CITY OF RICHLAND
PUBLIC WORKS ENGINEERING

PUBLIC INFRASTRUCTURE
CONSTRUCTION PLAN REQUIREMENTS
AND DESIGN GUIDELINES

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1. Introduction

This document has been prepared to assist project developers to obtain a right of way construction permit in the most efficient manner. Construction of infrastructure intended for donation to the City must be accepted by the via the successful acquisition and execution of a right of way construction permit as described in Richland Municipal Code Chapter 12.08. The developer should refer to that code chapter for the requirements of the permitting process.

The City's goal is to issue a permit in no more than two reviews. Developer's ability to achieve this goal depends on the developer's adherence to the City's design standards, preliminary project approval conditions, the instructions detailed in this document, and the complete and accurate response to review comments. Prior to submitting engineering plans the developer is encouraged to conduct a thorough check of its submittal to ensure compliance with the referenced items.

Several items in this document reference several City of Richland webpages. This is done to support and provide additional information to the specific bullet points. Below is a compiled list of City of Richland documents referenced throughout the guidelines:

- **Richland Municipal Code (RMC):** https://www.codepublishing.com/WA/Richland/
- **Public Works Standard Details:** https://www.ci.richland.wa.us/departments/public-works/engineering-and-private-development/standard-details
- **Private Development Standards:** https://www.ci.richland.wa.us/departments/public-works/engineering-and-private-development/private-development
- **Record Drawing Requirements:** https://www.ci.richland.wa.us/departments/public-works/engineering-and-private-development/record-drawing-requirements
- **Construction Stormwater General Permits:** https://www.ci.richland.wa.us/departments/public-works/engineering-and-private-development/construction-stormwater-general-permits
- **Public Works Management/ Comprehensive Plans:** https://www.ci.richland.wa.us/departments/public-works/management-plans
- **City of Richland GIS Homepage:** https://richland-hub---gis-mapping-richlandwa.hub.arcgis.com/

2. Permit Project Procedures

2.1. Standard Right-of-Way Construction Permits

Any project that includes the construction of public infrastructure or represents an impact to public infrastructure, shall comply with the following procedures. Public infrastructure includes all construction or impact to public streets, water lines, sanitary sewer lines, storm drainage lines, streetlights, or any other facilities that will be owned, operated, and maintained by the City of Richland.

1. The first plan set package submitted for review shall contain:
    - Completed *Private Development Cost Estimating Tool*
    - Completed *Right-of-way Construction Application & Submittal Checklist*

Plan submittals not accompanied by those two items will be deemed incomplete and the plan review "clock" will not be started until they are received. Both items can be found on the Private Development webpage.

2. When submitting drawings for a new subdivision (long plat), four stapled paper copies of the construction plans are required along with a PDF version (24-in. X 36-in. plans) for the first review submittal. All subsequent re-submittals require two copies of the plans at a minimum (either hard copy or electronic). Any addendums or resubmittals are typically not allowed. If an addendum is allowed, then the applicant may see an increase in the plan review timeline and/or the cost of review for the additional sheets.

3. When submitting drawings for any project other than a subdivision (long plat), the submission will be made directly to the City of Richland Building Department. The number of plan copies for each submission will be defined by Building Department Staff.

4. Any work within public right-of-way, utility easements, or involving the construction of public infrastructure will require the applicant to obtain a Right-of-Way Permit prior to construction. A plan review and inspection fee in an amount equal to a percentage of the public infrastructure construction cost will be collected at issuance of the construction permit. The permit may include other fees, such as water tapping fees required for the project. The fee shall be calculated using the *Private Development Cost Estimating Tool.* The Right-of-Way Permit will not be issued until payment of the associated fees is made. All the referenced fees are defined in most recent version of the *City of Richland Fee* Schedule, as well as Richland Municipal Code (RMC) Chapter 12.08.040.

5. The applicant shall pay a plan review based on a cost-per-sheet of engineering infrastructure plans. This public infrastructure plan review fee shall apply each time a project is submitted for review. This fee is different for commercial and subdivision projects. The fee amounts are defined in the latest version of the *City of Richland Fee Schedule*, which can be found by clicking here. This fee is applied to pertinent civil infrastructure sheets and is due when the project invoice is provided. If plans are submitted without the fee being paid, then the review timeline will not begin until the invoice is paid in full for the previous review.

6. In addition to standard plan review and utility fees, locations in new development areas across the City of Richland are required to pay Transportation Impact Fees. These fees apply to projects that are in locations established as a part of the Transportation Impact Fee Program. For any new development or significant improvement project within one of the four (4) Transportation Impact Fee Zones (see Figure in RMC 12.03.070), projects will be charged a fee based on the number of potential trips generated in the zone. This fee is to gather funds to improve the City-owned roadway network feeding these locations. The rate for each zone is defined within RMC 12.03, though rates are subject to change with future updates to the RMC. The fees will be applied at the time of Construction ROW Permit issuance, in conjunction with other ROW Permit Fees.

7. Grading permits are issued by the City of Richland Building Department. Submitting a grading permit is a separate process from the Public Works plan review process outlined in this document. Please contact the City of Richland Building Department for further information. Any grading that is to take place within existing or future public right-of-way shall be placed and compacted per City of Richland Construction standards. Compaction tests from an independent material testing firm shall be taken at intervals consistent with City standards, and passing results submitted to the Public Works Engineering Department prior to or at the time of the pre-construction meeting. If filling and compaction within future or existing right-of-way is done after

issuance of the Right-of-Way Construction Permit, the City will contract for the compaction testing.

8. For all Grading permits, please note that the final grades of any infrastructure within the right-of-way are not established with these permits. Grades of infrastructure items are subject to change upon further development and review of the construction plans.

9. One copy of stamped storm drainage calculations, along with any other supporting narrative information, are required with the first plan submittal. Calculations do not need to be included with re-submittals unless there is a substantial change to the project, or if additional documentation is requested. Reference the storm drainage calculations requirements outlined in the Stormwater Section of the document.

10. If required, a State Stormwater Permit shall be obtained prior to the Pre-Con Meeting and the Right-of-Way Construction Permit issuance. See requirements on the City of Richland Private Development webpage.

11. After the construction plans are approved a minimum of nine (9) full-size stapled paper copies are required (unless stated differently) along with a PDF copy. The contractor shall also provide all material submittals, an insurance certificate naming the City as insured, and payment of the construction permit fee prior to the pre-con meeting. All paper construction sets will be stamped (and red-lined, if necessary) by the City Engineer and six (6) of the paper copies will be distributed internally as follows (all other copies will be for the owner's / contractor's use, if more are needed, please include);

- 1 copy to the City Engineering Private Development Office
- 1 copy to Public Works Inspector
- 1 copy to the City Water Division
- 1 copy to the City Wastewater Division
- 1 copy to the City Streets Division
- 1 copy to Richland Energy Services

Three (3) of the paper copies will be stamped and given back to the Contractor & Project Developer.

12. After the Right-of-Way Construction Permit is issued, a pre-construction conference will be scheduled. This meeting will include representatives from the City, owner, contractor, subcontractors, surveyor, various utilities, various agencies, and other impacted or potentially impacted stakeholders. The contractor that is installing the City infrastructure shall be present at this meeting.

13. When the permit is issued, a Public Works Inspector is assigned to the project. From this point all communications with the City shall go through the Public Works Inspector. Any discrepancies on the plans or any disputes needing to be resolved shall first go through the Project Engineer. If a solution cannot be found, then the Public Works Director shall be consulted. Any involvement by other City staff for any reason during construction activities will be scheduled by the Inspector.

14. **Datum:** The topographic survey used for the construction plans shall use NAD83 (2011) State Plane Coordinates for the Horizontal Datum and NAVD 88 Vertical Datum Geoid 12, for control. A minimum of three (3) City of Richland approved control points shall be referenced on all construction and record drawings. The City Surveyor will delineate an acceptable list of existing monuments for collection.

15. A copy of the construction drawings shall be submitted for review to any appropriate jurisdictions by the developer and their engineer. All required condition and comments shall be incorporated into one set of drawings and resubmitted (if necessary) for final permit review and issuance.

16. Some development and commercial locations have specific design parameters that were approved for use. When developing any project in these communities, the special condition documents will govern the designs. These communities are as follows:

    - Badger Mountain South
    - Horn Rapids Master Plan Area

    Please work with City of Richland Public Works staff for any help or guidance with finding these documents.

2.2. Special and Non-Standard Projects

1. Some projects will be eligible for an alternative development and permitting process. Projects that contain elements not clearly covered in the City Standards may be eligible for project development consultation before the developer prepares permit submittals. The City Engineer shall make the final determination regarding eligibility for this process. The City will determine whether 30%, 60% and 90% design plan review stages will be needed based on project complexity, specialty features, staff availability, and impacts to City maintenance and operations.

2. This process does not exempt the project from submitting for and obtaining a right of way construction permit. This process is intended to allow development of a project design that is permit review ready after preliminary consultation with subject matter experts on the City staff.

    The special projects process is a voluntary path to permitting for the developer, subject to the approval of the City. To make this process most effective it is beneficial that it begins as early in the development planning as possible, to avoid delays to developer construction schedules. Complex elements of a developer's project should be identified in a pre-application meeting or other early project planning.

3. Timing and scheduling of any non-standard permitting projects will be coordinated through discussions between the developer and the City Engineer and the City Transportation and Development Team. The anticipated review turnarounds will vary as well, considering the design process is more iterative during these reviews.

