

——— ss ——— Design Sanitary Side Sewer

### SEWER SYSTEM NOTES

cost of which shall be borne by the Developer.

Sanitary sewer pipe and side sewers shall be 10 feet away from building foundations and/or roof lines.

Design Driveway Line/Hatch

- 2. No side sewers shall be connected to any house or building until all manholes are adjusted to the finished grade of the completed asphalt roadway and the asphalt patch and seal around the rina are accepted
- 3. After all other utilities are installed and prior to asphalt work, all sanitary pipes shall pass a low pressure air test in accordance with Section 7-17 of the "Standard Specifications". Products used to seal the inside of the pipe are not to be used to obtain the air test.
- I. For commercial developments in which sources of grease and/or oils may be introduced to the City sanitary sewer system, a City approved grease interceptor shall be installed downstream from the source.
- 5. The City of Marysville Community Development Department shall be notified a minimum of 48 hours in advance of a tap or connection to an existing sanitary sewer main. The inspector shall be present at the time of the tap or connection.
- 6. The Contractor shall be fully responsible for the location and protection of all existing utilities. The Contractor shall verify all utility locations prior to construction by calling the Underground Locate Line at 1-800-424-5555 a minimum of 48 hours prior to any
- Gravity sewer main with □5' of cover shall be D.I.P. Class 52; 5'-18' of cover shall be PVC, ASTM D 3034 SDR 35, or ASTM F 789 with joints
- and rubber gaskets conforming to ASTM D 3212 and ASTM F 477; 18' cover shall be D.I.P. Class 52, or C-900. 8. Precast manholes shall meet the requirements of ASTM C 478. Manholes shall be Type 1-48" manhole unless otherwise specified on the plans. Joints shall be rubber gasketed conforming to ASTM C 443 and shall be grouted from the inside. Lift holes shall be grouted
- from the outside and inside of the manhole. 9. Side sewer services shall be PVC, ASTM D 3034 SDR 35 with flexible gasketed joints. Side sewer connections shall be made by a tap to
- an existing main or a tee from a new main connected above the springline of the pipe. 10. All sewer mains shall be field staked for grades and alignment prior to construction by a licensed engineer or surveying firm qualified to perform such work. Prior to constructing any sewer, the lot corners shall be staked and sewer line location established by survey,
- 11. All plastic pipe and services shall be installed with continuous tracer tape installed 12" to 18" under the proposed finished subarade. The marker shall be plastic non-biodegradable, metal core or backing marked sewer which can be detected by a standard metal
- 12. Each side sewer lateral shall have a 2" x 4" wood "marker" at the termination of the stub. The "marker" shall extend from the trench to above finished grade. Above the ground surface, it shall be painted "green" with SEWER and the depth, in feet, stenciled in white
- 13. Side sewers shall be installed by the Developer and coordinated for clearance with power, telephone, and other utilities.
- 14. All side sewers to be installed 10 feet into lot served and staked and marked as shown on these plans.
- 15. Pipe bedding shall be in accordance with WSDOT Standard Plan B-18c Class F. Pea gravel is an acceptable bedding material. All 7-02.3(1). This shall include necessar eveling of the trench bottom or the top of the foundation materials as well as placement and compaction of required bedding material to uniform grade so that the entire length of the pipe will be supported an a uniformly dense unyielding base.
- 16. A 6-foot square X 4-inch thick concrete pad shall be installed around all SSMH'S and a 3-foot square X 4-inch thick concrete pad shall be installed around all cleanouts that are not in a pavement area.
- 17. All lines shall be cleaned and pressure tested prior to paving in conformance with the above referenced specifications. Testing of the sanitary sewer main shall include TV-ing of the main by the Contractor. Immediately prior to TV-ing, enough water shall be run down the line so it comes out the lower manhole. A copy of the video tape shall be submitted to the City of Marysville. Acceptance of the line will be made after the tape has been reviewed and approved by Public Works. A water test of all manholes in accordance with Marysville standard may also be required. Testing shall take place after all underground utilities are installed and compaction of the roadway subgrade is completed.
- Prior to backfill all mains and appurtenances shall be inspected and approved by the City of Marysville Department of Public Works. Approval shall not relieve the Contractor for correction of any deficiencies and/or failures as determined by subsequent testing and inspections. It shall be the Contractor's responsibility to notify the City of Marysville for the required inspections

## WATER SYSTEM NOTES

- 1. Biological test samples will be taken by the City (or FMWC, VW or TCW when served by that purveyor) and paid for by the contractor.
- 2. Water mains shall have a minimum cover of 36 inches in improved right-of-way and a minimum of 48 inches in unimproved
- 3. Pipe for water mains shall be ductile iron conforming to Section 7-09 of the Standard Specifications, Class 52 with tyton or approved equal joints. Pipe shall be cement lined in accordance with A.S.A. Specification A 21.4-1964.
- 4. Connections to existing water mains shall typically be wet taps through a tapping 'tee' and tapping valve and shall be made by a City-approved contractor. The tapping sleeve shall be epoxy coated or ductile iron. Stainless sleeves shall only be used on AC pipe.
- The City (or FMWC, VW or TCW when served by that purveyor) shall approve the time and location for these connections.
- 5. All water mains and appurtenances shall be hydrostatically tested at 200 psi in accordance with City Standards. 6. Fire hydrants shall be installed in accordance with City Standard Detail 2-060-001 and as directed by the City of Marysville Fire Code
- 7. Valve marker posts shall be installed where valve boxes are hidden from view or in unpaved areas.

8. Resilient seated wedge gate valves shall be used for 10-inch mains and smaller. Butterfly valves shall be used for mains greater than 10

- 9. Pipe fitting for water mains shall be ductile iron and shall be mechanical joint conforming to AWWA Specification C111-72.
- 10. Water main pipe and service connections shall be a minimum of 10 feet away from building foundations and/or roof lines. 11. Where a water main crosses the Northwest Gas pipeline, the water line shall be cased with PVC pipe a minimum of 10 feet beyond
- each side of the gas line easement. Contact Williams Northwest Pipeline before the crossing is made.
- 12. Trenching, bedding, and backfill for water mains shall be installed in accordance with City Standard Detail 3-703-002 and-003.
- 13. All commercial and industrial developments, irrigation systems, and multi-family water service connections shall be protected by a double check valve assembly or a reduced pressure backflow assembly as directed by the City conforming to City Standard Details
- 14. Any lead joint fitting disturbed during construction shall be replaced with a mechanical joint fitting at the contractor's expense.

# ARCHAEOLOGICAL RESOURCES NOTE

The Department of Archaeology and Historic Preservation's (DAHP) Inadvertent Discovery Plan shall be followed during site construction. If at any time during construction archaeological resources are observed on the project area, work shall be temporarily suspended at the ocation of discovery and a professional archaeologist should document and assess the discovery. The DAHP and all concerned tribes should be contacted for any issues involving Native American sites. If project activities expose human remains, either in the form of burials or isolated bones or teeth, or other mortuary items, work in that area should be stopped immediately. Local law enforcement, DAHP, and affected tribes should be immediately contacted, No additional excavation should be undertaken until a process has been agreed upon by these parties, and no exposed human remains should be left unattended.

t is the responsibility of the contractor and construction manager to ensure that all conflicts between plan sets are identified and resolved prior to commencement of construction activities.

