TABLE OF CONTENTS

1 PRE-CONSTRUCTION REQUIREMENTS

1.1 CONSTRUCTION PLAN STANDARDS

1.1.1 GENERAL

1.1.1.1 Plans shall be prepared on sheets preferably measuring 24" high by 36" wide, but may be as large as 36" high by 40" wide. Sheets shall have margins of ½-inch on all sides except on the left side which shall be 2 inches.

1.1.1.2 The title block shall be in the lower right corner of the construction plan sheet and include at a minimum, the following information:

- City of New Berlin
- Name and Address of Engineering (Design) Firm
- Date of the Drawing and last Revision
- Scale
- Plan Sheet Number (# of #)
- Name and Location Description of Development

1.1.1.3 Plans submitted for final approval shall include the seal and signature of the professional engineer responsible for the preparation of the construction plans which shall be shown immediately adjacent to the title block.

1.1.1.4 North shall be to the top or left of the sheet and shall be shown by a 2" long north arrow, clearly, shown without intrusion.

1.1.1.5 The scale of the construction plans shall be 1" = 50' or 1" = 40' horizontally (1" = 100' is allowable for 1 acre or larger lots) and 1" = 5' or 1" = 4' vertically. Partial site plans shall have a scale of 1" = 20' or larger. The scale of details shall be such that the detail is clearly shown. The scale shall be shown with a line scale and text.

1.1.1.6 Each plan set shall have the “Call Digger’s Hotline” note prominently displayed.

1.1.1.7 All construction plan sets shall include a cover sheet that shows the locations of the proposed improvements and an index of all plan sheets included in the set. The cover sheet shall also include the following statement: “*All site improvements and construction shown on the plans shall conform to the City of New Berlin Developer’s Handbook. Where the plans do not comply, it shall be the sole responsibility and expense of the Developer to make revisions to the plans and/or constructed infrastructure to comply*.”

1.1.1.8 The plan set of drawings shall include a list of:

- A minimum of two (2) current SEWRPC reference benchmarks shall be required for each forty (40) acre or less project. Survey documentation of tie to USGS, MMSD and City of New Berlin datum shall be provided. Project or Plan datum is not acceptable.
- All permanent benchmarks;
- All temporary control points which shall be established at least every 1,000 feet;
- A description of the locations of the benchmarks; and the basis or origin of the vertical control network.

1.1.1.9 Existing surface improvements shall be indicated with solid light lines and clearly labeled.

1.1.1.10 A profile view shall be located below the plan view on plan - profile sheets and both views shall be aligned by stationing whenever possible. Stationing shall be from left to right.

1.1.1.11 Plan and profile sheets shall start and terminate at match lines.

1.1.1.12 The plan view shall show the following:

- The assumed bearing base, control monuments and stationing reference line(s).
- Right-of-way limits and easement limits;
- Edge of pavement or face and back of curb;
- Name of each existing and proposed roadway and any intersecting roadways.
- Lot lines, lot and block numbers and frontages;
- Proposed utilities and laterals and appurtenances with length, size and material type clearly labeled;
- Ghosting of existing utilities and service locations either in screened or dashed format. Pipe size of existing utilities shall be labeled;
- Dimensions showing offset from right-of-way to the utility line and separation distance between other utilities;
- All laterals shall have the proposed invert elevations at right-of-way lines and lengths clearly shown;
- An estimate of all material quantities to be used in the construction of the public infrastructure;
- Material and size of proposed utility and that of the existing utility to be connected to;
- All obstructions located within the project limits including, but not limited to: trees, signs, utilities, fences, light poles, structures, etc.;

- A note warning that underground utilities must be located by “Diggers Hotline” prior to start of construction; and

1.1.1.13 The profile view shall show the following:

- Stationing;
- Existing and proposed surface profiles over the subject utility;
- Existing and/or proposed utilities;
- Limits of gravel, spoil, and/or slurry backfill; and
- Material and size of any existing utility to be tied into.

