



ENGINEERING DEPARTMENT
MINIMUM ACCEPTANCE CRITERIA
PLAN REVIEW CHECKLIST
Last Revision 9/08

NOTE: The following are minimum criteria. The reviewing staff will exercise professional judgment as to the need for any additional requirements on a project-by-project basis. Plans are subject to additional requirements, conditions and/or comments during subsequent reviews.

Project Name: _____

Consulting Firm: _____

Consultant's Signature: _____ Date _____

Phone Number: _____ Email _____ Fax _____

Please use this legend to mark *each* checklist item:

- Complete **Initialed by Consultant/Submitter**
- Not Applicable **N/A**
- Incomplete **Inc.**
- Additional Comments. *** & use last sheet of checklist**

SUBMITTER

CITY REVIEW

1.0 GENERAL

1. _____ All sheets shall be sealed signed and dated by the appropriate Maryland Registered Professional (engineer, land surveyor, landscape architect, etc.) and shall include the appropriate professional certification. _____
2. _____ City Engineer approved for construction/signature block with Executive Order 1-02 and Water Allocation Ordinance note on all sheets. _____
3. _____ One set of supporting engineering calculations signed, sealed and dated by a MD Registered Professional Engineer for stormwater management, storm drain, water, sewer and roadway design included along with the engineer's professional certification with improvement plan submission. _____
4. _____ A copy of the letter from the Planning Department stating that the Site Plan has met All 60-day conditions of approval. A copy of the revised Site Plan shall be included. _____

SUBMITTER

CITY REVIEW

- 5. _____ A copy of approved preliminary Forest Conservation Plan must be included. _____
- 6. _____ Maximum plan sheet size shall be 24" x 36". _____
- 7. _____ Provide vicinity map (City Of Frederick Street Map ONLY). For a copy call 301-600-1405) with north arrow provided at 1" = 2000' min. scale on plan set Cover Sheet or 1st sheet of plan set. _____
- 8. _____ Maryland State Plane Grid NAD 83/91 North Arrow provided on all plan sheets and on all sheets which have any portion of a plan shown. _____
- 9. _____ Minimum scale for improvement plans: 1" = 50' (drainage area maps may be larger depending on acreage). Graphic Bar Scale also required on plans. _____
- 10. _____ Provide legend of drawing symbols and abbreviations on Cover Sheet (preferred) or 1st sheet of plan set. _____
- 11. _____ Provide brief description of Project Scope of Work on the Cover Sheet or 1st sheet of plan set. _____
- 12. _____ To ensure drawing legibility text fonts which plot out less than 0.08" are not acceptable. _____
- 13. _____ **Minimum Required Drawing Notes:** Identify where notes are located on plans *(Italic wording below shall be supplied by the Consultant within the actual note):*
 - _____ a. Horizontal Datum shall be MD State Plane Coordinate System NAD 83/91 and Vertical Datum shall be National Adjusted Vertical Datum 1988 (NAVD 88). _____
 - _____ b. All Benchmarks shall be maintained for the duration of construction until City has granted Final Approval to the project. _____
 - _____ c. Contractor shall notify Miss Utility at (800) 257-7777 and City of Frederick Engineering at (301) 600-1405 at least 72 hours prior to the start of construction. Notify SHA for signal or lighting circuit location on State Roadways. _____
 - _____ d. The Contractor shall not (1) stage work, (2) store materials or (3) permit parking of equipment and/or construction-related vehicles in the public rights-of-way or publicly-owned property without prior approval of the City Traffic Engineer or designee. Where practical and to the degree possible, the Engineer shall designate on these plans appropriate space that can be utilized for the above purposes. It is the Contractor's ultimate responsibility to ensure that proper and appropriate areas are secured for these uses for the duration of the project. _____
 - _____ e. All taps to City of Frederick water lines shall be performed by the City of Frederick Department of Public Works at the developer's expense. _____
 - _____ f. All exterior water valves must open right. _____

SUBMITTER

CITY REVIEW

- _____ g. Contractor shall not tap or otherwise penetrate existing sewer main lines without prior approval from DPW and/or Engineering Department. Contractor is responsible to avoid spillage of raw sewage. Contractor shall provide all sewer plugging and pumping equipment necessary to avoid spillage. _____
- _____ h. On-site utilities shall comply with City Plumbing Code requirements. _____
- _____ i. Existing utility information is from: Provide source of utility information _____
- _____ j. Contractor is responsible for maintenance of traffic on existing roadways in accordance with the Manual of Uniform Traffic Control Devices (MUTCD) and the Maryland State Highway Administration (SHA) Book of Standards, latest editions. _____
- _____ k. Developer is responsible for all costs related to temporary and permanent traffic control (pavement markings, signage, signalization, traffic barriers, flaggers, etc.). _____
- _____ l. Any lane and/or road closures require four (4) weeks advance notice and a permit from the City of Frederick Traffic Engineer. The City Traffic Engineer can be reached by phone at 301-600-1498. _____
- _____ m. If road or any part of road is to be closed, a detailed Detour and/or Closure Plan shall be submitted to the City Traffic Engineer for approval. _____
- _____ n. If temporary parking, ingress/egress or pedestrian restrictions shall be required during project, the Contractor shall be responsible for installing signs and notifying all affected residents/businesses at least 1 day in advance. Contractor is responsible for contacting appropriate City or County authority before any of the above modifications are enacted. _____
- _____ o. Contractor shall be responsible for preventing dust, debris and mud from entering all roadways. If dust, dirt, debris and/or mud happen to override the prevention measures and enter the roadway or sidewalk, the Contractor shall be required to clean the roadway or sidewalk as soon as possible, at his/her expense. See City of Frederick Mud Ordinance pursuant to Section 22-2 of the Frederick City Code. The Contractor shall be responsible for the elimination of dust in the air by the required watering of the ground as needed. _____
- _____ p. The Contractor shall be responsible for keeping silt and debris out of storm drain system during construction and shall clean the system thoroughly, at the Contractor's expense, prior to final acceptance by The City. _____
- _____ q. All utilities and storm drains outside of City of Frederick right-of-way or public utility easements to be owned and maintained by property owner. _____

