# ENGINEERS NOTES

SPECTRUM ENGINEERS, PC assumes no responsibility for information on or adequacy of the plans until they have been approved by required public authorities.

Commencement of any work on the project is at the sole risk of the Owner/Developer.

SPECTRUM ENGINEERS, PC assumes no responsibility for the completion or quality of performance of the Contracts of the General Contractor, Sub-contractors or other third parties.

# GENERAL NOTES

STANDARDS: All materials and methods shall comply with the applicable standards of the American Society of Testing and Materials (ASTM), American National Standards Institute (ANSI), Virginia Department of Transportation (VDOT), Virginia Erosion and Sediment Control Handbook (ESC Handbook), Commonwealth of Virginia Department of Health (VDH) and/or the County of Roanoke, latest editions. Recommendations of applicable materials manufacturers shall also be followed as part of this Contract.

SOILS INVESTIGATION/TESTING:
General: Prior to beginning grading operations the Owner shall employ a qualified Soils Testing Laboratory which staffs a Professional Soils or Geotechnical Engineer registered in Virginia (hereinafter GE). The GE shall make a site inspection, review governing requirements for this Work and the test results and make recommendations on applicable portions of the Work (detention basin lining and berm, traffic bearing areas and building foundation, etc.). The GE shall submit two (2) certified copies of their test results and recommendations to the Design Engineer and copy the Owner with one (1). The recommendations of the GE shall be followed as part of this Contract. The GE shall provide an "As-Built" certification of rough grade and pavement base suitability (same distribution).
Specific:
For General Earthwork, the GE shall determine the maximum density in accordance with VTM-1 (Standard Proctor) of material proposed for use beneath buildings and pavement, whether cut or fill. The GE shall inspect potential existing problems when unearthed by the Excavating Contractor, perform tests as necessary and make recommendations regarding any special condition and/or treatments to be implemented. The GE shall also perform inspections, supervision and testing of all filling operations.
For Storm Water Management Structures, the GE shall review geotechnical maps and publications for the area and comment whether the underlying geology should be of concern. If so, the GE shall make recommendations concerning further testing, the need for a basin liner, etc. The GE shall also comment on the suitability of onsite materials for lining and berm construction, and on geotechnical aspects of the design for the specific site.
For Pavement, the GE shall determine the maximum density in accordance with VTM-1 (Standard Proctor) and the VTM-8 (California Bearing Ratio (CBR)) of material proposed for use beneath pavement, whether cut or fill. Results shall be submitted to VDOT and the Roanoke County Engineering Department prior to placement of base material. Final pavement design shall be based on a sufficient number of certified CBR tests to determine the support value of the subgrade. The GE shall certify the location and results of the CBR tests and submit a pavement redesign using the Vaswani method whenever the actual CBR value is less than ten (10). When the CBR value is greater than ten (10), the GE shall redesign the pavement using the Vaswani method to minimize cost of construction.

AMERICANS WITH DISABILITIES ACT (ADA): Detectable Warnings on Walking Surfaces: A curb ramp shall have a detectable warning extending the full width and depth of the curb ramp. Detectable warnings shall consist of exposed aggregate and shall contrast visually with adjoining surfaces, either light-on-dark or dark-on-light. The material used to provide contrast shall be an integral part of the walking surface.

PLANS, PERMITS, INSPECTION, VERIFICATION: The Contractor shall be responsible for obtaining any and all necessary permits, including fees. No work shall begin on this project without written approval of Construction Documents from Roanoke County. An approved set of Construction Documents shall be available on-site at all times while work is in progress. All work shall be subject to inspection by Roanoke County and Virginia Department of Transportation (VDOT) Inspectors. Contractor shall verify and be responsible for all dimensions on site.

VISIBILITY TRIANGLE: At the intersection of any entrance with a public/private street, no material impediment to visibility between a height of 2.5 – 8 feet shall be erected or planted within a triangular area as described by the following points:
1. Intersection of the center line of the entrance with the R/W
2. 35 feet along the R/W in the direction toward approaching traffic
3. 25 feet back into the entrance on the same center line.

UTILITY COMPANIES: The Developer and/or Contractor shall supply all utility companies with copies of approved plans, advising them that all grading and installation shall conform to approved plans.

STAKING: Grade stakes shall be set for all curb (& gutter), culvert, sanitary and storm sewer.