4. Some examples of unique or non-standard project designs include, but are not limited to, the following:

    - Roundabout Designs
    - Signalized Intersection Designs
    - Sewer Lift Station Designs
    - Water Pump Stations and Reservoirs

3. Construction Plan Requirements

All public infrastructure construction plans shall contain the following minimum information. Additional information shall be either added by the design engineer or required by the City to address specific concerns related to individual projects.

3.1. General Plan Requirements

1. The cover sheet shall include the following:

    - The title of the project.
    - The name, address, and phone number of the owner.
    - The name, address, and phone number of the engineer.
    - A vicinity map that clearly indicates the project location.
    - General construction notes.
    - The survey benchmark used for the project. The benchmark shall be on City of Richland datum NAD83 (2011) State Plane Coordinates for the Horizontal Datum and NAVD 88 Vertical Datum Geoid 12, for the control. A minimum of three (3) City of Richland approved control points shall be referenced on all construction and record drawings).
    - A sheet index.
    - A legend.
    - An overall plan view of the project.

2. All sheets shall be stamped and signed by a currently licensed professional engineer registered in the State of Washington. Electronically reproduced signatures will be accepted, so long as the signature follows the guidance stated in WAC 196-23-070 for electronic signatures.

3. All sheets shall be drawn on standard 24” x 36” format.

4. All sheets shall include a north arrow and bar scale.

5. All sheets shall be drawn at one of the following scales:

    1” = 10’, 1” = 20’, 1” = 30’, 1” = 40’

6. All sheets building public infrastructure shall include the note "CALL TWO WORKING DAYS BEFORE YOU DIG, CALL 811 OR 1-800-424-5555."

7. Cross sections of all streets shall be shown on the plans.

8. Match lines are required at breaks between sheets.

9. An erosion/sedimentation control plan sheet shall also be included in the plan set.

10. Any special construction details not included in the City Standard Details shall be shown on the plans.

11. All existing and proposed facilities shall be shown on the plans.

12. All existing and proposed easements shall be shown on the plans.

13. All existing and proposed underground utilities and pipes shall be shown in the profile views.

14. The location and depth of existing facilities should be verified if there is a potential conflict with proposed facilities.

15. All street, water, sewer, and storm drainage work shall be drawn on standard plan and profile sheets. Street, water, sewer, storm drainage, irrigation, and electrical design information shall all be shown on the same plan and profile sheets at a minimum. The limits of work shown in the profile view on each sheet shall match the limits of work shown in the plan view on the same sheet. Additional information shall be shown when needed to clearly specify the proposed work.

16. If the project has on-site water main work only, then the utility profile requirement may be waived if the following conditions are met:

    - the run is less than 100-feet.
    - There are no conflicting utilities present (storm, sewer, irrigation, power)
    - The line does not require the use of vertical fittings to accommodate a steep increase in slope.

    The City of Richland reserves the right to request profile views on any projects where the meeting of these requirements may be ambiguous or undefined.

17. Construction plans shall not duplicate the City's standard details in the plan sets. The City has a policy in place that the standard details that are currently on the City's webpage are the correct details to be used in the field. Supplying them in the plan sets is unnecessary as the Standard Details can be updated at any time. Adding the details to the plans can also cause confusion and be a waste of paper.

3.1.1. Water Utilities

PLAN VIEW

1. Location, size, length, and material type of all water mains.

2. Location, size, and type of all water valves.

3. Vertical bends need to be noted in the plan view, and horizontal bends need to be noted in the profile.

4. 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.

5. The finished ground elevation shall be provided at the location of all new fire hydrants.

6. 10-feet horizontal spacing shall be maintained between domestic water and sanitary sewer mainlines and service lines.

PROFILE VIEW

1. Location, depth, size, and material type of all water mains.

2. Horizontal bends, services & tees need to be noted in the profile.

3.1.2. Sewer Utilities

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-feet horizontal spacing shall be maintained between domestic water and sanitary sewer mainlines and service lines.

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.
4. Show all manhole penetrations in the profile view.

3.1.3. Stormwater Utilities

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.

PROFILE VIEW

1. Location, size, length, material type and slope of all storm drainage mains.
2. Location, size, number designation, rim elevation, and grate elevation of all manholes, inlets and catch basins.
3. All storm manholes with grated lids shall have an 18-inch sump in the bottom of them.

3.1.4. Irrigation Utilities

PLAN VIEW

1. Location, size, and material type of all irrigation facilities located within the limits of the proposed work.
2. City-owned irrigation systems require the inclusion of a separate irrigation plan sheet along with the full plan submittal.

PROFILE VIEW

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

3.1.5. Other Utilities

PLAN VIEW

1. Location of all transformers, vaults, boxes, underground lines, overhead lines and any other existing or proposed facilities.

3.1.6. Public Streets and Sidewalks

PLAN VIEW

1. Contours of the existing, native ground shall be shown.
2. Survey stations along the centerline of road.
3. Bearing and distance of all straight portions of the road centerline.
4. Radius, length and central angle of all centerline curves and curb line curves.
5. Survey monuments along the road centerline at all ends of curves, intersection points, angle points and center of cul-de-sacs.
6. Centerline road station and top of curb or flowline (or edge of pavement) elevations at all ends of curves, angle points and changes of slope.
7. Flowline slopes of all proposed curb and gutter. Curb returns shall have a minimum of three (3) elevations supplied.
8. Design elevations for pedestrian ramps shall be shown.
9. The mailbox cluster unit shall be shown (if applicable).
10. A separate street lighting / street signage sheet shall be provided (if applicable).

PROFILE VIEW

1. Existing, native ground elevations at centerline of road shall be shown.
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. Super-elevated roadways shall include a 2 (or 3) -line profile.
6. Submittals constructing new curb & gutter adjacent to an existing rural-section roadway need to include surveyed spot elevations at:
    - edge of asphalt
    - existing centerline
    - designed flowline of gutter
7. Crosswalk locations shall be shown in the road profile with the appropriate slope for the crosswalks, if different from the existing roadway.

3.1.7. Streetlights

PLAN VIEW

1. Location of all streetlights, junction boxes, disconnect boxes, and underground lines.

2. Include all street signage on street lighting sheet. Utilize street light poles as sign mounts when it is practical. Include striping and pavement markings on this sheet as required.

3. All street lighting, wire sizes, conduit sizes, pole specifications, details and other information required by the City Electrical Department shall be shown on a separate street lighting sheet.

3.2. General Construction Notes/ Specifications

The following notes shall be added to the general notes sections of construction plans when they are applicable to the project. Additional notes shall be added by the design engineer or may be required by the City to address specific concerns for each project.

1. All materials and workmanship shall be in conformance with the latest revision of the City of Richland Standard Specifications and Details and the current edition of the State of Washington Standard Specifications for Road, Bridge, and Municipal Construction Reference the latest set of City of Richland Standard Specifications and Details when designing public infrastructure. These items can be found by visiting the Standard Details page on the City's website.

2. For any standard details where a developer believes a standard detail is warranted, then a variance request shall be submitted in conjunction with the Right-of-Way Permit Application for staff to review.

3. Any work within the public right-of-way, utility easement, or involving the construction of public infrastructure will require the applicant to obtain a right-of-way permit prior to construction. A plan review and inspection fee in the amount equal to 3% of the construction costs of the work that will be accepted as public infrastructure or is within the Right-of-Way or easement will be collected at the time the permit is issued. A stamped, itemized Engineer's estimate (Opinion of probable cost) shall be used to calculate the 3% fee.

4. When the construction is substantially complete a paper set of "record drawings" shall be prepared by a licensed surveyor and include all changes and deviations. Please reference the Public Works document "RECORD DRAWING REQUIREMENTS & PROCEDURES" for a complete description of the record drawing process. After review of the paper copy, a final corrected copy of the record drawings shall be submitted along with CAD and PDF copies as well.

5. Once the plans have been accepted by the City, a pre-construction conference will be required prior to the start of any work within the public right-of-way or easement. Contact the Public Works Engineering Division at 942-7500 or 942-7742 to schedule a pre-construction conference.

6. No work on any project impacting or touching public right-of-way shall commence until a City of Richland right-of-way construction permit has been issued.

7. All traffic control devices shall be in accordance with the latest edition of the *2009 Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)*.

8. The contractor and all sub-contractors shall be licensed by the State of Washington and be bonded to do work in the public right-of-way. The contractor shall provide the City a certificate of

insurance prior to issuance of the Right-Of-Way Construction Permit. The minimum coverages shall comply with the City's Insurance Requirements.

9. The contractor and all sub-contractors shall have a current City of Richland business license.

10. The contractor shall be required to call "811" a minimum of two working days prior to commencing any excavation activities to determine field locations of all underground utilities. Alternatively, the contractor can elect to visit http://washington811.com to schedule utility verifications.

11. Any changes or modifications to the project plans shall first be approved by the City Engineer or their representative.

12. The locations of all existing underground utilities as shown on the Construction 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 all damages which might be associated with the failure to exactly locate and preserve any and all underground utilities. The engineer, surveyor, and/or contractor shall not rely solely on GIS Map data for utility locations.

13. The face of curb shall be stamped at all utility crossings, main lines and service lines as follows:

    - "S" – Sanitary Sewer
    - "I" – Irrigation "G" – Gas
    - "W" – Water
    - "C" – Conduits
    - "D" – Storm Drain

14. 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.

15. Any damaged or badly deteriorated concrete curb, gutter, or sidewalk within public right of way shall be removed and replaced. This includes any curb damaged by construction equipment during the project.

16. 2-inches of crushed gravel shall be placed and compacted beneath all sidewalks prior to placement of concrete.

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" or any crossing in which the water main crosses below the sewer main shall be in accordance with Washington State Department of Ecology standards. Pressurized sewer mains shall NOT cross over potable water mains in any case. If a minimum vertical separation of 12-inches cannot be maintained between mainline pipes, CDF or concrete shall be used as backfill in place of native soils or gravel.

