.4 TESTING

The Contractor shall perform and pay for all testing specified in the contract documents or by the Richmond Utilities District unless the test is specifically noted to be done by the District. The Contractor shall notify the District at least 48 hours in advance of any proposed testing or disinfection, and obtain approval for the proposed testing time. Testing and disinfection must be coordinated with Richmond Utilities District so that samples can be delivered to labs and tested properly. In general, Fridays and weekends are not acceptable times for testing and sampling.

SECTION III
AS-BUILT RECORDS

III.1 GENERAL

The Contractor shall maintain accurate as-built records throughout the construction project. A complete bound copy of these as-built records shall be delivered to the Richmond Utilities District before the District assumes ownership. The Contractor shall complete the drawings and records.

III.2 AS-BUILT DRAWINGS

The Contractor shall maintain a set of the construction drawings on the site at all times for the purpose of recording the actual configuration of the final work. The drawings shall show in a neat and legible fashion the final configuration, existing utilities, ledge, landmarks, etc.

III.3 MANUFACTURER'S LITERATURE

The Contractor shall submit copies of manufacturer's literature to the Richmond Utilities District for inclusion in the project Operations and Maintenance Manual. The literature shall include installation instructions, warranty certificates, operating instructions, maintenance instructions, maintenance schedules, a troubleshooting guide and other relevant data.

III.4 UTILITY LOCATIONS

The Contractor shall maintain a neat and accurate bound utility location book on the site at all times for the purpose of recording the location and arrangement of all manholes, catch basins, valves, tees, bends, fittings, service corporations, curb stops, couplings, sewer service tees, ends of sewer services, repairs, etc. The type of pipe and depth shall be noted. Utility Location Sheets shall be supplies to Richmond Utilities District for any new utilities or equipment installed during any project.

The Richmond Utilities District will supply the Contractor with Utility Locations Forms. The Contractor shall be responsible for all labor to complete the utility locations.

UTILITY LOCATION SHEET

Town of: _____ Dwelling No: _____

Project: _____ Occupant: _____

Date: _____ Located by: _____

Street: _____ Project Contractor: _____

_____

Survey ties shall be taken to manholes, catch basins, valves, tees, bends, fittings, service corporations, curb stops, couplings, sewer service tees, ends of sewer services, repairs, etc. Note depth and types of pipes, etc.

LOCATION DIAGRAM

Remarks: _____

_____

SECTION IV

EXISTING UTILITIES

IV.1 DEFINITIONS

"Utilities" - is defined in Section IV as physical property such as pipes, cables or structures used for water, sewer, stormdrain, electrical, telephone, communications, cable TV, etc. This does not include individual house sewer services or water services.

"Association" - is defined in Section IV as Public or private organizations which own, maintain or service "utilities". For the purpose of these specifications, "Association" may also be defined as an individual homeowner.

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IV.2 GENERAL

The Contractor is required by law to contact any Dig Safe, any individual affected homeowner or any local water/sewer "Associations" at least 3 business days prior to beginning any excavation work. The Dig Safe telephone number is 1-800-225-4977.

The Richmond Utilities District will make a careful attempt to locate and mark all known existing "utilities" that are in the area of any project.

IV.3 WATER MAINS, SEWER MAINS AND UNDERGROUND CABLES

Prior to starting work on any portion of any project, the Contractor shall give sufficient notice to all applicable "Associations" so that they may mark the location of their "utilities". The Contractor shall also inspect the area to verify the location of "utilities" shown on any plans and to check for any oversights or discrepancies. If "utilities" are located which are not shown on any proposed plans, the Contractor shall notify the Richmond Utilities District so that adjustments can be made (if necessary) to eliminate any conflict with the new work.

The Contractor shall follow responsible excavation practices at all times. When approaching a buried "utility", manual excavation shall be used to locate them. It is the contractor's responsibility to provide undisturbed maintenance for all structures that may be affected by the excavation. This includes structures both above and below grade. In instances where excavations are made in close proximity to utility poles or other structures, it shall be the Contractor's responsibility to notify the "Associations" and to provide support for the poles while the excavation is being done. Any costs associated with this shall be borne by the contractor.

If "utilities" are interrupted, the Contractor shall immediately notify the "Association". The "Association" shall inspect the damage and make suitable repairs or instruct the Contractor to

make suitable repairs. It a "utility" is shown on the drawings, located by an "Association" or could have been located by the Contracted by a simple inspection of the site, then the cost of any needed repairs, including materials and labor shall be borne by the Contractor. If a "utility" not shown on the plans, located by an "Association" or able to be located by the Contractor by a simple site inspection is accidentally damaged, the cost of repairs shall also be borne by the Contractor.

In all cases, satisfactory backfilling and maintenance of the trench is the Contractor's responsibility. The District and any "Association" shall inspect all repairs by the Contractor to broken or damaged "utilities". Approval of the repairs must be obtained by the Contractor prior to backfilling the work. The Contractor shall remain responsible for the integrity of broken "utilities" even after the work has been backfilled. The District has complete authority to stop work if the Contractor is doing excessive damage to the "utilities", and appropriate repairs are not being made or other precautions taken to minimize damage to existing "utilities".

The Contractor shall not make any claims against the District for delays in the progress of his work that are less than one day in duration and are caused by an interference not shown on any Contract Drawings. A delay shall exist when the work cannot progress because of an interference and no other work on the project is available for the men and machinery at that time. If the delay lasts more than one day, the Contractor may be compensated, based on hourly payroll and equipment rental rate, by the District for the actual costs for each day after the initial day. Compensation will not be based on the amount of work that might have been accomplished.

IV.4 INDIVIDUAL SERVICES

Some effort may be made by the District to show existing individual "utility" services. The Contractor shall assume that each structure along the route of the work has at least one set of "utility" services. The Contractor shall make no claims against the District for services not shown on any Contract Drawings or identified during field visits.

The Contractor shall be responsible to locate all existing services prior to excavating. All equipment needed to locate services, including detectors and locators, shall be provided by the Contractor. The Contractor shall take every reasonable caution to protect and preserve the integrity of these services.

The Contractor may have the "Association" provide assistance in locating any individual services. However, the contractor shall still be totally responsible for their location. Assistance provided by the Richmond Utilities District or "Association" shall not relieve the Contractor of his responsibility for their location. Any exploratory excavations done to attempt to locate individual services shall be done at the Contractor's expense (This includes locating existing service lines that are to be connected to new service lines).

