City of St. Charles Engineering Design and Inspection Policy Manual

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ENGINEERING DESIGN AND INSPECTION POLICY MANUAL

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SECTION I

SANITARY SEWER SYSTEM

A: Design Requirements:

1) Auger: Conditions (such as a recently reconstructed roadway or traffic impacts) may warrant that the City require roadway crossings to be augered. When required, steel casing and spacers shall be utilized. Following completion of the auger, the ends shall be blocked and mortared shut (refer to City casing pipe detail).

2) Cover Depth: All sanitary sewer and services must have a minimum cover of four (4) feet.

3) Calculations: Provide Population Equivalent (PE) calculations to substantiate the available capacity of the receiving sewer.

4) Drop Connections: Drop connections will be required for all manhole connections with a pipe invert higher than one (1) foot above the flowline of the manhole. Drop connections will only be allowed when site conditions dictate the need to construct a drop structure. Exterior drop connections are preferred. Interior drop connections may be permitted at the discretion of the City (refer to City drop manhole detail).

5) Manhole Spacing: Manholes shall be provided at:
    - 400' maximum intervals.
    - All changes in pipe diameter, material, grade or horizontal alignment.

6) Manhole Sizing: Sanitary sewer manholes shall have a minimum inside diameter of four (4) feet (refer to City sanitary manhole detail).

7) Separation Requirements: Separation requirements shall follow the current edition of the Standard Specifications for Water and Sewer Construction in Illinois and the Ten States Standards.

8) Services, Domestic: Domestic sanitary services shall be constructed of PVC SDR 26 with a minimum diameter of 6". All domestic services shall connect to the public sewer with a wye fitting. A cleanout shall be installed within 10 feet of the structure.

9) Services, Industrial & Commercial: Industrial and commercial sanitary services shall be constructed of PVC SDR 26 or 21, with a minimum diameter of 6". All industrial and commercial services shall connect to the public sewer at a manhole. An inspection manhole shall be provided within 10 feet of the structure (refer to manhole details for service connections).

10) Sewer Pipe, Materials (gravity): Sanitary sewer shall be constructed of the following materials:

    Depth less than 20': PVC SDR 26

    Depth greater than 20': PVC SDR 21 or DR 18. Other pipe types may be approved by the Public Works Department as special circumstances warrant.

11) Gravity Sewer Pipe Size and Velocity Requirements: Public sewer must have a minimum diameter of 8", and must provide a minimum self-cleaning velocity of 2 fps, not to exceed 10 fps.

12) Force Main Requirements: Sanitary sewer force main shall conform to the following:
    i) Pipe Size and Velocity Requirements: 6" minimum diameter. Smaller diameters approved by Public Works Department as special circumstances warrant.
    ii) Material Requirements: Pipe shall be PVC SDR 21 with tracing wires.
    iii) Clean-outs: Required at all vertical and/or horizontal bends, with a maximum spacing of 400'. Cleanouts shall be installed via the use of a "Wye" connection with a cap at the top of the cleanout, and be constructed within a manhole. See City detail.
    iv) Air/release valves: Shall be located at all high points and be independent of cleanouts.

13) Trench Backfill: All utility and service trenches within three feet of paved surfaces shall be backfilled with CA-7 (Virgin Crushed Limestone), mechanically compacted in one-foot lifts to 95% proctor density.

    Flowable Fill: The City may approve or require the use of flowable fill as backfill under existing pavements. Flowable fill shall meet IDOT standards for Controlled Low Strength Material (CLSM) Mixture #1.

14) Lift Station: Lift stations will be permitted only where site conditions do not allow for the construction of a functional gravity sewage collection system. Where lift stations are permitted, the following criteria shall be met:
    i) A lift station design report shall be submitted for review and approval *(Contact the City of St Charles for sample reports and/or additional information).*
    ii) A complete set of shop drawings and product specification information (i.e.: generator, pump, lift station...) shall be provided to the City for review and approval.
    iii) A detailed plan depicting the proposed layout of the lift station, including the location of the generator, control panel, wet and dry wells, bypass valves with quick connects, access drive, fencing, lighting and landscape features shall be submitted for review.
    iv) A natural gas-powered emergency generator shall be provided.
    v) A communication connection to the main Sewage Treatment Plant alarm system shall be provided, preferred method is City owned fiber network.
    vi) A dedicated parking area and access drive consisting of heavy-duty paved asphalt (SN = 3.0) shall be provided to the City.
    vii) Provide a 4' diameter gravity sewer manhole within 15' upstream of wet wells.

15) Extension of Sewer System: Sanitary sewer system must be extended to the limit of the development. Note on plans which sewer lines are to be public and private. Sanitary sewers shall be designed to accept all existing and future demand based on the fully developed state under present zoning and the City's Comprehensive Plan.

16) Disconnection of Existing Services: Disconnection of existing services at their respective mains shall be by means of cutting out existing wye or tee and replacing with a straight piece of equal size pipe and making the final connection with "non-shear" couplings.

    Disconnection of all services must be performed prior to the demolition of an existing structure. Existing services to be abandoned shall be filled or removed.

17) Connecting to an Existing Sewer: When connecting to an existing sewer main by means other than an existing "Y", "T", or an existing manhole, one of the following methods shall be used:
    i) Removal of a section of the existing pipe will be required. Install a new "Y" or "T" fitting with non-shear repair couplings, following manufacturer's recommendations for the installation. No cut-in connection, made by breaking or cutting a hole in the main and inserting the spigot end of an ordinary sewer pipe shall be permitted.
    ii) Other connections may be approved by the City as conditions warrant.

18) Structures Located Within the 100-year Floodplain: Sanitary sewer manholes constructed within the 100-year floodplain must be constructed with a water-tight lock-type frame and cover, Neenah R-1916 C or approved equal.

19) Video Note on All Plans: Engineering plans must contain the following note: "A current color video record and a written transcription of the internal inspection of the newly constructed storm and sanitary sewer systems shall be submitted prior to refunding of site improvement escrow retention monies by the City of St Charles. All public mains shall be televised and digitally recorded. The contractor must rotate the lens of the camera to look at all services. The service connections must be noted in the television report. When the proposed sanitary sewer system connects to an existing sewer system, the existing sewer must also be televised and reported. The contractor shall coordinate the televising of existing contiguous sewers with the City of St Charles. All lines shall be flushed and cleaned prior to televising."

