



CITY OF WEST RICHLAND

CIVIL AND UTILITY ENGINEERING

PUBLIC INFRASTRUCTURE CONSTRUCTION PLAN REQUIREMENTS AND DESIGN GUIDELINES

(REVISED July 2018)

SECTION 1 - PROJECT PROCEDURE

Any project that includes the construction of public infrastructure shall comply with the following procedure. Public infrastructure includes all construction of public streets, water lines, sewer lines, storm drainage lines, street lights and any other facilities that will be owned, operated and maintained by the City.

1. The plan review fee for subdivisions/short plats and Utility and/or Street Extension plans can be found in the City Master Fee Schedule. The fee is due prior to review. The fee is to cover costs incurred by the City. Plan review shall remain valid for 1-year after date of 1st review letter. After which time a second full review process and fee will be required.
2. When submitting drawings for a new subdivision (long plat or short plat), two paper copies of the construction plans are required for the first review submittal (22" x 34"). Subsequent re-submittals shall also require two copies unless otherwise approved.
3. One copy of storm drainage calculations and any other support information are required with the first submittal. Calculations do not need to be included with re-submittals unless there is a substantial change to the project.
4. For subdivisions and short plats, water system modeling may be required to ensure adequate pressures and fire flow can be achieved. Developer shall be required to upsize any water lines need to achieve the required pressures and flows. The City will perform the water modeling and costs shall be reimbursed to the City by the developer. Three criteria must be met during modeling:
 - System must maintain 30 PSI in pressure zone during Peak Hour Demand
 - System must maintain 20 PSI in pressure zone during fire flows and Maximum Daily Demands
 - System must maintain velocities less than 10 ft/sec during fire flow and Maximum Daily Demands
5. For subdivisions and short plats, a Water and Sewer System Development Fees will be due before Public Works approval of construction drawings. Developer shall deliver single set of paper original plans (22" x 34") with only the cover sheet being mylar with all required utility signatures. All sheets shall be stamped by a Professional Engineer and have a signature block for the City Public Works Director. The Public Works Director will then sign and date each sheet of the plans.
6. After the construction plans are approved and signed by the Public Works Director, a minimum of two (2) full size (22" x 34") paper copies, the original set with mylar cover, four (4) half size (11"x17") and electronic copy in PDF are required (unless stated differently). Approved drawings shall be valid for 12 months from the date of the 1st review letter. If the project has not commenced after 12 months, drawings shall be resubmitted to the City for a re-review and approval. Plan review fees will again be assessed.

7. A Construction Inspection fee in an amount equal to 5% of the public infrastructure construction cost (\$500 minimum) will be collected before issuance of a Notice to Proceed for construction. An itemized engineer's cost estimate is required to determine the inspection fee. The fee is to cover actual costs incurred by the City. If the cost to the City exceeds the amount of the fees paid, the developer shall pay an additional fee prior to final approval.
8. After the construction drawings are approved and fees paid, a pre-construction conference will be scheduled by the contractor/developer and will include representatives from the City, owner, contractor, subcontractors, surveyor, various utilities, agencies and any others who may have an interest in the project or who are likely to be affected by it.
9. The City will issue Notice To Proceed after all required signed copies of construction plans have been received, fees paid (Water and Sewer Development fee, water modeling fee if applies, construction inspection fee), signed HMA Testing and Acceptance Criteria form received, pre-construction conference, site erosion control BMP's, silt fence, Dust Control Plan, 24-Hr emergency contact list, Benton County Destabilization registration, project schedule, and installation of construction entrance.
10. Some projects may be eligible for Waterline or Sewerline Upsize and Traffic Impact Fee Agreements. Such agreements must be approved by City Council prior to the start of project construction. At the final acceptance of the project, the City will honor the conditions of the agreement.
11. After the City Inspector feels all items of work are complete, a final walk-through inspection will be conducted by all affected City divisions and a punchlist of all deficiencies found will be compiled in to a punchlist that will be issued to the Contractor. It is expected that the Contractor will steadily address all items on the punchlist and complete within 10 business days of the date they receive the list.
12. The City will order and install all required signs on City streets for private developments. The City will invoice developer for all materials and labor required for installation. A minimum of 1.0 hours/laborer will be billed for each sign location.
13. Any public infrastructure that is not within a public right-of-way will require an easement prior to final acceptance. A legal description and exhibit map (1-inch boarders) is to be prepared by a professional land surveyor licensed Washington State and is required to be provided to the City both in hard copy and electronic format. The City will insert the easement information on to the proper form for property owner to sign. Owner shall recorded the document with Benton County. In general, all sewer mains require a 20-foot easement. Water mains, storm mains, irrigation mains and franchise utilities require a 10-foot easement. Developer shall be responsible to record and pay for all associated fees. Copy of recorded documents shall be provided to the City.
14. After all punchlist items have been completed, easement documents recorded with Benton County, "Record Drawings/As-Builts" (mylar, AutoCAD 2017, and PDF) have been provided, the City will issue a final Letter of Acceptance for the project. For subdivisions and short plats, letters of acceptance will be required from all utilities providing services to the development prior to final acceptance of project.
15. If a Developer wishes to record a plat prior to all work being completed, a performance bond, or cashier's check in lieu of a bond, may be issued to the City to allow early acceptance of the plat. For a performance bond to be considered by the City, all lots must meet the current International Fire Code for fire protection and access and City must receive approval letters from the servicing Utilities. The bond amount will be determined by the City Engineer based on all unfinished or unaccepted work remaining to be completed. The bond will be 150% of the calculated amount. It is the understanding of the City that all incomplete work will be promptly completed. If work is not completed in a continuous and timely manner, the City reserves the right to contact the bonding agency or use held moneys to complete the work as approved in the plans. The City reserves the right to not grant the option of a performance bond on any project if it feels it is in the best interest of the City.
16. The Developer or Contractor shall submit a One-Year Maintenance Bond, or cashiers check in lieu of a bond, in the amount of 5% of the public infrastructure construction costs. The bond will be held for a period of one-year from the date accepted by Public Works or the City Council, whichever is the later. After one year, the City will inspect the infrastructure for any deficiencies that may exist. The City will

reimburse the contractor/developer the amount of the bond if no deficiencies exist or after all listed deficiencies are repaired. In the event that the repairs are not completed, the City will use the money to have the repairs completed. If held funds are insufficient, the Developer will be invoiced for remaining balance to fully reimburse the City for equipment, labor and materials required to complete the works.

