
# TOWN OF LIZTON
# SUBDIVISION CONTROL ORDINANCE
# 2021

***A special thank you to the town officials and citizens whose hard work made this document possible.***

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## SECTION 1:
## GENERAL PROVISIONS



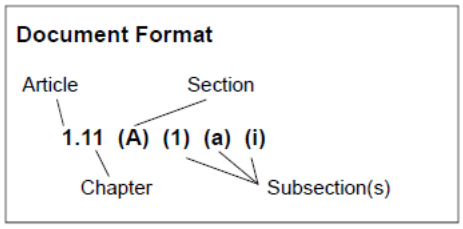
### 1.1 Title

These regulations shall hereafter be known and cited as the Subdivision Control Ordinance of the Town of Lizton.

### 1.2 Document Format

**Format:** The structure of the text of this Ordinance is as follows:

Article (indicated by 1, etc.), Chapter (indicated by 1.1, etc.), Section (indicated by A, etc.), and subsequent Subsections (indicated by 1, a, i, etc.)



## 1.3 Subdivision Definition

For the purpose of this ordinance, the word "Subdivision" shall mean land, vacant or improved, both residential and nonresidential, which is divided for the purpose of sale, lease, or development, whether by deed, metes and bounds description, devise, intestacy, lease, map, plat or other recorded instrument.

Within the corporate limits of the Town of Lizton, the division of a single lot, tract, or parcel of land into two or more lots, tracts, or parcels, any one of which is less than five (5) acres, for the purpose, whether immediate or future, of transfer of ownership for residential, commercial, or industrial purposes, shall be considered subdivision of land and require approval by the Plan Commission as a Minor or Major Subdivision in accordance with the provisions of this ordinance; provided, however, this definition shall not include the division of a single parcel into lots five (5) acres or greater in area, or that this definition shall not include divisions of land for agricultural purposes only, not involving any new street(s) or easement(s) of access; or the sale or exchange of parcels between adjoining lot owners that do not create additional building sites.

**A. Classification of Land Divisions**

All land to be divided shall be categorized into one of the classes of land division indicated in this ordinance's definition of subdivision. These classes are:

**(1) Minor Subdivisions**

A Minor subdivision shall create no more than three (3) lots, counting the balance of the original parcel as one of the three; and further providing that the subdivision of said parcel shall not involve the creation of any new street, either public or private. The balance of the parcel of land, or any lot created within the Minor subdivision shall be further subdivided only as a Major subdivision, with this provision also being applicable to any subsequent change in ownership.

**(2) Major Subdivisions**

A Major subdivision will be required when four (4) or more lots, counting the balance of the original parcel as one of the four is created. Regardless of the number of lots involved, creation of any new street in the division of land shall also be by means of a Major subdivision. In addition, a Major subdivision plat shall be required when any parcel of land previously divided as a Minor subdivision is further divided.

**B. Exempt Land Divisions**

The following subdivisions of land are exempt from the provisions of this Subdivision Control Ordinance subject to the specifications described for each. All exempt divisions shall be recorded through metes-and-bounds legal descriptions in the office of the Hendricks County Recorder.

**(1) Legal Description Correction**

A division of land for the transfer of a tract or tracts to correct errors in an existing legal description, provided that no additional building sites are created, and no additional public improvements are required or created.

**(2) Right-of-Way Acquisition**

A division of land for the Federal, state, or local government to acquire right-of-way.

**(3) Transfer Between Adjoining Property Owners**

A division of land for the transfer of a tract or tracts between adjoining lots provided that:

**a)** No additional building sites are created,

**b)** No non-conforming lots are created, and

**c)** No additional public improvements are required or created by the subdivision.

**(4) Cemetery Plots**

A division of land for the purpose of identifying spaces for the burial of the deceased.

## 1.4 Policy

**A.** It is hereby declared to be the policy of the Town to consider the subdivision of land and the subsequent development of the subdivided plat as subject to the official Comprehensive Plan and related policies (such as those embodied in the Zoning Ordinance) for the orderly and efficient development of the Town and its jurisdictional area.

**B.** Land to be subdivided shall be of such a character that it can be developed without peril to health or peril from flood, fire or other menace, and land shall not be subdivided until having access to available existing public facilities and until improvements and proper provision have been made for drainage, water, sewerage, other necessary new public improvements such as schools, parks, recreation facilities, and transportation facilities adequate for serving the subdivision. Private wells and septic systems in lieu of public water and sewer facilities are allowable where permitted under the Zoning Ordinance and approved by the County Health Department and the Zoning Administrator.

**C.** Both existing and proposed public facilities serving the subdivision shall be properly related and conform to the official Comprehensive Plan, related policies and implementation programs including the Capital Budget, Official Map, Thoroughfare Plan, Zoning Ordinance and Housing and Building Codes.

**D.** It shall be the policy to guide major development of land and consideration by encouraging the following:

**(1)** A more useful pattern of open space and recreation areas and, if permitted as part of the subdivision, more convenience in the location of accessory commercial uses, industrial uses, and services;

**(2)** A development pattern which preserves and utilizes natural topography and geologic features, scenic vistas, trees, and other vegetation, and prevents the disruption of natural drainage patterns;

**(3)** A more efficient use of land resulting in substantial savings through shorter utility lines and streets;

**(4)** A development pattern in harmony with land use density, transportation facilities, and community facility objectives of the Comprehensive Plan.

## 1.5 Purpose

This ordinance is deemed necessary for the purpose of promoting the public health, safety, comfort and general welfare of persons living within the corporate boundaries of the Town of Lizton and within its jurisdictional area; to guide future growth and development in accordance with the Comprehensive Development Plan; to encourage orderly and beneficial development; to protect and conserve the value of land; to establish reasonable standards of design and procedures for subdivision and resubdivision; in order to further the orderly layout and use of land; and to insure proper legal descriptions and monumenting of subdivided land.

The purpose of this Ordinance is to protect and promote public health, safety, and general welfare, and to:

**A. Comprehensive Development Plan**
Provide guidance for future growth and development in accordance with the Town of Lizton Comprehensive Development Plan.

**B. Stability**
Protect the character and social and economic stability of the area.

**C. Orderly Development**
Encourage the orderly development of the Town.

**D. Property Values**
Protect and conserve the value of land, structures, and other improvements to the land.

**E. Land Use Conflict**
Discourage conflicts between the uses of land and structures.

**F. Planned Subdivisions**
Avoid scattered and uncontrolled subdivisions of land that would result in the imposition of an excessive expenditure of public funds for the distribution or supply of infrastructure and/or services.

**G. Reasonable Standards & Procedures**
Establish reasonable standards and procedures for subdivisions and resubdivisions, in order to further the orderly layout and use of land.

**H. Recording & Monumenting**
Ensure proper legal descriptions, legal recording, and monumenting of subdivided land.

**I. Drainage**
Ensure the provision of drainage facilities, the safeguarding of the water table, and protection from flooding.

**J. Natural Resources**
Encourage the protection of natural resources in order to preserve the integrity, stability, natural beauty, topography, and the value of land.

**K. Balance**
Plan for a balance between land uses, natural resources, and public infrastructure that is beneficial to the community as a whole, both currently and in the future.

## 1.6 Authority

**A.** This ordinance which was enacted pursuant to Indiana home rule and planning enabling legislation (Indiana Code, titles 36-1-3-4 and the 36-7-4-700 series, as amended) authorizes the Lizton Plan Commission to review and approve or disapprove plats for subdivision throughout the Town, except, which show lots, blocks, or sites with or without new streets or highways. This authority extends to the development or resubdivision of undeveloped portions of already recorded plats.

**B.** No building permit or certificate of occupancy shall be issued for any parcel or plat of land which was created by subdivision after the effective date of, and not in conformity with, the provisions of these subdivision regulations, and no excavation of land or construction of any public or private improvements shall take place or be continued except in conformity with the regulations contained herein and in conformity with construction standards adopted by the County.

## 1.7 Jurisdiction

This Subdivision Control Ordinance, as amended from time to time, shall apply to all incorporated land within the Town of Lizton, Indiana on the Official Zoning Map on file with the County Recorder, Hendricks County, Indiana.

## 1.8 Interpretation

In their interpretation and application, the provisions of these regulations shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare.

## 1.9 Conflict with Public and Private Provisions

**A. Public Provisions**

The regulations are not intended to interfere with, abrogate, or annul any other ordinance, rule or regulation, statute, or other provision of law. Where any provision of these regulations imposes restrictions different from those imposed by any other provision of these regulations or any other ordinance, rule or regulation, or other provision of law, whichever provisions are more restrictive or impose higher standards shall control.

**B. Private Provisions**

These regulations are not intended to abrogate any easement, covenant or any other private agreement or restriction, provided that where the provisions of these regulations are more restrictive or impose higher standards or regulations than such easement, covenant, or other private agreement or restriction, the requirements of these regulations shall govern. Where the provisions of the easement, covenant, or private agreement or restriction impose duties and obligations more restrictive, or higher standards than the requirements of these regulations, or the determinations of the Plan Commission in approving a subdivision or in enforcing these regulations, and such private provisions are not inconsistent with these regulations or determinations thereunder, then such private provisions shall be operative and supplemental to these regulations and determinations made thereunder. [Note: Private provisions can only be enforced privately unless a public agency has been made party to such agreements.]

## 1.10 Amendments

For the purpose of providing for the public health, safety, and general welfare, the Town, on recommendation of the Plan Commission, may from time to time amend the provisions imposed by these subdivision regulations. Public hearings on all proposed amendments shall be held by the Plan Commission and/or the Town in the manner prescribed by law.

The following provisions shall apply to amendments to this Ordinance. Consistent with IC 36-7-4-701, this section provides that this Subdivision Control Ordinance may be amended or repealed in the same manner as the zoning ordinance.

**A. Ordinance Text Amendment Process**
The Town Council or the Plan Commission may initiate a proposal to amend or partially repeal the text of this Ordinance according to the procedure of IC 36-7-4-602(b) and the adopted Plan Commission Rules and Procedures.

**B. Decision Criteria**
In the review of the text amendment proposals, the Plan Commission and Town Council shall pay reasonable regard to (consistent with IC 36-7-4-603):

**(1)** the most recently adopted Comprehensive Plan;

**(2)** current conditions and the character of structures and uses in each district;

**(3)** the most desirable use for which the land in each district is adapted;

**(4)** the conservation of property values throughout the jurisdiction;

**(5)** responsible development and growth; and

**(6)** the public health, safety and welfare.

## 1.11 Conditions

Regulation of the subdivision of land and the attachment of reasonable conditions to land subdivision is an exercise of valid police power delegated by the state to this town. The developer has the duty of compliance with reasonable conditions laid down by the Commission for design, dedication, improvement, and restrictive use of the land in order to conform to the physical and economical development of the Town and its jurisdictional area and to the safety and general welfare of the future plot owners in the subdivision and of the Town and its jurisdictional area at large.

## 1.12 Saving Provision

These regulations shall not be construed as abating any action now pending under, or by virtue of, prior existing subdivision regulations, or as discontinuing, abating, modifying, or altering any penalty accruing or about to accrue, or as affecting the liability of any person, firm, or corporation, or as waiving any right of the Town under any section or provision existing at the time of adoption of these regulations, or as vacating or annulling any rights obtained by any person, firm, or corporation, by lawful action of the Town except as shall be expressly provided for in these regulations.

## 1.13 Transition Rules

The following transition rules shall apply to the adoption of this Ordinance:

**A. Previously Filed Subdivision Applications**
Any subdivision submitted and docketed for a public hearing prior to the adoption of this Ordinance shall be regulated by the terms and conditions of this Ordinance and the Zoning Ordinance that were in place at the time of its docketing. However, all administrative procedures and penalties shall follow those set forth by this Ordinance. In no instance shall this be interpreted as permitting the future use or development of lots in the subdivision in a manner inconsistent with the Zoning Ordinance in effect at that time.

**B. Previously Filed Permit Applications**
Any application for an Improvement Location Permit that has been filed with the Plan Commission and is complete, prior to the effective date of this Ordinance, shall be regulated by the terms and conditions of the subdivision control ordinance that was in place at the time of filing. However, all administrative procedures and penalties shall follow those set forth by this Ordinance.

**C. New Building Sites**
All new building sites shall meet the requirements of this Ordinance unless:

**(1)** An Improvement Location Permit for the site has been issued and is still valid, or

**(2)** A buildable lot was approved by the Plan Commission or the Board of Zoning Appeals prior to the effective date of this Ordinance.

**D. Previous Approvals**
All Primary Plats regulated by this Ordinance that were approved prior to the effective date of this Ordinance, and not yet executed through either

**(1)** the receipt of an Improvement Location Permit authorizing construction of any phase of the development, or

**(2)** the recording of the Final Plat in the office of the Hendricks County Recorder, shall expire and become void 1 year following the effective date of this Ordinance. All approvals that expire and/or become void shall comply with all applicable provisions of this Ordinance if re-issued.

### 1.14 Appeal from Plan Commission Determination

Every decision of the Plan Commission which regards subdivision platting shall be subject to review by certiorari. Any person aggrieved by a decision of the Plan Commission may present to the circuit or superior court of the County in which the premises affected are located a petition duly verified, setting forth that such decision is illegal in whole or in part, and specifying the grounds of the illegality. The petition shall be presented to the court within thirty (30) days after the entry of the decision or order of the Plan Commission being challenged.

### 1.15 Severability

If any part or provision of these regulations or application thereof to any person or circumstances is adjudged invalid by any court of competent jurisdiction, such judgment shall be confined in its operation to the part, provision, or application directly involved in all controversy in which such judgment shall have been rendered and shall not affect or impair the validity of the remainder of these regulations or the application thereof to other persons or circumstances. The Town hereby declares that it would have enacted the remainder of these regulations even without any such part, provision or application.

### 1.16 Repealer

Upon the adoption of this ordinance according to law, the Subdivision Control Ordinance of the Town of Lizton previously adopted, as amended is hereby repealed, except for such sections expressly retained herein.

### 1.17 Enactment

In order that land may be subdivided in accordance with these purposes and policies, these subdivision regulations are hereby adopted.

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# SECTION 2:
# ADMINISTRATION



## 2.1 Administration

### A. Administrative Officer

The administrator of this Ordinance shall be the Zoning Administrator (including any designee(s) of the Zoning Administrator).

**(1) Enforcement Authority**

The Zoning Administrator is hereby authorized and directed to enforce and carry out all provisions of this Ordinance both in letter and spirit, pursuant to state statute.

**(2) Delegation Authority**

The Zoning Administrator is hereby empowered to delegate the duties and the powers granted to, and imposed upon, him/her under this Ordinance. As used in this Ordinance, "Zoning Administrator" shall include any authorized representative(s).

### B. General Administrative Provisions

The following general administrative provisions shall apply:

**(1) Appeals**

Any person aggrieved by a decision of the Plan Commission may present a duly verified petition to a Hendricks County court of jurisdiction that:

**a)** asserts that the aggrieving decision is illegal and

**b)** specifies the grounds for the illegality. The petition shall be submitted to the court within 30 days of the decision that is being appealed.

**(2) Inspection of Improvements**

The subdivider shall comply with the Town's requirements and policies for the inspection of improvements, consistent with this Ordinance.

## 2.2 Resubdivision of Land

**A. Procedure for Resubdivision**

For any change in a map of an approved or recorded subdivision plat, if such change affects any street layout shown on such map, or area reserved thereon for public use, or any lot line, or if it affects any map or plan legally reached prior to the adoption of any regulations controlling subdivisions, such parcel shall be approved by the Commission by the same procedure, rules, and regulations as for a subdivision.

**B. Procedure for Subdivisions**

Where future resubdivision is indicated. Whenever a parcel of land is subdivided and the subdivision plat shows one or more lots containing more than one acre of land and there are indications that such lots will eventually be resubdivided into smaller building sites, the Plan Commission may require that such parcel of land allow for the future opening of streets and the ultimate extension of adjacent streets. Easements providing for the future opening and extension of such streets may be made a requirement of the plat.

## 2.3 Vacation of Plats

Any recorded plat or part of any recorded plat may be vacated only in accordance with LC. 36-7-3 as amended. (The changes to the Indiana Code regarding the vacation of plats requires the adoption of rules governing procedure, notice and the conduct of hearings.)

## 2.4 Waivers of Subdivision Regulations

**A. General Provisions**

Where the Plan Commission finds that (1) extraordinary hardships or practical difficulties may result from strict compliance with these regulations, or (2) the purposes and intent of these regulations may be served to a greater extent by an alternative proposal, it may grant waivers of the standards set forth in this Ordinance so that substantial justice may be done and the public interest served. No waiver shall be granted in relief of mere inconveniences or financial disadvantages of the subdivider.

**B. Decision Criteria**

The Plan Commission shall not approve any waivers of the subdivision regulations unless it makes written findings based upon the evidence presented by the petitioner in each specific case, indicating how:

**(1) Public Welfare**

The granting of the waiver will not be detrimental to the public safety, health, and/or welfare;

**(2) Adjacent Property**

The granting of the waiver will not be injurious to the reasonable use and development of other property;

**(3) Unique Condition**

The conditions upon which the request for the waiver is based are unique to the property for which it is sought and are not applicable generally to other property;

**(4) Physical Conditions**

Because of the particular physical surroundings, shape, or topographical conditions of the specific property involved a hardship to the owner would result if the strict letter of these regulations were carried out; and

**(5) Comprehensive Plan**

The waiver will not contradict the intent of the Comprehensive Development Plan.

**C. Public Facility Waiver**

Where the waiver impacts the design, construction, or maintenance of required public improvements, it shall not be granted unless the appropriate public agency has reviewed the proposed development and indicated approval, in writing, to the Plan Commission.

**D. Conflict of Authority**

No waiver of these Subdivision Control regulations shall conflict with the powers and duties of the Board of Zoning Appeals. The Board of Zoning Appeals does not have the authority to hear or grant requests for waivers to the regulations of this Ordinance. The Plan Commission does not have the authority to grant variances of the Zoning Ordinance.

**E. Procedure**

The procedure for review of waiver requests is as follows:

**(1) Waiver Requests**

At the time of filing a subdivision application, consistent with this Ordinance, the applicant must submit a detailed written statement documenting all waivers requested as part of the application and reasons for the waiver request(s) consistent with the decision criteria outlined in Section 2.4(B). The waiver requests may be modified and added to by the applicant at any time prior to public notice of the subdivision request being provided.

**(2) Conditions**

Waivers may only be granted in a public hearing and shall be considered at the time of the Primary Plat review by the Plan Commission. The Plan Commission may make reasonable conditions an element of any waiver approval.

**(3) Recording**

The Plan Commission action taken on all waiver requests and the reasons for each action taken shall be recorded in the minutes of the Plan Commission. Conditions imposed by the Plan Commission as part of the waiver approval shall be included in writing on the recorded plat of the subdivision, at the discretion of the Zoning Administrator.

## 2.5 Enforcement

### A. General

**(1)** It shall be the duty of the Zoning Administrator to enforce these regulations and to bring any violations or lack of compliance to the attention of the Plan Commission Attorney [or if there is none, the Town's Attorney].

**(2)** No owner, or agent of the owner, of any parcel of land located in a proposed subdivision shall transfer or sell any such parcel before a plat of such subdivision has been approved by the Plan Commission, in accordance with the provisions of these regulations, and filed with the County Recorder and the Plan Commission is provided proof thereof.

**(3)** The division of any lot or any parcel of land into a subdivision, as defined in this ordinance, by the use of metes and bounds description for the purpose of sale, or transfer, or lease resulting in the creation of one or more new building sites shall not be permitted. All such described divisions shall be subject to all of the appropriate requirements of this ordinance.

**(4)** No Improvement Location Permit or Building Permit required under the Uniform Building Code, the Zoning Ordinance or this ordinance shall be issued on any property subject to this ordinance until the provisions of this ordinance have been complied with.

### B. Enforcement

The enforcement of this Ordinance shall be consistent with the following provisions:

**(1) Investigation of Suspected Violations**

Suspected violations of the provisions of this Ordinance shall be investigated by the Zoning Administrator consistent with the Enforcement and Penalties provisions of the Zoning Ordinance.

**(2) Enforcement & Penalties**

The enforcement of any violations of this Ordinance shall be consistent with the provisions for enforcement and penalties established by the Zoning Ordinance. However, in addition to remedies provided by the Zoning Ordinance, the enforcement of violations of this Ordinance may also include the following alternatives:

**a) Permits Withheld**

The Zoning Administrator shall reserve the right to withhold Improvement Location Permits for improvements to and/or structures on lots in a subdivision if the subdivider has failed to:

1. comply with the procedures of this Ordinance;
2. properly install, maintain, or otherwise provide for all of the required public improvements, or
3. conform with any requirement of this Ordinance.

**(3) Occupancy Withheld**

A permanent Certificate of Occupancy shall not be issued for any lot until (1) any required sidewalks and street trees are installed and (2) the grading and seeding are complete for that lot, or a performance bond is posted to the Town by the applicant (consistent with Section 5.5 of this Ordinance) for the installation of the sidewalk.

**(4) Improvements Delayed**

No public board, agency, commission, official, or other authority shall proceed with, or authorize the construction of, any public improvements required for a subdivision until the proposed subdivision has been approved in accordance with this Ordinance. Upon the request of the Zoning Administrator, the installation and/or authorization of improvements shall be delayed until the remedy of any violations present on the property.

## 2.6 Violation and Penalties

Any person who violates a provision of this ordinance or any regulations herein contained, shall be guilty of a misdemeanor and, upon conviction, shall be fined not less than one hundred dollars ($100.00) and not more than five hundred dollars ($500.00) for each day's violation.

## 2.7 Restraining Provisions

**A.** Any land within the participating jurisdictions subdivided in violation of the terms of this ordinance after the effective date hereof, is hereby declared to be a common nuisance, which may be restrained, enjoined or abated in any appropriate action or proceeding.

**B.** The Plan Commission may institute an injunction suit requesting an individual or governmental unit be directed to remove a structure erected in violation of this ordinance, or to make the same comply with its terms. If the Plan Commission is successful in its suit, the respondent shall bear the costs of the action.

**C.** The Plan Commission may institute a suit for mandatory injunction requesting an individual or governmental unit be directed, where such individual or governmental unit has violated any provisions of this ordinance, to comply with the provisions of this ordinance. If the Plan

Commission is successful in its suit, the respondent shall pay the Plan Commission’s reasonable attorney fees and all costs related to the enforcement of this Ordinance.

## 2.8 Establishment of Fees

The Town Council shall establish fees that shall be charged for the checking, reviewing, and approval procedures on all plats.

## 2.9 Notice of Public Hearing

For all public hearings, notice shall be provided consistent with the requirements of *Section 10.3 Notice of Public Hearing* in the Lizton Zoning Ordinance.

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# SECTION 3:
# MINOR SUBDIVISIONS



## 3.1 General Provisions

### A. Purpose and Intent

A Minor Subdivision Plat allows the Plan Commission the opportunity to expedite a subdivision approval when the major subdivision process requires unnecessary scrutiny. A Minor Subdivision Plat is streamlined by requiring less support material and by allowing final plat approval to be conducted administratively following the primary plat approval.

### B. Project Applicability

A Minor Subdivision Plat can be used to subdivide property within the planning jurisdiction, but only if the proposed division meets the "Prerequisites" standards written below.

### C. Prerequisites

**(1) Eligible Applicant**

An application for a Minor Subdivision Plat shall be initiated by the owner of the land involved in the development or the owner's authorized agent. If an authorized agent files an application, a signed and notarized consent form from the owner shall accompany the application.

**(2) Pre-application Meeting**

Prior to submitting an application for Minor Subdivision Plat, the applicant shall meet with the Zoning Administrator to review the zoning district of the site, review applicable regulatory ordinances, review the procedures, discuss external street and pedestrian systems the development will have to connect into, determine what submittal material will be necessary, and the like.

The Zoning Administrator shall advise the applicant in preparing the application and supportive documents as necessary.

**(3) Disqualifications**

A proposed division of land that includes one (1) or more of the following shall not be permitted to utilize the Minor Subdivision Plat process:

**a)** Utilizing any subdivision type other than the "Simple Subdivision Type."
**b)** A new street or improvements to an existing street,
**c)** Divisions of land that result in four (4) or more total lots (i.e. splitting one lot into three),
**d)** Divisions of land that result in new or modified easements; excluding a shared driveway,
**e)** Divisions that requires waivers from the applicable design standards, or
**f)** Divisions that require, or elect to have, common area or features that will be in common ownership; excluding a shared driveway.

## 3.2 Application and Review Process

### A. General Application Requirements

All applications may be obtained through at the Town Hall. Fees shall be paid at the time application are submitted.

**(1) Application Forms**

All applications shall be made on forms provided by the Zoning Administrator. All applicants shall submit original applications that are completed in their entirety either in ink or typed.