20) GPS Location of Utilities: The following shall be GPS located in coordination with the City:

    - Sanitary manholes, wyes, tees, cleanouts and any service stubs. GPS location shall be completed prior to backfilling all wyes, tees and stubs.

21) Connecting to an Existing Structure: Pipe penetrations into existing sanitary manholes shall be properly sized and cored and sealed with flexible watertight connections (refer to City sanitary sewer connection to existing manhole detail).

SECTION II

STORM SEWER SYSTEM

A: Design Requirements:

1) Auger: Conditions (such as a recently reconstructed roadway or traffic impacts) may warrant that the City require roadway crossings to be augered. When required, steel casing and "Cascade" spacers (or approved equal) shall be utilized. Following completion of the auger, the ends shall be blocked and mortared shut (refer to City casing pipe detail).

2) Catch Basins: Catch basins shall consist of 4' minimum interior diameter reinforced concrete structures with a 3' sump (refer to City catch basin detail).

3) Cover Depth: All storm sewer and sump lines must have a minimum cover of 2'.

22) Video Note on All Plans: Engineering plans must contain the following note: "A current color video record and a written transcription of the internal inspection of the newly constructed storm and sanitary sewer systems shall be submitted prior to refunding of site improvement escrow retention monies by the City of St Charles. All public mains shall be televised and digitally recorded. The contractor must rotate the lens of the camera to look at all services/connections. The service connections must be noted in the television report. When the proposed sewer system connects to an existing sewer system, the existing sewer must also be televised and reported. The contractor shall coordinate the televising of existing contiguous sewers with the City of St Charles. All lines shall be flushed and cleaned prior to televising."

4) Disconnection of Existing Services: shall be by means of cutting out existing wye or tee and replacing with a straight piece of equal size pipe and making the final connection with "non-shear" couplings. Disconnection of all services must be performed prior to the demolition of an existing structure.

5) Flared End Sections: All flared end sections greater than or equal to 12" shall have a removable grate system. Grates shall be galvanized steel.

6) Extension of Sewer System: The storm sewer must be extended to the limits of the subdivision or lot and shall be sized to accept all tributary areas.

7) Capacity Calculations: Provide calculations to substantiate the available capacity of the existing receiving storm sewer/stream in light of the design discharge from the proposed development. Note on all plans which sewer lines are to be public and private. All proposed storm sewer systems shall be designed per the Kane County Stormwater Ordinance as adopted and modified by the City of St. Charles.

8) Connecting to an Existing Sewer: All connections to existing storm sewers shall be at a manhole, except for permitting sump pump connections. Sump pump connections shall be made utilizing a wye or tee-wye fitting for all sewer mains 12" in diameter or less. When connecting to an existing sewer main that is over 12" diameter, one of the following methods shall be used:

    a. Using pipe cutter, neatly and accurately cut out desired length of pipe for insertion of proper fittings. Use non-shear couplings utilizing shear rings and clamps. Non-shear couplings shall have the length of boot approximately

equal to the pipe diameter. Follow manufacturer's recommendations for the installation. No cut-in connection, made by breaking or cutting a hole in the main and inserting the spigot end of an ordinary sewer pipe shall be permitted.

b. Circular, saw-cut of sewer main with proper tools ("Shewer-tap" machine or similar) and proper installation of hub-wye saddle or hub-tee saddle, in accordance with manufacturer's recommendations. All must be encased in concrete flowable fill.

9) Frame & Grate: Frames and grates shall be provided as appropriate for the structure location (i.e.: depressed curb, barrier curb, overflow route, rear yard). All grates to be located near a paved surface shall be "bicycle safe."

10) Inlets: Inlets shall consist of a two (2) foot minimum interior diameter reinforced concrete structure. Inlets shall be placed at the sag of vertical curves in roadways, at low points in parking areas, and at other locations as necessary to minimize stormwater ponding and/or flow across roadways or intersections. Inlet spacing shall be based on design calculations and as required per the IDOT Drainage Manual and Kane County Stormwater Ordinance.

11) Release Structure / Restrictor: The release structure shall be of a weir wall orifice design (refer to overflow weir structure detail) or as approved by the City of St. Charles.

12) Underground Storage System
    a. Underground chambers must be large enough to allow the chamber to be manually cleaned.
    b. Access points for ingress and ventilation purposes are to be provided in the chamber at a maximum spacing of 100 feet and at the ends of the chamber.
    c. Underground storage chambers are to be clearly labeled on the engineering plans as "Private Storm Water Storage Facility." These chambers are to be maintained by the developer until an owner's association is established.
    d. Poured in place reinforced concrete chamber designs must be signed and sealed by an Illinois Licensed Structural Engineer (SE). Precast chambers must have shop drawings approved by a Licensed SE.
    e. All reinforcement steel shall be epoxy coated. All concrete shall be treated with a protective concrete coating on the interior and exterior of the chamber.
    f. For precast concrete construction, geo-textile fabric must be placed over the top of the structure, and all joints must be grouted.
    g. A minimum of 12 inches of topsoil must be placed to cover the underground storage facility when constructed under grass/landscaped areas.
    h. All trenches penetrating the underground storage shall include a bentonite cut off wall.

13) Separation Requirements: Separation requirements shall follow the current edition of the Standard Specifications for Water and Sewer Construction in Illinois and the Ten States Standards.

14) Sewer Pipe, Minimum Size: Public sewer shall have a minimum diameter of 10" for the first "run" of pipe, 12" minimum for all other pipe runs. Design calculations, when required, may dictate that larger pipe sizes are required.

15) Slope: Slopes shall be designed to provide a minimum "flowing full" pipe velocity of 3 fps and maximum velocity of 10 fps.

16) Structure Sizing: Manholes / Catch basins sizing shall meet IDOT Drainage Manual requirements. Manholes and catch basins shall have a minimum inside diameter of 4' for sewer pipe 18" or less in diameter, 5' for sewer pipe 21" to 48" in diameter. Pipes larger than 48" in diameter will require engineered manhole design (refer to standard manhole and catch basin details.)

    Structures with multiple pipes may require larger manholes. The City may require engineering design of manholes to ensure adequate sizing.

    Structure Spacing: Manholes / Catch basins spacing shall meet IDOT Drainage Manual requirements.

17) Sump Lines: Domestic sump services shall be constructed of PVC SDR 26 with a minimum diameter of 6".