17. In locations where unusual conditions exist as determined by the City Engineer, such as high groundwater, steep slopes, or questionable material, a geotechnical report will be required.
18. Roadways sections may be required to be designed by a Licensed Profession Engineer based on site conditions and set design criteria. See Section 3-D of these guidelines for more information.
19. The Developer is advised that the Department of Ecology has determined infiltration facilities are Class V injection wells. Effective February 3, 2006 and prior to acceptance of the project by the City, the owner of the facility must register the drywell/infiltration system with the Washington State Department of Ecology. Registration forms may be obtained from the Department of Ecology web page at: http://www.ecy.wa.gov/programs/wq/grndwtr/uic/registration/reg_info.html.
20. The Developer may be required to apply for a Construction Stormwater General Permit with the Washington State Department of Ecology if there is a possibility stormwater could run off of the site during construction and into surface waters or conveyance systems leading to surface waters of the State. Additional information can be found on the Department of Ecology website: www.ecy.wa.gov/programs/wq/stormwater/index.html.
21. It is the responsibility of the Developer to purchase and install mail box cluster units (CBU) per Richland Post Office standards. Coordinate with Joe Spry at 967-0400. Developer shall install 10 LF of sidewalk in front of CBU. For rural roadways, a 30-foot long by 10-foot wide asphalt turn-out shall be constructed with 30-foot tapers on each side.

SECTION 2 - CONSTRUCTION PLANS

All public infrastructure construction plans shall contain the following minimum information. Additional information shall be added by the design engineer or may be required by the City to address specific concerns for each project.

A. GENERAL

1. The cover sheet shall include the following:
 - a. The title of the project.
 - b. The name, address and phone number of the owner and engineer
 - c. A vicinity map that clearly indicates the project location.
 - d. Section, Township, and Range
 - e. General construction notes. (See Section 4)
 - f. The survey benchmarks (minimum of 2) used for the project with tie to project. The benchmark shall be on City of West Richland datum (ROS 3910).
 - g. A sheet index.
 - h. A legend.
 - i. An overall plan view of the project.

- j. For subdivisions and utility improvement drawings, a signature block shall be included for all utilities that have a franchise permit covering the area of the project, whether they will provide service or not.
2. All sheets shall have a signature block for the City of West Richland Public Works Director approval.
3. For plats and short plats, one sheet (preferably the cover sheet or 2nd sheet) shall show all property line lengths, square footage of proposed lots, lot numbers, phasing, and existing and proposed easements and right-of-way.
4. All sheets shall be stamped and signed by a currently licensed professional engineer registered in the State of Washington. Electronically reproduced signatures will not be accepted.
5. All sheets shall be drawn on standard 22" x 34" format.
6. All sheets shall include a north arrow and bar scale.
7. All sheets shall be drawn at a scale that is large enough to clearly depict the proposed construction. Sheets shall be drawn at one of the following scales:

1" = 10', 1" = 20', 1" = 30', 1" = 40', 1" = 50'
8. All sheets shall include a version of the note "CALL 811 BEFORE YOU DIG."
9. Typical cross sections of all streets shall be shown in the plans.
10. Match lines are required at breaks between sheets.
11. Any construction details not included in the City Standard Details shall be shown on the plans unless required by City Engineer.
12. All existing and proposed facilities shall be shown in the plans.
13. All existing and proposed easements and property lines shall be shown on the plans.
14. All existing and proposed underground pipes shall be shown in the plan and profile views.
15. The location and depth of existing facilities should be verified if there is a potential conflict with proposed facilities.
16. All street, water, sewer and storm drainage work shall be drawn on standard plan and profile sheets. Whenever it is feasible, street, water, sewer and storm drainage work shall all be shown on the same plan and profile sheets. If the project has on-site water line work only then the profile requirement may be waived with the approval of the City Engineer. The limits of work shown in the profile view on each sheet shall match the limits of work shown in the plan view on that sheet. The plan and profile sheets shall show the minimum information listed in Sections B thru L of this document. Additional information shall be shown when needed to clearly specify the proposed work.

B. WATER, PLAN VIEW

1. Location, size, length, and material type of all water mains.
2. Location, size, and type of all water valves and fittings.
3. Location and size of all blow-offs, air relief valves, pressure reducing valves, tees, bends, caps, thrust blocks, service lines, fire hydrants, and any other water facilities.

4. 10-foot horizontal spacing shall be maintained between domestic water and sanitary sewer mainlines and service lines.
- C. WATER, PROFILE VIEW
1. Location, depth, size, and material type of all water mains.
- D. SANITARY SEWER, PLAN VIEW
1. Location, size, and material type of all sewer mains.
 2. Location and number designation of all manholes, cleanouts and lift stations.
 3. Location and size of all service lines, cleanouts, and any other sewer facilities.
 4. 10-foot horizontal spacing shall be maintained between domestic water and sanitary sewer mainlines and service lines.
- E. SANITARY SEWER, PROFILE VIEW
1. Location, size, length, material type, and slope of all sewer mains.
 2. Location, size, number designation and rim elevation of all manholes, cleanouts, and lift stations.
 3. All pipe invert elevations at all manholes, cleanouts, and lift stations.
- F. STORM DRAINAGE, PLAN VIEW
1. Location, size, length, slope, and material type of all storm drainage mains.
 2. Location and number designation of all manholes, inlets, drywells, percolation trenches, and catch basins.
 3. Location and size of any other storm drainage facilities.
- G. STORM DRAINAGE, PROFILE VIEW
1. Location, size, number designation, rim and grate elevation of all manholes, inlets, catch basins and percolation trenches.
 2. Location, size, length, material type and slope of all storm drainage mains.
 3. Designate rock envelope width and barrel depth on proposed drywells.
- H. STREETS, PLAN VIEW
1. Contours of the existing ground.
 2. Bearing and distance of all straight portions of the road centerline.
 3. Radius, length, tangent length, and central angle of all centerline curves and curb line curves.
 4. Survey monuments along the road centerline at all ends of curves, intersection points, angle points and center of cul-de-sacs.
 5. Centerline road station every 100-ft. with 50-ft. tics and at all ends of curves and angle points.
 6. Intersection station equations.

7. Flowline slopes of all proposed curb and gutter at intersections and locations where slope varies from proposed road centerline grade.
8. Curb return data including PT/PC elevations, length, and any grade breaks. All ADA ramps shall not exceed 2% across limits of ramp parallel to roadway.

I. STREETS, PROFILE VIEW

1. Existing ground at centerline of road.
2. Location and slope at centerline of proposed road.
3. Location, length, and data for all vertical curves.
4. Centerline elevation at all ends of curves, intersection points, angle points and changes of slope.
5. Crosswalks between pedestrian ramps shall be designed to City standard details and ADA requirements, and shall have cross-slopes no greater than 2%. The road profile shall be designed to accommodate this to all extents feasible.
6. Finish grade and existing ground elevations at bottom of profile grid.