18. Residential sewer services shall be 4-inches in diameter and shall extend 10-feet beyond the right-of-way into the lot. The end shall be marked with a marker post installed in accordance with City of Richland Standard Detail S-10.

19. Residential water services shall be 1-inch in diameter and shall extend 1-foot beyond the back of sidewalk through the curb stop. The end shall be marked with a blue marker post installed in accordance with City of Richland Standard Detail S-10.

20. The contractor shall take any necessary means to keep from tracking mud and debris out onto the existing streets, while also keeping mud and any other debris from the site from entering the

existing public storm drainage system, per requirements from RMC Section 16.05. In addition, construction materials that may introduce sediment into the stormwater system may not be stockpiled in the street. Such materials may include but are not limited to the following:

- Construction materials
- Soil
- Sand
- Gravels

21. The contractor shall supply a dust control plan prior to starting work in accordance with standard set forth by the *Benton Clean Air Authority*. For information and requirements on the dust control plan, please visit the hyperlinked webpage.

22. All disturbed areas shall be hydro-seeded at the completion of the project.

4. Design Guidelines

4.1. 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 to provide for the monumentation required by this section. It shall be the duty of every land surveyor to cooperate with such governmental agency or other person in matters of maps, field notes, and other pertinent records. Monuments set to mark the limiting lines of highways, roads, or streets shall not be deemed adequate for this purpose unless specifically noted on the records of the improvement works with direct ties in bearing or azimuth and distance between those and other monuments of record. (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)).

2. ***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 the 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.***

3. The survey benchmark used for the project needs to be noted. The benchmark shall be on City of Richland datum (NAD83 (2011) State Plane Coordinates for the Horizontal Datum and NAVD 88 Vertical Datum Geoid 12).

4. 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 copy of the record survey with the City.

4.2. Water Utilities

1. All water mains shall be installed with minimum 4-feet of cover. Legitimate conflicts that arise during design or in the field can force the water main to be installed shallower or deeper than this. This shall be addressed with the City Inspector for approval before the change is made in the field. Under no circumstances shall the amount of cover over a water main be less than 30-inches or greater than 66-inches. The water main shall return to 48-inches of cover immediately beyond the conflict. Vertical bends should be avoided unless necessary.

2. Water service lines shall not be located within driveways or driveway transitions.

3. Domestic water and non-potable irrigation services should be extended to opposite lot corners in new construction wherever possible. Where it is impossible to install them in that manner, 10-feet of separation needs to be supplied between the service points (meter boxes). Typically, the irrigation service is installed behind the domestic water meter box. 5-feet of separation needs to be supplied between the underground service lines where they run parallel. They may not be installed in the same ditch.

4. Water meters should be installed within 2-feet of the property corner, but shall not be installed so close as to be in conflict with other utilities installed at that corner.

5. Longer water services (longer than 50-feet) shall be upsized to 2-inches to reduce pressure loss due to friction. Long service lines shall have no couplings and shall be a continuous piece of pipe.

6. All water service lines for 1-inch meters shall be 1-inch in diameter. All service lines for 1 1/2-inch and 2-inch meters shall be 2-inches in diameter. See Standard Details W-3 & W-4.

7. Service taps on PVC mains shall be a minimum of 18-inches apart and staggered either side of the main. If they need to be on the same side of the PVC main then they need to be a minimum of 36-inches apart.

8. Live water line taps or cut-ins to existing water lines shall be performed by City crews at the developer's expense. The contractor shall supply all materials, excavation, and provide traffic control for the connection to be made.

9. Water mains in either local streets or rural streets (minor streets) shall be a minimum of 8-inch diameter unless flow analysis or the latest edition of the City's Water System Plan indicates that a larger pipe is required. Water mains in either urban principal arterials, urban minor arterials, urban arterial collectors, or neighborhood collectors (major streets) shall be as indicated in the latest edition of the Water System Plan or as determined by the City Engineer.

10. 8-inch water mains in residential streets may be class 150, AWWA C900 polyvinyl chloride pipe. Water mains larger than 8-inches, or mains that are outside of the roadway, or water mains in commercial and industrial areas shall be class 50 ductile iron pipe. If the native soil is exceptionally rocky the water main shall be ductile iron instead of PVC.

11. The following options need to be noted on the construction plans when connecting to or extending an existing City domestic water main;

    - A new 8-inch gate valve shall be installed at the point of connection to isolate the new, untested water main from the existing City main.
    - Or, the contractor shall provide a pressure test showing that the existing water main stub can hold 150 psi for 2 hours and can therefore pass a standard pressure (and bacteriological) test. The contractor therefore takes responsibility for the existing water main stub that the connection utilizes.
    - Or, the new main shall be installed and pressure tested entirely separate from the existing water stub. Final connection shall be done by contractor with City supervision.

12. A minimum of 2 valves are required at a mainline tee. A minimum of 3 valves are required at a cross.

13. Valves 8-inches and smaller shall be gate valves. Valves 10-inches and larger shall be butterfly valves.

14. Water lines that are stubbed for future extension shall have a valve at the tee or cross where the stub leaves the main line, and the end of the stub shall have a fire hydrant or a blow-off assembly. In certain circumstances, a minimum of two sticks of pipe may need to be installed beyond the last valve. This is to facilitate connection in the future if the mainline cannot be shut down.

15. All PVC water mains and non-metallic service lines shall have a locate wire installed over them per City of Richland Standard Detail W-12. All new ductile iron water main over 100 feet in length between valves shall have locate wire installed over them.

16. Combination air & vacuum valves (ARV) will be installed on new distribution mains when;

    - There are long water main extensions of over 1,000-feet with few or no service connections.
    - In areas with long steep slopes of 10% or greater.
    - Significant, localized high points with few or no service connections nearby.
    - At all pressure zone breaks (at closed valves or PRVs).

    Air/Vacuum valves for all new mains 12” in diameter or greater and all transmission mains shall be evaluated by a professional engineer following AWWA M51 Guidelines.

17. The above-ground portion of any required ARVs shall be piped to the nearest lot corner and remain within the road right-of-way.

18. A minimum horizontal separation of 10-feet shall be maintained between water mains and sewer mains and service lines when running parallel. 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 or CDF, etc.).Pressurized sewer mains shall NOT cross over potable water mains in any case. If a minimum vertical separation of 12-inches cannot be maintained between mainline pipes, CDF or concrete shall be used as backfill in place of native soils or gravel.

19. Fire hydrants shall be installed 2-feet behind the back of curb when sidewalk is not present and 2-feet behind the back of sidewalk when sidewalk is present. If a larger than 2-feet buffer space is present between the curb and sidewalk, then the fire hydrant can be installed 2-feet from the back

of curb/ edge of pavement, unless limited by a physical obstacle, such as a drainage ditch or culvert.

20. Fire hydrants shall be located at the ends of curb returns or at property lines between lots.

21. Fire hydrants shall not be located within driveways, driveway transitions or pedestrian ramps. Keep hydrants 5-feet from driveways whenever possible. If not possible, then protect with bollards (see City of Richland Standard Detail W-15).

22. Fire hydrants shall be spaced at approximately 600-feet in residential areas. The final decision on hydrant locations will be made by the City of Richland Fire Marshal.

23. All fire hydrant runs shall be restrained ductile iron pipe with thrust blocks.

24. The finished grade around the base of the new hydrant shall be noted on the plans. Extensions are not allowed on new hydrant installations.

25. A 4-feet X 4-feet concrete pad shall be installed around a hydrant where landscaping will not be maintained to prevent weeds from obscuring it.

26. All fire hydrants shall have the following minimum clearances:

    - 5-feet from poles, transformers, buildings, and other large, fixed objects
    - 5-feet from shrubs
    - 10-feet from trees
    - 3-feet from any obstacle not listed above

27. No bends are allowed in fire hydrant runs. If a bend cannot be avoided, the fittings shall be “restrained” and all-threaded.

28. Dead end fire hydrant runs that are 50-feet or longer shall be 8-inch diameter pipe, minimum.

29. Water mains that are installed beneath irrigation canals, railroad tracks, State highways, building structures, etc. shall be encased in a continuous welded steel casing and provided with casing spacers in accordance with City Standards & Details.

30. If a new utility line crosses under an existing asbestos cement (AC) water pipe, a section of the asbestos cement water pipe shall be replaced with ductile iron pipe prior to the undermining. This work shall be performed by the City Water Department. The Developer shall coordinate the City and all work performed will be at the Developer’s expense. The City may allow leaving the existing AC pipe and backfilling with CDF from spring line of new pipe to spring line of existing AC.

31. All water fixtures that need to be adjusted to grade that are outside of a paved area shall have a concrete collar installed per City of Richland Standard Detail U-4.

32. Water mains shall be extended to all adjacent properties, 10-feet past the end of pavement.

33. Domestic water main blow-offs shall be installed at least 20-feet from the curb & gutter line in cul-de-sacs to minimize the conflict with the concrete curb & gutter machine.

34. Water mains shall not be deflected more than 50% of the manufacturer recommendation. For Ductile Iron pipes, the deflection will occur at the joints between pipe runs. For the PVC pipes, the pipe is bent on the mainline runs between the joints. Under no circumstances shall the Ductile Iron pipes be bent to achieve deflection.