SUBMITTER

CITY REVIEW

- _____ r. When working in the area of an existing gas line, the Contractor shall have the Washington Gas Company (301) 662-2151 verify that no leaks exist prior to any work in the area. A Gas Company representative must be present at the project site before any blasting within 20 feet of gas lines. Any excavation within 5' of a gas line shall be done by hand (no machinery). The Developer, or the Developer's Representative shall get approval from the Gas Company for any work within a gas line easement area. _____

- _____ s. All handicap accessibility design and construction shall be in accordance with the State of MD Accessibility Code and the Americans with Disabilities Act (ADA), latest editions. _____

- _____ t. Required Street Data: Provide stationed street centerlines. Provide stationing for PC's, PI's, PT's, etc. and for street centerline intersections. _____

- _____ u. Place 4" min. of topsoil in all green areas before permanent seeding is performed. This includes HOA property. _____

- _____ v. Minimum 2% slopes must be provided for adequate drainage of grassy areas. _____

- _____ w. Driveways shall have a maximum 15% slope. _____

- _____ x. Only steel forms are to be used while placing sidewalk for straight sections and radii greater than 200'. _____

- _____ y. Include a note to reference public improvements required by any phasing plan or planning conditions of approval for the project. _____

- _____ z. All contractors must comply with all applicable City, State and Federal Labor and Industry Regulations to include City Safety & Health Policy, MOSHA, OSHA, etc. _____

- _____ aa. Provide by note the topography source and date of topography source. _____

- _____ bb. Provide note on plans: *There is or there is not* floodplain located on the project site as determined by provide source and date of source. Provide floodplain zone designations, FEMA panel number and date of panel. (If floodplain exists on site, also delineate and label on improvement plans. Also scan any permits, determinations, map revisions, etc. and show on improvement Plans.) _____

- _____ cc. Provide note on plans: *There are or are not* wetlands located on the project site. As determined by a field inspection by provide the name of the person and the the company doing the field inspection and the determination, a qualified wetland's technician. Provide the date of the inspection, list any other sources used to make the wetlands determination and the dates of those sources. _____

SUBMITTER

CITY REVIEW

14. GENERAL LANDSCAPING NOTES AND INFORMATION: for City tree plantings, where applicable, notes on improvement plans, at a **minimum**, shall include the following:

- _____ a. Only trees on the City approved tree planting list in the City Standard Details, latest edition, are permitted to be planted in the City of Frederick’s Right-Of-Way. _____
- _____ b. All street tree plantings shall be a minimum of 2-1/2” caliper and display a single straight trunk to 7’ of which 5’ shall be free of branching (ANZI Z60.1). _____
- _____ c. There shall be no excess soil or mulch on top of root ball so as to expose basal root flare. All street tree plantings shall be free of damage, disease and defects. _____
- _____ d. Per The City of Frederick Charter And Code Of Laws Sec. 22-10.2. *“Plantings on Utilities or in Easements.* (a) It shall be unlawful to place or plant a tree or trees on top of or within ten (10) feet of any underground utility line or equipment of The City. (b) It shall be unlawful to place or plant trees, bushes, shrubs or other plantings or ground cover of any nature whatsoever within the utility easement area of The City unless prior written approval of The City is secured.” Also there shall be a min. of fifteen (15) feet of separation between planted trees and City streetlights. To obtain prior written approval of exception to any of the above in design or in construction, contact The City Engineer. _____

For utilities owned by companies other than The City on public or private property with privately maintained landscaping, there shall be a min. of ten (10) feet of separation between the center of designed or planted trees and any such utility lines and structures (under or above ground) unless prior written consent is obtained from the utility company owner. Where utilities are privately-owned, a reasonable and prudent effort to maintain a min. ten (10) foot separation between designed or planted trees and utility lines shall be required.