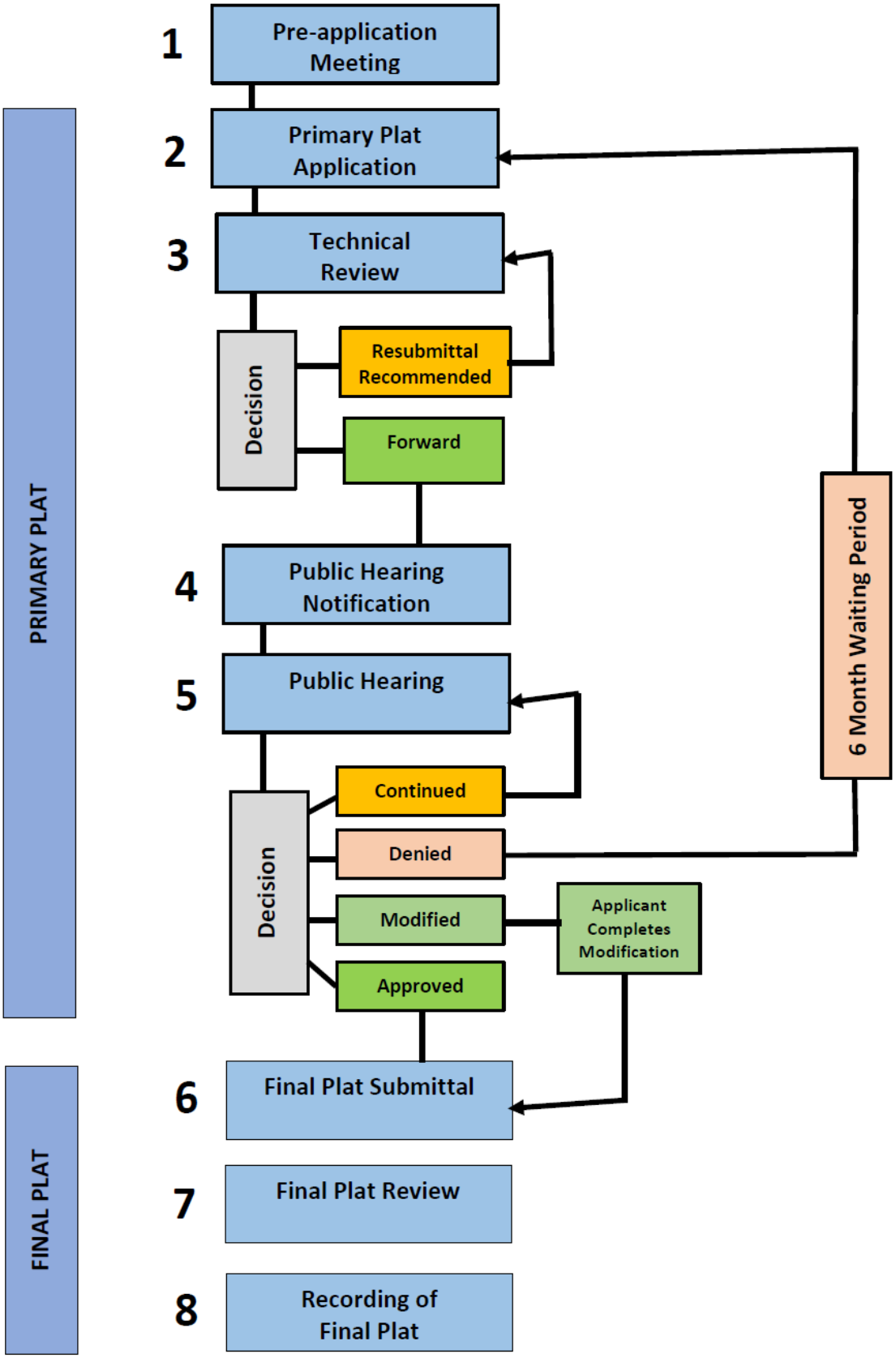
**(2) Copies Required**

All applicants shall submit copies of applications and necessary attachments as required by the adopted policies of the Zoning Administrator and the applicable Rules and Procedures of the Plan Commission.

### B. Review Schedule

All applications shall be assigned reference and/or docket numbers by the Zoning Administrator. Applications shall be scheduled by the Zoning Administrator for the appropriate public hearings based on the completeness of the application consistent with the requirements of this Section and the adopted Calendar of Filing and Meeting dates for the Plan Commission.

*Minor Subdivision Plat Process*



## 3.3 Primary Plat Procedure

**A. Application Requirements**

In order to officially begin the subdivision review process the applicant shall file an application for Primary Plat Review with the Zoning Administrator.

**(1) Application Materials**

Required application materials include the following:

**a) Application Form**

Application shall be made on forms available at the Town Hall, be typed or completed in ink and be signed by the owner and subdivider.

**b) Document Copies**

The application shall be accompanied by seven (7) 11x17 and two (2) 24x36 hard copies of a Primary Plat, Vicinity Map and Contiguous Holdings Map (if necessary) as well as a digital copy.

**c) Fee**

The application shall be accompanied by a fee in the amount established by the adopted Official Fee Schedule.

**(2) Processing Standards**

No application shall be processed, and no docket number shall be assigned, until the application is filled out correctly, and all required attachments, including the fee, are presented to the Zoning Administrator.

**(3) Meeting Dates Established**

In accordance with IC 36-7-4- 705, the Zoning Administrator shall announce the date of a hearing before the Plan Commission within 30 days after receipt of a final and complete application. The dates of all hearings regarding the application shall be based on the adopted Schedule of Meeting and Filing Dates and the date on which the application for Primary Plat review is filed with the Zoning Administrator.

**B. Primary Plat Documents**

Primary Plat application materials shall be prepared and certified by a land surveyor or engineer registered by the State of Indiana. They shall include the following:

**(1) Primary Plat**

The Primary Plat shall be at an appropriate scale no greater than 1:100; shall be prepared in pen or electronic media; and shall include the following:

**a) Property Name**

***1.*** The name of the subdivision (if the subject property is within a previously platted subdivision); or
***2.*** A proposed name (if the property is not within a previously platted subdivision). The proposed name shall not duplicate the name of any subdivision in Hendricks County that has been previously recorded.
***3.*** The name(s) of all proposed new streets.

**b) Property Description**

***1.*** A written description of the location of the property, including current zoning, street address, and legal description. The legal description shall state the total area of the subdivision in acres.
***2.*** A dimensioned drawing of the parcel of land that is being subdivided, including any remaining tract. The drawing shall show the subdivision boundary with benchmarks, the legal description point of beginning, and all dimensions, including the size of all existing properties included in the proposed subdivision in acres. If any properties to be included in the subdivision are less than 1 acre, they shall also be described in terms of square footage.
***3.*** Indication of the use of any lot (single-family, two-family, multi-family, townhouse) and all uses other than residential proposed by the subdivider.

**c) Property Ownership**

***1.*** The name, street address, e-mail address, and telephone number of the legal property owner and the developer of the property or his/her agent. The ownership information shall include the citation of the last instrument conveying titles to each property involved in the proposed subdivision, giving grantee, date, and book and page or instrument number reference.
***2.*** An indication of any existing covenants, rights-of-way, and/or easements affecting the property.
***3.*** The name, street address, e-mail address, and telephone number of any professional person(s) responsible for the Primary Plat application materials.

**d) Primary Plat Drawing**

***1.*** A legend and notes, including a graphic scale, north arrow, and date.
***2.*** The location of existing burial grounds, watercourses, 100-year floodplains and floodways (including elevations), wooded areas, wetlands (certified by a professional possessing a U.S. Army Corps of Engineers Regulation 4 Jurisdictional Wetland Certification), and other natural features.
***3.*** The location(s) of any existing structure(s) on the site and a description of their future demolition or incorporation into the proposed subdivision.
***4.*** Topographic contours consistent with the requirements of the Town Engineer, referenced to sea level and an established bench mark.
***5.*** The location, area (indicated in square feet and acres), and dimensions of each lot. The location of all monuments and the buildable area of each lot, per applicable zoning district setback requirements and any other regulatory or natural limitations, shall also be indicated. All lots shall be consecutively numbered. Outlots shall be lettered in alphabetical order.
***6.*** All existing and proposed easements and rights-of-way, including the location, width, and purpose of each.
***7.*** The location of existing and proposed streets, street tree planting areas, and sidewalks within or immediately adjacent to the property.
***8.*** Any parcels of land proposed to be dedicated or reserved for common areas, schools, parks, playgrounds, or other public, semi-public, or community purposes.
***9.*** The location and sizes of existing sewers, water mains, storm drains, gas or oil transmission lines, and any other known underground structures within or immediately adjacent to the property.
***10.*** Proposals for connection with sanitary sewage and storm water systems.
***11.*** Provisions for collecting and discharging surface storm water.

## SECTION 3: MINOR SUBDIVISIONS

### 3.3 Primary Plat Procedure

***12.*** A drainage report meeting the requirements of the Town Engineer and describing all drainage improvements required by this Ordinance (at the Town Engineer's discretion).

***13.*** A sanitary sewer capacity evaluation and report meeting the requirements of the Lizton Utilities.

**(2) Vicinity Map**

A vicinity map, drawn at a convenient scale, showing the location of the proposed subdivision, the streets, and the general development of the area within 600 feet of the proposed subdivision.

**(3) Contiguous Holdings Map**

Whenever the Primary Plat covers only a part of an applicant's contiguous property holdings, the applicant shall also submit a map of all contiguous holdings, drawn at a convenient scale. The map shall include a sketch of the proposed subdivision area and an indication of the likely future street, sanitary sewer, and drainage system serving the remaining portion of the property.

**(4) Subdivision Covenants**

The protective covenants applicable to the subdivision shall be prepared by the applicant and shall be legally sound. Either the covenants, or a reference to the covenants, shall be incorporated on the plat. At a minimum, covenants or other plat documentation shall provide a means for the maintenance and upkeep of drainage swales and other drainage facilities and any common areas or entry features. The covenants shall specifically provide that the maintenance of drainage swales and other drainage features be the responsibility of a lot owner's association and that the proper function and maintenance of the drainage system may be enforced by the Lizton Utilities and the Town Engineer.

**C. Primary Plat Review**

**(1) Procedure**

**a) Assignment**

An application for Minor Subdivision Primary Plat, which is determined to be complete and in proper form by the Zoning Administrator, shall be assigned a case number and placed on the Plan Commission agenda pursuant to the Plan Commission's Rules of Procedure. The Zoning Administrator shall notify the applicant of the meeting date.

**b) Zoning Administrator Review**

The Zoning Administrator shall review the proposed Minor Subdivision Primary Plat and submit a written report to the Plan Commission stating the facts concerning physical characteristics of the area involved in the subdivision of land, deficiencies in meeting provisions of the Subdivision Control Ordinance, public facilities available to service the area, and/or other pertinent facts. A copy of such report shall be made available to the applicant. The Zoning Administrator may also consult or meet with the Town Engineer when desired or necessary and include opinions of those persons in the report.

**c) Public Notice**

The requirements for public notice shall be per the Plan Commission's Rules of Procedures.

**d) Attendance**

The applicant shall be present at the Plan Commission meeting to present and explain the application for a Minor Subdivision Primary Plat, and address and discuss comments and concerns posed by the Plan Commission or interested parties. Failure to appear may result in the dismissal of the application for lack of prosecution.

**e) Public Hearing**

A public hearing shall be held in accordance with the Plan Commission Rules of Procedure.

**f) Review**

At their regularly scheduled public meeting, the Plan Commission shall review:

***1.*** The application for Minor Subdivision Primary Plat.
***2.*** All supporting information including the site plan, lot access, elevations, etc.
***3.*** The testimony of the applicant.
***4.*** Information presented in writing or verbally by the Zoning Administrator, other applicable agencies or departments.
***5.*** Input from the public during the public hearing.
***6.*** Any applicable provisions of this Ordinance.
7. Conformance with the goals, objectives and intent described in the Comprehensive Development Plan.
8. Any other information as may be required by the Plan Commission to evaluate the application.

**g) Decision**

***1.*** The Plan Commission shall make Findings of Fact and take final action or continue the application for a Minor Subdivision Primary Plat to a defined future meeting date.
***2.*** The Plan Commission shall make the following Findings of Fact. Findings, or lack of findings, may be in the form of a general statement.

**i.** The subdivision of land is consistent with the Comprehensive Development Plan.
**ii.** The subdivision of land satisfies the prerequisites, development requirements and design standards for the applicable subdivision type in this Ordinance.
**iii.** The subdivision of land satisfies the applicable design standards in *Article 6: Design Standards*.
**iv.** The subdivision of land satisfies the applicable development standards in the Zoning Ordinance.
**v.** The subdivision of land satisfies all other applicable provisions of these Ordinances.

**h) Final Action**

***1.*** If the Plan Commission finds all of the findings of fact in the affirmative, it shall approve or approve with commitments the application for Minor Subdivision Primary Plat.
***2.*** If the Plan Commission does not find all of the findings of fact in the affirmative, it shall deny the application for Minor Subdivision Primary Plat; or impose conditions of the approval that remedy areas of concern.

## SECTION 3: MINOR SUBDIVISIONS

### 3.3 Primary Plat Procedure

**i) Commitments**

Any verbal commitment made by, submitted in writing by, or illustration provided by the applicant or assigned representatives during a Plan Commission meeting shall be binding and required to be recorded. The Plan Commission may dismiss verbal, written, or illustrated commitments if they do not believe they are necessary. Commitments shall be recorded in the Office of the Hendricks County Recorder within thirty (30) days of the Plan Commission's final action.

**j)** The findings, final action, and any conditions shall be signed by the President of the Plan Commission and be attested by the Zoning Administrator.

**k)** The Zoning Administrator shall provide the applicant a copy of the decision.

**(2) Duration**

An approved Minor Subdivision Primary Plat shall be valid for one (1) year from the date the Plan Commission granted approval.

**(3) Modification**

**a) Minor Amendments**

Minor amendment to an approved Minor Subdivision Primary Plat which does not involve: an increase in the number of lots or intensity of land uses; the addition of new land uses; or the addition of driveways may be authorized by the Zoning Administrator without a public hearing. An example of a minor amendment could be the adjustment of a property line. A minor amendment authorized by the Zoning Administrator shall be reported, in writing, to the Plan Commission at its next regular meeting and entered into the project file.

**b) Major Amendments**

If the Zoning Administrator determines that the proposed modification adversely impacts or significantly changes the overall subdivision, or requires a variance or waiver, then the applicant shall be required to file a new application for a Minor Subdivision Primary Plat.

## 3.4 Final Plat Procedure

**A. Application Requirements**

The applicant shall file an application for Final Plat review with the Zoning Administrator. A Minor Subdivision Final Plat may not be sectionalized and shall include all lots included in the Primary Plat. The application shall:

**(1) Application Form**
Be made on forms available at the Town Hall, be completed in ink or typed, and be signed by the owner and developer;

**(2) Final Plat Copies**
Be accompanied by the required copies of the Final Plat meeting the requirements provided by Section 3.3(B);

**(3) Electronic Data**
Be accompanied by a computer disk containing an electronic version of the Final Plat in a form specified by the Zoning Administrator;

**(4) Fee**
Be accompanied by a fee in the amount established by the adopted Official Fee Schedule;

**B. Final Plat Documents**

All Final Plats shall substantially comply with the approved Primary Plat for the subdivision. The Final Plat shall be prepared by a land surveyor registered in the State of Indiana, shall be shown at an appropriate scale, shall be drawn on reproducible mylar, and shall include the following information on a sheet meeting the size and clarity requirements of the Hendricks County Recorder:

**(1) Property Name**
The name of the subdivision followed by the words “Minor Subdivision Final Plat” (the name shall not duplicate the name of any subdivision in Hendricks County that has been previously recorded).

**(2) Property Description**

**a) Legal Description**
An accurate metes and bounds description of the property boundary.

**b) Boundary Lines**
An accurate property boundary line expressed in feet and hundredths of a foot, with dimensions and angles, and the bearings of all lines to a minimum of 1/2 minute.

**c) Benchmark**
Accurate distances and directions to the nearest official monument, including reference corners.

**(3) Property Ownership**

**a) Owner/Developer**
The name, street address, e-mail address, and telephone number of the legal property owner and the developer of the property or his/her agent. The ownership information shall include the citation of the last instrument conveying titles to each parcel of

property involved in the proposed subdivision, giving grantee, date, and book and page or instrument number reference.

**b) Professionals Involved**
The name, street address, e-mail address, and telephone number of the professional land surveyor or engineer responsible for the Final Plat.

**(4) Subdivision Drawing**

**a) Legend and Notes**
A complete legend and notes, including north arrow, graphic scale, and date.

**b) Existing Features**
Accurate locations of all pre-existing easements, rights-of-way, and other pertinent features on the property and/or intersecting the boundaries of the tract; including a description of their future use or abandonment.

**c) Public Ways**
The location, width, and other dimensions of the rights-of-way and easements for any streets and alleys. Street rights-of-way shall include street names but shall exclude setbacks and/or build-to-lines.

**d) Lots**
The location, dimensions (expressed in feet and hundredths of a foot), area (expressed in acres and square feet), and the bearing of all lines to 1/2 minute for every lot and/or block created by the subdivision, including any remaining tract. All lots shall be consecutively numbered and all blocks shall be lettered in alphabetical order, consistent with the Primary Plat.

**e) Easements**
Accurate locations, widths, and other dimensions of all easements, including a description of their use.

**f) Monuments**
The location, type, material, and size of all existing and proposed monuments and markers included in the subdivision.

**g) Set-Aside Areas**
Accurate locations and dimensions for any property to be dedicated or reserved for public, semipublic, or community use, including common areas.

**h) Covenants & Restrictions**
The text of, or references to, any restrictions that will run with the land and become covenants in the deeds for lots.

**i) Explanations**
An explanation of all easements and reservations.

**j) References**
Sufficient data acceptable to the Town Engineer to readily determine the location, bearing, and length of all lines for the reproduction of such lines on the property.

**k) Endorsement**
A statement signed and dated by the property owner(s) endorsing the Final Plat.

**l) Land Surveyor Certification**
Certification by a registered land surveyor.

**m) Plan Commission Approval Statement**
A form indicating the approval of the subdivision and providing a place for the signature of the Plan Commission President and Secretary and the date of Primary Plat approval.

**n) Other Endorsements and Signatures**
Forms providing the necessary statements, signatures, and dates for the recording of the Final Plat in the Hendricks County Recorder's Office.

**o) Common Area Notation**
A note indicating that the maintenance of any common areas are the responsibility of the lot owner's association.

**C. Final Plat Review**
The Zoning Administrator and Town Engineer shall review the Final Plat submittal and associated materials to verify its consistency with the approved Primary Plat, and that all Plan Commission required modifications have been made to the plat.

**(1) Plan Commission Signing**
After verification by the Zoning Administrator and Town Engineer, both the Plan Commission President and Secretary shall sign the Final Plat.

**(2) Town Council Signing**
Following the signing of the Final Plat by the Plan Commission President and Secretary, the applicant shall contact the Town Council to have the Final Plat scheduled for review at its next available meeting. At that meeting, the Town Council shall review any public dedications and surety and, if deemed acceptable, shall sign the Final Plat.

**D. Recording**
It shall be the responsibility of the applicant to file the approved and signed Final Plat with the Hendricks County Recorder within 30 days of the date of signature by the Town Council. Simultaneously with the filing of the Final Plat, the applicant shall record any agreements of dedication and any covenants, together with any other legal documents that are required to be recorded by the Plan Commission or other applicable government agency. The filing and recording of a plat is without legal effect unless signed by the Plan Commission President, Plan Commission Secretary, and the Town Council.

**E. Recorded Copy Provided**
The applicant shall be required to submit a copy of the recorded Final Plat to the Zoning Administrator for the records of the Plan Commission.

**(1) Improvement Location Permits**
No Improvement Location Permits shall be issued for any subdivision improvements and/or structures on any subdivision lot until the copy of the Final Plat is provided.

**(2) Occupancy Restrictions**
No permanent Certificate of Occupancy shall be issued for any lot or structure in the subdivision until all required improvements have been completed for the lot. In no instance shall this provision be interpreted as preventing the issuance of a temporary Certificate of Occupancy allowing the use of structures prior to the installation of required sidewalks. Sidewalk installation may only be deferred in the event of unsuitable weather conditions, as defined by the Town Engineer.

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# SECTION 4:
# MAJOR SUBDIVISIONS



## 4.1 General Provisions

### A. Purpose and Intent

A Major Subdivision Plat allows the Plan Commission the opportunity to review the details of a subdivision of land to determine compliance with the provisions of this Ordinance. A Major Subdivision Plat also ensures the statutory requirements established in Indiana Code for the subdivision of land are met.

### B. Project Applicability

A Major Subdivision Plat can be used to subdivide property within the planning jurisdiction, but only if the proposed division meets the "Prerequisites" standards written below.

### C. Prerequisites

**(1) Eligible Applicant**

An application for a Major Subdivision Plat shall be initiated by the owner of the land involved in the development or the owner's authorized agent. If an authorized agent files an application, a signed and notarized consent form from the owner shall accompany the application.

**(2) Pre-application Meeting**

Prior to submitting an application for Major Subdivision Plat, the applicant shall meet with the Zoning Administrator to review the zoning district of the site, review applicable regulatory ordinances, review the procedures, discuss external street and pedestrian systems the development will have to connect into, determine what submittal material will be necessary, and the like.

The Zoning Administrator shall advise the applicant in preparing the application and supportive documents as necessary.

## 4.2 Application and Review Process

### A. General Application Requirements

All applications may be obtained through at the Town Hall. Fees shall be paid at the time application are submitted.

**(1) Application Forms**

All applications shall be made on forms provided by the Zoning Administrator. All applicants shall submit original applications that are completed in their entirety either in ink or typed.

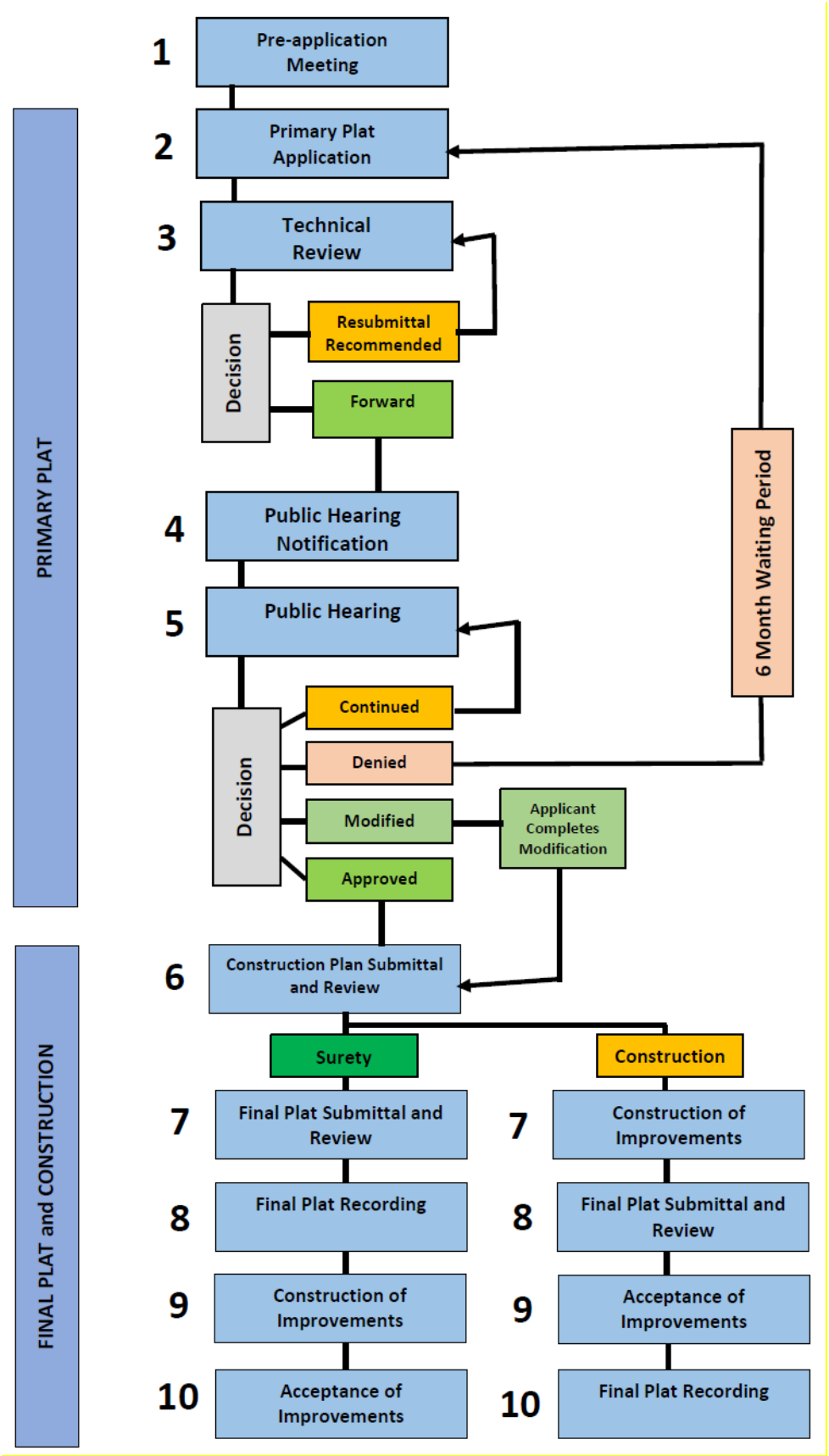
**(2) Copies Required**

All applicants shall submit copies of applications and necessary attachments as required by the adopted policies of the Zoning Administrator and the applicable Rules and Procedures of the Plan Commission.

### B. Review Schedule

All applications shall be assigned reference and/or docket numbers by the Zoning Administrator. Applications shall be scheduled by the Zoning Administrator for the appropriate public hearings based on the completeness of the application consistent with the requirements of this Section and the adopted Calendar of Filing and Meeting dates for the Plan Commission.

*Major Subdivision Plat Process*



## 4.3 Primary Plat Procedure

### A. Application Requirements

In order to officially begin the subdivision review process the applicant shall file an application for Primary Plat Review with the Zoning Administrator.

#### (1) Application Materials

Required application materials include the following:

**a) Application Form**

Application shall be made on forms available at the Town Hall, be typed or completed in ink and be signed by the owner and subdivider.

**b) Document Copies**

The application shall be accompanied by seven (7) 11x17 and two (2) 24x36 hard copies of a Primary Plat, Vicinity Map and Contiguous Holdings Map (if necessary) as well as a digital copy.

**c) Fee**

The application shall be accompanied by a fee in the amount established by the adopted Official Fee Schedule.

#### (2) Processing Standards

No application shall be processed, and no docket number shall be assigned, until the application is filled out correctly, and all required attachments, including the fee, are presented to the Zoning Administrator.

#### (3) Meeting Dates Established

In accordance with IC 36-7-4- 705, the Zoning Administrator shall announce the date of a hearing before the Plan Commission within 30 days after receipt of a final and complete application. The dates of all hearings regarding the application shall be based on the adopted Schedule of Meeting and Filing Dates and the date on which the application for Primary Plat review is filed with the Zoning Administrator.

### B. Primary Plat Documents

Primary Plat application materials shall be prepared and certified by a land surveyor or engineer registered by the State of Indiana. They shall include the following:

#### (1) Primary Plat

The Primary Plat shall be at an appropriate scale no greater than 1:100; shall be prepared in pen or electronic media; and shall include the following:

**a) Property Name**

***1.*** The name of the subdivision (if the subject property is within a previously platted subdivision); or
***2.*** A proposed name (if the property is not within a previously platted subdivision). The proposed name shall not duplicate the name of any subdivision in Hendricks County that has been previously recorded.
***3.*** The name(s) of all proposed new streets.