FIELD CORRECTIONS: Field corrections shall be approved by the Consulting Engineer and Roanoke County Engineering Department prior to such construction. Any new alignments, change in grades, alternative pipe sizes or manholes, changes in erosion and sediment control measures, will require a new set of plans stamped by the Consulting Engineer. Plan sheets can be 8.5"x11" if the information is legible.

DEBRIS: Construction debris shall be containerized in accordance with the Virginia Litter Control Act. No less than one litter receptacle shall be provided on site. All damaged material or surplus excavated material not suitable for use as fill, backfill or topsoil shall become the property of the Contractor to dispose of offsite as he wishes, without injury to the Owner or any individual.

LIGHTING: Illumination of off-street parking areas shall be in strict accordance with the Co. Public Street and Parking Design Standards and Specifications Section 201.08. Maximum intensity on adjoining streets or residential uses shall not exceed 0.5 foot candles. Security lighting (at other than business operating hours) shall be limited to 1.0 foot candle measured at the base of the lighting structure.

PROPOSED SIGNS: The Owner/Developer shall obtain a Sign Permit as required in the Roanoke County Zoning Ordinance Article V, Section 30-93-5.

EXISTING SIGNS: Any existing signs shall be moved if necessary to meet all applicable state and local ordinances including conformance in design and placement with the Virginia Supplement to the Manual on Uniform Traffic Control Devices, latest edition (edge of signs shall be 12' off edge of pavement or 6' off shoulder or 2' behind face of curb; clear height shall be 7' above grade).

CLEANUP & RESTORATION: Keep the construction site neat, clean and orderly at all times. Cleanup shall be vigorous and continuous to minimize hazards or obstructions.
Materials at the site shall be stored in a neat and orderly manner. All damaged material shall be removed from the site immediately and disposed of in a proper manner. After trenching, remove all excavated materials unsuitable for, or in excess of, backfill requirements.
Immediately following each portion of the Work as it progresses, by cleanup and restoration, make every reasonable effort to encourage return of the entire surface and all improvements to a pleasant appearance and useful condition appropriate and complementary to the surroundings, and equal or superior to that before construction began.

ENTRANCE PERMIT: The Contractor shall obtain a street opening/entrance permit to tie to existing public right-of-way from the local VDOT Residency Office prior to any construction within the public street/highway right-of-way. Plan approval by Roanoke County does not guarantee issuance of any permit by VDOT.

NOTIFICATION: The Contractor shall notify the Roanoke County Engineering Department, in writing, at least three (3) days prior to any construction, including but not limited to the following:
- Installation of approved erosion control devices
- Clearing and grubbing
- Subgrade excavation
- Installing storm sewers or culverts
- Setting curb and gutter forms
- Placing curb and gutter
- Placing other concrete
- Placing gravel base
- Placing any roadway surface
- Installing water lines
- Installing sanitary sewer lines

This notification shall include scheduling a preconstruction conference through the County Engineering Department with their staff, the Design Engineer, the Contractor, the VDOT Inspector and any other interested party at least two (2) days prior to initial construction.

UNDERGROUND UTILITIES: The Contractor shall verify the location and elevation of all underground utilities shown on the plans in areas of construction prior to starting work. The Engineer shall be contacted immediately:
- If any location or elevation is different from that shown on the plans,
- if there appears to be any conflict, or
- upon discovery of any utility not shown on the plans.

TO MISS UTILITIES CALL "MISS UTILITY" OF VIRGINIA (TOLL FREE) 1-800-552-7001 48 HOURS BEFORE YOU DIG. It shall be the Contractor's responsibility to notify area public utilities of proposed construction, through the above number, at least two but not more than ten working days in advance.

AS-BUILT PLANS: The Developer or Contractor shall supply the County with correct "As-Built" plans of items to be dedicated to the public for maintenance before final acceptance.

SIGNS: The Developer shall obtain a Sign Permit as required in Co. Zoning Ordinance Section 21-93 E. All permitted signs shall be set back at least fifteen (15) feet from the street R/W.

# GRADING & TRENCHING NOTES

CLEAR, GRUB & STRIP: All vegetation and overburden including topsoil, organic material and any unsatisfactory soil materials, shall be removed to the extent of grading indicated on the grading plan.

EXISTING FILL: Any existing fill material present on the site shall be removed and replaced with fill as herein specified, or tested in place by the Geotechnical Engineer (GE) and his recommendations followed.