If the services are interrupted, the Contractor shall immediately notify the "Association" and make suitable repairs to the service.

The District and "Association" shall inspect all repairs to broken or damaged services, and written approval of the repairs must be obtained by the Contractor from the District prior to covering the work. The Contractor shall remain responsible for the integrity of broken services even after the work has been backfilled. The District has complete authority to stop work if the Contractor is doing excessive damage to the services and appropriate repairs are not being made or other precautions taken to minimize damage to existing services.

IV. 5 CONNECTIONS TO EXISTING UTILITIES

In many cases, the Contractor is required to connect new utility mains and services to existing mains and services. The methods and equipment to complete these connections must be approved by the District per Section II prior to construction. In general, the following methods of connecting new pipes to existing pipes shall apply:

Gravity Sewer and Storm Drain Mains:

Straight and transition couplings for mains shall be non-shear sewer couplings Style CNSS as manufactured by Cascade Waterworks Mfg. Co., Style LSS2 or LSS3 as manufactured by Romac Industries, Inc., or approved equal.

Gravity Sewer and Storm Drain Services:

Flexible rubber compression couplings (Fernco, Calder, etc.); cast couplings; fittings made specifically for the pipe materials used.

Sewer Force Mains:

Cast couplings; fittings made specifically for the pipe materials used.

Water Mains:

Cast couplings, MJ solid sleeves; fittings made specifically for the pipe materials used.

Water Services:

Brass compression couplings; cast couplings' fittings made specifically for the pipe materials used. Connections to PE tubing shall utilize ss inserts and brass compression couplings.

Culverts:

Approved connecting bands; flexible rubber compression couplings; fittings made specifically for the pipe materials used.

SECTION V
TRAFFIC CONTROL

SECTION V.1 GENERAL

Supply all labor, materials and equipment necessary to control traffic for the safety of workmen, pedestrians, vehicular traffic and the general public.

SECTION V.2 REQUIREMENTS AND COMPLIANCE

Establish traffic control procedures to comply with all authorities having jurisdiction. All traffic control procedures and signing shall comply with MDOT and the Manual of Uniform Traffic Control Devices (MUTCD).

The Contractor shall keep local police and fire officials informed at all times regarding the work location and the effect it will have on traffic patterns.

SECTION V.3 CONTROL METHODS (WHERE APPLICABLE)

Provide project signing at the project limits as shown on the attached detail and as required by MDOT. Provide signing and barricades on either end of the actual construction location. Speed limit signs shall be posted with a 25 MPH speed limit. All barricades, signs and signing layouts shall meet MDOT and MUTCD specifications.

At least one traffic control person shall be located at each of the construction locations or work areas. A minimum of two traffic control personnel shall be provided at each construction location or work area where only one lane of traffic will be maintained. The traffic control personnel shall be in radio communication with each other at all times and shall wear fluorescent vests and direct traffic with fluorescent batons.

Uniformed police officers (authorized law enforcement officials) shall be used for traffic control personnel on projects when stipulated in any Special Conditions. Payment for uniformed police officers would be at the unit price in the bid schedule. Use of uniformed police officers must be authorized by the District for payment to be made. All other costs associated with traffic control (including traffic control personnel and signing) shall be incidental to the appropriate contract items.

Work will be allowed only during daylight hours. MDOT and MUTCD approved flashing lights and barricades shall be used for proper safety at night.

SECTION V.4 STREET CLOSINGS

No streets shall be closed without special permission of the local authorities having jurisdiction. If street closing are allowed, then "street closed" signs small be placed at all intersections adjacent to the work area to prevent traffic from entering. The contractor shall be responsible for maintaining access to all businesses and residences at all times. One lane shall be maintained for local traffic on all closed streets at all times. At the end of each workday complete street access shall be restored on all streets.

SECTION VI
CLEANUP

SECTION V1.1 GENERAL

Maintain all work areas and all haul routes in a neat and orderly condition. Cleanup is incidental to the appropriate items of the contract.

SECTION VI.2 PROCEDURES

Remove all debris and surplus material resulting from the work, and maintain all property, both public and private, in a condition acceptable to the party having jurisdiction.

Cleanup includes; removal of all debris and surplus material; replacement and repair of all removed or damaged structures, properties and vegetation; restoration of areas to final grade and contour.

Cleanup of trench areas shall be done concurrently with pipe installation (on a daily basis). When notified by the Richmond Utilities District that cleanup is not acceptable, pipe installation shall cease and all efforts shall center on cleanup. No compensation shall be paid the Contractor because of the stopping of the pipe installation for cleanup.

SECTION VII
DUST CONTROL

SECTION VII.1 GENERAL

Furnish all labor, materials and equipment necessary to control dust caused by work related to this project. Dust control (water and calcium chloride) shall be paid for under the Supplemental Unit Prices in the bid schedule. The cost for sweeping shall be considered incidental to the appropriate pipe bid item. Dust control shall proceed concurrently with pipe installation.

When notified by the Richmond Utilities District that dust is causing problems, the Contractor shall immediately implement approved dust control procedures.

SECTION VII.2 MATERIALS

Water for sprinkling shall be clean, free of salt, oil or other injurious matter.

Calcium chloride shall conform to requirements of AASHO M144 (ASTM D 98).

SECTION VII.3 CONSTRUCTION METHODS

All paved areas in the vicinity of trenches shall be swept at the end of each working day. Excavated material shall not be placed directly on gravel or paved surfaces.

Apply water by approved methods and with equipment including a tank with gauge equipped pressure pump and spray bar, dispersing water through nozzles at 20 psi or more.

Apply calcium chloride at a rate sufficient to maintain a damp surface, but low enough to assure noncontamination of water courses. Calcium chloride shall not be applied to paved surfaces.

SECTION VIII
EROSION CONTROL

SECTION VIII.1 GENERAL

Furnish all labor, equipment and materials necessary to prevent erosion and sedimentation from occurring on areas disturbed by construction and any other areas as may be designated on the plans. The Contractor shall be responsible for providing interim protection on disturbed areas until a sufficient vegetative cover has been established. Erosion control shall be considered incidental to appropriate items of the Contract.