- _____ e. Contractor shall call the City of Frederick Arborist at 301-600-1233 prior to placement and planting of City trees for field adjustments to locations. Prior to any excavation within 10’ of City Street Trees or designated State Trees, contractor to obtain permit from the office of the City Arborist. _____
- _____ f. Show all utilities (storm drain, water, sanitary sewer, electrical, gas, etc.) on Landscaping Plan. Label type and size of utility. Label electrical pole/fixture, exterior building fixture and electrical conduit locations. _____

15. REQUIRED BENCHMARK INFORMATION:

- _____ a. Provide on each plan a minimum of 3 sets of “grid ticks” at suitable intervals labeled with their Maryland State Plane Coordinate values (NAD 83/91) and all Vertical References (Benchmarks) shall be referenced to NAVD 88 with origin indicated (City, NGS, etc.). _____
- _____ b. Improvement plans shall contain sufficient horizontal and vertical references and information to enable stakeout and construction of proposed improvements by reference to the improvement plans only. _____

SUBMITTER

CITY REVIEW

- _____ c. Required Benchmarks:

All Benchmarks shall be of sufficient number (minimum four) and durability to last through the project duration. If there is any question about the adequacy of this on any plan, the City Surveyor shall make the final determination.
- _____ d. Project or Temporary Benchmarks (TBM) to be shown on all Roadway, Grading, Utility, Storm Drain, Dimension and Paving Plans. Each Benchmark shall be defined by an accepted symbol with number/letter identifier, description of the kind of benchmark, location description, coordinates and elevation in NAVD88.
- 16. _____ Topography at and beyond the project boundaries adequate for review of off-site drainage and other off-site impacts. 2' contour intervals shall be provided with elevations labeled
- 17. _____ **PROFILES:** Provide all appropriate profiles and show:

 - _____ a. Show and label all utility crossings with stations and invert elevations, to the extent possible, on the roadway and on the utility profile sheets.
 - _____ b. Pipe material specifications
 - _____ c. Provide all structure detail references (City of Frederick, MSHA, etc.).
 - _____ d. Show and label the existing ground and proposed grade.
 - _____ e. Label minimum 1' of vertical clearance from all crossing utilities.
 - _____ f. If 'crossing' water main is lower than sewer (to be avoided if possible) then sewer shall be encased in concrete for 10' in each direction. If 'parallel' water main is lower than sewer, then any sewer joints within 10' horizontal separation must be encased in concrete.
 - _____ g. Label all utilities as either 'public' or 'private'
- 18. _____ At stream crossings, protect the water and/or sewer mains as required by Standard Details and Specifications and protect water course according to the requirements of State agencies. Sewer main to be protected as per DPW.
- 19. _____ Proposed site grading shown with limits of disturbed area delineated and labeled.
- 20. _____ Horizontal clearance from storm drain structures or other utility structures is min. 5.0'. Clearance from waterline or other utility lines is min. 10'. All utility conflicts shown with method of protection as applicable.
- 21. _____ Water and sewer mains and connections shall be shown at the lot frontage.

SUBMITTER

CITY REVIEW

- 22. _____ All utilities (storm drains, water, sanitary sewer, etc.) to be shown and labeled on all plans. Include type, size, structure numbers, flow arrows, etc. Label which utilities are public and which are private. _____
- 23. _____ All required frontage improvements adjacent to a lot or lots must be shown to be completed within the same (plan) phase. _____
- 24. _____ All utilities must be shown to extend to just beyond the end of paving within the same (plan) phase. _____
- 25. _____ Improvement plans shall clearly show the finalized locations of all Power Utilities above and below ground (power lines, vaults, duct banks, switchgears and any other associated appurtenances). Upon obtaining an approved site plan, the Developer shall apply to the Power Company for options to provide power to the site. The Power Company shall provide a sketch plan showing the power options. It shall be the responsibility of the Developer to provide the power location information to the project's consulting engineer for inclusion on the plans. If during the construction process, the utility locations are revised, the Developer shall be required to submit revisions to the previously approved improvement plans to be re-approved by the City. Electric service equipment in the downtown area shall be subterranean. _____
- 26. _____ Show ownership of all existing easements and rights of way and all proposed required easements **with liber and folio**. Indicate whether easements are public or private, width of easement, owner name and type of easement, i.e., sewer, water, etc. _____
- 27. _____ Indicate distance from centerline of entrance to centerline of nearest street with name of street provided (excludes residential SF driveways). _____
- 28. _____ If construction is to occur in phases, provide a clear phasing plan showing separation of construction traffic from local residential traffic. _____

2.0 SEWER

- 1. _____ Obtain pretreatment permit or waiver (if applicable). Contact the City Industrial Program Coordinator at (301) 600-2979. _____
- 2. _____ Monitoring manhole shown for all commercial, industrial, business, etc. properties in accordance with the City Plumbing Code except as waived by the City Industrial Program Coordinator at (301) 600-2979. _____
- 3. _____ Show/label service connection locations. Min. slope of sewer laterals shall be 2%; Max. slope shall be 5%. _____
- 4. _____ Generally, min. slope for sanitary sewer mains shall be 0.7%. Pipes greater than 8" in diameter may, for good cause, have slope between 0.5% and 0.7%. At terminal lines, slope will not be required to exceed 2.0%, but must be at a min. of 1.0% slope. _____