35. City of Richland ordinance RMC Chapter 18.13 pertains to System Cross Connections. This chapter requires a premise isolation backflow assembly to be installed on the domestic water service of all new commercial/industrial buildings, as well as all buildings undergoing a tenant improvement, change of use, remodel, addition, etc. The correct device for this application is either a Double Check Valve Assembly (DCVA) or a Reduced Pressure Backflow Assembly (RPBA), which shall be installed outdoors, immediately downstream of the City's water meter. Check with Public Works Engineering to determine which assembly is required. Please note this on the plans and indicate where the backflow device is to be installed. Because of the above-ground installation requirement for RPBA's, a method of freeze-protection is also required. It is required that this information also be included in the plan set.

36. The City of Richland has a policy of allowing only one domestic water meter per multi-tenant commercial shell building (i.e. "strip malls"). Privately owned & maintained sub-meters can be installed downstream of the City domestic water meter if needed. Separate irrigation meters are allowed.

4.3. Sewer Utilities

1. All sanitary sewer design shall be in accordance with the latest edition of the Washington State Department of Ecology publication *Criteria for Sewage Works Design* (also known as the "Orange Book").

2. Sewer services shall extend 10-feet beyond the right-of-way and the pipe end shall be capped and marked. Services are typically located 10-feet from the water service toward the low side of the lot.

3. Sewer services to residential single family lots shall be 4-inches at a minimum, while commercial properties shall be 6-inch at a minimum.

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 400-feet for pipes smaller than 12-inches nor 600-feet for pipes 12-inches and larger.

6. A permanent 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. For reference, please see Section C1-4.1 of the *Washington "Orange Book."*

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 follow (see Section C1-4.4 of the *Washington "Orange Book")*:

Pipe Size	Minimum Sewer Slope	Pipe Size	Minimum Sewer Slope
6-in.	1.00%	18-in.	0.12%
8-in.	0.40%	21-in.	0.10%
10-in.	0.28%	24-in.	0.08%
12-in.	0.22%	27-in.	0.07%
14-in.	0.17%	30-in.	0.06%
15-in.	0.15%	36-in.	0.05%
16-in.	0.14%		

8. Sewer mains should not exceed a slope of 5%, if possible. If sewer slopes more than 10% are required, then the use of energy dissipaters and pipe restraints shall be investigated. Sewers on a 20% or greater slope shall be anchored securely with concrete anchors. Suggested minimum anchorage spacing is as follows (see Section C1-4.4 of the *Washington "Orange Book")*:

    - 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. Sewer mains over 15-feet deep shall be constructed out of SDR26 PVC (including all fittings). 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 material (SDR35 PVC) above 15-feet depth.

11. Deep sewer mains that terminate at a manhole (or pipe extensions out of "deep" manholes), shall have long stubs installed out of them to provide for future development. This is a safety matter as exposing only one side of a deep manhole can result in collapse of the manhole from soil pressure during future development activities.

12. For any future manholes installed over 20-feet deep, the manhole shall be installed in a 40-feet dedicated sewer easement outside of Public Right-of-Way. This is to ensure that the manhole can be accessed outside of Public Right-of-Way for any future maintenance repairs.

13. 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 standards (see item 13 for more information). Pressurized sewer mains shall NOT cross over potable water mains in any case. If a minimum vertical separation of 12-inches cannot be maintained between mainline pipes, CDF or concrete shall be used as backfill in place of native soils or gravel.

14. If field conditions do not allow for 18-inches of vertical separation between a waterline and gravity sewer line, then the sewer line shall meet the following conditions (see Orange Book Section C1-9.1):

    - Each service line shall have separate trenches, if running in parallel.
    - Design the sewer line to water-class material standards (Ductile Iron Class 50 or PVC C-900, depending on pipe size).
    - Pass a pressure test to ensure watertightness prior to backfilling
    - Pipe crossings shall be centered to ensure the ends are equidistant from one another
    - At the intersecting points, the pipes shall be encased in concrete.

15. Sewer mains that are installed beneath large structures, such as irrigation canals, railroad tracks, State highways, and buildings shall be encased in a continuous steel casing and provided with casing spacers in accordance with City Standards & Details.

16. Sewer mains that are stubbed for future extension shall have a manhole or standard cleanout at the end of the stub. Capped sewer mainlines are not allowed.

17. At the termination points for sanitary sewer lines, the preferred method of treatment is to install a manhole. However, for 6-inch and 8-inch sewer lines, cleanouts can be installed over distances of 150-feet or less (see Orange Book Section C1-6.1).

18. Sanitary sewer cleanouts shall be installed at least 20-feet from the curb & gutter line in cul-de-sacs to minimize the conflict with the concrete curb & gutter machine.

19. Manholes or cleanouts outside of paved areas shall have a concrete collar around them per City of Richland Standard Detail U-4.

20. 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 if 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.

4.4. Stormwater Utilities

4.4.1. Storm Drainage Collection Systems

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. The City has adopted revised standards affecting the construction of new stormwater facilities to comply with conditions of its NPDES General Stormwater Permit program. This project, and each phase thereof, shall comply with the requirements of the City's stormwater program in place at the time each phase is engineered.

3. All construction projects that don't meet the exemption requirements outlined in Richland Municipal Code, Section 16.06 shall comply with the requirements of the Washington State Department of Ecology issued Eastern Washington NPDES Phase II Municipal Stormwater Permit. All construction activities subject to this title shall be required to comply with the standards and requirements set forth in the latest edition of the *Stormwater Management Manual for Eastern Washington* (SWMMEW). In addition, a Stormwater Pollution Prevention Plan (SWPPP) or submission of a completed erosivity waiver certification is required at the time of plan submittal. A State Stormwater Permit shall be obtained prior to Right-of-Way construction permit issuance.

4. All new development and redevelopment projects that disturb one acre or more or disturb less than one acre but are part of a larger common plan of development disturbing more than one acre, shall retain runoff generated on-site for the 24-hour, 25-year storm.

5. All public storm drainage systems shall be designed following the core elements defined in the latest edition of the Stormwater Management Manual for Eastern Washington (SWMMEW). The Hydrologic Analysis and Design shall be completed based on the following criteria: Washington, Region 2, Benton County; SCS Type 1A – 24 Hour storm for storm volume with a 25-year return period. The applicant's design shall provide runoff protection to downstream property owners.

6. The flow-rate of the public storm drainage system for pipe and inlet sizing shall be designed using the Eastern Washington 3-hour, 50 year storm at sag points and the 3-Hour, 25-Year short duration storm for all other locations. The SCS or Santa Barbra method shall be used; no modifying or adding time of concentration; no surcharging of pipes or structures allowed. Calculations shall be stamped by a registered professional engineer and shall include a profile of the system showing the hydraulic grade line. The calculations should include a 50-feet wide strip

behind each right of way line to represent drainage from private property into the City system. Of that area, 25% shall be considered pervious and 75% impervious. Passing any runoff to an existing system downstream requires analysis of the downstream system's ability to properly treat and control the added drainage volume.

7. For privately-owned & maintained commercial sites the on-site storm drainage system shall be designed following guidance from 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 1A – 24 Hour storm for storm volume with a 25-year return period. Calculations shall be stamped by a registered professional Civil Engineer. Prior to discharging any storm drainage waters from paved surfaces into drainage ditches, groundwater, or a public system, means of oil/water separation must be provided. The applicant's design shall also provide runoff protection to downstream property owners.

8. To ensure that all drainage can be maintained on-site without any overflow into public Right-of-Way, an analysis of the 100-year storm event for individual locations is required for both design and permit projects. This is to ensure that the condition is met to contain stormwater on site. The 100-year storm will also provide insight into both flooding and overflow conditions within the system.

9. Consultants performing project stormwater analyses for the City of Richland have the option of either performing calculations using SWMMEW standards or can utilize computer programs with pre-built data, such as SSA or HydroCAD. To help check the quality of calculations being performed for these items, the following table has been developed to provide guidance on design storm parameters when performing standard analyses on designs and permits:

Design Strms	Required Use	Rainfall Depth (inch)
6-month, 3-hour	Designing flow-based water quality treatment BMPs	0.26
6-month, 24-hour	Designing volume-based water quality treatment BMPs	0.53
25-year, 3-hour Short Duration	Designing public storm runoff conveyance drainage system pipe or inlet	0.92
50-year, 3-hour Short Duration	Designing roadway drainage runoff conveyance and inlets at road sag points	1.14
25-year, 24-hour	Designing flow control facilities to limit flow between the proposed developed condition and the pre-developed condition and volume-based roadway drainage elements	1.60

10. For commercial sites, the proposed storm drainage and grading of all areas within the proposed development shall be shown on the plans (most grading and drainage plans must be prepared by a licensed civil engineer). If the site contains at least 1,000-sq.ft. of new impervious surfaces, and/or contains 30% or more impervious surfaces, storm drainage calculations from a licensed civil engineer are required. Stormwater shall be kept on-site (on the developing property that generated it). Stormwater shall not be flowed onto adjacent properties, or to the public Right-of-Way, without first obtaining written permission.

11. If any existing storm drainage or ground water seepage empties onto the proposed site, said storm drainage shall be considered an existing condition, and it shall be the responsibility of the property developer to design a system to contain or treat and release the off-site storm drainage. For additional information, please review Chapter 7 of the latest version of the SWMMEW.

12. If there are any natural drainage ways across the proposed pre-plat, the engineered construction plans shall address it in accordance with Richland Municipal code 24.16.170 ("Easements-watercourses").

13. The City may require that the public storm drainage system be extended to the adjacent, undeveloped property, 10-feet past the end of pavement.

14. All public storm drainage pipes or culverts shall be 12-inches diameter or larger.

15. Pipes shall have a minimum slope of 0.5% and a minimum velocity of 3-feet per second. Pipes shall be sized so that they do not surcharge under design storm conditions.

16. Storm mains shall be constructed out of SDR35 PVC. Always reference the most current City of Richland Materials List for acceptable materials.