**b) Property Description**

***1.*** A written description of the location of the property, including current zoning, street address, and legal description. The legal description shall state the total area of the subdivision in acres.
***2.*** A dimensioned drawing of the parcel of land that is being subdivided, including any remaining tract. The drawing shall show the subdivision boundary with benchmarks, the legal description point of beginning, and all dimensions, including the size of all existing properties included in the proposed subdivision in acres. If any properties to be included in the subdivision are less than 1 acre, they shall also be described in terms of square footage.
***3.*** Indication of the use of any lot (single-family, two-family, multi-family, townhouse) and all uses other than residential proposed by the subdivider.

**c) Property Ownership**

***1.*** The name, street address, e-mail address, and telephone number of the legal property owner and the developer of the property or his/her agent. The ownership information shall include the citation of the last instrument conveying titles to each property involved in the proposed subdivision, giving grantee, date, and book and page or instrument number reference.
***2.*** An indication of any existing covenants, rights-of-way, and/or easements affecting the property.
***3.*** The name, street address, e-mail address, and telephone number of any professional person(s) responsible for the Primary Plat application materials.

**d) Primary Plat Drawing**

***1.*** A legend and notes, including a graphic scale, north arrow, and date.
***2.*** The location of existing burial grounds, watercourses, 100-year floodplains and floodways (including elevations), wooded areas, wetlands (certified by a professional possessing a U.S. Army Corps of Engineers Regulation 4 Jurisdictional Wetland Certification), and other natural features.
***3.*** The location(s) of any existing structure(s) on the site and a description of their future demolition or incorporation into the proposed subdivision.
***4.*** Topographic contours consistent with the requirements of the Town Engineer, referenced to sea level and an established benchmark.
***5.*** The location, area (indicated in square feet and acres), and dimensions of each lot. The location of all monuments and the buildable area of each lot, per applicable zoning district setback requirements and any other regulatory or natural limitations, shall also be indicated. All lots shall be consecutively numbered. Outlots shall be lettered in alphabetical order.
***6.*** All existing and proposed easements and rights-of-way, including the location, width, and purpose of each.
***7.*** The location of existing and proposed streets, street tree planting areas, and sidewalks within or immediately adjacent to the property.
***8.*** Any parcels of land proposed to be dedicated or reserved for common areas, schools, parks, playgrounds, or other public, semi-public, or community purposes.
***9.*** The location and sizes of existing sewers, water mains, storm drains, gas or oil transmission lines, and any other known underground structures within or immediately adjacent to the property.
***10.*** Proposals for connection with sanitary sewage and storm water systems.
***11.*** Provisions for collecting and discharging surface storm water.

## SECTION 4: MAJOR SUBDIVISIONS

### 4.3 Primary Plat Procedure

***12.*** A drainage report meeting the requirements of the Town Engineer and describing all drainage improvements required by this Ordinance (at the Town Engineer's discretion).
***13.*** A sanitary sewer capacity evaluation and report meeting the requirements of the Lizton Utilities.

**(2) Vicinity Map**
A vicinity map, drawn at a convenient scale, showing the location of the proposed subdivision, the streets, and the general development of the area within 600 feet of the proposed subdivision.

**a) Property Location**
The location of the proposed subdivision within the Town, referencing surrounding streets and subdivisions.

**b) Adjacent Property Owners**
Existing subdivisions and lots adjacent to or within 250 feet of the proposed subdivision. The owners of each of these properties shall be identified on the drawing with the date and book and page (or instrument number) of the last conveyance of ownership.

**c) Related Facilities**
Existing schools, parks, playgrounds, neighborhood commercial businesses, or other similar facilities that will serve the proposed subdivision.

**d) Utilities**
Location and size of all utilities adjacent to or within 250 feet of the subdivision site, including sanitary and storm sewers, gas lines, electric lines, telephone lines, water mains, fire hydrants, fiber optic and cable lines.

**e) Thoroughfares**
All public thoroughfares/rights-of-way adjacent to or within 250 feet of the site.

**f) Street & Pedestrian Systems**
Existing streets and rights-of -way on and adjoining the site of the proposed subdivision showing the names, functional classifications, roadway widths, surface types, widths of pavement, and presence of curbs, street trees, sidewalks, on-street parking, and streetlights.

**g) Boundaries**
Any municipal, fire district, school district, utility service, or other boundaries lying within or contiguous to the subdivision property.

**(3) Contiguous Holdings Map**
Whenever the Primary Plat covers only a part of an applicant's contiguous property holdings, the applicant shall also submit a map of all contiguous holdings, drawn at a convenient scale. The map shall include a sketch of the proposed subdivision area and an indication of the likely future street, sanitary sewer, and drainage system serving the remaining portion of the property.

**(4) Subdivision Phasing Description**
If the Primary Plat is to be divided into sections for the phasing of development, the preliminary boundaries and numbers of such sections shall be shown.

**(5) Subdivision Covenants**

The protective covenants applicable to the subdivision shall be prepared by the applicant and shall be legally sound. Either the covenants, or a reference to the covenants, shall be incorporated on the plat. At a minimum, covenants or other plat documentation shall provide a means for the maintenance and upkeep of drainage swales and other drainage facilities and any common areas or entry features. The covenants shall specifically provide that the maintenance of drainage swales and other drainage features be the responsibility of a lot owner's association and that the proper function and maintenance of the drainage system may be enforced by the Lizton Utilities and the Town Engineer.

**(6) Drainage Plan and Report**

The subdivider shall provide a drainage report describing the existing and proposed drainage conditions and evaluating the ability of the proposed water courses, channels, drainage tiles, farm tiles, storm sewers, culverts, and other improvements to accommodate the additional run-off generated by the proposed subdivision.

**a) Drainage Report**

A professional engineer or land surveyor, registered in the State of Indiana, shall prepare the report, which shall include:

***1.*** The conditions of the watershed that may affect run-off, such as subsoil type, positive drainage, and obstructions.
***2.*** The location of all subsurface drainage tiles and a plan to preserve or relocate the tiles.
***3.*** Estimates of the water entering the subdivision.
***4.*** The method of hydraulic and hydrologic analysis used (including any assumptions or special conditions), and the results of the analysis. The hydraulic and hydrologic calculations, including input and output flows, shall be included as appendices to the report.
***5.*** A description of the recommended minor and major drainage systems. The minor drainage system shall consist of storm sewers, drainage ditches, grassed swales, and storm inlets or infiltration structures. The major system shall consist of roadways, culverts, bridges, and drainage flow-ways.

**b) Watershed Map**

On a separate sheet, a watershed map complementing the Drainage Report using USGS contour information shall be provided, showing:

***1.*** The delineation of the drainage area in which the subdivision is located.
***2.*** The location of drainage courses and the existing direction of surface water flow within the drainage area.

**c) Drainage Plan Description**

On a separate sheet in the same scale and media as the Primary Plat, a description of drainage/topography/natural environment complementing the Drainage Report shall be provided that includes the following information:

***1.*** The location of natural streams, regulated drains, 100- year floodplains and floodways (including elevations).
***2.*** The location of any existing or proposed subsurface drain tile, structures, culverts, or swales.

***3.*** A map noting significant physical and topographical features of the tract. This map shall also show the proposed direction of the flow of surface water runoff from the site.

***4.*** A preliminary drainage plan showing the proposed storm water drainage system to an improved outlet. The plan shall include surface drainage system, storm sewer systems, subsurface drainage systems, and storm water detention facilities. Arrows designating the general drainage of all streets and lots shall be included.

**(7) Engineering Capacity Report**

A report prepared by a professional engineer or land surveyor registered in the State of Indiana covering sewage, street, and drainage facilities for the subdivision shall be provided which includes, but is not limited to, the following:

**a) Utility Systems**

A description of the feasibility of connecting to existing storm and sanitary sewers. This portion of the report shall include the distance from the nearest public sewer and the capacity of the existing system intended to handle the additional waste load. The sanitary sewer capacity evaluation and report shall meet the requirements of the Lizton Utilities.

**b) Street Construction**

A preliminary report on the anticipated street construction based on the specifications provided by this Ordinance and any additional requirements of the Town Engineer.

**c) Traffic Analysis**

A traffic analysis (at the discretion of the Zoning Administrator and/or Town Engineer).

**C. Agency Coordination**

The applicant corresponds with all applicable regulatory agencies for all other necessary approvals. These may include, but are not limited to the following:

**(1)** the Indiana Department of Transportation;

**(2)** the Indiana Department of Environmental Management;

**(3)** the Indiana Department of Natural Resources; and

**(4)** the Hendricks County Drainage Board

**D. Technical Review**

The Zoning Administrator shall distribute the application for Primary Plat review to the Town Engineer.

**(1) Review Criteria**

In reviewing the application, the Town Engineer shall consider the provisions of this Ordinance, the Zoning Ordinance, and other applicable requirements.

**(2) Possible Action**

The Town Engineer shall make comments regarding the application. Based on those comments, the Zoning Administrator may either forward the application to the Plan Commission or recommend further review.

**a) Forward to Plan Commission**

The Zoning Administrator shall forward the application for Primary Plat review to the Plan Commission if addressing the Town Engineer comments will not require the applicant to significantly alter the layout of streets, lots, utility systems, topography, or other proposed subdivision features. The applicant shall revise the Primary Plat consistent with the comments received from the Town Engineer and supply revised application materials to the Zoning Administrator in preparation for the Plan Commission hearing.

**b) Recommend Re-submittal**

The Zoning Administrator may recommend further review of the Primary Plat application if addressing the comments will require significant alterations to the layout of streets, lots, utility systems, topography, drainage ways, or other proposed subdivision features. The applicant shall revise the Primary Plat consistent with the comments received from the Town Engineer and supply revised application materials to the Zoning Administrator in preparation for either review by the Town Engineer, or the Plan Commission hearing.

***1.*** No additional fees shall be required for the resubmittal, however the Zoning Administrator shall announce an updated Plan Commission hearing date.
***2.*** There shall be no limit to the number of times the Zoning Administrator may recommend the re-submittal of any application.

**E. Primary Plat Review**

**(1) Procedure**

**a) Assignment**

An application for the Primary Plat, which is determined to be complete and in proper form by the Zoning Administrator, shall be assigned a case number and placed on the Plan Commission agenda pursuant to the Plan Commission's Rules of Procedure. The Zoning Administrator shall notify the applicant of the meeting date.

**b) Zoning Administrator Review**

The Zoning Administrator shall review the proposed Primary Plat and submit a written report to the Plan Commission stating the facts concerning physical characteristics of the area involved in the subdivision of land, deficiencies in meeting provisions of the Subdivision Control Ordinance, public facilities available to service the area, and/or other pertinent facts. A copy of such report shall be made available to the applicant. The Zoning Administrator may also consult or meet with the Town Engineer when desired or necessary and include opinions of those persons in the report.

**c) Public Notice**

The requirements for public notice shall be per the Plan Commission's Rules of Procedures.

**d) Attendance**

The applicant shall be present at the Plan Commission meeting to present and explain the application for the Primary Plat, and address and discuss comments and concerns posed by the Plan Commission or interested parties. Failure to appear may result in the dismissal of the application for lack of prosecution.

**e) Public Hearing**

A public hearing shall be held in accordance with the Plan Commission Rules of Procedure.

**f) Review**

At their regularly scheduled public meeting, the Plan Commission shall review:

***1.*** The application for the Primary Plat.
***2.*** All supporting information including the site plan, lot access, elevations, etc.
***3.*** The testimony of the applicant.
***4.*** Information presented in writing or verbally by the Zoning Administrator, other applicable agencies or departments.
***5.*** Input from the public during the public hearing.
***6.*** Any applicable provisions of this Ordinance.
***7.*** Conformance with the goals, objectives and intent described in the Comprehensive Development Plan.
***8.*** Any other information as may be required by the Plan Commission to evaluate the application.

**g) Decision**

***1.*** The Plan Commission shall make Findings of Fact and take final action or continue the application for the Primary Plat to a defined future meeting date.
***2.*** The Plan Commission shall make the following Findings of Fact. Findings, or lack of findings, may be in the form of a general statement.

**i.** The subdivision of land is consistent with the Comprehensive Development Plan.
**ii.** The subdivision of land satisfies the prerequisites, development requirements and design standards for the applicable subdivision type in this Ordinance.
**iii.** The subdivision of land satisfies the applicable design standards in *Section 6: Design Standards*.
**iv.** The subdivision of land satisfies the applicable development standards in the Zoning Ordinance.
**v.** The subdivision of land satisfies all other applicable provisions of these Ordinances.

**h) Possible Action**

At the public hearing, the Plan Commission shall approve, approve with conditions, continue, or deny the Primary Plat.

***1. Approve***

The Plan Commission shall approve the Primary Plat if it is found to be completely consistent with the decision criteria listed in Section 4.3(E)(1)(g).

***2. Approve with Conditions***

The Plan Commission shall approve the Primary Plat with conditions if it is generally consistent with the decision criteria, but specific minor modifications are required to meet all of the applicable requirements.

***3. Continue***

The application may be continued based on a request by the Zoning Administrator, the applicant, a remonstrator, or an interested party. The application shall be continued in the case of an indecisive vote, a determination by the Plan Commission that additional information is required prior to action being taken on the request, or if an appropriate representative of the application fails to appear at the public hearing.

**i.** Additional legal notice shall not be required unless specified by the Plan Commission.

**ii.** The continuing of all applications shall be consistent with the Rules and Procedures of the Plan Commission.

***4. Deny***

The Plan Commission shall deny the Primary Plat if it is found to be inconsistent with the decision criteria and requires modifications that would result in significant changes to the characteristics of the subdivision. If the Primary Plat application is denied, the applicant may not resubmit the same application for 1 year from the date of disapproval. Fees and procedures for a resubmitted Primary Plat application shall be the same as if it were an original submittal.

**i) Documents of Findings**

The Plan Commission shall make written findings documenting its decision. The Zoning Administrator shall provide the applicant with a signed copy of the written findings of the Plan Commission that indicate the date of the Plan Commission's decision within 10 business days of the decision. The Zoning Administrator shall maintain 1 file copy of the proposed Primary Plat, all application materials, and the signed and dated findings letter.

**(2) Duration**

An approved Primary Plat shall be valid for one (1) year from the date the Plan Commission granted approval.

**(3) Sectionalizing Plats**

Sectionalizing (phasing) Major Subdivisions during the Primary Plat review of a Major Subdivision, a subdivider may present a phasing or sectionalizing plan. If a phasing plan is submitted, the build-out of the subdivision must be identified on the Primary Plat drawing and accompanying materials. As a part of this process, the Plan Commission can require that certain improvements be completed within or by a certain phase of the subdivision's development. For example, road termini, utility improvements, or neighborhood or community amenities may be required within the early phases of the subdivision.

Additional financial guarantee may be required for subdivisions developed in phases to ensure that public improvements are connected as shown in the approved Primary Plat or financial guarantee may be required to remain in place until all sections of the subdivision are completed. For example, prior to the development of a new phase or section, a maintenance guarantee may be required to ensure the satisfactory condition of the required improvements from earlier sections of the affected subdivision—or adjacent development. Financial guarantees must also be consolidated if different phases or sections are owned or controlled by the same subdivider.

## 4.4 Construction Plans

### A. Construction Plan Documents

The Construction Plans shall be based on the approved Primary Plat and shall be consistent with the Final Plat. Construction plans shall be prepared for all required improvements and certified by a land surveyor or engineer registered in the State of Indiana. The improvements shall be designed on state plane coordinates. The Construction Plans shall include the following:

**(1) Topographical Features Map**

A map noting significant physical and topographical features of the property, meeting the requirements of the Town Engineer, that extends 100 feet beyond the boundary lines of the proposed development. This map shall also show the direction of the flow of surface water runoff to and from the site.

**(2) Street Profiles**

Profiles showing existing and proposed elevations along center lines of all streets. Where a proposed street intersects an existing street or streets, the elevation along the center line of the existing street or streets within 100 feet of the intersection shall be shown. Radii of all curves, lengths of tangents, central angles on all streets, and intersection details shall be shown.

**(3) Street Cross-Sections**

Plans and profiles showing the location and typical cross-section of streets including curbs, gutters, rights-of-way, drainage facilities and easements, street trees, streetlights, street signs, sidewalks, manholes, and catch basins.

**(4) Street Systems Map**

Plans identifying each street's functional classification (consistent with the Thoroughfare Plan) and showing the location of all street tree planting areas, streetlights, street signs, sidewalks and/or pedestrian pathways, and permitted on-street parking areas.

**(5) Utility Systems Map**

Utility system plans showing the following:

**a)** the location, size, invert elevations, and top-of-casting of existing and proposed sanitary sewers, stormwater drains, water lines, gas lines, and fire hydrants, as applicable;

**b)** connections to any existing or proposed utility systems;

**c)** the location, size, material, and length of all pipes and other structures; and

**d)** the proposed horizontal alignment of manholes, pipes, culverts, streets and storm drain structures.

**(6) Grading Plan**

A site grading plan for the entire subdivision.

**(7) Drainage Plan**

Data regarding the proposed stormwater storage basin(s), including the top of bank elevation, invert elevations of primary and emergency spillways, size and pipe material of the primary spillway, emergency spillway shape and dimensions, and the width of the top of the embankment.

**(8) Significant Features**

Location, size, elevation, and other appropriate descriptions of any other existing physical and natural features or facilities including 100-year floodplains and floodways, water bodies, trees, the points of connection to proposed facilities and utilities, and the approximate high and low-water elevations of all ponds, lakes, and streams.

**(9) Other Approvals**

Copies of any necessary approvals from other agencies, such as any required approvals from the US Army Corps of Engineers, Indiana Department of Environmental Management, Indiana Department of Transportation, County Drainage Board, or Indiana Department of Natural Resources.

**(10) Other Features**

Title, name, address, signature, registration number and seal of the professional engineer and/or surveyor, and date, including revision dates and any other construction details required to be shown by the Zoning Administrator or the Town Engineer.

## 4.5 Approval of Construction Plans

The Zoning Administrator and Town Engineer shall review the Construction Plans, providing comments to the applicant and verifying the correctness of any required revisions.

### A. Submission Procedure and Requirements

Following the approval of the Primary Plat and prior to submission of the Final Plat for approval, the applicant, if they wish to proceed with the subdivision, shall file with the Zoning Administrator before starting work on any improvements three (3) sets and a digital version of the detailed plans and specifications thereof for approval.

### B. Review Process

The Zoning Administrator shall immediately refer these plans to the appropriate agencies of the affected participating jurisdictions for review. Once these agencies indicate their approval of the construction plans or fourteen (14) working days have elapsed since their distribution without a written response, the Zoning Administrator shall stamp the plans approved and return one (1) set to the applicant. In no event shall Final Plat approval be given prior to approval of the construction plans.

**(1) Documentation of Findings**

The Zoning Administrator and Town Engineer shall make written findings documenting any required revisions. The Zoning Administrator shall maintain 1 file copy of the proposed Construction Plans, all application materials, and the signed, dated findings letter.

**(2) Appeals**

All appeals of decisions by the Zoning Administrator and/or Town Engineer regarding the Construction Plans shall be made to the Plan Commission.

## 4.6 Final Plat Application

**A. Application Requirements**

Following approval or conditional approval of the Primary Plat and approval of the Construction Plans, the applicant, if he wishes to proceed with the subdivision, shall file with the Zoning Administrator a request for approval of a Final Plat. The application shall:

**(1)** Be submitted on forms available at the Town Hall and accompanied with the associated fee(s);

**(2)** Include the entire subdivision, or section thereof which derives access from an existing state, county, or municipal roadway;

**(3)** Be accompanied by three (3) hardcopies and in digital form of the Final Plat as described in this Ordinance;

**(4)** Totally comply with the Ordinance and the terms and conditions of Primary Plat approval;

**(5)** Be accompanied by the performance bond, if required, in a form satisfactory to the Plan Commission Attorney and in an amount established by the Plan Commission upon recommendation of the participating jurisdiction and shall guarantee the completion of all required subdivision and off-site public improvements;

**(6)** Be accompanied by any restrictive covenants in a form approved by the Plan Commission, where they have been proposed by the subdivider or required by the Plan Commission.

**B. Final Plat Drawing**

All Final Plats shall substantially comply with the Primary Plat and Construction Plans for the subdivision. The Final Plat shall be shown at an appropriate scale, shall be drawn on reproducible mylar, and shall include the following information on a sheet meeting the size and clarity requirements of the County Recorder:

**(1) Property Name**

The name of the subdivision followed by the words “Major Subdivision Final Plat” (the name shall not duplicate the name of any subdivision in Hendricks County that has previously been recorded).

**(2) Property Description**

**a) Legal Description**

An accurate metes and bounds description of the property boundary.

**b) Boundary Lines**

An accurate property boundary line expressed in feet and hundredths of a foot, with dimensions and angles, and the bearings of all lines to a minimum of 1/2 minute.

**c) Benchmark**

Accurate distances and directions to the nearest official monument, including reference corners.

**d) Composite Map**

A map of the entire subdivision Primary Plat indicating the area included on the Final Plat.

**(3) Property Ownership**

**a) Owner/Developer**
The name, street address, e-mail address, and telephone number of the legal property owner and the developer of the property or his/her agent. The ownership information shall include the citation of the last instrument conveying titles to each parcel of property involved in the proposed subdivision, giving grantee, date, and book and page or instrument number reference.

**b) Professionals Involved**
The name, street address, e-mail address, and telephone number of the professional land surveyor or engineer responsible for the Final Plat.

**(4) Subdivision Description**

**a) Legend & Notes**
A complete legend and notes, including north arrow, graphic scale, and date.

**b) Existing Features**
Accurate locations of all preexisting easements, rights-of-way, and other pertinent features on the property and/or intersecting the boundaries of the tract; including a description of their future use or abandonment.

**c) Public Ways**
The location, width, and other dimensions of the existing and proposed rights-of-way and easements for all streets, alleys, and pedestrian pathways. Street rights-of-way shall include street names but shall exclude setback and/or build-to-lines.

**d) Street Tree Areas**
All street tree planting areas coordinated with utility and sidewalk locations.

**e) Curve Table**
A complete curve table for all curves included in the plat.

**f) Lots**
The location, dimensions (expressed in feet and hundreths of a foot), area (expressed in acres and square feet), and the bearing of all lines to 1/2 minute for every lot and/or block created by the subdivision, including any remaining tract. All lots shall be consecutively numbered and all blocks shall be lettered in alphabetical order, consistent with the Primary Plat.

**g) Flood Information**
The location of any regulatory flood boundaries, including elevations, as of the date the Final Plat is drawn.

**h) Easements**
Accurate locations, widths, and other dimensions of all easements, including a description of their use.

**i) Monuments**
The location, type, material, and size of all existing and proposed monuments and markers included in the subdivision.

**j) Set-Aside Areas**
Accurate locations and dimensions for any property to be dedicated or reserved for public, semipublic, or community use, including any common areas and linear open space surrounding pedestrian pathways.

**k) Covenants & Restrictions**
The text of, or references to, any restrictions that will run with the land and become covenants in the deeds for the lots.

**l) Explanations**
An explanation of all easements and reservations.

**m) References**
Sufficient data acceptable to the Town Engineer to readily determine the location, bearing, and length of all lines for the reproduction of such lines on the property.

**n) Endorsement**
A statement signed and dated by the property owner(s) endorsing the Final Plat.

**o) Land Surveyor Certification**
Certification by a registered land surveyor.

**p) Plan Commission Approval Statement**
A form indicating the approval of the subdivision and providing a place for the signature of the Plan Commission President and Secretary and the date of Primary Plat approval.

**q) Other Endorsements & Signatures**
Forms providing the necessary statements, signatures, and dates for the recording of the Final Plat in the County Recorder's Office.

**r) Common Area Notation**
A note indicating that the maintenance of any common areas is the responsibility of the lot owner's association.

**C. Staff Review**

The Zoning Administrator and Town Engineer shall review the Final Plat providing comments to the applicant and verifying the correctness of any required revisions.

**(1) Other Approvals**
The applicant shall be responsible for obtaining the necessary approvals of any utility providers and other county, state, or Federal agencies.

**(2) Documentation of Findings**
The Zoning Administrator and Town Engineer shall make written findings documenting any required revisions. The Zoning Administrator shall maintain 1 file copy of the proposed Final Plat, all application materials, and the signed, dated findings letter.

**(3) Appeals**
All appeals of decisions by the Zoning Administrator and/or Town Engineer regarding the Final Plat shall be made to the Plan Commission.

## 4.7 Construction of Public Improvements

**A. Surety or Construction Options**

Upon approval of the Final Plat and Construction Plans, the applicant has 2 procedural options for completing the required improvements. The applicant may select either of the following procedures:

**(1) Performance Surety**

The applicant may submit performance surety for the required improvements as described by Section 4.7(B).

**(2) Construction of Improvements**

The applicant may construct all required improvements as described by Section 4.7(C).

**B. Performance Surety Option**

If the applicant chooses to submit performance surety prior to constructing the required improvements, the following process shall be followed:

**(1) Final Plat and Performance Surety Submittal**

Upon Zoning Administrator or approval of the Final Plat and Town Engineer approval of the Construction Plans, the applicant shall submit the following to the Zoning Administrator:

**a) Final Plat and Construction Plans**

The approved Final Plat and Construction Plans with all required modifications. The Final Plat shall be shown at an appropriate scale, shall be drawn on reproducible mylar, and shall be on a sheet meeting the size and clarity requirements of the County Recorder.

**b) Surety**

Performance surety for the subdivision improvements. The surety shall meet all requirements of *Section 5: Surety and Inspections* of this Ordinance.

**(2) Final Plat Review**

The Zoning Administrator shall review the Final Plat submittal and associated materials to verify its consistency with all previous approvals and to verify that all required modifications have been made to the plat.

**a) Plan Commission Endorsement**

The approval of the subdivision shall be certified on behalf of the Plan Commission by the President and Secretary who shall affix their signatures to the Final Plat original.

**b) Town Council Endorsement**

Following the signing of the Final Plat by the Plan Commission President and Secretary, the applicant shall contact the Town Council to have the Final Plat scheduled for review at their next scheduled meeting. The Town Council shall review the Final Plat's public dedications and other improvements, as well as the submitted performance surety for the construction of those improvements. If deemed acceptable, the Town Council shall sign the Final Plat.

**(3) Final Plat Recording**

It shall be the responsibility of the applicant to file the approved and signed Final Plat with the County Recorder within 30 days of the date of signature by the Plan Commission's President and Secretary.

**a) Other Documents**
Simultaneously with the filing of the Final Plat, the applicant shall record any agreements of dedication, covenants, and commitments together with any other legal documents that are required to be recorded. The filing and recording of a plat is without legal effect unless signed by the Plan Commission's President and Secretary.