SUBMITTER

CITY REVIEW

- 5. _____ Provide velocity and capacity computations for any sewer proposed at less than _____
0.7% slope (minimum velocity of 2 fps at peak flow required).
- 6. _____ Manholes shall be provided at all turns, breaks in grade and terminal ends of sewer _____
mains, max. spacing of manholes shall be 400' center to center. A 0.1' min. drop shall
be provided through the invert in and invert out of all manholes and cleanouts. If more
than a 1.5' drop, use a drop manhole.
- 7. _____ Manhole and sewer main depth shall not exceed 16', min. cover is 3.5'. Hardship _____
cases for greater than 16' will be considered on a case by case basis. For depths
greater than 16', ductile iron pipe shall be used for the sewer line.
- 8. _____ Provide stub out of terminal manhole for planned future extension of main, where _____
applicable.
- 9. _____ For service connections, cleanouts to be provided at property line, 5' outside _____
building, and every 75' along the service line. For private on-site systems,
provide a manhole at the property line.
- 10. _____ Show lowest finished floor elevations on profiles at each service connection of _____
buildings to be served by public sewer main.
- 11. _____ Public utilities shown shall be in accordance with the City's Water and Sewer Master _____
Plan.
- 12. _____ Provide a min. of 3' laterally between individual sewer service connections. _____
- 13. _____ Provide min of 90° between the inflow and outflow lines at all manholes. _____
- 14. _____ For service connections to manholes, provide a minimum of 90° between the service _____
connection and the outflowing line and provide a min. of 1' of separation between
service connections and/or sewer main, as measured at the inside wall of the manhole.
- 15. _____ For terminal manholes from which there will be no future sewer main extensions, 3 _____
service connections will be allowed (>3, design required). For other manholes a
max. of 2 service connections will be allowed.
- 16. _____ For sanitary sewer lines not within the public road right-of-way, provide a public _____
sanitary sewer easement over and through open space. Easement widths for sanitary
sewer shall be a min. of 20' for line depths of 8' or less otherwise a min. width of
30' shall be provided.
- 17. _____ Certify the hydraulic capacity of existing downstream sewer mains and other sewer _____
system facilities for the proposed use and additional flows or specify in note
conditions regarding Adequate Public Facilities analysis.
- 18. _____ Any service restrictions, such as first floor only, etc. shall be noted on the plans. _____

SUBMITTER

CITY REVIEW

- 19. _____ Any service connections subject to overflow from system surcharges shall be noted _____
on the plans.
- 20. _____ Manholes within the 100-year flood plain, in flood-prone areas or in the flow line of _____
swales shall have watertight frames & covers.
- 21. _____ If sanitary sewer is provided by Frederick County, applicant is responsible to under- _____
stand all rules, regulations and requirements of Frederick County in connection with
receiving County sanitary sewer service.
- 22. _____ Provide on plans the invert elevations of service connection cleanouts at property line. _____
(Determine/compute these by taking the main invert + 0.2' (min.) + service slope
(decimal) times the horizontal distance to the cleanout. The maximum slope is 5%.

3.0 WATER

- 1. _____ Provide The Water Pressure Zone designation on cover sheet (preferred) or on 1st _____
sheet of plan set and identify whether project is in the high or low zone.
- 2. _____ Proposed and existing pipe line size, material type and class shall be indicated on the _____
plan and profile sheets (minimum diameter for proposed lines is 8"). Smaller sizes
may be allowed for dead ends without hydrants dependent upon usage.
- 3. _____ All valves, tees, bends, fire hydrants, etc. shall be shown with a symbol and called _____
out as to type, size and station on plans and profiles. Vaults required for valves
larger than 16 inches and all butterfly valves. Bends of 90° should be avoided, where
possible, except for cornering buildings.
- 4. _____ Provide 3-valves at each tee, 4-valves at each cross, with the exception of hydrant _____
tees which require only 1-valve (on branch line) unless spacing of run requires
otherwise. Locate valves at the intersection of the right-of-way projection and the
centerline of street. Show and note: all valves to be restrained to tees with approved
restraining devices.
- 5. _____ Water valve spacing maximum as follows: _____
 1,200 feet for smaller than 12-inch lines
 1,500 feet for 12-inch lines
 2,000 feet for 16-inch lines
 2,500 feet for 24-inch lines
- 6. _____ Indicate easement widths for all existing and proposed waterlines not within the public _____
road rights-of-way. For proposed waterline depths up to 8', the min. easement width
shall be 20'. For waterline depths greater than 8', the min. easement width shall be 30'.
- 7. _____ Show water meter location. Where applicable, place inside building. If meter vault is _____
used, locate in open space and not within paved area. Show and indicate public water
meter easement with size and liber and folio references.

SUBMITTER

CITY REVIEW

- 8. _____ Service to be provided to valve at right-of-way line for all existing or proposed lots, buildings and parcels and shall be installed prior to paving operations. Consider all lots within 200 L.F. of main as available for access to main. _____
- 9. _____ Water line sizing, etc., is in accordance with City Water Master Plan. _____
- 10. _____ Fire hydrants shall be spaced at a max. of 500' for single family residential developments and a max. of 300' for multi-family and commercial developments. Hydrants shall generally be placed 2' behind the curb. Show and indicate public easement for any public hydrant not located within or in close proximity to the right-of-way of the road. _____
- 11. _____ If existing fire hydrants are to serve the proposed site the existing fire hydrants shall be clearly shown and labeled on the plans. _____
- 12. _____ Water service connections shown from the main to the structure being served and connection sizes indicated as typical on a view or specify in a note. _____
- 13. _____ Stationing of public and private waterlines to be shown at not greater than 50' intervals on plans and profiles. Provide invert elevations of water lines at the beginning station, at every 50' station and at end station on profiles. _____
- 14. _____ Fire hydrants to be located at terminal end of all lines 6" and larger. Dead end lines < 6", where acceptable, to be equipped with 2" blow-off. _____
- 15. _____ Locate air release valve (or fire hydrant where practical) at all high points, generally for 10" or larger mains. _____
- 16. _____ Dewatering device at all low points, generally for 10" or larger mains. _____
- 17. _____ Restrained joints to be used instead of buttresses for fittings located where unstable soil conditions are encountered/anticipated. Soils engineering report shall be submitted to support use of buttresses in unstable soil conditions. _____
- 18. _____ Install restrained valve and pipe joint(s) at terminal end of construction phase for future waterline connection. Valves to be restrained at all tees. _____
- 19. _____ Indicate the radius of curvature for main deflection. _____
- 20. _____ Standard min. cover for DI Pipe is 3.5' over top of pipe. Greater depths may be required for dewatering devices, valves and blow offs, etc. Max. depth shall not exceed 16'. Valve stem extension is required for all valves deeper than 4' from the operating nut to the surface. _____
- 21. _____ Indicate and label the size, type of all fittings, valves on plan & profile. _____
- 22. _____ Show all water main crossings with other utilities with station and invert elevations. Water main may need cradle or other structural support. _____