17. Manholes are required at all angle points and all changes in slope. Curved or deflected storm drainage lines are not allowed. The length of pipe between manholes shall not exceed 400-feet for 12-inches mains nor 600-feet for mains larger than 12-inches.

18. All storm manholes with solid lids shall have a channeled base and all catch basin manholes shall have a “sump” in the bottom of them in accordance with the approved standard details.

19. The need for either type of storm drain manholes (manhole or catch basin) to be 48-inches instead of a 24-inch barrel is a judgment call based on the following criteria:

    - Are there 2 or more catch basins upstream of the fixture in question?
    - Is the depth to pipe invert 4.5-feet or deeper?
    - Is the number of laterals penetrating the barrel more than 2?
    - If the angle of the laterals where they enter the fixture are close together, then the structural integrity of the catch basin could be compromised, therefore an increase to a 48-inches manhole may be necessary.

20. 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. At all low points & sag curves two times the required inlet capacity shall be provided. Curb line spread of the storm water shall not pond into the travelled way. Curb inlet structures or additional catch basins will be considered for use on curb line profiles exceeding 8% to improve inlet capacity.

21. Storm water flow shall be kept in the gutter, and shall not be allowed to flow across intersections (i.e.; “valley gutters”). Catch basins shall be installed at appropriate locations to prevent this. Catch basin “bubbler” type installations are not allowed.

22. Catch basins and inlets shall not be located within driveways or pedestrian ramps.

23. In locations where deviations are allowed from the standard crowned street, additional structures will be required so that surface stormwater flow does not transition from one side of the street to the other.

24. For any driveway, ADA curb ramp, or non-standard street cross-sections, ensure that all stormwater discharge can properly flow towards an already-designed catch basin, manhole, or BMP. If capacity of the existing or designed stormwater mitigation method cannot adequately function due to the additional traffic elements, then please either design a higher capacity catch basin, manhole, or BMP or increase the number of structures to mitigate stormwater effects.

25. A “spill control” separator (oil/water separator) is required prior to discharging any storm drainage waters from paved surfaces into drainage ditches, ground water, any type of pond (infiltration, evaporation, or detention), or a public drainage collection system. These structures may not be required if the stormwater is sheet-flowed into a grassy swale or natural pond.

26. For commercial projects, the designing engineer shall provide both the total square footage of the entire commercial property under review, and the total square footage of all impervious surfaces, including but not limited to; the proposed building, any concrete or asphalt paving, sidewalk, and roof surface, etc. (after addition is complete). Please provide this information in a table form on the cover sheet, or on the site plan sheet. This information is required of all new commercial development (or of any structure undergoing modification or addition).

27. For any commercial or subdivision projects, the designer shall evaluate and document the amount of disturbed area. This information will be used to determine the construction impacts to the site and any adjacent properties or systems prior to development of a self-contained stormwater pollution prevention plan (SWPPP) in the field.

28. To prevent seepage of water from the joints of catch basins, please ensure that the joints for both risers and concrete/casting interface locations will be grouted to prevent consolidation around the joints.

4.4.2. Stormwater Retention and Detention Design

1. All Best Management Practices used for stormwater treatment or flow control shall meet the requirements of the latest edition of the Stormwater Management Manual for Eastern Washington (SWMMEW) except for where criteria are amended by these guidelines.

2. Stormwater from City Right-of-Way (ROW) is typically collected into a central collection basin (storm pond). Drywells are only allowed in limited applications and are not normally allowed except in extreme circumstances where a central collection basin will not function. Percolation trenches (exfiltration trenches) are allowed in “temporary” circumstances when a permanent solution will retire it later.

3. A Spill Control Separator is required prior to discharging stormwater into ponds (infiltration, evaporation, detention, etc.). Discharge is only allowed in these structures in the form of sheet flow overflow parameters. This structure is used to supplement any best management practice required for runoff treatment or flow control per the latest edition of the SWMMEW.

4. The City of Richland will provide maintenance of the retention pond in the future by performing routine maintenance activities, such as maintaining the pond functionality and trimming weeds. If the developer proposes additional items that require more frequent maintenance (turf grass, shrubs, and/or trees), then the maintenance responsibilities shall be performed by either the Developer or associated Homeowner’s Association (HOA). These responsibilities will include installation of an irrigation meter and sprinkler system (and a power source), as well as regular mowing around the pond. The project will require an Operations & Maintenance (O&M) Plan for the life of the retention pond. Any maintenance responsibilities beyond the basic scope of the City of Richland’s maintenance crews shall be noted on the final plat.

5. Basins designed as infiltration facilities shall require a percolation test of the native soils that will comprise the base of the basin to confirm the effectiveness of the design. The test shall be supervised by a professional engineer or geologist using a minimum safety factor of 2. The pond shall drain within 72 hours of a storm event.

6. Basins designed with the potential for water depth greater than 24-inches shall be either fenced or have side slopes no steeper than 4h:1v. Basins designed with maximum water depth less than 24-inches shall have side slopes no steeper than 4h:1v.

7. A maintenance road from the City right-of-way to the bottom of the pond or the storm pipe outlet will be needed. This road shall be sloped no greater than 12%. The road shall be a minimum of

12-feet wide and shall be surfaced with 2-inches of crushed top course rock, minimum. Gate openings shall be 12-feet wide, minimum.

8. The designer should consider the long-term appearance of the basin, particularly if it will occupy a prominent location in the development. City maintenance practices involve only semi-annual vegetation trimming and silt and debris removal. Basins designed as detention and evaporative basins need to include plantings that will tolerate or thrive on standing water in the basin. Planting designs for areas not routinely exposed to water shall include plants that will thrive without irrigation.

9. During the 12-month warranty period identified within the plans, the contractor shall be responsible for the following maintenance activities:

    - Maintaining all plantings within the storm system, which includes replacing any plantings that do not survive the elements
    - Trimming and controlling any weeds that exceed 18-inches in height
    - Maintaining the storm basin, including the removal of accumulated oil, sediment, and debris after 11 months

10. The parcel occupied by a stormwater basin shall be identified as a separate parcel or tract on the final plat and shall be dedicated to the City of Richland Stormwater Utility Network.

11. Surface water from a pollution-generating source shall not be collected directly into a subsurface infiltration BMP, but shall first be collected in an inlet, swale or some other means for separating the suspended solids. For reference, please see SWMMEW Section BMP T5.30.

4.5. Irrigation Utilities

1. Please include the following City standards or requirements as notes on the irrigation sheet:

    - Non-potable irrigation mains installed within the right of way that are 4-inches or smaller shall be schedule 40 PVC, mains larger than 4-inches shall be constructed out of C900 PVC.
    - Irrigation valve boxes or lids within the roadway or public Right-of-Way need to be per City of Richland spec: “Rich 931” cast iron lid shall have “Irr” cast into top.
    - Approval from the Irrigation District with jurisdiction over the developing property is required prior to issuance of Right-of-Way permit.

2. City-owned irrigation systems require the inclusion of a separate irrigation plan sheet along with the full plan submittal. This separate, stand-alone irrigation sheet shall show the entire irrigation system along with all valves, fixtures, services, drains, etc. This sheet shall also include all the property lines, the lot numbers, and the finished grade elevations (E.g., contours and spot elevations).

3. City-owned irrigation systems shall reference all City Standard Irrigation Details. Irrigation not belonging to the City of Richland (Kennewick Irrigation District, Badger Mountain Irrigation District, Columbia Irrigation District, or others) will be subject to design criteria of the irrigation districts.

4.6. Other Utilities

1. “Other Utilities” are defined in this document as those utilities not belonging to the City of Richland Public Works Department. Those include the following:

    - Power/ Electrical Lines
    - Telecommunication Lines (Telephone, Fiber, Internet, Cable)
    - Natural Gas Lines

2. A separate 10-feet utility easement is to be provided for all other utilities within the plan set. All miscellaneous power, telecommunications, and natural gas lines should be located within this easement.

3. When developing subdivision and/or building plans, please ensure that there is adequate separation between the liquid utilities (water, storm, sewer) and the electrical utilities (power, telecommunications) at points where the utilities need to cross each other. These crossing points should be noted within both the plan and profile views.

4. For any questions about materials, constructions, or installation of electrical lines within the City the Richland, the developer and/or designer should contact the City of Richland Energy Services Department. Similar questions about telecommunications and natural gas will need to be directed to the private entities in charge of those utilities.

4.7. Public Streets and Sidewalks

4.7.1. Streets & Roadways

1. Dead end cul-de-sac streets shall not be longer than 400-feet. See RMC Chapter 24.16.050 for more information.

2. Cul-de-sacs are the only dead-end street turnaround design in the City of Richland (see COR Standard Detail ST-19. Approval by the City Engineer is required if hammerhead turnarounds are desired on local roadways. The design team must ensure that garbage truck do not have to back up more than 50-feet before being able to turn around and must meet International Fire Code.

3. Curb returns and the adjoining Right-of-Way at local-to-local classified street intersections shall have a minimum radius of 17-feet. Curb returns at other intersections and the adjoining Right-of-Way should have a radius of 25-feet. In some cases, a larger radius shall be used based on turning radius of the design vehicle and site conditions.

4. Horizontal curves on streets classified as “local streets” shall have a minimum centerline radius of 100-feet. All other street classifications shall meet AASHTO standards for a normal crown section on low-speed urban streets. For reference, refer to RMC Section 24.16.070.

5. The minimum centerline grade for all streets is 0.50%. Grades should be designed as flat as possible while matching as close as practical to the natural terrain. Per Municipal Code, the maximum grade for local streets is 10% (unless approved by the City Engineer). AASHTO requirements for grades shall apply to all other streets. For reference, refer to RMC Section 24.16.100.