NEW FILL: Fill material shall be satisfactory soil materials as determined by the GE and be free of rock or gravel larger than two (2) inches in any dimension, debris, waste, frozen materials, organics and other deleterious matter.

BACKFILL: Material, compaction and methods per VDOT requirements.

EXISTING SUBGRADE PREPARATION: Scarify existing subgrade and compact to specifications for new fill below. Bench beneath areas of slopes.

COMPACTION: Fill material shall be placed in lifts not exceeding eight (8) inches and compacted to one hundred (100) percent of its maximum density as determined in accordance with VTM-1 (Standard Proctor). Separate Proctors shall be run for each soil type being used. It shall be the Contractor's responsibility to inform the GE of sources of fill material other than that obtained on-site.

TESTING: Each compacted lift shall be inspected and tested by the Soils Engineer by conducting a minimum of three (3) field density tests per lift. Additional tests per lift shall be required if deemed appropriate by the GE.

GRADING LIMITS: Transition along the grading limits shall be smooth and uniform and prevent surface water ponding. Transitions at top and toe of slopes shall be graded smooth with uniformly rounded surfaces.

# EROSION CONTROL NOTES

STANDARDS: Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained in accordance with the minimum standards and specifications outlined by the Virginia Uniform Coding System in the Virginia Erosion and Sediment Control Handbook, latest edition. References to VDOT refer to the Virginia Department of Transportation "Road and Bridge Standards and Specifications," latest edition.

APPROVAL/PERMIT: The Erosion and Sediment Control Plan must be approved and land disturbing permit obtained prior to any work on the site. Plan approval in no way relieves the Developer or Contractor of the responsibilities contained in state and local erosion and sediment control ordinances/standards.

RIGHT OF ENTRY: Owner/Developer grants right of entry to County personnel for the purpose of monitoring compliance with the Code of Virginia, Erosion and Sediment Control Law (Title 21, Chapter 1, Article 6.1).

DETAILS: All details, unless otherwise referenced, are from the ESC Handbook, which shall supplant these Plans, should a discrepancy exist.

COUNTY MAY REQUIRE MORE ESC: Upon inspection of the erosion control devices the County Inspector may require that further steps be taken to control silt.

TIMING: All siltation controls shall be in place prior to clearing, stripping of topsoil or grading and shall remain in place until all disturbed areas have adequate ground cover.

MAINTENANCE & ADJUSTMENT OF ESC MEASURES: Erosion and sediment control measures shall be inspected after each rainfall and daily during periods of prolonged rainfall. The Contractor shall be responsible for maintaining and adjusting or relocating ESC measures or providing any other device or measure needed or required by existing conditions to prevent erosion, mud, or other debris from flowing in or upon the public right-of-way, waterways or abutting properties.

PUBLIC STREETS: The Contractor shall provide adequate means of cleaning mud from trucks and/or other equipment prior to entering public streets. It is the Contractor's responsibility to insure that adjacent streets are in a clean, mud and dust free condition at all times.

SEEDING: All cut and fill slopes shall be seeded and mulched as soon as possible after grading. All areas to be landscaped shall be seeded or receive finished surface treatment within seven (7) days of finished grading.

DRAINAGE DIVIDES & FLOOD: Construction shall honor/maintain proposed drainage divides as shown on the plans. Restrictions pertaining to construction within the 100 year floodway and/or flood plain (if such boundaries exist on the site) shall be honored.

REMOVAL: Erosion control devices shall remain in place until all disturbed areas have adequate ground cover.

BUILDING PERMIT: Building permits will not be issued until the initial erosion and sediment control measures reflected in the approved plans have been properly installed.

TOPSOIL STOCKPILE: Locate on-site in south corner of property and surround with silt fence. Seed stockpile immediately with temporary seed mix.

UTILITY INSTALLATIONS: No more than 500LF of trench shall be opened at one time. Excavated material shall be placed on the uphill side of trenches.

# PAVEMENT NOTES

STANDARDS: All construction methods and materials shall be in accordance with the VDOT "Road & Bridge Standards & Specifications," latest edition and the latest requirements of Roanoke County.

CHANGES WITHIN RIGHT-OF-WAY: Local government approval of plans for improvement within public rights-of-way preclude the right to add additional facilities without repeating the review process.