1.1.1.14 Erosion control measures shall be clearly shown on the plans.

1.1.1.15 All submittals of revised plans shall include:

- Written correspondence shall accompany each set of plans explaining, in detail, each and every revision that was made to the plans.
- Revision date and description of the revisions on each sheet of plan set.
- Place a cloud symbol around each revision.
- If no revisions are made, indicate such on the respective plan sheets.

1.1.1.16 Upon approval of construction plans, provide a rendition of the project area reduced to fit on an 8 ½” x 11” or 11” x 17” plan sheet.

1.1.1.17 Upon approval of construction plans, provide complete PDF and CAD files on CD/DVD with CAD drawings in an AutoCAD format that is compatible with the version used by the City.

1.1.2 SANITARY SYSTEM

1.1.2.1 Proposed sewer shall be designed and located in accordance with City’s Development Handbook and shall be dimensioned on the plan view.

1.1.2.2 The plan view shall show the following:

- Distance between manholes and between each sewer lateral;
- Manholes shall be numbered with a Design Plan Number;
- Rim and invert elevations at each manhole, based on City of New Berlin datum;
- Lengths, slopes and flow directions of all proposed mains;
- Length of each sanitary sewer lateral and length of any lateral risers;

1.1.2.3 The profile view shall show the following:

- The proposed sanitary sewer and manholes;
- Proposed rim and invert elevations, based on City of New Berlin datum, type of frame to chimney seal and design plan number for each manhole;

- Pipe diameter, length, percent grade to two (2) decimal places, direction of flow, and center to center length of proposed sanitary sewer installed between manholes and laterals shall be shown;

1.1.2.4 A general note on each plan sheet giving the size, class, type, and ASTM designation of every proposed main and lateral shall be shown, with an estimate of material quantities clearly tabulated. General specifications on manhole frames / lids / barrel structure shall be noted. Elevations, based on City of New Berlin datum, shall be referenced to MMSD datum. The MMSD datum shall be shown in parentheses by subtracting the conversion factor of 580.58 from City datum.

1.1.3 WATER SYSTEM

1.1.3.1 Proposed water main shall be designed and located in accordance with City's Development Handbook and shall be dimensioned on the plan view.

1.1.3.2 The plan view shall show the following:

- At least one clearly labeled benchmark or control point;
- Lengths and slopes of water main between fittings and grade breaks;
- Label appurtenances (i.e.: hydrants, valves, bends, etc.);
- Proper position of each hydrant pumper nozzle;
- All areas to be insulated over water main;

1.1.3.3 The profile view shall show the following:

- Labels, elevations (based on City of New Berlin datum), and distances between appurtenances;
- Pipe diameter, percent grade to two (2) decimal places, direction of flow, and center to center length of proposed water main installed between valves, grade breaks and laterals locations;
- Invert elevation at grade breaks;
- Material choices of the new water main;
- Hydrant nozzle and hydrant tee elevations;
- Stationing of any areas to be insulated;

1.1.3.4 Curved lines shall indicate deflected pipe (with proposed curve data provided); lines shall be straight between fittings.

1.1.3.5 A general note on each plan sheet giving the size, class, type, and ASTM designation of every proposed main, service lateral, and hydrant shall be shown, with an estimate of material quantities clearly tabulated. Water services shall include size of service, footage and count. General specifications on valve boxes and manhole frames / lids / barrel structure shall be noted.

1.1.4 STORM SYSTEM

1.1.4.1 Proposed storm sewer shall be designed and located in accordance with City's Development Handbook and shall be dimensioned on the plan view.

1.1.4.2 The plan view shall show the following:

- Proposed storm sewer, catch basins and junction boxes;
- Length and size of storm sewer between catch basins and junction boxes;
- Details of outfall or ditch inlet protection requirements such as rip-rap, end sections or headwalls as needed;
- Details of detention facilities outfall and overflow structures as needed;

1.1.4.3 The profile view shall show the following:

- The proposed storm sewer, catch basins and junction boxes;
- Distance, length, slope to two (2) decimal places, and size of storm sewer between catch basins and junction boxes;
- Rim and invert elevations, based on City of New Berlin datum, at each manhole, catch basin and junction box;
- Lateral locations;
- Material and size of proposed storm sewer and that of the existing storm sewer to be connected to; and
- Cross-section of detention facilities, including outfall and overflow structures.