SECTION VIII.2 MATERIALS

Jute mesh shall meet specifications of the Soil and Water Conservation Service.

Hay bales shall have minimum dimensions of 18: x18" x3'6" and shall weigh at least 40 lbs.

Erosion control fence shall be Envirofence by Mirafi, Inc., Charlotte, NC, or approved equal. The fencing shall have the following properties: grab strength of 120 lbs., grab elongation of 30% (max), water flow rate of 40 gal/min/S.F., and ultraviolet stability of 90%. The fabric width shall be 3 ft. and post length shall be 4.5 ft. The post spacing shall be 7.7 ft. The fence fabric shall be securely staples to the stakes.

All materials on the project shall be new per Section II. The Richmond Utilities District may accept erosion control fence that has been used on previous projects if it meets this specification and the fence is in good and serviceable condition.

SECTION VIII.3 CONSTRUCTION METHODS

Install erosion control hay bales in drainage swales at 100 foot spacings, and as shown on the plans, per the attached detail.

Hay mulch shall be applied at the rate of 40 to 50 lbs. (1 bale) to 300 square feet of area. In areas of steep slopes, mulch shall be secured. If erosion control hay bales or mulch does not adequately prevent erosion then jute mesh shall be installed.

Install erosion control fencing where shown on the drawings and along banks of streams, water bodies and wetlands when adjacent areas are to be disturbed. Installation shall be as shown on the attached erosion control fence detail and according to the manufacturer's latest recommendations. Use coupler when joining sections.

SECTION VIII.4 MAINTENANCE AND REMOVAL

Maintain and re-install erosion control measures until vegetation cover has been established. Carefully remove materials that are not intended to be permanent (such as erosion control fence) when they are no longer needed.

SECTION IX
SITE WORK

SECTION IX.1 GENERAL

Supply all labor, materials and equipment necessary to perform site work for the project.

SECTION IX.2 SITE PREPARATION

Supply all labor, materials and equipment necessary to prepare the site for excavation and/or construction. Site preparation includes clearing, grubbing and stripping. Before removing any structure or vegetation, the contractor shall obtain approval of the party having jurisdiction. Prior to beginning any excavations in paved areas the pavement shall be cut at the limits of the excavation.

A. Clearing - Cut and remove all trees, brush, and undergrowth in areas designated for clearing. Protect all vegetation outside the limits of the areas designated and any trees or vegetation so designated within the area. The District shall be contacted prior to removal of any trees within the site boundaries. Any branches which must be removed from standing trees shall be removed in accordance with established arborists' practices. All scars and cuts in standing timber shall be painted with tree paint. Dispose of all removed vegetation in a satisfactory manner.

B. Grubbing - Remove all material, both natural and man-made, in the areas designated on the plan for excavation and/or construction. This includes roots, stumps, rocks, boulders, pavement, curbing and other structures.

   Material which is amenable to reuse shall be stored. Unsuitable or excess material shall be removed and property disposed of by the Contractor.

C. Stripping - In areas to be stripped, the contractor shall strip the surface and top soil to a sufficient depth to expose a uniform subgrade of soil

Top soil which is amenable to reuse shall be stored. Unsuitable or excess top soil shall be removed and properly disposed of by the Contractor.

SECTION IX.3 CONSTRUCTION METHODS

The Contractor shall use responsible and safe construction and excavation practices. The Contractor shall verify the condition of the site and neighboring properties and structures prior to beginning work. The contractor shall use equipment of the appropriate size and construction methods that will not produce damage, excessive noise or vibrations on neighboring properties.

Monitoring of vibrations from site work, excavation and compaction procedures may be done by the contractor. It is recommended that the contractor complete a pre-work survey of any site and neighboring properties to document their condition and determine what construction methods are appropriate.

SECTION X
EXCAVATION

SECTION X.1 GENERAL

Furnish all labor, equipment and materials necessary to provide all excavation for trenches, construction, utility installation, foundations and subsurface structures. All excavation shall be classified as either earth excavation or ledge excavation.

Earth excavation shall consist of removal of all grades of soil and rock sufficiently friable to be worked with an excavator. This shall included any other material less than two cubic yards in volume

Ledge excavation shall consist of blasting, removal and replacement of all material not classified as earth and greater than two cubic yards in volume.

SECTION X.2 EXCAVATION PRACTICES

The Contractor is responsible for establishing and practicing safe construction and excavation practices at all times. The Contractor shall keep himself informed of all safety regulations and comply with them at all times. The Contractor shall provide all sheeting, shoring, bracing and cofferdamming necessary to insure the stability of the sides of the excavation.

Information on underground structures and utilities shown on the plans is not guaranteed for accuracy nor completeness, therefore, when excavation approaches such utilities, manual excavation shall be used to locate them. The contractor shall be held liable for responsible excavating practices throughout the project. This responsibility shall include the undisturbed maintenance of all structures and utilities, above or below grade, which may be affected by the excavation.

SECTION X.3 CONSTRUCTION METHODS

Excavate all trenches to the depth required for the installation of the utility and appropriate bedding. All structure excavation shall provide sufficient working area to construct the structure. Excavated material shall not be placed on pavement. The Contractor shall at all times keep the excavation free of water and saturated soil. Water removed from the excavation shall be disposed of so as not to interfere with adjacent areas. The bottom of the excavations shall be kept dewatered and firm at all times. No excavations shall be continued into fill material which has been on site less than 12 months without approval of the District.

The Contractor shall not have any right of property on any excavated material. The Contractor shall remove and properly dispose of excess excavated material. When requested by the District, this material shall be delivered to a District specified site within a three (3) mile radius of the loading point. Otherwise it shall be the contractor's responsibility to find and utilize a proper disposal site. Removal, transportation and disposal of excess excavated material shall be done at the contractor's expense.

All trenches shall be closed at the end of each construction day and the surface restored, unless specifically authorized by the District.

SECTION X. 4 OVER EXCAVATION

Any excavation beyond the prescribed limits for construction or utility installation shall be filled with crushed or screened stone to the necessary grade at the Contractor's expense. This shall include the removal of overblasted ledge.

SECTION X.5 UNSUITABLE MATERIAL

The District shall have the right to reject any material as unsuitable for backfill. Any such material shall be transported from the site and disposed of properly. Cost of the transportation and disposal of unsuitable earth excavation shall be borne by the contractor. Cost of material, installation and compaction of replacement material shall be borne by the contractor.