OVERBURDEN: All vegetation, overburden and unsatisfactory material shall be removed to the full width of the public right-of-way, or to the construction limits indicated on the plans prior to the construction/preparation of the subgrade.

UTILITIES: All utilities shall be in place prior to laying the base material.

PAVEMENT ONSITE: Onsite paving shall consist of a six (6) inch base course of #21-B (based upon a CBR = 10 (VTM-8)), prime coat and 150# of S-5 or SM-2A. Subbase fill shall be compacted to 100% of VTM-1 (Standard Proctor).

PAVEMENT WITHIN RIGHT-OF-WAY: Paving within the right-of-way shall consist of a six (6) inch base course of #21-B (based upon a CBR = 10 (VTM-8)), (3) inches BM-2, and 165# of SM-2A. Subbase fill shall be compacted to 100% of VTM-1 (Standard Proctor). CBR values less than 10 will require revised pavement sections as determined by the Vaswani Method.

SIGNAGE: Standard street and traffic control signs shall be erected at each intersection by the Developer prior to final street acceptance.

CURBING: All drives and islands as well as the perimeter of all parking lots shall be bordered by VDOT Std. CG-6 curb and gutter or CG-2 (curb only). See Plan for delineation.

STRIPING: Parking lot striping shall be four (4) inch painted lines. Marking paint shall be Chlorinated rubber-alkyd type, AASHTO M248, Type III. and applied in accordance with the manufacturer's instructions. Provide products by Sherwin-Williams, Benjamin Moore, or Devoe. Handicap Space Marking shall conform to Americans With Disabilities Act (ADA) requirements. Color shall be white, unless required otherwise by ordinance.

GUARD RAILS: Location of guard rails shall be determined at a joint field inspection by the County and VDOT. See also VDOT notes.

# DRAINAGE NOTES

NATURAL DRAINAGE: The Contractor shall make provisions at all times to allow natural drainage to flow through the work area with minimum damage to the new construction and NO damage to adjacent property or the existing downstream storm drainage system, whether natural or man-made.

MATERIALS:
ALUMINIZED STEEL PIPE (ASP): (For 48" & 60" dia) Pipe shall be 14 gauge fabricated corrugated steel with 5"x1" helical corrugation in accordance with ASTM A760 and A796. The pipe shall be coated with an aluminized steel Type 2 coating as per ASTM A929. The pipe shall be manufactured with a continuous lockseam and shall have no less than three (3) annular corrugations at each end of all plant-fabricated pipe. ASP JOINTS shall be in accordance with ASTM A760 and A798. Joining system shall be 12 inch wide minimum and shall include a 3/8" thick x 7" wide expanded rubber meeting the requirements of ASTM D1056. The bands shall be 16 gauge and galvanized steel.

REINFORCED CONCRETE PIPE (RCP): VDOT Spec. Section 232.02(a) 1. b. Reinforced concrete culvert pipe, circular, Class III (for 14' max cover and H-20 live load); mesh reinforcement; inside nominal diameter as indicated on Drawings, standard or modified tongue-and-groove joints.

POLYVINYL-CHLORIDE PIPE (PVC): Rain water collection pipe and fittings shall be Polyvinyl-chloride pipe (PVC) installed per manufacturer's instructions and conforming to ASTM F-405 and VDOT Section 302. Transition from downspout to rain water collector and/or transition to discharge through sidewalk shall be by pre-manufactured pieces specifically designed for their applications.

FLOOD: The subject property is not within the limits of the FEMA 100 Year Flood boundary.

EASEMENTS: Drainage is to be conveyed within easements and carried to a natural water course. Field Determination may require adjustments to drainage easements prior to final Plat submission.

SPRINGS: All springs shall be capped and piped to the nearest storm sewer or natural water course. The pipe shall be a minimum of six (6) inches in diameter and conform to VDOT Standard SB-1.

# LANDSCAPING NOTES

EXISTING SCREENING AND BUFFERING: Existing 25 foot buffer yard between existing R-3 and C-2 zoning consisting of one row of white pines and deciduous shrubs shall remain intact. Screening between site and Commander Road consisting of existing vegetation and change in elevation shall remain intact.

PROPOSED SCREENING AND BUFFERING: Off-street parking shall be screened from Williamson Road within the first (10) feet inside Right-of-Way. Screening shall consist of (7) large deciduous trees, (52) evergreen shrubs, and ground cover as located on the Drawings.