    Sump lines shall be constructed for all buildable lots and shall be extended to the right-of-way or easement limits. All connections to the public main shall be at a manhole or as approved by the Public Works Department (See Section 9: Connecting to an existing sewer.) Once installed, all services extending to the City right-of-way limits shall be capped and located utilizing a 2" x 4" wooden stake painted green.

23) Trench Backfill: All utility and service trenches within three feet of paved surfaces, or at a distance specified by the Engineer, shall be backfilled with CA-7 (Virgin Crushed Limestone), mechanically compacted in one-foot lifts to 95% proctor density.

    Flowable Fill: The City may approve or require the use of flowable fill as backfill under existing pavements. Flowable fill shall meet IDOT standards for Controlled Low Strength Material (CLSM) Mixture #1.

18) Underdrains: Underdrains will be required under curbs at the bottom of all roadway sags. Underdrains shall extend 50 feet on each side of the inlet. Underdrains shall be perforated polyethylene pipe. The underdrain shall be encased in gravel trench with no fines, and a geo-textile fabric shall be used to limit sedimentation in the pipe (refer to standard "Pipe Underdrain" detail).

    Culverts: Culvert pipe designs shall be in accordance with the IDOT Drainage Manual. Publicly owned culvert pipes shall be PVC for pipes less than 15" in diameter or RCP for pipes equal to 15" or larger in diameter.

19) GPS Location of Utilities: The following shall be GPS located in coordination with the City:

    Storm inlets, manholes, catch basins, flared-end sections, as well as any wyes, tees, cleanouts and service stubs. GPS location shall be completed prior to backfilling all wyes, tees and stubs.

SECTION III

WATER SYSTEM

A. **DESIGN REQUIREMENTS**

B: Design Requirements:

1) Auger: Augering or directional drilling will be required at all roadway crossings unless otherwise permitted by the City of St Charles Public Works Department. Steel casing and spacers shall be utilized. (Refer to City casing pipe detail.)

2) Cover Depth: All water main, hydrant leads, and services must have a minimum cover of five and one-half feet, and a maximum cover of ten feet. Variations from these standards will require approval of the Public Works Department.

3) Fire Flows: Appropriate water pressure and flow must be provided in accordance with the most current adopted International Fire Code.

4) Hydrants: Hydrants must be placed at a maximum of 400-foot intervals, and may not be less than three feet from the back of curb. No buildable area shall be farther than 300' from a fire hydrant, and a minimum of one hydrant shall be located at each intersection. For proposed subdivisions, hydrants shall be located at high points for air release. All hydrant locations shall be coordinated with the City of St. Charles Fire Department and Public Works Department.

   During water main installation and before the water main has been placed into operation, the contractor shall "bag" or cover fire hydrants. The bag will be removed by the City after the main has become operational. All hydrants shall be placed and rotated to face the roadway.

5) Horizontal and Vertical Separation: - Separation requirements shall follow the current edition of the Standard Specifications for Water and Sewer Construction in Illinois and the Ten States Standards.

   A ten-foot horizontal separation shall be maintained between water mains and appurtenances and all other utilities, public and private.

   Water appurtenances shall be a minimum of twenty feet from permanent structures; this applies to any structure that may require a building permit (i.e. retaining walls, pools, sheds, garages, etc.)

6) Abandoning and Replacing Existing Services: All existing services shall be abandoned at the main by removing the corporation stop and using a stainless-steel band clamp to complete removal. Existing lead service lines shall be replaced from the main to the meter.

   Existing services that utilize a mechanical tee shall be abandoned by removing the tee and sleeving the main.

7) Interruption of Water Usage: Water services may only be interrupted when the transfer of services to the new main takes place. Services shall be transferred subsequent to testing and chlorination of the proposed main. The contractor shall contact the St. Charles Water Division at 630-377-4405 prior to transfer of service; a minimum notice of three business days will be required.

8) Residential Services, Domestic: Domestic water services shall be provided to each lot. The minimum size for domestic services is one inch. Once installed, all services extending to the City right-of-way limits shall be located utilizing a 2" x 4" wooden stake painted blue.

9) Commercial Domestic Services/ Fire Protection: Where fire protection services are required, combined domestic and fire protection services shall be provided.
    i. The first O. S. & Y. valve on the inside of the building must be in place for pressure testing, chlorination and sampling.
    ii. Testing against flanges will not be allowed.

10) Thrust Blocking: Preformed concrete block thrust blocking shall be provided at all bends greater than 10 degrees, at all mechanical joint connections, and at all fire hydrants (refer to City thrust blocking detail.)

11) Trench Backfill: All utility and service trenches within three feet of paved surfaces, or at a distance specified by the Engineer, shall be backfilled with CA-7 (Virgin Crushed Limestone), mechanically compacted in one-foot lifts to 95% proctor density.

    Flowable Fill: The City may approve or require the use of flowable fill as backfill under existing pavements. Flowable fill shall meet IDOT standards for Controlled Low Strength Material (CLSM) Mixture #1.

12) Valve Spacing: Valves shall be spaced at intervals not to exceed 600 feet. Valve locations at water main crossings shall be designed to provide one less valve than legs of the crossing. (Two valves required per tee crossing, three valves required per "x" crossing.)

13) Valve Vaults: All water valve vaults are to be pre-cast reinforced concrete, concentric type. (Refer to City valve vault detail.)

14) Water Main, Minimum Size: The minimum size for any public water main shall be 8" (with the exception of hydrant laterals that may be 6". (See design requirement #3 above for fire flow considerations.)

15) Municipal Watermain Dead Ends: The water system must be extended, at a minimum, to the limits of the development and looped wherever possible. Note on all plans which mains are to be public and private. Where dead end mains cannot be avoided on a temporary basis, a fire hydrant shall be placed at the end to meet water main flushing requirements.

16) Connecting to Existing Water Mains: The preferred method of connection to existing watermains shall be via cut-in tee. Watermain shut downs shall be coordinated as identified in #7 Interruption of Water Service. Pressure connections will only be allowed as approved by City of St. Charles Public Works Department. When a pressure connection is utilized, the valve shall be connected within a vault. No water connection shall be within three feet of an existing watermain joint.

17) Service Taps: It is preferred that service taps to water mains are performed prior to conducting pressure testing of the water main. Water service connections shall be made by approved personnel.

18) Landscaping: Landscape plantings shall not interfere with operation and maintenance of water appurtenances. Trees shall be placed no closer than ten feet from any structure.