**b) Final Copy Provided**
The applicant shall be required to submit a copy of the recorded Final Plat to the Zoning Administrator for the records of the Plan Commission.

**(4) Construction of Improvements**
No site work or earthwork shall be allowed until the Improvement Location Permit signifying the approval of the Construction Plans and recording of the Final Plat has been issued by the Zoning Administrator. The inspection of all improvements shall comply with Section 5.5 of this Ordinance. All required improvements shall be made by the applicant, at his/her expense, without reimbursement by the local government or any other improvement district. Prior to the acceptance of the public improvements by the Town Council, all applicants shall complete all of the required improvements as depicted on the approved Construction Plans.

**(5) Acceptance of Public Improvements**
Following the completion of the public improvements and their certification the applicant shall request that the matter be placed on the agenda of the Town Council.

**a) Materials Required**
The applicant shall provide As-Built documentation consistent with Section 5.4 and surety meeting the requirements of *Section 5: Surety and Inspections.*

**b) Review**
The Town Council shall review the condition of the public improvements and surety. The Town Council shall consider input from the Town Attorney, Zoning Administrator, and the town departments responsible for the maintenance of the improvements.

**c) Approval**
If the condition of the public improvements and the surety are deemed to be acceptable, the Town Council shall accept the improvements.

**C. Construction of Improvements Option**
If the applicant chooses to construct all required improvements prior to the recording of the Final Plat the following process applies. Upon Zoning Administrator approval of the Final Plat and Town Engineer approval of the Construction Plans, the applicant shall submit to the Zoning Administrator the approved Construction Plans with all required modifications. An Improvement Location Permit for the construction of the subdivision improvements shall then be issued.

**(1) Construction of Improvements**
No site work or earthwork shall be allowed until the Improvement Location Permit signifying the approval of the Construction Plans and Final Plat has been issued by the Zoning Administrator. The inspection of all improvements shall comply with *Section 5: Surety and Inspections* of this Ordinance. All required improvements shall be made by the applicant, at his/her expense, without reimbursement by the local government or any other improvement district. Prior to the acceptance of the public improvements by the Town Council, all applicants shall complete all of the required improvements as depicted on the approved Final Plat and Construction Plans.

**(2) Final Plat Submittal**

Upon completion of the public improvements, the applicant shall submit the following to the Zoning Administrator:

**a) Final Plat**

An approved Final Plat shown at an appropriate scale, drawn on reproducible mylar, and on a sheet meeting the size and clarity requirements of the County Recorder.

**b) Surety**

Maintenance surety for the subdivision improvements meeting the requirements of *Section 5: Surety and Inspections* of this Ordinance.

**(3) Final Plat Review**

The Zoning Administrator shall review the Final Plat submittal and associated materials to verify its consistency with all previous approvals. The approval of the subdivision by the Town Engineer shall be certified on behalf of the Plan Commission by the President and Secretary who shall affix their signatures to the Final Plat original.

**(4) Acceptance of Public Improvements**

Following the completion of the public improvements and their certification the applicant shall request that the matter be placed on the agenda of the Town Council.

**a) Materials Required**

The applicant shall provide As-Built documentation consistent with Section 5.4 and surety meeting the requirements of *Section 5: Surety and Inspections.*

**b) Review**

The Town Council shall review the Final Plat's public dedications and other improvements, submitted maintenance surety for those improvements, and the condition of the constructed public improvements. The Town Council shall consider input from the Town Attorney, Town Engineer, Zoning Administrator, and the town departments responsible for the maintenance of the improvements.

**c) Approval**

If the Final Plat, completed public improvements, and maintenance surety are deemed to be acceptable, the Town Council shall sign the Final Plat.

**(5) Final Plat Recording**

It shall be the responsibility of the applicant to file the approved and signed Final Plat with the County Recorder within 30 days of the date of signature by the Plan Commission's President and Secretary.

**a) Other Documents**

Simultaneously with the filing of the Final Plat, the applicant shall record any agreements of dedication, covenants, and commitments together with any other legal documents that are required to be recorded. The filing and recording of a plat is without legal effect unless signed by the Plan Commission's President and Secretary.

**b) Final Copy Provided**

The applicant shall be required to submit a mylar copy of the recorded Final Plat to the Plan Administrator for the records of the Plan Commission.

**D. Permit Restrictions**

No Improvement Location Permit shall be issued by the Zoning Administrator for any subdivision improvements or for any structure on any subdivision lot prior to the receipt of a copy of the recorded Final Plat for the records of the Plan Commission, except in the following instances:

**(1) Temporary Structures**

The Zoning Administrator may issue Improvement Location Permits for temporary structures, such as construction trailers, signs, and home sales trailers subject to the following conditions.

**a)** The structure shall be provided with adequate access from a public street.

**b)** The structure shall be provided with adequate sewage disposal and utility facilities.

**c)** The location and placement of the temporary structure shall not cause a hazard to the welfare of any members of the public as a result of the construction activities on the site.

**(2) Model Homes**

The Zoning Administrator may issue Improvement Location Permits for model homes subject to the following conditions:

**a)** The home shall be provided with adequate access from a public street.

**b)** The home shall be provided with adequate sewage disposal and utility facilities.

**c)** The location and placement of the home shall not cause a hazard to the welfare of any members of the public as a result of the construction activities on the site.

**d)** Appropriate grading and drainage shall be completed for the model home site prior to the model's placement or construction.

**e)** No more than 1 home may be located on any existing parcel or property. *Example: If the subdivision is occurring on one parcel of property then only one model home may be constructed prior to the recording of the Final Plat and the legal establishment of additional lots. Additional model homes are permitted following the recording of the Final Plat*.

**E. Occupancy Restrictions**

No permanent Certificate of Occupancy shall be issued for any structure until all required public improvements have been completed and accepted by the Town Council for the lot that the structure occupies. In no instance shall this provision be interpreted as preventing the issuance of a temporary Certificate of Occupancy allowing the use of structures prior to the acceptance of public improvements.

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# SECTION 5:
# SURETY and INSPECTIONS



## 5.1 Surety Requirements

### A. Surety Required

At the time when the Final Plat is placed on the Town Council agenda for their signatures, the subdivider shall provide appropriate surety for the public improvements related to the subdivision (including both on and off-site improvements). All surety shall be filed with the Zoning Administrator and maintained in the office of the Clerk-Treasurer.

### B. Sectionized Plat Surety

For Major Subdivisions that have been divided into sections for the purpose of a phased development, additional financial guarantee may be required for subdivisions developed in phases to ensure that public improvements are connected as shown in the approved Primary Plat or financial guarantee may be required to remain in place until all sections of the subdivision are completed. For example, prior to the development of a new phase or section, a maintenance guarantee may be required to ensure the satisfactory condition of the required improvements from earlier sections of the affected subdivision—or adjacent development. Financial guarantees must also be consolidated if different phases or sections are owned or controlled by the same subdivider.

### C. Surety Specifications

All surety shall be in a format and amount consistent with this Section, including the following requirements:

**(1) Recipient**
The surety shall be drawn in favor of the "Town of Lizton, Indiana".

**(2) Provider**
The surety shall be provided by a company certified to bond by the Federal government consistent with Circular 570 and any subsequent amendments.

**(3) Improvements Requiring Surety**
Performance surety shall be provided for all incomplete public improvements, including but not limited to street compaction, subsurface, base, and surface; street signs; street lights; street trees; pedestrian pathways; sanitary sewers; curbs; gutters; sidewalks; surface swales; subsurface and storm drainage systems; seeding/erosion control; monumentation; required through lot buffering & screening; and any other public improvements required by this

Ordinance, the Plan Commission, or other appropriate public agency. Upon the acceptance of these public improvements by the Town Council maintenance surety shall be provided.

**a) Lot Improvements**
Performance surety shall specifically include an amount to guarantee the completion of all lot improvements including, but not limited to, soil preservation, final grading, lot drainage, lawn seeding and/or sod, removal of debris and waste, and other items identified by the Town Engineer.

**b) Temporary Improvements**
Performance surety shall be provided for the construction, maintenance, and removal of temporary public improvements. In the case of temporary turn-arounds for stub streets connecting to future development the performance surety shall provide only for installation, and maintenance surety shall be provided consistent with that for other subdivision improvements.

**(4) Asphalt Surface Exception**
A subdivider may request permission, in writing, of the Town Engineer to delay the installation of the surface layer of asphalt until the binder layer has had a sufficient time period to prove its durability under the stress of traffic. The subdivider shall be required to submit a separate performance surety to cover the cost of the installation of the surface layer of asphalt.

**(5) Amount & Time Frame**
The surety shall be in an amount and time period sufficient to adequately maintain completed improvements or to install yet incomplete improvements in compliance with this Ordinance. The subdivider's engineer or contractor shall supply an estimate of the cost of the improvements and their installation to aid the Town Engineer in the determination of the amount of the surety. The petitioner's estimate, however, shall not be binding.

**a) Maintenance Surety**
Maintenance surety shall be provided in an amount equal to 25% of the cost of the public improvements and their installation and shall be provided for a period of 3 years from the date the improvements are accepted by the Town Council.

**b) Performance Surety**
Performance surety shall be provided in an amount equal to 120% of the cost of the yet incomplete public improvements and their installation and shall be provided for a time period sufficient to ensure the installation of the improvements, but not more than 2 years. The Town Council may grant a maximum 1 year extension of the surety period, provided that replacement surety, reflecting the new time frame, is provided by the subdivider.

**c) Multiple-Use Surety**
If multiple types of improvements (such as street surface and sanitary sewers) are included on a single surety, the Town Council shall be permitted to use the entire bond amount for the installation of a single improvement, regardless of any itemization that has been established.

**(6) Form of Surety**
The surety shall be provided in the form of a bond, a certified check, an irrevocable letter of credit, or a certificate of deposit. The surety shall be consistent with U.S. Circular 570 and any subsequent amendments.

**(7) Applicability**

The surety shall specifically list the name of the subdivision (including phase and/or section) to which it applies, the date from which it is valid, the time period for which it is valid, the public improvements to which it applies, and whether it is "maintenance" or "performance" surety. The surety shall further comply with all statutory requirements and shall be satisfactory to the Town Attorney, Town Engineer, Zoning Administrator, and Clerk-Treasurer as to form, sufficiency, and manner of execution as set forth in this Ordinance.

**D. Performance Surety Reduction**

The amount of performance surety may be reduced upon the actual dedication and acceptance of portions of the public improvements for which the surety was originally posted. A maximum of 2 reductions are permitted during the life of any surety. Any such reduction shall be at the discretion of the Town Council based on the recommendation of the Town Engineer. The reduction of performance surety shall follow the procedure for the release of performance surety provided by Section 5.2.

**E. Building Permit Limitations**

No Improvement Location Permits shall be issued for structures on the final 25% or 2 lots (whichever is greater) in a subdivision section until all public improvements have been accepted by the Town Council and all performance surety for that section has been converted to maintenance surety.

## 5.2 Release of Performance Surety

**A. Release Request**

Upon completion of the public improvements for which performance surety has been provided, the subdivider shall make a written request to the Town Engineer for the release of the surety and the acceptance of public improvements. The request shall include the following:

**(1) Description of Improvements**
A description of the public improvements that have been completed;

**(2) Engineering Report**
A report from the subdivider's engineer, who must be licensed by the State of Indiana, certifying that the improvements were completed consistent with all applicable requirements and standards, and that the improvements are free and clear of all liens and other encumbrances; and

**(3) Maintenance Surety**
Maintenance surety for the public improvements consistent with the requirements of Chapter 5.1 C (5) of this Section.

**B. Inspection of Improvements**

Appropriate inspections of the public improvements shall occur consistent with the provisions of Section 5.5 and the adopted policies of the Town Engineer. Before any performance surety covering a street installation is released, the Zoning Administrator or Town Engineer may request that core borings of the street be done at the subdivider's expense. Cores shall be reviewed by an independent testing laboratory or registered engineer for analysis. Any requests for testing by the Zoning Administrator and/or Town Engineer may be appealed by the subdivider to the Town Council.

**C. Decision Criteria**

In reviewing requests for the release of performance surety the Town Council shall consider the following:

**(1)** Whether or not the improvements were completed in a manner consistent with the approved Primary Plat, approved Construction Plans, and all applicable standards and requirements;

**(2)** Whether or not the report provided by the subdivider's engineer is complete and satisfactory; and

**(3)** Whether or not the public improvements are in good condition and appropriate for use by the public.

**a)** All streets, sidewalks, and other pedestrian pathways shall be clear of all dirt, debris, standing water, and construction equipment and/or supplies.

**b)** All drainage structures shall be clear of sedimentation, debris, or other obstructions and be adequately secured to prevent access by the public.

**c)** All erosion control measures shall be consistent with applicable standards for the limiting of erosion and sedimentation.

**d)** The areas adjacent to all sidewalks and other pedestrian pathways shall be graded and seeded.

**e)** All sanitary sewer infrastructure and facilities shall meet the inspection, testing, and other requirements of the Town.

**D. Default**

In any case where the required public improvements have not been completed prior to the date the performance surety expires, and the Town Council and the subdivider are unable to reach agreement on an extension of the time frame for the surety and the completion of the public improvements, the Town Council may declare the surety to be in default. The required public improvements may then be installed by the Town, using the funds from the surety.

## 5.3 Release of Maintenance Surety

### A. Maintenance Required

The subdivider shall be required to ensure that, upon acceptance by the Town Council, public improvements are covered by maintenance surety and that they remain free of construction related defects for the term of that surety.

**(1) Inspections**

The public improvements shall be subject to periodic inspection by the Town. Written notice shall be provided to the subdivider of any defects that are detected and any corrections that are required. The subdivider shall make the necessary corrections consistent with all applicable requirements.

**(2) Surety for Repairs**

The Town Council may require that additional maintenance surety be provided for any portion of the public improvement that was subject to repair for a time period of 3 years from the date the repair was completed.

### B. Release Request

Prior to the expiration of the surety, the subdivider shall make a written request to the Town Engineer for the release of the surety on the expiration date. The request shall include the following:

**(1) Description of Improvements**

A description of the public improvements to which the surety applies; and

**(2) Engineering Report**

A report from the subdivider's engineer, who must be licensed by the State of Indiana, certifying that the improvements remain free of construction related defects, and that the improvements are free and clear of all liens and other encumbrances.

### C. Inspection of Improvements

The Zoning Administrator and Town Engineer shall provide appropriate inspections of the public improvements, including a final on-site inspection.

### D. Substitution of Performance Surety

Subject to the approval of the Town Council, the subdivider may provide a performance surety for any portion of the public improvements to be corrected in lieu of the completion of the correction in order to obtain the release of the maintenance surety.

**(1) Limitations**

Generally, the use of performance surety in this manner shall be limited to instances when weather conditions or other features unique to the subdivision or nature of the public improvements prevent the timely completion of the required corrections.

**(2) Timeframe**

In no case may the time period provided for the completion of the corrections and the performance surety be more than 1 year from the date that notice of the required corrections is provided to the subdivider.

### E. Decision Criteria

In reviewing requests for the release of maintenance surety the Town Council shall consider the following:

**(1)** Whether or not the improvements are free of construction related defects;

**(2)** Whether or not the report provided by the subdivider's engineer is complete and satisfactory;

**(3)** Whether or not the public improvements are in good condition and appropriate for use by the public.

**a)** All streets, sidewalks, and other pedestrian pathways shall be clear of all dirt, debris, standing water, and construction equipment and/or supplies.

**b)** All drainage structures shall be clear of sedimentation, debris, or other obstructions and be adequately secured to prevent access by the public.

**c)** All erosion control measures shall be effective consistent with applicable standards for the limiting of erosion and sedimentation.

**d)** The areas adjacent to all sidewalks and other pedestrian pathways shall be graded and seeded.

**e)** All sanitary sewer infrastructure and facilities meet the inspection, testing, and other requirements of the Town.

**F. Default**

In any case where the public improvements are not deemed to be free of construction defects and otherwise in unsatisfactory condition prior to the date the maintenance surety will expire, and the Town Council and the subdivider are unable to reach agreement on an extension of the time frame for the surety and the correction of the public improvements, the Town Council may declare the surety to be in default. The required corrections to the public improvements may then be made by the Town, using the funds from the surety.

## 5.4 As-Built Documentation

### A. As-Built Documentation Required

As-Built documentation meeting the requirements of this Section shall be required for all completed public improvements. No public improvements shall be accepted by the Town Council prior to the provision of acceptable As-Built documentation.

**(1) Hard-Copy Documentation**
Finalized As-Built drawings shall be provided to the Zoning Administrator.

**(2) Electronic Documentation**
Finalized As-Built electronic files shall be provided to the Zoning Administrator in a format consistent with the requirements and the Rules and Procedures of the Plan Commission.

### B. As-Built Drawing Specifications

A professional land surveyor or engineer, licensed in the State of Indiana, shall certify all As-Built drawings. Finalized As-Built drawings shall be provided to the Zoning Administrator and shall include the following information:

**(1) Street Profiles**
Profiles showing elevations along center lines of all streets at 50 foot maximum intervals, at high and low points, and at all intersections.

**(2) Grading Data**
Building pad elevations, flow line elevations of the highpoint along side yard swales, and spot elevations along the flow line of rear yard swales at intersections with property lines and the midpoint of the swale on each lot. The distance between spot elevations along rear yard swales shall not exceed 50 feet.

**(3) Utility Systems**
Utility system documentation showing the following:

**a)** all structure and pipe inverts and top-of-castings;

**b)** all pipe sizes, materials, and the length of pipe structures;

**c)** the horizontal alignment of manholes, pipes, culverts, streets and storm drain structures to an accuracy of +/- 2 feet.

**(4) Drainage Facilities**
Data regarding the stormwater storage basin(s), including the top of bank elevation, invert elevations of primary and emergency spillways, size and pipe material of the primary spillway, emergency spillway shape and dimensions, and the width of the top of the embankment. The horizontal location and/or bank cross sections for all wetbottom and dry-bottom storage facilities or other information sufficient to verify that constructed stormwater storage facilities provide the required minimum runoff storage volume shall also be indicated. The drawings shall include a certified statement that the completed storm water drainage system substantially complies with the approved Construction Plans.

**(5) Other Information**
Any other details required to be shown by the Zoning Administrator or Town Engineer.

## 5.5 Inspection of Public Improvements

### A. Execution of Contractual Agreement

As a condition of Construction Plan approval, the developer shall enter into a contractual agreement with the Town Council to provide for public improvement inspection and testing services in accordance with the standards and procedures of this Ordinance. The agreement shall be subject to terms and conditions specified by the Town Council.

### B. Duties and Powers of Inspectors

The Town Engineer, or his/her designated representative, shall be responsible for adequate inspection of all public improvements constructed within the jurisdiction of the Town. Private improvements, including but not limited to drainage, streets, grading, and erosion control, shall also be subject to inspection when they are determined by the Town Engineer to have the potential to affect adjacent property. The inspector shall perform, but not be limited to, the following duties:

**(1) Monitor**
Monitor work being performed to insure that it complies with the standards and specifications of this Ordinance;

**(2) Record**
Maintain an accurate log of inspections and findings;

**(3) Enforce**
Issue directives or stop-work orders when necessary to assure compliance with this Ordinance; and

**(4) Report**
Make reports to the Town Council when necessary or requested.

### C. Installation and Inspection of Improvements

All improvements shall be installed consistent with the approved Construction Plans. The developer shall be responsible for requesting inspections consistent with the policies of the Town Engineer. Inspection shall be required as follows:

**(1) Street Sub-Grade**
When the street sub-grade has been graded to proper elevation and compacted in compliance with Town specifications. No stoning or paving shall occur until approval has been granted by the inspector.

**(2) Street Sub-Base**
When the stone sub-base has been graded and compacted in compliance with Town specifications. No paving shall occur until approval has been granted by the inspector.

**(3) Street Paving**
During the time of paving.

**(4) Drainage Rough-In**
When the land has been cut to grade and properly sloped in compliance with the approved Construction Plans.

**(5) Open Trench Storm Sewer Rough-In**
When all conduits or storm sewer structures that are to be at or below grade level are in place in the open trench.

**(6) Open Trench Sanitary Sewer Rough-In**

When all conduits or sanitary sewer structures that are to be at or below grade level are in place in the open trench. The developer shall provide the Town Engineer with documentation of all requested tests and certification.

**(7) Sidewalk Sections**

At the time relatively large sections of sidewalk involving several lots have been poured and all forms removed. No backfilling or grading shall occur until approval has been granted by the inspector. If sidewalks on a lot-by-lot basis, all work necessary for complete installation of the sidewalk, including backfilling, may occur without approval. The Town Engineer may make periodic inspections of such sidewalks to assure compliance with approved Construction Plans and related specifications.

**(8) Subdivision or Section Completion**

When work for all improvements in a subdivision (or subdivision section) has been completed.

# SECTION 6:
# DESIGN STANDARDS

## 6.1 Purpose and Use

**A. Design Standards**

This Article provides the standards for all subdivisions. Every subdivider shall be required to install these general and public improvements consistent with the requirements of this Ordinance and any other applicable regulations.

**B. Purpose**

The purpose of these regulations is to:

**(1)** promote the proper arrangement of streets and other infrastructure;

**(2)** prevent congestion of streets and promote traffic safety;

**(3)** provide adequate public improvements;

**(4)** insure the accurate survey and proper preparation of plats; and

**(5)** protect the health, safety, and general welfare of the community.

**C . Standards**

No Primary or Final Plat of land will be approved unless it conforms with the Zoning Ordinance.
Whenever there is a variance between the minimum standards set forth in these regulations and those contained in the Zoning Ordinance, building code, or other regulations, the highest standards shall apply.

## 6.2 General Standards

### A. Land Suitability

No land shall be subdivided for any use if the land is considered by the Plan Commission to be unsuitable for such use by reason of flooding or improper drainage, objectionable earth or rock formations, incompatible topography, or other features harmful to the health, safety and welfare of future residents or visitors or to the community as a whole.

### B. General Welfare

The subdivision design and layout shall be such that it protects the health, safety, and general welfare of the residents of the Town of Lizton as defined by this Ordinance.

### C. Applicable Regulations

In addition to the requirements established by this Ordinance, all subdivision plats shall comply with the following guidelines, rules, laws, and regulations:

**(1)** The Zoning Ordinance, building code, Lizton Utilities standards, all other applicable laws of the Town of Lizton, and the statutory provisions of the State of Indiana.

**(2)** The current Comprehensive Plan, Parks & Recreation Master Plan, and any other applicable plans.

**(3)** The rules and regulations of the Indiana Department of Environmental Management, Department of Natural Resources, Board of Health, and other appropriate State agencies.

**(4)** The rules, regulations and standards of the Indiana Department of Transportation (if the subdivision abuts a state highway and/or affects an airport or railroad).

**(5)** The rules and regulations of the County Board of Health, Drainage Board, and other appropriate County agencies.

**(6)** All applicable planning and regulatory guidelines, including access control and driveway manuals, parking and traffic control ordinances, and other applicable guides published or adopted by the Town.

**(7)** The "Indiana Manual of Uniform Traffic Control Devices" and current AASHTO standards as specified by the Town Engineer.

**(8)** The applicable specifications and requirements of the utility providers serving each subdivision.

### D. Design Requirements

All subdivisions should be designed on state plane coordinates. All Final Plats and "As-Built" drawings shall be made available in an electronic format specified by the Zoning Administrator that can be referenced to state plane coordinates. GIS Coordinates shall be provided for all buried utilities. Refer to As-built requirements for additional information.

### E. Utilities

All utility lines shall be located underground throughout each subdivision. Whenever existing utilities lines are located above ground, except along public roads and rights-of-way, they shall be replaced underground. Service connections, placed underground, shall be provided to each lot by the subdivider.

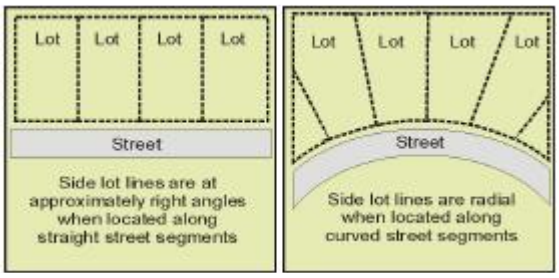
## 6.3 Lot Standards

### A. Orientation to Streets

The lot size, width, depth, shape, grade, location, and orientation shall be in proper relation to the street and block design and to existing and proposed topographical conditions.

**(1) Side Lot Lines**

Side lines of lots shall be at approximately right angles to straight streets and on radial lines on curved streets. Some variation from this requirement is permissible, but irregular lots, such as flag lots shall generally be prohibited.




**(2) Street Frontage**

Every lot shall abut a public street, or private street approved with a Primary Plat, consistent with the requirements of this Ordinance and the Zoning Ordinance.

### B. Double-Frontage Lots

Double Frontage lots (also known as through lots) shall be avoided except where essential to provide separation of residential development from arterial and collector streets or to overcome specific disadvantages of topography and orientation.

**(1)** For all residential through lots, a landscape common area or easement shall be provided between the yard of each lot and the right-of-way of the adjacent arterial / collector street.

**(2)** The landscaped area shall be a minimum of 15 feet in width and shall meet the following requirements:

**a)** The landscape area shall be in addition to the minimum lot area required by the Zoning Ordinance.

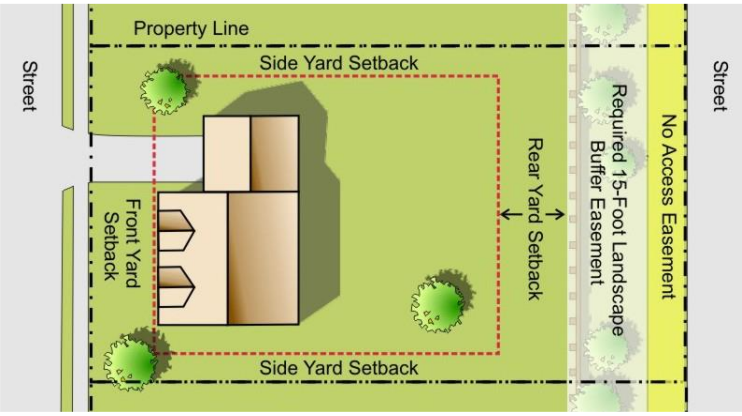
**b)** A row of broad leaf / deciduous canopy trees shall be planted parallel to the adjacent arterial / collector street, within the landscape area, with one tree provided for every 300 square feet of landscape area. The trees shall measure 2 1/2 inches in diameter at 6 inches above the rootball at the time of planting.