CALL AT LEAST 2 **BUSINESS DAYS** BEFORE YOU DIG 1-800-424-5555

# **GENERAL NOTES**

- All work in City right-of-way requires a permit from the City of Marysville. Prior to any work commencing, the general contractor shall arrange for a preconstruction meeting at the Development Services Center to be attended by all contractors that will perform work shown on the approved engineering plans, representatives from all applicable utility companies, the project owner and appropriate city staff. Contact Development Services at (360-363-8100) to schedule the meeting. The contractor is responsible to have their own set of approved plans at the meeting.
- 2. After completion of all items shown on these plans and before acceptance of the project the contractor shall obtain a "punch list" prepared by the City's inspector detailing remaining items of work to be completed. All items of work shown on these plans shall be completed to the satisfaction of the City prior to acceptance of the water, sanitary sewer and storm systems.
- 3. All materials and workmanship shall conform to the Standard Specifications for Road, Bridge, and Municipal Construction (hereinafter referred to as the "Standard Specifications"), Washington State Department of Transportation and American Public Works Association, Washinaton State Chapter, latest edition, unless superseded or amended by the City of Marysville City Engineering Design and Development Standards (hereinafter referred to as the "City Standards").
- 4. All work within the development and City right-of-way shall be subject to the inspection of the City engineer or designated
- 5. Prior to any site construction including clearing/logging or grading, the site clearing limits shall be located and field identified by the project surveyor (or project engineer) as required by these plans. The project surveyor's name and phone number is Steven C. Berg, PLS, 206.354.7015
- 6. The developer, contractor and project engineer is responsible for water quality as determined by the monitoring program established by the project engineer. The project engineer's name and phone number is Tyler Foster, 360.652.9727
- 7. The contractor shall be responsible for obtaining all permits for utility, road, and right-of-way construction. The contractor for this project is \_. Contact person is \_\_\_\_\_ \_\_. Phone \_\_\_\_, Mobile phone \_\_\_\_, emergency phone
- 8. The Construction Stormwater Pollution Prevention Plan (SWPPP) Best Management Practices (BMP's) shall be constructed in accordance with the approved SWPPP prior to any grading or extensive land clearing. These facilities must be satisfactorily maintained until construction and landscaping is completed and final stabilization has occurred. Sediment laden waters shall not
- enter the city stormwater drainage system or a natural drainage system. 9. The contractor shall keep two sets of plans on site at all times for recording record drawing information; one set shall be submitted to the project engineer, and one set shall be submitted to the City engineer at completion of construction and prior to final acceptance
- 10. Prior to construction the owner and/or contractor shall notify the project engineer and the City engineer when conflicts exist between the plans and field conditions. Conflicts shall be resolved (including plan and profile revisions) and resubmitted for approval prior to proceeding with construction.
- 11. Any revisions made to these plans, or changes to the design must be reviewed and approved by the developer's engineer and the City prior to any implementation in the field. The City shall not be responsible for any errors and/or omissions on these plans.
- 12. The contractor shall have all utilities verified on the ground prior to any construction. Call (811) at least two working days in advance. Prior to construction the owner and/or contractor shall notify the project engineer and the City engineer when conflicts exist between the plans and field conditions. Conflicts shall be resolved (including plan and profile revisions) and resubmitted for approval prior to proceeding with construction.
- 13. City of Marysville horizontal datum shall be NAD 83, and the vertical datum shall be NAVD 88, in Washington State Plane Coordinates (feet), Washington North Zone 4601. A list of benchmarks is available through the Public Works Department.
- 14. Temporary street patching shall be allowed for as approved by the City Engineer. Temporary street patching shall be provided by placement and compaction of ATB or Class B asphalt concrete. Contractor shall be responsible for maintenance as required.
- 15. Provide traffic control plan(s) in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) as required.
- 16. It shall be the responsibility of the Contractor to have a copy of these approved plans on construction site at all times.
- 17. Any structure and/or obstruction that requires removal or relocation relating to this project shall be done so at the developer's
- 18. Locations of existing utilities are approximate. It shall be the contractor's responsibility to determine the true elevations and locations of hidden utilities. All visible items shall be the engineer's responsibility. Location of utilities shown on construction plans are based on best records available and are subject to variation. For assistance in utility location, call 1-800-4245555.
- 19. The contractor shall install, replace, or relocate all signs, as shown on the plans or as affected by construction, per City Standards.
- 20. Power, street light, cable, and telephone lines shall be in a trench located within a 10-foot utility easement adjacent to public
- right-of-way. Right-of-way crossings shall have a minimum horizontal separation from other utilities (sewer, water, and storm) of 5 feet.
- 21. All construction surveying for extensions of public facilities shall be done under the direction of a Washington State licensed land surveyor or a Washington State licensed professional civil engineer.
- 22. During construction, all public streets adjacent to this project shall be kept clean of all material deposits resulting from on-site construction, and existing structures shall be protected as directed by the City.
- 23. Certified record drawings are required prior to project acceptance.
- 24. A NPDES Stormwater General Permit may be required by the Department of Ecology for this project. For information visit the Department of Ecology web site www.ecy.wa.gov/programs/wq/stormwater/construction/.
- 25. Any disturbance or damage to Critical Areas and associated buffers, or significant trees designated for preservation and protection shall be mitigated in accordance with a Mitigation Plan reviewed and approved by the City's Planning Division. Preparation and implementation of the Mitigation Plan shall be at the developer's expense.
- 26. A grading permit issued pursuant to the current adopted International Building Code, and approval of the temporary erosion and sedimentation control plan shall be obtained from the Community Development Department prior to any on-site grading work not expressly exempt by the current adopted International Building Code.
- 27. Prior to commencement of framing, final drainage inspection and approval of the roof leader and positive footing systems shall be completed by the Building Department. Call 360-363-8100 to schedule the inspection. CONSTRUCTION SEQUENCE

## Arrange and attend a pre-construction meeting with City staff, the on-site erosion control specialist, the design engineer, and owner.

- 2. Identify clearing limits and stream/wetland NGPA areas as required with flagging and/or temporary orange construction fence. Wetland buffer marking is to be checked by wetland consultant (or the county) before clearing begins.
- 3. Install construction zone road signs.
- 4. Grade and install construction entrance(s).
- 5. Place silt fence, straw bales, etc. as necessary to prevent sediment-laden runoff from leaving site.
- 6. Provide protection for existing offsite catch basins and other drainage facilities.
- 7. Grade and stabilize roads and interceptor swales in conjunction with clearing and grading activity.
- 8. Install temporary sedimentation measures.
- 9. Clear and grub site. Complete mass grading. Reconstruct sediment-trapping measures as grading progresses. Relocate surface water controls and erosion control measures, or install new measures as site conditions change so as to maintain compliance with City
- 10. Final grade, construct and pave roadways. Ensure that the permanent drainage system is complete and functional.
- 11. Remove any temporary sediment controls when permanent drainage is complete and erosion measures are in place and functional. Add topsoil to planting areas. Plant rain gardens and wetland areas in accordance with landscape and wetland mitigation plans.
- 12. Remove remaining temporary erosion control measures when danger of erosion has passed and site is stabilized with final City

### GRADING, EROSION AND SEDIMENTATION CONTROL NOTES

- All limits of clearing and areas of vegetation preservation as prescribed on the plans shall be clearly flagged in the field and observed during construction.
- 2. All required sedimentation and erosion control facilities must be constructed and in operation prior to any land clearing and/or other construction to ensure that sediment laden water does not enter the natural drainage system. The contractor shall schedule an inspection of the erosion control facilities prior to any land clearing and/or other construction. All erosion and sediment facilities shall be maintained in a satisfactory condition as determined by the City, until such time that clearing and/or construction is completed and final stabilization has occurred. The implementation, maintenance, replacement and additions to the erosion and sedimentation control systems shall be the responsibility of the permittee.
- 3. The erosion and sedimentation control system facilities depicted on these plans are intended to be minimum requirements to meet anticipated site conditions. As construction progresses and unexpected or seasonal conditions dictate, facilities will be necessary to ensure complete siltation control on the site. During the course of construction, it shall be the obligation and responsibility of the permittee to address any new conditions that may be created by his activities and to provide additional facilities, over and above the minimum requirements, as may be needed to protect adjacent properties, sensitive areas, natural water courses, and/or storm
- 4. Approval of these plans is for grading, temporary drainage, erosion and sedimentation control only. It does not constitute an approval

of permanent storm drainage design, size or location of pipes, restrictors, channels, or retention facilities.

- 5. Any disturbed area which has been stripped of vegetation and where no further work is anticipated for the time period set forth by the SWPPP, must be immediately stabilized with mulching, grass planting, or other approved erosions control treatment applicable to the time of year in question. During the dry season (May 1 - September 30) soils may be exposed and unworked for 7 days. During the wet season (October 1 - April 30) soils may be exposed and unworked for 2 days. Grass seeding alone will be acceptable only during the dry season. Seeding may proceed outside the specified time period whenever it is in the interest of the permittee but augmented with mulching, netting, or other treatment approved by the City.
- 6. In case erosion or sedimentation occurs to adjacent properties, all construction work within the development that will further aggravate the situation must cease, and the owner/contractor will immediately commence restoration methods. Restoration activity
- will continue until such time as the affected property owner is satisfied. 7. Stockpiles are to be located in safe areas adequately protected by temporary seeding and mulching. Hydroseeding is preferred. No temporary or permanent stockpiling of materials or equipment shall occur within critical areas or associated buffers, or the critical root zone for vegetation proposed for retention.
- 8. Non-compliance with the requirements for erosion controls, water quality, and clearing limits may result in revocation of project permit, plan approval, and bond foreclosures.
- 9. All earth work shall be performed in accordance with City Standards. Pre-construction soils investigation may be required to evaluate
- 10. If cut and fill slopes exceed a maximum of two feet horizontal to one foot vertical, a rock or concrete retaining wall may be required. All rock retaining walls greater than four (4) feet in height are to be designed and certified by a professional engineer experienced in soil mechanics
- 11. The Surface of all slopes shall be compacted. This may be accomplished by over-building the slopes, then cutting back to final grades; or by compacting each lift as the slope is being constructed. All slopes shall be compacted by the end of each working day.
- 12. Upon completion of work, final reports must be submitted to the City in conformance with the current City adopted International

### MAINTENANCE OF SILTATION BARRIERS

Building Code.

Siltation barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Close attention shall be paid to the repair of damaged bales, end runs and undercutting beneath bales. Necessary repairs to barriers or replacement of bales shall be accomplished promptly. Sediment deposits should be removed after each rainfall. Sediment deposits must be removed when sediment level reaches approximately one-half the siltation barrier height. Any sediment deposits remaining in place after the straw bale barrier is no longer required shall be dressed to conform to the existing grade, prepared and seeded.

# TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

1. The temporary construction entrance should be cleared of all vegetation, roots, and other objectionable material. Any drainage facilities required because of washing should be constructed according to specifications in the plan. If wash racks are used, they should be installed according to manufactures specifications.

3. The gravel ballast rock shall be 4" to 8" in diameter and placed across the full width of the vehicular ingress and egress area. The

- 2. Gravel shall be crushed ballast rock, 8" to 12" in depth and installed to the specified dimensions at the entrance.
- length of entrance shall be a minimum of 100 feet. 4. If conditions on the site are such that most of the mud is not removed from vehicle tires by contact with the gravel, then the tires must be washed before vehicles enter onto a public road. Wash water must be carried away from entrance to a settlina area to remove
- sediment. A wash rack may also be used to make washing more convenient and effective. 5. The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with 2" stone, as conditions demand, and repair and/or clean out any structures used to trap sediment. All materials spilled, dropped, washed or tracked from vehicles onto roadway or into storm drains must be removed immediately

- HYDROSEEDING GENERAL NOTES Construction Acceptance: Will be subject to a well established ground cover that fulfills the requirements of the approved construction plans and City of Marysville Standards.
- 2. All disturbed greas such as retention facilities, roadway backslopes, etc., shall be seeded with a perennial ground cover grass to
- minimize erosion. Grass seeding will be done using an approved hydroseeder or as otherwise approved by the City of Marysville. 3. Preparation of Surface: All areas to be seeded shall be prepared in a manner consistent with BMP T5.13 Post Construction Soil Quality
- and Depth in Chapter 5 of Volume V of the stormwater manual. 4. Immediately following finish grading permanent vegetation shall be applied consistent with the design and maintenance standards for Temporary and Permanent Seeding in the City adopted Department of Ecology Stormwater Management Manual for Western
- 5. All hydroseeding firms shall have a printout of the application rate for each job readily available for inspection by the Construction Inspection Division of Community Development.
- 6. The City of Marysville Construction Inspection Division of Community Development shall be notified of potential hydroseeding prior toe the commencement of same to ensure compliance of these specifications.

- Monuments shall be installed at all street intersections, at angle points, and points of curvature in each street. All boundary
- monuments must be installed according to the Washington State subdivision laws. 2. Curb and gutter installation shall conform to City Standard Detail 3-514.
- 3. Sidewalks and driveways shall be installed as lots are built on. Sidewalks and driveways shall conform to City Standard Detail 3-303-001 and -002. If asphalt is damaged during replacement of curb and gutter, the repair shall conform to City Standard Detail 3-514-001.
- 4. The surrounding ground (5 feet beyond the base) for all power transformers, telephone/TV pedestals, and street light main disconnects shall be graded to a positive 2 percent slope from top of curb.
- 5. Signage and traffic control devices are safety items and shall be installed prior to issuance of any certificate of occupancy or plat approval. However, in larger developments, exact locations of stop and yield signs may need to be determined after full buildout when traffic patterns have been established. In this case, contractor shall provide indicated "City-placed" signs, signposts, and brackets to the City sign specialist (425) 328-7954 for later installation by the City. All signage shall be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).
- 6. Prior to any sign or striping installation or removal the Contractor shall contact the City sign specialist (425) 328-7954 to arrange for an on-site meeting to discuss placement and uniformity.
- 7. New or revised stop signs or yield signs shall be advance warned using the procedure outlined in the MUTCD. Advance warning signs and flags shall be maintained by installer for 30 days and then removed.

# CHANNELIZATION & SIGNING

developer shall pay for installation of all devices. The inspector shall notify the Department of Public Works (DPW) Traffic Operations when the project is ready for channelization and signing

Approved permanent traffic control signs and markings within the public Right-of-Way (ROW) shall be installed by City forces. The

During project construction, the contractor shall provide and maintain all temporary construction signs, traffic control signs, delineators and temporary markings as required. All signs, traffic control signs, delineators and temporary markings shall be according to the current Manual of Uniform Traffic Control Devices (MUTCD).

Access by emergency vehicles shall be maintained at all times during construction.

After work within the traveled roadway is competed at the end of each day, the road shall be clear of debris and equipment and completely open to traffic (unless otherwise approved by the DPW of the City). Lighted barricades or barrels shall delineate all areas within the roadway affected by construction (i.e., edge of pavement, new curb edges not illuminated by street lights).

A ROW use permit is required from the DPW for any lane/road closure within the City ROW. Contact DPW at least 15 days prior to construction activity within the public ROW. City does not have jurisdiction on state routes, roadways within incorporated cities, private roads, or private property. For any activity encroaching on such property, the applicant shall obtain permission from the appropriate authority.

# WET WEATHER GRADING NOTES

Grading from October 1 to March 31st is not permitted without specific approval. If permitted, soil may be exposed for not more than two (2) days, if wet weather grading has been permitted by city. From May 1 to September 30, soil shall not be exposed for more than seven (7) days. Ground cover BMPs shall be used to stabilize the soil including but not limited to PVC cover, straw or other BMPs approved by the

## STORMWATER NOTES

- During construction, all existing and newly installed drainage structures shall be protected from sediments 2. All storm manholes shall conform to City Standard Detail No.4-080-009. Flow control manhole/oil water separator shall conform to City
- 3. Manhole ring and cover shall conform to City Standard Detail 4-080-009 and 4-080-015 thru 4-080-024. The cover shall be marked with "storm" or "drain" in 2-inch raised letters. Minimum weight of the frame shall be 210 pounds. Minimum weight of the cover shall be 150
- 4. Catch basins shall by Type I unless otherwise approved by the City Engineer or Designated representative. Type I Catch basins shall
- conform to City Standard Detail No.4-080-007 and 4-080-008 and shall be used only for depths less than 5 feet from top of the grate to 5. Catch basins Type II shall conform to City Standard Detail No. 4-080-009 and shall be used for depths greater than 5 feet from top of
- the grate to the invert of the storm pipe 6. Cast iron or ductile iron frame and grate shall conform to City Standard Detail No.4-080-022. Grate shall be marked with "drains to stream". Solid catch basin lids (square unless noted as round) shall conform to WSDOT Standard Plan B-30.20-02 (Olympic Foundry No.
- shall conform to WSDOT Standard Plan B-30.30-01 (Olympic Foundry No. SM60V or equal). Grates located in the gutter flow line shall be depressed 0.1 feet below payement level.

SM60, SM52, or SM44 or equal). Vaned grates shall be required on all storm structures when roadway profile is greater than 3% and

- 7. All catch basins and manholes located outside of paved areas, shall be placed in a six foot square by four inch thick concrete pad. All catch basins and manholes shall have locking lids. Rolled grates are not approved for use outside of the City right-of-way or for use
- 9. Contractor shall be responsible for adjusting all manhole, inlet and catch basin frames and grates to grade just prior to curb
- 10. Trenching, bedding, and backfill for pipe shall conform to City Standard Detail No. 3-703-002 and-003.

these installations shall be shown on the record drawing construction plans submitted to the City.

- 11. Trench backfill of new utilities and stormwater drainage system features shall be compacted to 95% maximum density (modified proctor) under roadways and 90% maximum density (modified proctor) off roadways. Compaction shall be performed in accordance with Sections 7-08.3(3) and 2-03.3(14)C - Method B as defined in the current edition of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction. For permeable pavement and other stormwater BMP's designed to infiltrate subgrade compaction should be "firm and unyielding" (qualitative), and 90- 92% Standard Proctor (quantitative). Do not allow heavy compaction due to heavy equipment operation. The subgrade should not be subject to truck traffic.
- 12. Storm pipe shall be a minimum of 10 feet away from building foundations and/or roof lines.
- 13. After all other utilities are installed and prior to asphalt work, all storm pipe shall pass a low pressure air test in accordance with Section 7-04.3(1) E & F of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction. Pipe runs shall be tested with [pipe loaded and compacted to finish grade. Products used to seal the inside of the pipe are not to be used to obtain the air test.
- 14. All temporary sedimentation and erosion control measures, and protective measures for critical areas, preserved native vegetation and significant trees shall be installed prior to initiating any construction activities. 15. Stormwater facilities with side slopes steeper than 3:1 or with a maximum water depth greater than 3 feet shall require a powder or
- and outfall pipes shall have a trash rack installed and a mortared riprap headwall. Refer to storm drainage note 21. 16. Prior to sidewalk construction; lot drainage systems, stub-outs and any behind sidewalk drains must be installed as required. Pipe shall be PVC 3034, or SDR-35. Stub-outs shall be marked with a 2" x 4" with 3 feet visible above grade and marked "storm". Locations of

vinyl coated chain link perimeter fence per standard plans 3-501-007 and -008. Side slope averaging shall not be allowed. All inlet

17. Storm water retention/detention facilities, storm drainage pipe and catch basins shall be flushed and cleaned by the developer prior to; City of Marysville final acceptance of the project and; upon commencement and completion of the 2-year warranty period for the storm drainage system. 18. Unless otherwise noted, all storm sewer pipe shall be; (CP) non-reinforced concrete, ASTM C-14; (RCP) reinforced concrete for

concrete pipe diameters 24" or greater, ASTM C-76; or (CMP) corrugated metal. CMP to be; galvanized steel with Treatment I asphal