J. IRRIGATION, PLAN VIEW

1. Location, size and material type of all irrigation facilities located within the limits of the proposed work.

K. IRRIGATION, PROFILE VIEW

1. Location, size, depth and material type of all irrigation facilities located within the limits of the proposed work (required only when inside roadway prism or crossing).

L. STREET LIGHTING/UTILITY PLAN VIEW

1. Location of all street lights, junction boxes, disconnect boxes and underground lines.
2. All street lighting, wire sizes, conduit sizes, pole specifications, details and other information required by the City Engineer shall be shown on a separate street lighting sheet.
3. Location of all transformers, vaults, boxes, underground lines, overhead lines and any other existing or proposed facilities.

SECTION 3 - DESIGN GUIDELINES

The following guidelines shall be used for the planning and design of public infrastructure. Some of the items listed in this section may need to be modified by the City Engineer to address specific circumstances for each project.

All materials shall be per the City pre-approved materials list. If a Contractor wishes to use a product not listed in the approved materials list, they must submit proposed material with data showing it meets or exceeds the approved material. The City will review the submittal and provide an acceptance or rejection notification on the material.

All designs and construction shall be per the current WSDOT Standard Specifications, City of West Richland General Special Provisions, and the City of West Richland Standard Details.

A. WATER

1. Minimum 10-foot wide water easements are required for all public waterlines not located within a dedicated public right-of-way.
2. Water line alignment shall be 6-foot from roadway centerline and shall remain at this offset when feasible with the use of fittings.
3. Recorded easements shall be provided prior to final acceptance of the project if not created as part of the plat.
4. Each water service shall have its own dedicated connection to the main line.
5. Water services are typically installed in the road right-of-way near property lines between lots. Boxes are typically paired and do not share a property corner with a proposed power transformers.
6. Water services shall not be located within driveways or driveway transitions.
7. Water service shall be stubbed a minimum of 18-feet behind property line or back of easement (whichever is further). Stub shall be marked with pressure treated 2x4 painted blue.
8. Service taps on PVC mains shall be 18-inches apart if staggered on either side of the main. If they need to be on the same side of the main they must be 36-inches apart. No service tap should be closer than 3-feet to a pipe bell.
9. Live water line taps or cut-ins to existing water lines shall be performed by the Developer's Contractor under direct supervision of a City representative. The contractor shall supply all materials, excavation and perform connection to existing City water lines. Contractor is required to schedule work with the City 2 business days prior to work being performed. No live tap or cut-ins on Fridays and no water shut downs on Fridays, Mondays, or day following a Holiday.
10. Water mains in residential areas shall be minimum of 8-inch diameter unless flow analysis, City's Water Comprehensive Plan, or Developer required modeling indicates that a larger pipe is required. Water line upsize agreement may be allowed for water mains larger than required by model results and will require City Council approval. Agreements must be approved by council prior to issuance of Notice to Proceed.
11. Water mains shall be AWWA C900 DR 18 polyvinyl chloride pipe sizes 4-inch to 12-inch and C905 or ductile iron Class 50 sizes 14-inch and larger as approved by City Engineer. Commercial and industrial areas shall be sized a minimum 12-inch, unless otherwise noted by City Engineer.
12. All water mains shall be installed with a minimum of 42-inches of cover.
13. The following options need to be noted on the construction plans when connecting to or extending an existing City domestic water main:
 - A new valve shall be installed at the point of connection to isolate the new, untested water main from the existing City main. This is standard for new construction. Only one connection will be permitted with all other points of connection being equipped with temporary blow-offs for flushing and testing. After testing is complete, the Contractor will connect all remaining points to existing mains (if applicable)
 - Or, the new main shall be installed and pressure tested entirely separate from the existing water stub. After testing is complete, the Contractor will connect all points to existing mains.
14. A minimum of 2 valves are required at each tee (excluding tees for fire hydrant assemblies which only have valve on line to fire hydrant). A minimum of 3 valves are required at each cross. City Engineer may require additional valves.

15. Valves 12-inch and smaller shall be gate valves. Valves larger than 12-inch shall be butterfly valves. 12-inch valves may be butterfly style with approval from the City Engineer.
16. An air/vacuum valve assembly is required at all high points in the water system as determined by City Engineer.
17. A minimum horizontal separation of 10-feet shall be maintained between water mains and sewer mains and service lines. Water mains should cross over the top of sewer mains with a minimum vertical separation of 18-inches. Any crossing with a vertical separation of less than 18-inches or any crossing in which the water main crosses below the sewer main shall be in accordance with Washington State Department of Ecology's publication "Criteria For Sewage Works Design", Orange Book. (sewer lines shall be constructed of water-class pipe, crossing pipes shall be centered so that the ends are equidistant from one another, intersections of pipes shall be encased in concrete, etc.). Pressure sewer mains shall NOT cross over potable water mains in any case. If a minimum vertical separation of 12-inches cannot be maintained between storm pipe and water or sewer pipe, commercial concrete shall be used as backfill in place of soil or gravel.
18. Fire hydrants shall be located 2-feet behind the back of sidewalk to the face of storz adaptor/sideport where the sidewalk is adjacent to the curb and 3-feet behind the back of curb where there is separated sidewalk.
19. Fire hydrants shall be located at the ends of curb returns or at property lines between lots and shall not be located within driveways, driveway transitions, handicap ramps nor directly on property corner.
20. Fire hydrants shall be installed at all intersections and spaced at a maximum of 400-feet in residential areas. The final decision on hydrant locations will be made by the City Engineer.
21. All fire hydrants shall have the following minimum clearances:
 - 3-feet from any obstacle
 - 5-feet from poles, transformers, etc.
 - 5-feet from shrubs
 - 10-feet from trees
 - 1-foot from property pin (measured parallel to street centerline)
22. No bends are allowed in fire hydrant runs without approval of City Engineer.
23. Fire hydrants must be fully restrained 6-inch ductile iron pipe from tee to hydrant assembly (no shackle rods allowed)
24. If a new utility line crosses under an existing asbestos cement water pipe, a section of the asbestos cement water pipe shall be replaced prior to the undermining. Replacement pipe shall be per City piping standards and Section 7-09.3(12) of the City Special Provisions.
25. Water mains shall be extended 10-feet into to all adjacent properties.
26. Water main pipe may only be deflected a maximum of 50% of the manufactures recommendations at joints only. Bending of pipe is not allowed.

B. SANITARY SEWER

1. Minimum twenty foot sewer easements are required for all sewer mains not located within a dedicated public right-of-way.
2. All sanitary sewer design shall be in accordance with the Washington State Department of Ecology publication "Criteria for Sewage Works Design."
3. Sewer line shall designed at a 6-feet offset from centerline of roadway on the opposite side of the roadway as the water line. Variation of this must be pre-approved by the City Engineer.