SUBMITTER

CITY REVIEW

- 23. _____ Water distribution system design to be in compliance with Water Master Plan, the City Plumbing Code and Life Safety (Fire) Code for all levels of structures served by the public water system. _____
- 24. _____ Any special water distribution design issues shall be shown on the plans and supported with modeling, reports and calculations as necessary. _____
- 25. _____ Pipe joint deflections shall be within allowed limits of Standard Specs. _____
- 26. _____ Areas of structural fill shall be cross-hatched and labeled on profile. Add note to drawing indicating fill to be “structural” (joint restraint) or “non-structural”. _____
- 27. _____ Show a valve at the property line per the City Plumbing Code. _____
- 28. _____ All compound/combined meters must be located in non-traffic areas within an easement and labeled as such. All other meters to be located inside of building with a valve located at right-of-way line per Plumbing Code. _____
- 29. _____ Private hydrant lines with a run greater than 20’ shall be protected from the public water supply by the installation a check valve installed in an accessible vault. _____
- 30. _____ Looping (second feed) of a dead end water main is required where service to more than 50 residential customers or more than 20 non-residential customers would otherwise be interrupted by closing of valve on the dead end main. The loop should be designed for practicality and use. _____

4.0 PUBLIC ROADS AND STREETS

- 1. _____ A min. of 25’ (50’ desirable) radii at intersecting streets shall be provided. For an alley intersection, a 10’ radius may be used, provided said alley is not required for fire and rescue vehicle and/or City service vehicle access and is designated for passenger vehicles only. _____
- 2. _____ For developments which anticipate 15% or more tractor trailer traffic, roadway intersections and entrance radii shall be designed to accommodate a WB-67 (metric WB-20) design vehicle. _____
- 3. _____ Minimum of 30’ radius for commercial entrances, adequate turning radii for single unit truck design vehicles shown with templates. _____
- 4. _____ The design speed used for the roadway design (including improvements to existing roadways) shall be noted on the plans and shall be as follows: _____
 - Alley 20 mph (ASSHTO low volume design stds.)
 - Local 30 mph (ASSHTO low volume design stds.)
 - Collector 40 mph
 - Minor Arterial . . . 45 mph
 - Major Arterial . . . 50 mph

SUBMITTER

CITY REVIEW

- 5. _____ Indicate on plans and profiles whether streets, alleys, roadways, etc. are public or private. Provide evidence of grant (Plat Book and Page Numbers/Liber and Folio) for public. Provide typical public and private street sections as applicable. Reference City Standards if public. _____
- 6. _____ Provide typical pavement sections for public and private paving. Reference City Standards if paving is public. _____
- 7. _____ Sidewalk (5' width) and accessible ramps with truncated dome contrasting color area to be included per State of Maryland HC Code, the ADA and, where applicable, City Standard Specifications, latest edition. Restrict parking within 20' of crosswalk. _____
- 8. _____ Show traffic flow on plans for public and private sites. Indicate one-way traffic where applicable. _____
- 9. _____ Provide plan, notes, details and specifications for pavement markings, signage, speed humps, crosswalks, traffic signalization, etc. _____
- 10. _____ Grading shown in Plan View with labeled proposed and existing contours provided at suitable intervals. _____
- 11. _____ Proposed drainage culverts within rights-of-way shown, labeled (size and type), dimensioned and profiled. Show and label all existing culverts. _____
- 12. _____ Headwalls / end sections shown and labeled. _____
- 13. _____ Acceptable horizontal and vertical site distance (per SHA standards) provided at all intersections. Show all corner site distances on plan. _____
- 14. _____ Provide for guardrail requirements / limits as per SHA regulations. _____
- 15. _____ Public and private street-lighting plans and private on-site lighting plans included with details and per City Standards. Section 1114 of LMC requires the following: _____
 - _____ a. Plan must indicate the light location on the premises and the type of illuminating devices, fixtures, lamps, supports, reflectors or other devices. _____
 - _____ b. A description of the illuminating devices, fixtures, lamps, supports, reflectors and other devices shall be provided (including catalog cuts by manufacturers). _____
 - _____ c. Pole base notes and details provided. _____
 - _____ d. Photometric data shown on plan with illumination levels documented at a min. of 50' exterior to and surrounding the site. _____
 - _____ e. Conduits and fixtures to be shown and labeled on lighting plans and landscaping plans. Fixture and pole locations to be shown on storm drain and other utility plans. _____

SUBMITTER

CITY REVIEW

16. _____ Paving fillets with positive drainage and adequate radii provided. _____