All ledge excavation shall be classified as unsuitable material. Cost of the removal, disposal and replacement of unsuitable ledge excavation shall be borne by the Contractor.

When so directed by the District, the Contractor shall excavate unsuitable material below the bottom of the trench and backfill to grade with the specified borrow. Cost of excavation, disposal and borrow shall be at the Contractor's expense.

SECTION X.6 BLASTING AND LEDGE EXCAVATION

All blasting shall comply with all federal, state and local regulations. The blasting contractor shall have a pre-blast survey completed of all structures within 300 feet of the work area prior to beginning work. Vibration monitoring may be required by blasting contractor during all blasting. Warning signs shall be posted whenever blasting occurs. No blasting shall be permitted without blasting mats or sufficient soil overburden.

All ledge shall be classified as unsuitable material for backfill. All ledge shall be replaced with borrow.

SECTION X.7 RIGHTS-OF-WAY

The Contractor shall maintain clear passage along all rights-of-way affected by the construction. No permanent rights-of-way shall be closed without prior written approval of the proper civil authorities.

SECTION X.8 PROTECTION OF THE PUBLIC

Improved streets, roads, driveways and sidewalks shall be kept open over or around all trenches and excavations and the use of these rendered safe for public use, as required by OSHA. All open excavations, if allowed, equipment and materials encroaching on rights-of-way shall be clearly marked by barricades and flashing yellow lanterns from dusk to dawn.

SECTION X.9 BACKFILLING

In addition to the requirements of Section XII, the Contractor shall comply with the following. No backfilling around concrete walls shall be permitted until they have attained sufficient strength to support all loads to which they will be subjected. Compaction of backfill around structures shall be accomplished by water jetting, puddling, tamping, or rolling. Backfill shall be compacted to a density of 95% of the optimum density as determined by the modified proctor test. In place density shall be determined by ASTM D 1556.

SECTION XI
BORROW AND BEDDING MATERIAL

SECTION XI.1 GENERAL

Furnish all materials, equipment and labor necessary to place and compact all required borrow and bedding. Optimum moisture content shall be as determined by the modified proctor test.

All borrow and bedding shall be free of frozen material, peat, rubbish, and other debris.

SECTION XI.2 COMMON BORROW

Common borrow shall consist of earth suitable for fill and embankment construction. It shall meet the following criteria:

Moisture content	less than 4% above optimum
Particle size	75 mm - .005 mm
D 10 (effective size)	.06 mm - .04 mm
Uniformity coefficient	6 - 10

SECTION XI.3 SAND BORROW

Sand borrow shall be sand of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation shall meet the grading requirements of the following table.

Sieve Designation	% by Weight Passing
3/8 inch	85 - 100
No. 200	0 - 5

SECTION XI.4 GRAVEL BORROW

Gravel borrow shall consist of uniformly graded granular material and shall be free from vegetable matter, lumps or balls of clay and other deleterious substances. The maximum stone size is 6" The gradation of the part that passes a 3 inch sieve shall meet the requirements of the following table.

Sieve Designation	% by Weight Passing
¼"	<70
No. 200	<10

SECTION XI.5 BASE GRAVEL

Base gravel shall be screened or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The maximum stone size is 6". The gradation of the part that passes a 3 inch sieve shall be an even gradation and meet the requirement of the following table.

Sieve Designation	% by Weight Passing
¼"	25-70
No. 40	0-30
No. 200	0-5

SECTION XI.6 CRUSHED GRAVEL

Crushed gravel shall be gravel that has been screened or crushed. Crushed gravel shall consist of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation shall meet the requirement of the following table.

Sieve Designation	% by Weight Passing
¾"	90-100
No. 4	40-65
No. 10	10-45
No. 200	0-7

SECTION XI.7 SCREENED STONE

Screened stone shall consist of clean, hard, durable stone particles. It shall be screened and contain uniformly graded stone particles ranging in size form 10 to 20 mm unless otherwise specified. Screened stone shall be free of fine gravel, sand, dirt, vegetation, disintegrated or laminated soils, and other unsuitable material.

SECTION XI.8 CRUSHED STONE

Crushed stone shall consist of clean, hard, durable stone fragments. It shall be crushed and contain uniformly graded stone fragments ranging in size from 20 to 30 mm unless otherwise specified. Crushed stone shall be free of fine gravel, sand, dirt, vegetation, disintegrated or laminated soils, and other unsuitable material.

SECTION XI.9 CONCRETE FILL

Concrete fill shall have a minimum 28 day compressive strength of 2000 psi.

SECTION XI.10 PLACEMENT AND COMPACTION

Crushed or screened stone shall be placed in lifts which will compact to a 6" maximum layer. Gravel and borrow shall be places in 12" maximum lifts. All placement and compaction of borrow and bedding shall comply with Section XII Backfilling.

SECTION XII
BACKFILLING

SECTION XII.1 GENERAL

Furnish all labor, equipment and material necessary to completely fill all excavations. Backfilling shall be defined as replacement and compaction of soil in excavation for the purposes of protecting underground construction, maintaining grades, or providing stable foundation material for above ground construction.

SECTION XII.2 MATERIAL

Generally, the excavated soil shall be suitable as backfill and shall be replaced in the excavation. Exceptions include frozen fill, fill containing large stones, stumps or other rubble, and any material deemed unsuitable by the District.

SECTION XII.3 CONSTRUCTION METHODS

Backfilling shall proceed as soon as possible after underground construction has been completed. Backfill shall be extended to the grade indicated on the plans, compacted and graded.

Fill material shall be placed in layers not to exceed 12" and compacted to the density equal to at least 95% of the optimum density determined by the modified proctor test. Compacting may be done by vibrating compactor or roller.

The Contractor shall take care not to damage or disturb any structure, including his own, during backfilling and compaction. The Contractor shall be held liable for any such damage.

Excavations in paved areas shall be paved according to specifications as soon as possible. Other areas shall be loamed and seeded or otherwise restored to a condition equal to or better than that of adjacent areas as soon as possible.

The Contractor shall not withdraw any sheeting without the approval of the District. All voids created by such removal shall be filled and compacted. Any backfilling which does not conform to these specifications, or which settles differentially, shall be excavated to a depth sufficient to correct the problem and refilled as required. Any pavement or structure which is damaged due to settlement of backfill shall be repaired by the Contractor at his expense.