4. When sewer lines are within a roadway curve, additional sewer manholes shall be installed to keep the required 6-foot offset from centerline. Some variations may be approved by the City Engineer. Manholes are required at all angle points and all changes in slope. Curved sewer lines are not allowed.
5. Sewer services shall extend a minimum of 18-feet beyond the right-of-way or back of easement and the pipe end shall be capped and marked per City detail. Services are typically located in the middle of the lot however variations may be approved by the City Engineer.
6. The length of pipe between manholes shall not exceed a distance of 400-feet for pipes smaller than 12-inch and shall not exceed a distance of 600-feet for pipes 12-inch and larger.
7. A cleanout is allowed at the end of a sewer main in place of a manhole if the length of the sewer line from the last manhole does not exceed 150-feet and contains 2 or less services.
8. All sewers shall be designed and constructed to give velocities, when flowing full, of not less than 2.0 fps. Where velocities greater than 15 fps are expected, special provisions shall be made to protect against internal erosion or displacement. Minimum sewer slopes are as follows:

8" pipe	0.40%	18" pipe	0.12%
10" pipe	0.28%	21" pipe	0.10%
12" pipe	0.22%	24" pipe	0.08%
14" pipe	0.17%	27" pipe	0.07%
15" pipe	0.15%	30" pipe	0.06%
16" pipe	0.14%	36" pipe	0.05%

9. Sewer mains should not exceed a slope of 5% if possible. If sewer slopes in excess of 10% are required then the use of energy dissipaters and pipe restraints shall be investigated. Sewers on a 20-percent or greater shall be anchored securely with concrete anchors. Suggested minimum anchorage spacing is as follows:
 - Not over 36-feet center-to-center on grades of 20% to 35%.
 - Not over 24-feet center-to-center on grades of 35% to 50%
 - Not over 16-feet center-to-center on grades of 50% or more
10. Sewer mains should be installed with a minimum of 4-feet of cover. If a sewer main must have less than 4 feet of cover then the need for structural protection shall be investigated.
11. Sewer pipe sizes 8-inch to 15-inch shall be constructed out of ASTM D3035 SDR35 polyvinyl chloride (PVC) pipe. Sizes 18-inch to 48-inch shall be SDR 26 ASTM F679 PVC pipe.
12. Sewer mains over 15-feet deep shall be constructed out of SDR26 PVC. C900, C905, and ductile iron pipe can be used, but SDR26 PVC is preferable as the fixtures and joints are more conductive as sewer main material. The entire main from manhole to manhole shall be the same material. Private sewer service lines over 15-feet deep shall also be constructed of the same material, then transition to regular sewer piping above 15-feet.
9. A minimum horizontal separation of 10-feet shall be maintained between water mains and sewer mains and service lines. Water mains should cross over the top of sewer mains with a minimum vertical separation of 18-inches. Any crossing with a vertical separation of less than 18-inches or any crossing in which the water main crosses below the sewer main shall be in accordance with Washington State Department of Ecology's publication "Criteria For Sewage Works Design", Orange Book. (sewerlines shall be constructed of water-class pipe, crossing pipes shall be centered so that the ends are equidistant from one another, intersections of pipes shall be encased in concrete, etc.). Pressure sewer mains shall NOT cross over potable water mains in any case. If a minimum vertical separation of 12-inches cannot be maintained between storm pipe and water or sewer pipe, commercial concrete shall be used as backfill in place of soil or gravel.

10. Sewer mains stubbed for future extension shall be run at minimum grade to extend the potential service area and have a manhole or cleanout at the end of the stub unless otherwise approved by the City Engineer.
11. Sewer mains shall be extended 10-feet into all adjacent properties. The sewer main may need to be extended further if it is deep, and/or the native soils are prone to sloughing or caving. This is needed to keep from undermining the roadway when the main is extended in the future.
12. All commercial businesses shall have a minimum 6-inch service.
13. Industrial/commercial businesses producing non-domestic strength wastewater will be required to provide and install a monitoring station. The City Engineer will provide details on the requirements for the monitoring station, which will include at minimum a flumed manhole, flow metering equipment, sampler, and pH measurement devices. The equipment will be owned and maintained by the City and must be accessible by City staff at all times. The user will be required to enter into a use agreement with the City prior to discharge.

C. STORM DRAINAGE

1. Earth disturbing projects shall have an erosion and sedimentation control plan (ESC) indicating how existing downstream storm systems and properties will be protected from storm runoff.
2. The applicant's project may require coverage under the Washington State General NPDES Permit for Construction projects. The Developer shall be responsible for compliance with the State stormwater permit conditions.
3. All public storm drainage systems not part of a linked piping network shall be designed following the core elements defined in the latest edition of the Stormwater Management Manual for Eastern Washington (SMMEW). The Hydrologic Analysis and Design shall be completed based on the following criteria: Washington, Region 2, Benton County; SCS Type 2 – 24 Hour storm for storm volume with a 25-year storm return period.
4. Stormwater reports shall include but is not limited to the following:
 - a. Introduction – This should identify the drainage impacts resulting from the development and describe the improvements that are necessary to treat the impacts that the stormwater will have on the site.
 - b. Narrative
 - i. Project Description – This should also include a description of the drainage basins.
 - ii. Pre-Development Basing Information – This should state what the pre-design conditions are (wetlands, structures, surfacing, use, etc)
 - iii. Design Assumptions – Infiltration rates, CN values, supporting table values, reference to the geotechnical report.
 - c. Design Criteria – This section should describe how the 8 Core Elements are being met per the Stormwater Management Manual for Eastern Washington (SMMEW).
 - d. Design Calculations and Methodology – This section should include all modeling/routing calculations with the supporting graphs, table, etc.
 - e. Conclusion – This should include a basin summary. Each basin shall have the basin area, volume, proposed length of infiltration trench or number of drywells with depth and rock envelope thickness stated.
 - f. References/Appendices – Copy of geotechnical Report, Infiltration Test Report, detailed drainage basin map (with areas and locations of drainage structures and features)
5. The flow-rate of public storm drainage systems which are a linked piping network shall be designed using the 2-Year, 3-Hour short duration Eastern Washington storm for pipe and inlet sizing using the SCS or Santa Barbara method; no modifying or adding time of concentration; no surcharging of pipes or structures allowed without approval of the City Engineer. Profile of the system showing the hydraulic grade line shall be included.