17. DIMENSIONING PROVIDED FOR PROPOSED AND EXISTING:

_____ a. Pavement shown and dimensioned. _____

_____ b. Cul-de-sacs shown and dimensioned. _____

_____ c. Right-of-way lines shown on both sides of the road, dimensioned and evidence of grant L____, F____ and/or PB____, P____ provided. _____

_____ d. Property Lines for the project site and Centerline Road Alignments shown with bearings and distances and complete curve data (curve number, tangent, radius, delta, chord bearing, chord length, etc). Curve data may be shown in a curve table on the plan. Interior lot lines to be shown and labeled as necessary. _____

_____ e. Indicate roadway classification as per the Comprehensive Plan as collector or arterial and the ultimate right-of-way width specified in the Comprehensive Plan. _____

_____ f. Label the centerline(s) of roadway(s). _____

_____ g. Dimension the distance between curb cuts. _____

_____ h. Show the location and types of marking for traffic control devices as per the Uniformed Manual of Traffic Control Devices. _____

18. IMPROVEMENTS TO EXISTING STREET FRONTAGES:

_____ a. Provide acceleration / deceleration and left-turn lanes where necessary. _____

_____ b. Modify existing entrance(s) as required. _____

_____ c. Standard clearing and grading within right-of-way along existing streets as necessary. Show improvements to maintain proper drainage. _____

_____ d. Show surveyed sight triangle from access onto City streets where applicable and confirm that it meets AASHTO Standards and City L.M.C. Provide corner sight distance on plans for each intersection. _____

19. HORIZONTAL ALIGNMENT:

_____ a. Provide centerline bearings and distances and complete curve data (curve number, tangent, radius, delta, chord bearing, chord length, etc.). Label and station P.I.s, P.C.s, P.R.Cs, P.T.s, etc. _____

_____ b. Provide curves of sufficient radii for design speed. _____

_____ c. Ensure that curve labeling on plan and curve chart data agree. _____

SUBMITTER

CITY REVIEW

_____ d. Provide determination of whether super-elevation of section required for horizontal curves. _____

20. **VERTICAL ALIGNMENT:**

_____ a. Minimum street grade to be used is one percent (1%). Exceptions maybe considered with justifiable supporting documentation. _____

_____ b. Street grades are within acceptable range for design speed. _____

_____ c. Vertical curves meet design standards for design speed (AASHTO). Label and station P.V.I.s, P.V.C.s, P.V.R.C.s, P.V.T.s, etc. on profiles. _____

_____ e. Provide and indicate 'A', 'K' and 'e' values and curve length for all vertical curves: _____
A - Algebraic difference in grades (absolute value)
K - Rate of vertical curvature (length in feet per percent of A)
e - Ordinate at point of vertical intersection in feet

_____ f. Minimum 'A' value for intersecting street grades is 2.5 (absolute value) to provide positive drainage around curb fillets. _____

_____ g. Minimum 'K' value for sag vertical curve is 30 and for crest vertical curve is 40 regardless of design speed. _____

5.0 ACCESSIBILITY ISSUES

1. _____ Indicate and show at least 1-Handicap Accessible Route per building that meets all requirements of the ADA Accessibility Guidelines for Buildings and Facilities (ADAAG) including the following minimums: _____

_____ a. The route shall be continuous, with a minimum clear width of 36". _____

_____ b. If an accessible route has less than 60" clear width, then passing spaces at least 60" by 60" shall be located at reasonable intervals not to exceed 200'. _____

_____ c. An accessible route with a running slope greater than 1:20 (or 5%) is a ramp and shall provide landings (handrails where applicable and required by ADAAG). The cross slope of an accessible route shall not exceed 1:50 (or 2%). _____

6.0 STORM DRAINAGE

1. _____ Submit computation package (report) with Drainage Area map and calculations. This can be combined with SWM Report, sealed signed and dated by a MD Registered Professional Engineer. Seal DA map if not bound. _____

2. _____ All storm drain pipes and appurtenances shall be designed for the 10-yr storm event. _____

SUBMITTER

CITY REVIEW

- 3. _____ Culvert design for the 25-yr storm event for local and collector streets; the 50-yr storm event for minor and major arterial streets. Provide a min. of 1' of freeboard from WSE to the lowest point at gutter flow line of the road at the culvert crossing. _____
- 4. _____ Maximum gutter spread for the 10-yr storm event shown to be 8.0' or less for streets 20' wide or greater. For streets less than 20' wide, the max. gutter spread for the 10-yr storm event to be 6.0' or less. _____
- 5. _____ Provide storm drain profiles which show 10-yr hydraulic grade line regardless of pipe size. Show utility crossings with invert elevations on profile. _____
- 6. _____ Provide Q_{10} , V_{10} , S_{min} on profile for all pipe segments. _____
- 7. _____ Ensure that minimum scour velocity of 2 fps is provided for the 10-yr storm event for each pipe segment. _____
- 8. _____ Minimum drop through all storm drain structures to be shown as 0.25'. Where hydraulic considerations dictate, a greater drop is to be provided. _____
- 9. _____ Provide on all profiles and in the storm drain structure schedule, at a minimum: type of structure, detail reference (City, MSHA, etc.), size of structure, top of structure elevation, etc. _____
- 10. _____ RCP Class IV to be specified for all storm drains within City rights-of-way or under traffic bearing areas. Other materials acceptable for privately maintained storm drain systems outside public rights-of-way /easements. _____
- 11. _____ Minimum pipe cover in accordance with storm drain pipe manufacturer's specifications provided and/or manufacturer's recommendations. _____
- 12. _____ 3.0' min. from invert to bottom of top slab for precast COG inlets comprised of a base section, slab and throat section provided there is a minimum of 2.77' from top of highest pipe to top of curb. 20" min. from top of pipe to top of curb for precast rectangular COG inlets with slab. _____
- 13. _____ Use only "bike friendly" grates as per City/MSHA standards and specifications. Grates in travel lanes of main roads will not be permitted. _____

