



CITY OF WEST RICHLAND

CIVIL AND UTILITY ENGINEERING

PUBLIC INFRASTRUCTURE CONSTRUCTION PLAN REQUIREMENTS AND DESIGN GUIDELINES

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. 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 (24" x 36"). Subsequent re-submittals shall also require two copies unless otherwise differently.
2. 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.
3. The plan review fee for subdivisions/short plats is \$200/Lot with a maximum of \$2500. The fee is due prior to review. For Utility and/or Street Extension plan review fees shall be \$500 minimum. The fee is to cover actual costs incurred by the City and any deficiency shall be paid prior City approval of the final improvement plan.
4. For subdivisions and short plats, a Water System Development Fee will be due before Public Works approval of construction drawings. Developer shall deliver single set of paper original plans (24" x 36") with only the cover sheet being mylar which has all required utility signatures. All sheets shall be stamped by a Professional Engineer. The Public Works Director will then sign and date each sheet of the plans.
5. After the construction plans are approved and signed by the Public Works Director, a minimum of four full size (24" x 36") paper copies and the original set with mylar cover are required (unless stated differently). Approved drawings shall be valid for 12 months. 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.
6. 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 with 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 before final approval.
7. After the construction drawings are approve 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, other agencies and others who may have an interest in the project or who are likely to be affected by it.

8. City will issue Notice To Proceed after all construction plans have been received, fees paid, signed HMA Testing and Acceptance Criteria form received, pre-construction conference, site erosion control BMP's, silt fence, and construction entrance have been installed and approved.
9. After 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 will be compiled.
10. 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 prepared by a currently licensed Washington State professional land surveyor is required to be provided to the City both on hard copy and electronically. The City will put the easement on the proper form for property owner to sign and have the document recorded with Benton County. In general, all sewer mains require a 20' easement. Water mains, storm mains, irrigation mains and franchise utilities require a 10' easement.
11. After all punchlist items have been completed and easement documents, "Record Drawings/As-Builts" (mylar, electric in AutoCAD 2014, 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.
12. The developer or contractor shall submit a 1-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 1-year from the date accepted by Public Works or the City Council, whichever is the later. After 1 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.
13. 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.
14. The developer is advised that the Department of Ecology has determined that 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.
15. 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 that 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.
16. It is the responsibility of the Developer to purchase and install mail box cluster units per Richland Post Office standards. Coordinate with Brenda Nickles at 967-0400 Developer to install 10 LF of sidewalk in front of mail box cluster units. 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.
 - c. The name, address and phone number of the engineer.
 - d. A vicinity map that clearly indicates the project location.
 - e. General construction notes. (See Section 4)
 - f. The survey benchmark used for the project with tie to project. The benchmark shall be on City of West Richland datum.
 - g. A sheet index.
 - h. A legend.
 - i. An overall plan view of the project.
 - j. For subdivisions, 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. 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.
4. All sheets shall be drawn on standard 24" x 36" format.
5. All sheets shall include a north arrow and bar scale.
6. All sheets shall be drawn at a scale that is large enough to clearly depict the proposed construction.
7. All 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 the note "CALL TWO BUSINESS DAYS BEFORE YOU DIG, DIAL 811 OR 1-800-424-5555."
9. Cross sections of all streets shall be shown on 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.
12. All existing and proposed facilities shall be shown on 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 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. 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 following minimum information. 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, length 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 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 and material type of all storm drainage mains.
2. Location and number designation of all manholes, inlets and catch basins.
3. Location and size of any other storm drainage facilities.

G. STORM DRAINAGE, PROFILE VIEW

1. Location, size, length, material type and slope of all storm drainage mains.
1. Location, size, number designation, rim elevation and grate elevation of all manholes, inlets and catch basins.

2. All storm manholes shall have a 2-foot sump in the bottom of them.

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 and top of curb or flowline elevations at all ends of curves, angle points and changes of slope.
6. Flowline slopes of all proposed curb and gutter at intersections and locations where slope varies from proposed road centerline grade.
7. Survey stations along the centerline of road.

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 A.D.A. guidelines, and shall have cross-slopes less than 2%. The road profile shall be designed to accommodate this.

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.