1.1.4.4 A general note on each plan sheet giving the size, class, type, and ASTM designation of every proposed manhole, inlet or outlet section shall be shown, with an estimate of material quantities clearly tabulated. General specifications on storm sewer pipe, catch basins and manhole frames / lids / barrel structure shall be noted.

1.1.5 ROADWAY

1.1.5.1 Elevations shall be based on City of New Berlin datum.

1.1.5.2 The plan set of drawings shall include:

- Plan and profile views; and
- Cross-sections at 50-ft intervals.

1.1.5.3 Each roadway plan sheet shall show the following:

- The assumed bearing base, control monuments and stationing reference line along the centerline of the roadway, including cul-de-sacs;
- At least one clearly labeled bench mark or control point;
- Width of pavement and median;
- Final grade elevations at 50' intervals for pavement centerline and edge of pavement for all streets and roadways, and at 50' intervals for top of curb for urban sections;

- Final grade elevations for cul-de-sacs at 50' intervals, including high points, edge of pavement and top of curb for urban sections;
- Final grade elevations for all PVC's, PVT's and PVI's, and PC's, PT's, PI's for vertical and horizontal curves at intersections;
- Radii of all intersections (edge of pavement or back of curb, with note indicating which is referenced);
- All driveways within 100' of the proposed intersection;
- All roadside ditch locations, flowline elevations (based on City of New Berlin datum) at 100' intervals of the ditches;
- Slope intercepts;
- Invert profile for 200' downstream for any existing ditches receiving flow from a proposed road or street;
- All culverts and endwalls, with length, size and material type clearly labeled;
- The limits of any areas which need special stabilization techniques;
- Specific details of all existing connected roadways. Pavement, shoulders, ditches, curb alignment, and grades shall be shown as needed to adequately make the transition;

1.1.5.4 The profile view shall show the following:

- Stationing and final centerline grades at all 50' and 100' stations and at grade breaks;
- Existing and proposed roadway profiles along centerline of roadway and cul-de-sacs;
- Stationing and final centerline grades at all PC's, PT's, PVI's, and POC's at PVI's for horizontal and vertical curves;
- Slope of the roadway between each grade break;
- Sizes and inverts for all existing and/or proposed utilities and all culverts;
- Limits of any areas that need special stabilization techniques.

1.1.5.5 All existing lot, property, and public utility easement lines in the area in which the road or street is to be located shall be shown. The address, lot and block numbers, and subdivision or development name shall be indicated. Addresses shall be labeled with italics. Unplatted lands and the address of any home on such lands shall be so indicated. All street names shall be clearly shown.

1.1.5.6 Road cross sections shall show the following:

- Slope intercepts shall be clearly labeled by station, elevation to the nearest 0.1', and offset distance (left or right) from the reference line.
- Invert elevation of ditches (for rural roadway) and flowline elevation of the gutter (for urban street).
- Final pavement elevation at the centerline of the street or roadway.

1.1.5.7 A separate detail sheet shall be required for the roadway plans. This detail sheet shall show typical cross-sections for a roadway and cul-de-sac if applicable.

1.1.5.8 Specific cross-section(s) and details along with specifications must be shown if not supplied elsewhere in the plan set.

1.1.6 LOT GRADING

1.1.6.1 The plan shall show existing tree lines and any obstructions (fences, structures, power poles, etc.) within the project limits.

1.1.6.2 Lots with proposed private owner waste treatment systems (POWTS) shall have the POWTS area designated as a “No-Touch” zone with respect to grading or other ground disturbance activities during overall project site or lot grading and construction activities, except for the actual POWTS installation commensurate with the home construction.

1.1.6.3 The plan shall show:

- all proposed lot lines and lot numbers;
- lot line dimensions;
- outline of buildable areas for each lot;
- all existing and proposed roads with names;
- all existing buildings, structures and foundations;
- all existing drainage channels and watercourses;
- the 100-year flood plain limit;
- wetlands; and
- all existing and proposed easements.