- coating or better; or corrugated aluminum; or AASHTO M274-70 aluminized steel. All pipes shall be installed with rubber gaskets as per manufacturers recommendations. Coverage Requirements for 12" diameter pipe Backfill over pipe less than 12" requires RCP Class IV. Backfill over pipe less than 24" requires RCP minimum
- Backfill over pipe greater than 24" requires 16 gage CMP minimum. 19. Corrugated Polyethylene Pipe (CPP):
- A. All pipe shall be smooth interior. CPP shall be double-walled. All pipe shall meet AASHTO and ASTM specifications.
- B. Upon request by the City inspector, all pipe runs shall pass the low pressure air test requirements of Section 7-04.3(1) E & F of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction. Pipe runs shall be tested with pipe loaded and compacted to finish grade.
- C. Upon request by the City inspector, pipe shall be subject to mandrel testing (mandrel size = 90% of nominal pipe diameter).
- D. Pipe shall be stored on site in shipping bunks on a flat level surface. This requirement will be strictly enforced; failure to comply may result in rejection of the pipe and/or future restriction on use of material
- E. Minimum depth of cover shall be 2 feet.
- F. Couplings shall be integral bell and spigot or double bell separate couplings. Split couplings will not be allowed. G. Backfill shall comply with Section 7-08.3(3) of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction
- The second paragraph of Section 7-08.3(3) is deleted and replaced with the following: The material used for backfilling around and to a point 1 foot above the top of the pipe shall be clean earth or sand, free from clay. Any gravel or stones included in the backfill shall pass through a 1 inch sieve.
- 20. All non-perforated metal pipe shall have neoprene gaskets at the joints. O-ring gaskets may be used for type-F coupling band 21. Culvert ends shall be beveled to match side slopes. Field cutting of culvert ends is permitted when approved by the City engineer or
- designated representative. 22. All field cut culvert pipe shall be treated as required in the Standard Specifications or General Special Provisions.
- 23. All pipe shall be placed on stable earth. If in the opinion of the City inspector, the existing trench foundation is unsatisfactory, then it shall be excavated below grade and backfilled with gravel bedding to support the pipe.
- 24. All landscaped and lawn areas, except areas within the dripline of preserved trees, shall be amended per BMP T5.13 Post Construction Soil Quality and Depth in Chapter 5, Volume V of the Stormwater Manual.

# INFILTRATION FACILITY NOTES

deign specification prior to final inspection.

- Infiltration facility installations shall be directed/overseen by a licensed geotechnical engineer if directed by the City Engineer or designee. The geotechnical engineer shall certify that the Bioretention Soil Media soil type and condition (native or fill soil) meets the
- 2. The geotechnical engineer will prescribe corrective action for soil that does not meet the design specification, soil that has been over compacted or for soil that has been contaminated by turbidity. Final engineering approval is required from the City.
- Performance testing and verification for a facility shall be conducted before final construction approval by the City, or prior to construction of other project improvements or recording of a subdivision as required by MMC 14.15.120. The contractor shall be responsible for making corrections to ensure the stormwater system functions as designed.

STAND PIPE AND SEDIMENT POND MAINTENANCE The embankment of the basin should be checked regularly to ensure that it is structurally sound and has not been damaged by erosion or construction equipment. The emergency spillway should be checked regularly to insure that the lining is well established and erosion resistant. The siltation basin should be checked for sediment cleanout after each rainfall which produces runoff. When the

## sediment reaches the cleanout level, it shall be removed and properly disposed.

BIOFILTER SWALE PLANTING NOTES Final engineering approval is contingent on swale inspection by the City of Marysville Construction Inspection Division of Community

Inspection must be requested by calling the City of Marysville Construction Inspection Division of Community Development at 360.363.8100 Erosion control seed mix or shingle-weave sod, as determined by the City Engineer or designated representative, shall be placed above the design water surface for the 6-month, 24-hour storm event. A minimum topsoil depth of 4" shall be placed within the swale. The topsoil surface shall be at design grade for the swale. An erosion control blanket shall cover the topsoil to prevent erosion of topsoil and seed mix

until a well defined ground cover is established. The wetted surface area as defined by the 6-month, 24-hour storm event shall be planted

### with wet tolerant plant species. Recommended Seed Mix for Bioswales: Tall or meadow fescue Festuca arundinacea or festuca elatior Seaside/Creeping bentgrass 10-15

agrostis palustris

agrostis alba or Agrostis gigantea

Redtop bentgrass

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# KEN MCINTYRE, P.E., ASSISTANT CITY ENGINEER

ACT. THIS \_\_\_\_ DAY OF \_\_\_\_\_, 202\_.