19) Fire Hydrant Extensions: Fire hydrants shall be installed with a maximum of one extension kit used, and a maximum extension of 12". Fire hydrant extension kits must be of the same manufacture as the hydrant, and must be installed according to the manufacturer's specifications using original manufacturer's parts.

20) Joint Restraint**:** Joint restraints shall follow state specifications for sewer and water construction.

SECTION IV

PAVEMENT / ROADWAYS

A. DESIGN REQUIREMENTS

A: Design Requirements:

1) Generally: Street Systems shall be designed to meet the requirements of the applicable jurisdiction (e.g., City, IDOT, KDOT, DuDOT, and St. Charles Township). Any proposed street dedication shall be in accordance with the following standards.

2) Right-of-way and Pavement Requirements:

Street Designation	Minimum R.O.W. Width	Minimum Street Width (Measured at Face of Curb)	Minimum Structural Number	Minimum Horizontal Centerline Radius	Parking Restrictions (See Note 2)
Residential					
Local	66 ft.	27 ft.	3.65	200 ft.	1 Side Only
Collector	80 ft.	33 ft.	4.00	300 ft.	No Restrictions
Arterial	100 ft.	39 ft.	See Note 1	500 ft.	No Parking
Industrial					
Local	66 ft.	35 ft.	4.00	200 ft.	1 Side Only
Collector	80 ft.	35 ft.	See Note 1	300 ft.	1 Side Only
Arterial	100 ft.	39 ft.	See Note 1	500 ft.	No Parking

Note 1: Heavily traveled streets in industrial and residential areas shall be considered on an individual basis and pavement designs shall be based on specific engineering data for each street.
Note 2: Parking Restrictions may be modified if design meets the International Fire Code, Appendix D.

Street Designation	Minimum Gradient	Maximum Gradient	Minimum Soil Support (I.B.R.)	Maximum A.D.T.
Local	0.5%	7.0%	3.0	3,000
Collector	0.5%	5.0%	3.0	10,000
Arterial	0.5%	5.0%	3.0	N/A

3) Pavement Lengths:
   a. Maximum residential block length shall be per title 16.08.030.
   b. Cul-de-sac shall have a maximum length of as defined in Title 12.30.050(B)4

4) Pavements: Pavements shall be designed and constructed so as to obtain a minimum twenty (20) year service life with minimal maintenance after acceptance of the pavement by the City of St. Charles. The design engineer should consider such factors as construction and end use traffic loading sub-base Illinois Bearing Ratio (IBR), etc., in determining the structural design of the pavement section.

a. Cross Section Requirements:
    i. Rigid Pavement
        1. Minimum thickness of Portland Cement Concrete pavement (PCC):
            a. Estate/Local Roads: 6”
            b. Collector Roads: 8”
            c. Arterial Roads: 9”
        2. Concrete pavements shall be reinforced in accordance with IDOT standards.
        3. Concrete pavement shall have a minimum 6-inch of sub-base granular material, Type B. Millings or recycled material will not be accepted.
        4. Portland Cement Concrete shall have minimum 14-day compressive strength pf 3500 psi.
        5. All Portland Cement Concrete shall be treated with a protective coat application.
        6. Jointing of PCC pavements shall be approved by City of St. Charles. Jointing shall align with joints in curb.
        7. Concrete pavement sections shall be poured prior to curb and gutter sections.
    ii. Flexible Base Pavement
        1. Flexible base pavements shall have minimum of twelve inches (12”) of Sub-base Granular Material, Type B. Millings or recycled material will not be accepted.
        2. Standard Cross Section for Local Roads:
            a. Hot-Mix Asphalt Binder Course, IL-19.0, N50, 4”
            b. Hot-Mix Asphalt Surface Course, Mix “C”, N50, 2”
        3. All asphalt is to be laid by a self-propelled mechanical spreader.
        4. Alternative cross-sections may be considered by the City, with sufficient engineering pavement design calculations.

b. Sub-base: All aggregate sub-base material shall pass a proof-roll in the presence of a City inspector prior to paving asphalt binder course or pouring concrete roadway or curb and gutter. All areas of sub-base rutting greater than ½” shall be deemed as failing the proof-roll. Sub-grade improvements shall be performed prior to scheduling any additional sub-base proof-rolls.

c. Sub-grade: All sub-grade material shall have a minimum Illinois Bearing Ratio (IBR) of 3.0. All unsuitable sub-grade material, including sub-grade material having an IBR less than 3.0 shall be removed and replaced with a suitable fill material, or the pavement must be designed to compensate for the soil condition. The soil support IBR values selected for use by the engineer shall represent a minimum value for the soil to be used.

    Sub-grade shall pass a proof-roll in the presence of City inspector prior to placement of sub-base. All areas of sub-grade rutting greater than ½” shall be deemed as failing the proof-roll. Sub-grade improvements shall be performed prior to scheduling any additional sub-grade proof-rolls.

d. Pavement Design Shall Include: In addition to the information provided in the right-of-way and pavement requirements, pavement design shall include the following:

i. Public Alleys shall be constructed of reinforced Portland Cement Concrete (PCC) designed in accordance to specifications listed above for rigid pavements.
ii. Maximum allowable pavement grade = 7% and minimum allowable pavement grade = 0.5%;
iii. Driveway grades shall have a minimum slope of 1% and a maximum slope of 8%. All driveway grades in excess of 5% shall substantiate that vehicular bottom clearances are met.
iv. Vertical curves shall be used when the absolute value of the algebraic difference between the intersecting pavements' centerlines exceed 1.5%. The minimum length of vertical curves shall be one hundred (100) feet for one and one-half (1.5) percent absolute value of the algebraic difference of grade. For each additional (1.0) percent, or fraction thereof, of absolute value of the algebraic difference in grade over one and one-half (1.5) percent, a fifty-foot increment, or fraction thereof, shall be added to the length of the vertical curve.
v. The minimum intersection curb radius:
    1. Two local streets: 30'
    2. Local and collector streets: 30'
    3. Two collector streets: 40'
    4. Truck routes or zoned industrial: 45'
vi. Curb and gutter shall be a B-6.12 barrier type unless otherwise directed by the City of St. Charles Public Works Department. Curbs shall be constructed of 6.1 bag mix Portland Cement Concrete, with 5-8% air entrainment, with two continuous epoxy coated #4 rebar. 1" expansion joints shall be placed at 60' intervals and within 5' of curb structures. Contraction joints shall be at 15' intervals and all points of curvature. All B-box, sanitary services and storm service locations shall be marked on the curb with a "W", "S" or "ST", as the case may be. All Portland Cement Concrete shall be treated with a protective coat application.
vii. 26-foot wide bituminous pavement shall have a 4" crown as measured from the flag of the curb. 26-foot wide concrete pavement shall have a 4" crown as measured from the flow line of the gutter. Minimum cross-slope for pavement sections shall be two (2%) percent.
viii. Pavement Patches

Note: All pavement patches shall be the greater of: the existing pavement cross-section or the following:

1. Flexible Pavement

Patches shall have a minimum of 4" of Hot-Mix Asphalt Binder Course, IL-19.0, N50, and 2" of Hot-Mix Asphalt Surface Course, Mix "C". Patches shall be roller-compacted.