**c)** A 6-foot-tall opaque wooden fence, brick or stone wall, or alternate of similar material approved by the Plan Commission; a 4-foot-tall undulating mound planted with shrubs, or a row of evergreen trees shall also be placed within the landscape area.

***1.*** If an undulating mound is used to fulfill the requirements, 1 shrub for every 5 feet of continuous boundary shall be planted on the mound. All required shrubs shall measure 18 inches in height, measured from grade, at the time of planting.

***2.*** If a row of evergreen conifer trees is used to meet the requirements, 1 tree shall be placed every 10 feet along the common area. Evergreen conifers shall be a minimum of 6 feet in height, measured from the top of the rootball, at the time of planting.

**d)** An association of lot owners in the subdivision shall be responsible for the maintenance and upkeep of any landscape common area.




**C. Multiple Frontage Lots**

Corner lots, through lots, and other lots that have frontage on more than 1 street shall be required to provide front yard setbacks on all frontages and shall be designed with adequate size and width to accommodate the required setbacks and to provide an adequate buildable area.

**(1)** Adequate buildable area shall be defined as that which is equal to the buildable area provided or interior lots in the same subdivision.

**(2)** A "no-access" easement shall be provided along all frontages from which this Ordinance, the Zoning Ordinance, or the Plan Commission indicates access shall be prohibited.

**D. Lot Numbering**

Lots shall be numbered consecutively throughout the entire subdivision and shall be consistent with any phasing that may be planned for the development.

**E. Lots Abutting a Watercourse**

Lots abutting a watercourse, drainage way, channel, stream, or flood plain shall have additional minimum width or depth as required to provide an adequate building site and accommodate the requirements of the Zoning Ordinance.

**F. Street Access**

Access to streets shall generally be permitted in a manner consistent with the Thoroughfare Plan and the intent of the street system design for each subdivision.

**(1) General Standards**

The Plan Commission may, upon the recommendation of the Town Engineer, prescribe any treatment necessary for adequate protection of residential properties, and/or to afford separation of through and local traffic.

**(2) Arterial and Primary Collector Street Standards**

No lot zoned for purposes other than commercial or industrial use shall derive access from an arterial or primary collector street. Where a subdivision abuts or include an arterial or collector street the Plan Commission may require:

**a)** double frontage lots that include a no-access reservation along the property line shared with the arterial or primary collector street,

**b)** shared driveways or other marginal access designs,

**c)** frontage roads, and/or

**d)** alleys.

**(3) Secondary Collector Street Standards**

Where several adjoining lots are designed with access from a secondary collector street, the Plan Commission may require the use of shared driveways or other marginal access designs for those lots. The use of shared drives is specifically encouraged where non-residential uses access a secondary collector street.

## 6.4 Block Standards

### A. Block Dimensions

Block length, width, and acreage within bounding streets shall be appropriate to accommodate the size of lot required by the Zoning Ordinance for the district in which the subdivision is to be located, and to provide convenient access, circulation control, and traffic safety.

**(1) Block Width**

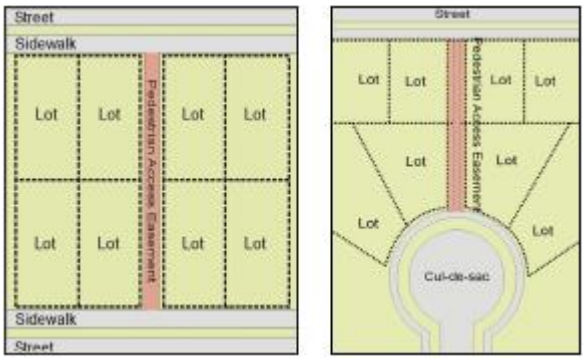
Blocks shall have sufficient width to provide for 2 tiers of lots of appropriate depth. Exceptions to this prescribed block width shall be permitted where double frontage lots are used in blocks adjacent to arterial or collector streets, watercourses, or industrial or commercial areas.

**(2) Block Length**

Blocks shall not exceed 800 feet in length, nor be less than 200 feet in length. Block length shall be measured as the distance between center lines of intersecting streets.

### B. Mid-block Access

In blocks exceeding 600 feet in length and/or at the end of cul-de-sacs, the Plan Commission may require that a common area or easement be provided through the block to accommodate utilities, drainage, and/or pedestrians.




**(1) Common Area/Easement Standards**

Any required common area or easement shall be a minimum of 15 feet in width and shall be provided near the center and entirely across any block.

**(2) Pedestrian Access Construction Standards**

All required pedestrian accesses shall be constructed consistent with the sidewalk standards provided in Section 6.10 and shall be a minimum of 5 feet in width.

**(3) Maintenance & Ownership**

An association of lot owners in the subdivision shall be responsible for the maintenance and upkeep of any common area.

## 6.5 Street Arrangement Standards

### A. General Requirements

The arrangement, character, width, grade, and location of all streets shall be consistent with existing and planned streets, existing topography, public convenience and safety, and the proposed land uses in the subdivision.

**(1) Thoroughfare Plan**

The arrangement of all streets within each subdivision shall conform to the Thoroughfare Plan. Where the Thoroughfare Plan indicates the development of street system extensions or improvements, the construction and dedication of those streets shall be incorporated into the subdivision design. Rights-of-way shall be platted by the subdivider in the location and of the width recommended by the Thoroughfare Plan.

**(2) Natural Features**

Proposed streets shall be adjusted to the contour of the land in order to produce usable lots, provide streets of reasonable gradient, and preserve the aesthetic quality and natural drainage provided by the topography and natural features of the property.

**(3) Access**

The street layout shall provide adequate vehicular access to all lots and within the subdivision, to any remaining tract, and to all adjacent undeveloped properties and stubbed streets.

### B. Design Considerations

In designing and reviewing subdivision street systems, the following factors shall receive consideration:

**(1)** accessibility for emergency vehicles and school buses;

**(2)** safety for both vehicular and pedestrian traffic;

**(3)** efficiency of service for all users;

**(4)** connectivity between subdivisions and the development of complete communities; and

**(5)** economy of both construction and use of land.

### C. Private Streets

The use of any private street is specifically discouraged.

**(1) Construction Standards**

All private streets shall comply with all Town standards for public street construction. This shall include, but not be limited to, sidewalks, street trees, pavement width and construction, and drainage.

**(2) Width**

All private streets shall be included in an easement of width equal to the right-of-way that would be required if the street were public. This easement shall not be counted as a part of any lot for the purpose of that lot meeting the minimum size requirements for the district in which it is located.

**D. Pond Locations**

No subdivision shall be designed or constructed to allow any portion of a pond to encroach into a street right-of-way. If any portion of a pond is located within the building setback or build-to line or the slope from the street surface to the water's edge exceeds 1:5 (rise:run) then guard rails shall be required along the roadway consistent with the Indiana Department of Transportation specifications or approved by the Town Engineer.

**E. Street Arrangement**

The arrangement of streets in all subdivisions shall promote the continuation of existing and proposed street systems, as well as the street system to be provided as a result of the subdivision construction.

**(1) Street Functions**

Local streets shall be designed and arranged to discourage their use by through traffic. Arterial and Collector streets shall be designed to promote through traffic. Collector streets shall be used to create connections between subdivisions consistent with the Thoroughfare Plan.

**(2) Continuation of Existing and Proposed Street Systems**

The arrangement of streets in all subdivisions shall provide for the continuation of existing and proposed streets on immediately adjacent properties and in surrounding areas consistent with the Thoroughfare Plan.

**(3) Continuation of Subdivision Streets**

Right-of-way of proposed streets shall be extended to the boundary lines of the proposed subdivision so that either (1) at least one connection may be made to each adjacent undeveloped property, or (2) at least one connection may be made for every 1,600 feet of property line shared between the subdivision and adjacent undeveloped property. In cases where these provisions are in conflict, that which provides the most points of connectivity shall apply.

**a)** The Plan Commission may waive this requirement in cases where the Plan Commission deems that any such extension is not feasible due to topography or other physical conditions, or not appropriate for the development of adjacent property consistent with the Comprehensive Plan.

**b)** No subdivision shall be designed so as to create or perpetuate the land-locking of any adjacent property.

**(4) Dead-End Streets**

All permanent dead-end streets shall include a cul-de-sac meeting the standards of Section 6.8. A temporary dead-end street may be permitted in any case in which a street is designed to be extended to adjacent properties in the future.

**a)** Any temporary dead-end street that extends more than 200 feet in length shall be provided with a temporary cul-de-sac or other turn-around consistent with the requirements of the Town Engineer.

**b)** Any temporary turn-around shall be included in a roadway easement that shall be vacated to the property owners at the time the street is extended or the Town Engineer determines that the turn-around is no longer needed.

**c)** All temporary dead-end streets shall be provided with street signs (consistent with Section 6.13) that indicate the road as being a "temporary dead-end". The subdivider shall assume all costs of the installation of the signs.

**(5) Additional Collector Streets**

The Plan Commission may require that streets anticipated to serve the lot counts specified below be designed, constructed, and designated as collector streets in addition to those shown on the Thoroughfare Plan.

**a)** Streets anticipated to serve between 150 and 300 lots may be considered secondary collector streets.

**b)** Streets anticipated to serve greater than 300 lots may be considered primary collector streets.

**F. Limited Access Highway / Railroad Accommodation**

Where a subdivision borders on or contains an existing or proposed interstate or other limited access highway or a railroad right-of-way, the Plan Commission may require (1) a street approximately parallel to, and on each side of the right-of-way, at a distance suitable for the appropriate use of the intervening land, or (2) screening meeting the requirements of Section 6.3(C).

**(1)** Parallel street separation distances shall be determined with due regard for the requirements of approach grades, future grade separations, and adequate locations for non-residential land uses. Streets parallel to a railroad shall be a minimum of 200 feet (measured from the edge of each right-of-way) from that railroad when intersecting a street that crosses the railroad at grade.

**(2)** The Plan Commission may require that any landscaped areas or intervening land strips be dedicated to the Town as right-of-way, or to a lot owners association for the subdivision in which they are located.

**G. Half-Streets (Single Lane Streets)**

The construction and/or dedication of half-streets shall be prohibited. Whenever a half-street is adjacent to a property to be subdivided, the other half of the street shall be platted and constructed within the subdivision.

**H. Improvement of Existing Streets**

Whenever a proposed subdivision borders or includes an existing street the design and construction of the subdivision shall include the reconstruction, realignment, or widening of such street; the provision of sidewalks; and any other improvement consistent with the requirements of this Ordinance for new streets developed as a part of a subdivision.

**(1) Right-of-Way**

Additional dedication of right-of-way may be required consistent with the adopted Thoroughfare Plan and/or for the construction of adequate passing blisters or tapers at intersections. The right-of-way shall be obtained by the subdivider and dedicated to the Town prior to Final Plat approval.

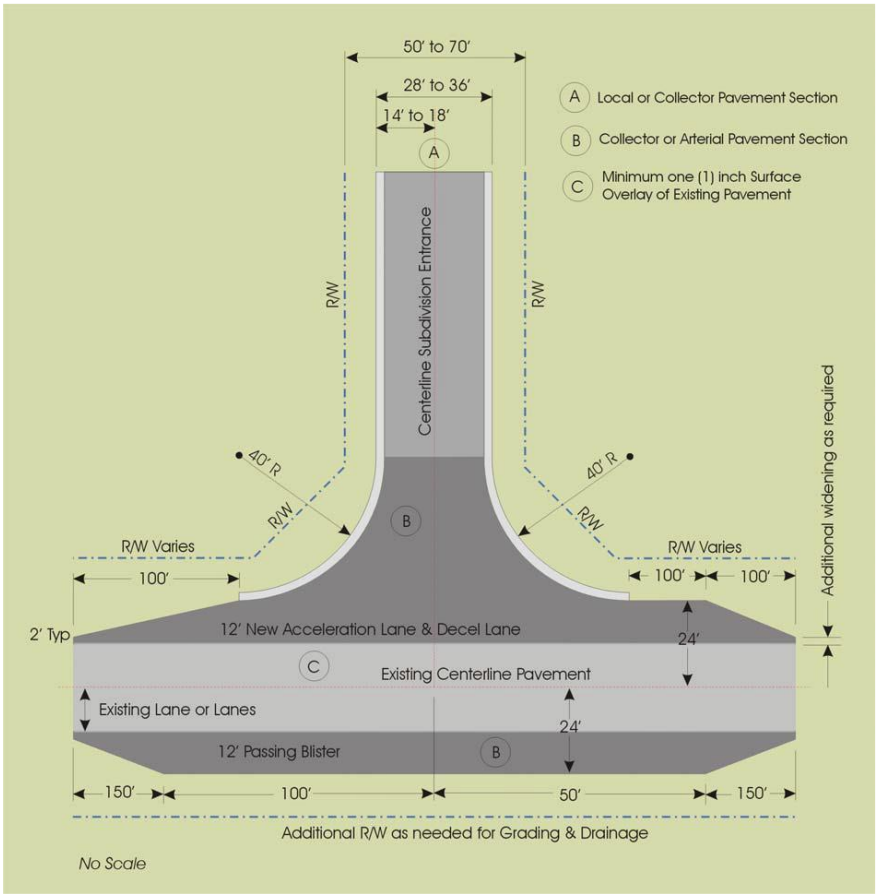
**(2) Intersection Improvements**

At the intersection of a subdivision street or planned drive with an existing street, the subdivider shall install deceleration, acceleration, and passing lanes meeting the requirements of the Town Engineer.

**a)** These improvements shall require a 1-inch overlay of bituminous surface, which extends across the full width of the existing street in addition to the new features.

**b)** The extreme ends of any taper and/or blister shall be the limits of the required improvements.

**c)** Butt joints shall be milled at the ends of the improvements to ensure a smooth transition.




**I. Alleys**

Alleys may be required at the discretion of the Plan Commission. All alleys shall have a minimum pavement width of 12 feet, shall be consistent with the design and construction standards provided in Sections 6.6 and 6.7 of this Ordinance, and shall meet any additional requirements of the Town Engineer.

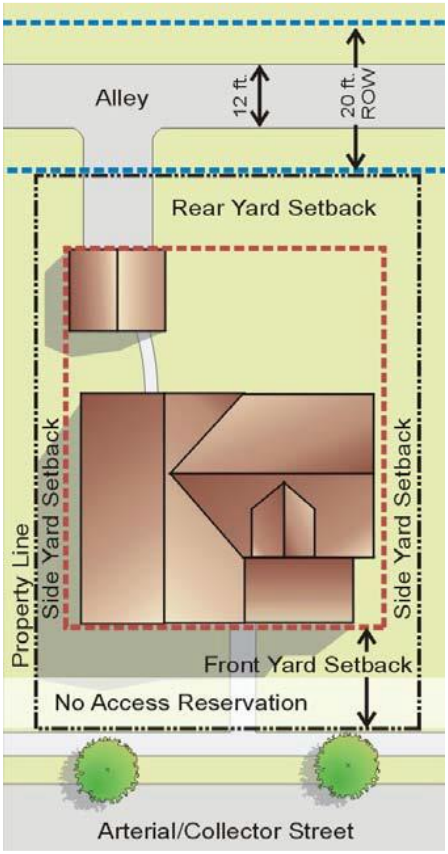
**(1)** Dead-end alleys shall be prohibited.

**(2)** The use of alleys shall be considered in the following circumstances.

**a) Service Access**
Alleys may be provided in order to accommodate service access and off-street parking and loading.

**b) Rear Access**

Where blocks are developed along an arterial or collector street alleys may be provided to allow vehicle access to lots fronting on that street.



## 6.6 Street Geometric Standards

### A. General Requirements

The functional classification of all streets shall be defined by the Thoroughfare Plan. The Plan Commission shall assign a classification, based on the provisions of the Thoroughfare Plan, to all proposed streets at the time of Primary Plat review and approval.

### B. Street Measurement

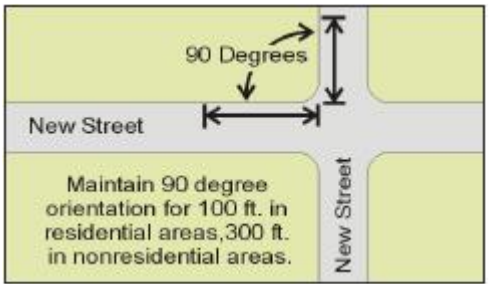
Street width shall be measured from back of curb to back of curb or from the edge of pavement where no curbs are present.

### C. Intersection Requirements

Street intersections shall be designed to promote the maintenance of the sight visibility triangle requirements of the Zoning Ordinance and shall be consistent with the following additional requirements:

**(1) Intersection Angle**

Streets shall be laid out so as to intersect as nearly as possible at right angles. A proposed intersection of 2 streets at an angle of less than 75 degrees shall not be acceptable. All streets shall intersect at 90 degrees whenever possible and maintain the 90-degree orientation for a minimum distance of 100 feet in residentially used and/or zoned areas and a minimum distance of 300 feet in non residentially zoned or used areas (measured from the centerline of the intersecting street).




**(2) Maximum Intersecting Streets**

Not more than 2 streets shall intersect at any 1 point, unless specifically required to promote efficient and safe traffic movement or in response to a recommendation of the Thoroughfare Plan.

**(3) Intersection Radii**

Street intersections shall be rounded by minimum radii consistent with the Street Geometric Design Requirements table in this Section. The minimum radii shall be increased as required by the Town Engineer when the angle of street intersection is less than 90 degrees in non-residential areas and/or where necessary to accommodate a school bus or emergency vehicle. The radii at alley intersections and abrupt mid-block alignment changes shall have corner designs consistent with the requirements of the Town Engineer.

**(4) Approach Grade**

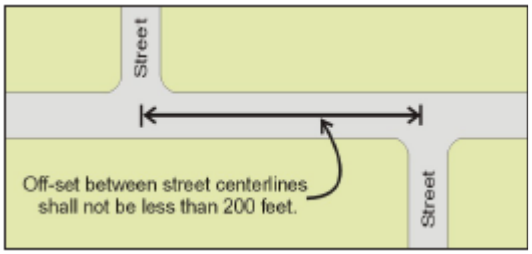
Intersections shall be designed with a flat grade wherever practical. A leveling area shall be provided having not greater than a 2% grade. The leveling area shall extend for a distance of 100 feet in either direction of the intersection, measured from the center line of the intersecting street.

**(5) Intersection Off-sets**

Proposed new intersections along 1 side of an existing street shall, whenever practicable, coincide with any existing or proposed intersection on the opposite side of such street. Street jogs with center line offsets of less than 200 feet shall not be permitted. Where necessary to accommodate turning lanes and other features, longer off-sets may be required by the Town Engineer.

**a)** Where local streets intersect with a collector or arterial street the local street alignment shall be continuous.

**b)** Intersections of collector and arterial streets with each other shall generally be separated by a minimum distance of 800 feet.




**(6) Corner Right-of-Way**

The right-of-way shall follow the curb line on all corners in order to maintain a consistent distance between the back-of-curb and the edge of the right-of-way.

**(7) Intersection Visibility Requirements**

Intersection visibility is the measurement from 3.5 feet above the pavement surface, at a distance of 10 feet back from the travel lane, to an object 51 inches high on the pavement in the appropriate travel lanes of the intersecting street. Clear visibility measured along the centerline of the road shall be provided for the minimum distance established by the Intersection Visibility table below.

The Town Engineer may establish additional requirements based on applicable AASHTO standards and common practices.

## Intersection Visibility Standards

| Posted Speed Limit | Minimum Line of Sight |
|---|---|
| 25 MPH | 350 ft |
| 30 MPH | 400 ft |
| 35 MPH | 470 ft |
| 40 MPH | 580 ft |
| 45 MPH | 710 ft |
| 50 MPH | 840 ft |
| 55 MPH | 990 ft |

**(8) Additional Requirements**

At any intersection acceleration and deceleration lanes, passing or left turn lanes, and other traffic management features may be required by the Plan Commission and/or Town Engineer.

**D. Vertical Grade Requirements**

The maximum vertical grade shall not exceed a maximum of 7.5% for all residential local streets and alleys, 7% for non-residential local streets, 6% for collector streets, and as specified by the Town Engineer for arterial streets. In order to ensure proper drainage, the minimum grade for all streets shall be 0.5%.

**E. Reverse Curve Requirements**

The minimum tangent length between reverse curves shall be 100 feet for local residential streets and alleys, 150 feet for local non-residential streets, 200 feet for collector streets, and as specified by the Town Engineer for arterial streets.

**F. Horizontal Curve Requirements**

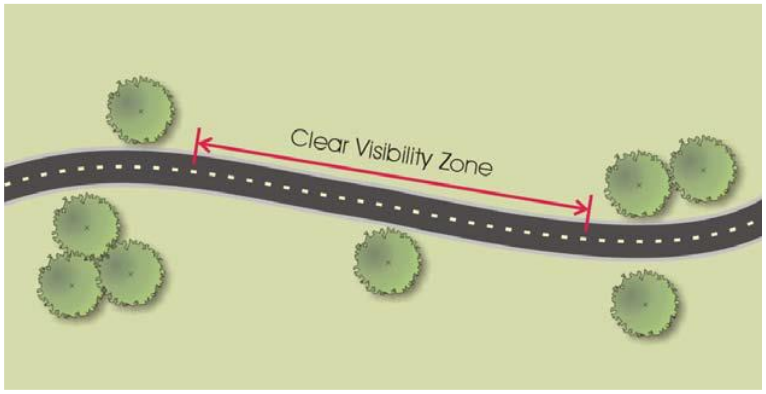
In instances where the street centerline deflects more than 5 degrees connections shall be made through the use of horizontal curves. The minimum curve radius shall be 100 feet for local residential streets and alleys and 200 feet for collector residential streets. Requirements for nonresidential and arterials streets and unique circumstances shall be as specified by the Town Engineer in accordance with AASHTO standards.

**G. Cross Slope Requirements**

The cross slopes on all streets, including intersections, shall be 3% or less. Typical cross slopes of streets shall be set at 2%.

**H. Clear Visibility Requirements**

Clear visibility, measured along the centerline of the street, shall be provided for a minimum of 600 feet on all arterial streets, 400 feet on all collector streets, and 200 feet on all local streets.




**I. On-Street Parking Design Requirements**

Street designs shall include provisions for on-street parking consistent with the Street Geometric Design Requirements table. On-street parking shall be provided at the discretion of the Plan Commission, consistent with the following guidelines.

**(1) Residential Requirements**

On-street parking guidelines for residential areas shall be as follows:

**a) Local Street No Parking**

On-street parking should not be required in residential subdivisions where the gross density is less than 2 dwelling/unit per acre.

**b) Local Street 1-side Parking**
On-street parking should be required on 1 side of all local streets in residential subdivisions where the gross density is at least 2 dwelling units per acre but no more than 6 dwelling units per acre.

**c) Local Street 2-side Parking**
On-street parking should be required on both sides of all local streets in residential subdivisions where the gross density is greater than 6 dwelling units per acre.

**d) Collector and Arterial Street Parking**
On-street parking shall be provided on collector streets in residential subdivisions at the discretion of the Plan Commission.

**(2) Non-Residential Requirements**
On-street parking shall be provided on non-residential streets at the discretion of the Plan Commission.

**J. Street Geometric Design Requirements**

All streets shall conform to the minimum specifications established by the Street Geometric Design Requirements table based on the classification provided by the Thoroughfare Plan or otherwise assigned by the Plan Commission. The urban cross-section shall be used for all streets unless the Plan Commission grants a specific waiver allowing the use of the rural cross-section based on the following:

**(1)** the use of a natural drainage system is preferred for the subdivision, or

**(2)** the subdivision is characterized by clearly unique topography that makes the urban cross-section impossible or impractical.

**K. Bicycle Lanes**

All street designs shall consider any applicable bike lane requirements. Where bike lanes are required, they shall be designed consistent with AASHTO standards and the requirements of the Town Engineer.

**(1)** The minimum width for a 2-way path, separated from the street shall be 8 feet.

**(2)** All bikeways along the street shall be 1-way paths, moving with the direction of traffic on the street. The minimum width for a 1-way path shall be 5 feet.