SPACING: If on-center spacing is not required, then the planting may be irregularly dispersed throughout the yard to maximize screening and buffering.

STANDARDS: for required plantings:

| Type | Height/Caliper @ Planting | Ultimate | Spacing |
|---|---|---|---|
| Evergreen shrubs | 18 inches | > 6 feet | 2.5 ft |
| Lg. deciduous tree | 1 in. caliper | >= 50 feet | 30 ft. |

(Per County – substitute low ground cover for some shrubs)

STREET FRONTAGE: Where a parking is adjacent to a public street R/W, a planting strip of (10) feet width shall be established between the two. Two small evergreen shrubs shall be planted for every five feet, and one small or large deciduous for every 30 feet shall be planted.

OTHER SCREENING: No Refuse storage, loading areas, or exterior mechanical equipment is proposed.

PLANT SCHEDULE:

| # | ITEM COMMON NAME | SCIENTIFIC NAME | REMARKS |
|---|---|---|---|
| 7 | DT-1 Greenspire Littleleaf Linden | Tilia Cordata | B&B |
| 52 | ES-1 Gold Tip Juniper | Juniperous Fitzer | #3 Container |
| 40 | GC-1 Blue Rug Juniper | Juniperous Horizontalis | 6" Cont |

# PLANTING NOTES

MATERIALS: Topsoil shall be fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from a drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of 5.5 and maximum of 7.0.

Seed shall be the following mixture and application rate:
Temporary Seeding for Erosion and Sediment Control: Based on seeding date, use species indicated.

| Date | Common Name | Rate |
|---|---|---|
| May – Aug. | German Foxtail Millett | 25#/ac |
| Sept.– Oct. | Annual Rye Grass | 30#/ac |
| Nov. – Feb. | Winter Rye | 25#/ac |
| Mar. – Apr. | Annual Rye Grass | 30#/ac |

Lawns (Permanent Seeding):

| Percentage | Common Name | Rate |
|---|---|---|
| 90% | Turf-Type Tall Fescue | 215#/ac |
| 10% | Kentucky Bluegrass (i.e.; Rebel, Rebel 2, Bonanza, Falcon, Mustang, or equivalent) (If seeding out of season and temporary seeding hasn't been done previously, add appropriate temporary seed to above) | |

Soil Amendments shall be the following materials and application rates:

Lime: Natural dolomitic limestone containing not less than 85% of total carbonates with a maximum of 30% magnesium carbonates, ground so that not less than 90% passes a 100-mesh sieve. Apply three (3) tons/acre (140 lbs/1000 sf) pulverized agricultural lime.

Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources and containing the following percentages of available plant nutrients.
– For lawns, provide fertilizer with the percentage of nitrogen required to provide not less than one (1) pound of actual nitrogen per 100 square feet of lawn area and not less than 4% phosphoric acid and 2% potassium. Provide nitrogen in a form that will be available to lawn during initial period of growth: at least 50% of nitrogen shall be organic form.

SOIL PREPARATION: Loosen subgrade of lawn areas to a minimum depth of 4". Remove stones over 1-1/2" in any dimension and sticks, roots, rubbish and other extraneous matter which may hinder preparation, growth and maintenance operations. Limit preparation to areas which will be planted promptly after preparation.
Spread topsoil to the depth required to meet lines, grades and elevations shown (4" min.), after light rolling and natural settlement. Topsoil shall not be spread if the topsoil is either wet or frozen. Add specified soil amendments and mix thoroughly into upper 4" of topsoil. Excess topsoil shall be removed from the site or stored onsite as directed by the Owner.
Fine grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll, rake and drag lawn areas. Remove ridges and fill depressions as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.
Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and prior planting.

METHOD OF APPLICATION: Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage. Do not seed within 48 hours of fertilizing. Do not seed when wind velocity exceeds 5 mph.
Apply seed uniformly on seed bed by sowing equal quantity in two directions at right angles to each other with a cyclone seeder, or drill cultipacker seeder on a firm, moist seed bed. Maximum seeding depth should be 1/4 inch on clayey soils and 1/2 inch on sandy soils.
Sow not less than the quantity of seed specified or scheduled.
Rake seed lightly into top 1/4" of soil, roll lightly, and water with a fine spray.

