

CITY OF LONGMONT
SECTION 100 – GENERAL REQUIREMENTS
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**SECTION 100 – GENERAL REQUIREMENTS
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Table 1-1 Bedding Material Gradation

100.00 PURPOSE

100.01 TITLE

1. These regulations, together with all future amendments, shall be known as the City of Longmont Public Improvement Design Standards and Construction Specifications, 2019 Edition, and may be cited as such and will be referred to herein as the City Standards. The Public Improvement Design Standards and Construction Specifications were last amended July 1st, 2007, and adopted by reference as ordinances of the City. Upon adoption of these City Standards by City Council, the previous manual is hereby repealed and replaced by these City Standards. In these City Standards any reference made in singular may be construed as plural.

100.02 JURISDICTION

1. These City Standards shall apply to all land within the incorporated boundaries of the City of Longmont, except in areas where the City's jurisdiction is superseded by the Federal, State of Colorado or another jurisdiction, but including those areas the City has identified Municipal Service Areas that extend past the incorporated boundaries and within which the City currently provides, or intends to provide, utilities and urban services.

100.03 AUTHORITY

1. These City Standards have been adopted pursuant to the authority conferred within: Article 4.9 (Enactment of Codes by Reference) of the Municipal Charter and the Subdivision Design and Improvements Section in Chapter 15.07 of the Longmont Municipal Code and shall have the same force and effect as all other ordinances of the City.

100.04 PURPOSE

1. The purpose of the City of Longmont City Standards is to provide the minimum design and technical criteria to be adhered to in the design and construction of public improvements and work in streets, rights-of-way, easements, floodplains and properties located within the jurisdiction of the City of Longmont, Colorado. It is the intent of these City Standards to obtain high quality construction throughout the City, with the completed work complying with City Standards.

100.05 INTERPRETATION

1. In the interpretation and application of these provisions of the City Standards, the following shall govern:
 - a. In the interpretation and application of these City Standards, these provisions shall be regarded as the minimum requirements for the protection of public health, safety, comfort, convenience, prosperity and welfare of the residents of the City of Longmont.
 - b. Whenever the provisions of these City Standards are found to be inconsistent with any other regulations or codes, the City Engineer shall determine the standard to apply. The provisions of these regulations are minimum requirements that do not preclude imposition of more restrictive standards by agreement or by law.
 - c. Projects shall comply with all laws, regulations, codes and ordinances applicable to the design and the furnishing and performance of the work. Except where otherwise expressly required by applicable laws, regulations, codes or ordinances, the City shall not be responsible for monitoring

compliance with any law, regulation, code or ordinance, but maintains the right to enforce such compliance as law

100.06 ENFORCEMENT RESPONSIBILITY

1. It shall be the duty of the City Engineer of the Department of Public Works and Natural Resources to enforce the provisions of these City Standards.

100.07 AMENDMENTS AND REVISIONS

1. These City Standards may be amended as new technology is developed or the experience gained in the use of these City Standards indicates a need for revision. Technical modifications to these City Standards including the standard details within each Section, the information in the Appendices and the Approved Material lists, shall be approved by the City Engineer of the Department of Public Works and Natural Resources and shall thereafter become effective. Policy changes within these City Standards shall be approved by City Council, following the recommendations of the City Engineer of the Department of Public Works and Natural Resources.

100.08 EXCEPTIONS

1. Any exceptions from or modifications of the City Standards shall be subject to review as exceptions to City Standards under this Section and in accordance with the Exceptions to City Standards Section in Chapter 15.02 of the Longmont Municipal Code.
 - a. Requests for exceptions shall be submitted to the City at the time of plan submittal. The request shall state the exception requested, the justification and supporting data for the exception, and the requested change to the City Standards for the specific project. The City may require that exceptions be signed and sealed by a registered Professional Engineer licensed to do work in the State of Colorado.
 - b. Variances to Street Design Standards located within the Development Standards Section of Chapter 15.05 and the Subdivision and Improvement Standards Section of 15.07 of the Longmont Municipal Code shall meet the requirements for either the Administrative Modification or Variances Sections in Chapter 15.02 depending on project designation.
 - c. Exceptions to City Standards for Utility Trenching (City Standards Section 100), Transportation (City Standards Section 200), Storm Drainage (City Standards Section 300), Wastewater Collection (City Standards Section 400), Water Distribution (City Standards Section 500), Landscaping & Irrigation (City Standards Section 600), & Longmont Power & Communications (City Standards Section 700) as outlined in this document shall be reviewed by the City Engineer or their designee and shall demonstrate compliance through the following criteria for approval:
 - i. Special circumstances or conditions exist which are outside of the control of the applicant and which limit the ability of the design to meet the City Standards outlined in the document. Financial difficulties, loss of prospective profits and previously approved exceptions in other developments shall not be considered special circumstances.
 - ii. The exception represents an alternative design that mitigates the special circumstances or conditions while meeting the intent of the City Standards set forth in this document.

- iii. The exception will not be detrimental to the public interest or other property, nor in conflict with Envision Longmont or applicable provision of the Longmont Municipal Code, and will not endanger public safety, health or welfare.
2. All exceptions for City Standards must be reviewed and acted on prior to construction. The City shall respond promptly and in writing to exception requests. Exceptions may be submitted in conjunction with design plans as part of the Development review process.
3. Exceptions occurring during public improvement construction, due to unforeseen site conditions, require the Developer to submit the exception in writing to the City Engineer. The City shall respond promptly and in writing to exception but reserves a minimum of 10 working days for review and response. When additional review time is required, the City shall notify the Developer of the need for additional time within five (5) working days of the submittal.
4. Approval of construction plans by the City, which contain design elements not in compliance with these City Standards, and for which an exception request has not been specifically requested and approved, does not imply approval of an exception from these City Standards. Only those exceptions submitted in writing and approved by the City Engineer are granted exception.

101.01 ABBREVIATIONS

1. For the purposes of these City Standards, the following abbreviations shall mean the following phrases, except where the context clearly indicates otherwise. For words, terms and phrases used in these City Standards that are not abbreviated below, or elsewhere in the Longmont Municipal Code, the City Engineer shall interpret or define the abbreviations of such words, terms, and phrases.

AA – Aluminum Associates

AASHTO – American Association of State Highway and Transportation Officials

ACI – American Concrete Institute

ADAAG – Americans with Disabilities Act Access Guidelines

ADT – Average Daily Traffic

ANSI – American National Standards Institute

ASCE – American Society of Civil Engineers

ASME – American Society of Mechanical Engineers

ASSE – American Society of Sanitary Engineers

ASTM – American Society for Testing and Materials

APWA – American Public Works Association

AWWA – American Water Works Association

CDPHE – Colorado Department of Public Health and Environment

CDPS – Colorado Discharge Permit System

CDOT – Colorado Department of Transportation

CLOMR – Conditional Letter of Map Revision

CLOMR-F – Conditional Letter of Map Revisions based on Fill

CP – Colorado Procedure

CPPA – Corrugated Plastic Pipe Association

CPW – Colorado Parks and Wildlife

CUHP – Colorado Urban Hydrograph Procedure

DRC – Development Review Committee

DWR – Division of Water Resources

EPA – Environmental Protection Agency

ECS – Erosion Control Specialist

FEMA – Federal Emergency Management Agency

FHWA – Federal Highway Administration

FPDP – Floodplain Development Permit
FIA – Floodplain Impact Analysis
HI – Hydraulic Institute
IBC – International Building Codes
IFC – International Fire Code
IGA – Inter-governmental Agreement
IPC – International Plumbing Code
ISO – Insurance Services Office or International Organization for Standardization
LABCAT – Laboratory for the Certification of Asphalt Technicians
LAPC – Longmont Area Comprehensive Plan
LID – Low Impact Development
LOMR – Letter of Map Revision
LOMR-F – Letter of Map Revision based on Fill
LPC – Longmont Power & Communications
MGPEC Metropolitan Governments Pavement Engineers Council
MS-2 – Asphalt Institute’s “Mix Design Methods for Asphalt Concrete” manual
MS4 – Municipal Separate Storm Sewer System
MUTCD – Manual of Uniform Traffic Control Devices
NCSPA – National Corrugated Steel Pipe Association
NEC – National Electric Code
NEMA – National Electrical Manufacturers Association
NESC – National Electric Safety Code
NIST – National Institute of Standards and Technology
NPDES – National Pollutant Discharge Elimination System.
NSF – National Sanitation Foundation
OSHA – Occupational Safety Health Administration
PIA – Public Improvements Agreement
PGSS – Parks & Greenways Signage System
PPI – Plastic Pipe Institute
PROWAG – Public Rights-of-Way Accessibility Guidelines
PSC – Permanent Stormwater Control
PWNR – Public Works and Natural Resources
RPZ – Reduced Pressure Zone

ROW – Right-of-Way

SCAP – Stormwater Construction Activities Permit

SWMP – Stormwater Management Plan

UDFCD – Urban Drainage and Flood Control District

UMC – Uniform Mechanical Code

UNCC – Utility Locates Center of Colorado

USACE – US Army Corps of Engineers

WEF – Water Environment Federation

WSE – Water Surface Elevation

101.02 DEFINITIONS

1. For the purposes of these City Standards, the following terms shall have the following definitions, except where the context clearly indicates otherwise. For words, terms and phrases used in these City Standards that are not defined below, or elsewhere in the Longmont Municipal Code, the City Engineer shall interpret or define such words, terms, and phrases.

APPLICANT – Any of the following parties with a connection to a property that is the subject of a requested procedure under this development code:

- a. The record owner(s) of the subject property or the owner of subsurface oil and gas or leasehold interest therein
- b. The city or other quasi-governmental entity
- c. The developer of the subject property
- d. A purchaser of the subject property under a sale
- e. The duly authorized agent of the owner(s)

APPROVED MATERIALS LIST – The latest revised list of materials approved for construction in the City of Longmont.

APPROVED PLAN – The latest revised construction plan approved by the City Engineer.

AREA UNDERDRAIN – pipe installed to intercept or drain groundwater, but not located around the footing, foundation or basement of a building, dwelling or structure.

BASEMENT – Any area of the building having its floor subgrade below ground level on all sides.

BUILDING – Any structure utilized or intended for supporting or sheltering any use or occupancy including walled and roofed structures, gas or liquid storage tanks located principally above ground, or a manufactured homes.

BUILDING PERIMETER UNDERDRAIN – A pipe installed around the footing, foundation or basement to drain groundwater away from a building, dwelling or structure.

CAPITAL IMPROVEMENT PROJECT – A project performed by the City that leads to the design, acquisition, construction, maintenance or improvement of a City asset or infrastructure.

CITY – Shall mean the City of Longmont, a municipal corporation of the State of Colorado.

CITY CODE – Shall mean the official adopted City of Longmont Municipal Code.

CITY ENGINEER – Shall mean the Director of Engineering Services for the City of Longmont or designated representative.

CITY INSPECTOR – Shall mean an authorized representative of the City at the site of the work.

CITY STANDARDS – Shall refer to the City of Longmont Public Improvements Design Standards and Construction Specifications.

CLEAN WATER ACT – The federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

CLEARING – Any activity that removes the vegetative surface cover.

COLORADO DISCHARGE PERMIT SYSTEM (CDPS) – The Colorado program based on the National Pollutant Discharge Elimination System (NPDES) framework that is required by the Environmental

Protection Agency (EPA) under the Clean Water Act amendments of 1987 to regulate municipal and industrial stormwater discharges. The Water Quality Control Division has stormwater regulations (5CCR 1002-61) in place that require specific types of industrial facilities that discharge stormwater associated with industrial activities including construction activities disturbing over one (1) acre of land to obtain a CDPS permit for such discharge.

COMMON AREAS – Open areas within or related to a development that are designed and intended for the common use or enjoyment of the residents of the development and their guests, and may include such complementary structures and improvements as are necessary and appropriate.

CONSTRUCTION ACTIVITY – Earth-disturbing activities, such as the clearing, grading, excavation of land, demolition and other construction-related activities (e.g., stockpiling of fill materials; placement of raw materials at the site, installation of utilities, construction streets, sidewalks and buildings) that could lead to the generation of pollutants.

CONSTRUCTION SITE – Any location where construction activity occurs.

CONTRACTOR – Shall mean a person, partnership or corporation duly licensed to work in the public right-of-way and insured to perform work in the City of Longmont, Colorado.

CONTRACTOR'S REPRESENTATIVE – Shall mean the owner, superintendent, foreman, or any person designated by the Contractor to be responsible for construction in the field.

CONTRACT DOCUMENTS – The Contract Documents include these City Standards, City approved Drawings, the approved PIA, and City approved revisions.

CUL-DE-SAC – A street open at one end only, with a radius bulb for the turning around of vehicular traffic on the other end.

CURB – A stone, concrete, or other improved boundary usually demarcating the edge of a street, parking lot, or other paved area.

CURB CUT – An opening along the curb line at which point vehicles or pedestrians may enter or leave the street, parking lot, or other paved area.

CUSTOMER – Shall mean a property owner, resident or member of the municipal service area that is afforded the use or the availability of utility services from the City of Longmont.

DESIGN ENGINEER (ENGINEER OF RECORD) – Shall refer to the engineering firm or Professional Engineer responsible for the design, plans and specifications, and the field surveys of a specific project.

DESIGN PROFESSIONAL – Shall refer to the person or firm responsible for the design, plans and specifications, and field surveys of a specific project.

DEVELOPER – Shall mean any person, firm, partnership, joint venture, limited liability company, association, or corporation who participates as owner, promoter, or sales agent in the planning, platting, development, promotion, sale, or lease of a subdivision or development.

DEVELOPMENT PROJECT – Any manmade change to improved or unimproved real estate, including but not limited to, the alteration, construction, reconstruction, conversion, or enlargement of any structure; any change in use of a property, building, or structure; and any mining, dredging, filling, grading, paving excavation or drilling operation. The term "development" shall include the act of subdivision, unless otherwise expressly excluded.

DEVELOPMENT CODE – Title 15 of the Longmont Municipal Code, entitled "The City of Longmont Land Development Code."

DEVELOPMENT REVIEW PROCEDURES – Shall be as outlined in Chapter 15.02 – Development Review Procedures of Title 15 – Land Development Code, latest or revised version.