1.1.6.4 Wetland limits shall be labeled with bearings and distances and be tied down to lot lines for easy location by individual lot owners. Bearings and distances may be tabulated.

1.1.6.5 Existing topography of the site and all areas within 100 feet of the site shall be shown at a one foot contour interval using City of New Berlin datum (USGS). Two foot contour intervals may be used on lots over 1 acre in size. Existing contours shall be shown as thin, dashed lines with a readily discernable heavier line used for the 5-foot contour intervals.

1.1.6.6 The yard grade of any existing buildings located within 150 feet of the subdivision boundary shall be shown.

1.1.6.7 Proposed grading by a developer shall be shown at a contour interval of 1 foot using City of New Berlin datum (USGS). Two foot contour intervals may be used on lots over 1 acre in size. Proposed contour lines shall be shown as solid medium lines, with a discernible heavier line use for the 5-foot contour intervals.

1.1.6.8 The grading plan shall show proposed road(s), curb and gutter, all storm sewer grates and storm sewer manholes (or cross-culverts for open ditches). Show any off road storm inlets and discharge locations with surface entry elevations.

1.1.6.9 At front setback line show a typical 66' x 54' house shell on each lot and the proposed yard grade to the nearest tenth of a foot (assumed to be 0.7' below the top of block) for each building. Show proposed finished elevations to the nearest tenth of a foot at all lot corners and along side lot lines adjacent to the front and back corners of the typical house. Show proposed finished elevations to the nearest tenth of a foot at high and low points along any side or back lot lines, and at high and low points if roads to demonstrate proposed drainage.

1.1.6.10 The grading plan for any house that will probably require special design due to topography, shall clearly show separate grades for the garage and yard grade if extra steps are needed. Separate spot finish elevations shall be shown for rear or side exposure or walkout.

1.1.6.11 The plan shall indicate if cuts and fills will be balanced on site.

1.1.6.12 Proposed storm inlets shall be shown on each grading plan. Each plan shall also include specific details on all applicable retention/detention basins, ponds, overflows, etc. Separate sheets or notes may be required.

1.1.6.13 The plan shall include all notes required to properly sequence the construction activities (i.e.: erosion and grading plans must be done ahead of other operations on site to manage storm water runoff).

1.1.6.14 On a separate plan sheet show erosion and sediment control measures and details including:

- Locations and dimensions of all proposed land disturbing activities, including finished topography;
- Proposed limits of disturbance including proposed tree cutting areas;
- Location and dimensions of all temporary topsoil and dirt stockpiles;
- Location and dimension of all construction site control measures necessary to meet the requirements of the City of New Berlin Erosion Control Ordinance;
- Location of all channels, pipes, basins or other conveyances proposed to carry runoff to the nearest adequate outlet, including applicable design assumptions and computations;

- Areas to be sodded or seeded and mulched or otherwise stabilized with vegetation, describing the type of final vegetative cover; and
- Schedule of anticipated starting and completion date of each land disturbing and land developing activity, including the installation of the construction site control measures that are needed.

1.1.7 GRADING PLANS

1.1.7.1.1 A detailed grading plan is necessary for all new subdivisions, land divisions, and construction of any new industrial, commercial, or multi-family building. The final grading plan and other associated utility plans are to be approved by the Engineering Services Division prior to signing the Development Agreement. The grading plan that is required is the "DEVELOPER's CONSTRUCTION GRADING PLAN". It shows all the grading that the developer proposes to do. It differs from the "MASTER GRADING PLAN", which shows the typical ultimate lot grading after each individual homeowner has constructed his house and done his finish landscaping. For a commercial or industrial site that the developer is building himself, the Developer's Construction Grading Plan and the Master Grading Plan are one and the same.

1.1.7.1.2 A Developer's Construction Grading Plan and a Master Grading Plan are required for any new subdivision.

1.2 DEVELOPMENT AGREEMENT

Projects that include public infrastructure shall be required to enter into a Development Agreement. Regulations regarding development agreements are set forth in Municipal Code Chapter 235, Subdivision of Land, § 235-15J.