2. Rigid Pavement

Concrete pavements shall be replaced with a minimum of 14-day, 3500 psi, 6" of Portland Cement Concrete. The existing pavement shall have #6 epoxy-coated dowel bars, 2' in length, drilled at 24" on center, grouted in place. P.C.C. patch shall be reinforced with 6" x 6" #6 wire mesh. All Portland Cement Concrete shall be treated with a protective coat application. (See details for pavement patching). PCC shall be a 6.1 bag mix, 5-8% air entrained.

3. Composite Pavement

For pavements with a concrete base and asphalt surface, the concrete shall be placed at the same thickness as the existing pavement, but shall be a minimum of 6" thick. #6 Epoxy-coated dowel bars, 2' in length, shall be placed at 24" on center, grouted in place. P.C.C. patch shall be reinforced with 6" x 6" #6 wire mesh.

Hot-Mix Asphalt Surface Course, Mix "C" shall match existing pavement section. In cases where asphalt thickness is 3" or greater, binder and surface may be required. Steel plates shall be placed over all Portland Cement Concrete patches until concrete is cured or a minimum of 3 days (See City pavement patch detail.)

ix. Storm inlets and catch basins placed within the roadway surface shall be designed to incorporate an underdrain system of perforated PVC pipe in accordance with the City detail.

5) Sidewalks:

a. Public Sidewalks are to be constructed of a minimum of five inches thick by five feet wide, 6.1 bag mix Portland Cement Concrete (P.C.C.) with (5-8%) air entrainment. All Portland Cement Concrete shall be treated with a protective coat application.
b. Public walks that cross driveways are to be thickened to a minimum of six inches or match the thickness of the driveway; and shall include steel mesh reinforcements matching concrete driveway requirements.
c. Sidewalks shall be constructed one foot off the street R.O.W. line unless otherwise directed by the City;
d. Sidewalks shall be continuous through driveways.
e. A one-inch expansion joint shall be provided at fifty foot intervals, and troweled contraction joints shall be at five foot intervals.
f. Ramping and sloping of sidewalks at intersections shall be in accordance with the specifications and standards as set forth by the Illinois Department of Transportation, the American Disabilities Act (ADA), and the Illinois Disability Code.

SECTION V

STORM WATER MANAGEMENT /SITE GRADING

Design Requirements:

1) High Water Level: The proposed grading conditions shall not result in conditions that will cause water to pond on adjacent property and shall meet the freeboard requirements of the Kane County Stormwater Management Ordinance, including City of St. Charles amendments.

2) Off-site Grading: Off-site grading will not be permitted unless permission in the form of an easement is obtained from the subject property owner.

3) Release Rates: Storm water release rates shall meet requirements of the Kane County Stormwater Ordinance, as adopted and modified by the City of St Charles.

4) Watershed boundaries: Proposed construction may not result in any modification to existing watershed boundaries or the alteration of off-site drainage patterns.

5) Stormwater designs shall meet or exceed the Kane County Stormwater Ordinance as adopted and modified by the City of St Charles.

6) Basin Grading and Access:
    a. Provide a 10' wide (min.) embankment (max of 3:1 slope) to function as access to the bottom of the basin.
    b. Provide flat (max 5:1 cross-slope) access to restrictor structure.
    c. 4:1 max. side slope for grass embankments, 3:1 max. side slope for embankments planted with natural/deep rooted vegetation.

7) Flared End Section: Flared end sections shall be required in any areas where a storm sewer discharges into a detention basin. Permanent erosion control shall be provided with riprap at all flared end sections. Temporary erosion control shall be in accordance with the Illinois Urban Manual, shall be provided at all outlet flared end sections, and shall be maintained until the topsoil has been adequately stabilized with vegetative cover. (See Storm Sewer Section for additional flared end section requirements.)

8) Green Space, Slope Requirements: Green space slopes shall conform to the following:
    - 4:1 maximum slope
    - 2% minimum slope

9) Retaining Walls: Where retaining walls greater than (4) four feet high are required, a registered Illinois Structural Engineer must design the retaining wall and sign/seal the plans.

10) Inlet Ponding, Maximum Levels: The engineer shall calculate the 100-year water surface elevations for the stormwater storage facilities. Inlet ponding in excess of one foot during a 100-year event will not be permitted. The overflow route and limits of ponding shall be clearly illustrated on the plans. Paved parking lots may not be utilized to provide any portion of the required site run-off storage volume.

11) Overflow: An overflow drainage route must be established. All storm water management facilities shall have a clearly defined and protected overflow route illustrated with an overflow elevation and a large arrow. The overflow routes through the subdivision shall also

be illustrated with large arrows and spot elevations shall be shown at 50' intervals along the route. Overflow weir locations should be identified on Final Engineering Plans and appropriate measure taken to ensure that building and associated apparatus (a/c units, fireplaces, etc.) does not impact the overflow route or weir.

12) Pavement Slope Requirements: Pavement slopes shall conform to the following:
    - Parking Lots: 1% minimum and 5% maximum
    - Streets/Curb and Gutter: 0.5% minimum slope
    - Driveways/Property Access: 8% maximum slope

13) Stormwater Management Report: A Stormwater Management Report shall be submitted to the City for review. The report shall include, but not be limited to, the following:
    - All appropriate permit forms, associated fees need be submitted.
    - A narrative that discusses topographical conditions, soil conditions, analysis methodology, modeling results, and conclusions.
    - Data from an analytical modeling program which features hydrograph methodology, TR20 or equal.
    - A critical duration analysis shall be performed which analyzes the proposed topographic and drainage conditions for the 2, 6, 12, 18, and 24-hour durations of the 100-year rainfall. Hydrograph methodology shall be used in cooperation with projected rainfall data as documented in the "Bulletin 75 Huff Distribution Curve". The largest storage volume that is produced from this analysis shall be the required volume for the development.
    - Basin sizing calculations; required and proposed stormwater storage volumes.
    - Stormwater release structure calculations including proposed, required, and existing release rates.
    - Exhibits which illustrate the following:
        - Existing conditions (i.e.: topography, buildings / structures, water bodies, roadways...).
        - Proposed conditions (i.e.: topography, lot alignments, top of foundation elevations, roadways, drainage ways, stormwater storage facilities, overflow routes...).
        - Existing and proposed watershed boundaries and ridgelines.
        - Proposed 100-year water surface elevation and high-water level.