DISTURBED AREA – That area of the land’s surface disturbed by any work or activity upon the property by means including but not limited to grading; excavating; stockpiling soil, fill, or other materials; clearing; vegetation removal; removal or deposit of any rock, soil, or other materials; or other activities which expose soil. Disturbed area does not include the tillage of land that is zoned for agricultural use.

DRAINAGE OR DETENTION FACILITY – a facility for storage of excess storm runoff.

DRIVEWAY – An improved and maintained way providing vehicular access from the public street to a parking area or to dwellings or other uses.

DRYLAND GRASS OR VEGETATION – Any live landscaping, including native grass and vegetation but not including weeds, capable of growing in the local environment without supplementary watering once established.

EARTHWORK – The disturbance of soils on a site associated with clearing, grading, or excavation activities.

EASEMENT – An interest in real property that establishes the right of the easement holder to use the property for certain purposes, such as utilities installation, access, or maintenance. Fee ownership of the underlying land remains with the property owner, not the easement holder.

EROSION – The detachment and movement of soil or rock fragments by water, wind, ice or gravity.

EROSION CONTROL – Measures that prevent erosion.

EROSION CONTROL SPECIALIST – An individual who has received training and is certified by an organization acceptable to the City Engineer to install, inspect and maintain erosion and sediment control practices.

EXCEPTION – A deviation from the specific terms of the City Standards that will not be contrary to public interest.

FINAL STABILIZATION – When all soil disturbing activities at the site have been completed, and uniform vegetative cover has been established with a density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed. Establishment of a vegetative cover capable of providing erosion control equivalent to pre-existing conditions at the site is considered final stabilization.

FLOODPLAIN DEVELOPMENT PERMIT – A permit that is required before any construction or development can begin within any 100-year floodplain in the City including the placement of manufactured homes proposed within flood-prone areas. Permits are required to ensure that proposed development projects meet the requirements of the NFIP and the City of Longmont floodplain regulations.

GOVERNING AGENCY – means that governmental agency, including the City of Longmont or Counties of Boulder or Weld, with authority to inspect and approve an electrical installation.

GRADING – Rearrangement of the earth's surface by stripping, cutting, filling, or stockpiling of earth or land, including the land in its cut or filled condition, to create new contours or grades.

GRADING PERMIT – A written permit issued by the city to allow grading or any other land disturbing activity, as set forth more specifically in the City Code. Reference the Stormwater Construction Activity Permit located in Appendix E

INFILL – The development of a parcel of land adjacent to platted lots or developed parcels along at least 2/3 of its perimeter, and where water, sewer, electric, gas, and phone utilities and street access are adjacent to the parcel and other public services and facilities are available nearby.

INFILTRATION – Refers to extraneous flow (excluding sewage) which enters a sewer system at pipe connections to manholes, or through joints in manholes or pipe, or because of breaks in pipe or joints, corrosion of pipe, poor construction or ground movement.

INFLOW – Refers to the extraneous flow in sewer systems from sources other than infiltration, such as basement drains, roof drains, and manhole covers, etc.

LANDSCAPE ARCHITECT – A registered landscape architect licensed with the State of Colorado, with expertise and qualifications in the areas covering the scope of work.

LANDSCAPE AREA – An area comprising any combination of living plants, inorganic material such as rocks or stones, and architectural features including but not limited to fountains, pools, art works, screen walls, fences, street furniture and ornamental concrete or stonework.

LANDSCAPING – Preserving the existing trees, shrubs, grass, and decorative materials such as fences or walls on a lot, tract, or parcel of land, or the rearranging or modifying thereof by planting or installing more or different trees, shrubs, grass, or decorative materials.

LOCAL STREET SYSTEM – The interconnected network of local and collector streets that provides access to a residential development from an arterial street.

LOW IMPACT DEVELOPMENT – Systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat. It is a comprehensive land use planning and engineering design approach to managing stormwater runoff with the goal of mimicking the pre-development hydrologic regime. It emphasizes conservation of natural features and use of engineered, on-site, small-scale hydrologic controls that infiltrate, filter, store, evaporate, and detain runoff close to its source.. Reference Chapter 14.26 of the City Code.

MAJOR STRUCTURE – For the purposes of these specifications, a “major structure” is defined as a bridge or culvert(s) with a total length greater than 20 feet measured along the centerline of the roadway between the inside face of abutments, inside faces of the outermost walls of culverts, or spring lines of arches. Major Structures also include culverts with multiple pipes where the clear distance between the centerlines of the exterior pipes, plus the radius of each of the exterior pipes, is greater than 20 feet.

MINOR STRUCTURE – For the purposes of these specifications, a “minor structure” is defined as a bridge, culvert, or a group of culverts that have a length greater than or equal to four (4) feet and less than or equal to 20 feet measured along the centerline of the roadway between the inside face of abutments, inside faces of the outermost walls of culverts, or spring lines of arches.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) – A stormwater collection or conveyance system that is owned by a public entity that discharges to waters of the U.S. To prevent harmful pollutants from being washed or dumped into MS4s, public entities are required to obtain NPDES permits and develop stormwater management programs (SWMPs) that include pollution prevention measures,

treatment or removal techniques, monitoring, use of legal authority, and other appropriate measures to control the quality of stormwater discharged to the storm drains.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGE PERMIT – As authorized by the Clean Water Act (CWA), the NPDES Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or manmade ditches.

NATURAL AREA – Any of the following:

- a. Streams, rivers, wetlands, and other bodies of water, including their associated riparian areas.
- b. Areas characterized by significant stands of mature trees and vegetation.
- c. Areas of topography characterized by steep slopes, erosion characteristics, geographic formations, high visibility from off-site locations, or the presence of rock outcroppings.
- d. Any area identified as habitat, natural landmarks, or natural areas on the "Map of Wildlife and Plant Habitats, Natural Landmarks and Natural Areas" included in Boulder County's Comprehensive Plan, as amended.
- e. Any land that qualifies as a "wetland" under the Federal Clean Water Act, regardless whether shown on any city or county map or inventory

NON-STORMWATER DISCHARGE – any discharge to the storm drainage system that is not composed entirely of stormwater or any release of pollutants that potentially or actually discharges to the storm drain system.

OPERATOR – The individual who is responsible for day-to-day supervision and control of activities occurring at the construction site. The operator can be the Owner, Developer, Contractor or an agent of one of these parties.

OWNER or PROPERTY OWNER – The owner or titleholder of any fee, leasehold, or possessory interest in property subject to the requirements of the development code, and shall include any agent, representative, person, or entity duly authorized by the owner to act on the owner's behalf.

PARK – Land area owned by the city that is developed and maintained for active or passive recreational use and is open for the general public's use and enjoyment. A "park" may, by way of example only, include public playfields, courts, and other recreation facilities, or may include greenways, water features, picnic areas, or natural areas.

PEDESTRIAN BRIDGE – A structure designed and constructed to provide means for pedestrian and light vehicle traffic only to cross an obstacle such as a river, stream, ditch, road, railway, etc. The minimum span width over the obstacle shall measure at least five (5) feet.

PERMANENT STORMWATER CONTROL MEASURE – long term techniques, processes, activities, structures, or treatment devices that, when used singly or in combination, prevent or reduce the pollutant content of a stormwater discharge.

POLLUTANT – Any substance that is harmful to humans, animals, public health, the environment, or that can degrade the quality of receiving waters, cause the receiving waters to violate the stream standards established by the State of Colorado, or affect beneficial uses of water. The term includes, but is not limited to, sediment, dredged spoil, rock, sand, silt, incinerator residue, ash; solid waste;

sewage; wastes from industrial, commercial, domestic, or agricultural sources; trash, litter, garbage or food waste; landscaping materials, lawn clippings, leaves, branches or other landscaping and yard debris; medical waste; wrecked or discarded equipment; radioactive materials; wastes that contain bacteria, viruses and other pathogens that pose a threat to human health; pet wastes; heat, surfactants, soaps, and cleaning products and wastes and residues from washing operations, including those that are biodegradable; oil and grease, petroleum hydrocarbons and antifreeze; metals; and toxic or hazardous wastes as defined by Federal, State, or Local laws and regulations, including biocides and pesticides.

POLLUTION – The presence in waters of the state of any substances, contaminants, or manmade or man-induced impairment of waters or alteration of the chemical, physical, biological, or radiological integrity of water in quantities or at levels which are or may be potentially harmful or injurious to human health or welfare, animal or plant life, or property or which unreasonably interfere with the enjoyment of life or property, including outdoor recreation unless authorized by applicable law.

PRIMARY GREENWAY – A public right-of-way consisting of linear strips of land adjacent to creeks, rivers, ponds, lakes, reservoirs, ditches or roadways used for stormwater drainage, passive and scenic open space and park purposes, and self-propelled transportation modes. Greenways provide connections between community and residential areas as described and designated by the Longmont Area Comprehensive Plan.

PROFESSIONAL ENGINEER – A registered engineer licensed with the State of Colorado, with expertise and qualifications in the areas covering the scope of work.

PUBLIC IMPROVEMENT – Any facility that is within City rights-of-way, on City property, or maintained by the City after final acceptance, including but not limited to streets, alleys, sidewalks, primary greenways, parks, water and sewer lines, electric facilities, storm drainage facilities, arterial rights-of-way landscaping and concrete trails.

PUBLIC IMPROVEMENT AGREEMENT – An agreement executed by the city and an applicant guaranteeing the installation of, and participation in, specific improvements. Financial security for the improvements shall be submitted in conjunction with the execution of the agreement. A public improvements agreement is generally required before recording a final plat or site plan.

PUBLIC OPEN SPACE – Any parcel or area of land or water essentially unimproved with any residential, commercial, or industrial uses and set aside, dedicated, or reserved for public or private use and enjoyment including recreational, scenic, or environmental purposes. Open space may include agricultural uses and natural features located on a site, including but not limited to meadows, forested areas, steep slopes, flood plains, hazard areas, unique geologic features, ridgelines, unique vegetation and critical plant communities, stream or river corridors, wetlands and riparian areas, wildlife habitat and migration corridors, areas containing threatened or endangered species and archeological, historical, and cultural resources. Areas comprising minimum building separation and setbacks for light and air shall not be considered "open space" under this definition.

RECEIVING WATER – Any water of the State of Colorado. These include any and all surface waters that are contained in or flow in or through the State of Colorado. This definition includes all watercourses, even if they are usually dry, and irrigation ditches that receive municipal stormwater. It also includes storm sewer systems owned by other entities.

RIGHT(S)-OF-WAY – A strip of land for public purposes, including but not limited to utilities, streets, pedestrian walkways, bicycle paths and alleys.

RIPARIAN AREA – The land areas adjacent to a stream corridor, wetlands, or other body of water that contain vegetation, habitats, and ecosystems associated with bodies of water or dependent on the flow of water in the adjacent stream, wetlands, or other water body. A riparian area will vary in width depending on the particular stream, wetlands, or other body of water.

SANITARY SEWER – Refers to a sewer that carries wastewater from residential, industrial and commercial facilities to the sewage treatment plant.

SECONDARY GREENWAY – Public rights-of-way consisting of an eight (8) foot wide pathway designed to provide open space connections between living areas and parks, schools, and primary greenways.

SEDIMENT – Soil (or mud) that has been disturbed or eroded and transported naturally by water, wind or gravity, or mechanically by any person.

SEDIMENT CONTROL – Measures that prevent eroded sediment from leaving the site. The land or water area where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.

SERVICE CONNECTION – Are the extensions from individual properties to the public electric, water or wastewater facilities.

SIDEPATHS – Sidepaths are detached or attached paths that are a minimum of eight (8) feet wide allowing for shared use by pedestrians and bicyclists.

SIDEWALK – That portion of a street between the curb line (or lateral line of the roadway) and the adjacent property line, intended for pedestrian use.

SIGHT DISTANCE TRIANGLE – A triangular shaped portion of land established at street intersections and street or driveway intersections in which nothing is erected, planted, or allowed to grow in such a manner as to limit or obstruct the sight distance of persons entering or leaving the intersections. Specifications for required sight distance triangles are found in the City Standards.

SITE PLAN – A specific development plan for a lot, use, or building, specifying how the entire site will be developed including, but not limited to, building envelopes, uses, densities, open space, parking or circulation, access, drainage, building area, landscaping, and signs. Approval of a site plan means a proposed development complies with the standards and provisions of this development code and, consequently, the City may issue a building or grading permit to an applicant, assuming all other City Standards and regulations have been satisfied.

SLOPE – The ratio of horizontal distance (run) proportional to vertical distance (rise or drop) of a slope, such as a 4H:1V slope having one (1) foot of rise for every four (4) horizontal feet.

SPILL – An unintentional release of solid or liquid material, which may cause pollution of the MS4 or waters of the State.

STATE SPECIFICATIONS – Shall refer to the latest edition of the State Department of Transportation, Division of Highways, State of Colorado – Standard Specifications for Road and Bridge Construction.

STORMWATER – Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

STORMWATER CONTROL MEASURES (OR BMPS) – Any program, technology, process, siting criteria, operating method, measure or device that controls, prevents, removes or reduces pollution. Stormwater control measures include schedules of activities, prohibitions of practices, pollution prevention, educational practices, maintenance procedures and facilities, procedures, techniques, or practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater,

receiving waters or stormwater conveyance systems. Stormwater control measures also include treatment requirements, operating procedures and practices to control site runoff, spillage or leaks, wastewater or sludge disposal or drainage from materials storage.

STORMWATER POLLUTION CONTROL PLAN – A set of plans prepared by or under the direction of a Professional Engineer licensed in the State of Colorado that indicates the specific measures and sequencing to be used controlling sediment and erosion on a development site during construction activity.

STREAM OR RIVER CORRIDOR – The corridor defined by a river's or stream's ordinary high-water mark, plus associated riparian areas.

STREET CLASSIFICATION and DEFINITION – A public way dedicated to the public for purposes of vehicular travel, including all area within rights-of-way. The street classifications for roadway design are as follows:

- a. Regional/Principal Arterials – As defined in Envision Longmont Multi-modal and Comprehensive Plan (2016), have the functional priority to provide mobility and access. These type of roads provide interconnectivity and continuity within regions and metro areas. Principal arterials should be constructed with or have the provision to include four or more through lanes. Principal arterials shall include bike lanes and bike paths.
- b. Minor Arterials/Collectors – Provide interconnections and continuity between or within neighborhoods. Minor arterials should be constructed with or have the provision to include two to four through lanes and one bi-directional center turn lane. They shall include eight (8) foot sidepaths and on-street bike lanes
- c. Local Streets – Local streets have the functional priority to provide access and limited mobility. No continuity is required. They should be designed to include two travel lanes, bicycle vehicle mixed traffic, parking lanes and five (5) foot detached sidewalks.