6. For privately owned & maintained commercial, industrial, and multi-family sites the on-site storm drainage system shall be designed following the core elements defined in the latest edition of the SMMEW. The Hydraulic analysis and Design shall be completed based on the following criteria: Washington, Region 2, Benton County; SCS Type 2 – 24 Hour storm for storm volume with a 25-year storm return period. All stormwater must be contained and treated on-site.
7. Networked storm systems on City streets are to have channeled bases on storm drain manholes. Storm drain manholes are required after 3 or more catch basins are collected in a common pipe. Storm water from a networked system discharged to a City owned pond shall be pre-treated by a CDS system or other treatment system designated by the SMMEW and approved by the City Engineer.
8. When designing an infiltration pond as the collection and treatment method for storm runoff, pond must be designed to contain 100% of the design storage assuming no surface infiltration (frozen ground condition when no infiltration structure is located within the pond). Ponds must be designed allowing water to infiltrate/dissipate completely even during frozen ground conditions within 72 hours. Ponds that will be under City ownership and maintenance shall be lined with slope rock unless otherwise approved by City Engineer unless approved otherwise by City Engineer.
9. Field infiltration tests shall be supervised by a professional engineer or geotechnical firm to determine infiltration rates. City Inspector or Engineer must be present to witness testing procedures. When testing with open pit, grounds shall be pre-saturated prior to conducting official infiltration test. Infiltration test shall be conducted at the lowest depth of proposed infiltration structures. A factor of safety of 3 shall be applied to field infiltration rates for design. All properties must conduct site infiltration rates if project includes storm facilities.
10. A minimum of one infiltration test is required per five acres, not to exceed 5 tests (40 acres or less) shall be required. Additional testing may be required by the City Engineer depending on results and soils encountered. Test pits shall be located evenly throughout the site and placed near locations of future stormwater drainage facility locations. Testing on properties larger than 40 acres will be evaluated on a case by case basis.
11. If bedrock or impervious layers are known or expected to be present or of a concern to the City, borings or seismic refraction surveys may be required to determine subsoil conditions and their impacts to site stormwater and lot irrigation. Additional analysis maybe required in the stormwater report in regards to stormwater and development irrigation water if there is a concern of subsurface penetration.
12. All storm calculations are to be stamped by a registered profession engineer licensed in Washington State.
13. If the storm pond slopes are greater than 4:1, then a 6 foot fence will be required around the perimeter of the pond with a minimum 15-foot wide gate for maintenance vehicles. A maintenance road shall be designed to the bottom of the pond from the City Right of Way. City may condition pond with amenities needed for ease of maintenance and aesthetics. The City's maintenance of the City owned pond in the future will consist of trimming weeds to below 6-inches and maintaining the pond for functionality. If the developer wishes for the pond to be landscaped and visually appealing, then a homeowners association should be considered for maintenance responsibilities. This will require an irrigation meter and sprinklers system (with a power source), and the responsibility for all maintenance including but not limited to irrigation repairs, fertilizing, and mowing.
14. A parcel occupied by a City owned public stormwater basin shall be identified as a separate parcel or tract on the final plat and shall be dedicated to the City stormwater utility.
15. All privately owned storm systems shall be operated and maintained per the City of West Richland Municipal Code.
16. A minimum of an oil/water separator is required prior to discharging any storm drainage water from paved surfaces into drainage ditches or a public drainage system from a piped system. The City may

require additional infrastructures dependent on flow of discharge (example: CDS Unit). SMMEW shall be used to determine if additional treatment measures are required.

17. All storm drainage pipes or culverts shall be 10-inch diameter or larger. Minimum slope is 0.5% and minimum cover is 2 feet.
18. Manholes are required at all angle points and all changes in slope. Curved storm drainage lines are not allowed. Catch basins may be used at angle points as approved by the City Engineer.
19. Storm mains shall be constructed out of SDR35, D3035 PVC.
20. Storm drain manholes shall have 2-foot sump when not part of a piped storm network or when required by City Engineer. When part of piped storm network, bases shall be channeled per City Details.
21. The length of pipe between manholes shall not exceed a distance of 400-feet.
22. Catch basins and inlets shall be spaced at appropriate locations to catch all the storm water within the contributing area. The spacing shall be based on inlet capacity and curb line grade and shall not exceed 500-feet between inlet structures. Preferred spacing is in the range of 300-feet. The City Engineer reserves the right to add additional catch basins at locations deemed necessary.
23. Network storm system infrastructure shall be designed to remain with the roadway section excluding ponds or infiltration galleries unless approved by the City Engineer.
24. Valley gutters are not to be used unless approved or required by the City Engineer.
25. Catch basins shall be located at the ends of curb returns or property lines between lots. Catch basins should not be located within driveways or driveway transitions and never in front of pedestrian ramps. Catch basins shall be installed at the ends of roads and the end of property on sub-division phases.
26. The Dept. of Ecology's latest revision of "Guidance for UIC Wells that Manage Stormwater" shall be used for design of all drywell, percolation trenches and other underground stormwater dissipation systems. The entire stormwater collection system shall be in compliance with the current Phase II Municipal Stormwater Permit.

D. STREETS

1. Dead end cul-de-sac streets shall not be longer than 400 feet, measured from the intersection to the start of the bulb.
2. Cul-de-sacs shall have a minimum right-of-way radius of 60 feet and a minimum curb radius of 53 feet.
3. Curb returns at minor intersections shall have a minimum radius of 20 feet. Curb returns at major intersections should have minimum radius of 30 feet but should be evaluated on a case by case basis.
4. All roadways with speeds posted up to and including 45 mph shall have a minimum centerline radii designed per Low-Speed Urban Street Standards in the most recent AASHTO edition unless otherwise approved by the City Engineer. Roadways with speeds posted in excess of 45 mph shall use $e_{max}=4\%$ tables in the latest AASHTO edition to determine minimum radii for design super elevation rates unless approved otherwise by City Engineer. On minor loop local streets and cul-de-sac streets where the street makes a 90 degree plus or minus 5 degree turn, the minimum centerline radius shall be 100-foot. Minor loop street determination will be made by the City Engineer.
5. The minimum grade for all streets is 0.50%. The maximum grade for minor streets is 10%. The maximum grade for major streets is 8%.
6. All streets shall have a minimum cross slope of 2%.