SECTION XIII
TRENCH INSULATION

SECTION XIII.1 GENERAL

Trench insulation refers to insulation board installed between mains and storm drains or where cover is insufficient.

SECTION XIII.2 MATERIALS

A. Extruded Polystyrene insulation for trenches shall be plastic foam insulation board equal to STYROFOAM brand as manufactured by the Dow Chemical Company and as meeting ASTM C-578 Type IV. Insulation shall be Dow STYROFOAM T&G or UCI Foamular 250 T&G or equal. Insulation shall be 2" thick and have a minimum compression strength of 25 psi (ASTM D-1621).

B. Foamglass insulation for trenches shall be equal to foamglass board insulation as manufactured by Pittsburgh Corning Corporation meeting ASTM Standard C-552.

SECTION XIII.3 INSTALLATION

The insulation shall be a minimum of 2 feet wide and shall extend a minimum of 6" beyond the outside edge of the pipe. The insulation thickness shall be 2 inch unless otherwise required by the District. In general it shall be used where the top of the pipe is less than 4 feet below finish grade.

The insulation shall be installed on top of a smooth, flat surface of compacted select backfill or bedding. The insulation shall be 6 inches above the top of the pipe. Joints shall be butted

tightly for maximum protection. Backfilling over the insulation shall be done by hand for the first 8 inches and compacted before remaining backfill is applied.

Installation for each type of insulation shall be according to the manufacturer's recommendations. In general, backfill shall be clean, dry, and be free of any material which can dissolve or harm the plastic such as petroleum products.

SECTION XIV
BITUMINOUS PAVEMENT

SECTION XIV.1 GENERAL

Furnish all labor, materials, and equipment necessary to surface areas designated for paving and resurface sections of roadway, sidewalks and driveways disturbed by construction. Bituminous paving shall comply with MDOT standard specifications 401.01 through 401.20

Painting and marking of pavement to match pre-construction state is incidental to the paving items. Painting and marking shall conform with MDOT specifications.

SECTION XIV.2 MATERIALS

A. Base Gravel as per Section XI.

B. Crushed Gravel (as per Section XI.

C. Permanent Pavement

Hot bituminous permanent pavement shall conform to the Maine Department of Transportation mixes. The permanent pavement shall be:

For Town Streets:

2" thick MDOT Type B Binder

For MDOT Streets:

4" thick MDOT Type B Binder (in 2 lifts)
2" thick MDOT Type C Surface

For Sidewalks:

1 ½" thick MDOT Type B Binder
1" thick MDOT Type D Surface

For Driveways:

2" thick MDOT Type B Binder
1" thick MDOT Type C Surface

SECTION XIV.3 CONSTRUCTION METHODS

pavement at the limits of excavations shall be cut prior to excavation. Recut edges prior to paving to insure a uniform and straight edge. All edges shall be tacked prior to paving per MDOT 401.18.

Gravel base courses shall be constructed in accordance with Sections XI and XII when applicable.

SECTION XIV.4 LIMITS OF PAYMENT

The limits of payment for pavement are as specified above. Pavement disturbed beyond the project limits shall be replaced by the Contractor at his expense.

The Contractor will obtain MDOT Location and Opening Permits that are required for this project.

When bituminous curbing is required it shall set on the binder pavement. The cost of the binder pavement under and behind the curb shall be considered incidental to the curbing.

SECTION XV
BITUMINOUS CURBING

SECTION XV. 1 GENERAL

Furnish all labor, materials and equipment necessary to install bituminous curbing as specified herein. Existing bituminous curbing disturbed by construction shall be replaced as specified in this section.

SECTION XV.2 MATERIALS

Bituminous curb shall be in reasonable conformity to the dimensions proposed by the project. New curbing shall be of the shape shown in the following detail. Replacement curbing shall match the shape of the existing curbing. Bituminous curb shall conform to MDOT 712.36 and bituminous material for curb shall meet the requirement of MDOT Section 403.

SECTION XV.3 INSTALLATION

Installation shall comply with MDOT Section 609-04.

Bituminous curbing shall be placed on the binder pavement. The binder pavement shall extend beyond the back of the curb at least 3". Binder pavement under and behind the back of the curb shall be considered incidental to the unit price for the curb. Prior to placing the curb, the binder course shall be thoroughly cleaned of all foreign and objectionable material. String or

chalk lines shall be positioned on the prepared base to provide guide lines. The foundation shall be uniformly painted with tack coat per MDOT Section 410.

The curb shall be placed by an approved power operated extruding type machine. A tight bond shall be obtained between the base and the curb. The District may permit the placing of curbing by other than mechanical curb placing machines when short sections or sections with short radii are required. The resulting curbing shall conform in all respects to the curbing produced by the machine.

SECTION XV.4 ACCEPTANCE

Curb may be accepted or rejected on the basis of appearance in regard to texture and/or alignment. All damaged curb shall be removed and replaced at the Contractor's expense

SECTION XVI
LOAM AND SEED

SECTION XVI.1 GENERAL

Supply all labor, materials and equipment necessary to provide healthy grass cover over areas disturbed by construction and any other such areas designated to be loamed and seeded. Such responsibility shall extend 12 months from project completion.

SECTION XVI.2 MATERIALS

Grass Seed - Grass seed shall heave the following composition:

40 percent Creeping Red
25 percent Kentucky Bluegrass
5 percent White Clover
30 percent Kentucky 31 Fescue

Lime - Lime shall be agricultural ground limestone containing not less than 90% total carbonate. At least 90% shall pass through a No. 20 sieve and at least 50% shall pass through a No. 100 mesh sieve.

Fertilizer - Fertilizer shall be commercial fertilizer with the following minimum percentages:

12% available nitrogen (75% organic)
12% available phosphoric acid
12% available potash

Hay Mulch - hay mulch shall be long-fibered hay or straw, reasonably free of noxious weeds and other undesirable material. Hay mulch shall be less than one (1) year old. No material shall be used which is so wet, decayed or compacted as to inhibit even and uniform spreading. No chopped hay, grass clippings or other short-fibered material shall be used.

Alternative Mulch - Other materials may be accepted for mulch following submittal of samples
by the Contractor and demonstration that performance is similar to hay mulch.