TRANSPORTATION PLANNING – Focuses on the long range planning issues for surface transportation in the City including pedestrian, bicycle, public transit and future roadway planning. The primary guiding documents for transportation planning are listed below as part of Envision Longmont and associated Multimodal Transportation Implementation Plan (MTIP) adopted together in 2016 and found on the City's website.

- a. Arterial and Collector Street Master Plan – Envision Longmont Multimodal and Comprehensive Plan (2016) identifies planned Arterial and Collector streets..
- b. Enhanced Multi-Use Corridor Plan – The Enhanced Multi-Use Corridor (EMUC) Plan identifies a set of corridors falling under this category and desirable design features. Developments within and or adjacent to the EMUCs route framework will be required to meet the Longmont Enhanced Multi-Use Corridor Plan and these Design Standards.

TESTING AGENCY – Any individual, partnership, or corporation qualified and licensed to perform the required sampling, analysis, testing, and report writing services.

TRAFFIC ENGINEER – Shall mean the Transportation Engineer with the Public Works and Natural Resources Department, City of Longmont, Colorado.

TRAFFIC OPERATIONS – shall mean the Transportation Sign Shop with the Public Works and Natural Resources Department, City of Longmont, Colorado.

TREATED WATER – Water processed by the Longmont Municipal Water Utility.

TREATMENT FACILITIES – Any plant, equipment or other works used for the purpose of treating, separating or stabilizing any substance produced from a well.

UNDERDRAIN COLLECTION SYSTEM – pipe collection system installed to collect the groundwater from building perimeter underdrains or area underdrains and to carry the groundwater to a point of discharge on the surface, or into a storm sewer, or into a drainage channel.

UNTREATED WATER – Water not processed by the City of Longmont Municipal Water Utility.

UTILITIES – Shall mean all utilities on site prior to the time of any design; such as but not limited to water lines, sanitary sewer lines, drainage lines, electric lines, gas lines, telephone lines, and cable television lines.

WASTEWATER – Shall mean the water-carried and liquid wastes from dwellings, commercial buildings, institutions and industrial facilities discharged to the Public Owned Treatment Works, (POTW), and sewer system.

WATERCOURSE – A natural or artificial channel through which water can flow.

WATERS OF THE STATE OF COLORADO (WATERS OF THE STATE) – Any and all surface and subsurface waters that are contained in or flow in or through the State of Colorado. The definition includes all watercourses, even if they are usually dry.

VARIANCE – A deviation from the specific terms of the Chapter 15.02 Longmont Development Code that will not be contrary to public interest.

VOLUME-TO-CAPACITY RATIO (V/C) – A measure of the operating capacity of a roadway or intersection, in terms of the number of vehicles passing through, divided by the number of vehicles that theoretically could pass through when the intersection or roadway is operating at its designed capacity. A V/C ratio of 1.0 means the roadway or intersection is operating at capacity; if the V/C ratio is less than 1.0, the traffic facility has additional capacity.

WELL – An oil and gas well or an injection well.

WELL SITE – The surface area of a proposed or existing well and its pumping systems.

WETLANDS – An area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wherever the words "as directed", "as required", "as permitted", or words of like meaning are used, it shall be understood that the direction, requirements or permission of the City Engineer is intended. Similarly, the words "approved", "acceptable", and "satisfactory" shall refer to approval of the City Engineer. References made to City Standards, methods of testing materials, codes, practices, and requirements are understood to be the latest revision of said references and shall govern unless a specific revision is stated.

102.01 GENERAL QUALIFICATIONS

1. The provisions of these City Standards apply to the construction, enlargement, removal, alteration, relocation, repair, trenching and restoration of any Public Improvement or common facilities regulated herein.
2. The City Standards are complementary, what is called for by one is as binding as if called for by all. It is the intent of the City Standards to require a functionally complete project to be constructed in accordance with these City Standards. Any work, materials or equipment that may reasonably be inferred as being required to produce the intended result will be provided whether or not specifically called for. When words, which have a well-known technical or trade meaning in the development, construction, utility and infrastructure realm, are used to described work, materials or equipment such words shall be interpreted in accordance with that meaning.

102.02 USING THESE STANDARDS

1. These City Standards are to be used when designing and constructing all public improvements and infrastructure within the City of Longmont. For the purposes of this document, public improvements and infrastructure includes without limitation: streets, sidewalks, trails, curb and gutter, curb cuts, landscaping, water mains, fire hydrants, water services and meters, wastewater mains and services, manholes, stormwater mains, inlets, drainage swales and channels, and other improvements intended for public purposes or for the benefit of the community located within dedicated public rights-of-way and public easements.
2. These City Standards also provide design and construction requirements to be used when developing private lands that create an impact on public improvements, public rights-of-way and/or public easements. The required private improvements associated with property development include without limitation: landscaping standards per City Standards Section 600, traffic mitigation, site access and driveway design, stormwater site drainage and detention facility improvements, and water quality and erosion control measures.
3. In addition, these City Standards provide design and construction requirements to be used when developing in the any 100-year floodplain within the City of Longmont's jurisdiction.
4. Reference to standard specifications, manuals or codes of any technical society, organization or association or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or laws or regulations in effect at the time of City approval. However, no provision of any referenced standard specification, manual or code shall be effective to change the duties and responsibilities of the City or any of their consultants, agents or employees from those set forth in these City Standards. Work shall be done in compliance with the approved plans, and to the satisfaction of the City.

102.03 PUBLIC IMPROVEMENT DESIGN

1. These City Standards prescribe minimum requirements and specifications for designing adequate and functional public improvements. However, the design of public improvements also depends on the land use zoning and comprehensive planning requirements for the City, as well as the specific site geography of the land to be improved or developed.
2. The City review for approval of submitted design plans for public improvements occurs as part of the development review process which distributes design applications to staff in multiple departments,

divisions, and agencies. The PWN development review staff has the primary responsibility for the review and approval of construction plans for public improvements.

102.04 DESIGN APPROVALS

1. An applicant seeking approval to construct public improvements in the City will need to develop engineering designs and construction plans that comply with the design and construction standards provided in this manual. In addition to complying with these City Standards, an applicant will need to file the necessary applications and meet the requirements of the City's land use regulations, permit standards, and fee assessments.
2. An applicant seeking construction approval will need to consult floodplain mapping, local master plans and locate existing public infrastructure to develop specific project designs.
3. In order to develop project designs that comply with these City Standards, an applicant for construction approval will need to enlist the services of a Design Professional which may include but is not limited to a civil engineer and a Professional Land Surveyor to meet the requirements for certifying acceptable designs for public improvements.

102.05 PROJECT RESPONSIBILITY

1. Where required all plans shall be signed and sealed by a Design Professional. The Design Professional shall be responsible for all plans and specifications. Approval by the City Engineer shall in no way relieve the Design Professional of the responsibility for errors or omissions in design, plans, specifications or field surveys. Any errors shall be corrected by the Design Professional to the satisfaction of the City Engineer at no cost or expense to the City. Where required, plans shall be signed and sealed by a registered Professional Engineer licensed in the State of Colorado. Landscape plans shall be stamped by a Registered Landscape Architect.

102.06 STANDARDS

1. Utility Trenching: The trenching standards prescribed in City Standards Section 100 under "Utility Trenching," outline the excavation and backfill process required for installation of utilities, pipelines, manholes, vaults, diversion structures and other appurtenances. .
2. Transportation Improvements: The transportation standards prescribed in City Standards Section 200, "Transportation," provide for the study, design, and construction of site accesses, streets, sidewalks, bicycle facilities, and trails. A traffic impact study may be required as part of construction approvals to demonstrate adequate design and mitigation for traffic impacts associated with new streets and driveways.
3. Storm Drainage Improvements: The stormwater standards prescribed in City Standards Section 100, "Utility Trenching," City Standards Section 300, "Storm Drainage" and Urban Drainage Volumes 1 and 2 provide for the study, design, and construction of stormwater drainage and flood management improvements. Detention facilities, storm sewer and drainageway systems, water quality, and erosion control measures may be required as part of construction approval to mitigate the impacts of increased runoff resulting from land development.
4. Wastewater Collection: The utility standards prescribed in City Standards Section 100, "Utility Trenching," and City Standards Section 400, "Wastewater Collection Design," provide for the study, design, and construction of sanitary sewer service facilities. These City Standards detail required forecasting for sizing wastewater collection mains, specific construction requirements for ensuring public health standards, and requirements for installing sanitary sewer service lines.

5. **Water Utilities:** The utility standards prescribed in City Standards Section 100, “Utility Trenching,” and City Standards Section 500, “Water Distribution Design,” provide for the study, design, and construction of water service facilities. These City Standards detail required forecasting for sizing water distribution collection mains, specific construction requirements for ensuring public health standards, and requirements for installing domestic water service lines.
6. **Landscaping & Irrigation:** The landscaping standards prescribed in City Standards Section 200, “Transportation Improvements,” and City Standards Section 600, “Landscaping & Irrigation” provide for the selection, design, placement, and protection of trees and landscaping along all City owned and/or maintained areas including public street rights-of-way, primary and secondary greenways, park sites as well as private common areas and other privately maintained landscaped areas throughout the community.
7. **Longmont Power & Communications:** The power and communications standards prescribed in City Standards Section 700, “Longmont Power & Communications,” provides for the selection, design, and placement of electric and internet service utilities.

103.00 PLAN REVIEW & SUBMITTAL PROCESS

103.01 INTRODUCTION

1. The procedures outlined in the following sections are guidance for Consultants and Developers seeking approval of any submittals requiring the construction of Public Improvements. All public improvements constructed within the City must be designed in conformance with these City Standards.
2. The City's review and approval will only determine if the plans, specifications and construction conform to the City's requirements. The City's approval shall be in writing. The City's review and approval will not relieve the Design Professional and Contractor from responsibility for any variation from the City requirements or adequate design standards. The City's review and approval shall not constitute any assumption of responsibility or liability for the design or construction.
3. Unless waived by the City, all plans, specifications, and calculations submitted to the City for review must be prepared by or under the direct supervision of a Professional Engineer duly registered and licensed to practice engineering in the State of Colorado. The Professional Engineer shall sign and certify all plans, specifications, and calculations along with the Professional Engineer's registration number and seal.

103.02 PLAN REVIEW

1. The City utilizes a Development Review Committee (DRC) to provide a coordinated and integrated Planning and PWR staff review of development submittals and Capital Improvement Projects.
2. These City Standards apply to submittals for Capital Improvement Projects, Annexations, Plats, Site Plans, Public Improvements Plans (PIPs), Stormwater Pollution Control plans, Permanent Stormwater Control plans and all other development applications listed in Chapter 15.02 of the City Code. Additional guidance on the land development processes and the associated application forms can be found on both the City website and in the City Code under Title 15, Land Development Code (LDC).
3. The requirement for Public Improvement Plans (PIPs) depends on the complexity of the public improvements required for a site to develop. Approval of PIPs is required prior to the final plat being recorded. Any development submittal that requires public improvement plans is required to enter into a Public Improvement Agreement with the City per the Public and Common/Private Improvement

Review, Construction and Acceptance Section in Chapter 15.02 of the City Code. The PIA identifies public improvements that are required to be constructed, stipulates the timing of improvements and the warranties that will cover them and provides the requisite assurance that the public improvements will be constructed to City Standards. The PIA includes all commitments and responsibility of the City and the applicant with respect to public improvement design, installation, acceptance, cost participation, payment and fees.

103.03 SUBMITTAL PROCEDURE & REQUIREMENTS

1. Submittal procedures shall conform to the City Code under Title 15, Land Development Code (LDC), Title 20, Floodplain Regulations, these City Standards, and other project specific requirements in accordance with the appropriate City Divisions or Departments.
2. Consultants and Developers are required to submit electronic files of all documents to the City of Longmont for DRC review including but not limited to Annexations, Capital Improvement Projects Engineering Design Submittals & Reports, Master Utility Plans, Plats, Public Improvement Plans and Site Plans. All drawings are to be spatially correct, to allow information to be transferred to the City's geographic information system (GIS).
3. The electronic drawing file(s) shall be in a (.dxf), (.dwg) or (.dgn) drawing format and a PDF format submitted on compact disc (CD) or (DVD), portable data storage device (USB), protected online sharing services or by other means acceptable to the City Engineer. At a minimum, the file shall be an overview of the entire project.

103.04 CONSTRUCTION PLAN GENERAL PROVISIONS

1. All construction plans will be checked for conformance to the City Standards prior to acceptance and shall be submitted to the City for review on 24 x 36 inch sheets with legible lettering. All sheets shall be drawn to scale including plan sheets, profile sheets and detail sheets. The only exceptions allowed will be for City Standards details however they must be placed on the drawings without any modifications made to them.
2. Checklists that outline design requirements are provided in Appendix A to assist in the preparation of construction plans to be submitted to the City for review including but not limited to Plats, Public Improvements Plans (PIPs), Stormwater Pollution Control Plans, Permanent Stormwater Control Plans, Floodplain Impact Analysis, FEMA submittals and record drawings. The checklist shall be considered the minimum information required for plan preparation however the City Engineer may waive some of the requirements outlined in the checklist based on the complexity of the project. All construction plans shall include all the necessary information required for the construction of all public improvements.

103.05 SURVEY REQUIREMENTS

1. Construction plans shall be designed in such a manner that conforms to the City's geographic coordinate system. Plans must state whether coordinates are measured from the surface of the earth (ground measurements) or are based on the spatial data's coordinate system (grid measurements) and provide a scaling factor for conversion. Street center lines, property lines, and all other infrastructure shall utilize the City's geographic coordinate system for all aspects of the design.
2. All Land Survey Plats and Improvement Survey Plats submitted for development applications must comply with the Colorado Revised Statutes and the Bylaws and Rules of the State Board of Licensure for Architects, Professional Engineers and Professional Land Surveyors. Upon submittal of an

Annexation Map, Preliminary Plat and/or Final Plat, the Professional Land Surveyor must include a location and a written description of coordinate values for monumentation on the plat. At least two control points must be labeled on the plat using the state plane coordinate values. The two control points must be section corners or 1/4 section corners.