7.0 STORMWATER MANAGEMENT

1. **GENERAL**

- _____ a. Provide Construction Specifications. Indicate in note if pond is regulated by standards of NRCS-MD Code No.378. _____

SUBMITTER

CITY REVIEW

- _____ b. Provide SWM materials, notes and details. Materials to be included in the construction specifications. _____
- _____ c. Delineate Outfall, Drainage and other necessary easements and provide evidence of grant of easement prior to as-built and final acceptance. _____
- _____ d. Provide Sequence of construction for sediment and erosion control and SWM Provision for conversion of sediment control facility to permanent SWM shall be included in the Sequence of Construction. _____
- _____ e. Provide inspection/maintenance schedule for SWM facility. Plans shall include LMC section 741(O)(1) in its entirety and portions of LMC Section 741(O)(2) that pertain to the SWM design as applicable. _____
- _____ f. Provide Maintenance Agreements for SWM facilities including required City SWM Facility Access And Inspection Easements. City Access and Inspection Easements to be shown and labeled on the plans along with owner name, liber and folio prior to as-built and final acceptance. _____
- _____ g. Proposed SWM facilities shall be labeled on plan with name of owner, whether public or private and the liber and folio references. All SWM plans to include elevations in NAVD88. _____
- _____ h. If fencing is required per the LMC, show and label on the plans and provide details. _____
- _____ i. If applicable, provide private operation and maintenance agreements between property owners if connecting/discharging to adjoining properties. _____
- _____ j. SWM shall comply with Chapter 741 of The City of Frederick LMC, and the MDE 2000 Stormwater Design Manual. All existing ponds and facilities to be utilized by proposed development shall meet current requirements. _____
- _____ k. In accordance with the City LMC Section 741 (g) (2) (F), an analysis of the impacts of stormwater flows downstream in the watershed must be provided. The study area to be established at the time of site plan submission. The study shall be signed and sealed by a MD Professional Engineer and shall determine the impacts of the proposed development upon any dam, highway, structure, storm drain system or natural points of restricted streamflow. _____
- _____ l. All requests for Waiver of SWM requirements shall be accompanied by a completed Waiver Application Form _____

2. **DRAINAGE AREA MAPS:**

- _____ a. Provide drainage area maps with topography at 2' contour intervals for on-site drainage area and 20' max. contour intervals for off-site drainage area (ref. to NAVD88). _____

SUBMITTER

CITY REVIEW

- _____ b. Provide delineated pre-developed drainage areas with RCN's – use 'meadow' CN for non-forested areas, and 'forest in good condition' CN for forested areas. _____
- _____ c. Provide delineated post-developed drainage areas with RCN's. _____
- _____ d. Offsite drainage areas shall be modeled as present land use in good condition for 2-yr and 10-yr storms. _____
- _____ e. Offsite drainage areas should be modeled as ultimate land use (based on zoning) when analyzing the 100-yr storm, except in the Carroll Creek watershed where they shall be modeled as present land use condition with any existing SWM quantity facilities taken into account. _____
- _____ f. Provide pre-developed flow path, overland sheet flow length to be a max. of 100'. _____
- _____ g. Provide post-developed flow path, overland sheet flow length to be a max. of 100'. _____
- _____ h. Drainage Area Maps shall be signed, sealed and dated by a qualified Registered MD Professional Engineer or a qualified Registered MD Professional Surveyor unless they are part of a bound computations package or report. _____

3. **RUNOFF CALCULATIONS:**

- _____ a. Calculations to be based on TR-55 modeling. _____
- _____ b. Calculations may be based on Rational method for storm drain design. _____

4. **FOR RATIONAL METHOD:**

- _____ a. Use "C" values from Frederick County Stormwater Management Manual. _____
- _____ b. Base "i" value on engineering documentation or Frederick County Manual. _____

5. **STORMWATER MANAGEMENT COMPUTATIONS:**

- _____ a. Water quality volume (WQ_v), channel protection (CP_v) sized per the 2000 MDE Stormwater Design Manual. Water quality provided based upon MDE approved methods appropriate for proposed site. Recharge volume (Re_v) not required due to karst topography. Use of stormwater credits for innovative site planning (MDE Stormwater Manual, Chapter 5) is encouraged. _____
- _____ b. **Within** the Carroll Creek watershed, control the 2, 10 and 100-yr storm events to pre-development rate. Water quality, WQ_v , and channel protection, Cp_v , required. _____
- _____ c. **Outside** of the Carroll Creek watershed, control the 2 and 10-yr storm events to pre-development rate and show safe conveyance of 100-yr storm event. Water quality, WQ_v , and channel protection, Cp_v , required. _____