7. All vertical curves shall be designed to provide adequate stopping sight distance per the most current edition of the AASHTO manual. The minimum design speed for residential streets is 25 mph.
8. Refer to the City of West Richland Special Provisions and Details for typical roadway sections. In addition to the street right-of-way as required, an additional public utility easement of 12-feet shall be provided along both sides of all rights-of-ways for local streets, neighborhood collector streets, minor arterial streets, and arterial collector streets. Principle arterial streets shall have 10-feet of public utility easements provided along both sides of rights-of-ways. When local streets have separated sidewalk, an 18 foot sidewalk and utility easement shall be provided along both sides of all rights-of-ways. Street right-of-way and easement widths shall not be less than as follows:

Roadway Classification	Right-of-way Width (Feet)	Utility Easement Width (Feet)	Sidewalk/Utility Easement Width (Feet)
Principle Arterial	90	10	N/A
Principle Arterial w/ Separated Sidewalk	74	N/A	18
Principle Arterial w/ Separated Sidewalk (Limited Access)	90	10	N/A
Minor Arterial / Arterial Collector w/ Separated Sidewalk	60	12	N/A
Minor Arterial / Arterial Collector w/ Separated Sidewalk	50	N/A	18
Minor Arterial / Arterial Collector w/ Separated Sidewalk (Limited Access)	66	10	N/A
Neighborhood Collector	60	12	N/A
Neighborhood Collector w/ Separated Sidewalk	44	N/A	18
Local Street	50	12	N/A
Local Street w/ Separated Sidewalk	40	N/A	18

9. Residential streets shall be constructed with a minimum of 3-inches of HMA Cl. 3/8-inch or HMA 1/2-inch on 8-inches of crushed rock top course on compacted subgrade. A geotechnical report for roadway design may be required by the City Engineer.

10. Major streets and streets in commercial or industrial areas shall require a geotechnical evaluation of existing soils and a roadway section shall be determined by a Licensed Professional Engineer using the set criteria below. In no situation shall a road be constructed with less than 3-inches of HMA CI. 1/2-inch on 3-inches of crushed surfacing top course on 7-inches of crushed surfacing base course on compacted subgrade. All measurements are compacted depths.

Design Parameter	Value	References
Reliability - R		Estimated
Arterial	90%	AASHTO 1993 (80-99%)
Arterial Collector	85%	AASHTO 1993 (80-95%)
Neighborhood Collector	80%	AASHTO 1993 (80-95%)
Local Street	70%	AASHTO 1993 (50-80%)
Standard Deviation - S	0.45	AASHTO 1993
Initial Serviceability - PSI	4.2	Typical Eastern Washington area values
Terminal Serviceability - PSI	2.2	Typical Eastern Washington area values
Design Life	20 Years	Standard Eastern Washington design life
Traffic Loading (ESALs)		
Principle Arterial	3,000,000	2% trucks, 2% growth rate, 1.7 truck factor(ESALs/Truck), >16,000 ADT
Minor Arterial	2,500,000	2% trucks, 2% growth rate, 1.7 truck factor(ESALs/Truck), 4000-16,000 ADT
Arterial Collector	675,000	1.5% trucks, 2% growth rate, 1.7 truck factor(ESALs/Truck), 1500-6000 ADT
Neighborhood Collector	150,000	0.5% trucks, 2% growth rate, 1.7 truck factor(ESALs/Truck), 1500-4500 ADT
Local Street	55,000	0.5% trucks, 2% growth rate, 1.7 truck factor(ESALs/Truck), <1500 ADT

- 11. Sidewalks shall be a minimum width of 5.5-feet (measured from face of curb) and placed on 2-inches of compacted crushed surfacing top course.
- 12. Residential driveways shall have a minimum width of 10-feet and a maximum width of 20-feet for a two car garage, and 30-feet for a three car garage. Non-residential one-way driveways shall have a minimum width of 15-feet and a maximum width of 20-feet. Non-residential two-way driveways shall have a standard width of 40-feet but may be reduced to a minimum width of 30-feet or may be increased to a maximum width of 60-feet if approved by the City Engineer. In no case shall the driveway width exceed 40% of the lot frontage. Deviations from these widths must be granted by the City Engineer.
- 13. Concrete pedestrian ramps shall be installed at the time of plat construction. Truncated domes shall be installed at all sidewalk pedestrian ramps per the City's current Standard Details.
- 14. The preferred pedestrian ramp is the Type Parallel A (City standard detail 2-12A). Pedestrian ramps shall be designed to meet current ADA requirements. If meeting the ADA requirements is not feasible, the Engineer of record must submit a "Maximum Extent Feasible" report explaining why the design cannot meet ADA requirements. The City Engineer will evaluate and approve or reject the justification. Typical ramp locations are to provide pedestrian crossing in all directions. The City Engineer will evaluate anticipated pedestrian routes and safety concerns with unrestricted pedestrian crossings and may add/eliminate certain crossings.
- 15. Roadway profiles shall take into account intersection ADA requirements. Grade changes approaching an existing intersections may be required to facilitate compliant ADA ramps.
- 16. Plans shall provide adequate details at all curb returns for ADA compliance review. Details should show grades and distances to key points around curb return and across ramp, grades in and out of curb returns, etc.

- 17. Street name signs and regulatory signs on minor streets will be located and installed by City crews at the developer's expense. Regulatory signs on major streets will be evaluated on a case by case basis.
- 18. In addition to underground utilities as required by WRMC, the Developer must install conduits, per size and number as directed by City Engineer, at every street intersection or every approximately 300-foot if distance between intersections is greater than 400-foot.

E. SURVEYING

1. SURVEY MONUMENT DESTRUCTION

- A. No survey monument shall be removed or destroyed (*the physical disturbance or covering of a monument such that the survey point is no longer visible or readily accessible*) before a permit is obtained from the Department of Natural Resources (DNR). WAC 332-120-030(2) states "It shall be the responsibility of the governmental agency or others performing construction work or other activity (including road or street resurfacing projects) to adequately search the records and the physical area of the proposed construction work or other activity for the purpose of locating and referencing any known or existing survey monuments." (RCW 58.09.130).
- B. Any person, corporation, association, department, or subdivision of the state, county or municipality responsible for an activity that may cause a survey monument to be removed or destroyed shall be responsible for ensuring that the original survey point is perpetuated. (WAC 332-120-030(2)).
- C. Survey monuments are those monuments marking local control points, geodetic control points, and land boundary survey corners. (WAC 332-120-030(3)).

When a monument must be removed during an activity that might disturb or destroy it, a licensed Engineer or Land Surveyor must complete, sign, seal and file a permit with the DNR. If many monuments are in danger along a proposed construction route, one permit can be issued for the entire project with location and description details outlined for each monument. The permit will alert others that may encounter the construction or maintenance project and location information will be protected until a new monument is placed. In most cases, ***an agency official must be in responsible charge of protecting monuments during maintenance and construction activities within their jurisdiction.***

- 2. All surveys must be tied to a minimum of two City control monuments shown on Record of Survey #3910 and established per Washington South (3602) State Plane (NAD 83/91) coordinates and NAVD 88 elevations. The control monuments must be shown, labeled, and visually tied to project with in the plans.
- 3. All permanent survey monuments existing on the project site shall be protected. If any monuments are destroyed by the proposed construction, the Owner/Developer/Contractor shall retain a professional land surveyor to replace the monuments and file a record survey with the County, and supply a copy to the City.
- 4. All Construction Surveying shall be conducted by a surveyor currently licensed in the State of Washington.