3. The primary and secondary control points and other GIS land points, which may be used as initial starting values are provided free through the Boulder County web page. However, the information being provided by Boulder County does include a disclaimer. Please note that the GIS land points cannot be used for determining legal boundaries. Boulder County accepts no liability for the accuracy of data points. The primary and secondary control point data can be found at the Boulder County Government website.
4. All topographic mapping including contours and construction drawings shall be based on the NGVD 1988 vertical survey datum (replaces NGVD 1929). The City will not accept any other datum nor will an adjustment from some other datum to NAVD 88 be acceptable. Contours are required to be shown on plans a minimum 50 feet beyond the project construction extents to adequately depict off-site drainage basins. Survey for floodplain modeling and mapping shall be a minimum of 100 feet beyond the property boundaries to adequately tie into existing mapping and to define offsite impacts.
5. The basis of bearing of the proposed development must be in the Colorado State Plane Coordinate System, based on the 1992 HARN adjustment of the 1982 North American Datum (HPGN NAD 83/92).
6. Units of measurement shall be defined in U.S. Survey foot.

103.06 UTILITY LOCATION REQUIREMENTS FOR DESIGN

1. Per the provisions of Section 9-1.5-101 et seq. (Colorado Revised Statutes) (also known as Senate Bill 18-167 and referred to herein as the “Underground Utility Location Law”), projects that meet all of the following four (4) criteria are required to meet Quality Level B for design utility locations as identified in the subsurface utility engineering (SUE) standard ASCE 38.
 - a. Project involves a construction Contract with a public entity.
 - b. Project involves primarily horizontal construction and does not involve primarily the construction of buildings.
 - c. Anticipated excavation footprint exceeds two (2) feet in depth and is a contiguous 1000 square feet (excluding fencing and signing projects) OR involves utility boring.
 - d. Project requires the design services of a licensed Professional Engineer.
2. For all projects that fall under SUE the following requirements must be initiated as part of the project design.
 - a. A thorough subsurface utility engineering investigation that takes the results of any comprehensive geophysical searches for known and unknown utilities and integrates the results of the geophysics with existing records and physical evidence in a risk based depiction.
 - b. Test holes where needed for utility locations.
 - c. Utility location data that is transmitted to the Design Engineer in order to make informed design decisions and the Quality Level of each utility is marked on the plan set.

- d. All of the utility investigation must take place under the direct responsible charge of a licensed Professional Engineer with training and a working knowledge of surface geophysics, engineering surveying, utility construction and design principles, utility conflict identification resolution, and utility risks as they pertain to the project.
3. Please reference City Standards Section 109 titled Utility Trenching for specific information regarding utility installations requirements.
4. Nothing in this City Standards Section 103.06 is intended to alter the requirements of or to conflict with the State of Colorado Underground Utility Location Law.

103.07 ENGINEERING DESIGN SUBMITTALS

1. All engineering design submittals including reports, master plans and CAD file information shall include on the title page; 1) the type of document 2) the project name, 3) the preparer's name, date, and firm, and 4) P.E. seal of preparer. The City Engineer may require one or all of the following design submittals containing site specific engineering information for a project. These documents shall be submitted with initial submittal for review.
2. A cover letter shall be included, identifying the project and the type of information submitted (conceptual, preliminary, or final). All final reports shall be typewritten on 8-1/2 x 11 inch paper and bound. All submitted reports shall be legible. If reports are unreadable, resubmittal of readable copies shall be required. The report shall be prepared (or supervised), signed and stamped by a registered Professional Engineer. The report shall contain a certification sheet with the report statement, and appropriate signatures per Appendix requirements for each type of report.
3. The drawings, figures, plats, and tables shall be bound within the report or included in a pocket attached to the report. Photo copies of charts, tables, calculations, or any other referenced material shall be legible and contain the origin of the reference. Washed out, blurred, or unreadable portions of the report are unacceptable, as is incomplete or absent information. The information presented in technical appendices shall contain sufficient detail to allow replication of the results presented in the report. Any unacceptable conditions could warrant a requirement for resubmittal of the report, and subsequent delay of the project review.
4. Unless otherwise approved by the City Engineer, the report shall be dated within two (2) years of the plan submittal date.

103.07.02 DRAINAGE REPORT

1. A drainage report shall be submitted to the City, for review and approval, prior to any construction on a project or development. The drainage report shall comply with the requirements outlined in City Standards Section 300 and shall follow the Drainage Report Checklist outlined in Appendix A. All applicable elements in the checklist for each report shall be included or the study may be returned for completion prior to review.
2. There are three levels of drainage reports that may be required during the review process depending on the size and complexity of the project; drainage letter or technical memorandum, preliminary drainage report and/or a final drainage report. The level of report shall be determined by the City Engineer prior to the initial project submittal.
3. The drainage report shall be a stand-alone document. When references are made or assumptions are based on previously submitted studies or reports, the drainage report must include the appropriate

excerpts, pages, tables, and maps containing the referenced information. Assumptions made in previous reports must be verified and substantiated in all new reports.

103.07.03 GEOTECHNICAL (SOILS) ENGINEERING REPORT

1. A geotechnical report shall be submitted to the City, for review and approval, prior to any construction related to the installation of public improvements. The geotechnical material design specifications shall comply with the requirements outlined in the City Standards Section 200 titled Transportation. A checklist is provided in Appendix A to assist in the preparation of the report to be submitted to the City for review. Unless otherwise approved by the City Engineer, the report shall be dated within two (2) years of the plan submittal date.

103.07.04 PAVEMENT REPORT

1. A pavement report shall be submitted to the City, for review and approval, for all proposed pavement within public rights-of-way or easements. The pavement design shall comply with the requirements outlined in City Standards Section 200 titled Transportation. A checklist is provided in Appendix A to assist in the preparation of the report to be submitted to the City for review. Unless otherwise approved by the City Engineer, the report shall be dated within two (2) years of the plan submittal date.

103.07.05 LONGMONT POWER & COMMUNICATIONS PROJECT INFORMATION

1. A PDF of an electric One-Line diagram, a CAD file including the site, utilities, landscaping and irrigation that identifies transformer locations and an Electric Service Request Form shall be provided with the initial submittal of construction documents to the City, for review by Longmont Power & Communications. The submittal will initiate the electric utility design by Longmont Power & Communications. Further information on LPC submittal requirements can be found in Appendix A as well as City Standards Section 700 Longmont Power & Communications.

103.07.06 TRAFFIC IMPACT STUDY

1. Transportation Impact Studies are required in order to adequately assess the impacts of a development proposal on the existing and/or planned street system. Unless waived by the City, a written Transportation Impact Study signed and sealed by the responsible Professional Engineer will be required for all development proposals when trip generation is expected to exceed 50 vehicles during the peak hour or 500 Average Daily Traffic (ADT) based on the traffic generation estimates of the current Institute of Transportation Engineers Trip Generation manual or in the case where a localized safety or capacity deficiency exists as determined by the City Engineer. The Traffic Impact Study shall include at a minimum the proposed land use, trip distribution, traffic project years, intersections requiring analysis, signal timing assumptions, background traffic assumptions and may require additional information as determined by the City Engineer. The Transportation Impact Study shall comply with the Criteria for Transportation Impact Studies included in Appendix A.

103.07.07 WATER AND WASTEWATER PROJECT INFORMATION REPORT

1. On commercial, industrial or mixed use developments over five (5) acres and residential developments over 50 acres or areas of limited capacity, the City Engineer may request a project information report to be submitted with the preliminary construction plans to analyze the ability to provide water and wastewater service to the proposed site. A checklist is provided in Appendix A to assist in the preparation of the report to be submitted to the City for review

103.07.08 UNDERDRAIN REPORT

1. An underdrain report will be required for all projects or developments where an underdrain collection system or area underdrain is required to be installed per the recommendations made in the geotechnical engineering report. The purpose of the underdrain report is to identify and define solutions to groundwater problems on the site. The underdrain report shall be submitted to the City for review and approval prior to any construction on the project or development. The underdrain report shall comply with the requirements outlined in City Standards Section 303 titled Underdrains and the Underdrain Report Checklist in Appendix A.

102.08.08 FLOODPLAIN IMPACT ANALYSIS REPORT

1. A floodplain impact analysis (FIA) report will be required for projects proposed in any 100-year floodplain within the City of Longmont's jurisdiction unless it is a utility boring project that will not impact the floodplain. The FIA will describe the changes to the floodplain from the proposed project including filling in a floodplain with no mapped or defined floodway. The FIA report shall be submitted to the City for review and approval prior to approval of the Floodplain Development Permit. The FIA report shall comply with the requirements outlined in City Standards Section 301 titled Flood Risk Management and the FIA Report Checklist in Appendix A.

103.08 EASEMENT AND RIGHTS-OF-WAY REQUIREMENTS

1. Public utilities are required to be located in public rights-of-way or designated easements. Public utility mains shall be aligned in public rights-of-way per the alignment descriptions for City Standards Sections 300, 400, and 500 for storm sewer, sanitary sewer and water distribution systems respectively. Reference Detail 100-01 Placement of Utility Mains within Public ROW.
2. Easement requirements for one public utility main shall include a minimum width of 30 feet with a 20 feet wide exclusive utility easement at the center and five (5) feet wide nonexclusive easements on either side. Easement requirements for two public utility mains shall include a minimum width of 30 feet with 10 feet of separation from the center line of each pipe to the easement boundary and from the center line of each pipe to the center line of the adjacent pipe. Easement requirements for three public utilities shall include a minimum width of 40 feet with 10 feet of separation from the center line of each pipe to the easement boundary and from the center line of each pipe to the center line of the adjacent pipes. Longmont Power & Communications easement information can be found in City Standards Section 700 for Longmont Power & Communications. Reference Detail 100-02 Public Utility Easements on Private Property.
3. Easements granted by means of a separate easement agreement shall be governed by the terms of that agreement. Easements dedicated to the City by means of a plat, according to the Core Review Section under Chapter 15.02 of the City Code, shall be governed by the following conditions:
 - a. Easements shall be dedicated for the purposes of: Surveying, locating, installing, constructing, using, operating, maintaining, inspecting, repairing, altering, removing and replacing the designated public utility, in whole or in part, and all necessary subsurface and surface appurtenances; Marking the location of the Easement, and any improvements, by suitable markers set and maintained in the ground at locations which shall not interfere with such reasonable use as Property Owner shall make of the Easement under the terms of this Easement Agreement; and Right of ingress and egress over and on the lands depicted upon the plat to enforce the rights, terms and conditions as outlined in this section.

- b. That the property owner reserves the right to use and occupy the Easement for any lawful purpose consistent with the rights and privileges granted herein which will not interfere with or endanger any of the City's rights or improvements on or under the Easement or owner's use thereof, provided that owner shall not construct or allow the construction of any building, structure, or other improvement on or under the Easement, or take any action which would impair or in any way modify the improvements or lateral or subjacent support for the improvements, without obtaining the specific written permission of the City, except as agreed upon by the parties in the final subdivision plat for the land.
 - c. That the Property Owner covenants and agrees to cause the Easement area and any improvements installed thereon by the Property Owner to be maintained and kept, at its sole cost and expense, in good condition and state of repair.
 - d. Should the City have cause to excavate within the easement for repair, replacement, inspection, etc., the City or the City's representative or contractor, shall restore the surface to similar or better condition than was originally in place prior to the work commencing. The Property Owner provides clear title to the Easement and warrants title to the same.
4. The conditions listed in paragraph three of this City Standards Section shall be included as standard notes for all easements dedicated by Plat.

103.09 UTILITY LINE SEPARATION AND CROSSINGS

103.09.01 HORIZONTAL SEPARATION

1. Unless otherwise approved by the City, the following minimum separation or clearance requirements shall apply for all parallel public and private improvements.
 - a. A minimum of 10 feet separation is required from center line to center line for all existing or proposed water, sewer and storm sewer lines where the pipe sizes are less than 15 inches in diameter. This may be increased due to the depth and size of existing and proposed utilities.
 - b. A minimum of five (5) feet of separation horizontally from flowline to flowline is required during the placement of all existing or proposed wet utility lines.
 - c. If it is not possible to achieve 10 feet of separation of the water and sewer services due to the size, location or other physical restraints of the lot, the lines may be installed in the same trench with the approval of the City Engineer and under the following conditions:
 - i. The water service must be installed 18 inches above the sewer service on a separately excavated shelf of undisturbed soil in the common trench.
 - ii. Cover of 4-1/2 feet must be maintained as a minimum over the water service.
 - d. Clearance from existing electric utility underground lines and vaults must be three (3) feet when the exact location has been determined by pot holing the infrastructure. Maintain a minimum of three (3) feet of clearance on either side of proposed underground electric utility facilities
 - e. Maintain a minimum of three (3) feet clearance between above ground infrastructure and the sides and back of any electric utility above ground facilities and a minimum of 10 feet in front of doors or openings.

- f. Maintain 10 feet of clearance from overhead electric lines and 10 feet from poles and anchors. If this is not feasible, or conditions warrant additional protection or pole stabilization, the contractor must contact Longmont Power & Communications.
- g. A minimum of five (5) feet radial clearance between any above ground infrastructure and a fire hydrant. No above ground installation shall block the view or accessibility of any fire hydrant.
- h. Open trenches must not be within a 1H:1V slope area of pavement, curbs, gutter, or sidewalks. Any pavement, curbs, gutters, or sidewalks that are undermined by excavation shall be removed and replaced.
- i. All water lines, sanitary sewer mains, and storm sewer mains and laterals shall have a minimum of 15 feet of separation from any existing or proposed structures and/or foundations.