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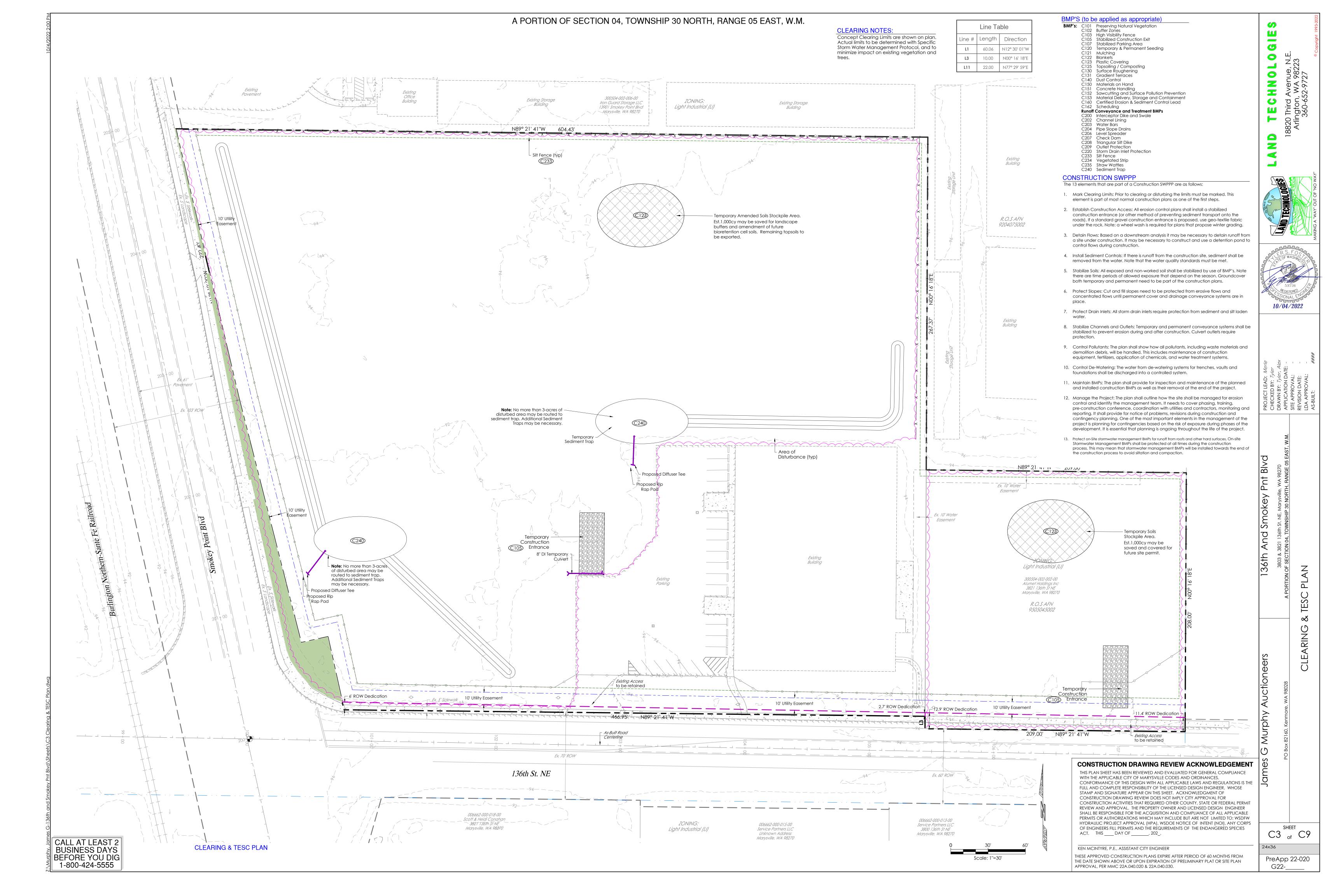
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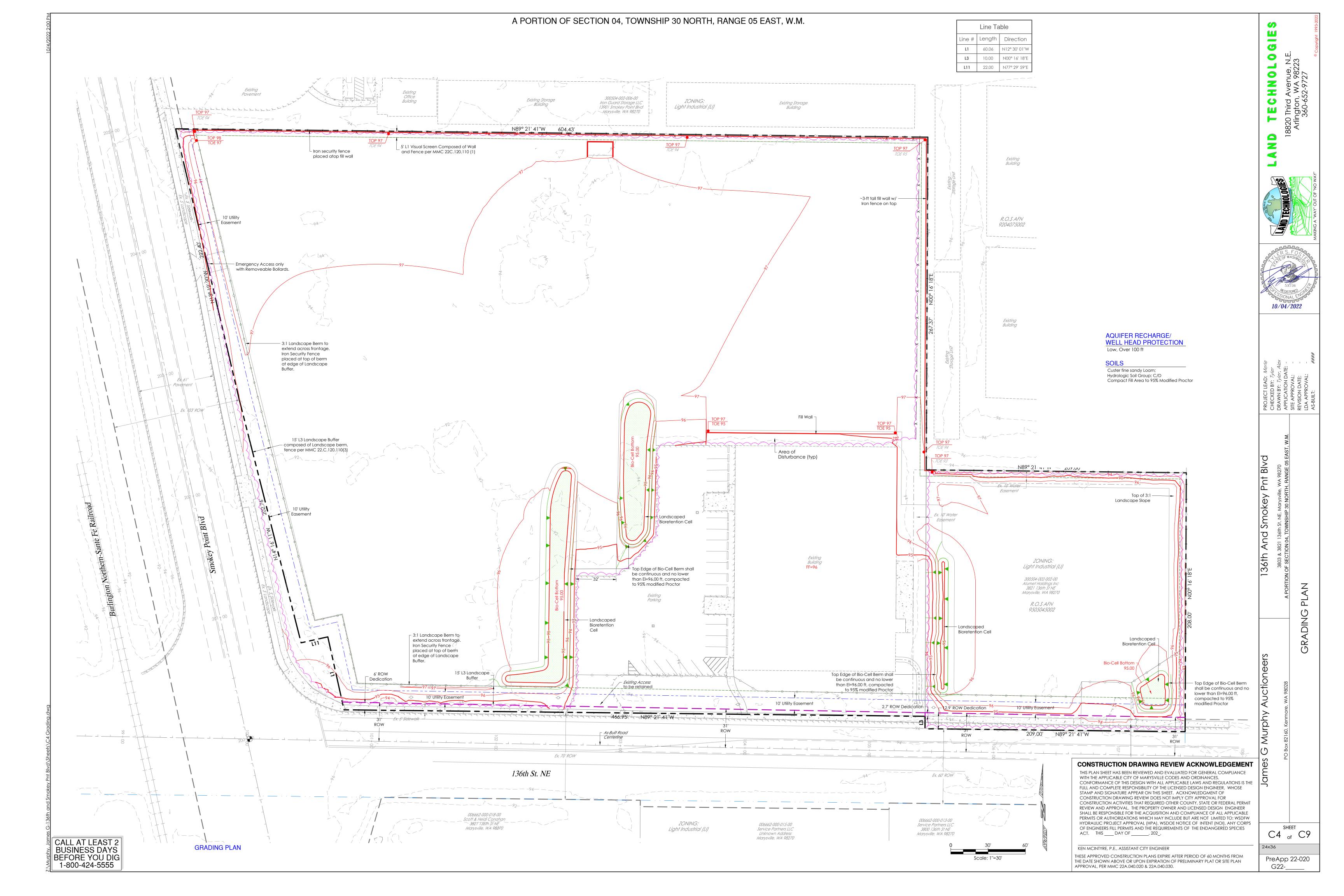
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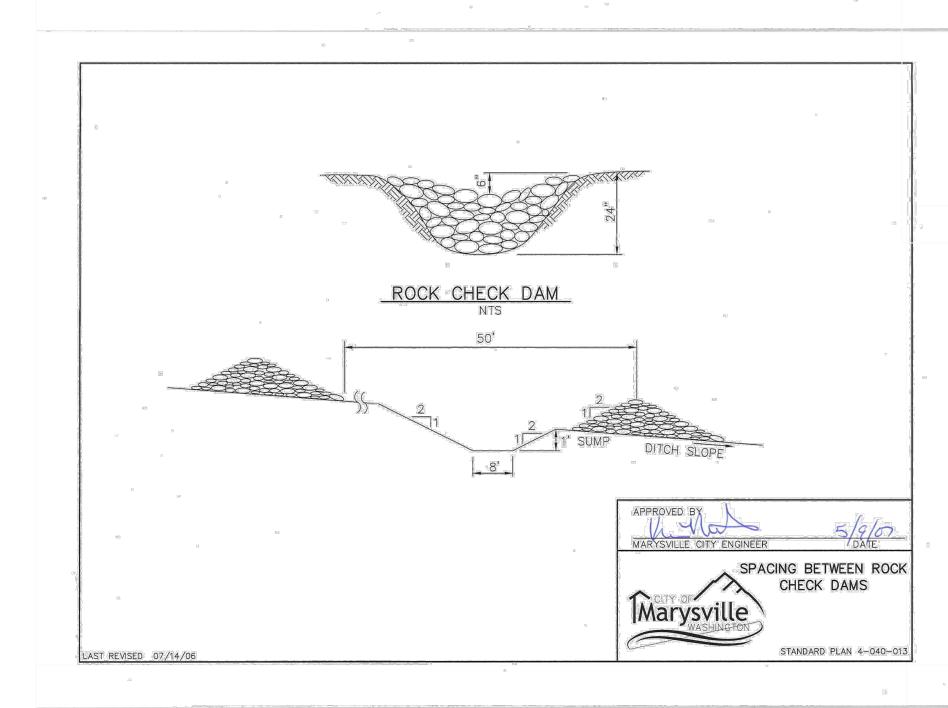
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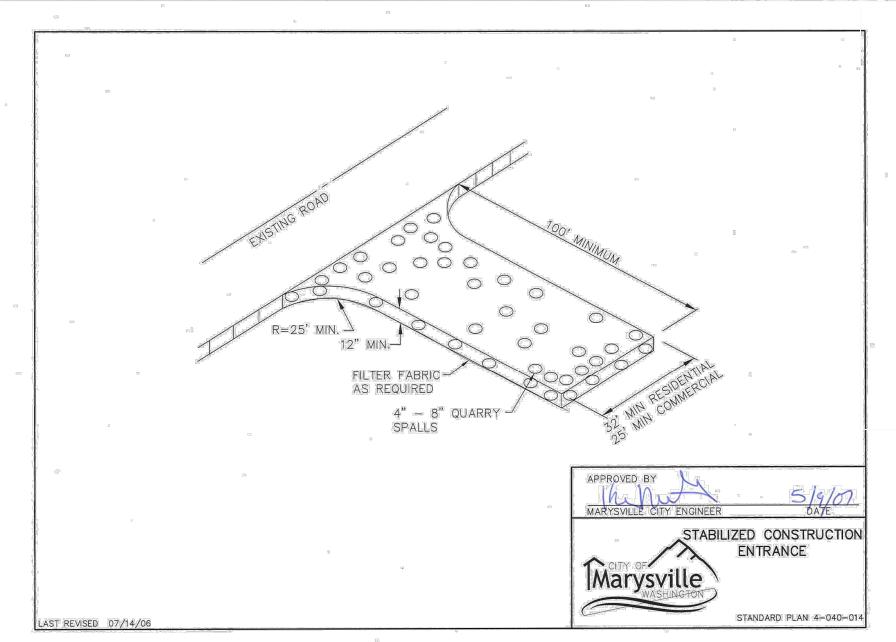
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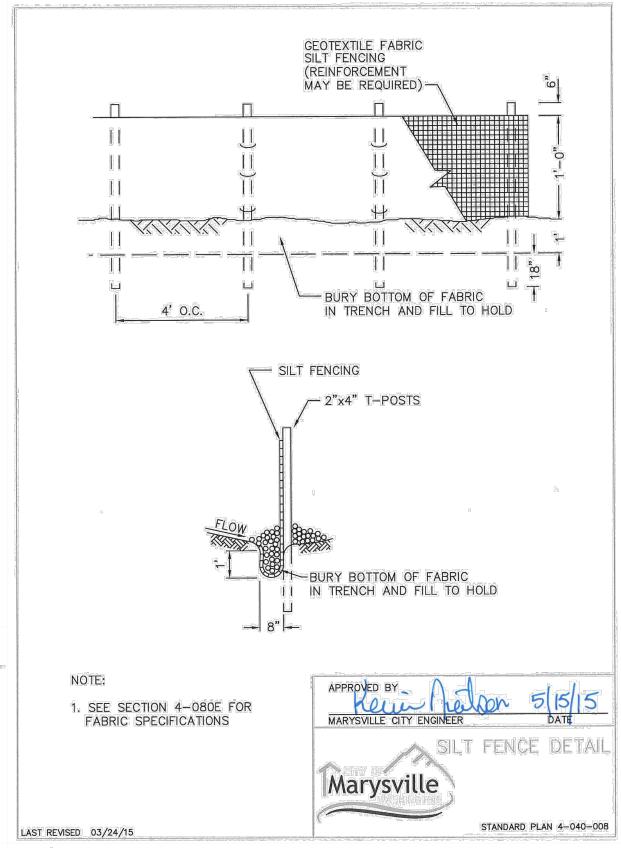
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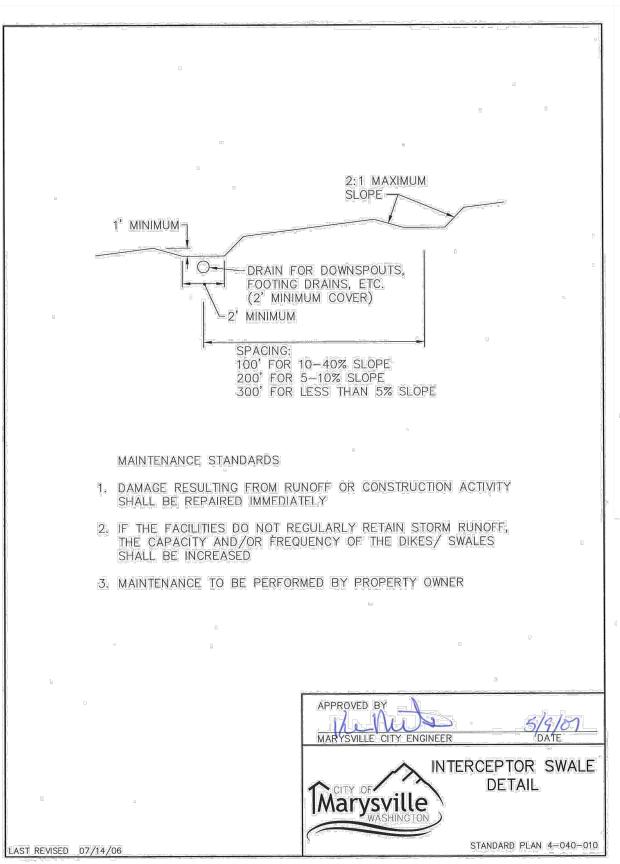