6. All streets shall have a minimum cross-slope from crown to gutter of 2%. Additional cross-slope may be provided in situations with additional thru and/or turn lanes. The rate of cross-slopes in these instances shall not exceed 3% (see AASHTO Green Book, Section 4.2.2.1 for additional information and guidance).

7. All vertical curves shall be designed to provide adequate stopping sight distance. If not previously defined, then a “K” value of 20 shall be used for local streets. The design speed for local streets is 25 MPH.

8. Private streets shall be constructed per local street city standards, which are depicted in Standard Detail ST-13. For reference, please see RMC Section 12.02.075.

9. Street typical cross-sections shall be included in the plans and shall reference the appropriate City Standard Details. Do not include reproductions of the standard details in any City of Richland plan submittals.

10. The vision-clearance triangle (VCT) shall be shown at commercial driveways and at all lots fronting at intersections, in accordance with RMC Chapter 12.11.020 (Intersection Sight Distance). If the intersection is in a curve, it will have to be evaluated per AASHTO guidelines. This information may need to be designed by the engineer of record and supplied to the surveyor of record for inclusion into the final plat document.

11. The mailbox cluster unit shall be shown in the plan view (if applicable). The location shall allow for access by pedestrians with physical disabilities, as well as avoid being a sight line hazard if close to an intersection. Mailbox clusters shall not be located on Collector or Arterial Streets.

12. If the City Fire Marshal requires a secondary emergency vehicle access, it shall be included in the construction plan set and be designed to the following standards:

    - 2-inches compacted gravel, minimum (temp. SEVA only).
    - 2% cross-slope, maximum.
    - 5% slope, maximum. Any access road steeper than 5% shall be paved or be approved by the Fire Marshal.
    - Be 20-feet in width.
    - Have radii that are accommodating with those needed for City Fire apparatus.

13. Secondary emergency vehicles accesses (SEVA’s) shall be 20-feet wide, as noted above. Longer secondary accesses can be built to 12-feet wide with the approval of the City of Richland Fire Marshal, however turn-outs are required at a spacing acceptable to the Fire Dept. Temporary SEVA’s shall be constructed with 2-inches of compacted gravel, at a minimum. Permanent SEVA’s shall be paved with 2-inches of asphalt over 4-inches of gravel, at a minimum.

14. Local and collector streets shall be constructed with HMA Class 3/8-inch PG 64H-28 mix design. Arterial streets shall be constructed with HMA Class ½-inch PG 64H-28 mix design.

4.7.2. Sidewalks & Ramps

1. Concrete pedestrian ramps shall be installed at the time of plat or project construction. Detectable warning surfaces shall be installed at all sidewalk pedestrian ramps per Standard Details ST-4 through ST-7.

2. Pedestrian ramps shall be designed to City standard details and PROWAG guidelines. If there is a situation where a City standard ramp cannot be utilized and meet PROWAG, then PROWAG shall govern with additional guidance from the City Engineer.

3. Parallel ramps shall be used for sidewalk adjacent to back of curb for new development when sidewalk width is less than 12-foot (reference City standard detail ST5 – Parallel Type A ramp). Consult with the City Engineer regarding use of blended transitions.

4. Perpendicular ramps shall be used for sidewalk offset from back of curb (reference City standard detail ST6 – Perpendicular Type B ramp) or when curb adjacent sidewalk is equal to or greater than 12-foot width (reference City standard detail ST4 – Perpendicular Type A-1 or A-2 ramp). When constructing a Perpendicular Type A ramp, the Type A-2 shall be used for new construction.

5. Pedestrian ramps shall be provided at intersections based on standards from the most recent version of PROWAG. Pedestrian ramps shall be kept separate from residential driveways and shall be installed directly across the street from one another. Please show the future driveways when submitting plans for permitting to help eliminate conflicts.

6. All ADA pedestrian ramps will require individual designs. The designs shall comply with either City of Richland Standard Detail ST-4 (Perpendicular Type A), ST-5 (Parallel Type A), or ST-6 (Perpendicular Type B). As a part of the designs, dimensions and elevation points shall be provided for the following areas:
    a. Top and bottom of landing areas
    b. Front and back of sidewalk
    c. Front and back of transition areas

7. When designing ADA ramps, the running slopes need to be designed no steeper than 7.5% grade. The length of the running slopes should not exceed 15 feet from the back of sidewalk. The landing areas shall not have any cross-slopes steeper than 1.5%.

8. A minimum of 1-foot of Right-of-Way shall be provided behind any concrete pedestrian ramp area.

9. Crosswalks between pedestrian ramps shall be designed to City Standard Details and PROWAG guidelines. Crosswalks at stop-controlled intersections shall have cross-slopes less than 2%. Crosswalks crossing thru-streets shall have cross-slopes less than 5%. Road profiles shall be designed to accommodate this. When design plans, the crosswalks shall be shown in the profile views with the appropriate grades referenced.

10. Typical sidewalk installation in the City of Richland shall be 5-feet in width for new construction. Any project that ties into existing sidewalk of 4-feet in width shall be allowed to transition to and tie-in at the 4-feet width (see RMC Chapter 12.10.030).

11. For sidewalks in areas zoned C-2 or C-3, the sidewalk width will be 8-feet when built against the curb. If a 2-foot buffer space is provided between back of curb and face of sidewalk, then the sidewalk can be reduced to 6-feet in width in these zones. For reference, please see RMC Chapter 12.10.030.

12. For sidewalks in the Central Business District CBD, the required sidewalk width is 8-feet, per RMC Chapter 12.10.030. However, there are a few roadways that can be installed to a 5-feet standard. Those roadways are as follow:

    - Guyer Avenue
    - Corondolet Drive
    - Stevens Drive (North of Majorie Sutch Greenway and Harding Street)

4.7.3. Driveway Access Guidelines

1. For any privately-owned lots seeking only a new driveway construction permit or a driveway expansion or addition, the standard Right-of-Way Permit will be used. There will be a standard fee for this application, which will be determined and updated in Richland Municipal Code (RMC) Chapter 12.08.

2. Basic provisions for the location of driveways are found in RMC 12.04.070 (Location of Driveways). Actual placement and approval of driveway locations shall reference information from this section of guidelines.

3. Residential driveways shall have a minimum width of 10-feet and a maximum width of 35-feet. The driveway width shall also not exceed 50% of the frontage along Public Right-of-Way (RMC Section 12.04.090).

4. 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 either reduced to a minimum width of 35-feet or increased to a maximum width of 60-feet. For reference, please see RMC Section 12.04.100.

5. The minimum width of a commercial one-way driveway shall be 15-feet (RMC Section 12.04.095). The maximum width for the single directional driveway shall be 20-feet (RMC Section 12.04.100). One-way commercial driveways shall have directional signage and painted arrows on the pavement directing the flow of cars.

6. For any redevelopment that does not utilize an existing driveway drop, the driveway shall be replaced with standard sidewalk segments.

7. When proposing connections to new or existing roadways, careful consideration should be given to the locations of the intersections with these roadways. The intersections should be adequately spaced from each other and provide adequate sight distance for oncoming traffic, based on both City of Richland and AASHTO Guidance.

8. Non-Residential Driveways should follow spacing requirements in the table below, unless providing the spacing below is deemed not practical.

Posted Speed (MPH)	*Minimum Driveway Spacing (ft.)	**Best Practice Driveway Spacing (ft.)
25	105	155
30	125	200
35	150	250
40	185	305
45	230	360

*Minimum width spacing based on guidance from Exhibit 15-16 of the TRB Access Management Manual, 2nd Edition

**Best practice spacing based on guidance from Exhibit 15-19 of the TRB Access Management Manual, 2nd Edition

9. Initial evaluation of any access management related issues should be discussed early in the permit development process to avoid unnecessary site redesign. Consideration should be given to the proposed driveway location, property lines, and any adjacent driveways on both sides of the street for 400 feet in either direction from the proposed driveway.

10. When designing lots for subdivision plats, consider the placement of driveways for corner lot properties. Corner lot driveways can be impacted by sidewalk ADA ramp transition areas and utility service placements.

11. Approval of driveway designs under joint access agreements shall be performed by the City Traffic Engineer.

12. Adequate driveway throat length shall be provided at all non-residential driveways. In this case the throat length is defined as the distance from the face of the curb to the first parking space or drive aisle. The typical minimum throat length to be applied is 35 feet. Properties with larger trip generation potential may require longer distances.

13. All properties abutting Washington State routes will be under the jurisdiction of Washington State Department of Transportation (WSDOT) regarding any access management questions or permitting onto those roadways. The City shall get involved if any adjacent City of Richland roads or properties are impacted by the WSDOT access decisions. For additional information regarding access to State Highways within the City of Richland, refer to RMC 12.05 (State Highway Access Management).

4.8. Work Zone Traffic Control

1. For any Right-of-Way permit that impacts existing sections of roadway or shoulder, a traffic control plan is required to be submitted and approved approximately 24-hours prior to any work commencing. If desired, a contractor and/or other representative can submit a traffic control plan earlier for review, just so long as the updated and agreed upon version is submitted prior to construction activities within the public right-of-way.

2. Before beginning any construction activity that impacts a Public Road in the City of Richland, a complete traffic control plan is required. For the traffic control plan, the following items are required:

    - Type of traffic control (flagging operation, lane closure detail, shoulder closure, etc.)
    - Types of signs being used and sizes
    - Placement/ spacing of the signs
    - Number of channelizing devices (cones, barrels, or temporary barrier) and spacing requirements
    - Work zone lengths and channelizing device taper lengths (if appropriate for work zone)
    - Work zone and/or closure duration (hours, days, etc.)