SUBMITTER

CITY REVIEW

- _____ d. Provide routing computations based on TR-20 program (including summary table with Q_{pre} , Q_{post} without SWM, and Q_{post} with SWM). Clearly label TR-20 input and output. Include a schematic diagram of the watershed that correlates with the TR-20. _____
- _____ e. Provide spillway that safely conveys the 100-yr storm event. _____
- _____ f. Provide or note the State Stream Classification of receiving water. _____
- _____ g. Provide Soils Type – Investigation: Soil Borings and report, where applicable, per the MDE 2000 Stormwater Design Manual, or latest edition. (Appendix D.2.) _____
- _____ h. SWM report must include a detailed narrative with pertinent background information, methodologies used, SWM controls provided, type of SWM facility proposed (**indicate if “378 Pond”**), pre-developed vs. post-developed flows vicinity map, hydrology and hydraulics descriptions, etc. _____
- _____ i. If grass channels are used for water quality credit, show calculations to provide for a minimum of 9-minute travel time through the channel. _____

6. **LOCATION OF ALL EXISTING FEATURES:**

- _____ a. Buildings and other impervious areas & storm drain facilities shown. _____
- _____ b. Indicate on plan set detailed operations, maintenance and inspection procedures required for SWM Facilities (Stormceptors, Baysavers, Underground Facilities, etc.) _____
- _____ c. Show all existing and proposed utilities. _____
- _____ d. Provide all existing and proposed topography (adequate for review and construction). _____

7. **INFILTRATION:**

- _____ a. In general, not allowed in areas subject to sinkhole formation, which is basically the entire City of Frederick area . If filtration is proposed, accompany with geotechnical testing and reports, signed and sealed by a qualified Registered Maryland Professional Engineer stating that the proposed facility is not located within a karst region. _____
- _____ b. If infiltration permitted per the above, at a minimum provide the following:
 - _____ i. Report of percolation testing. _____
 - _____ ii. Complete design calculations. _____
 - _____ iii. Infiltration area dimensions and details including materials. _____

SUBMITTER

CITY REVIEW

_____ iv. Description of the method of pre-filtration. _____

_____ v. Landscaping Plan sealed, signed, dated by Landscape Architect _____

8. **DETENTION AND RETENTION PONDS:**

_____ a. Provide storage versus elevation versus discharge chart and graph with computations. _____

_____ b. Provide outlet structure details. Provide cut sheets for pre-cast riser structures to be provided prior to construction. Weir walls and cast in place structures to be designed, signed and sealed by a qualified Registered MD Professional Engineer competent in structural engineering. Structural design of rebar, concrete mix and test strength to be provided as part of the SWM plans. _____

_____ c. Pond routing - Q_{pre} , Q_{post} and Q_{routed} provided in computations. _____

_____ d. Provide core trench detail and embankment profile with stationing. _____

_____ e. The minimum horizontal clearance between the toe of embankment or the edge of the 100-yr water level for an excavated pond, and the centerline of water or sewer pipe, if any, shall be 25'. _____

_____ f. Provide anti-flotation computations for riser structures. _____

_____ g. Provide anti-seep collar computations as necessary. _____

_____ h. Provide structure (dam) classification per USDA NRCS Code 378. _____

_____ i. Dam breach analysis provided where required or applicable. _____

_____ j. Provide synthetic pond liner (PVC, geo-synthetic or similar, minimum 30 mil thickness) for all ponds. Any Waiver request to use liner other than 30mil PVC type to be accompanied by sound rationale for same **and** adequate geotechnical testing results/recommendation by a MD Registered Professional Geotechnical Engineer to show that the pond is not located in a karst (sinkhole-prone) area. _____

_____ k. SWM Landscaping Plan sealed, signed, dated by Landscape Architect. _____

9. **CROSS SECTION THROUGH EMBANKMENT:**

_____ a. Show side slopes (3:1 maximum on downstream side of embankment, 2:1 max. on upstream side of embankment). _____

_____ b. Show, dimension and label top width. Show fence, where required. _____

_____ c. Show top height constructed and settled with adequate freeboard. _____

SUBMITTER

CITY REVIEW

- _____ d. Provide emergency outfall details. _____
- _____ e. Barrel profile including anti-seep collars, cradle or mud-mat, water-tight joints, phreatic line, low-flow pipe, trash racks, riser structure, etc. _____
- _____ f. Profile along centerline of embankment a minimum of 50 feet beyond the core trench on each end. _____

8.0 FLOODPLAIN STUDIES

- 1. _____ All floodplain maps and topography to be in MD State Plane Coordinate System (NAD 83/91 horizontal and NAVD 88 vertical). Include North Arrow and scale. _____
- 2. _____ Floodplain study to be signed, sealed and dated by a qualified Registered Maryland Professional Engineer and include the professional certification. _____
- 3. _____ Floodplain study includes drainage area map, map with topography showing cross section locations and all other supporting engineering document including a hydrologic study. _____

9.0 OTHER ENGINEERING STUDIES

- 1. _____ All other required engineering studies, including but not limited to geotechnical, materials, sewer, traffic (including any required MUTCD traffic and/or pedestrian signal warrant analysis) and water distribution which are required to be submitted to the Engineering Department shall be signed, sealed and dated by a qualified Registered Maryland Professional Engineer. _____
- 2. _____ Study area / drainage area clearly delineated. All necessary mapping and/or plans included with study. _____
- 3. _____ Purpose of study clearly stated within study report. _____

(end)