235-15J(3)(a) "Development agreements are intended to provide the City with the public infrastructure and amenities necessary to serve the proposed land use (development) and that they will be provided for according to an agreed-upon schedule and at a level of quality consistent with current City standards adopted by the Board of Public Works. Public benefits arising from a development agreement may include, but are not limited to, provision of public facilities such as streets, sewerage, parks/open space, transportation, schools, drainage, stormwater facilities, and utility facilities."

1.3 FINANCIAL GUARANTIES

Projects that include public infrastructure shall be required to guarantee the construction of the improvements through financial securities. Regulations regarding improvement guaranties are set forth in Municipal Code Chapter 235, Improvement guaranties, §235-16.

1.4 CONSTRUCTION MANAGEMENT DEVELOPER DEPOSIT

Projects that include public infrastructure shall be required to provide a Construction Management Developer Deposit to cover any of the following applicable public infrastructure inspection costs: as-built and easement preparation and inspection services for roadway, water system, sanitary system, storm system and all associated apparatus. Regulations regarding the construction management developer deposit are set forth in Municipal Code Chapter 275, Developer Deposit Fees, §275-20.C(2).

1.5 INSPECTION REQUIREMENTS

Development Projects that include public infrastructure shall be subject to City Inspection. Regulations regarding inspections are set forth in Municipal Code Chapter 235, Inspections, §235-17. City Inspection of public infrastructure shall be performed by the City or by an Inspection Consultant approved by the City, at the sole cost of the Developer. The City inspection is required to observe that the public infrastructure is in accordance with City standards. The City inspection is not responsible for supervision or directing of the work. The City inspection is in addition to and not replacement of construction oversight by the developer and their contractors and at no time replaces the developer's or the contractor's responsibilities of construction management and oversight or their work.

The following requirements apply to City projects where the City is hiring a consultant to provide full construction management.

1.5.1 GENERAL CONSTRUCTION MANAGEMENT

1.5.1.1 The Inspection Consultant shall be responsible for managing, coordinating and inspecting all construction work performed on-site relative to completing the project for intended use and purpose.

1.5.1.1.1 Provide full-time on-site construction observation services for the installation of all project elements, as appropriate for the nature and type of project element being constructed. Intermittent site observation is generally suitable for work performed that can be fully accessed and assessed as to material and workmanship quality after installation.

1.5.1.1.1.1 Inspection Consultant shall provide a list of inspectors to the City Engineer for approval prior to the start of construction. Inspectors that will be on site shall be pre-approved by the City Engineer prior to performing site inspections.

1.5.1.1.2 Be responsible for coordination of the contracts, as necessary and appropriate per the Contract Documents and monitoring the schedule of individual phases of the project elements to ensure a timely completion. Verify that all necessary Permits are obtained by the Contractor(s).

1.5.1.1.3 Make recommendations for adjusting the work to accommodate changing and unforeseen conditions, as applicable and appropriate. Delay Reports when required, reflecting the effect on each Contractor or Subcontractor and the overall project schedule.

1.5.1.1.4 Prepare daily progress reports describing work completed, trades involved, and any issues that occurred at the site.

1.5.1.1.5 Maintain an ongoing and current record of changes to the Plans or Specifications that occur on the project. The Marked up plan-set shall be submitted to the City Engineer prior to final payment to the Contractor.

1.5.1.1.6 Receive and forward required Shop Drawings to the Designer for review. The Designer shall be responsible to distribute the reviewed Shop Drawings to the appropriate parties. Document correspondence via Memorandum.

1.5.1.1.7 Assist the City in selecting and obtaining material and laboratory testing services required by the project.

1.5.1.1.8 Inspect all materials delivered to the site to ensure that they meet required standards.

1.5.1.1.9 Maintain daily logs and records, submitting an original copy to the City at no less often that weekly during the project construction period.

1.5.1.1.10 Assist the City with such other services as may be required in execution of the Contract Documents to complete the project.

1.5.1.1.11 Assist City in implementing the project completion consistent with the project schedule and the Contract Documents.

1.5.1.1.12 Prepare contract closeout and acceptance documents, including oversight of all Start-up operations of equipment in accordance with the Contract Documents.

1.5.1.1.13 At the close of the project, the inspection consultant shall provide the City with a Construction Inspection Binder including the following documents.