103.09.02 VERTICAL SEPARATION AND CROSSINGS

1. In the event that a water and sewer line must cross the following requirements apply:
 - a. Water and sewer crossings shall have an 18 inch vertical separation, minimum, from outside wall to outside wall with the water line above the sewer line.
 - b. Where sewer lines cross water lines and the sewer is above the water line or less than 18 inches clear distance vertically below the water line, then the water line will be DIP or PVC pipe 20 feet long and centered on the sewer line. In addition, if the sewer is sanitary and is made of concrete or vitrified clay pipe, it shall be replaced with a 20 foot length of C-900 PVC pipe centered on the water main. Watertight transition couplings shall be used to join the PVC pipe to the existing sewer pipe. The transition couplings shall be solid sleeve and have an interior and exterior fusion bonded epoxy coating, stainless hardware and be externally wrapped with 10 mil thick polyethylene. Other requirements may be imposed by the City Engineer on a case by case basis.
 - c. In all cases, bedding material or other approved structural protection shall be provided to preclude settling and/or failure of the higher pipe.
 - d. Separation of sanitary sewer and storm sewer lines will be reviewed on a case by case basis.
 - e. A minimum of 12 inches of vertical separation must be maintained for lateral crossings of electric utility facilities, with 18 inches recommended.

103.09.03 LANDSCAPE SEPARATION REQUIREMENTS

1. Trees to be located five (5) feet minimum away from all underground utilities measured from the edge of utility pipe.
 - a. No trees, shrubs, ground cover, boulders, berms, fences or other improvements exceeding 36 inches in height measured from surface of travel lane adjacent to planting area shall be planted within the site distance triangle or within six (6) feet of a vehicle travel lane.
 - b. Trees shall be planted in the center of the tree lawn area between edge of sidewalk and back of curb when space is less than 12 feet wide. No trees are to be planted in areas narrower than eight (8) feet in width without approval from the City Forester.
 - c. There shall be a minimum distance of eight (8) feet between trees and any adjacent vertical surface unless an exception is obtained. Trees to be spaced to accommodate the full canopy of the mature tree and proper root zone. Reference City Standards Section 605 for more information.

- d. Minor trimming and branch removal for street trees should be performed to maintain a minimum clearance of 15 feet above roadways or eight (8) feet above sidewalks and sidepaths.
 - e. For required clearances between plants and existing or proposed electrical cabinets, vaults or other infrastructure, refer to City Standards Section 700 for more information on Longmont Power and Communications. Electrical facility height restrictions are as follows:
 - f. Residential metering pedestal or pit: six (6) inch maximum height within four (4) feet of the window (meter) side of the cabinet and 40 inches maximum height within two (2) feet elsewhere.
 - g. Utility poles: no climbing vines.
 - h. Electrical Vaults: no landscape material on top of the vault and six (6) inch maximum height within four (4) feet.
 - i. Pad mount switchgear and cabinets: sod, cobble, mulch or other low growing shrubs or groundcover only within 10 feet of the unit doors. Residential pad mount transformers: no landscape material on top or front (street side) shall be used.
2. Fences that abut irrigated turf areas maintained by the City require an 18 inch wide centered on fence or nine (9) inches each side of fence, six (6) inch thick mow band along the fence. Reference City Standards Section 600 for more information on Landscaping and Irrigation.

104.00 CONSTRUCTION

104.01 GENERAL INFORMATION

1. Prior to the contractor beginning construction on a project, an approved set of plans and specifications must be on file with the City of Longmont. All contracts, bonds, insurance, permits and licenses must be fully executed by the Contractor before beginning work. Contractor shall have a copy of these City Standards on the site at all times during construction.

104.02 COMMENCEMENT OF CONSTRUCTION

1. Construction shall commence within one (1) year of the approved date shown on the plans, or plans must be resubmitted for review and approval. If construction is halted for more than one (1) year (12 consecutive months), plans must be resubmitted to the City for review and approval. All improvements will be accurately surveyed and staked in accordance with the approved plans prior to their construction. The Contractor shall be responsible for the preservation of all such staking and any necessary re-staking.
2. If construction does not commence within six (6) months of the approved date shown on the plans, Longmont Power & Communications reserves the right to modify the design or fees to reflect changes in standards or costs.

104.03 PRE-CONSTRUCTION CONFERENCE

1. The Contractor shall be required to schedule a Pre-Construction Conference(s) to be held at least 48 hours prior to the start of any construction on any topic regulated herein. The Pre-Construction Conference for development projects may not be scheduled until after the PIA has been approved by City Council, and the City has received recorded plans, securities, etc. The Contractor, Developer, City Engineer, Design Professional, City Inspector, and all other subcontractors shall be in attendance. At the time of the meeting, it shall be the Contractor's responsibility to assign one contact person to be responsible for coordinating all field changes and significant communications.
2. The Contractor shall be required to schedule a Pre-Paving Conference to be held at least 48 hours prior to paving. The Contractor, Developer, Soils Engineer, Design Professional, City Engineer and City Inspector shall be in attendance.
3. The Contractor shall be required to schedule a Landscape and Irrigation Pre-Construction Conference to be held at least 48 hours prior to the start of any construction for these trades. The landscape and irrigation Contractor, Developer, City Engineer, City Inspector, and all other subcontractors shall be in attendance. At the time of the meeting, it shall be the Contractor's responsibility to assign one contact person to be responsible for coordinating all field changes and significant communications.

104.04 PLANS ACCESSIBLE AT CONSTRUCTION SITE

1. The Contractor shall be required to have a set of plans approved by the City of Longmont and a copy of the current City of Longmont Public Improvement Design Standards and Construction Specifications, 2019 Edition on site at all times that construction is being completed. The contractor is also required to have a Stormwater Pollution Control plans, updated to current conditions, on site at all times. The plans shall include any approved revisions, and, where applicable, shall be signed and sealed by the Design Professional.

104.05 PERMITS

1. The Contractor shall obtain all necessary permits for construction, unless otherwise directed by the City. All permits must be in accordance with Federal, State, County, City, and other Local requirements. City review and approval of all permits must be accomplished prior to the start of any construction. Examples of permits that might be required, and locations where initial contact is to be made, are as follows:

PARTIAL LIST OF PERMITS	CONTACT
Access Permit	CDOT
Air Pollutant Emissions Notice Air Permit	CDPHE
Construction Dewatering Permit	CDPHE
General Purpose: Water Well Permit	Colorado DWR
Floodplain Development Permit	PWNR
Infrastructure Permit	PWNR
Permanent Stormwater Control Permit	Environmental Services
Railroad Use of Right of Way	Railroad Company
Railroad Work in Right of Way	Railroad Company
Section 404 Permit	USACE
Stormwater Construction Activity Permit	Environmental Services
Stormwater Discharges Associated w Construction Activity	CDPHE
Temporary Water Use Permit	PWNR
Use of Public Places Permit	Planning & Development Services
Utility and Special Use Permit	CDOT
Work in Ditch Right-of Way	Individual Ditch Companies
Work in Right-of-Way Permit	PWNR

2. This list is provided as an aid, and shall not be interpreted as a complete list of all permits required. It shall be the responsibility of the Contractor to determine the type of permits required by the specific project. The City shall make reasonable efforts to assist the Contractor in determining, and obtaining the permits required. A copy of all permits must be available for inspection on the job site at all times.
3. All required permit fees must be paid in advance, prior to commencement of any construction. No construction work will be started until the Contractor has obtained all appropriate permit(s) for the project and provided a copy to the City.
4. All required costs must be paid in advance, prior to commencement of any construction. Longmont Power & Communications charges for the electric distribution facilities are found in City Standards Section 700.

104.06 STORMWATER QUALITY

1. The Contractor is required to protect the environment, the water quality of watercourses, waterbodies and wetlands, and the health, safety and welfare of the public by preventing the discharge of pollutants to the City of Longmont municipal separate storm sewer system (MS4). Pollution control shall be implemented through regulation and control of public and private activities that are sources of pollutants to the MS4 as mandated under Chapter 14.26 of the City Code. The regulations in this chapter enable the city to comply with the requirements of the Federal Clean Water Act, the State of Colorado Water Quality Act, Federal and State law.

2. The Contractor is required to obtain City of Longmont issued stormwater quality permits per requirements outlined in Chapter 14.26 of the City Code. In addition, the Contractor is also required to obtain all Colorado Department of Public Health and Environment issued stormwater quality permits per State regulations.
3. As part of all construction activities, it is unlawful to cause materials to be deposited or remain in such a manner or location as to constitute an illegal discharge of pollutants into the MS4 or waters of the state. The Contractor is required to implement all necessary control measures to prevent any such illegal discharge of pollutants.

104.07 SAFETY AND PROTECTION

1. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 - a. All employees on the construction site and other persons and organizations who may be affected.
 - b. All the work and materials and equipment to be incorporated therein.
 - c. Other public or private property at the site or adjacent thereto, including but not limited to, trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation or replacement in the course of construction. In the event that any property at the site or adjacent thereto is damaged during the work, the Contractor shall repair or replace the property. The replacement shall be of the same or greater quality than the original property. At a minimum, the replacement shall meet the requirements of the City Standards. The determination of whether or not the property was adequately replaced shall be solely at the City's discretion.
 - d. Public who may be affected by the project.
2. Contractor shall comply with all applicable Federal, State, or Local laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss: and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify, in writing, owners of adjacent property, underground facilities and utility owners when progress of the work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property caused, directly or indirectly, by Contractor, Subcontractor, Supplier or any other person or organization directly or indirectly employed by them shall be remedied by Contractor. Contractor's duties and responsibilities for the safety and protection of the work shall continue until such time as all the work is completed and accepted by the City of Longmont.
3. If a representative of the City of Longmont deems a situation unsafe, the Contractor shall take the necessary steps to correct the situation prior to proceeding with the work. In addition, if, in the opinion of the City, the health, welfare, or safety of the public is endangered the City may, at the expense of the Contractor, take immediate action to correct any hazardous or inappropriate conditions at any time during construction or until final acceptance. Nothing within the provision to protect City representatives shall be construed as relieving the Contractor from being responsible for initiating, maintaining, or supervising all safety precautions and programs in connection with the work.

104.08 RESPONSIBILITY FOR DAMAGE

1. Should any public utility or public or private property be damaged during construction operations, the Contractor shall immediately notify the City and the owner of such utility or private property, and unless authorized by the owner of the utility or private property, the Contractor shall not attempt to make repairs. The Contractor will be liable for all damages and shall indemnify and hold the City harmless from any liability or expense for injuries, damages, or repairs to such facilities. Prior to work on any private property, the Contractor shall obtain written approval from the Owner of the private property. In addition to the repair costs, the Contractor shall be responsible for any administrative costs incurred by the City. The City may choose, at its sole discretion, to perform or contract for the repair work. If the City contracts for the repair work, the Contractor shall be responsible for reimbursing the City for the contract costs, and administration of the work.

105.01 CHANGES FROM APPROVED PLANS

1. Changes from the approved plans or specifications must be submitted by the Design Professional and approved by the City Engineer, and approved copies given to the Contractor, City Inspector, Developer, and Design Professional. No work shall proceed on that portion of the project being revised until said revisions are submitted, approved and distributed. The City shall respond promptly and in writing to such requests, but reserves a minimum of two (2) working days for review and response to change requests. When additional review time is required, the City shall notify the submitter of the need for additional time within one (1) working day of the submittal. Minor changes from the plans or specifications may be made only with permission from the Project Engineer or designee. This procedure shall be followed for all changes whether requested by the City, the Design Professional, the Contractor, or the Developer. All plan changes must be reflected on Record Drawings.

105.02 NOTIFICATION OF DESIGN ERRORS

1. Should any omissions or design errors be discovered after final approval of the plans, the person or agency discovering the omission or error shall notify the City Engineer, the Developer and the Design Professional. The Contractor, if unaware, shall be notified by the Developer, and following such notification, no work shall be allowed in the affected area until revisions are made by the Design Professional and approved by the City.

105.03 AUTHORITY OF THE CITY ENGINEER

1. The City Engineer is authorized to enforce all provisions of these City Standards or may appoint a civil engineer, City Inspector, any other related technical employee, or any consulting firm engaged specifically to act on the City Engineers behalf.
2. Whenever any work is being completed contrary to the provisions of the City Standards the City Engineer has the authority to order said work to be stopped. Notice to such effect will be presented to the Contractor or Design Professional's representative in writing, and such person shall stop work until authorized by the City Engineer to proceed.
3. City Standards revisions that are under review and have not yet been formally adopted by City Council shall not be required for any public improvement construction or public improvement construction plans that are active in the review process and that meet submittal requirements per currently adopted City Standards, unless it is a revision that will immediately affect public safety or adversely impact City maintenance processes in which case the draft City Standards revisions may be applied to an active development review process.

105.04 AUTHORITY OF THE CITY INSPECTOR

1. The City Inspector is authorized to check all work performed in connection with construction of the project. The City Inspector shall have the authority to reject defective, or inferior materials, or workmanship in cases where it is judged to be unacceptable, substandard, defective, unsafe or not in accordance with City Standards, good construction practices and/or good engineering judgment. The City Inspector has the authority to suspend work until any questions of issue can be resolved by the City Engineer, and advise the Contractor in complying with the drawings and standards. If the City Inspector or Engineer deems it necessary, the previously covered work will be exposed at the Contractor's expense. The Contractor shall immediately correct any defective materials or poor

workmanship as determined by the City Inspector. The City Engineer and City Inspector shall, at all times, have reasonable and safe access to the work whenever it is in preparation or progress and the Contractor will provide proper facilities and precautions for such access and inspection.

2. The City Inspector shall in no case act as foreman or perform duties for the Contractor, nor provide line and grade stakes, nor take an active part in the management of the work done by the Contractor. The presence or absence of the City Inspector shall not relieve the responsibility or obligation of the Contractor. The City Inspector is present on the site to advise Contractors on, and to enforce compliance with these City Standards.
3. The City Inspector has authority to inspect work performed in connection with street, sidewalk, sidepath, curb and gutter, storm sewer, sanitary sewer, and water construction, including, but not limited to, clearing and grubbing, erosion control and water quality, compaction of subgrade, placement of sub base, base and asphalt, forms, pavement and concrete work and materials to be used. The City Inspector also has inspection authority of work performed in connection with arterial rights-of-way and primary greenway landscaping, irrigation and concrete paths in areas to be maintained by the adjacent owner.
4. The City Inspector has inspection authority of work performed in connection with the existing water and wastewater system. The City Inspector is to have access to the construction site at all times. Connections to the existing water and wastewater system shall be made only under the City Inspector's observation.
5. The City Inspector has inspection authority over any water or sanitary sewer service line installation from the main to a point two (2) feet away from any building. The Building Inspector has inspection authority over construction from that point to and including the building.
6. The City Inspector has inspection authority of work performed in connection with the existing and proposed electrical system. The City Inspector is to have access to the construction site at all times. Connections to the existing electrical system shall be made only under the City Inspector's observation.
7. The City Inspector has inspection authority over construction of the underground service connection up to the building.
8. The City Inspector has inspection authority over City maintained concrete trail layout and landscape and irrigation construction performed in areas maintained and/or owned by the City of Longmont.
9. The City Inspector has inspection authority over the Stormwater Construction Activity Permit (SCAP) to ensure all permittees install and maintain sediment and erosion control measures to protect the Municipal Separate Storm Sewer System (MS4) from any and all illegal discharges.