F. STREET LIGHTING

- 1. Plans shall include a sheet dedicated to street light layout. As-builts shall include any light layout changes plus wire runs with wire size, j-boxes, disconnects and any other items related to the lighting system.

2. Street lights shall be located 2-feet behind the back of sidewalk to the face of equipment where the sidewalk is adjacent to the curb, 2-feet from face of curb when separated sidewalk, and 6.5-feet behind edge of asphalt where no curb and gutter is present.
3. Street lights shall be located at every intersection and spaced every 300-feet in residential areas, every 150-feet in commercial and major roadways, and 125-feet on large high density commercial roadways or as determined by the City Engineer. Street lights shall be placed at the ends of curb returns or at property lines between lots. On major/arterial streets, two lights shall be installed at intersections and positioned over the major/arterial roadway.
4. Street lights shall not be located within driveways, driveway transitions, ADA ramps nor on property corners.
5. Street lights shall be offset 1-foot from property pins measured parallel to road centerline.
6. Street lighting designs shall be in accordance with the City of West Richland Standard Details 6-1 through 6-7, the current City of West Richland Special Provisions, and verified with Benton Rural Electric Association (BREA).
7. Luminaires shall be light-emitting-diode (LED) and shall be per City of West Richland Standard Detail 6-2. Lights shall be equipped with an Acuitybrands ROAM photo electric control compatible with ROAMVIEW per City of West Richland Standard Detail 6-2.
8. All street lights shall be wired for 240 Volts.
9. Disconnect shall be lockable in on and off positions.

G. IRRIGATION

1. All subdivisions shall include a complete irrigation system, whether irrigation water is available or not.
2. All irrigation main lines shall be located in a 10-foot irrigation easement. Easements shall be located to one side of property lines (not straddle).
3. Specifications and details shall be per Kennewick Irrigation District or Columbia Irrigation District when within their designated areas. When irrigation is to be installed not in a designated irrigation district, Columbia Irrigation District Standards shall apply.
5. Irrigation pipe sizes 3" and below shall be solvent welded, 4" and above shall have ring gasketed joints. All irrigation mains crossing road right of way shall be constructed with class 150, AWWA C900 polyvinyl chloride pipe or installed in sleeves.

SECTION 4 - TYPICAL GENERAL CONSTRUCTION NOTES (June 2018)

The following notes shall be used when they are applicable to the project. Additional notes shall be added by the design engineer or as required by the City Engineer to address specific concerns for each project.

1. All materials and workmanship shall be in accordance with the latest revision of the City of West Richland Special Provision, City of West Richland Standard Details and the current edition of the State of Washington Standard Specifications for Road, Bridge and Municipal Construction.
2. The placement of fill material on lots exceeding 24-inch shall be placed and compacted in accordance with the latest version of the International Building Code (IBC). The developer shall be responsible for hiring an independent materials testing company to complete and document compaction tests and a licensed professional engineer to certify that the fill placed on lots is buildable meeting the latest version of the IBC. A copy of this certification shall be provided to the City Engineer and City Building Official.

3. First order of work on-site shall be installation of erosion control BMP's, silt fence and construction entrance.
4. Developer must provide to the City a signed and dated copy of the HMA Testing and Acceptance Criteria when applicable and required by the City Engineer.
5. Contractor shall submit a Soil Destabilization Notification on the Benton County Clean Air Authority website and provide the City with a copy of the registration notification.
6. NO work on this project shall commence until a written Notice To Proceed (NTP) has been issued by the City of West Richland. Notice to Proceed will not be issued until General Construction Notes 3, 4, and 5 have been completed. Contractor may begin removal of woody material prior to NTP but no clearing of ground cover or earthwork is allowed until NTP has been issued.
7. Contractor shall clear and grub all vegetation, sage brush and woody materials from entire site including lots unless otherwise approved by City Engineer. All material shall be removed from site and disposed of at an authorized facility. No wood or vegetation shall be buried onsite.
8. All materials shall be in new condition when brought to the job site. Dates stamped on the material shall be clearly visible for inspection by the City. Any pipe over 2 years (24 months) old, or appearing sun-bleached or damaged, will be rejected and shall be removed from the job site immediately.
9. All traffic control devices shall be in accordance with the latest "Manual on Uniform Traffic Control Devices for Streets and Highways."
10. The Contractor and all subcontractors shall be licensed by the State of Washington and bonded to do work in the public right-of-way and have a current City of West Richland business license.
11. The Contractor shall be responsible for any and all construction deficiencies for a period of one year from the date of acceptance by the City of West Richland. On private developments, Developer/Contractor is to provide City with a maintenance bond in the amount of 5% of the total project cost.
12. The contractor shall be required to call 811 a minimum of two business days prior to commencing any excavation activities to determine field locations of all underground utilities.
13. Any changes or modifications to the project plans shall first be approved by the City Public Works Director or his/her representative.
14. Water mains shall cross over the top of sewer mains with a minimum separation of 18". Any crossing with a vertical separation of less than 18-inch or any crossing in which the water main crosses below the sewer main shall be in accordance with Washington State Department of Ecology Standards.
15. The locations of all existing underground utilities as shown on these plans are approximate only. The Contractor shall determine the exact locations of all existing utilities before commencing work and agrees to be fully responsible for any and all damages which might be associated with the failure to exactly locate and preserve any and all underground utilities.
16. The face of curb shall be stamped at all utility crossings, main lines and service lines as follows:

"S" – Sanitary Sewer	"I" – Irrigation	"E" – Electrical
"W" – Water	"C" – Conduits	"G" – Gas

Gutter pan shall receive stamp if face of curb has been depressed at crossing location or stamp is removed during driveway cut process.
17. All sanitary water mains shall have min. 42" cover.