## Street Geometric Design Standards

### Urban Cross Section (*see 6.6 J*)

| Design Standard *(all measurements in feet)* | Alley | Local Street | | Collector Street | | Arterial Street* |
|---|---|---|---|---|---|---|
| | | Residential | Non-Residential | Residential | Non-Residential | |
| Right-of-Way Width (no parking) | 20 | 50 | 50 | 50 | 60 | * |
| Right-of-Way Width (parking on 1 side) | NA | 50 | 60 | 60 | 60 | * |
| Right-of-Way Width (parking on 2 sides) | NA | 50 | 60 | 60 | 60 | * |
| Pavement Width (no parking) | 12 | 24 | 30 | 28 | 30 | * |
| Pavement Width (parking on 1 side) | NA | 28 | 32 | 30 | 30 | * |
| Pavement Width (parking on 2 sides) | NA | 30 | 40 | 36 | 36 | * |
| Curb Requirement | None | Vertical or Rolled | Vertical or Rolled | Vertical or Rolled | Vertical | * |
| Pavement/Sidewalk Separation | NA | 5 | 5 | 5 | 5 | * |
| Sidewalk Width | NA | 5 | 5 | 5 | 5 | * |
| Maximum Grade** | 7.5%*** | 7.5%*** | 7%*** | 6%*** | 6%*** | * |
| Minimum Grade | 0.5% | 0.5% | 0.5% | 0.5% | 0.5% | * |
| Minimum Reverse Curve Tangent Distance** | 100** | 100** | 150** | 200** | 200** | * |
| Minimum Corner Radius** | 25** | 25** | 30** | 40** | 40** | * |
| Minimum Curve Radius** | 100** | 100** | 100** | 200** | 200** | * |
| Minimum Clear Visibility** | 200** | 200** | 200** | 400** | 400** | * |

**All arterial street designs shall be consistent with the requirements of INDOT and the Town Engineer.*
***Subject to additional requirements and any alternate standards established by INDOT and/or the Town Engineer based on street design speed.*
****See also Intersection Approach Grade in Section 6.6 C(4).*

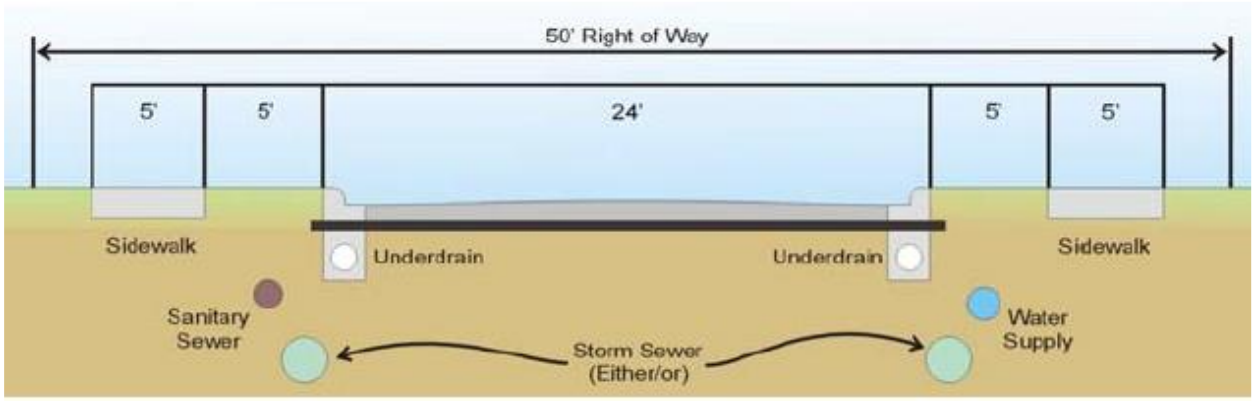
### Rural Cross Section (*see 6.6 J*)

| Design Standard *(all measurements in feet)* | Local Street | | Collector Street | Arterial Street* |
|---|---|---|---|---|
| | Residential | Non-Residential | | |
| Right-of-Way Width (no parking) | 70 | 70 | 80 | * |
| Pavement Width (no parking) | 26 | 30 | 36 | * |
| Maximum Grade** | 7.5% | 7% | 6% | * |
| Minimum Grade | 0.5% | 0.5% | 0.5% | * |
| Minimum Tangent Distance | 100 | 150 | 200 | * |
| Minimum Corner Radius | 25 | 30 | 40 | * |

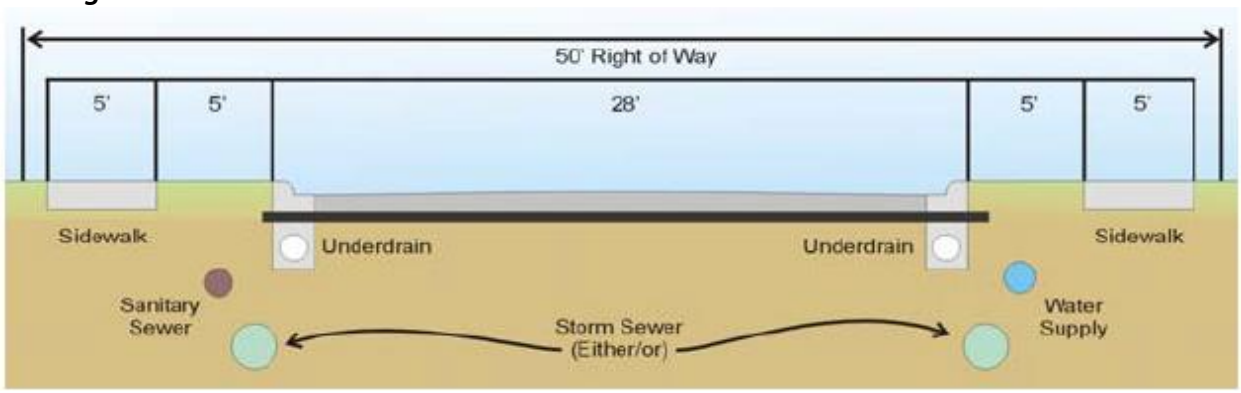
**All arterial street designs shall be consistent with the requirements of INDOT and the Town Engineer.*
***See also Intersection Approach Grade in Section 6.6 C(4).*

## Local Residential Street Design Options Cross Section Examples (*see 6.6 I*)

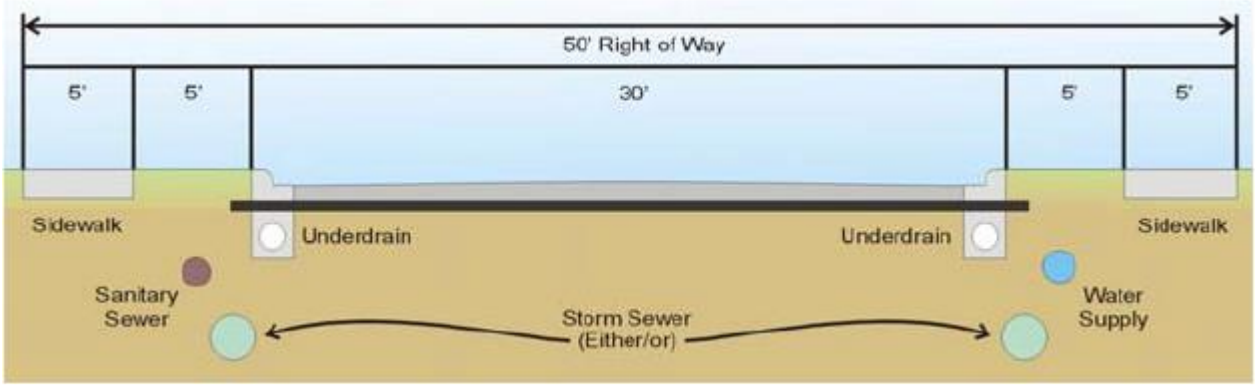
***No Parking***




***Parking 1-Side***




***Parking 2-Sides***



## 6.7 Street Construction Standards

### A. General Requirements

All streets and alleys shall be completed to the grades shown in the plans, profiles and cross-sections provided in the approved subdivision Construction Plans consistent with the requirements of this Section.

**(1) Design Professionals**

All plans shall be prepared by a professional engineer or surveyor licensed in the State of Indiana.

**(2) Inspections**

All stages of street construction must be inspected consistent with the adopted procedures of *Section 5.5 Inspection of Public Improvements*.

**(3) INDOT Specifications**

All materials, mixtures, and workmanship shall conform to current Indiana Department of Transportation specifications.

**(4) Street Hierarchy**

At the intersection of streets with different functional classifications, as indicated on the Thoroughfare Plan or determined by the Plan Commission, all new street construction shall conform to the standards provided by this Section for the highest classification.

### B. Construction Requirements

The streets shall be graded, surfaced, and improved to the dimensions shown in the Street Construction Requirements table and shall meet the following standards:

**(1) Abnormal Use**

Additional requirements may be imposed by the Town Engineer to account for unusual soil conditions, extraordinary traffic volume, heavy loads, or other abnormal use characteristics.

**(2) Poor Drainage**

Poorly drained ground or unsuitable material may require the replacement of the material with #2 stone under the base, consistent with the requirements of the Town Engineer.

**Street Construction Requirements**

| Pavement Requirements | Alley | Local Street | | Collector Street | | Arterial Street* |
|---|---|---|---|---|---|---|
| | | Residential | Non-Residential | Residential | Non-Residential | |
| **Concrete (Option #1)** | | | | | | |
| **Concrete Pavement with Wire Mesh** | 5" | 6" | 7" | 7" | 8" | 9" |
| **Compacted Aggregate #53 Base** | 4" | 4" | 4" | 4" | 4" | 4" |
| **Total Thickness** | 9" | 10" | 11" | 11" | 12" | 13" |
| **Asphalt (Option #2)** | | | | | | |
| **HMA Surface** | 1" | 1.5" | 1" | 1" | 1" | 1" |
| **HMA Binder** | 3" | 3.5" | 2" | 2" | 2" | 3" |
| **HMA Base** | na | na | 4" | 4" | 6" | 6" |
| **Compacted Aggregate #53 Base** | 8" | 8" | 8" | 8" | 8" | 8" |
| **Total Thickness** | 12" | 13" | 15" | 15" | 17" | 18" |

**All arterial street designs shall be consistent with the requirements of INDOT and the Town Engineer.*

**(3) Soil Stabilization**

A lime or cement stabilized base may be used at the discretion of the Town Engineer. If lime stabilization is used, the stone base thickness required for the asphalt construction option may be reduced by 2 inches, or the 4 inches of stone required for the concrete construction option may be deleted.

**(4) Underdrains**

Underdrains shall be required along the edge of all streets. Underdrains shall be 6-inch PVC with 8 inches washed gravel backfill with a minimum depth 24 inches from the street subgrade to the pipe invert.

**(5) Base Grade**

The final grade of the base and all road surfaces shall be 2% from the center to both edges.

**(6) HMA Standards**

All hot mix asphalt (HMA) materials and application must meet Indiana Department of Transportation (INDOT) specifications, unless otherwise modified by the provisions of this Ordinance. All HMA mixing and application shall be performed under proper weather conditions as defined by the Town Engineer.

**(7) Base Width**

The aggregate base for all streets shall extend 2 feet beyond the road surface on both sides of the road. Where curb and gutter is not required, 4 foot wide shoulders of compacted aggregate shall be required on each side of all local and collector streets, and 8 foot wide shoulders of compacted aggregate shall be required on all arterial streets.

**(8) Concrete Street Specifications**

Concrete streets shall be constructed with 4000 PSI minimum compression strength and shall be 5-7% air entrained. Contraction and expansion joints shall meet the following requirements:

**a) Contraction Joints**

Concrete streets shall have contraction joints linearly every 10 feet, at every manhole, and elsewhere as specified by the Town Engineer.

**b) Expansion Joints**

Concrete streets shall have expansion joints every 400 feet and elsewhere as specified by the Town Engineer.

**(9) Excavations**

Any excavations within 5 feet of a street shall be backfilled with Compacted #53 stone in 8-inch lifts.

**C. Grading Specifications**

All streets and alleys shall be graded to their full widths by the subdivider so that street pavements and sidewalks can be constructed on the same level plane. Deviation from this standard due to special topographical conditions will be allowed only with the approval of the Town Engineer.

**(1) Preparation of the Subgrade**

Before grading is started, the entire right-of-way area shall be first cleared of all tree stumps, roots, brush, and other objectionable materials and of all trees not intended for preservation. The subgrade shall be properly shaped, rolled, and uniformly compacted to conform with the accepted cross-section and grades.

**a)** All subgrade shall pass inspection consistent with Section 5.5 of this Ordinance and other adopted policies of the Town.

**b)** Inspection shall include an acceptable proof roll the full length of each driving lane by a loaded tandem truck or tri-axle provided by the developer, with a minimum load being 20 tons. Depressions by the truck wheels that exceed 1/4 inch or greater will constitute rejection of the subgrade area and require a subsequent re-test. Changes in earth or site conditions may result in the need for additional proof rolls, as determined by the Town Engineer.

**(2) Cuts**

In cuts, all tree stumps, boulders, organic material, soft clay, and other objectionable materials shall be removed to a depth of at least 2 feet below the graded surface. Rock, when encountered, shall be removed to a depth of at least 12 inches below the graded surface.

**(3) Fills**

In fills, all tree stumps, boulders, organic material, soft clay, and other objectionable materials shall be removed to a depth of at least 2 feet below the natural ground surface. This objectionable matter, as well as similar matter from cuts, shall be removed from the right-of-way area and disposed of so that it will not become incorporated in fills or hinder proper drainage system operation.

**D. Bridges**

Bridges of primary benefit to the subdivision, as determined by the Plan Commission and/or Town Engineer, shall be constructed at the full expense of the subdivider. All culverts and bridges that are intended to be incorporated into the Hendricks County bridge system shall conform to the most recent county standards.

## 6.8 Cul-de-Sac Standards

### A. General Requirements

Cul-de-sacs (permanent dead-end streets) may be permitted by the Plan Commission only in locations where one of the following conditions exist:

**(1) Natural Barriers**
The construction of a through street is not possible due to the presence of natural barriers,

**(2) Adjacent Development**
The construction of a through street is not possible due to the presence of adjacent development that provides no opportunities for connecting any through street, or

**(3) Ample Connections**
Ample through streets are already provided in the area or are otherwise proposed to be provided (in the opinion of the Plan Commission).

### B. Design Requirements

All cul-de-sacs streets shall meet the following design requirements:

**(1) General Design Standards**
The cul-de-sac street shall be designed to meet the standards for a local street consistent with its use (residential or non-residential). The minimum pavement and right-of-way radii and other design features of the cul-de-sac turn-around shall be consistent with the Cul-de-sac Design Standards.

**(2) Limitations**
In no case may an arterial or collector street terminate in a cul-de-sac.

**(3) Maximum Length**
The maximum length of any cul-de-sac streets shall be 500 feet, measured along the centerline from its intersection with the centerline of another street to the center of the turn-around right-of-way.

**(4) Street/Turn-Around Transitional Curve Radii**
The intersection of the cul-de-sac street segment and the cul-de-sac turnaround shall feature a transitional curve with a minimum radius of 50 feet for residential areas and 100 feet for nonresidential areas. The radius shall be measured at the curb.

**(5) Landscape Islands**
Landscape islands shall be required in all residential cul-de-sacs but shall be prohibited in all nonresidential cul-de-sacs. Landscape islands shall measure between 15 and 20 feet in diameter for urban cross-section streets and 20 to 30 feet in diameter for rural cross-section streets. All such islands shall be curbed, shall be planted with grass, and may include trees meeting the specifications of Section 6.14.

**(6) Parking Prohibited**
On-street parking shall be prohibited within the turn-around of the cul-de-sac.

**(7) Mailboxes**
All mailboxes for lots accessed from the turnaround of the cul-de-sac shall generally be clustered together at a single location, subject to review and approval.

**(8) Driveways**

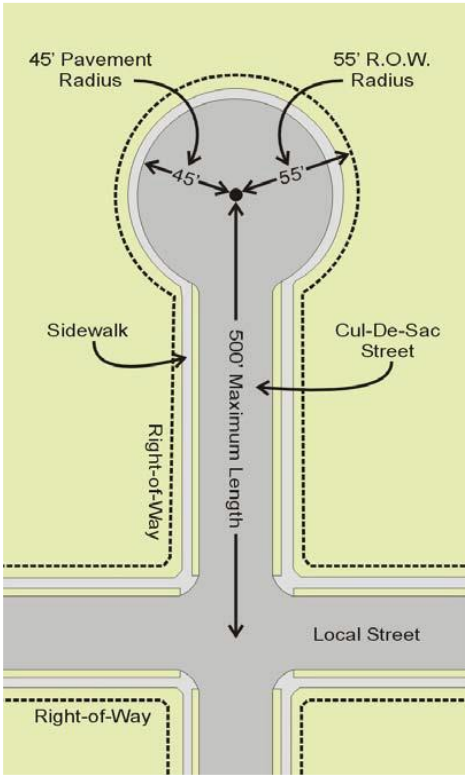
All driveways accessing the turn-around of the cul-de-sac shall generally be grouped at common property lines to maximize the availability of snow storage areas.

**C. Construction Requirements**

All cul-de-sac streets shall be constructed to meet the standards for a local street consistent with its use (residential or non-residential).

## Cul-de-Sac Design Standards

| Design Standard *(all measurements in feet)* | Residential Street | | Non Residential Street | |
|---|---|---|---|---|
| | Urban | Rural | Urban | Rural |
| Right-of-Way Radius | 55 | 75 | 65 | 75 |
| Pavement Radius | 45 | 55 | 55 | 55 |
| Curb Requirement | Vertical or Rolled | na | Vertical or Rolled | na |
| Pavement/Sidewalk Separation | 5 | na | 5 | na |
| Sidewalk Width | 5 | 5 | 5 | 5 |
| Maximum Grade | 7.5% | 7.5% | 7% | 7% |
| Minimum Grade | 0.5% | 0.5% | 0.5% | 0.5% |



## 6.9 Curb and Gutter Standards

### A. General Requirements

Poured concrete curbs and gutters shall be provided on all streets designed with the urban cross-section and on any other street as specifically required by the Plan Commission at the time of Primary Plat review.

**(1) Curb Locations**

Where curbs are required, they shall be installed on each side of the street surface and are to be considered as part of the street.

**(2) Curb Types**

Where curbs are required, vertical or rolled curbs shall be provided on all streets, consistent with the requirements of the Street Geometric Design Standards table in Section 6.6.

### B. Gutter Grade Requirements

The minimum grade of any street gutter shall not be less than 0.5%.

### C. Construction Requirements

All curbs and gutters shall be constructed to the applicable adopted standards of the Town and the specifications of the Town Engineer. Curbs and gutters shall also meet the following requirements.

**(1) Inlets**

Additional inlets shall be required when encroachment of storm water into the street will disrupt traffic under the 10-year storm design, consistent with Section 6.19.

**(2) Inlet Grates**

Inlet grates should be depressed slightly below the plane of the gutter to improve removal of runoff water. Inlet grates shall be heavy-duty type and appropriate for bicycle traffic.

**(3) Joints**

All curbs shall be constructed with 1.5-inch minimum depth control joints every 10 feet and 1/2-inch expansion material at all sides of structures.

**(4) Width and Material**

Curbs and gutters shall have a 24-inch minimum width and shall be constructed with 6 bag, air entrained concrete.

**(5) Vertical Face**

Curbs and gutters shall provide a 4-inch vertical face on all local and collector residential streets and a 6-inch vertical curb face on all non-residential and arterial streets.

## 6.10 Sidewalk and Trail Standards

### A. General Sidewalk Requirements

Sidewalks shall be provided along all streets designed with the urban cross-section and on any other street as specifically required by the Plan Commission at the time of Primary Plat review.

**(1) Location**

Where sidewalks are required, they shall be provided on both sides of the street and shall completely encircle the turn -around of any cul-de-sac.

**a)** All required sidewalks shall be located within the street right-of-way, or within a 5-foot-wide easement adjacent to an Indiana Department of Transportation right-of-way.

**b)** Concrete curbs may be required by the Plan Commission and/or Town Engineer for all streets where sidewalks are to be provided.

**(2) Width**

All sidewalks shall be a minimum of 5 feet in width. The Plan Commission may require additional sidewalk width in commercial or mixed-use areas intended to promote pedestrian travel.

**(3) Pavement/Sidewalk Separation**

Sidewalks shall be separated from the back of curb of the adjacent road by a minimum width of 5 feet. All areas between the back-of-curb and sidewalk that are not used for drives accessing individual properties from the street shall be planted and maintained as grass lawns.

**(4) Additional Pedestrian Access**

In order to provide pedestrian access from a street to other streets or centers of activity, the Plan Commission may require that additional sidewalks be provided. These sidewalks shall meet the design and construction standards of this Section, and shall be included in perpetual, unobstructed easements measuring a minimum of 15 feet in width.

**a)** A subdivision lot owner's association shall be the holder of any sidewalk easements internal to a development.

**b)** Sidewalks external to the development shall be included in easements held by the Town.

**(5) Trail Substitution**

An 8-foot-wide asphalt path located along 1 side of a collector street may be substituted by the subdivider for the sidewalks required along both sides of the same street. All such trails shall meet the requirements of Section 6.10(D) of this Ordinance and any additional specifications of the Town Engineer.

### B. Sidewalk Waiver Considerations

The Plan Commission shall only permit a waiver of the sidewalk installation requirements of this Ordinance under the following circumstances:

**(1) Design Context**

The subdivision serves as an addition to an existing residential neighborhood without sidewalks where the addition of sidewalks would be incompatible with existing landscaping, site design, and/or pedestrian and vehicle patterns.

**(2) Pending Public Project**
Sidewalks are scheduled to be installed as part of a city or state improvement project that has been funded for construction.

**(3) INDOT Recommendation**
The Indiana Department of Transportation has recommended, in writing, that no sidewalks be constructed.

**(4) Impractical Conditions**
A combination of conditions (such as topography, low pedestrian volumes, etc.) exist that make sidewalk construction and/or use impractical.

**C. Sidewalk Construction Requirements**
Sidewalks shall be constructed consistent with the following requirements:

**(1) Materials**
Sidewalks shall be constructed of six bag, air entrained, Portland cement concrete.

**a)** All sidewalks shall have a minimum thickness of 4 inches unless specifically noted below.

**b)** All sidewalks greater than 6 feet in width shall have a minimum thickness of 5 inches with fiber mesh reinforcement, or 6 inches without reinforcement.

**c)** All sidewalks crossing driveways shall be a minimum of 6 inches thick.

**(2) Slope**
All sidewalks shall slope to the street at a rate of 2%. Sidewalk slope may be varied through a gradual transition to match existing, adjoining walks. The street side edge of the sidewalk shall be located above the adjacent curb 1/2 inch for every 1 foot of separation horizontally between it and the curb.

**(3) Finish**
All sidewalks shall have a uniform texture with a “broom” finish. Stamped imprints indicating the contractor and date of construction shall not exceed an area greater than 4 inches by 6 inches per property, and a depth of 1/4 inch.

**(4) Joints**
All sidewalk joints shall be spaced to form square panels and must be delineated through driveways. All joints shall also meet the following specifications:

**a) Tooled Joints**
Tooled joints are permissible for all sidewalks less than 6 feet in width. Framing is permissible on sidewalks with tooled joints and should match existing, adjoining sidewalks. Framing shall have a maximum depth of 1/16 inch. Joint depth shall be ¼ the thickness of the sidewalk, and joint width shall be minimized.

**b) Sawed Joints**
Sawed joints are permissible for all sidewalk widths and shall be equal to 1/4 of the sidewalk thickness.

**c) Expansion Joints**

Performed expansion joints, 1/2 inch in width, shall be installed at approximately 100-foot intervals or at each property line, whichever occurs more frequently. They shall also be installed adjacent to all curb ramps.

**D. Trail Requirements**

Recreational trails shall be provided within subdivisions by the subdivider where indicated by the most recent Parks & Recreation 5-year Master Plan.

**(1)** All trails shall be a minimum of 8 feet in width and shall meet the specifications of the Town Engineer.

**(2)** All trails shall generally be constructed of 4 inches of HMA over 4 inches of #53 stone.

**(3)** In locations where trails are providing vehicular access, in addition to pedestrian access, they shall be constructed of Portland cement concrete and have radii meeting the requirements of the Town Engineer.

**E. ADA Compliance**

Americans with Disabilities Act compliant ramps for wheelchairs and bicycles shall be provided appropriately on all sidewalks and trails. Ramps are to be located at all intersections, driveways, and other transition access points.

**(1)** Generally, ramps shall be sloped no greater than 1 inch of rise per 12 inches of linear distance (8%), with no slope exceeding 12%. The cross slope for all ramps shall not exceed 2%. All ramps shall be equal in width to that of the sidewalk or trail they serve.

**(2)** Rolled curbs are not a substitute for wheelchair ramps and shall not be considered to meet ADA requirements.

**(3)** It is the legal responsibility of the subdivider to assure compliance with current ADA laws.

**(4)** The subdivider and/or his/her engineer may be required to certify compliance with ADA laws to the Town Engineer at the time the public improvements are accepted by the Town.

**F. Crosswalks**

When a sidewalk or trail crosses streets within or adjacent to the subdivision, safety devices such as vehicle stop lines, painted crosswalks, alternative crosswalk pavement types, crosswalk signs, traffic calming measures, or traffic control devices shall be installed. All crosswalk treatments shall be subject to the approval of the Town Engineer.

## 6.11 Street Lighting Standards

### A. General Requirements

The subdivider shall be responsible for the initial cost of the purchase and installation of all streetlights. All street light standards and fixtures shall meet the specifications established by the Town Engineer and the appropriate electric utility.

**(1) Standard Height & Material**

Streetlights shall be pole mounted on standards of non-corrosive metal not to exceed 28 feet in height. Wood and fiberglass mounting poles shall be prohibited.

**(2) Decorative Lighting**

The use of decorative street lighting shall be encouraged consistent with the performance standards of the Zoning Ordinance.

### B. Locations within the Subdivision

Generally, street lighting shall be provided at all intersections of streets within, and adjacent to, the subdivision and elsewhere as deemed appropriate for public safety by the Zoning Administrator, Town Engineer, and the Plan Commission. The spacing of streetlights shall be determined at the discretion of the Town Engineer based on the level of illumination provided by the chosen fixture.

### C. Locations along the Street

Streetlights shall be located in the right of way, adjacent to the street.

## 6.12 Subdivision and Street Name Standards

### A. Subdivision Name Standards

The proposed name of all subdivisions shall be provided by the subdivider at the time of Primary Plat application.

**(1) Duplication of Names**

The proposed name of the subdivision shall not duplicate, or too closely approximate phonetically, the name of any other subdivision in the Town that has been previously recorded.

**(2) Approval Authority**

The Plan Commission shall have final authority to approve the name of the subdivision, which shall be determined at the time of the Primary Plat approval.

### B. Street Name Standards

The proposed name of all subdivision streets shall be provided by the subdivider at the time of Primary Plat application.

**(1) Duplication of Names**

Street names shall not duplicate any existing street name within the Town, irrespective of the use of the term street, avenue, boulevard, drive, place, court, lane, road, pike, highway, parkway, or similar suffix. Street names that are spelled differently but sound the same as existing street names shall not be used.

**(2) Street Extensions**

Streets that are designed and/or function as the extension of an existing street shall be named consistent with the existing street.

**(3) Street Terms**

The term “court” shall generally be reserved for cul-de-sac streets. The terms “place” and “circle” shall generally be reserved for circular streets that intersect with another street at two locations and cannot be divided into more than one street.

**(4) Review & Approval Authority**

All street names are subject to review and approval of the Plan Commission, upon recommendations from the US Postal Service, at Primary Plat review.

## 6.13 Street Sign Standards

### A. General Street Sign Requirements

Street signs, including street name signs, stop signs, "no-parking" signs, and all other appropriate regulatory signs, shall be installed by the subdivider at all locations specified on the approved Construction Plans and otherwise as required by the Town Engineer.

### B. Street Sign Installation

All street signs shall be installed prior to the acceptance of the subdivision's streets by the Town Council.

**(1) Temporary Signs**

The subdivider shall be responsible for the installation and maintenance of temporary street and traffic control signs until the permanent signs are installed and accepted by the Town Council.

**(2) Permits**

At the Zoning Administrator's discretion, the issuance of Improvement Location Permits may be withheld, including those for model homes and speculative structures, until appropriate permanent or temporary street signs have been installed.

### C. Street Sign Standards

All street sign and post types and locations shall conform to the Uniform Manual of Traffic Control Devices, applicable INDOT standards and specifications, the requirements of the Town Engineer, the specifications of the Town Council, and the following:

**(1) Signposts**

Each signpost shall consist of a 2-inch galvanized Type A post, 12 feet long with a minimum of 3 feet below grade.