105.05 INSPECTION REQUIREMENTS

1. The City Inspector shall be notified at least 24 hours in advance of any construction activity. Inspections are required as identified in the Appendix A.
2. No pipes, joints, or service connections shall be covered until they have been inspected by the City Engineer or City Inspector.
3. The Contractor is to supply any inspection aids that are necessary for inspection such as a pump system for hydrostatic testing and a compression system for air testing of sanitary sewer lines.
4. Regardless of when a deficiency is discovered, it is still the responsibility of the Contractor to meet the requirements of the City's Standards and the requirements of the Contract Documents.

5. If a project holds a Stormwater Discharge Permit for Construction Activities from CDPHE the project is required to be inspected by the Contractor every 14 days and after a major storm event to ensure compliance with the approved Stormwater Management Plan. The City Stormwater Construction Activity Permit is separate process that requires the City Inspector to preform on-going stormwater inspections to verify that erosion control measures are installed adequately, and maintained regularly. All sites will be assessed on how well their stormwater erosion control measures protect the City's Municipal Separate Storm Sewer System (MS4) from any and all illegal discharges. SCAP inspections must continue until the permit is formally terminated.

105.06 TESTING

1. All tests required by the City Standards shall be performed by a testing agency approved by the City and paid for by the Contractor or Developer. If the materials or methods used do not comply with City Standards, the City Engineer may require that additional tests be performed to ensure compliance with City Standards. Testing methods and location will be as specified herein or as required by the City Engineer.

105.07 LIABILITY

1. The City, the City Engineer, or Engineer's authorized representatives charged with the enforcement of these City Standards, acting in good faith and without malice in the discharge of their duties, will not thereby be rendered personally liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of their duties. Nothing in these City Standards is intended to eliminate or modify the immunity, protections and/or requirements of the Colorado Governmental Immunity Act, C.R.S. § 24-10-101 et seq.

105.08 NO WAIVER OF LEGAL RIGHTS

1. The City will not be precluded or stopped by any measurement, estimate, or certificate (made either before or after the completion and acceptance of the work) from showing the true amount and character of the work performed and the materials furnished by the Contractor, or from showing that any such measurement, estimate or certificate is untrue or is incorrectly made.

106.00 CONTROL OF MATERIALS

106.01 GENERAL INFORMATION

1. All materials and equipment shall be of a quality acceptable to the City. As required by the City Engineer, the Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to City, or any of City's representatives, any duty or authority to supervise or direct the furnishing or performance of the work.

106.02 CERTIFICATES AND WARRANTIES FROM MANUFACTURER

1. When deemed necessary by the City Engineer, the Developer shall submit a certificate to the City Engineer, secured from manufacturer of all the material used as a permanent part of the project, certifying that their product as used on the project conforms to all City Standards. No material shall be used until the certificates are approved by the City Engineer. Where materials, equipment or other property is to be transferred to and accepted by the City, the Developer will assign any applicable warranties to the City (if such warranties are assignable), or, if not assigned to the City, Developer will make any warranty claims on behalf of the City for any City owned materials, equipment or other property covered by warranty.

106.03 MANUFACTURER'S SPECIFICATIONS OR RECOMMENDATIONS

1. All manufacturer's recommendations, instructions, or specifications regarding installation and use of products shall be considered a part of these City Standards and of equal force. Any conflict between the manufacturer's instructions and these City Standards shall be decided and settled by the City Engineer whose determination shall be final. All such manufacturer's instructions and submittals shall be presented to the City Engineer for approval prior to scheduling a pre-construction meeting.

106.04 APPROVED MATERIALS LIST

1. The City shall maintain a list of approved materials for use in the construction of public improvements as outlined in these City Standards.
2. On an annual basis, during the months of December through February only, concerned parties may submit a request in writing for a material to be included in the current list of approved materials.
3. The submittal shall include all of the manufacturer's specifications concerning the design, installation, intended use, and any other information that is requested by the City Engineer or designee.
4. If the submittal is determined to be appropriate by the City Engineer or designee, the evaluation of the materials shall be made by a committee called by the City Engineer or designee. The committee shall be composed of a minimum of three representatives from the City. The City Engineer or designee will act as chairperson and the remaining committee members will represent the City divisions affected by the proposed product or material.
5. If an accepted product fails to perform as anticipated or if there is a change related to the availability of repair or replacement parts, the product may be excluded from the approved materials list.
6. Materials or products not included in the approved materials list shall not be used in construction unless an exception is granted in accordance with the City Standards Section 100.08 titled Exceptions.

106.04.02 EVALUATION

1. The review committee members will give due consideration to the products or methods based upon their collective experience and opinions. They will assure themselves that proper criteria exist or will develop criteria by which the product or methods can be evaluated. They will seek out other knowledgeable persons both within and outside the City departments and attempt to determine by this means whether the product is acceptable or unacceptable.
2. If necessary, the committee chairperson will contact the concerned party for additional data, for product samples, and to arrange for testing.

106.04.03 TESTING

1. A testing program for the product may be undertaken at the discretion of the City Engineer and with the concurrence of the concerned party. The review committee will arrange actual field testing procedures. The concerned party shall furnish samples to be tested, any special test equipment not already available to the review committee, any necessary appurtenant materials, pipe, gauges, charts, recording equipment, and, when necessary, a location to conduct the tests. In some instances, testing may consist of trial installations in the field. Determination of the nature of the testing shall rest with the City, and the City reserves the right to require full reimbursement for test and evaluation expense.
2. Testing shall be undertaken with the objective of clearly determining the acceptability of the product. For some products where durability is in question, the test period may last for several years. The City's goal will be to make an adequate determination within a reasonable time frame. The costs and expenses of testing of the product shall be borne by the concerned party proposing the new product, and the City Engineer may require a bond from the concerned party to cover any estimated testing costs and expenses.
3. Following completion of tests, the committee will meet with the concerned party to discuss results and any further testing or consideration. The committee will then discuss the product and reach a decision.

106.04.04 NOTIFICATION

1. The City Engineer will notify the concerned party in writing of City Engineer's decision to either accept the product and include it or reject the product as unacceptable. Notification shall be made within 30 working days of the completion of any testing. If the product is to be included that inclusion will be made within six (6) months of notification.

106.04.05 APPEAL

1. If the product is rejected and if the concerned party has good reason to feel that their product did not receive an adequate or fair test or was otherwise improperly rejected, the concerned party may appeal in writing within 30 days of notification to the appropriate PWNR Department. The concerned party shall fully document their case and ask for reconsideration based on new facts, testing, late results, or other factual basis. If the PWNR Department finds reason for further consideration, the PWNR Department will arrange for a meeting with the concerned party, the City Engineer and any other City employee who might contribute to consider further testing or evaluation. A subsequent final decision will be made in writing under the signature of the City Engineer. If the PWNR Department does not find sufficient cause to further investigate the matter, the City Engineer shall so advise the concerned party in writing, and that decision shall be final.

106.04.06 LIMITATIONS ON REAPPLICATION

1. If, after a product is rejected, significant changes are incorporated into its manufacture that would render it acceptable, the concerned party may reapply to the City Engineer for reconsideration. In the absence of changed conditions, the product or method will not be reconsidered for inclusion for a period of three (3) years after having been rejected.

107.00 CONTROL OF SITE

107.01 UTILITY LOCATES

1. The Contractor shall notify all utility companies and locate all existing utilities on and near the site prior to construction in accordance with all State and Local requirements.
2. At the request of the Contractor, the PWR Department will attempt to locate private lines connecting to City maintained infrastructure within the public right-of-way (i.e. sewer service lines, fire lines etc.) as a courtesy to the private line Owner and Contractor. The City does not guaranty the accuracy or completeness of its locates and the Contractor will be responsible for verifying the location of these private lines and shall release the City from any liability associated with these locates. The City reserves the right to charge a fee for water or sewer locates equal to the actual cost of performing the work.
3. Also, all affected parties must be notified by the Contractor at least four (4) days in advance of the commencement of work in order to ensure that there will not be any unexpected interruptions of services during construction.

107.02 CONSTRUCTION WATER

1. All water needed for approved construction use must be obtained from either a private supply, an approved tank loading facility or by a City Temporary Water Use permit. Temporary use of potable water from the City's water distribution system for construction purpose by means of a fire hydrant, or other devices shall require a permit from the City and is subject to availability. The permit shall include provisions for payment of water used, installation of a meter and an approved backflow prevention assembly, deposit and daily rental charge. For temporary hydrant water, only City designated "blue top" fire hydrants shall be used unless otherwise approved on the Temporary Water Use permit. The City will require a minimum of two (2) working days advance notice prior to the issuance of any Temporary Water Use permit. At the City's sole discretion, the Water Use Permit may be suspended with one (1) weeks' notice.

107.03 RELOCATION OF EXISTING UTILITIES

1. In the event that during construction it is determined that any underground utility conduit, including, but not limited to, sanitary sewer mains, water mains, electric and communication lines, traffic signal loops, gas mains, drainage and ditch structures, irrigation pipes and any below grade or above ground utility facilities are required to be relocated or removed, the Contractor shall notify the utility owner and the City immediately, but not less than 48 hours of Contractor's approach to such utility, so that arrangements with the City and owners of the affected utility can be completed without delay of work. Relocation of any such utilities shall be at the Contractor's and the Developer's sole expense and liability.

107.04 INTERRUPTION OF WATER, WASTEWATER, AND STORM SEWER

1. The Contractor shall obtain approval from the City Engineer four (4) days in advance of any construction which will result in the interruption of service to an existing City customer. This will allow the following to be completed by the City Engineer's designee.
 - a. With approval of the City Inspector, Contractor shall give notice in writing 48 hours in advance to all affected Customers. Notices shall include appropriate information concerning interruption of services and instruction on how to limit the Customer's inconvenience. An attempt shall be made

to deliver the notice personally to the customer, otherwise the notice shall be left at the customer's door.

- b. In commercial areas any disruption of service shall be undertaken only after said disruption has been coordinated with the City and the private property owner. Coordination shall be required for both the service change over and any connections made to the existing system. Interruptions of service to customers shall be kept to a minimum length of time.
- c. A normal interruption of service (outage) shall be a maximum of four (4) hours. If the outage will be greater than hours, then work shall be done in a manner so as to minimize the inconvenience to the customer as directed by the City Engineer or City Inspector.
- d. If in the process of installing a connection there exists an industry or building that cannot be without utility services for any length of time, the Contractor shall be required to provide appropriate means, approved by the City, of providing services to the affected customer during the interruption of regular service.

107.05 SWEEPING AND CLEANING OF ROADS AND ROW DURING CONSTRUCTION

1. The Contractor shall be responsible for the removal and proper disposal of all construction debris, dirt, and mud from all the public streets, private property or driveways, and parking lots within or adjacent to the project area, whether caused directly by the Contractor's construction operation, or that of subcontractors or material suppliers, or indirectly due to the work site conditions in general. Failure by the Contractor to correct any of the above within 48 hours of written notice by the City shall cause the City to issue a Stop Work Order (Red Tag) and/or do the work and make a claim against the Contractor or the Developer for any costs incurred by the City. Additional enforcement and/or penalties will be in accordance with Section 14.26 of the City Code.
2. The Contractor shall be responsible for any damage caused due to maintenance or cleaning operations, or the lack thereof.

107.06 MATERIAL STORAGE AND HANDLING

1. All materials will be stored in a manner so as to preserve their quality and suitability for the work. All pipe, fittings, valves, hydrants, and accessories shall be loaded and unloaded by lifting with hoists, skidding, or by hand so as to avoid shock or damage. Under no circumstances shall material be dropped. Pipe handled on skidways will not be skidded or rolled against pipe already unloaded. Cast iron, ductile iron, and steel pipe will be handled so that the coating or lining will not be damaged. If any part of the coating or lining is damaged the repair shall be made to the satisfaction of the City Engineer, by the Contractor or Developer at no expense to the City. Any material judged by the City Inspector to be damaged beyond repair or that is not in conformance with the City Standards will be rejected.

107.07 LANDSCAPE PROTECTION

1. The Contractor shall avoid disturbing existing landscaping and plant material not specified for removal. Unless otherwise stipulated in the approved plans, or addressed by other City regulations, areas of landscaping disturbed by construction shall be returned to original or better condition by the Contractor. All materials and workmanship for replacement of landscaping and plant material shall be approved by the City, and shall comply with the City's appropriate landscape requirements.

107.08 FINAL CLEANUP

1. All surplus materials furnished by the Contractor and all tools and temporary structures shall be removed from the site by the Contractor. All debris and rubbish caused by the Contractor's operations shall be removed by the Contractor, and the areas occupied during operations shall be restored to their original condition, unless otherwise directed by the City Engineer. All surplus materials furnished by the City of Longmont and delivered to the site by the Contractor shall be removed by the Contractor and delivered to a site designated by the City. All surplus supplies furnished and delivered by the City shall be removed by the City.
2. The burning of material is not permitted within the jurisdictional area of the City. The disposal of material is the responsibility of the Contractor and shall be done in a manner that is approved by the City and in compliance with applicable law. The Contractor shall not dispose of material or debris within the project limits. The Contractor is responsible for obtaining an approved and legal site for the disposal of clearing and grubbing materials, debris, rubbish and trash, excavated rock, excess excavated materials, and materials not suitable for backfilling. Removed concrete material may be used to construct embankments only if approved by the City Engineer. All pavements, sidewalks, structures, curbs, gutters, etc. not designated to remain shall be disposed of as debris. If materials are disposed of on private property, written permission shall be obtained from the property owner and a copy shall be given to the City Engineer.