18. All fire hydrants and guard posts shall be painted OSHA safety yellow, Quickset Enamel No. 3472 hydrant yellow as manufactured by Farwest paint manufacturing company or approved equal. A Storz adaptor shall be installed on every fire hydrant.
19. Fire hydrants and street lights shall be installed at 2-feet behind the back of sidewalk to the face of equipment where the sidewalk is adjacent to the curb and 6-feet behind the back of curb where the sidewalk is not adjacent to the curb unless otherwise noted on the plans. Hydrants, nor lights, shall be placed right at property corners, rather shifted slightly to accommodate any property pins.
20. The Contractor shall coordinate location and construction of power, natural gas, telephone and TV cable lines and services with utilities.
21. Contractor to furnish trench and vault excavation and backfill for all utilities. Contractor shall coordinate conduit requirements and schedule the work with each individual utility. Direct bury conduit under streets shall be schedule 80.
22. Contractor to adjust new and existing valve boxes to grade after paving. Contractor is required to replace existing valve boxes not meeting current standard.
23. All tracer wire must be 12 gauge solid copper 600 volt with UF insulator 0.06" nominal thickness minimum and blue in color for water and green for sewer. Wire must be tested and approved by the City prior to sub-grade approval.
24. Sewer service lines shall be no steeper than 45° and no flatter than 2.0%. Minimum depth at curb line is 5-feet. Service lines to be constructed at 2.0% slope where noted on the plans.
25. City to furnish and install permanent street signs. Developer to reimburse City for materials and labor costs prior to final plat approval.
26. Locations of private utilities, as shown on the plans, are suggested locations and may be schematic. Contractor to coordinate field locations with utility.
27. Where necessary to avoid water and storm drain conflicts, Contractor shall construct water lines deeper. Maintain min. 12-inch vertical separation.
28. At minimum, a 20'X40' rip-rap pad shall be constructed at the site. If debris cannot be controlled, the length of construction entrance may be required to be increased or a wheel wash may be required.
29. Where new sanitary sewer or storm drain lines are to be connected to existing manholes or pipes, the Contractor shall dig and verify elevations of existing lines and notify the City Engineer should grades need to be revised.
30. Detectable warning patterns to be armor tile cast in place system detectable warning tiles.
31. Contractor to allow City Engineer and design engineer to inspect each storm drain drywell excavation to evaluate soils and make adjustments if necessary.
32. Developer to purchase and install mail box cluster units (CBU) per Richland Post Office standards. Coordinate with Joe Spry at 967-0400. Developer to install 10 LF of sidewalk in front of CBU. CBU's can not be installed right at property corner as it conflicts with property pins. Contractor to install unit to one side of the pin or other as shown in the plans or directed by City Engineer.
33. After satisfactory health samples, water lines shall be tested at 150 PSI for one hour, no loss. The contractor is responsible to control all flushed water.
34. All fire hydrants are to be restrained from hydrant to tee. Pipe shall be 6-inch ductile iron.
35. Sewer manhole sections shall have rubber "A-Lock" gaskets and shall be grouted and trowled to a smooth finish. All pipe inlets and outlets shall be grouted.

36. Sewer lines shall be air tested per current WSDOT Standard Specifications. Storm sewer lines in excess of 100-LF shall also be air tested.
37. When connecting to existing sewer facilities, downstream pipe shall be sealed off until upstream construction is finished, tested, cleaned, and accepted. All construction debris and water shall be removed prior to opening downstream pipe.
38. It will be the responsibility of the Contractor to flush and clean all sewer and storm mains prior to television inspection.
39. Contractor shall television inspect all sewer main lines. Storm sewer lines shall have television inspection for runs in excess of 100-LF. A ball or equivalent device shall be attached to the camera to show any "belly" in the line which may exceed 3/4-inch in depth. Inspection shall be recorded on DVD and viewable thru a Windows Media Player. Video must be submitted to City Engineer for approval.
40. All disturbed areas to be hydroseeded with tackifier with dry land seed mix.
41. Contractor must have a verbal approval from City Inspector prior to any placement of roadway rock.
42. All catch basins shall have an ADS 90° bend with tapered end for oil/water separation. Storm sewer pipe shall be stubbed into catch basins 2-inches and a 3/8-inch diam. stainless steel lag screws 1-1/2-inch long with 1/2-inch Hex Head shall be used to anchor ADS 90 to storm pipe.
43. Roadway Staking
 - Subgrade and Base Course: Residential streets, subgrade and base course are to be blue-topped on centerline and curb line. 40' and wider streets shall also include quarter crown stakes.
 - Top Course: For all streets, top course to be red-topped on centerline and quarter crown.
44. All construction surveying must be done by a licensed surveyor.
45. All roadway paving on City streets up to 36-foot wide curb-to-curb shall be paved with two pulls placing pavement joint along roadway centerline. City Engineer shall give pre-approval to proposed pavement joints when City streets are wider than 36-foot curb-to-curb.
46. At locations where irrigation and storm pipe cross a domestic watermain, the length of irrigation/storm pipe shall be centered at the point of crossing so that the joints will be equidistant and as far as possible from the watermain. The irrigation/storm pipe shall be the longest standard length available from the manufacture. On irrigation pipe only, the nearest joint on either side of the crossing shall be restrained.
47. All ductile iron for the following items shall be domestic products made in the USA: pipe fittings, bolts, accessory kits, valve boxes, rings and covers, lids, grates, and monument frame and covers.
48. All wetted materials, including rubbers, plastics, adhesives, lubricants, etc. must meet NSF Standard 61 Lead Leach limit of allowable lead at 5 ppb maximum. Products must be stamped No Lead (NL) or submittals provided to the City Engineer indicating the products meet the no lead requirements.
49. Pedestrian ramps must meet current ADA guidelines unless a Maximum Extents Feasible report has been submitted and approved by City Engineer. Curb ramp running slopes shall not exceed 8.33% at any location across the curb ramp. Curb ramp lengths must be extended to satisfy the minimum slope of 8.33%. The curb ramp maximum running slope shall not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely. When extending curb ramp lengths, both ramp lengths shall match in length for that specific ramp.
50. City reserves the right to change any items on approved plans until the project has been accepted.
51. Materials shall be from pre-approved City Materials List. Any substitutions or approved equal materials shall be submitted to City Engineer.

COMPACTION STANDARDS

ACP- 91% maximum density AASHTO T209

Crushed Rock Top Course- 95% AASHTO T180

Crushed Rock Base Course- 95% AASHTO T180

Road Sub Grade- 95% AASHTO T180 or 98% AASHTO T99

STREET LIGHTING NOTES

1. All new lights shall be wired for 240V.
2. Street lighting system to be furnished and installed in conformance with the City of West Richland Special Provisions and Standard Drawings 6-1 through 6-7.
3. The Benton R.E.A. will make approval of the power source in all situations. It is the Contractor's full responsibility to verify the luminaires ordered are compatible with the power voltage that is available.
4. Contractor shall not connect additional or new light circuits without Benton R.E.A. approval. All connections shall be done in coordination of Benton R.E.A.
5. All disconnects must be lockable in the on and off positions.
6. As-built street light layout and light wire diagram must be submitted to the City Engineer for field verification prior to being incorporated in final project mylar. Final approval of lighting system will not be granted until field verification of the as-built information is approved by the City Engineer.
7. Any discrepancies or clarifications shall be discussed and approved with the City Engineer prior to ordering or installation of street light infrastructure.