3. Most traffic control signs will be 48-inches X 48-inches in size. However, there are some signs that have specified sizes different from the standard 48-inches X 48-inches. For any sign variations please refer to Table 6F-1 in the latest version of the Manual on Uniform Traffic Control Devices (MUTCD).

4. For any roadway pavement markings impacted during construction or utility permit activities, please replace the pavement markings in kind or updated based on guidance from Section M of the WSDOT Standard Plans Manual, M21-01 and Chapter 3 of the Manual on Uniform Traffic Control Devices (MUTCD).

5. If a detour route is designed as a part of a traffic control plan, please contact all parties with roadways involved during the initial design process. Failure to contact all stakeholders could resulting in the delay or potential denial of the detour by one or more of the impacted parties. For City of Richland notifications, please contact the Public Works Permitting Office for review/ approval prior to the detour taking place.

6. Any detours or road closures for a parade, street dance, or procession (see RMC 12.24) shall be vetted through the City of Richland Public Works Department. The road closure and detour plans shall be held to the same standard as a construction work zone in terms of signs and channelizing devices. Please note that the Public Works review will be initiated by the City of Richland Parks Department prior to being sent over to Public Works for review. Requirements apply for road closures for festivals and block parties as well.

4.9. Traffic Control Devices

4.9.1. Pavement Markings

1. For any pavement markings installed within City of Richland Right-of-Way, follow WSDOT Standard Plan Section M guidance for type of markings and dimensions. Any questions or potential deviations shall be discussed with the City Traffic Engineer.

2. All pavement marking applied on City of Richland roadways shall be retroreflective thermoplastic. The only exception is at roadway intersections with Washington Department of Transportation (WSDOT) roadways. For all roadway approaches at these intersections, please install markings utilizing WSDOT Standards.

4.9.2. Signs

1. Street name options are the responsibility of developers to supply. include a street signage design plan on the street lighting sheet. Provide proposed at least two unique street names for each new roadway as soon as possible. The names will be reviewed for compliance with city municipal code and BCES naming convention. Addresses and block numbers will be provided by the city after names are approved. Street sign markups shall be submitted for approval prior to installation.

2. After a permit is approved for construction, the developer will submit sign proofs for each individual sign being design for a subdivision or new construction project. The sign proofs shall have the type of sign, size, text dimensions, background color, text color, and reflectivity noted on the drawings. For specific design standards regarding the signs, please refer to City of Richland Standard Details TR-1 through TR-6.

3. For any traffic signs are required to be installed in a project, but no information is included in the Standard Details, then please refer to specific information located in the latest editions of both the Manual of Uniform Traffic Control Devices (MUTCD), along with the Standard Highway Signs Manual and the supplement.

4. When installing signs near streetlights, consider mounting the sign on the streetlight to alleviate potential sight distance issues with the streetlight obstructing the sign.

4.9.3. Guardrail

1. When evaluating the need for any guardrail on or adjacent to City of Richland right-of-way, ensure that all treatments of roadside obstacles are evaluated first. These items can be found in Section 4.10 of the latest edition of the AASHTO *A Policy on Geometric Design of Highways and Streets* (Green Book) and are listed below:

    - Remove or redesign the obstacle
    - Relocate the obstacle
    - Use a breakaway device to reduce impact severity
    - Redirect the vehicle using longitudinal barrier and/or crash cushion
    - Delineate the obstacle (only if options above are not appropriate for situation)
    - Take no action

2. For any new roadway construction or improvements to existing roadways, evaluate the clear zone for any potential roadway hazards. For guidance, please reference Table 3.1 in the 4th Edition of the AASHTO Roadside Design Guide. If roadside hazards are discovered, then please evaluate potential methods for protection or alleviation from the hazard.

3. If guardrail is warranted for installation on or adjacent to City right-of-way, the following items need to be evaluated and/or measured for inclusion in the design:

    - Length of rail
    - Location/placement of rail
    - Guardrail type (runs and terminals)
    - Shoulder type
    - Length of Need (LON) calculation

4. For any Capital Improvement Project or Construction Permit, guardrail cannot be proposed using only standard plans from either AASHTO or WSDOT. Due to the vast variability of field conditions and available room for placement, full unique designs are required for all proposed guardrail section.

5. For any new roadway construction or improvements to existing roadways, evaluate the steepness of the existing and/or proposed roadway slopes using guidance for AASHTO Green Book. If the slope is deemed non-recoverable and non-traversable, then guardrail barrier service needs to be evaluated based on the existing conditions in the field.

6. For any new guardrail installations within the roadway, please reference AASHTO *Manual for Assessing Safety Hardware* (MASH) standards to determine the appropriate type of rail to install.

7. When determining guardrail length of need (LON) calculations for City of Richland roadway construction and rehabilitation projects, please reference guidance from Exhibits 1610-5 & 1610-6 of the WSDOT Design Manual, M 22-01.20 for reference.

8. For any guardrail modifications, ensure the newest version of guardrail is installed, as opposed to replacing the existing guardrail in kind.

4.9.4. Miscellaneous Traffic Control Devices

1. Information about installation of various traffic control devices shall follow City of Richland Standard Details TR-7 through TR-13. Devices included in these details are as follow:

    a. Rectangular Rapid Flashing Beacons (RRFB's)
    b. School Beacons
    c. Traffic Signal Foundations and Cabinets

2. For any questions regarding the placement of traffic control devices, consult City Traffic Engineer.

3. For any projects or permits installing traffic signals, consult City Traffic Engineer during all phases of design of the signal.

4.10. Streetlights

1. The streetlight layout, offsets and overall design shall be designed using the ANSI/IESRP-8-18: Design of Roadway Facility Lighting (or the most current edition), City of Richland's Street Lighting Policy 2020 (or the most current version), and the Street Light Design Criteria and Luminaire Selection Guide (Appendix A, Figure 1) provided at the end of this section. Also use this guidance to design intersection lighting and midblock crosswalk lighting, which calls for providing a luminaire approximately 20 to 30-feet ahead of the pedestrian crossing locations on both sides of the non-stop-controlled street. Once the intersection and pedestrian crossing layouts are designed, the rest of the light locations can then be designed around them. See graphical examples for intersection lighting and midblock crosswalk lighting shown in Figure 2 add the end of this section.

2. A table shall be provided on the plan that includes data for the streetlight installations including the Light number, Station, Offset, Pole Height, Arm Length, Foundation Type, Lumen Output and Color temperature, roadway classifications within the project (arterial, neighborhood collector or local), the spacing for the lights, and the number of required lights. Reference the Richland Lighting Standards.

3. Streetlights shall not be located within curb returns, driveways, or driveway transitions when placed at mid-block locations. Keep streetlights 5-feet from driveways whenever possible or protect with bollards.

4. In residential neighborhoods, streetlights shall typically be located at the ends of curb returns or within 2-feet of property lines between lots when placed at intersections. This is done to avoid driveway conflicts. For reference, please see Note 2 in Figure 2 below.

5. Any underground conduit roadway crossings shall also include an additional junction box on the opposite side of the street at the crossing. The location of this junction box shall also be within 2-feet of the property lot lines between residential lots.

6. In rare instances where there are no design alternatives to avoid placement of a junction box in occasional vehicular traffic bearing areas such as driveways or sidewalks, a heavy-duty lid shall be used for such junction box. See City's Materials List for pre-approved option(s).

7. The lighting circuit design shall be in accordance with the City of Richland Electrical Engineering requirements.

8. Streetlights shall not be installed in a location that will cause conflict with another utility.

9. Installation of a breakaway standard mounting system shall be required on all standards located on arterial and major collector streets.

10. Conductor and/or conduit minimum depth below top of pavement shall be a minimum of 2-feet under finished grade when placed under the roadway or sidewalk (see City of Richland Standard Detail SL-3).

5. Project Closeout

1. When the construction is substantially complete a paper set of “record drawings” shall be prepared by a licensed surveyor and include all changes and deviations. Please reference the Public Works document Record Drawing Requirements for a complete description of the record drawing process. After review by the City of the paper copy, a final hard copy of the record drawings shall be submitted along with a CAD and PDF copy of them.

2. Public utility infrastructure located on private property will require recording of a City Standard Form Easement prior to acceptance of the infrastructure and release of a Certificate of Occupancy (CO) and the closure of the Right-of-Way Construction Permit. The City requires preparation of the easement legal description, as well as a plan view exhibit of the easement location, by the developer’s surveyor two weeks prior to the scheduled date of occupancy / acceptance. Once received, the City will prepare the easement document and provide it to the developer. The developer shall collect signatures and record the easement at the Benton County Assessor and return a recorded original document to the City Engineer’s office prior to application for occupancy / final platting.

3. All easements granted to Public Works shall be exclusive easements, not general “utility” easements. General utility easements are used for utilities defined in the *Other Utilities* Section of this document (Section 6.6).

4. After all final “record drawings”, associated paperwork, and easement documents have been provided, and all punchlist items have been completed, the City will issue a final “Letter of Acceptance” for the project. This issuance of this letter closes out the construction permit and starts the one-year warranty period for all infrastructure built as part of this project.

5. Recorded exclusive easements for all public utilities associated with the project shall be provided prior to final acceptance of the project.

6. Whenever any public infrastructure items are built on behalf of the City, a *Public Infrastructure Bill of Sale and Warranty* form will be required prior to either the issuance of a Certificate of Occupancy (Commercial) or acceptance of the final plat (Subdivision). No public infrastructure items will be dedicated to the City until the form is completed by the project owner or representative with all project wrap-up items completed and all expenses associated with the permit project paid in full.