A. WATER

1. Minimum ten foot wide water easements are required for all public waterlines not located within a dedicated public right-of-way.
2. Recorded easements shall be provided prior to final acceptance of the project if not created as part of the plat.
3. Each water service shall have its own dedicated connection to the main line.
4. 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 transformer.
5. Water services shall not be located within driveways or driveway transitions.
6. Water service shall be stubbed 12 feet behind property line if no gas is present in easement behind the right of way and 17 feet if gas is present. Stub shall be marked with pressure treated 2x4 painted blue.
7. Service taps on PVC mains shall be 18-inches apart and staggered either side of the main. If they need to be on the same side of the main then they need to be 36-inches apart.
8. 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.
9. Water mains in minor streets shall be 8-inch diameter unless flow analysis or the City's Water Comprehensive Plan or developer required modeling indicates that a larger pipe is required. Water mains in major streets shall be as indicated in the Water Comprehensive Plan or as determined by the City Engineer.
10. 8-inch water mains in residential areas shall be AWWA C900 DR 18 polyvinyl chloride pipe. Commercial and industrial areas shall be sized a minimum 12", unless otherwise noted by City Engineer. Water mains larger than 12-inch shall be AWWA C905 or ductile iron, as approved by the City Engineer.
11. All water mains shall be installed with a minimum of 42-inch of cover.
12. 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 applies)
 - 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.
13. A minimum of 2 valves are required at a tee. A minimum of 3 valves are required at a cross.
14. Valves 12" 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.

15. An air/vacuum valve assembly is required at all high points in the water system.
16. A minimum horizontal separation of ten-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 standards (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, CDF shall be used as backfill in place of soil or gravel.
17. Fire hydrants shall be located 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.
18. Fire hydrants shall be located at the ends of curb returns or at property lines between lots.
19. Fire hydrants 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 approximately 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 restrained from tee to hydrant assembly.
24. Pipe from tee to hydrant assembly shall be 6-inch ductile iron pipe.
25. 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 ductile iron in commercial areas and PVC in residential areas.
26. Water mains shall be extended to all adjacent properties, 10-feet past the end of pavement.
27. Water main pipe may only be deflected a maximum of 50% of the manufactures recommendations at joints only.

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 services shall extend 10 feet beyond the right-of-way and the pipe end shall be capped and marked. Services are typically located in the middle of the lot.
4. Manholes are required at all angle points and all changes in slope. Curved sewer lines are not allowed.
5. The length of pipe between manholes shall not exceed a distance of 400 feet for pipes smaller than 12" and shall not exceed a distance of 600 feet for pipes 12" and larger.
6. 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.
7. 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%

8. 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-percent.
 - Not over 24-feet center-to-center on grades of 35 to 50-percent
 - Not over 16-feet center-to-center on grades of 50-percent or more
9. 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.
10. 8-inch to 15-inch sewer mains shall be constructed out of ASTM D3035 SDR35 polyvinyl chloride (PVC) pipe.
11. 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 conducive to use 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.
12. A minimum horizontal separation of ten-feet shall be maintained between water mains and sewer mains and service lines. Sewer service lines or mainlines that cross within 18-inches of water mains or over water mains will be required to comply with Dept. of Ecology standards (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 pipes and water or sewer pipes, CDF shall be used as backfill in place of soil or gravel.
11. Sewer mains that are stubbed for future extension shall have a manhole or cleanout at the end of the stub.
12. Sewer mains that are stubbed for future extension shall be run at minimum grade to extend the potential service area unless otherwise approved by the City Engineer.

13. Sewer mains shall be extended to all adjacent properties, 10-feet past the end of pavement. 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.
14. All commercial business shall have a minimum 6" service.
15. Industrial/commercial industries 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 site shall be protected from the public in a fenced area, and be available at all times for City access. The user will be required to enter into a use agreement with the City prior to discharge.