14) Topography: A drainage plan shall be provided which includes the following:
    - One-foot contours.
    - Easements, including dimensions and easement type.
    - Proposed storm water storage facilities.
    - Existing water bodies and drainage features.
    - Proposed roadways and Right-Of-Ways.
    - Proposed lot alignments and lot numbers.
    - Existing and proposed top of foundation elevations, including elevations of lookouts and walkouts.
    - Overflow drainage routes and 100-year water surface elevations with cross sections.
    - Proposed basin volumes, 100-year water surface elevations, and high-water levels.

- Storm sewer appurtenances.
- Existing drain tile location and elevations.
- Proposed elevations at all lot corners and along all break points at side yards.

15) As-Built Drawings: As-built drawings shall be provided to the City prior to project closeout by the City. As-built drawings shall encompass all items as required above (see #s 10 and 14), with actual field measured final elevations. As-built drawings shall include field measured and located data for all utilities. As-built shall be provided to the City as a paper copy as well as PDF and CAD formats.

SECTION VI

MATERIALS

Sanitary Sewer:

1) Exterior Drop Connections: Drop connections shall be constructed of Ductile Iron Pipe, Class 52 or PVC SDR 26, per manufacturer specifications. All drop manhole piping shall be encased in concrete (refer to City standard drop manhole detail).

2) Frames & Lids: Frame: *Neenah R-1713 or R-1916C in Floodplain*
Lid: *Neenah R-1713 or R-1916C type "B" with the words "City of St. Charles - SANITARY" cast into surface*

3) Joints: All joints shall conform to ASTM D-3212 for PVC pipe and ASTM A-746 for ductile iron. Both pipe types shall be joined by means of a flexible gasket. Gaskets for PVC joints shall be in conformance with ASTM A 21.11-79 (AWWA C111).

4) Manholes: Sanitary manholes are to be precast reinforced concrete eccentric type, with a minimum 48" I.D. barrel section; Cone sections shall have a 3" integrally cast precast concrete collar; Pipe penetrations are to be sealed via the use of a cast in place flexible synthetic rubber pipe sleeve which is to be fastened to the pipe with two stainless steel bands. Barrel sections shall be sealed using a butyl rubber strip on the tongue and groove section as well as an external joint seal. Chimney seals are to be external type only. All new or adjusted steps shall be made of steel reinforced plastic, using an approved plastic meeting ASTM D4101, Type II, Grade 49108 over a #3 Grade 60, ASTM A615, reinforcing bar. A maximum of 8" of adjusting height is allowed; no more than two adjustment rings shall be used (refer to City standard sanitary manhole detail). Barrels and cones shall be bituminous coated.

5) Services: Sanitary services shall be constructed for all buildable lots. Services shall be constructed of PVC SDR 26 pipe, six (6) inch minimum diameter, and shall be extended to the rights-of-way limits. All connections to the public main shall be at a manhole or at a "wye" fitting approved by Public Works Division. Once installed, all services extending to the City right-of-way limits shall be securely capped and located utilizing a 2" x 4" wooden stake, painted red.

6) Thrust Blocks (force main): Thrust blocking shall be a combination pre-cast masonry blocks and *"Mega-lug"* brand restraints, or approved equal.

Storm Sewer:

1) Casing: Where water main protection is required, encasement shall consist of PVC SDR 26 or steel casing with *"Cascade type CCR-STD"* spacers or approved equal.

2) Frame & Grate:

Curb Inlet/C.B.:	High back:	*Neenah R-3281-A or R-3278-1*
	"Type V":	*Neenah R-3506-A2*
	Depressed	*Neenah R3281-AW with R-3281 (or approved equal)*
C.B., "behind the curb type":		*Neenah R-3305* *Neenah R 1713 (Refer to Lid Detail)*
C.B./M.H., Type "D":	Grate:	*Neenah R 1713 (Refer to Lid Detail)*
	Frame:	*Neenah R-1713*
C.B., "beehive type":		*Neenah R-4340-B*

3) Sewer Pipe, Materials: Main line storm sewer shall be constructed of one of the following:
    a. Pre-cast reinforced concrete pipe, with "O-ring" joints.
    b. PVC pipe, rigid, (Min. SDR 26, push-on gasket joints).
    c. All joints shall conform to ANSI 21.11 for ductile iron pipe.
    d. PVC C-900
    e. HDPE pipe shall be rigid with corrugated exterior and smooth interior meeting AASHTO M-294, Type S. Pipe sections shall be joined with PVC double bell couplers installed on the pipe with O-ring gaskets. Ex-filtration standards shall meet or exceed that of PVC SDR 26 with push-on-joints.) FOR PRIVATE USE ONLY. NOT TO BE USED WITHIN PUBLIC RIGHT-OF-WAY OR FOR PUBLICLY OWNED AND MAINTAINED STORM SEWER
    f. The type of pipe material will be dependent upon the depth of bury, soil conditions, and pipe criteria, and as approved by the City of St. Charles.

4) Flared End Section: Flared end sections shall be constructed of reinforced concrete with galvanized steel grates. Steel flared end sections may be permitted for use with 15" diameter or smaller PVC pipe.

Watermain Materials:

1) Corporation Stops:
    a. Compression fittings.
        a. A. Y. McDonald 4701-BQ (1", 1 ½", 2")

2) Curb Stops:
    a. Compression fittings.
        a. A. Y. McDonald 6104-Q (1", 1 ½", 2")

3) Valve Box: Minneapolis pattern, lid marked "WATER"
    a. For 1" thru 2", Mueller H-10300 Copper service
    b. A. Y. McDonald, 5615 1 ¼"

4) Fire Hydrant:
    a. Waterous Pacer Model WB-67-250 or approved equivalent.
    b. All hydrants shall have:
        1. 6" mechanical joint connection
        2. 5 ¼" valve opening
        3. 5.5' cover over hydrant lateral
        4. 6" valve on lateral
        5. Valve box shall have a valve box stabilizer installed *
           *(Valve box adaptor #2 type A, as made by Adaptor, Inc. or approved equivalent)
        6. Painted red

5) Bolts: All factory installed bolts and fasteners shall be 304-grade stainless steel.