Topsoil - topsoil shall be natural, friable loam soil possessing the characteristics of representative soils in the vicinity which produce heavy growths of crops, grass or other vegetation. Topsoil shall be reasonably free from subsoil, brush, objectionable weeds, other litter, large stones, stumps, roots, and other objectionable material. Topsoil shall be free of toxic substances which might be harmful to plant growth or be a hindrance to grading, planting, and maintenance operations. Topsoil shall be from naturally well drained areas. Topsoil shall be screened (1" maximum for lawns; 2" maximum for areas that are not expected to be mowed).

SECTION XVI.3 SEASONAL AND WEATHER CONDITIONS

Do not place or spread topsoil (or loam/compost) when the subgrade is frozen, excessively wet or dry, or in any conditions otherwise detrimental to the proposed planting or to proper grading. The recommended seeding time is from April 1 to October 1. Regardless of the time of seeding, the contractor shall be responsible for each seeded area until it is accepted. Do not perform seeding work when weather conditions are such that beneficial results are not likely to be obtained, such as drought, excessive moisture, or high winds.

SECTION XVI.4 CONSTRUCTION METHODS

A.) Topsoil - Install topsoil uniformly so that final depth of topsoil is 4 inches. Trim and rake the topsoil to true grades free from unsightly variations, humps, ridges or depressions. Remove all objectionable material and form a finely pulverized seed bed. Thoroughly till to a depth of at least 2 inches by plowing, discing, harrowing, or other approved method to prepare a seedbed.

B.) Fertilizer - Install fertilizer uniformly at a rate determined by the soils test over the areas to be seeded (12#/1000 sf typical). Incorporate fertilizer into the soil to a depth of at least 2 inches by discing, harrowing, or other approved methods. Installation of fertilizer may be a part of the tillage operation specified above. Installation by means of an approved seed drill equipped to sow seed and distribute fertilizer at the same time will be acceptable.

C.) Lime - Uniformly distribute lime immediately following or simultaneously with the installation of fertilizer. Install lime at a rate determined from the pH test. Incorporate lime into the soil to a depth of at least 2 inches by discing, harrowing, or other approved methods.

D.) Seeding - Uniformly place seed (5 lbs/1000 square feet) by broadcasting, hydroseeding or drill seeding. With broadcasting, sow half the seed with the equipment moving in one direction and the remainder of the seed with the equipment moving at right angles to the first sowing. Then cover the seed to an average depth of ½-inch by means of a brush harrow, spike-tooth harrow, chain harrow, cultipacker, or other approved devices. Do not perform broadcast seeding work during windy weather. Drill seeding may be performed with approved equipment having drills not more than 2 inches apart.

E.) Mulching - Install mulch evenly and uniformly over areas to be protected from erosion and after seeding. Install hay mulch at the rate of 1-2 tons per acre. Anchor mulch by "wetting-down", applying approved liquid tackifiers (according to manufacturer's recommendations), or use of a serrated, straight disk. Within the low-flow area of drainageways, mulch should be anchored with erosion control matting or equivalent material and secured with staples.

E.) Compacting - Compact the area immediately following seeding and mulching by means of a cultipacker, roller or other approved equipment weighing 60 - 90 pounds per linear foot of roller. If the soil is of such type that a smooth or corrugated roller cannot be operated satisfactorily, use a pneumatic roller (not wobbly wheel) that has tires of sufficient size to obtain complete coverage of the soil. When using a cultipacker or similar equipment, perform the final rolling at right angles to the prevailing slopes to prevent water erosion.

SECTION XVI.5 MAINTENANCE

The loamed and seeded areas shall be maintained by the Contractor until a firm sod with healthy grass growth sufficient to prevent any erosion of the soil develops. Areas that do not develop sufficient grass growth shall be scarified, re-seeded and mulched by the Contractor until healthy grass growth develops.

Responsibility for maintenance of the seeded areas shall extend for 12 months from the completion of the entire project.

SECTION XVII
GRAVITY SANITARY SEWERS

SECTION XVII.1 GENERAL

Furnish all labor, materials and equipment necessary to install the Gravity Sanitary Sewers as specified in the contract documents.

SECTION XVII.2 MATERIALS

Unless specified otherwise on the plans, all gravity sewer pipes shall be polyvinyl chloride (PVC) pipe and shall conform to ASTM D3034 SDR 35. The joints shall be push-on type utilizing rubber sealing rings that conform to ASTM D3212 and F477. PVC resin shall conform to ASTM D1784. When ductile iron pipe is specified for gravity sewers it shall be push-on pipe bell-tite joint double cement lines tar coated Class 50 (per AWWA C151, C-111 and C-104).

Care should be exercised in transporting and handling of pipe to avoid damage. Pipe stored on site shall be in enclosures or under protective coverings. Materials shall not be stored directly on the ground.

SECTION XVII.3 INSTALLATION

The pipe shall be installed to the Contractor's proposed lines and grades as shown on any contract documents. The pipe elevation at any point shall not be off-grade by more than 0.0002 ft/ft. The allows for a maximum tolerance of 0.02 feet in a 100 foot run and a maximum tolerance of 0.06 feet in a 300 foot run. The allowable elevation tolerance for individual lengths of pipe shall be +/- 0.01.feet.

The pipe alignment at any point shall not be off-line by more than 0.0002 ft/ft. The allowable tolerance for individual lengths of pipe shall be +/- 0.01 feet.

The pipe shall be bedded with crushed or screened stone from 6" below the pipe to 6" above the pipe. The trench shall be excavated to the required grade and 5" of bedding installed and compacted. The pipe shall be installed on the bedding and joints assembled in accordance with the recommendations of the manufacturer. Bedding material shall then be installed to the mid-point of the pipe. The bedding shall be worked and packed under the edges of the pipe with hand shovels and then it shall be compacted. Bedding material shall then be installed to 6" above the pipe and compacted.

All compaction of bedding material shall be done with a vibrating plate compactor for the full trench width. Care shall be taken to prevent movement of the pipe during bedding installation, compaction, and backfilling.

Blocking (installation of the pipe prior to bedding and then support of the pipe while bedding is installed under it) shall not be allowed.

All field cutting and beveling of pipe shall comply with the manufacturer's recommendations. Ends shall be cut square and perpendicular to the pipe axis. Ends shall be beveled, filed smooth and stop marked with a felt tip marker so that they are comparable to factory pipe spigots.