7. Once all easements are defined, punchlist items are address, and certificates of occupancy are issued, a final Letter of Acceptance is issued for the project. The Letter of Acceptance signifies the closure of the Right-of-Way Construction Permit process.

8. After issuance of the Letter of Acceptance, the project will have a one-year warranty. Any deficiencies to public infrastructure within the 12-month period will be the responsibility of the contractor to fix.

Appendix A Streetlight Guidance Documents

Appendix A, Figure 1. Street Light Design Criteria & Luminaire Selection Guide

City of Richland Street Light Recommendations		Roadway Classification											
		Principal Arterials (Std. ST9)		Minor Arterials and 3-Lane Major Collectors (Std. ST10 and ST11)		2-Lane Major Collectors (Std. ST11)			Minor Collectors and Local Streets (Std. ST13 and ST14)		
Land Use		Residential, Public Facilities, & Commercial	Agricultural/ Industrial	Residential, Public Facilities, & Commercial	Agricultural, Industrial	Residential & Public Facilities	Commercial	Agricultural & Industrial	Residential & Public Facilities	Commercial	Agricultural & Industrial
Assumed Pedestrian Conflict Level		Med	Low	Med	Low	Low	Med	N/A	Low	Med	N/A
Average Maintained Luminance (cd/m^2)		0.9	0.6	0.9	0.6	0.4	0.6	-	0.3	0.5	-
Luminance Uniformity	Ave/Min	3.0	3.5	3.0	3.5	4.0	3.5	-	6.0	6.0	-
	Max/Min	5.0	6.0	5.0	6.0	8.0	6.0	-	10.0	10.0	-
Average Maintained Illuminance for curved roadway sections (fc)†		1.3	0.9	1.3	0.9	0.6	0.9	-	0.5	0.7	-
Illuminance Uniformity	Ave/Min	3.0	3.0	3.0	3.0	4.0	4.0	-	6.0	6.0	-
LED Luminaire Characteristics	Distribution	III		III		II			II		
	Lumen Maintenance Factor‡	0.855		0.855		0.855			0.855		
	BUG Rating	B2 U0 G3		B2 U0 G3		B1 U0 G1			B1 U0 G1		
LED Selection	Lumen Output	High (15,000± 500)		High (15,000± 500)		Low (5,500± 500)			Low (5,500± 500)		
	Color Temperature*	4,000K		4,000K		3,000K	4,000K	4,000K	3,000K	4,000K	4,000K
Pole Layout & Selection	Maximum Pole Spacing (ft)**	120	150	155	180	150	105	Non-Cont.***	180	110	Non-Cont.***
	Mounting Height (ft)	30		30		30			30		
	Curb Setbacks (ft)****	2.5	6.5	9.5	2.5	6.5	9.5	2.5	6.5	9.5	2.5	6.5
	Arm Length (ft)	12	12	15	8	12	15	12	12	15	8	12

GENERAL NOTES: Typical design for development only requires determination of LED's, maximum pole spacing, and pole/arm combinations unless otherwise required by the Public Works Director for special designs utilizing the City of Richland 2020 Street Lighting Policy. Pre-approved street light poles and luminaires can be found in sections 9-29.6(1) & 9-29.10 of the City of Richland Special Provisions. Plan sheets will show the type of pole (including concrete base or direct burial), luminaire arm lengths, and light types (as either High-4K, Low-3K, or Low-4K).

†For R2 and R3 Pavement

‡ Lumen maintenance includes lamp lumen depreciation (LLD) and lamp dirt depreciation (LDD).

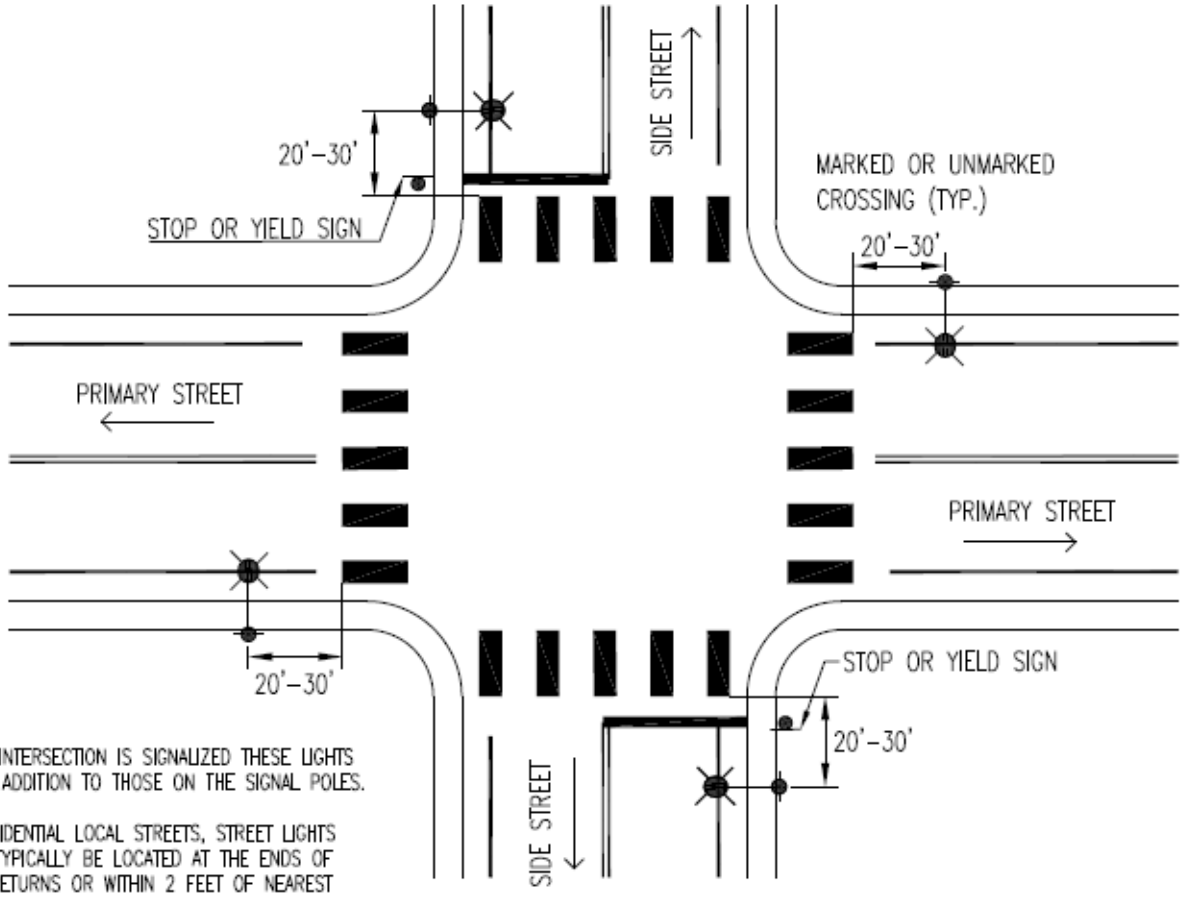
* Per Table 2, and Figure 2 in the City of Richland Street Lighting Policy for correlated color temperature determination.

** Poles shall be staggered on opposite sides of the street unless approved by the Public Works Director. Spacing to be measured along centerline between poles.

*** Non-continuous lighting shall be placed at intersections only, except when the block length is 600 feet or more in which case a mid-block light shall be placed. Additional lights may be required in very long blocks or at key conflict points at the discretion of the Public Works Director or designee.

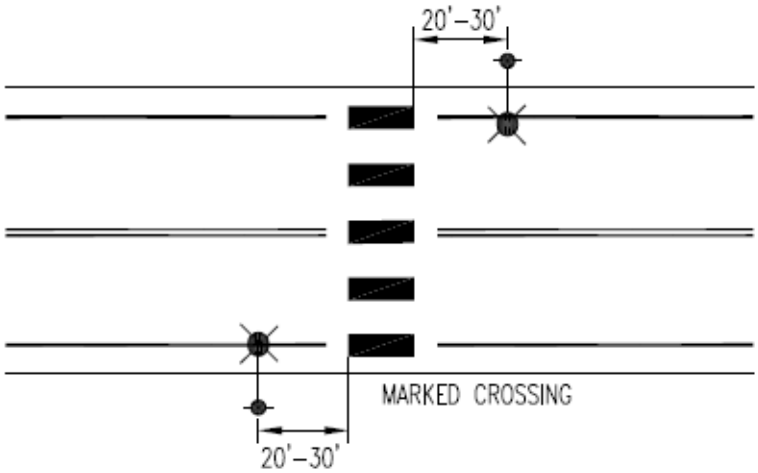
***** Setback is defined as face of curb to face of pole. Arm length is based upon setback

Appendix A, Figure 2. Lighting for Intersections and Midblock Crosswalk



1. IF THE INTERSECTION IS SIGNALIZED THESE LIGHTS ARE IN ADDITION TO THOSE ON THE SIGNAL POLES.
2. ON RESIDENTIAL LOCAL STREETS, STREET LIGHTS SHALL TYPICALLY BE LOCATED AT THE ENDS OF CURB RETURNS OR WITHIN 2 FEET OF NEAREST PROPERTY LINES AT THE INTERSECTION, WHILE MEETING MAXIMUM LIGHT SPACING IN FIGURE 1.
3. LOCAL STREET INTERSECTIONS SHALL HAVE AT LEAST ONE LIGHT PLACED WITHIN 30 FEET OF CURB RETURN ON THE UNCONTROLLED PRIMARY STREET.

INTERSECTION LIGHTING



MIDBLOCK CROSSWALK LIGHTING