1.5.1.1.13.1 Material Submittals
1.5.1.1.13.2 Inspection Reports
1.5.1.1.13.3 Test Results/Reports
1.5.1.1.13.4 Change Orders / Substitutions
1.5.1.1.13.5 Pay Applications
1.5.1.1.13.6 Final Record Set of Construction Plans

1.5.2 GENERAL INSPECTION

1.5.2.1 Inspector shall have a thorough understanding of construction dealing with construction of sanitary systems, water systems, storm systems, roadway systems, and all associated construction requirements.

1.5.2.2 Review project plans, specifications and special provisions. At all times have a set of Approved Construction Documents and a copy of the City of New Berlin Development Handbook available for use at the Project Site.

1.5.2.3 Hold a briefing for any new Inspectors prior to their performing inspection services at a Project.

1.5.2.4 Pre-notify the City Engineer of any meetings that are scheduled.

1.5.2.5 Attend the pre-construction meeting.

1.5.2.6 Provide daily notification to the City Engineer of any Inspectors scheduled to be working. This notification may occur during the previous days work or before 8:00 a.m. each day.

1.5.2.7 At the request of the City Engineer, prior to the start of construction, take photos or videotapes of pre-construction conditions of adjacent or intersecting pavement conditions on material or hauling routes. Make note of any special drainage features to be restored after construction.

1.5.2.8 Before work starts, confirm that the Contractor has the necessary barricades and warning devices in conformance with applicable standards.

1.5.2.9 Monitor the installation and condition of erosion control devices prior to allowing any land disturbing activities to proceed in accordance with the Contract Documents and any Agency permits issued.

1.5.2.10 Complete a Daily Projects Events Report that includes monitoring erosion control devices to ensure that they are functioning at the beginning and end of the workday. Note the status of erosion control. Turn in the report to the City Engineer during the next day or mail it to the Engineering Department if leaving the Project Site.

1.5.2.11 Review all construction materials delivered to the project. Mark all defective material and have the Contractor remove it from the site in a prompt manner. Record manufacturer, class and type of material being used on both the Daily Project Events Report and in the Inspector's set of field plans. Equipment shall be verified through review of the approved Shop Drawings.

1.5.2.12 Review the project location and become familiar with marked underground utility locations. Be alert for underground utilities when the Contractor is excavating.

1.5.2.13 Watch for damage to private and City property and report any damages to the City Engineer. Include photographs and document any damage in the Daily Project Events Report. Notify the Contractor, in writing, of any damages so that he/she will be aware of the responsibilities for repairing the damage.

1.5.2.14 Take a reasonable and representative number of construction photos during the progress of the Project to record routine and special construction.

1.5.2.15 If a laser is being used to install pipe, check the laser for accuracy at least twice daily. Determine that the correct grade percentage is dialed in on the laser. Checks should be done more frequently in cold weather.

1.5.2.16 After the project is substantially completed, prepare a Punch List of corrective work and provide copies to the Contractor, City and project inspection file. Perform follow-up to assure completion of the Punch List work items, as directed by the City.

1.5.2.17 During final inspection, determine that all areas disturbed by the Contractor have been cleaned up, graded and properly restored.

1.5.2.18 When corrective work has been completed, coordinate the completion of Record Drawings, compilation of all test and inspection forms and reports and submit to the City Engineer.

1.5.2.19 Maintain one (1) record set of “as-built” drawings at the Project Site, marked up to show all field changes, locations of buried utilities around and contiguous to the building(s), and other significant items. This information shall be turned over to the City Engineer at the conclusion of the Project. Preparation of the Utility line as-builts shall be the responsibility of the Inspection Consultant, consistent with City Standards.

1.5.2.20 Review, modify or approve all progress and final payment requests by the Contractor(s), verifying work completed, reasonableness of request, and recommend to City Engineer the amount to be paid with each request using specified forms.

1.5.2.21 Identify any liquidated damages that may become due, basis for the charges against the Contractor(s) and document in writing to the City Engineer. Track any possible causes that justify the granting of a time extension to the Contract. Review and recommend any requests by the Contractor for changes in compensation differing from the amount(s) bid. Document these issues on the Daily Project Events Report form.