SECTION XVI.4 INSPECTION

The Contractor will supply all labor necessary for the District to inspect the pipe and fittings. The Contractor will examine the areas to receive piping for defects, weak structural components, and deviations beyond allowable tolerances for pipe clearances that would adversely affect the execution and quality of the work. The contractor will remove all rejected materials from the job site. Work will be started only after adverse conditions are corrected. Backfilling of pipe will begin only after the pipe installation is in conformance with these specifications.

SECTION XV1.5 SEPARATIONS AND CROSSING OF SEWERS & WATER MAINS

Sanitary Sewers shall be laid at least 10 feet horizontally from any existing or proposed water mains, per State of Maine Department of Human Services Regulations. The distance shall be measured edge of pipe to edge of pipe. At crossings, one full length of sewer pipe shall be located so both joints will be as far from the water pipe as possible. Special structural support for the water and sewer pipes may be required

SECTION XVIII
SEWER MAIN TESTING

SECTION XVIII.1 GENERAL

Furnish all labor, materials and equipment required to test all sewer mains as specified herein. All sewer mains shall be tested prior to acceptance. All testing shall be done in the presence of the District or it's representative. The Contractor shall notify the District at least 48 hours in advance of any testing.

SECTION XVIII.2 REQUIREMENTS

The Contractor shall only use testing equipment, plugs and compressors specifically designed for low pressure sewer testing. Equipment shall include a pressure relief valve set no higher than 9 psig. The Contractor shall follow the manufacturer's recommendations for operation and safety. Equipment shall only be operated by personnel trained and experienced with its proper use.

For a sewer main test to be considered for acceptance, the sewer main segment must be part of a manhole to manhole reach of pipe that has been completed and backfilled to final grade. The manholes on each end of the reach of pipe shall be successfully tested prior to testing of the sewer main.

The maximum allowable infiltration limit for all pipe shall be 100 gal/day/inch/mile of pipe installed. If there is evidence of poor workmanship, improper storage of pipe, or if test results are unsatisfactory, the District may direct that additional tests be made on any and all of the pipe.

SECTION XVIII.3 PROCEDURE

Test all gravity sewer lines for leakage by conducting a low pressure exfiltration air test. All sewer lines shall be cleaned to remove all sediment and debris prior to testing.

Test plugs shall be properly installed and braced.

A minimum of 4 lbs/sq. in. air pressure shall be applied to the line being tested. The air compressor shall then be shut off. A pressure drop, from the applied pressure, of less than 1.0 psi during the period of time specified in the table below will constitute an acceptable air pressure test. If the pressure drop during the indicated time interval is exceeded, the test will be determined as a failure and the Contractor shall locate and correct the leak associated with the failure. Following correction of the leak the pipe shall be re-tested at the Contractor's expense.

Table of Air Test Durations

Sewer Diameter (Inches)	4	6	8	10	12	15	18	21	24-30
Test Duration (Minutes)	2	3	4	5	6	8	9	10	11.5

All sewer lines not complying with the requirements for infiltration and/or air testing shall be repaired or replaced at the Contractor's expense. The Contractor shall repair and retest the line at his expense until an acceptable test is achieved. No repairs will be made internally on the pipe unless specifically authorized by the District in writing. All repairs shall be made externally to the sewer lines. If any pipe is defective, it shall be removed and replaced.

If, during the process of repairing the new sewer main or during other operations not necessarily related to sewer construction (such as constructing roadways, cleanup, etc.), debris and sediment enters the new sewer or manholes, the sewer shall again be cleaned before final acceptance shall be made.

SECTION XVIII.3 DEFLECTION TEST

Prior to final acceptance of the sewer the Contractor shall take deflection measurements of all sewer mains by use of a mandrel assembly (7 ½%) pulled through the entire length of each sewer run. If a deflection in the diameter of the pipe equal to or greater than 7 ½% of the specified pipe diameter is measured, the defective pipe will be removed and replaced by the Contractor at the Contractor's expense. The pipe shall then be re-tested.

Sewer mains that are to be deflection tested must be backfilled for at least 2 weeks prior to testing

SECTION XIX
GRAVITY SEWER SERVICES

SECTION XIX.1 GENERAL

Furnish all labor, materials and equipment necessary to install the Gravity Sewer Services as specified in the contract documents.

SECTION XIX.2 RELATED SPECIFICATION SECTIONS

The pipe materials, installation and inspection requirements shall conform with Section XVII. Testing of gravity sewer services (when required) shall conform to Section XVIII.

SECTION XIX.3 FITTINGS

All PVC sewer fittings shall be in full conformance with ASTM D-3034. PVC resin shall conform to ASTM D-1784, joints shall conform to ASTM D-3212 and gaskets shall conform to ASTM F-477.

The lateral service pipe shall connect to the sewer main with a wye or tee. No saddles are allowed.

For connection of new sewer services to existing service laterals, a flexible compression coupling shall be used. Coupling shall be made of elastometric polyvinyl chloride with series 300 stainless steel clamps. Couplings shall be manufactured by Calder, Fernco or approved equal.

SECTION XIX.4 SERVICE PIPE SLOPE

Unless otherwise required all sewer service pipes shall be installed at the following slopes. The following slopes are the minimum acceptable slopes and shall be utilized to allow for connecting by the users. For 6" pipes the slope shall be 0.01 ft/ft. For 4' pipes the slope shall be 0.02 ft/ft.

SECTION XIX.5 SERVICE TIES

The Contractor shall maintain records of service locations as described in the contract documents. These records shall include distance from the nearest downstream manhole to the service tee, length of service pipe laid, type of existing service pipe if applicable, and survey ties to end of service pipe.

SECTION XX
MANHOLES

SECTION XX.1 GENERAL

Furnish install and test all manholes as indicated on the drawings and as specified herein.

SECTION XX.2 MATERIALS

A.) Manholes - All manholes shall be constructed of precast concrete. Manholes shall be designed for H-20 loading. Concrete manholes shall have 4000 psi 28 day strength (for 4' dia. And 5000 psi for any of larger dia.) and shall acquire 75% of their 28 day strength before being shipped to the project. Manholes shall have factory cast holes at the proper location and elevation as shown on the contract drawings. Manhole sections shall be joined with butyl rubber kent seal no. 2. Minimum thickness of the reinforced barrel sections and base shall be 5 inches. All manholes shall have eccentric cones. The tops of the cones shall be 8 inches wide to accommodate bricks. Two coats of bituminous waterproofing shall be applied to the outside of all manholes. Damaged manholes shall be rejected.