MULCHING: Seeding shall be followed with the application of organic mulch conforming in material and application to Std & Spec 3.35 of the ESC Handbook.

HYDROSEEDING: (permitted in lieu of standard seeding) Apply seed uniformly on a firm, moist seed bed.
Mix specified seed, fertilizer and pulverized mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
Apply slurry uniformly to all areas to be seeded. Rate of application as required to obtain specified seed sowing rate.

RECONDITIONING EXISTING LAWNS: Recondition existing lawn areas damaged by Contractor's operations including storage of materials and equipment and movement of vehicles. Also recondition existing lawn areas where minor regrading is required.

ESTABLISHMENT: The Contractor shall water, fertilize, mow and otherwise maintain all seeded areas beginning at installation and going through the third cutting of an established lawn. An established stand shall be uniform in coverage and of the specified mixture. The Contractor shall restore/replace any portion of the seeding and/or mulch work that is found defective or which becomes damaged prior to final acceptance.

# WATER NOTES

STANDARDS: Construction of all water lines, structures, and pavement replacement shall conform to the requirements of the Virginia Department of Transportation (VDOT) "Road and Bridge Standards and Specifications" and the Commonwealth of Virginia/State Board of Health (VDH) "Water Works Regulations" latest editions, as minimum standards, as well as those of Roanoke County.

APPLICATION NUMBER: Application for utilities reference number # 95-236

SURFACE & COVER: In areas of water line construction, grades shall be within six (6) inches of finished subgrade prior to the commencement of this work. Minimum clear cover over all water pipe shall be three (3) feet.

TAPS/CONNECTIONS: All connections to existing water mains shall be done by the County of Roanoke Utility Department.

SEPARATION: The Contractor shall comply with the State Water Works Regulations pertaining to separation of water and sanitary sewer.

MATERIAL: Water main shall be minimum class 52 Ductile Iron in accordance to AWWA C-151 or Polyvinyl Chloride (PVC) conforming to AWWA C-900 with a Ductile Iron OD dimension ratio (DR) of 14, pressure class 200. On specific authorization of the Roanoke County Utility Director, transmission lines may be PVC meeting Uni-Bell-B-11 with (DR-25) PR-165 rating. For PVC pipe only bell and spigot joints with elastomeric gaskets shall be used. Solvent-cement joints or pipe requiring use of couplings shall not be used.

BEDDING, BACKFILLING, LOCATING: Bedding and backfilling shall be per VDOT Standards & Spec. PVC pipe shall be installed, embedded and backfilled in accordance with the manufacturer's written instructions. To facilitate future locating of PVC water pipe, a metallic wire shall be laid with the pipe and in contact with all fittings and valves.

SERVICE: All service line connections to PVC pipe shall be made using a service saddle and corporation stop. The service saddle shall be of a type specifically manufactured for PVC pipe and shall be of the extra wide or double band type. No direct tap to PVC pipe will be permitted. All water service pipe from the main connection to the meter box assembly shall be Type "K", hard drawn, copper tubing. All connections shall use flared fittings. The minimum size service connection shall be 3/4 inch ID for a single setter and 1 inch for a double setter. Fittings for service lines shall meet AWWA spec. C-800.

# SEWER NOTES

STANDARDS: Construction of all sanitary sewer lines, structures, and pavement replacement shall conform to the requirements of the Virginia Department of Transportation (VDOT) "Road and Bridge Standards and Specifications" and the Commonwealth of Virginia/State Board of Health (VDH) "Sewage Handling and Disposal Regulations" latest editions, as minimum standards, as well as those of Roanoke County.

SURFACE & COVER: In areas of sewer construction, grades shall be three (3) feet over the crown of the pipe to be laid or within six (6) inches of finished subgrade prior to the commencement of this work. Minimum clear cover over proposed lines shall be three (3) feet.

SEPARATION: The Contractor shall comply with the State Water Works Regulations and County Design and Construction Standards pertaining to separation of water and sanitary sewer. When the sewer cannot maintain ten (10) feet horizontal separation measured edge to edge or eighteen (18) inches vertical separation edge to edge (below waterline), the sewer shall be constructed of AWWA approved water pipe (DR-14), pressure tested in place to fifty (50) psi without leakage prior to backfilling.

MATERIAL & BEDDING: Pipe and fittings shall be Polyvinyl Chloride (PVC) SDR 35 and shall conform to ASTM D-3034. Bedding shall be per VDOT Standard and Spec. (Class B min.). All trenches shall be compacted according to VDOT Standards.