1.5.2.22 Review, document and recommend payment or disapproval of all Contractor proposals and requests for Change Order using appropriate forms. Document any verbal requests for Change Order work on the Daily Project Events Report form. Compile all Change Order request documentation and submit to the City Engineer with recommendation.

1.5.2.23 The Project Designer shall be responsible for resolving any conflict between the Plans, the Specifications and the site conditions that are encountered in the Construction Phase with due notice to the City Engineer. The Designer shall be responsible for review and approval of all Shop Drawings for the Project.

1.5.3 GENERAL UTILITY CONSTRUCTION

1.5.3.1 As grade staking is completed for various sections of the project, verify stakes for offsets and note all locations for structures, hydrants, valves and fittings. Confirm that the line and grade of the grade stakes corresponds with the approved construction plans and survey cut sheets.

1.5.3.2 Verify that the surface upon which the pipe is to be laid is true to grade, firm and thoroughly compacted. Never allow pipe to be laid upon a trench bottom which is soft, yielding, mucky or under water. Any undercutting not provided for in the contract should be cleared with the City Engineer. Measure all undercutting to depth, width and location to provide proper documentation and payment.

1.5.3.3 Confirm that the pipe is properly bedded the entire length.

1.5.3.4 Verify that the proper trench width is maintained, but not exceeded, from the trench floor to a point 12” above the top of pipe.

1.5.3.5 Check the line and grade of the pipe as it is being set by the Contractor.

1.5.3.6 Verify that the pipe is clean, joint components and contact surfaces are free of defects. Make sure that the pipe is driven “home” to the full depth of the socket according to manufacturer’s requirements and instructions.

1.5.3.7 Obtain an accurate measurement of all piping installed and record the measurements on the Daily Inspection Report and Inspector’s field plans.

1.5.3.8 Confirm that the Contractor is using a pipe plug or “cookie” in the last installed pipe prior to excavation of the next length of pipe to prevent debris from entering the pipe. Also insist that the Contractor installs the pipe plug in the last pipe installed each day to prevent dirt, water or animals from entering the pipe.

- Observe removal of the pipe plug or “cookie”.

1.5.3.9 Observe the backfilling work to assure that only proper material is placed into the trench (no clay lumps, broken concrete, frozen chunks, etc.).

1.5.3.10 Verify that the pipe is properly protected against subsequent damage during backfilling operations.

1.5.3.11 Observe that backfilling around the pipe is done by hand methods to one foot above the top of pipe. Observe that subsequent backfill is completed in uniform lifts and compacted per the specifications.

1.5.3.12 Observe staking and Record ties and invert and top of pipe elevations for all main line stubs which are installed for future connections.

1.5.3.13 Observe that all services, including those to vacant properties and buildings, have been properly staked by the survey crew. Verify the staked service locations and elevations against the approved construction plans.

- Record the actual location of services on the Inspector's field plans.
- Confirm that all services are marked by a wooden marker as specified.
- Accurately record the location, size, depth (or invert elevation) and length of all sanitary services on the Inspector's field plans.

1.5.4 SANITARY SEWER CONSTRUCTION

1.5.4.1 All precast and cast-in-place manhole components should be checked for configuration, dimensions, thickness, damage, and defects as they are delivered or constructed.

1.5.4.2 When the manhole base is installed, confirm the base is level and at proper grade.

1.5.4.3 Prior to backfilling, verify that the manholes are completely finished. Check for plumbness, dimensions, proper inverts, proper patching and leakage. All manholes must be free of dirt and debris.

1.5.4.4 Prior to completion, confirm that all manhole inverts have been finished off, in accordance with the plans and specifications. Check the floor and flow line, castings and steps for compliance with Contract Documents. Verify that the casting and adjusting rings are mortared in place.

1.5.4.5 Schedule and observe low pressure air tests and mandrel tests. Coordinate the scheduling with the Utility Department. Confirm that the Contractor removed all plugs in existing lines.