B.) Mortar and Bricks - Mortar to be used in the construction of inverts and placement of frames shall be Type II Portland cement (one part), sand (2 parts) and hydrated lime (not over 10 lbs. per bag of cement). Bricks shall be solid red clay bricks, not concrete units.

C.) Steps - Manhole steps shall be polypropylene plastic coated steel by M.A. Industries of approved equal. Steps shall be cast into the manhole sections and spaced a maximum of 12" on center vertically.

D.) Frames and Covers - Covers shall be 24" diameter and shall be clearly marked "SEWER". Frames shall have a clear opening of 22". The castings shall be of good quality even grained gray cast iron (ASTM-A48 Grade 30) and shall be free of lumps, blisters, scales and other defects. Manhole covers shall have two lift holes and shall be matched to the frames with machined surfaces. The covers and frames shall be factory coated with a smooth nonbrittle coat of coal tar epoxy. Frames and covers shall have an H-20 load rating.

E.) Pipe Sleeves - Pipe sleeves shall be lock joint flexible sleeves which shall be cast or locked into the manhole base. These sleeves shall be capable of allowing substantial off center alignment. The sleeves shall be attached securely to the outside of the pipe with stainless steel bands to provide a water tight seal.

SECTION XX.3 INSTALLATION

A.) Manhole bases shall be installed before laying pipe to the manhole. The manhole base shall be set on a 12" compacted stone bed. Once the sewer pipe has been connected to the manhole, barrel sections shall be installed after installing kent seal at the joints. The pipe shall extend into the manhole so that it is flush with the inside wall. There shall be no pipe bells inside the manhole.

B.) Manhole spacing varies based on the slope or grade, change of direction or piping layout. Manhole spacing may not exceed 300 feet. Manholes must be installed at each change of direction. The District Superintendent reserves the right to dictate the distance between manholes should he feel it is in the District's best interest.

C.) Manhole inverts shall be installed using bricks and mortar as shown on the Contract Drawings. The trough and table shall be lined with bricks. The trough depth shall be equal to the pipe diameter. The tables shall slope toward the trough at 1" per foot for drainage. The finished surface of the invert shall be smooth, free of any obstructions and shall have a uniform pitch from inlet to outlet. The finish surface for both inverts and tables shall be brick. Inverts formed out of plastic designed for gravity sewer application are also acceptable.

D.) Install frames and covers as shown on the plans. The frames shall be brought to the proper grade with brick and mortar or cast-in-place concrete. All voids between bricks shall be filled with mortar and the bricks shall be coated with mortar on both the interior and exterior of the manhole. The mortar surface shall be smooth and even and shall slope inward on the exterior of the manhole to avoid lifting from frost. Frames shall not be backfilled until the mortar has set and acquired sufficient strength to avoid damage.

When manholes are in paved areas, the frame and cover shall be adjusted to grade once the base pavement has been places. The cost of adjusting the frame and cover to grade, including pavement cutting and replacement, is incidental to the manhole cost. In paved areas the frame and cover shall be set ¼% below final grade.

SECTION XX.4 TESTING

All manholes shall be vacuum tested immediately after assembly and prior to backfilling. All lift holes shall be plugged with an approved non-shrink grout. All pipes entering the manhole shall be plugged. The plugs shall be securely braced to prevent them from being sucked into the manhole. The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed the time shall be measured for the vacuum to drop to 9 inches. The test shall pass if the time is greater than 60 seconds for 48" diameter, 75 seconds for 60" and 90 seconds for 72" diameter manholes. If the manhole fails the initial test, necessary repairs shall be made with a nonshrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained.

SEWER MAIN EXTENSION CONTRACT

This agreement entered into this _____ day of _____, ____, by and between _____ of _____, Maine (hereinafter called the "developer") and the Richmond Utilities District, a water utility duly established under the laws of the State of Maine with principal place of business at 331 Front Street Richmond, Maine (hereinafter called the "utility").

WHEREAS, the utility is engaged in the business of supplying sewer service to the public in the Town of Richmond, and

WHEREAS, the developer has requested that the utility's sewer main be extended to serve property owned by _____ in Richmond, Maine a distance of approximately _____ feet from the end of the existing sewer main on _____.

NOW, THEREFORE, it is agreed between the developer and the utility as follows:

1. The developer agrees to pay all costs associated with the extension, including, but not limited to: sub-contractors, service taps, project inspection and any testing services deemed necessary by the Superintendent. The developer will install the new sewer main to the utility's specifications. The utility will make no investment in the extension.

2. If any of these facilities are being installed on private property, the applicant agrees to furnish the utility a permanent easement, free of encumbrances, entitling the utility to construct, own, maintain and replace the above described facilities.

3. The sewer main extension shall become the property of the utility after proper inspection and acceptance and the utility will have a continuing obligation to maintain the line. The service lines connected to the sewer main shall be the responsibility of the property owners as per the Sanitary Sewer Regulations of the utility that were enacted on January 1, 1996.

4. The water main extension and utility portions of all service lines shall become the property of the utility after proper inspection and acceptance. The utility will have a continuing obligation to maintain them once we receive as-builts and service ties for the sewer infrastructure.

5. The utility shall have the right to extend its main further beyond the extension and to serve other mains or to branch off from the extension laterally with no financial reimbursement to the developer

6. This contract is subject to the rules of the Richmond Utilities District Sewer Use Rules and Regulations, adopted December 15, 1987 and last revised on February 13, 2008 as well as the Sanitary Sewer Regulation regarding Connections to Public Sewer, adopted January 1, 1996, governing sewer main extensions, which are hereby incorporated by reference into this contract. The parties understand that the provisions of this contract are subject to alteration by a decision or rule of the Richmond Utilities District Board of Trustees.

IN WITNESS WHEREOF, said parties hereto have caused this agreement to be executed by their duly authorized officers this _____ day of _____ in the year _____.

WITNESSES:

RICHMOND UTILITIES DISTRICT

_____

By: _____
Its Chairman

_____

_____

By: _____
Its