C. STORM DRAINAGE

1. All submittals shall contain 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 which are 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. 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. 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 Barbra method; no modifying or adding time of concentration; no surcharging of pipes or structures allowed. Profile of the system showing the hydraulic grade line shall be included.
5. 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 Stormwater management Manual for Easter Washington. 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.
6. 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 infiltration (frozen ground condition). In order to use infiltration, infrastructure must be design into the pond that allows water to infiltrate even during frozen ground conditions.
7. 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 depth of proposed infiltration structures. A factor of safety of 3 shall be applied to field infiltration rates for design.
8. All storm calculations are to be stamped by a registered profession engineer in Washington State.
9. If the storm pond slopes are greater than 4:1, then a fence will be required around the perimeter of the pond with a minimum 15-foot wide gate for maintenance vehicles. A maintenance road to the bottom of the pond from the City Right of Way will also be needed. The city's maintenance of the pond in the future will consist of trimming weeds to keep them below 6-inches and maintaining the

pond for functionality. If the developer wishes for the pond to be landscaped and visually appealing, then the homeowners association should be considered for maintenance responsibilities. This will require an irrigation meter and sprinkler system (and a power source), and responsibility for mowing grass.

10. A parcel occupied by a 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.
11. The City may require a Stormwater Maintenance Agreement be recorded for privately owned storm systems which will ensure the system is maintained and managed as originally designed.
12. An oil/water separator is required prior to discharging any storm drainage waters from paved surfaces into drainage ditches, groundwater or a public drainage collection system.
13. All storm drainage pipes or culverts shall be 10" diameter or larger. Minimum slope is 0.5%.
14. 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 in certain circumstances as approved by the City Engineer.
15. Storm mains shall be constructed out of SDR35 PVC.
16. Storm drain manhole with solid lids shall have a channeled base and all catch basin manholes shall have a sump in the bottom in accordance with the approved standard details. City Engineer may require sump in manholes. When required, storm manholes shall have a 2-foot sump.
17. The length of pipe between manholes shall not exceed a distance of 400 feet.
18. 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. City Engineer reserves the right to add addition catch basins at locations he/she deems needed.
19. Valley gutters are not to be used unless pre-approved by the City Engineer.
20. Catch basins should 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.
21. The Dept. of Ecology's latest revision of "Guidance for UIC Wells that Manage Stormwater" shall be used for design of all drywell, French drain and other underground stormwater dissipation systems. The entire stormwater collection system shall be in compliance with the 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. Horizontal curves in minor streets shall have a minimum centerline radius of 100 feet. Curves in major streets shall have a minimum centerline radius of 300 feet.

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. The minimum design speed for residential streets is 25 mph.
8. Standard residential streets shall have a 50 foot wide right-of-way and a 36 foot wide street from face of curb to face of curb. Narrower streets may be allowed by the City Council but on-street parking will be restricted and the developer will be required to pay for all parking restriction signs.
9. Residential streets shall be constructed with 2-inches of HMA Cl. 3/8" or HMA 1/2" on 6" of crushed rock top course on compacted subgrade. Major streets and streets in commercial or industrial areas shall be constructed with 3" of HMA Cl. 1/2" on 3-inches of crushed surfacing top course on 7-inches of crushed surfacing base course on compacted subgrade. All measurements are compacted depths. A geotechnical report for roadway design may be required by the City Engineer.
10. Sidewalks shall be a minimum width of 5 feet and placed on 2-inches of compacted crushed surfacing top course.
11. 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 if approved by the City or may be increased to a maximum width of 60 feet if approved by the City. In no case shall the driveway width exceed 40% of the lot frontage. Deviations from these widths must be granted by the City Engineer.
12. Concrete pedestrian ramps shall be installed at the time of plat construction. Truncated domes shall be installed at all sidewalk pedestrian ramps per the standard details.
13. The preferred pedestrian ramp is the Type 2A (City standard detail 2-12A). Pedestrian ramps shall be designed to meet current ADA requirements. If meeting the A.D.A requirements is not feasible, the Engineer must submit a "Maximum Extent Feasible" report explaining why the design can not meet A.D.A. 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.
14. Crosswalks between pedestrian ramps shall be designed to City standard details and A.D.A guidelines and shall have cross-slopes less than 2%. The road profile shall be designed to accommodate this.
15. 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.
16. In addition to underground utilities as required by WRMC 16.16.340, developer must provide at every street intersection or every approximately 300 feet if distance between intersections is greater than 400 feet, blank or vacant conduit installed per the size and number as directed by the City Engineer.