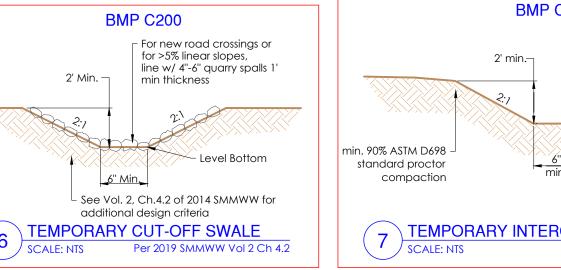


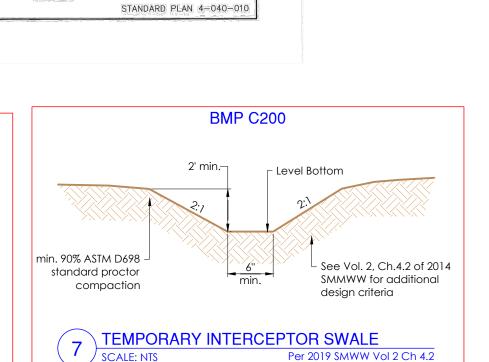


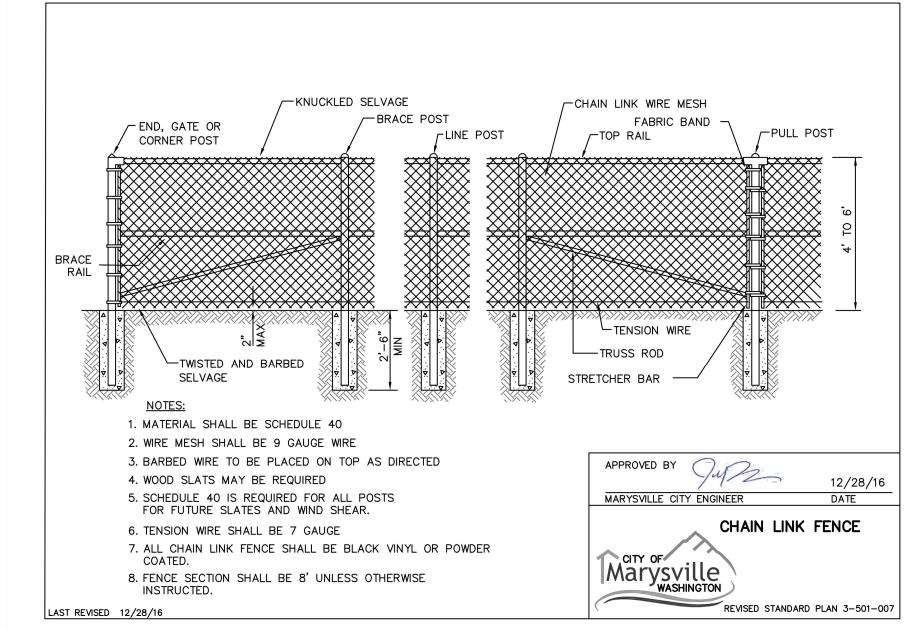


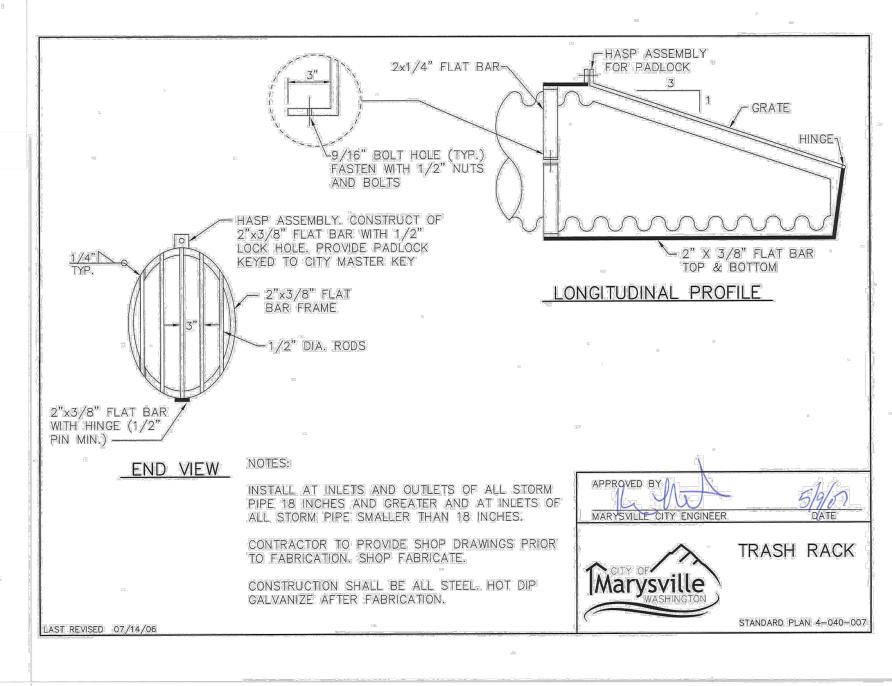


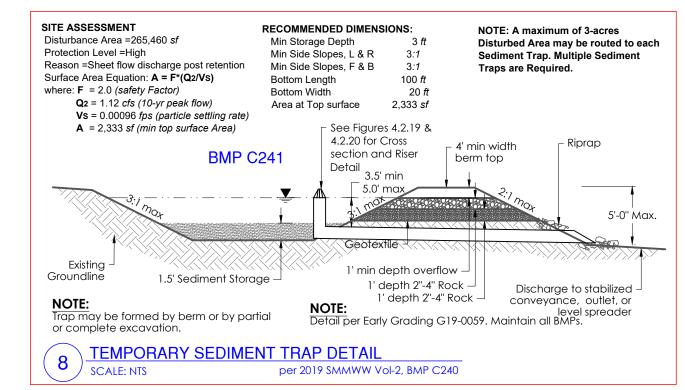












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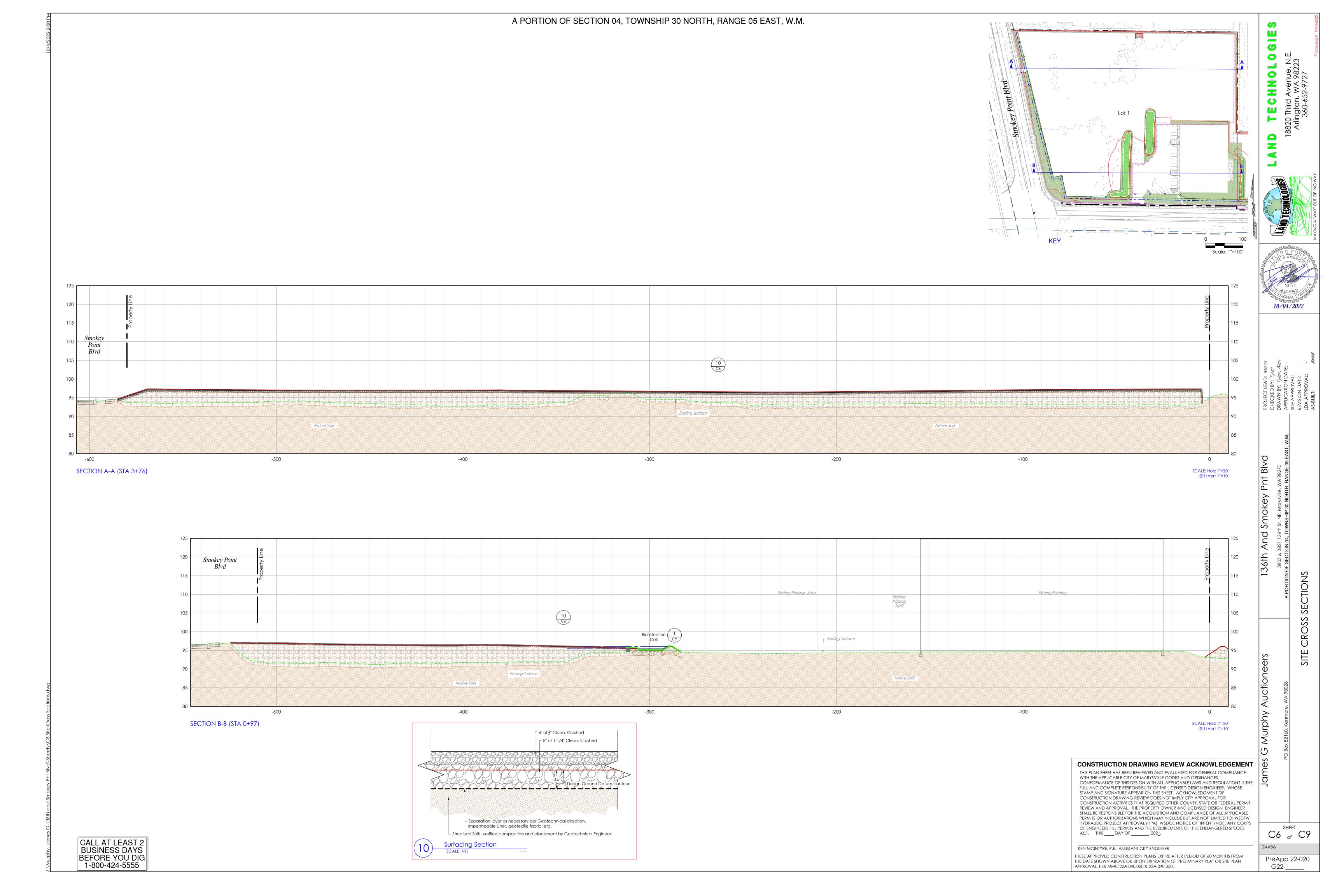