107.09 SITE STABILIZATION

1. If no construction activities take place on-site for 30 days or more, the Contractor is responsible for seeding and stabilizing the site to Final Stabilization with seed mix identified in the City Standards, Parks and Open Space Approved Material List or approved equivalent. Final Stabilization is a condition reached when all ground surface disturbing activities at the site have been completed, and for all areas of ground surface disturbed by activities a uniform vegetative cover has been established with an individual plant density of at least 70% of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed

108.00 ACCEPTANCE OF WORK

108.01 GENERAL

1. Acceptance of the construction of public improvements is the final phase and marks the end of the project and beginning of the warranty period. The acceptance process involves construction acceptance where the City accepts the project but installations are to be verified and confirmed under operational conditions over a one (1) year time period and final acceptance where construction is verified, maintenance responsibilities are transferred and the warranty period is completed.

108.02 RECORD DRAWINGS

1. Prior to Construction Acceptance, it shall be the responsibility of the Contractor to provide the City Engineer with one set of Record Drawings for all public improvements including landscaping and irrigation that indicates any revisions (at the same scale as the original construction plan set) upon the completion of the project. Irrigation record drawings shall meet the requirements of the City Standards Section 602 titled Completion Services.
2. Format of Record Drawing plans shall be provided in 24 x 36 inch digital format (PDF) that is scalable to 11 x 17 inch size and Mylar sheets. Revisions shall be clouded, numbered, or lined out on the Record Drawings. Erasures are not allowed. A checklist of the information to be included on the Construction Record Drawings plans can be found in the Appendix.
3. There is a separate Record Drawing (As-built Plans) checklist for LOMR and LOMR-F submittals which is also included in the Appendix.

108.03 CONSTRUCTION ACCEPTANCE

1. Construction Acceptance shall be granted when all capital and public improvements are approved by the City Engineer as detailed in the construction plans and, if applicable, the Public Improvement Agreement.
2. In order to obtain Construction Acceptance for utilities, all utility lines and services must be installed, backfilled, compacted, and have passed required testing, and all valves, fire hydrants, and manholes shall be brought to grade. In order to obtain Construction Acceptance for streets, all concrete and paving, with the exception of the upper lift of asphalt for development projects must be complete. In order to receive Construction Acceptance for landscaping and irrigation, all concrete trails, irrigation, and landscaping must be installed and have passed all inspections. In order to receive Construction Acceptance for the Permanent Stormwater Control permit, all post-construction permanent stormwater control structures must be installed and have passed all inspections.
3. Public improvement construction shall be completed in strict compliance with the approved plans. Upon completion of all capital and public improvement installations, the Contractor shall contact the City Engineer, and the City Engineer shall notify required staff to perform construction acceptance inspections to determine the acceptability of capital and public improvements. If deficiencies are observed, the City Engineer shall issue a denial letter for development projects including a construction acceptance checklist or a Notice of Substantial Completion for capital improvement projects outlining the repairs required. The Contractor shall repair all deficiencies noted during the inspection for Construction Acceptance.
4. The construction acceptance inspection shall occur during the growing season between April and October. City Inspectors will not be available to inspect the landscape and irrigation portions during the dormant season between the months of November and April. If all other City Divisions and

Departments are able to approve Construction Acceptance for other areas during the dormant season, a Partial Construction Acceptance may be granted for weather dependent improvements. If the Developer and Contractor can finalize all work and obtain a Landscape and Irrigation Construction Acceptance prior to June 1 of the next growing season, then the City will allow for less than one (1) year warranty period for landscape and irrigation improvements and sign for Final Acceptance at the same time as the other City Divisions and Departments. This shortened warranty period may not be available in seeded areas where establishment is unsatisfactory. In the event that the Developer and Contractor are not able to obtain a full Construction Acceptance from the City for outstanding items prior to June 1, then a delay of the Final Acceptance for all public improvements may be required.

5. For capital improvement projects, once all capital improvements are found acceptable and complete, including final clean up and the Contractor is no longer on-site, the City Engineer will issue the Notice of Construction Acceptance. The completed Notice of Construction Acceptance will be sent to the purchasing department for preparation and publication of a Notice of Final Settlement. If no claims are filed within 10 days from the date of the last publication of the Notice of Final Settlement, the Final Retainage Release Payment can be made to the Contractor. Prior to final acceptance, all capital improvements shall be warranted against defects for a minimum of one (1) year from the date of Construction Acceptance. Any cracking, settling, displacement and damage to those improvements are to be repaired or replaced at no cost to the City. The project one (1) year warranty period starts on the date shown on the Notice of Construction Acceptance.
6. For development projects, the Developer shall submit a repair schedule, for review and approval by the City Engineer, within 30 days of receipt of the denial letter and construction acceptance checklist. If Developer does not meet the schedule, the City may use the Developers financial securities and complete repairs. If the Developers proposed repair schedule extends beyond the current life of the financial securities, the securities shall be extended to cover the repair period. Once public improvements are found acceptable, a letter of Construction Acceptance shall be issued by the City Engineer. The Developer then begins the one (1) year warranty period and shall guarantee all work free of defects in workmanship or materials for a period of one (1) year from the date of Construction Acceptance. The Developer shall be responsible for maintenance during the one (1) year warranty period and shall be responsible for correcting any deficiencies that occur prior to Final Acceptance.
7. In support of the application for a permit for Permanent Stormwater Controls, the applicant shall submit record drawings as proof of written certification that the post-construction permanent stormwater control was inspected and confirmed to be constructed as shown on the construction plans and specifications and the final grading and drainage plan approved by the City. The certification shall be in the form prescribed by the City and include all information and documentation required. The certification shall be signed by a registered Professional Engineer licensed by the State of Colorado. The certification and accompanying documentation shall clearly show that the stormwater control measures meet the design and operating conditions associated with the site.

108.04 FINAL ACCEPTANCE

1. Capital improvement projects
 - a. A warranty claim can be made at any time during the one (1) year warranty period, even if the warranty work will not be completed within the one (1) year period. The City Engineer shall complete the Notice of Warrant Work for all claims and send to the Contractor for signature. A copy will be sent to Purchasing. At the end of the Warranty Period, the purchasing department will issue Final Acceptance to the City Engineer for execution before returning it to the purchasing department. At this time, the Contractors bonds will be released.

- b. If the area is to be maintained by the City, the maintenance responsibilities will transfer either upon Final Acceptance or per the bid documents will clarify when City maintenance is to begin.

2. Development projects

- a. For development projects, warranty claim can be made at any time during the one-year warranty period, even if the warranty work will not be completed within the one (1) year period. At the end of the warranty period, the Developer shall request a final acceptance inspection from the City Engineer a minimum of 30 days before the end of the maintenance period. The City shall inspect the installed public improvements to determine compliance with City Standards, approved plans, specifications and materials. If deficiencies are observed, the City Engineer shall issue a denial letter for development projects including a final acceptance checklist outlining the items not in compliance. Any construction not meeting City Standards shall be brought into compliance by the Developer.
- b. At the City's discretion, an extended warranty may be accepted for portions of a project that do not fully meet City Standards at the time of inspection, in order to facilitate Final Acceptance. Securities for extended warranty periods will be required.
- c. For City owned landscaped areas it is the Developers responsibility to schedule final acceptance inspections during the growing season between April and October when plants are not dormant. Failure to do so may result in the delay of Final Acceptance until the following growing season.
- d. For Permanent Stormwater Controls, the developer will be required to identify a responsible party for all ongoing operation and maintenance of the facility or facilities associated with their development prior to the issuance of Final Acceptance.
- e. Until final acceptance is granted, all maintenance and repair of improvements shall remain the responsibility of the Developer. If identified deficiencies are not corrected and finally accepted within 120 days after the one (1) year warranty period, the City may cause the required corrections to be made at the expense of the Developer. In addition, the City may suspend building permits or certificates of occupancy until the corrections are made and the work is completed in a satisfactory manner.
- f. If the area is to be maintained by the City, the maintenance responsibilities will transfer upon Final Acceptance. If it is to be maintained by the property owner, Developer, Contractor or homeowner's association, the appropriate entity shall continue maintenance after Final Acceptance.
- g. Final acceptance shall be granted when requirements have been met for all public improvements and securities shall be released per the City Code.

109.00 UTILITY TRENCHING

109.01 GENERAL

1. The minimum trench width for wet utilities is 18 inches, unless otherwise approved by the City Engineer. Approval of trench widths less than 18 inches shall be based on the demonstration of the Contractor that suitable mechanical means of backfill compaction is available and compaction is being obtained, or an approved non-shrinkable Flow-Fill material will be used for trench backfill.
2. As a general rule the edge of the trench shall not be allowed closer than 12 inches to concrete structures (i.e. curb and gutter, sidewalks, driveways, inlets, etc.) The actual distance shall be dependent upon the characteristics of the soil, the type of equipment that is used for trenching, and the methods used for excavation and backfill. If, in the opinion of the City Engineer, concrete structures are endangered by undermining of the structure or settlement the City Engineer may require that the structure be replaced, or special construction methods may be required, or the distance of the trench from the structure will be increased.
3. All new underground facilities including utility mains and service laterals must be installed with the means to be electronically locatable per Senate Bill 18-167: Improvements to the 811 System in Colorado. When designing and installing non-conductive underground utility facilities, the use of a tracer wire or an equivalent method is required as part of the design and installation. This allows for the facilities to be identified, located and marked prior to future excavation activities.
4. See City Standards Section 700 for LPC trench requirements.

109.02 MATERIALS

109.02.01 STABILIZATION MATERIAL

1. Stabilization material shall be 1-1/2 inch washed rock. A layer of geotextile fabric shall be placed between the stabilization material and the bedding material. See the City of Longmont approved material list for types of fabric that may be used. Under severe conditions, where the bottom of the trench is found to consist of material that is unstable to such a degree that, in the opinion of the City Engineer, it cannot be removed and replaced with 1-1/2 inch rock and support the pipe properly, the Contractor shall construct a foundation for the pipe, consisting of piling, timbers or other methods as approved by the City Engineer.

109.02.02 BEDDING MATERIAL

1. The bedding material shall conform to coarse aggregate gradation #8, #89 or #9 from the American Association of State Highway and Transportation Officials (AASHTO) *Standard Specification for Sizes of Aggregate for Road and Bridge Construction* (M 43). The coarse gradations #89 and #9 consisting of smaller aggregate sizes are not to be utilized in instances of trench groundwater and underdrain installations unless otherwise approved by the City Engineer.

Table 1-2 Bedding Material Gradation

Sieve Size	#8	#89	#9
1"	----	----	----
3/4"	----	----	----
1/2"	100	100	----
3/8"	85-100	90-100	100
#4	10-30	20-55	85-100
#8	0-10	5-30	10-40
#16	0-5	0-10	0-10
#50	----	0-5	0-5
#100	----	----	----

2. The Contractor shall provide sieve analysis for onsite bedding material conforming to ASTM D422 for every 500 lineal feet of pipe installation to demonstrate that the bedding material conforms to the approved gradation. The sampling, testing and reporting shall be performed by a qualified firm. The sample shall be taken from the onsite stockpile from which the material is being placed in the trench. The Contractor shall not place bedding material until the results of the sieve analysis are reported and shall remove material that does not meet the specified gradation. If in the opinion of the City Engineer the stockpile has been compromised or does not meet gradation or material specifications of these City Standards, additional soils analysis shall be required.

109.02.03 BACKFILL MATERIAL

1. All backfill material shall be free from frozen material, vegetation or other organic material, cinders or other corrosive materials, debris, broken asphalt and concrete, and any other material that is not suitable in the opinion of the City Engineer. Trench backfill material shall be free from any rocks or stones which are larger than six (6) inches, in any dimension. Rocks or stones which are larger than three (3) inches, in any dimension, shall not be placed within one (1) foot of pavement subgrade, or within one (1) foot of the finished surface of unpaved areas. Rocks or stones larger than two (2) inches in diameter may not be used for trench backfill of irrigation lines. Use of rocks, stones or boulders within allowable size limits shall not interfere with proper compaction.
2. Masses of moist, stiff clay and washed rock shall not be used as backfill material.
3. When the type of backfill material is not indicated on the drawings or specified, the Contractor may backfill with the excavated material, provided that such material consists of loam, clay, sand, gravel, or other materials that, in the opinion of the City Engineer, are suitable for backfilling. If excavated material is indicated on the drawings or specified for backfill, and there is a deficiency due to a rejection of part thereof, the Contractor shall furnish the required amount of approved material.
4. If imported backfill is not required on the drawings, and in the opinion of the City Engineer should be used in any part of the work, the Contractor shall furnish and backfill with approved material as directed by the City Engineer.
5. Flow-Fill shall be a self-leveling low strength concrete material composed of cement, fly ash, aggregates, water, chemical admixtures and cellular foam for air entrainment that does not require compaction. Flow-Fill shall meet CDOT "Standard Specifications for Road and Bridge Construction", Section 206 Structure Backfill (Flow-Fill) Specifications and the following requirements unless otherwise required by the City Engineer:

- a. Slump of 7 to 10 inches (ASTM C143) or minimum flow consistency of six (6) inches (ASTM D6103)
- b. Minimum 28 day strength: 50 psi (ASTM D4832)
- c. Maximum 28 day strength: 100 psi
- d. Removability Modulus (RM): 1.5 or less in areas requiring future excavation

109.03 EXECUTION

109.03.01 GENERAL

1. The Contractor is required to perform utility locates per City Standards Section 107.01 titled Utility Locates prior to starting trench work. Utility installation shall be installed per approved Construction Plans. Trench construction for wet utilities shall be in compliance with Detail 100-03 Wet Utility Trench. Trench construction for Longmont Power & Communications distribution system infrastructure shall be in compliance with City Standards Section 700.

109.03.02 REMOVAL OF ASPHALT SURFACES

1. The Contractor shall remove and properly dispose of pavement and road surfaces as a part of trench excavation. Contractor shall make an initial saw cut for trench width, then re-cut one (1) foot beyond trench excavation at time of patching. If the limits of the asphalt removal are within 3.0 feet of the edge of pavement, the pavement shall be removed and replaced completely to its edge per Detail 100-04 Trench Limits for Asphalt Removal and HMA Patch-Back. The width of pavement removed along the trench for the installation of pipe shall not exceed the width of the trench specified by more than one (1) foot on each side of the trench without approval of the City Engineer.
2. The Contractor shall use full depth cutting or milling to ensure the removal of pavement in a straight line. The face of the remaining pavement shall remain approximately vertical. If the edge is damaged during construction it shall be re-cut prior to final asphalt paving. See provisions for trench backfill.