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. Survey 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.
- 3. All permanent survey monuments existing on the project site shall be protected. If any monuments are destroyed by the proposed construction, the applicant shall retain a professional land surveyor to replace the monuments and file a record survey with the County, while supplying a copy to the City.
- 4. All Construction Surveying shall be conducted by a licensed surveyor.

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 sized, 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 and 6.5' feet behind the back of curb where the sidewalk is not adjacent to the curb.
- 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 position over the major/arterial roadway.
- 4. Street lights shall not be located within driveways, driveway transitions, handicap ramps nor on property corners.
- 5. Street lights shall be offset 1 foot from property pins measured parallel to road centerline.

6. Street lighting design shall be in accordance with the City of West Richland Standard Details 6-1 through 6-8 and City of Kennewick Standard Specification 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 a 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 generally be located to one side of all property lines (not straddle).
3. Specifications and details shall be per Kennewick Irrigation District or Columbia Irrigation District.
4. Mains across all road right of way crossings shall be constructed with class 150, AWWA C900 polyvinyl chloride pipe or installed in sleeves.

SECTION 4 - TYPICAL GENERAL CONSTRUCTION NOTES (11-6-15)

The following notes shall be used when they are applicable to the project. Additional notes shall be added by the design engineer or may be 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 Kennewick standard specifications and City of West Richland Standard Details and the current edition of the state of Washington standard specifications for road, bridge and municipal construction. Any reference in the details to City of West Richland Standard Specifications shall be directed to the same section in the City of Kennewick Standard Specifications.
2. The placement of fill material on lots exceeding 24" 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 building inspector.
3. First order of work on site shall be to install 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. 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 and 4 have been completed.
6. 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.
7. 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 severely sun-bleached or damaged, will be rejected and removed from the job site immediately.
8. All traffic control devices shall be in accordance with the latest "Manual on Uniform Traffic Control Devices for Streets and Highways."
9. 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 shall have a current City of West Richland business license.
10. 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.
11. The contractor shall be required to call 1-800-424-5555 a minimum of two business days prior to commencing any excavation activities to determine field locations of all underground utilities.
12. Any changes or modifications to the project plans shall first be approved by the City Public Works Director or his/her representative.
13. 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" or any crossing in which the water main crosses below the sewer main shall be in accordance with Washington State Department of Ecology Standards.

14. 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.
15. 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
16. All sanitary water mains shall have min. 42" cover.
17. 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.
18. 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 place right at property corners, rather shifted slightly to accommodate any property pins.
19. Residential sewer services shall be 4" diameter and shall extend 10 feet beyond the right-of-way into the lot. The end shall be capped and marked with a 2"x4" pressure treated wood marker post painted green, marked and labeled at 1 foot increments, extending from the end of the pipe to 2 feet above the ground. Contractor to place tracer wire on post.
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 shall replace existing valve boxes not meeting current standards with current City standard valve boxes.
23. Sanitary waterlines to be PVC DR18 meeting the requirements of AWWA C900. Typical sanitary sewer lines to be PVC SDR 35 pipe meeting the requirements of ASTM D3034 and D1869 (deep sewers may require different material requirement). Storm drain lines to be PVC SDR 35 meeting the requirements of ASTM D3034. Irrigation lines to be PVC class 200 SDR 21 or better. Irrigation pipe sizes 3" and below shall be solvent welded, 4" and above shall have ring gasketed joints. All irrigation pipe under the road shall be C900.
24. All tracer wire must be 14 gauge solid copper 600 volt with UF insulator 0.06" nominal thickness minimum and blue in color. Wire must be tested and approved by the City prior to sub-grade approval.
25. 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.
26. City to furnish and install permanent street signs. Developer to reimburse city for materials and labor costs prior to final plat approval.
27. Locations of private utilities as shown on the plans are suggested locations and may be schematic. Contractor to coordinate field locations with utility.
28. Where necessary to avoid water and storm drain conflicts, Contractor shall construct water lines deeper. Maintain min. 12" vertical separation.