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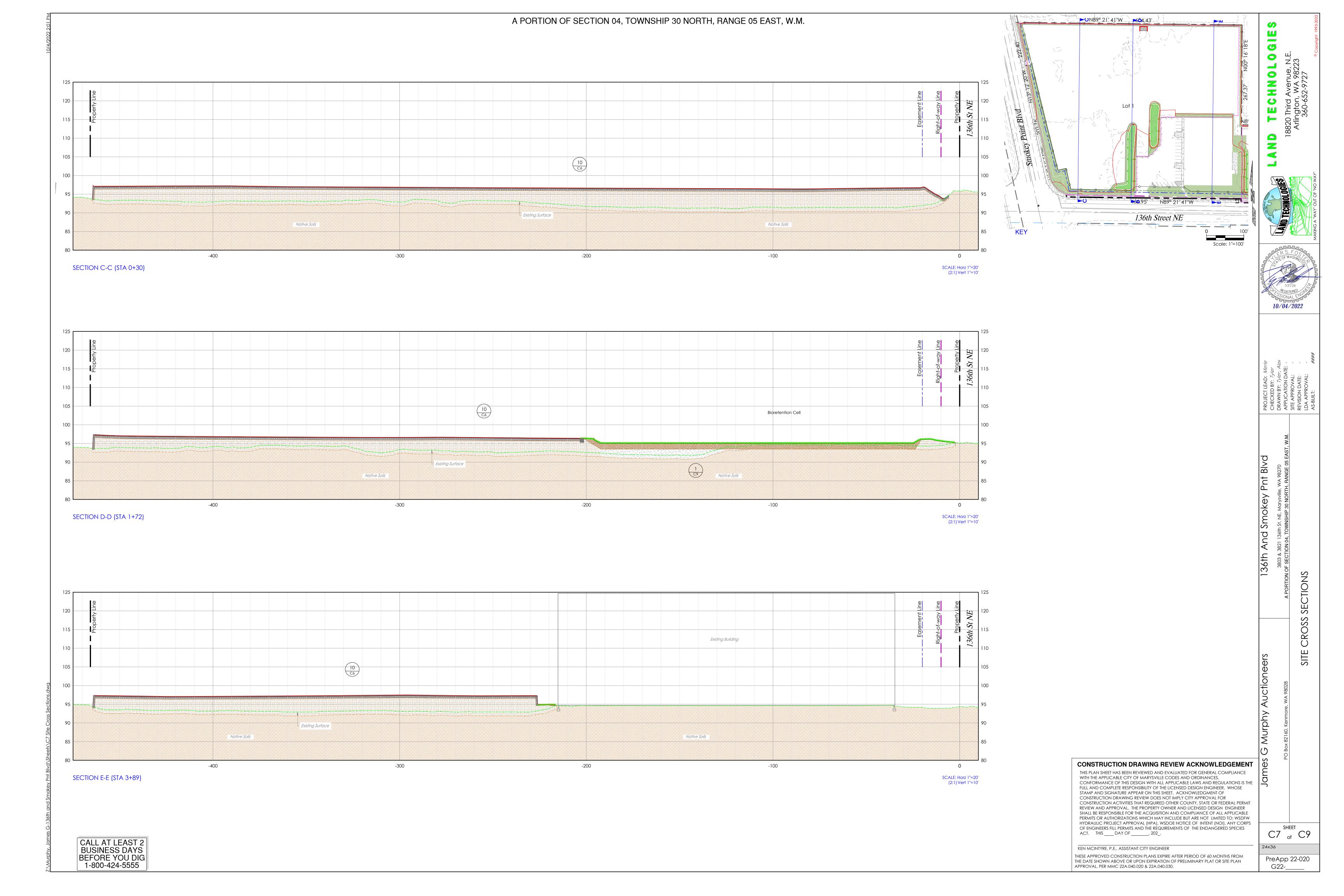
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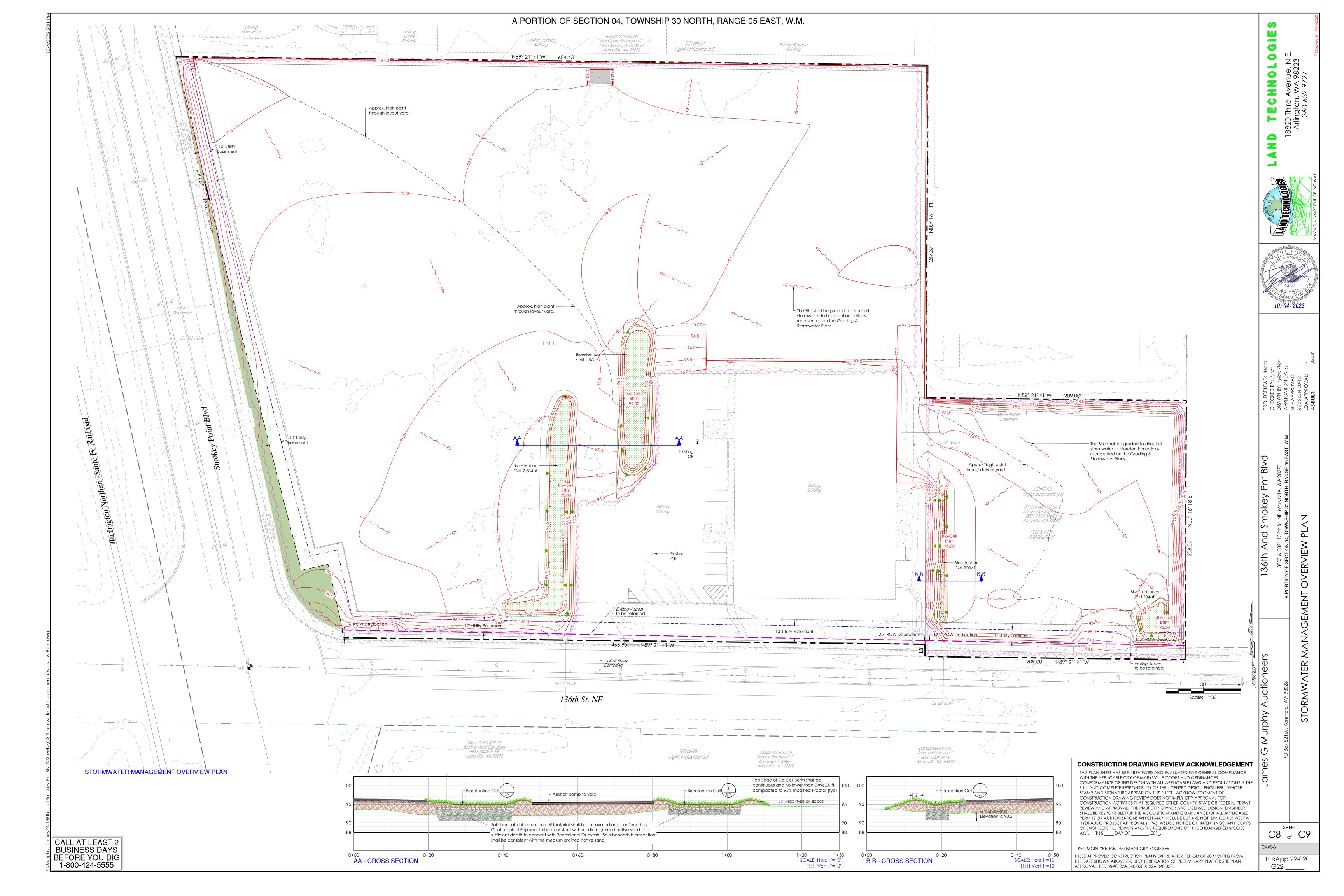
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Design Criteria for Custom Bioretention Soil Mixes Projects which