**a) Street Name Signpost Locations**

Street name signposts shall be located within the street right-of-way, no closer than 4 feet from the edge of the traveled portion of the street.

**b) Stop Sign Signpost Locations**

Stop sign signposts shall be located so that the edge of the sign is a minimum of 2 feet from the edge of the traveled portion of the street.

**c) Speed Limit and Informational Signpost Locations**

Speed limit and information sign signposts shall be located so that the edge of the sign is a minimum of 2 feet from the back edge of the curb (or shoulder if no curb is present).

**d) Sidewalk Obstruction Prohibited**

In no instance shall any signpost be located in or obstructing a sidewalk.

**(2) Street Name Signs**

Each street name sign shall be made of blue reflectorized, double-blade metal with 6 inch or large white letters mounted at the top of the post with the street name labeled on both sides.

**(3) Stop Signs**

Each stop sign shall be a minimum of 30 inches in width and have a high-intensity finish. There shall be a minimum of 7 feet from the top of the adjacent curb to the bottom of the sign.

**(4) Speed Limit and Information Signs**

Speed limit and other information signs shall be a 24 inch by 30-inch vertical rectangle with a high-intensity finish.

## 6.14 Easement Standards

### A. General Utility Requirements

All utility transmission lines shall be located underground in appropriate easements assuring their long-term accessibility and maintenance. The use of underground vaults is preferred for the location of utility equipment.

### B. General Easement Standards

Adequate areas of suitable size and location shall be provided by the subdivider as easements for the conveyance of utility systems, drainage, and other infrastructure to, and within, the subdivision. The location of all easements shall be subject to review and approval by the Town Engineer and the applicable utility companies.

### C. Utility Easements

Utility easements shall be reviewed by the Town Engineer for approval. Additional widths may be requested if circumstances warrant it. (i.e. deeper than typical sewers, larger facilities or structures, etc…) Utility easements shall be consistent with the following standards.

**(1) Water Supply, Natural Gas & Other Utilities**

Easements for water supply, natural gas and other utilities shall generally be a minimum of 15 feet in width, and shall be located as follows:

**a)** When alleys are present along the rear property line, utility easements shall be located in the rear yard adjacent to the alley right-of-way.

**b)** When alleys are not present along the rear property line, utility easements shall be located along in the front yard adjacent to the street right-of-way.

**c)** In all instances utility easements shall be provided around the perimeter of the subdivision shall measure a minimum of 20 feet in width.

**(2) Sanitary Sewer**

Easements for sanitary sewer service shall be a minimum of 20’ and be provided where requested by the Town Engineer and/or the Lizton Utilities.

**(3) Alleys and Other Alternatives**

Where alleys and other similar alternatives for the placement of utilities are available appropriate easements shall be provided consistent with the requirements of the Town Engineer and the Lizton Utilities and as noted in this document.

### D. Drainage Easements

Where required, drainage easements shall generally be a minimum of 20 feet in width, with 1/2 the width of the easement taken from each lot. In the case of lots extending to the boundary of the property platted and not adjoining another plat the full width of the easement shall be provided on each affected lot.

**(1) Drainage Easement Standards**

Drainage easements shall:

**a)** contain the primary drainage pathway in the easement,

**b)** provide continuity from block to block,

**c)** be located along rear or side lot lines, and elsewhere, as necessary, and

**d)** generally be contiguous to the street at the end of the block to connect with adjoining blocks in the shortest direct line.

**(2) Watercourses**

Where a subdivision is traversed by a watercourse, drainage way, channel, or stream the subdivider shall designate drainage easements on both sides of the watercourse, the width of which shall be determined by the Town Engineer or the County Drainage Board (in the case of legal drains). Coordinate with the Town Engineer early in the planning process to establish watercourse easements widths.

**(3) Access to Improvements**

Easements to permit both the Town and any lot owners association access for maintenance and repair of surface and subsurface drainage improvements and watercourses, shall be provided by the subdivider. Such easements shall be a minimum of 15 feet in width and shall be provided (a) around the top of bank of all water features and (b) along a convenient route between a public street and the water feature.

**(4) Off-Site Improvements**

When a proposed drainage system will carry water across private lands outside the subdivision, adequate drainage easement, as determined by the Town Engineer, must be secured by the subdivider and indicated on the required plat and Construction Plan drawings.

## 6.15 Street Tree Standards

### A. General Requirements

All subdivisions shall be required to provide street trees along streets within and adjacent to the subdivision.

**(1) General Location**

Street trees may be planted either in the right-of-way or within 5 feet of the right-of-way on adjacent property included in a street tree easement. Street trees shall be provided in the right-of-way unless, in the opinion of the Town Engineer, that location would present a hazard for utilities or public safety. A street tree planting area, coordinated with utility and sidewalk locations, shall be shown on all plats.

**(2) Use of Existing Trees**

Existing trees on property located in the right-of-way of a public street may be considered as meeting the street tree requirement if such trees are in good health and are protected during the construction process.

**a) Determination**

The Plan Commission shall determine whether or not existing trees may be used to satisfy the street tree requirement at the time of Primary Plat review.

**b) Maintenance**

The Zoning Administrator may require the subdivider to provide maintenance bonds consistent with *Section 5, Surety and Inspections*, of this Ordinance for any existing trees to be preserved.

### B. Planting Requirements

One street tree shall be planted for every 35 feet of street frontage or fraction thereof, regardless of driveways or other features. Trees may be evenly spaced or grouped together. Street trees shall also meet the following requirements:

**(1) Tree Size**

All street trees shall be a minimum of 2 1/2-inch caliper as measured 6 inches from the top of the rootball, at the time of planting.

**(2) Separation from Pavement**

No tree may be planted so that its center is closer than 2 feet to a sidewalk or curb, or edge of pavement if no curbs are present.

**(3) Visual Clearance**

No tree shall be planted within 25 feet of the intersection of 2 street rights-of-way, within 5 feet of the intersection of a street right-of-way and an entrance driveway, or within the Sight Visibility Triangle established by the Zoning Ordinance.

**(4) Separation from Utilities**

No tree shall be planted within 10 feet of any fire hydrant or 2 lateral feet of any underground utility service.

**(5) Permitted Tree Types**

Street trees shall be of one or more of the species described in the Zoning Ordinance, *Appendix C: Official Planting Guide*. No other types of trees, or any plant material other than

grass, shall be planted in a street right-of-way. A variety of permitted tree types shall generally be used in each subdivision.

**C. Installation**

Where required, street trees shall be installed on each lot after the structure(s) on that lot are completed. No permanent Certificate of Occupancy shall be provided for any lot (including the structures on that lot) until the approved street trees are installed.

**D. Permitted Street Trees**

Please refer to the Zoning Ordinance, *Appendix C: Official Planting Guide* for a list of approved trees.

## 6.16 Sanitary System Standards

### A. General Requirements

Lots in all subdivisions shall be served by sanitary sewers. The appropriate sanitary sewer system shall be designed and installed by the subdivider based on the adopted specifications of the Lizton Sanitary Sewer Standards. All sanitary sewer systems (excluding laterals and other features located on individual lots) and easements shall be dedicated to the Town of Lizton. Sanitary sewer system shall meet requirements noted in these documents and the *Recommended Standards for Wastewater Facilities,* latest addition, also known as Ten State Standards for Wastewater Facilities.

**(1) General Specifications**

The system shall be provided with all necessary supplemental equipment or machinery (including, but not limited to, lift stations) and be in such lengths, sizes, dimensions and specifications as required by the Town Engineer, the Lizton Utilities, and the applicable state and Federal agencies. A operation and maintenance manual with shop drawings shall be provided to the Town for supplemental equipment or machinery.

**(2) General Location**

Sewer mains, transmission lines and structures, with the exception of any above ground structures such as lift stations or pumps, shall generally be located underground in the right-of-way provided along public streets and alleys. Sewer lines shall be extended to the limits of the subdivision property to allow for future expansions as directed by the Town Engineer and Lizton Utilities.

**(3) Capacity Analysis**

All subdivisions shall provide a capacity analysis for sanitary sewers demonstrating the adequacy of the downstream system for accommodating the expected demand. Coordinate with the Town Engineer early in the planning process.

### B. Individual Property Waste Disposal Systems

No individual property waste disposal systems, such as septic systems or privately owned treatment plants shall be permitted where sewer service is required by this Ordinance.

### C. Select Design Standards

All sanitary sewer system improvements shall meet the following design standards:

**(1) Alignment**

All sewers shall be in a straight alignment between manholes, unless otherwise approved by the Town Engineer.

**(2) Manhole Location**

Manholes shall be installed at the end of each sewer line, at all sewer line intersections, and at minimum intervals of 400 feet for lines that are 8 inches in diameter and larger.

**(3) Sewer and Water Separation**

There shall be no physical connection between a potable water supply system and a sewer which will permit the passage of any sewage material or polluted water into the potable water supply. A minimum distance of 10 feet must be maintained between parallel water and sewer lines. Where sewer and water lines intersect, either (a) the sewer shall be constructed of cast iron or be encased in concrete for a distance of 10 feet from the point of intersection, or (b) the water line shall be a minimum of 2 vertical feet above the sewer line.

## 6.17 Water Supply Standards

### A. General Requirements

Lots in all subdivisions shall be provided with water, supplied by the appropriate utility. The appropriate water supply system shall be designed and installed by the subdivider based on the Lizton Water Standards.

**(1) Design Specifications**

The water system shall include all necessary supplemental equipment and machinery including, but not limited, to all pipes, fire hydrants, and valves.

**(2) General Location**

Water supply mains and transmission lines shall be located in the right-of-way adjacent to public streets (opposite any sanitary sewer also included in that right-of-way).

### B. Individual Property Wells

No individual property wells shall be permitted as the primary water supply for any property where water service is required by this Ordinance.

## 6.18 Environmental Standards

### A. General Requirements

Existing features that would add value to residential, commercial, natural, or man-made assets, such as trees (specifically those listed on the IDNR Historically Significant Tree List) or other vegetation, streams, stream-side forests, wetlands, and similarly irreplaceable assets should be preserved through careful and harmonious design.

### B. Erosion and Sedimentation Standards

The following measures to minimize erosion and sedimentation shall be included where applicable in the overall subdivision Construction Plans. The development shall provide specific storm water quality measures for controlling soil erosion; controlling and treating the nonpoint source pollution associated with sediment-laden run-off; and the management and treatment of pollutants associated with post-construction land uses. Guidelines for this work can be found in the *Indiana Storm Water Quality Manual*.

**(1) Best Management Practices (BMP's)**

Generally, erosion control measures shall support the implementation of best management practices that ensure the long-term operation and maintenance of erosion and sediment control features designed to reduce stormwater runoff pollution.

**(2) Applicable Requirements**

Erosion and sediment control shall conform with the requirements of requirements IDEM's Rule 13 (327 IAC 15-13), IDEM's Rule 5 (327 IAC 15-5) as noted in this ordinance, other requirements adopted by the Town, and any other requirements of the Town Engineer.

**(3) Minimizing Erosion**

Stripping of vegetation, regrading, or other development shall be done in such a way that will minimize erosion.

**a)** The disturbed area and the duration of exposure shall be kept to a practical minimum.

**b)** Temporary vegetation and mulching shall be used to protect environmentally sensitive areas during development.

**c)** The permanent final vegetation and structural erosion control and drainage measures shall be installed as soon as practical in the development.

**(4) Minimizing Cut/Fill Operations**

Development plans shall keep cut/fill operations to a minimum and ensure conformity with topography so as to create the least erosion potential and adequately handle the volume and velocity of surface water runoff.

**(5) Sequencing**

Runoff and erosion control systems shall be installed as soon as possible during the course of site development. Perimeter controls and construction entrance erosion facilities are required to be installed prior to the start of any site work. All basins shall be designed to collect sediment and debris in specific locations for ease of maintenance.

**(6) Sedimentation Trapped**

Sediment in the runoff water shall be trapped until the disturbed area is stabilized by the use of debris basins, sediment basins, silt traps, or similar measures.

**(7) Erosion Control Plan Requirements**

No changes shall be made in the contour of the land, nor shall grading or excavating begin until a plan for minimizing erosion and sedimentation has been reviewed and approved by the Town Engineer and all applicable permits obtained.

**a)** A Storm Water Pollution Prevention Plan (SWPPP) shall be submitted as an element of the subdivision Construction Plans.

**b)** If IDNR or IDEM permitting is required, a copy of the approved permit shall be provided by the subdivider to the Town Engineer for the records of the Plan Commission.

**c)** Design and construction of the erosion control system shall be such that it will be durable, easy to maintain, and meet the requirements of the Town Engineer.

**(8) Sedimentation Control**

Whenever sedimentation is caused by stripping of vegetation, regrading, or other development activities, it shall be the responsibility of the subdivider to remove it from all adjoining surfaces and properties, drainage systems, and watercourses, and to repair any damage at his/her expense.

**a) Remedy Required**

The Town Engineer and/or Zoning Administrator may require the subdivider to remedy any sedimentation that has been identified.

**b) Enforcement Options**

Failure by the subdivider to control sedimentation may be used by the Town Council as grounds to refuse the acceptance of public improvements, or by the Zoning Administrator as grounds to withhold the issuance of Improvement Location Permits for structures on lots in the affected subdivision. Violators may be fined per incident per day consistent with the enforcement provisions of the Zoning Ordinance.

**c) Surety**

The clean-up of all erosion control barriers, BMP's and the results of any erosion control failure shall be covered by the erosion control bond provided consistent with *Section 5, Surety and Inspections* of this Ordinance.

**C. Excavation and Fills**

Excavations and fills shall meet the following requirements:

**(1)** Fills shall not encroach or impede flows of natural watercourses or constructed channels.

**(2)** Grading shall not be done in such a way so as to divert water onto the property of another landowner without the expressed written consent of the landowner.

**(3)** During grading operations, necessary measures for dust control shall be exercised.

**(4)** Grading equipment shall not be allowed to cross streams. Provisions shall be made for the installation of temporary or permanent culverts or bridges.

**D. Watercourse Requirements**

No applicant, person, corporation, or other entity shall block, impede the flow of, alter, construct any structure, deposit any material or thing, or commit any act that will affect normal or flood flow in any watercourse without having obtained prior approval from the Town Engineer and/or the Indiana Department of Natural Resources, Division of Water, whichever is applicable.

**(1) Restoration of Pre-development Conditions**

It is the responsibility of the applicant and any person, corporation, or other entity acting on or across a communal stream, watercourse, or swale, or upon the 100-year floodplain or floodway area of any watercourse during the period of development, to return these areas to their original or equal condition upon completion of activities.

**(2) Responsibility**

The applicant or owner will assume the responsibility for maintaining, in open and free flowing condition, all minor streams, watercourses, and drainage systems, constructed or otherwise improved in accordance with this Ordinance, which are necessary for proper drainage.

**E. Topsoil**

Topsoil shall not be removed from residential lots or used as spoil but shall be redistributed to provide a minimum of 6 inches of cover on the lots and in the unpaved portion of the right-of-way. Topsoil shall be stabilized through seeding or sod application.

**F. Debris**

No cut trees, timber, junk, rubbish, or other waste materials of any kind shall be buried or otherwise left deposited on any lot or street at the time of the acceptance of public improvements.

**G. Wetlands**

Any area of poor drainage determined to be a wetland under the regulation of any applicable state or Federal agency shall be abated consistent with the requirements of that agency.

## 6.19 Stormwater and Drainage Standards

### A. General Requirements

A complete drainage design shall be included with the subdivision that controls both storm water quantity and quality and protects public health and safety. Drainage control and systems shall generally promote the maintenance of natural drainage ways and the incorporation of natural topography and protect the public from flood waters. The stormwater facilities design shall follow the following hydrologic and hydraulic standards in the Hendricks County Stormwater Technical Standards Manual (HCSTS), latest edition with any expectations or additions noted in this ordinance.

### B. Professional Design Requirements

The drainage design shall be completed by a registered professional engineer. A drainage report, figures, and plans shall be submitted as part of the drainage design review.

### C. Variance Requests

Early coordination with the Town Engineer is encouraged to specific site details and limitations. Variance requests shall be requested in writing to the Town Engineer with supporting calculations and rational for why the given standard cannot be met.

### D. Stormwater and Drainage Standard Exceptions to Hendricks County Stormwater Technical Standards Manual

The following exceptions to the HCSTS are noted and to be followed in design of subdivisions.

**(1) Minimum square opening of inlets**

The minimum opening size for inlets shall be 24" either circular or square. Storm swale inlets shall be sized to accept a 10-year storm volume with 50% of the inlet clogged and no greater than 9 inches of water pooling above each inlet.

**(2) Swales**

All swales shall meet the following requirements:

**a)** The minimum flow line grade of swales shall be 1%.

**b)** No side slopes steeper than 3:1 unless approved by the Town Engineer.

**(3) Open Drainage Restrictions**

Open drainage systems shall not be allowed in the front yards unless specifically requested of, and granted by, the Plan Commission. Where approved, shallow swales, sown or sodded in grass, shall be provided. The use of deep, open ditches shall generally be discouraged. Roadside drainage shall not be disrupted by driveways or other obstructions.

### E. Sump Pump, Downspout, & Foundation Drains

It shall be illegal for sump pumps, downspouts, or foundation drains to outlet directly to the street or into the right-of-way of the street, or to be connected to the sanitary sewer.

**(1) Sump Pumps**

In no case shall a sump pump be used for more than one function; sump pumps shall be used only for the discharge of stormwater. Sump pumps shall discharge onto a grass surface in the side or rear yard and no closer than 25 feet to the right-of way of the street.

**(2) Downspouts and Roof Drains**

Downspouts and roof drains shall be discharged no closer to the street than the building setback line, with the exception of single-family residential downspouts and roof drains. All

single-family residential downspouts and roof drains shall discharge onto a grass surface no closer than 25 feet to the right-of-way of any street.

**(3) Outlet Points**

A discharge pipe which outlets onto the surface of the ground shall have its point of discharge outside the boundaries of any drainage or utility easement or street right-of-way. Discharge pipes directed toward or into an open drainage swale or ditch shall provide sufficient separation distance so as to provide sufficient area for reasonable absorption of water into the soil without creating erosion control problems.

**F. Flood Hazard Areas**

Naturally occurring riparian areas surrounding water features in the floodplain shall be preserved. No grading or clearing of these areas shall be permitted without approval of the Town Engineer. Subdivisions proposed within regulatory flood plains shall meet the following requirements:

**(1) Floodways**

Floodways shall be preserved and not diminished in capacity by filling or obstruction. No building sites shall be located within a floodway.

**(2) Floodway Fringe**

Subdivisions and related improvements are permitted consistent with the following:

**a)** All streets shall be sufficiently raised so that the surface is a minimum of 1 foot above the regulatory flood elevation.

**b)** All lots shall have a finish floor grade that exceeds the regulatory flood elevation by a minimum of 2 feet.

**c)** All water and sanitary sewer facilities shall be constructed to eliminate contamination of, or by flood water.

**d)** The area may only be filled after permission has been granted by the IDNR and provided in writing to the Zoning Administrator.

Developments impacts on the floodplain shall not raise the level of the regulatory flood elevation more than 0.1 feet for that portion of the watercourse. The Town Engineer may require a river analysis utilizing computer modeling if there is construction in the floodplain (floodway and floodway fridge).

## 6.20 Covenant Standards

### A. General Requirements

The Zoning Administrator and Town Engineer may review any restrictive covenants to ensure that conflicts with the requirements of this Ordinance and the Zoning Ordinance are not created.

### B. Drainage Covenant

Each subdivision submitted for approval shall include on the Final Plat a covenant which states that: "This subdivision is subject to all drainage system design and construction standards of the Lizton Subdivision Control Ordinance, all other applicable adopted standards of the Town of Lizton, and the requirements of the Town Engineer that provide for the repair and maintenance of the system." All drainage easements shall provide the Town of Lizton with the right of access but shall not run to the Town or any of its departments.

### C. Administration

All covenants shall be administered by a lot owners association. All lots included in the Primary Plat of a subdivision shall be included in a single lot owner's association; in no instance shall a Primary Plat be divided into multiple lot owners associations. The Town shall have no responsibility to enforce covenants.

## 6.21 Monument and Marker Standards

### A. General Requirements

All monuments and markers shall comply with the Indiana Administrative Code provisions regarding surveys. Monuments and markers shall be placed so that the center of the bar, or marked point, shall coincide exactly with the intersection of lines to be marked and shall be set so that the top of the monument or marker is level with the finished grade. All required monument and markers shall be in place prior to the acceptance of the public improvements by the Town Council.

**(1)** All section corners and quarter section corners shall be monumented and perpetuated.

**(2)** All United States, State of Indiana, County, or other official benchmarks, monuments, or triangulation stations in or adjacent to the subject property shall be preserved in precise position.

### B. Exterior Monuments

Permanent concrete monuments 4 inches by 4 inches by 48 inches deep, with 5/8-inch rebar cast in the center or filled with concrete with a surveyor's cap set in the center, shall be installed at each corner or angle on the outside boundary of each section of the subdivision (or at the right-of-way where the boundary is a public street) and at all other locations necessary to clearly delineate all significant plat lines as specified by the Town Engineer.

### C. Interior Markers

Markers consisting of rebar at least 24 inches long and not less than 5/8 inch in diameter shall be placed at the following locations:

**(1)** the intersection of all street right-of-way lines within the subdivision,

**(2)** the beginning and ending of all curves in street right-of-way lines,

**(3)** all angles formed by the intersection of lot lines,

**(4)** all other lot corners not established by a monument, and

**(5)** all points required to delineate the location or extent of reservations, easements, or dedications not otherwise defined, as specified by the Town Engineer.

### D. Elevation Control

A permanent monument shall be installed in each section of a subdivision in order to establish proper elevation control. The monument shall be a minimum of 4 inch by 4 inch by 48 inch long concrete encasement with its top flush with grade level. Each monument shall state the finished elevation based on United States Geodetic Survey datum to the nearest one-hundredth of a foot.

### E. Street Monumentation

All new and existing streets included in the subdivision shall include monumentation as follows:

**(1) Centerlines**

All changes in street centerline direction, including the beginning and ending of all centerline curves and the center point of cul-de-sacs, shall be constructed to include a 5/8-inch minimum diameter by 24-inch-long steel rod epoxy grouted in place.

**a)** The top of all such markers shall be 1/4 inch below the finished pavement surface.

**b)** Any cul-de-sac which includes a center landscape island shall have the metal monument encased in a 4 inch by 4 inch by 48 inch long concrete encasement, with the top of the monument being flush with grade level.

**(2) Centerline Intersections**

All new and existing street centerline intersections shall be constructed to include 10-inch extendible markers (Harrison or an equal approved by the Town Engineer) epoxy grouted into a 6-inch diameter by 12 inch deep core in the pavement. The top of all such markers shall be 1/4 inch below the finished pavement surface.

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# SECTION 7:
# DEFINITIONS



## 7.1 Defined Words

Words used in a special sense in this Ordinance are defined in this Section. All other words, terms, and/or phrases not specifically defined by this Ordinance shall have the meaning inferred from their context in this Ordinance or their ordinarily accepted definitions.

## 7.2 Definitions

### A

**Abutting**
Having a common border, including being separated from such a common border by a right-of-way, street, alley, easement, body of water, or other feature. In some cases, where specified by this Ordinance, abutting also includes lots or other features within a specific vicinity.

**Access Point**
A driveway or other means of physical connection for the movement of vehicles between a property and an adjacent street.

**Acre**
A land area equal to 43,560 square feet.

**Adjacent**
see *Abutting*

**Adjoining**
see *Abutting*

**Advisory Plan Commission**
A plan commission serving a single local government jurisdiction established as defined under the Indiana Code, 36-7-1-2(1983) as amended. The Town of Lizton Plan Commission is the advisory plan commission referred to in this Ordinance.

**Alley**
A public right-of-way, other than a street, road, crosswalk, or easement that provides secondary access for the abutting property.

**Amend or Amendment**
Any repeal, modification, or addition to a regulation; or any new regulation.

**Applicant**
The owner(s), developer(s), subdivider(s), or other legal representative(s) of real estate who make(s) application for action affecting the property.

**Application**
The completed form or forms, together with any other required materials, exhibits, and fees required of an applicant consistent with the procedures established by this Ordinance.

**Arborist**
An individual trained in arboriculture, forestry, landscape architecture, horticulture, or related fields and experienced in the conservation and preservation of trees.

**Arterial Street**
see *Street, Arterial*

**Arterial Road**
see *Street, Arterial*

## B_____

**Base Flood Elevation**
The elevation, expressed in feet above mean sea level, to which flooding can be expected to occur on a frequency of once every 100 years, or which is subject to a 1 percent or greater chance of flooding in any given year.

**Berm**
A man-made mound of earth of definite height and width used for landscaping and obscuring purposes.

**Best Management Practices**
The utilization of the natural environment, artificial structures, scheduling, and/or prohibition to ensure the long-term operation and maintenance of features that control erosion and/or the discharge of polluting elements.

**Block**
Property abutting 1 side of a street and lying between the 2 nearest intersecting streets (either crossing or terminating), railroad right-of-way, lake, river, stream, or other physical boundary.

**Board of Zoning Appeals:** A board established consistent with the Indiana Code 36-7-4-900 series. The Town of Lizton Board of Zoning Appeals is the board of zoning appeals referred to by this Ordinance.

**Bond**
see *Surety*

**Buffer**
A strip of land, a fence, and/or area of landscaping between 1 use and another designed and intended to separate those uses.

**Buffer Landscaping**
Any trees, shrubs, walls, fences, berms, or related landscaping features required by this Ordinance as part of a buffer.

**Buffer Yards**
An area adjacent to front, side, or rear property lines, measured perpendicularly from adjacent property lines and/or right-of-way lines, intended to screen incompatible uses form each other. Buffer yards are also used to help maintain existing trees or natural vegetation; to block or reduce noise, glare, or other emissions; and to maintain privacy. Buffer yards are in addition to (separate from) front, rear, or side yard setbacks.

**Building Permit**
An official certification issued by the Building Official authorizing the construction, alteration, enlargement, conversion, reconstruction, remodeling, rehabilitation, erection, demolition, moving, or repair of a building or other structure.

**BZA**
see *Board of Zoning Appeals*

## C

**Certificate of Occupancy, Permanent**
A certificate issued by the City certifying that a newly constructed or modified structure and/or property is completed in its entirety and is in complete compliance with all applicable regulations of the City of Franklin, and therefore may be occupied.