29. The construction site shall have a silt fence installed and maintained around the entire perimeter. A single access point shall be coordinated with the City Engineer prior to construction. At minimum, a 20'X40' rip-rap pad shall be constructed at the entrance of the site. If debris cannot be controlled, a wheel wash shall be installed and maintained by the contractor.
30. Where new sanitary sewer or storm drain lines are to be connected to existing manholes or pipe lines, Contractor to dig and verify elevations of existing lines and notify the City Engineer should grades need to be revised.
31. Residential water services are to be 1" dia. and shall be constructed per COWR detail 4-26A.
32. Contractor shall be responsible for the construction of the street light system complete. Street lights shall be constructed per City of West Richland Standard Details 6-1 through 6-8. Contractor to meet all applicable codes and Benton REA standards. Luminaires shall be Light-Emitting-Diode (LED).
33. Pedestrian ramps to meet City of West Richland Standard Detail 2-12A Type Parallel A (new construction) unless otherwise noted in plans. Detectable warning patterns to be armor tile cast in place system detectable warning tiles.
34. Sidewalk and pedestrian ramps shall have 2" of compacted 5/8" rock under concrete.
35. Contractor to allow City Engineer and design engineer to inspect each storm drain drywell excavation to evaluate soils and make adjustments if necessary.
36. Developer to purchase and install mail box cluster units per Richland Post Office standards. Coordinate with Brenda Nickels at 967-0400. Developer to install 10 LF of sidewalk in front of mail box cluster units. Cluster units 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.
37. 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.
38. All fire hydrants are to be restrained from hydrant to tee and pipe shall be 6" ductile iron.
39. 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.
40. Sewer lines shall be air tested per WSDOT standards. Storm sewer lines in excess of 100 linear feet shall also be air tested.
41. When connecting to existing sewer facilities, down stream shall be sealed off until upstream construction is finished, tested, cleaned, and accepted. All construction debris and water shall be removed prior to opening the seal.
42. It will be the responsibility of the Contractor to flush and clean all sewer and storm mains prior to television inspection.
43. Contractor shall television inspect all sewer main lines. Storm sewer lines shall have television inspection for runs in excess of 100 linear feet. 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 Medial Player. Video must be submitted to City Engineer for approval.
44. All disturbed areas to be hydroseeded with tackifier with dry land mix.

45. 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 stainless steel 1-1/2" long Lang Screw with 1/2" Hex Head shall be used to anchor ADS 90 to storm pipe.
46. All gutters shall be widened at catch basins per City of West Richland Standard Detail 2-10B.
47. All construction surveying must be done by a licensed surveyor.
48. Roadway Staking
 - Subgrade and Base Course: residential streets, subgrade and base course are to be bluetopped on centerline and curb line. 40' and wider streets shall also include quarter crown stakes.
 - Top Course: For all streets, top course to be redtopped on centerline and quarter crown.
49. All roadway paving on City streets up to 36' wide curb-to-curb shall be paved with two pulls placing pavement joint along roadway centerline. City streets wider than 36' curb-to-curb shall be paved such that paving widths and locations of pavement joints shall be pre-approved by City Engineer.
50. 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.
51. All ductile iron for the following items shall be domestic products made in the USA: pipe fittings, accessory kits, valve boxes, rings and covers, lids, grates, and monument frame and covers.
52. 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 indicating the products meet the no lead requirements.
53. Pedestrian ramps must meet ADA guidelines unless a Maximum Extents Feasible report has been submitted and approved. 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.

COMPACTION STANDARDS

ACP- 91% maximum density ASTM D-2041
 Crushed Rock Top Course- 98% ASTM D-698
 Crushed Rock Base Course- 98% ASTM D-698
 Road Sub Grade- 98% ASTM D-698

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 standard specifications and standard drawings 6-1 through 6-8. Benton R.E.A shall be substituted for Benton P.U.D. in City of Kennewick Standard Specifications.
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 that the luminaires ordered are compatible with the power voltage that is available, or will be installed.

4. Contractor shall not connect additional or new light circuits without Benton R.E.A. approval. All connections shall be done with 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 for field verification prior to being incorporated in final project mylar. Final approval of lighting system will not be approved until field verification of the asbuilt information is approved by the City.
7. Any discrepancies or clarifications shall be discussed and approved with the city engineer prior to ordering or installation of street light infrastructure.