• 5 - 8 percent organic matter content before and after the saturated

Measured (Initial) saturated hydraulic conductivity of less than 12 inches

Ash, and Organic Matter of Peat and Other Organic Soils)

2-5 percent fines passing the 200 sieve; TMECC 04.11-A

criteria using the specified test method:

pH between 5.5 and 7.0

• CEC ≥ 5 meq/100 grams of dry soil; USEPA 9081

requirements above must demonstrate compliance with the following

prefer to create a custom Bioretention Soil Mix rather than using the default

hydraulic conductivity test; ASTM D2974(Standard Test Method for Moisture,

per hour; ASTM D 2434 (Standard Test Method for Permeability of Granular

Soils (Constant Head)) at 85% compaction per ASTM D 1557 (Standard Test

Method s for Laboratory Compaction Characteristics of Soil Using Modified

Effort). Also, use Appendix V-B, Recommended Procedures for ASTM D

2434 When Measuring Hydraulic Conductivity for Bioretention Soil Mixes.

per hour. Note: Design saturated hydraulic conductivity is determined by

applying the appropriate infiltration correction factors as explained above

Design (long-term) saturated hydraulic conductivity of more than 1 inch

under "Determining Bioretention soil mix infiltration rate."

Infiltration rates for the initial placement of Bioretention

Soil Media is to be within 6 to 12 inches per hour to

specifications listed below for compost.

ensure vegetation survival.

If compost is used in creating the custom mix, it must meet all of the

### Default Bioretention Soil Media

Projects which use the following requirements for the bioretention soil media do not have to test the media for its saturated hydraulic conductivity

## Mineral Aggregate

Percent Fines: A range of 2 to 4 percent passing the #200 sieve is ideal and fines should not be above 5 percent for a proper functioning specification according to ASTM D422.

### Aggregate Gradation

The aggregate portion of the BSM should be well-graded. According to ASTM D 2487-98 (Classification of Soils for Engineering Purposes (Unified Soil Classification System)), well-graded sand should have the following gradation coefficients:

 Coefficient of Uniformity (Cu = D60/D10) equal to or greater than 4, and • Coefficient of Curve (Cc = (D30)2/D60 x D10) greater than or equal to 1 and less than or equal to 3.

The sand gradation below is often supplied as a well-graded utility or screened. With compost this blend provides enough fines for adequate water retention, hydraulic conductivity within recommended range (see below), pollutant removal capability, and plant growth characteristics for meeting design guidelines and objectives. Where existing soils meet the aggregate gradation below, those soils may be amended rather than importing mineral aggregate.

General Guideline for Mineral Aggregate Gradation	
Sieve Size	Percent Passing

General Guideline for Mineral Aggregate Gradation	
Sieve Size	Percent Passing
3/8"	100
#4	95-100
#10	75-90
#40	25-40
#100	4-10
#200	2-5

### Compost to Aggregate Ratio, Organic Matter Content,

- Cation Exchange Capacity Compost to aggregate ratio: 60-65 percent mineral
- aggregate, 35 40 percent compost. Organic matter content: 5 - 8 percent by weight.
- Cation Exchange Capacity (CEC) must be > 5 milliequivalents/100 g dry soil Note: Soil mixes meeting the above specifications do not have to be

tested for CEC. They will readily meet the minimum

To ensure that the BSM will support healthy plant growth and root development, contribute to biofiltration of pollutants, and not restrict infiltration when used in the proportions cited herein, the following compost standards are required.

- Meets the definition of "composted materials" in WAC 173-350-220 (including contaminant levels and other standards), available online at
- http://www.ecy.wa.gov/programs/swfa/organics/soil.html
- Produced at a composting facility permitted by the WA Department of Ecology. A current list of permitted facilities is available at http://www.ecy.wa.gov/programs/swfa/compost/
- The compost product must originate a minimum of 65 percent by volume from recycled plant waste as defined in WAC 173-350-100 as "Type I Feedstocks." A maximum of 35 percent by volume of other approved organic waste as defined in WAC 173-350-100 as "Type III", including postconsumer food waste, but not including biosolids, may be
- substituted for recycled plant waste. Type II and IV feedstocks shall not be used for the compost going into bioretention facilities or rain gardens. • Stable (low oxygen use and CO2 generation) and mature (capable of supporting plant growth) by tests shown below. This is critical to plant success in a bioretention soil
- Moisture content range: no visible free water or dust produced when handling the material.
- Tested in accordance with the U.S. Composting Council "Testing Methods for the Examination of Compost and Composting" (TMECC), as established in the Composting Council's "Seal of Testing Assurance" (STA) program. Most Washington compost facilities now use these tests.
- Screened to the size gradations for Fine Compost under TMECC test method 02.02-B (gradations are shown in the specification in an appendix of the Low Impact Development Technical Guidance Manual for Puget Sound)
- pH between 6.0 and 8.5 (TMECC 04.11-A). If the pH falls outside of the acceptable range, it may be modified with lime to increase the pH or iron sulfate plus sulfur to lower
- the pH. The lime or iron sulfate must be mixed uniformly into the soil prior to use in the bioretention area.
- Manufactured inert content less that 1% by weight (TMECC 03.08-A) Minimum organic matter content of 40% (TMECC 05.07-A)
- Soluble salt content less than 4.0 mmhos/cm (TMECC 04.10-A) Maturity greater than 80% (TMECC 05.05-A "Germination and Vigor")
- Stability of 7 or below (TMECC 05.08-B "Carbon Dioxide Evolution Rate")
- Carbon to nitrogen ratio (TMECC 04.01 "Total Carbon" and 04.02D "Total Kjeldahl Nitrogen") of less than 25:1. The C:N ratio may be up to 35:1 for plantings composed entirely I Lowland native species and up to 40:1 for coarse compost to be used as a surface mulch (not in a soil mix)



- Length & Width per Plan — Gravel Yard Section — 100 Year storm 5' Safety Buffer, Pre-Filter ——— \_\_\_\_ 2" Fine Sand w/Compost Clean Sand, coarse sediment filter [2] - Bio-Cell Seed Mix - 0.5' Freeboard Structural during Early Soils Grading \_ 1.5' Bioretention Soil Media [1] NA NA NA NA NA NA NA Native Topsoil Topsoil Topsoil Stripped during Early Silty-fine Silty-fine Sand — Grading Approx. Exst Sand (Weathered Silty-fine Sand Silty-fine Sand Surface (Weathered Outwash) (Weathered (Weathered Outwash) Outwash) Outwash) Medium Sand Medium Sand — (Recessional (Recessional Outwash) Outwash) Medium Sand Bioretention Cell to Native (Recessional Existing High consist of materials Groundwater Soil Log Soil Log specified in Medium Sand Table (90.5') Bioretention Cell (Recessional Outwash) Materials, Typical Section Detail [1] -Subgrade to be scarified to a depth of at least 1-ft Soils beneath bioretention cell footprint shall be  $^{\perp}$ prior to material placement. Do not smear surface. excavated and confirmed by Geotechnical Engineer to be consistent with medium grained native sand to a sufficient depth to connect with Recessional Outwash. Soils beneath bioretention shall be consistent with the medium grained native sand. [1]. Soils per Bioretention Soil Media detail. Mix to be certified prior to placement. Compact to 80% proctor. [2]. Filter Sand. WSDOT spec 9-03.2(1) 'Grading for Surface Finishing applications.' or equivalent ("Clean Sand") Filter Sand Specification Table U.S. Sieve Percent Passing Number #4 95-100 70-100 #8 #16 40-90 #30 25-75 0-30 <2 #100

#200

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DETAILS

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PreApp 22-020

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KEN MCINTYRE, P.E., ASSISTANT CITY ENGINEER

ACT. THIS \_\_\_\_ DAY OF \_\_\_\_\_, 201\_.

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