1.5.4.6 Verify that the Contractor cleaned and televised the sewer.

1.5.5 WATER MAIN CONSTRUCTION

1.5.5.1 Verify that the hydrants are installed in accordance with the plans and specifications.

1.5.5.2 Verify that trace wire is installed in accordance with City requirements.

1.5.5.3 Determine if insulation is required above the water main at crossings of ditches and culverts.

1.5.5.4 Visually inspect to make sure that all water service corps are in the open position and not leaking before backfilling.

1.5.5.5 Verify that all sections of the water main have had chlorine tablets properly added for purpose of disinfection. After the specified disinfection period, confirm that the Contractor flushes the system. Observe the performance of the pressure test, main flushing, and safe water sampling (safe water sampling shall be conducted by the Utility Department). Coordinate these tasks with the Utility Department.

1.5.5.6 During final inspection, lamp all valve boxes to visually inspect that they are free of dirt and debris, and installed plumb. Confirm that the valve key fits on all valve operating nuts.

1.5.5.7 Check all hydrants for flags and ensure that the pumper nozzle on each hydrant is facing the proper direction.

1.5.5.8 Verify the finished grade around all hydrants and hydrant valve boxes to ensure that the valve box is exposed and that the break-off flange is above finished grade.

1.5.6 STORM SEWER CONSTRUCTION

1.5.6.1 Verify that catch basins are set to match the proposed curb and gutter for both line and grade.

1.5.6.2 When the Contractor is installing storm sewer directly below curb and gutter, check the elevation difference between the top of storm sewer and the bottom of the curb and gutter.

1.5.6.3 If a storm sewer line is laid close to a watermain, determine the separation distance between the storm sewer and watermain, and consult with City Engineer about the need for insulation.

1.5.6.4 During final inspection, determine that all manholes, inlets and catch basins are completely finished. Verify that the floor and flow line are in compliance with the Contract Documents and that the casting and adjusting rings are mortared in place.

1.5.6.5 Verify that the Contractor cleaned the storm sewer.

1.5.7 ROADWAY CONSTRUCTION

1.5.7.1 Before the start of construction, develop an understanding of the grading requirements.

1.5.7.2 Observe the grading for curb (including sidepath, if applicable) to verify that the Contractor is not undercutting the grades. If undercutting occurs, require the Contractor to bring the subgrade up with suitable granular material, at the Contractor's expense. Verify that the granular material meets the compaction requirements in the Contract Documents.

1.5.7.3 Determine that the pavement and the curb areas of the roadway are properly proof rolled, then monitor the repair of any substandard areas.

1.5.7.4 Use forms and/or string lines to check line and grade of curb and gutter (including sidepath, if applicable). The forms or string lines should be checked at every grade stake with a carpenter's level. Visually check the string line or form line to assure uniform grade.

1.5.7.5 Verify which technique will be employed by the Contractor to construct curbs (forms or curb machine). If forms are used, they should be clean, sprayed with form oil, and well braced.

1.5.7.6 Check curb immediately after the curb machine starts, for conformance to standard details. Continue to check for proper alignment, grade and pitch while the machine is in operation.

1.5.7.7 Ensure that the water lateral, sanitary lateral and all valve boxes are "branded" onto the curb face at the time of placement to accurately reflect respective aspects and locations.

1.5.7.8 Ensure that the curb is backfilled prior to when paving operations begins.

1.5.7.9 Before bituminous paving begins, verify that the job mix formula has been received and approved. As paving is conducted, sample and test in accordance with the testing program for the project.

1.5.7.10 Check temperatures of the bituminous mixtures from the truck box and the paver hopper.

1.5.7.11 Observe the pavement mixture as it is dumped from the truck to the paver. No lumps, clumps or non-coated aggregates are allowed.

1.5.7.12 Determine that all joints and areas around castings or obstacles are properly raked to ensure a uniform pavement after compaction.

1.5.7.13 Check for uniform shaping of the boulevards and backslopes. If grading beyond the plan limits is required, through no fault of the Contractor, measure and record the additional grading in the Daily Project Events Report and Item Record Accounts.

1.5.7.14 Walk the project to ensure that all structures are clean, plumb and functional.