6) Valves: Valves 4" through 16" diameter shall be right-hand closing resilient wedge gate valves, conforming to AWWA Standard C-515. All factory installed bolts and fasteners shall be 304-grade stainless steel.

7) Valve Vaults: Refer to City detail.

8) Watermain Pipes:
    a. Ductile Iron Class 52, conforming to AWWA Standard C-151.
        a. Cement Lining, conforming to AWWA Standard C-104.
        b. Mechanical or push-on joints shall conform to AWWA Standard C-111.
        c. At minimum, Type 3 laying conditions shall be provided, conforming to AWWA Standard C-600.
    b. All watermains shall be encased in a high density polyethylene encasement, following material specifications and installation in accordance with ANSI.AWWA C105/A21.5, ASTM A674, using "Method A" installation.
    c. All side yard and rear yard water mains not directly adjacent to public roadways or paved surfaces shall be Ductile Iron Pipe, Class 55 with a type 5 laying condition.
    d. Brass Wedges shall be installed to provide electrical conductivity.

9) Copper Service Lines:
    a. One-inch diameter minimum.
    b. Type K copper tubing.
    c. Compression fittings only.

    One-inch service connections may be connected utilizing direct tap methods to six-inch mains and larger. If there is insufficient diameter water main to install a direct tap, then a tapping saddle shall be utilized. Service taps of 1 ¼", 1 ½," & 2" require the use of a tapping saddle. Saddles shall be full circle, 304-grade stainless steel, with nylon washers and Nitrile gasket, as manufactured by Smith-Blair; model #372, or approved equivalent.

10) Tapping Sleeves:
    a. 4" through 8" diameter:
        a. Romac SST-945 stainless steel;
        b. Smith – Blair 665 stainless steel or approved equivalent.
        c. Mueller stainless steel or approved equivalent.
    b. 10" and larger diameter:
        a. Mueller H-615 cast iron or approved equivalent.
        b. Flange fasteners shall be 304-grade stainless steel.

11) Ductile Service Lines:
    a. Fire/Domestic:
        a. The first O. S. & Y. valve on the inside of the building must be in place for pressure testing, chlorination and sampling.
        b. Testing against flanges will not be allowed.

SECTION VII

DESIGN REFERENCES

Design References

All work shall be designed and constructed in accordance with the following references as they apply:

1. "Standard Specifications for Road and Bridge Construction," Illinois Department of Transportation, latest edition.

2. "Drainage Manual," Illinois Department of Transportation, latest edition.

3. "Manual for Structural Design of Portland Cement Concrete Pavement," Illinois Department of Transportation, latest edition.

4. "Manual of Instructions for the Structural Design of Flexible Pavements on Projects involving MFT, FAS, and FAUS Funds," Illinois Department of Transportation, latest edition.

5. "Design Manual," Illinois Department of Transportation, latest edition.

6. Standard Specifications for Water and Sewer Main Construction in Illinois, latest edition.

7. Ten States Standards, latest edition.

8. Kane County "Stormwater Management Ordinance" as adopted by the City of St. Charles.

9. Transportation Research Board of National Academies "Highway Capacity Manual", latest edition

10. Federal Highway Administration "Manual on Uniform Traffic Control Devices, for Streets and Highways", latest edition

11. American Association of State Highway and Transportation Officials "A Policy on Geometric Design of Highways and Streets", latest edition.

Note: Written requests received prior to final approval for alternate materials and/or construction methods will be reviewed by the Public Works Department and Community Development Engineering Division prior to final approval.

SECTION VIII

INSPECTION PROCEDURES

A. STORM AND SANITARY
B. WATER DISTRIBUTION SYSTEM
C. PAVEMENT AND ROADWAYS

General Note:
Inspection of improvements throughout St. Charles will be performed to ensure that the project is being constructed in accordance with the approved Final Engineering plans, and to determine if minimum construction and material standards are achieved. If the developer or contractor desires to deviate from the approved plan or does not feel that minimum construction standards are being satisfied, they are responsible for contacting the City immediately. The City of St. Charles will not accept a substandard product, and will not be responsible for any additional cost incurred by the developer / contractor as a result.

A. Storm and Sanitary Sewer:

Items 1 -3 of this list of tests shall be required for sanitary sewer improvements in St. Charles. An authorized representative of the City of St. Charles shall supervise all tests. All tests shall be scheduled a minimum of two business days in advance.

1) Air Test: All sanitary sewers shall pass an air test in conformance with Section 31 of the "Standard Specifications for Water and Sewer Construction in Illinois".

2) Deflection Test: All PVC sanitary sewers shall pass a mandrel test in conformance with Section 31 of the "Standard Specifications for Water and Sewer Construction in Illinois".

3) Televising: The Contractor shall provide the Public Works Department a current color video record and a written transcription of the internal inspection of the newly constructed sewer system. This shall be completed prior to refunding of site improvement financial guarantee monies by the City of St. Charles and final approval and acceptance of the system. All public and private lines equal to and larger than eight inches in diameter shall be videotaped.

   Televising shall not occur sooner than thirty (30) days after completion of the installation of the line.

4) Sanitary Manhole Testing: All manholes shall be inspected by the City prior to acceptance and shall be tested for watertightness following ASTM C 1244: "Standard Test Method for Concrete Sewer Manholes by the Negative Pressure (Vacuum) Test."

5) Acceptance Inspection: Prior to Council acceptance of public sewers, the Public Works Department must inspect and approve the improvement. A punchlist of items that require corrective action will be generated, and the developer will coordinate resolution efforts and schedule a re-inspection. Following approval, the acceptance process may proceed. Acceptance inspections will be coordinated through the Community Development - Engineering Office and follow City Code Section 16.

6) Maintenance Inspection (One Year After Acceptance): Prior to the release of a maintenance guarantee, the Public Works Department will re-inspect and approve the condition of the sewer improvement. This inspection is performed after a minimum of one year, at the developer's request, or following notification from the financial lending institution that the expiration date for the maintenance letter of credit is approaching. A punchlist of items that require corrective action will be generated, and

the developer will coordinate resolution efforts and schedule a re-inspection. Following approval, the maintenance guarantee will be released. The release of the maintenance guarantee shall be coordinated with the Community Development - Engineering Office.