109.03.03 REMOVAL OF CONCRETE SURFACES

1. The Contractor shall remove and properly dispose of pavement, sidewalks, and curb and gutter as a part of trench excavation.
2. The Contractor shall use methods such as full depth saw cutting to ensure the removal of pavement in a straight line. The minimum area removed on road surfaces shall be 1/4 of a panel section for panels no smaller than 12 x 10 feet otherwise the entire panel shall be removed. Remainder portions of a panel cannot be less than 6 x 5 feet per Detail 100-05 Concrete Pavement Patch-Back
3. On sidewalks and curb and gutter the minimum removal section shall be five (5) feet in length, as long as the remaining section is a minimum of five (5) feet long. If the remaining section is less than five (5) feet long the entire panel shall be removed and replaced.
4. In order to allow for forming and patch-back, when removing curb and gutter or curbside abutting asphalt pavement, the Contractor shall remove the adjacent asphalt pavement and base course 18 inches wide and 6 inches deep if any of the following conditions exist:
 - a. The length of the removal is greater than 30 feet.
 - b. The asphalt at the edge of the existing concrete gutter lip is higher or lower than the lip of the concrete by 1/2 inch or more.

- c. The edge of the existing asphalt pavement varies more than 3/8 inch horizontally or vertically.
 - d. The existing asphalt is cracked or distressed.
 - e. Upon removal of the concrete, the asphalt is chipped, deformed, undermined, or raised more than 3/8 inch vertically or horizontally.
5. If the removal of curb and gutter or curbside abutting asphalt does not meet any of the above conditions and per the approval of the City Engineer is allowed to be replaced without the removal of the adjacent asphalt, it must meet the following criteria or it shall be removed and replaced along with the adjacent asphalt pavement:
- a. No voids exist between the concrete and asphalt.
 - b. The fall in the lip of the gutter section must meet the required cross-section within +/- 1/4 inch.
 - c. All other requirements of the construction have been met in accordance with City Standards.

109.03.04 CARE OF SURFACE MATERIAL FOR REUSE

- 1. All surface materials that in the opinion of the City Engineer are suitable for reuse in the restoring of the surface shall be stockpiled separate from the general excavation materials. Surface materials as used herein are intended to include items such as gravel surfacing, landscape materials, topsoil, etc. It is not intended to include asphalt or concrete surfacing.

109.03.05 EXCAVATION

- 1. The trench shall be excavated to the depth required so as to provide proper bedding and support for the pipe. Any part of the bottom of the trench excavated below the specified grade shall be corrected with approved material as directed by the City Engineer. The subgrade shall be stable.

109.03.06 TRENCHING BY HAND OR MACHINE

- 1. Hand methods for excavation shall be employed in locations shown on the drawings or in locations where extreme care is required. In other locations the Contractor may use trench digging machinery or employ hand methods.

109.03.07 PILING OF EXCAVATED MATERIAL

- 1. Unless otherwise approved by the City Engineer and an approved Traffic Control Plan, all excavated material shall not be piled in a manner that endangers the work and shall not obstruct sidewalks, roadways, or driveways. It shall not be piled in a manner that obstructs the sight distance at driveways or intersections. This shall be determined in accordance with the sight distance criteria set forth in City Standards Section 204 titled Minimum Design Criteria. Hydrants under pressure, meter pit covers, valve boxes, electrical apparatus, manholes, inlets and other utility controls shall be left unobstructed and accessible during construction, unless otherwise approved by the City Engineer. If an emergency access is needed to any utility which is blocked, whether approved or not, the Contractor shall be responsible for removing the obstruction. Curb and Gutters and drainage swales shall be kept clear or other satisfactory provisions made for street drainage, and natural water course shall not be obstructed.

109.03.08 SPECIAL TRENCHES OR INSTALLATIONS

1. Special trenches or installations such as railroad, highway or irrigation ditches, and utility crossings shall conform to the specifications and instructions of the authority whose facility, right-of-way, easement, or utility is involved. The Contractor shall confer with the representatives of the agency concerned to arrange the details for construction. The Contractor shall be responsible for all costs for repairing all damage incurred to property during construction. All work shall be completed to the satisfaction of the agency involved as well as the City Engineer.

109.03.09 ROCK EXCAVATION

1. Large rock, boulders, and large stones shall be removed from the trench to provide six (6) inches of clearance to each side of the pipe and below all pipe accessories. Excavations encountering rock or boulders below subgrade shall be refilled to subgrade with compacted material approved by the City Engineer. Blasting will not be allowed without approval of City Engineer.

109.03.10 BORING

1. The requirements for boring and jacking of a line will be determined on a case by case basis to enable coordination with the owners and agencies involved. Boring of utilities whether service lines or main utility lines shall be done in such a manner as to ensure that there is no settlement of the soil or surface improvements. Contractor is responsible for all settlement and damage that occurs due to boring or jacking operations. Tunneling resulting in voids under surface improvements shall not be permitted.

109.03.11 TRENCH STABILIZATION

1. Where the trench subgrade is found to be soft, wet, unstable or to include ashes, cinders, refuse, vegetable or other organic materials, or large pieces of fragments of inorganic materials that in the judgment of the City Engineer should be removed, the Contractor shall excavate and remove such unsuitable material to the width and depth determined by the City Engineer. Over excavated areas shall be backfilled with foundation material as specified under Trench Backfill below.

109.03.12 DEWATERING OF TRENCHES

1. Pipe trenches shall be kept free from water in an adequate and acceptable manner during excavation, fine grading, pipe laying and joining, and pipe bedding operations. Where the trench bottom is mucky or otherwise unstable because of the presence of groundwater, and in all cases where the static groundwater elevation is above the bottom of any trench or bell hole excavation, the groundwater shall be lowered by means of well points and pumps or by other means acceptable to the City Engineer, to the extent necessary to keep the trench free from water and the trench bottom stable at all times during construction. Surface water shall be diverted, and otherwise prevented from entering trenches, to the greatest extent practical without damage to the adjacent property from dikes, ditches, or impounded water. Contractor shall clean the storm sewer system as part of site cleanup at completion of projects. It is the responsibility of the Contractor to obtain a Colorado Department of Public Health and Environment, Water Quality Control Division, Construction Dewatering Permit and be in compliance with all Federal, State and Local laws and regulations.

109.03.13 UTILITY PIPE CROSSING

1. Utility pipe crossings shall be centered over any utility pipe being crossed and crossing utility pipes shall be aligned perpendicular (90°) where possible. Provide minimum horizontal separation between

pipes based on requirements in City Standards Section 103.09 titled Utility Line Separation. If clearance is limited and spacing between pipes is less than 18 inches, utility pipes shall be supported per Detail 100-07 Pipe Crossing Support Pad. Pipe crossing support pads for pipe sizes larger than 24 inches require design submittal by a Professional Engineer and approval by the City Engineer. Bedding material for pipe crossing unable to meet clearance spacing is required to extend eight (8) inches below the lower pipe and 12 inches above the upper pipe. The concrete forms for the support pads are designed to extend six (6) inches on either side of the outside pipe diameter and either be 12 inches or 18 inches long depending on the pipe size. The concrete form is required to cradle the upper pipe to the spring line of the pipe. A bond break shall be placed between concrete and pipe being supported. For situations approved by the City Engineer where there are less than four (4) inches of vertical separation between the utility pipes in a crossing or the crossing involves a water line; fiber board insulation in accordance with ASTM-C578 or an approved equal shall be required to be installed between the pipes. The board should extend two (2) inches beyond the outside edges of the pipes.

109.03.14 CUT-OFF WALL CONSTRUCTION

1. In the situation that excessive groundwater is encountered and no provisions have been made for groundwater drainage, clay or flow fill walls shall be required per Detail 100-08 Cut-off Wall. Cut-off walls shall be two (2) feet thick spanning the full width of the trench horizontally and extend vertically one (1) foot below the bottom of the trench to six (6) inches above the bedding material. Cut-off walls are to be located a minimum of every 400 feet along the trench. Cut-off walls shall also be located within 12 feet on each side of open drainage and irrigation ways as shown in the Detail 100-09 Ditch Crossing. These requirements will be reviewed on a case by case basis.

109.03.15 INSTALLATION OF BEDDING MATERIAL

1. After completion of the trench excavation and proper preparation of the foundation, bedding material shall be placed on the trench bottom for support under the pipe. Bell holes shall be dug deep enough to provide a minimum of two (2) inches of clearance between the bell and bedding material. All pipe shall be installed in such a manner as to ensure full support of the pipe barrel over its entire length. After the pipe is adjusted for line and grade, and the joint is made, the bedding material shall be carefully placed and compacted uniformly under the haunches of the pipe, in the previously dug bell holes and on each side of the pipe to prevent settlement or lateral displacement. The bedding material shall be compacted by vibrating, rodding or slicing with a shovel.
2. Bedding will not be required on service lines less than four (4) inches in diameter; however, if soil conditions warrant, then bedding will be required. A layer of geotextile material shall be installed around the bedding whenever the native material consists of material which will, in the opinion of the City Engineer, result in the migration of the bedding material into voids in the existing trench bottom.

109.03.16 TRENCH BACKFILL

1. Trench backfill consists of the backfill above the bedding zone and below the base course as indicated in Detail 100-03 Wet Utility Trench Construction.
2. Unless approved by the City Engineer, or unless specified for hydrostatic test purposes, all trenches and excavation shall be backfilled within the same day after the pipe is laid therein, but not before the pipe has been inspected by the City Engineer or City Inspector. The length of open trench shall be approved by the City Engineer on a case by case basis. Unless otherwise approved by the City Engineer, cleanup must be performed after a maximum of 600 linear feet of pipe installation. No trench shall be left open overnight without proper protection and approval of the City Engineer. These

requirements apply for all mains and service lines. Backfilling of trenches shall comply with these City Standards, and with applicable design and soils reports.

109.03.17 BACKFILLING IN FREEZING WEATHER

1. Backfilling shall not be done in freezing weather except by permission of the City Engineer, and it shall not be done with frozen material. No backfill shall be placed when the material in the trench is frozen.

109.03.18 COMPACTION REQUIREMENTS AND TESTING

1. It is the responsibility of the Contractor to provide the proper means and equipment for obtaining compaction within the specified ranges. If the City Engineer feels that the means or equipment is not adequate to obtain the desired results, the City Engineer may require specific measures to ensure the desired results. One such measure may be the use of non-shrinkable Flow-Fill for trench backfill.
2. The Contractor shall retain a private, approved testing agency regularly involved in soils testing to perform required Proctor and compaction tests at the Contractor's expense. Two copies of all Proctor curves and test results showing exact location of sample collection and test sites must be furnished to the City Engineer for approval. Only actual test information will be submitted, estimated values will not be accepted. The City Engineer shall be informed before any tests are performed and may designate areas to have checked for compaction. The results of the tests must be given to the City Engineer before any compaction will be accepted.
 - a. Standard Proctor Tests (ASTM D698): The Contractor shall provide Standard Proctor results to develop compaction testing parameters for backfill. A sufficient number of Proctor tests shall be taken so as to, in the opinion of the City Engineer, adequately represent all types of soil encountered along the trench. Said tests are intended only to aid the verification of the quality of the work.
 - b. Field Density Tests: The Contractor shall provide field compaction tests conforming to ASTM D2922 and D3017 every one (1) foot of trench depth for every 200 lineal feet of pipe installation unless otherwise specified by the City Engineer. The Contractor shall provide one field compaction test per every 100 lineal feet of curbwalk and shall demonstrate that the subgrade passes a wheel test. The Contractor shall provide two field compaction tests for each water and sewer service line. For the sewer service, the tests shall be required at varying depths per the direction of the City Inspector and shall be located a minimum of 10 feet from the end of the service line. For the water service, the test shall be taken when the fill is at a level of two (2) feet below the final grade; one test shall be located five (5) feet from the water main and one test shall be located two feet from the curb stop (between the curb stop and the sidewalk. The Contractor may be required to dig up portions of the trench to afford access for compaction tests below the top surface of the backfill material. Acceptable field compaction test results shall not relieve the Contractor from correction or repair of any substandard work before or during warranty period.
3. Unless otherwise required on the plans, or by the City Engineer to prevent settlement or damage to existing or proposed public or private improvements, trench backfill compaction shall be to the following minimum densities indicated below:
4. All compaction shall be 95% of Standard Proctor, unless otherwise required by the City Engineer.
5. No ponding or jetting of trenches, or use of a hydrohammer or any impact type compaction is allowed. Compaction shall be done by mechanical methods.

6. All material shall be compacted within plus or minus 2% of the optimum moisture content as determined by the Standard Proctor Test. The Contractor shall be responsible for providing a stable non-pumping subgrade. If any portion of the subgrade is suspected of not being stable, the City Engineer may require that the subgrade be proof rolled. Proof rolling shall be performed with equipment and in a manner acceptable to the City Engineer. The Contractor shall provide any equipment required for proof rolling. Areas which fail shall be corrected and brought into compliance with City Standards by the Contractor.
7. If the required compaction is not obtained, it shall be the responsibility of the Contractor to re-compact the material. In cases where there is a failure to achieve the required compaction, the City Engineer may require that the backfill be removed and replaced with City approved backfill material. Any utilities within the trench that were tested prior to re-compaction shall be retested per the direction of the City Inspector after re-compaction.

109.03.19 ASPHALT & CONCRETE PATCHING

1. Surface material patch back for trenches shall be consistent with the surface material removed prior to trenching i.e. asphalt or concrete and in accordance with Detail 100-06 Typical Asphalt and Concrete Trench Patch-Back. Asphalt shall be patched back to a minimum thickness of eight (8) inches or to the existing full depth thickness if greater. Concrete pavement patching shall be patched back to a minimum thickness of 10 inches unless the existing thickness is greater and be in accordance with Detail 100-05 Concrete Pavement Patch-Back. Detail is not to be used for existing concrete panels that are less than eight (8) inches thick. Please refer to the City Standards Section 200 titled Transportation for additional information on asphalt and concrete patching.

109.03.20 UTILITY MARKER POST

1. When Utility Appurtenances are installed where adequate physical reference points are not available or utility is located in a position where it requires additional protection, a utility marker post may be required to be installed per Detail 100-10 Marker Post. Flexible utility marker posts may be considered with approval from the City Engineer.