TAPS: All connections to existing sanitary sewer mains shall be made by the Western Virginia Water Authority.

MANHOLE CONNECTIONS: Pipe shall be connected to manholes through precast openings and joined with either a flexible boot adapter or a pipe seal gasket. Laterals from manholes shall be of sufficient length to provide two (2) feet of bearing on natural ground. Transitions between allowable types of pipe shall be made with an adapter coupling within the right-of-way.

RESIDENTIAL SERVICE [LIGHT COMMERCIAL]: (Connection to Main) Residential service [Light commercial service) connections shall be made with a four (4) inch pipe through a wye or tee-wye branch fitting and shall be installed on a minimum grade of one-quarter (1/4) inch per one (1) foot from the sewer main or manhole to the property or easement line where a Sampling Manhole shall be placed and the service lateral plugged/capped until extension. Six (6) inch pipe shall be used when serving two (2) units. The location and invert depth of the service connection shall be shown on the "as-built" plans (this shall be the responsibility of the sewer line Contractor).

FINISH GRADE: The Contractor shall locate and uncover all sewer manholes after pavement/surface treatment of roads and adjust the tops to final road grades, if necessary.

# VDOT NOTES

QUALITY CONTROL: Streets shall be graded, paved and all structural components erected in accordance with the Virginia Department of Transportation (VDOT) "Road and Bridge Standards and Specifications," latest edition. All materials used shall be tested in accordance with standard policies. The Developer must contact the office of the Resident Engineer, prior to beginning any construction at which time an inspection and testing procedure policy will be drawn. The Developer may produce test reports from approved independent laboratories or solicit testing by VDOT, in either event at the Developer's expense.
The pavement designs shown are based on a subgrade rating (California Bearing Ratio) of 10 or greater. The subgrade soil shall be tested by an independent laboratory and the results submitted to VDOT prior to pavement construction. Should the subgrade CBR values be less than 10, then additional base material will be required as determined by the Vaswani Method.

UTILITIES: All necessary utility laterals shall be placed prior to pavement surfacing or conduit provisions made for the same (i.e. water, sewer, power, gas and telephone). Gas or petroleum transmission lines will not be permitted within the pavement or shoulder element (back of curb to back of curb) of this development. Service laterals crossing and pipe lines located outside the pavement but inside the right-of-way will be constructed in conformity with ASA B 31.8 Specifications and Safety Regulations. Distribution lines with pressures less than 120 lbs. are unaffected by the above.

EROSION CONTROL AND LANDSCAPING: Care must be taken during construction to prevent erosion, dust and mud from damaging adjacent property, clogging ditches, tracking public streets and otherwise creating a public or private nuisance to surrounding areas. The entire construction area back of curbs and/or pavement shall be backfilled and seeded together with ditches and channels, at the earliest possible time after final grading. Drainage easements shall be defined by excavated ditches or channels for their full length to well defined existing natural watercourses. If erosion is encountered in any drainage easement, it will be the responsibility of the Developer to sod, rip rap, grout, pave, or to do whatsoever is necessary to correct the problem.

RADIUS: Minimum curb/pavement radius shall be 25 feet at all street intersections.

APPROVAL/REVIEW: While these plans have been approved, such approval does not exempt connections with existing state maintained roads from critical review at the time permit applications are made. This is necessary in order that the prevailing conditions may be taken into consideration regarding safety requirements. Additional safety accompaniments such as turning lanes may or may not be required.

KEY PLAN

GENERAL NOTES

SPECTRUM DESIGN

10 CHURCH AVE SE, PLAZA SUITE 1 ROANOKE, VIRGINIA 24011 540.342.6001
ROANOKE • MARION

B & D LOCK, INC.

# SITE IMPROVEMENTS

SPECTRUM DESIGN PROJECT NO. 04051

# AS BUILT

| | | |
|---|---|---|
| DATE | 7 JUNE, 2005 | |
| DESIGN ARCHITECT | | |
| PROJECT ARCHITECT | | |
| PROJECT ENGINEER | MAR | |
| CHECKED BY | | |
| DRAWN BY | MF | |
| REVISIONS | NUMBER | DATE |

SHEET TITLE

NOTES & SPECIFICATIONS

C-5.2