If inspections and corrective actions have not been completed and approved, financial guarantees will be extended until final inspections have been passed.

B. Water Distribution System:

1) Required Testing:

Pressure testing and disinfection of water mains shall follow the Standard Specifications for Water & Sewer Construction in Illinois, latest edition, Title 35 of the Illinois Administrative Code Subtitle F: Public Water Supplies and AWWA Standards for Disinfection B300.

A representative of the City of St Charles Public Works - Water Division shall supervise all tests. All tests shall be scheduled 2 business days in advance. NOTE: *City of St Charles personnel may only operate public water main facilities. The contractor is not permitted to open, close, or adjust any public water valve for any reason. If an emergency situation arises, the contractor shall contact the City of St. Charles Public Works Department immediately.*

The contractor shall, after installation of the water main system or parts thereof, pressure test and chlorinate the new system. A two-hour pre-test must be made and passed by the Contractor before scheduling the pressure test with the City. The main shall then be pressure tested at 150 PSI for duration of two hours. If a scheduled pressure test does not pass because of the failure of the Contractor to hold a pre-test, the City may charge a re-inspection fee to the Contractor. Any other water main work will be halted until the re-inspection fees have been paid. If an existing valve is utilized for the pressure test, the contractor is responsible for the performance of the valve.

After a successful pressure test, the main shall be chlorinated by a qualified technician. Samples will be taken and tested by the Public Works Department, and shall only be taken on 2 consecutive working days, Monday through Friday, 24 hours after chlorination, and after the main has been flushed. A City representative shall determine the number of samples taken. If after four samplings, the results do not yield two consecutive satisfactory readings, a re-chlorination will be necessary.

a. All private fire service lines shall pass a pressure test in conformance with the requirements of ANSI/AWWA C600-87 Section 4. The following test criteria shall be met:
    i. Full pipe diameter flush
    ii. 200 psi minimum initial test pressure
    iii. 200 psi minimum residual pressure after two hours
    iv. If an existing valve is utilized for the pressure test, the contractor is responsible for the performance of the valve
    v. Test to be observed by City of St. Charles representative

vi. If the pressure gauge fails to 'zero' at the end of the test, the test will be failed
vii. The service line then needs to be disinfection process as defined below

2) Inspections:

a. Notice: The developer or contractor shall contact the City of St. Charles Water Division a minimum of 48 hours in advance of a scheduled inspection.

b. Acceptance Inspection: Prior to Council acceptance of public sewers, the City Public Works Department - Water Division must inspect and approve the improvement. A punchlist of items that require corrective action will be generated, and the developer will coordinate resolution efforts and schedule a re-inspection. Following approval, the acceptance process may proceed. Acceptance inspections will be coordinated through the Community Development - Engineering Office and follow City Code Section 16.

c. Maintenance Inspection (One Year After Acceptance): Prior to the release of a maintenance guarantee, the City Public Works Department - Water Division will re-inspect and approve the condition of the water improvement. This inspection is performed after a minimum of one year, at the developer's request, or following notification from the financial lending institution that the expiration date for the maintenance letter of credit is approaching. A punch list of items that require corrective action will be generated, and the developer will coordinate resolution efforts and schedule a re-inspection. Following approval, the maintenance guarantee will be released. The release of the maintenance guarantee shall be coordinated with the Community Development - Engineering Office.

If inspections and corrective actions have not been completed and approved, financial guarantees will be extended until final inspections have been passed.

d. B-Boxes: Upon completion of the project and after final grade has been established, the B-boxes will be adjusted to grade, and checked to see if they are operational without altering the shutoff key. Locations of the B-box with measurements to the property lines shall be shown on the as-built plans for the project. B-box locations shall be marked on the curb/sidewalk with a "W".

C. Pavement and Roadways:

1) Inspections:

a. Notice: The developer or contractor shall contact the City of St Charles Community Development Department a minimum of 24 hours in advance of a scheduled inspection.

b. Curb Inspection: An inspection is required for all curb work in the public Right of Way. A Community Development Department - Engineering representative must inspect and approve the compacted stone base, rebar,

forms, alignment and location, and expansion material prior to pouring concrete.

c. Sidewalk Inspection: An inspection is required for all public sidewalks. A Community Development Department - Engineering representative must inspect and approve the sidewalk stone base, forms, alignment, detectable warnings and expansion material prior to pouring concrete.

d. Proof Roll: Sub-grade and sub-base shall be proof-rolled utilizing a fully-loaded six-wheeler and rolling back and forth across the entire limits of the roadway. Any rutting of ½ inch or more in depth shall be deemed as failing the inspection. Sub-grade improvements will be required prior to completing a secondary proof roll test. All sub-grades must pass a proof roll test prior to placement of aggregate base or sub-base and sub-bases must pass a proof roll test prior to paving asphalt binder or pouring concrete pavement or curb and gutter.

e. Compaction Test: Asphalt binder and surface courses must meet minimum IDOT requirements for compacted density. The cost for said testing shall be borne by the developer and written documentation of results shall be provided to the City.

f. Prior to Paving Asphalt Surface: Prior to the placement of the asphalt surface course, a preliminary punch list generated by the City and must be completed by the contractor. The punch list will include inspection of the asphalt binder course for defects such as cracking, rutting and settling. All binder defects will be required to be removed full-depth and replaced as a requirement of the punch list.

g. Acceptance Inspection: Prior to Council acceptance of a public roadway, the Community Development Department - Engineering Division must inspect and approve the pavement section, parkway and sidewalks. A punchlist of items which require corrective action will be generated, and the developer will coordinate resolution efforts and schedule a re-inspection. Following City approval, the acceptance process may proceed.

h. Maintenance Inspection: Prior to the release of a maintenance guarantee, the City will re-inspect and approve the condition of the roadway. This inspection is performed after a minimum of one year, at the developer's request, or following notification from the financial lending institution that the expiration date for the maintenance letter of credit is approaching. A punchlist of items, which require corrective action, will be generated, and the developer will coordinate resolution efforts and schedule a re-inspection. Following approval, the maintenance guarantee will be released. The release of the maintenance guarantee shall be coordinated with the Community Development Department - Engineering Division.

If inspections and corrective actions have not been completed and approved, financial guarantees will be extended until final inspections have been passed.

SECTION IX

ENGINEERING DETAILS