**Certificate of Occupancy, Temporary**
A certificate issued certifying that a newly constructed or modified structure and/or property is sufficiently completed and is in general compliance with all applicable regulations and therefore may be temporarily occupied pending the completion of remaining tasks required to bring the location into complete compliance.

**Collector Street**
see *Street, Collector*

**Collector Road**
see *Street, Collector*

**Common Area**
Land within a development that is not individually owned or dedicated to the public, but which is designed and intended for the use, enjoyment, and maintenance of the property owners within that development or other specific area. The common area may include structures or other improvements.

**Common Ownership**
Ownership by the same person, corporation, firm, entity, partnership, or incorporated association, including ownership by different corporations, firms, partnerships, entities, or unincorporated associations with at least 1 common stockholder, partner, or associate.

**Compatible**
Having harmony and consistency in design, scale, location, function, and/or appearance.

**Comprehensive Plan**
A document, consistent with the requirements of the Indiana Code, that is a compilation of policy statements, goals and objectives, standards, maps, and statistical data for the physical, social, and economic development of the community.

**Condition of Approval**
Stipulations or provisions set forth as a prerequisite for approval of an application.

**Condominium**
Real estate lawfully subject to the I.C. 32-25 series, the Horizontal Property Law, by the recording of condominium instruments, in which undivided interests in the common areas and facilities are vested in the condominium unit owners.

**Construction Plans**
Subdivision drawings that detail the specific location and design of utilities, streets, and other improvements.

**Contiguous**
see *Abutting*

**County**
Hendricks County, Indiana.

**Covenants**
Private and legal restrictions of various kinds on the usage of lots, typically within a subdivision and applied by the subdivider, that are recorded with the plat and deed.

**Cul-De-Sac**
see *Street, Cul-de-Sac*

**Curb**
A concrete boundary marking the edge of a street or other paved area and providing for a change in grade between the street surface and the adjacent unpaved portions of the street right-of-way.

**Curb Cut**
The providing of vehicular ingress and/or egress between property and an abutting street.

**Curb Radius**
The curved edge of a street, driveway, or other paved area at an intersection with another street, driveway, or other paved area.

## D

**Dedication**
The intentional setting apart of land or interests in land for use by the Town of Lizton.

**Density**
The number of dwelling units per acre.

**Density, Gross**
The numerical value obtained by dividing the total number of dwelling units in a development or area by the gross size of the area (in acres), including all non-residential land uses, rights-of-way, streets, and other features included in the area.

**Density, Net**
The numerical value obtained by dividing the total number of dwelling units in a development or area by the gross size of the actual tract of land (in acres) upon which the dwelling units are to be located, including common open space and excluding non-residential uses, rights-of-way, and streets.

**Detention Area**
An area that is designed to capture specific quantities of stormwater and to gradually release the stormwater at a sufficiently slow rate to avert flooding.

**Developer**
An individual, partnership, corporation (or agent thereof), or other entity that undertakes the responsibility for land development, particularly the designing of a subdivision plat or site development plan showing the layout of the land and the public improvements involved. In as much as the subdivision plat is merely a necessary means to an end of assuring a satisfactory development, the term “developer” is intended to include the term “subdivider”, even though the personnel involved in successive stages of the project may differ.

**Development**
Any man-made change to improved or unimproved real estate including, but not limited to:
(1) construction, reconstruction, or placement of a structure or any addition to a structure;
(2) installing a manufactured home on a site, preparing a site for a manufactured home, or installing a recreational vehicle on a site for more than 180 days;

(3) installing utilities, erection of walls and fences, construction of roads, or similar projects;
(4) construction of flood control structures such as levees, dikes, dams, channel improvements, etc.;
(5) mining, dredging, filling grading, excavating, or drilling operations;
(6) construction and/or reconstruction of bridges or culverts;
(7) storage of materials; or
(8) any other activity that might change the direction, height, or velocity of flood or surface waters.

**Double Frontage Lot**
see *Lot, Through*

**Drainage**
The outflow of water or other fluids from a site through either natural or artificial means.

**Drainage System**
All facilities, channels, and areas that serve to convey, filter, store, and/or receive stormwater, either on a temporary or permanent basis.

**Drip Line**
An imaginary vertical line that extends from the outermost branches of a tree's canopy to the ground.

**Drive, Private**
see *Street, Private*

**Driveway**
A private roadway providing access for vehicles to a parking space, garage, dwelling, or other structure.

**Driveway, Common**
An access driveway that is shared by adjoining property owners.

## E

**Easement**
A grant by a property owner to specific persons, the general public, corporations, utilities, or others, for the purpose of providing services or access to the property.

**Erosion**
The detachment, movement, and wearing away of soil and rock fragments by flowing surface or subsurface water or by wind.

## F

**FBFM (Flood Boundary and Floodway Map)**
An official map delineating the floodway, floodway fringe, 100-year floodplain, and 500-year floodplain that is prepared in conjunction with a flood insurance study.

**FEMA**
The Federal Emergency Management Agency.

**FHBM**
The Flood Hazard Boundary Map.

**FIRM (Flood Insurance Rate Map)**
The official map on which FEMA has delineated both areas of special flood hazard and risk premium zones.

**FPG (Flood Protection Grade)**
The elevation of the regulatory flood plus 2 feet at any given location in the Special Flood Hazard Area (SFHA).

**Fence**
Any structure, solid or otherwise, that is a barrier and is used as a boundary or means of protection, confinement, or concealment.

**Flood**
A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow, the unusual and rapid accumulation, or the runoff of surface waters from any source.

**Floodplain**
The relatively flat area or low land adjoining the channel of a river or stream that has been or may be covered by flood water. The flood plain includes the channel, floodway, and floodway fringe. Floodplain boundaries are to be determined using the Floodway-Flood Boundary Maps of the Federal Insurance Administration/Federal Emergency Management Administration (FEMA).

**Floodway Fringe**
Those portions of the floodplain lying outside the floodway. The floodway fringe is not necessary for carrying and discharging peak flood flow but is subject to flooding.

**Floodway**
The channel of a river or stream and those portions of the floodplains adjoining the channel which are reasonably required to efficiently carry and discharge the peak flood flow of the regulation flood of any river or flooding stream.

## G

**Grading Plan**
The drawing and supporting documents, meeting the requirements of this Ordinance and the Town Engineer, that describe the process and result of the excavating, filling, or leveling of a property by mechanical or other artificial methods.

## H

**Historic Site**
All structures and other features identified as contributing, noteworthy, or outstanding by the Indiana Historic Sites and Structures Inventory - Hendricks County Interim Report, or listed in the National Register of Historic Places or the Indiana Register of Historic Sites & Structures, as well as any subsequent amendments and/or additions to any of these publications.

**Home Owner's Association**
see *Lot Owner's Association*

## I

**Improvement**
Any building, structure, bridge, work of art, area, parking facility, public facility, fence, gate, wall, landscaping, or other object constituting a physical addition to real property.

**Improvement Location Permit**
A permit allowing a person to erect, construct, enlarge, alter, repair, move, improve, remove, convert, or demolish any structure; alter the condition of the land; change the use or occupancy of a property; or otherwise cause any change to occur that is subject to the requirements of this Ordinance or the Zoning Ordinance.

**Indecisive Vote**
A vote that fails to receive a majority, either in favor or opposed.

**Infrastructure**
Facilities and services needed to sustain industry, residential, commercial, and all other land activities including utilities and streets.

**Interested Party**
Those persons, groups, property owners, or other entities that are considered or consider themselves to be affected by a change in land use or the results of an application to change land use. *For the purposes of public notification, "interested party" is defined by the Plan Commission Rules & Procedures.*

## J

**Jurisdiction:** Any area over which a unity of government exercises power and authority.

## K

## L

**Letter of Map Amendment (LOMA)**
An amendment to the currently effective FEMA map that establishes that a property, area, and/or structure is not located in a Special Flood Hazard Area (SFHA). A LOMA may only be issued by FEMA.

**Letter of Map Revisions (LOMR)**
An official revision to the currently effective FEMA map. It is issued by FEMA and changes flood zones, delineations, and elevations.

**Local Street**
see *Street, Local*

**Lot**
A contiguous area of land separated from other areas of land by a separate description (including a recorded deed, a subdivision plat or record of survey map, or by metes and bounds) for purpose of sale, lease, transfer of ownership or separate use.

**Lot, Corner**
A lot situated at the intersection of 2 streets.

**Lot, Double Frontage**
see *Lot, Through*

**Lot, Irregular**
A lot that is characterized by elongations, angles, shapes, and/or configuration that is inconsistent with the topography, street systems, other lots, and other features of the area in which it is located.

**Lot, Zoning**
A single tract of land which, at the time of filing for an Improvement Location Permit or other approval, is designated by its owner or developer for the purposes of compliance with this Ordinance as a tract to be used, developed, or built upon. A Zoning Lot or Lots may coincide with one or more lots of record.

**Lot Owners Association**
An incorporated non-profit organization operated under recorded land agreements through which each lot owner is automatically a member and each lot is automatically subject to a proportionate share of the expenses for the organization's activities, such as maintaining common property.

**Lot of Record**
A lot that is recorded in the office of the County Recorder as a part of a subdivision plat or a parcel described by metes and bounds.

**Lot, Recorded**
see *Lot of Record*

**Lot, Through**
A lot having frontage on 2 or more non-intersecting streets.

## M

**Marker (survey)**
A stake or other object which is used to mark a point on a lot or within a subdivision.

**Metes and Bounds**
A description of land prepared by a state-registered land surveyor providing measured distances and courses from known or established points on the surface of the earth.

**Monument (survey)**
A permanent physical structure that marks the location of a corner or other survey point.

## N

**Natural Condition**
The condition that arises from, or is found in nature unmodified by human intervention.

**Natural Drainage**
Drainage channels, routes, and ways formed over time in the surface topography of the earth prior to any modifications or improvements made by unnatural causes and/or human intervention.

**Natural Features**
The physical characteristics of a property or area that are not man-made, such as soil types, geology, slopes, vegetation, and drainage patterns.

**No-access Reservation**
A restriction placed on a lot, typically shown as a line labeled as such on primary and secondary subdivision plats, that prohibits vehicular access from the affected lot(s) to an adjacent street.

## O

**Occupancy**
The use of any land or structure.

**Official Zoning Map**
A map that legally denotes the boundaries of zoning districts as they apply to the properties within the Plan Commission's jurisdiction.

**Off-Site Improvement**
An improvement related to new development that occurs, or is constructed on property that is outside of the parcel or tract that is being developed. Off-site improvements typically include, but are not limited to drainage, public water systems, public sewer systems, and streets.

**Open Space**
An area of land not covered by structures or accessory uses except for those related to recreation. Open space may include nature areas; stream and flood plains; meadows or open fields containing baseball, football, and soccer fields, golf courses, swimming pools, bicycle paths, etc. Open space does not include street rights-of-way, platted lot area, private yards, patio areas, or land scheduled for future development.

**Owner**
Any person, group of persons, firm or firms, corporation or corporations, or any other legal entity having title to, or sufficient proprietary interest in the land, or their legal representative.

**Owners Association**
see *Lot Owners Association*

## P

**Parcel**
see *Lot*

**Parking, Off-Street**
A storage space for an automobile located outside of a street right-of-way.

**Parking, On-Street**
A storage space for an automobile that is located within the right-of-way and paved portion of a street.

**Paved Surface**
A durable surface for parking, driving, riding or similar activities that utilizes asphalt, concrete, brick, paving blocks or similar material. Crushed gravel, stone, rock, or dirt, sand, or grass are not a paved surface.

**Pedestrian Path**
A designated route for travel by pedestrians, bicycles, and other non-motorized methods of personal transportation and recreation that is with concrete, crushed rock, or asphalt and separated from streets by distance or striping.

**Person**
A person, corporation, firm, partnership, association, trust, organization, unit of government, or any other entity that acts as a unit, including all members of any group.

**Petitioner**
Any person who formally makes a request before the Plan Commission or Board of Zoning Appeals consistent with the processes and requirements of this Ordinance. See also *Applicant*.

**Plan**
see *Comprehensive Plan*

**Plan Commission**
see *Advisory Plan Commission*

**Planting Season**
The spring and fall time periods during which new plant material that is installed is most likely to survive the planting process. Generally these periods are from April 15 to June 15 in the spring and from October 15 to November 15 in the fall.

**Plat**
A map or chart that shows a division of land and is intended to be filed for record.

**Plat, Primary**
The Primary Plat, pursuant to Indiana Code 36-7-4-700 series, is the plat and plans upon which the approval of a proposed subdivision is based.

**Plat, Final**
The Secondary Plat, pursuant to Indiana Code 36-7-4-700 series, is the plat document in recordable form.

**Private Street**
see *Street, Private*

**Property Owner**
The person(s) identified as the property owner on the most recent list prepared and maintained by the County Auditor's Office. See also *Owner.*

**Public Hearing**
A formal meeting, announced and advertised in advance consistent with the requirements of this Ordinance, that is open to the public, and at which members of the public have an opportunity to participate.

**Public Improvement**
Any improvement, facility, or service that provides transportation, drainage, public utilities, or similar essential services which are typically or specifically required to be provided by a unit of government.

**Public Street**
see *Street, Public.*

## Q

## R

**Record**
The written documentation of the actions and expressions of a public body, such as the Plan Commission or Board of Zoning Appeals.

**Registered Land Surveyor**
A land surveyor properly licensed and registered or through reciprocity permitted to practice in the State of Indiana.

**Registered Professional Engineer**
An engineer properly licensed and registered or through reciprocity permitted to practice in the State of Indiana.

**Regulatory Flood**
The flood having a 1 percent probability of being equaled or exceeded in any given year, as calculated by a method and procedure which is acceptable to and approved by the Indiana Natural Resources Commission and the Federal Emergency Management Agency. The "Regulatory Flood" is also known by the term "Base Flood".

**Regulatory Floodway**
The channel of a river or stream and those portions of the flood plains adjoining the channel that are reasonably required to efficiently carry and discharge peak flow of the regulatory flood of any river or stream and, is that area covered by floodwaters in significant downstream motion or covered by significant volumes of stored water during the occurrence of the regulatory flood.

**Replat**
Any non-exempt change in a Final Plat of an approved or recorded subdivision.

**Right-of-Way**
Property occupied or intended to be occupied by a street, trail, utility transmission line, or other public utility or facility.

**Right-of-Way Line**
The limit of publicly owned land encompassing a public facility such as a street or alley.

**Road**
see *Street*

**ROW**
see *Right-of-Way*

## S

**Secondary Plat**
see *Plat, Secondary*

**Setback**
The horizontal distance between a structure and a lot line or right-of-way line.

**Sight Distance**
The measurement from a driver's eyes, which are assumed to be 3.75 feet above the pavement surface, to an object 6 inches high on the pavement.

**Sketch Plan**
A drawing portraying the general layout of a proposed subdivision, for the purpose of discussion and classification.

**Special Flood Hazard Area (SFHA)**
Those lands that are subject to inundation by the regulatory flood. The SFHAs are generally identified as such on the Flood Insurance Rate Map prepared by the Federal Emergency Management Agency.

**Stream Bank**
The usual boundaries, not the flood boundaries, of a stream channel.

**Street**
A public thoroughfare, including a road, highway, lane, avenue, place, boulevard, and any other thoroughfare that affords vehicular access to abutting property.

**Street, Arterial**
A street that serves the major traffic movements within a community, such as between the central business district and outlying commercial and residential areas, as well as a majority of the vehicular traffic entering and leaving the city to travel to and from adjacent communities. Arterial streets are identified by the Thoroughfare Plan.

**Street, Collector**
A street designed and used to carry moderate volume traffic from local streets to arterial streets. Collector streets are identified by the Thoroughfare Plan.

**Street, Cul-de-Sac**
A street having 1 end open to traffic that is permanently terminated by a vehicular turnaround.

**Street, Frontage**
The distance along which a property line of a lot abuts the right-of-way of an adjacent street.

**Street, Half**
A street for which only half of the required right-of-way and/or pavement width has been provided.

**Street, Intersecting**
Any street that joins another street at an angle, whether or not it crosses that street.

**Street Intersection**
The point of crossing or meeting of 2 or more streets.

**Street, Local**
A street designed to provide vehicular access between individual properties and the collector and arterial street system. Local streets are identified by the Thoroughfare Plan.

**Street, Non-Residential**
Any local or collector street where the primary land use of the lots that the street provides access to, and the lots on either side of the street is primarily non-residential (such as commercial, industrial, or institutional).

**Street, Private**
Any street that is privately owned and maintained that is used to provide vehicular access to more than 1 property, business, or dwelling unit.

**Street, Public**
A street maintained by a unit of government within an officially deeded and accepted right-of-way.

**Street, Residential**
Any local or collector street where the primary land use of the lots that the street provides access to, and the lots on either side of the street is primarily residential.

**Street Width**
The width of the paved surface of a street, measured from back-of-curb to back-of-curb or from edge-of-pavement to edge-of-pavement where curbs are not present.

## SECTION 7: DEFINITIONS

**Subdivider**
Any person or other entity which initiates proceedings to create a subdivision. See also *Developer.*

**Subdivision**
The division of any lot for the purpose of sale, transfer, gift, or lease that results in the creation of 1 or more new building sites.

**Subdivision, Major**
A subdivision that creates more than 3 total lots (including any remaining tract) and/or that requires the creation of any new public improvements.

**Subdivision, Minor**
A subdivision that (1) results in the creation of 3 or fewer total lots (including any remaining tract), each of which fronts on an existing street and (2) does not include the construction of any new public improvements. Minor subdivisions may include the upgrade of existing public improvements such as the construction of sidewalks, the dedication of additional street right-of-way along an existing street, and/or the extension of utility services to the new lots.

**Surety**
An amount of money or other negotiable instrument provided by a developer to the Town that guarantees that they will perform all actions required by the Town regarding an approved site plan, plat, or other improvement. Surety provides that, if the developer fails to comply with the requirements of the approval, funds will be provided for the Town to complete those requirements.

## T

**Thoroughfare Plan**
The official plan that sets forth the location, general alignment, dimensions, and classification of existing and proposed streets and other thoroughfares.

**Topography**
The configuration of the earth's surface, including the relative relief, elevations, and position of land features.

**Traffic Calming**
Methods of reducing the negative impact of vehicles on surrounding land uses and other methods of personal transportation through street design that decreases the speed of vehicles and provides increased space and comfort for pedestrians.

## U

**Undeveloped Land**
Land in its natural state.

## V

**Vested Right**
A right that has become fixed and cannot be revoked by subsequent changes of applicable regulations.

## W

**Waiver**
A specific modification or lessening of the regulations established by this Ordinance that may be granted by the Plan Commission for a specific development in response to unique site characteristics or development patterns that justify relief from the otherwise generally applicable regulations.

**Watercourse**
Any natural or man-made channel through which water flows on a continual or temporary basis.

**Wellfield**
An area that contains 1 or more existing or proposed wells for supplying water to a water utility.

**Wetland**
Areas that are inundated and saturated by surface or groundwater at a frequency and duration sufficient to support vegetation typically adapted for life in saturated soil conditions as identified by the National Wetlands Institute and certified by an individual with a US Army Corps of Engineers Regulation 4 Jurisdictional Wetland Certification.

## X, Y, & Z

**Zoning District**
A section of the Zoning Ordinance for which uniform zoning regulations governing use, height, area, size, intensity of use of buildings and land are established by this Ordinance.

**Zoning Map**
see *Official Zoning Map*

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# TOWN OF LIZTON

# HENDRICKS COUNTY, INDIANA

# SANITARY SEWER STANDARDS


***Prepared by:***

***Triad Associates, Inc.***
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***Indianapolis, Indiana 46216***
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**TOWN OF LIZTON, INDIANA**
**SANITARY SEWER STANDARDS**

## FORWARD

The enclosed Sanitary Sewer Standards are provided to outline the Town of Lizton's minimum Standards for Sanitary Sewer construction. All Sanitary Sewer infrastructure projects which are to connect to or become part of the Town's Collection System shall conform to these Standards. Construction drawings and specifications must be approved by the Town and a written permit must be obtained in accordance with existing ordinances prior to the start of construction.

The Owner/Developer is responsible for obtaining required permits and approvals from all applicable and associated governing agencies. Wastewater projects must be submitted to the Indiana Department of Environmental Management (IDEM) for approval. The Town will not approve a wastewater construction project until an approval from IDEM is received.

Construction observation shall be provided by the Town to assure compliance with these Standards. A minimum of 48 hours notice shall be given prior to starting construction. The Contractor is responsible for notifying applicable utilities to request locating services.

These Standards were prepared with the intent of obtaining the highest quality of construction possible and are consistent with accepted industry practices. The Standards may be revised and updated from time to time in order to incorporate new materials and construction methods.

Copies of the Standards may be obtained from the Town Hall, which is located at 106 N. Lebanon Street Lizton, Indiana 46149, telephone number 317-994-5500 during regular office hours. These Standards were approved and adopted by the Town Council of the Town of Lizton on ***June 13, 2022.***

# TOWN of LIZTON
# Sanitary Sewer Standards

## TABLE OF CONTENTS: Wastewater Collection System

# TOWN of LIZTON
# Sanitary Sewer Standards

## SECTION 5: WASTEWATER COLLECTION SYSTEM

# TOWN of LIZTON
# Sanitary Sewer Standards

## APPENDIX

# Section 1: General Requirements

## 1.01 DEFINITIONS AND TERMS

Whenever in these Standards or in any documents or instruments where the Standards govern, the following terms, abbreviations, or definitions are used, the intent and meaning shall be interpreted as follows:

### A. ABBREVIATIONS

| | |
|---|---|
| ASTM | American Society of Testing and Materials |
| AASHTO | American Association of State Highway and Transportation Officials |
| AWWA | American Water Works Association |
| ANSI | American National Standards Institute |
| ASME | American Society of Mechanical Engineers |
| ACI | American Concrete Institute |
| AREA | American Railway Engineers Association |
| NEMA | National Electrical Manufacturers Association |
| INDOT | Indiana Department of Transportation |
| OSHA | Federal Occupational Safety and Health Act |
| WPCF | Water Pollution Control Federation |

### B. DEFINITIONS

1. ACCEPTANCE: The formal written acceptance by the Town of Lizton of an entire project which has been completed in all respects in accordance with the approved Plans, Specifications and these Standards including any previously approved modifications.

2. ANNEXATION: The inclusion of additional property into the Corporate Limits by proper legal procedures.

3. BACKFILL: Earth and/or other material used to replace material removed from trenches during construction which is above the pipe bedding.

4. BEDDING: That portion of the trench backfill which encases the sewer pipe to a minimum depth above and below the bell/barrel of the pipe, as provided in the BEDDING section of these Standards, for the purpose of properly supporting the pipe.

5. BUILDING SEWER (LATERAL): The conduit for transporting waste discharged from the building to the public sewer commencing three (3) feet outside the building walls and ending at and exclusive of the wye or tee fitting at the connection to the public sewer.

6. CONTRACTOR: Any Contractor who meets the Town's requirements to perform the work of installing sewers under the Town's jurisdiction.

7. COUNTY: The County of Hendricks, State of Indiana.

8. EASEMENT: Easements are areas along the line of all public water mains which are outside of dedicated water or road easements or rights-of-way and are recorded and dedicated to the Town granting rights along the line of the water main. Easements shall be exclusively for water mains and no other utilities shall be constructed or encroach upon the easement except with the expressed written approval of the Town.

9. ENGINEER: The Engineer for the Owner or the Town of Lizton.

10. GOVERNING AGENCY/BODIES: Governing Agency having jurisdiction due to location or type of work being performed. Includes at a minimum the Town of Lizton, Hendricks County, and applicable State Agencies such as the Indiana Department of Transportation (INDOT), IDEM Etc.

11. INSPECTOR: A representative of the Town of Lizton assigned to make detailed inspection of any or all portions of the work and materials. The inspector has full authority to reject materials and/or any portion of the work not supplied and installed in accordance with these Standards and to stop work if the work is not proceeding in accordance with these Standards.

12. OTHER SPECIFICATIONS AND MATERIALS: Wherever in these Standards other specifications or regulations are mentioned, it shall be understood that the materials and methods mentioned therewith shall conform to all requirements of the latest revision of the specifications so mentioned.

13. OWNER: Any individual, partnership, firm, corporation or other entity who, as property owner, is initiating the work.

14. PERMITS: Clearance to perform specific work under specific conditions at specific locations. The Owner or his duly authorized representative shall furnish to the Town all necessary plans and documents required by the Town to make application for permits.

15. PLANS: Construction plans, including system maps, water plans, cross sections, utility plans, detailed drawings, etc., or reproductions thereof, approved or to be approved by the Town and the Ingalls Area Plan Commission, which show location, character, dimensions and details of the work to be done.

16. RECORD DRAWING (AS-BUILTS): Plans certified, signed and dated by a professional engineer registered in the State of Indiana, indicating that the Plans have been reviewed and revised, if necessary, to accurately show all as-built construction and installation details including, but not limited to, key elevations, locations and distances. Computer files as specified in Section 1.02 are required.

17. RIGHT-OF-WAY: All land or interest therein which by deed, conveyance, agreement, easement, dedication or process of law is reserved for or dedicated to the use of the general public, within which the Town shall have the right to install and maintain public utilities.

18. SEWER: A pipe or conduit for carrying wastewater (sanitary sewer), storm water (storm sewer) or a combination of both (combined sewer).

19. STANDARD DRAWINGS: The drawings of structures, sanitary sewer lines or devices commonly used and referred to on the plans and in these Standards.

20. STANDARDS: The Standards for Design and Construction within the Lizton Area as contained herein and all subsequent additions, deletions, or revisions.

21. TEN STATE STANDARDS: Recommended Standards for Sewage Works, latest edition, developed by the Committee of the Great Lakes - Upper Mississippi River board of State Sanitary Engineers.

22. TOWN: The Town of Lizton, the Town Council, or any dully authorized official acting on its behalf.

23. UNIFORM PLUMBING CODE: The Uniform Plumbing code adopted by the International Association of Plumbing and Mechanical Officials, current edition.

24. WORK: All the work to be done under Town's permit, in accordance with the approved Plans, Specifications, these Standards and permit conditions.

End of Section 1
General Requirements

# Section 2: Excavation, Trench Safety, Dust Control

## 2.01 GENERAL

This section provides for all surface removal, excavation and disposal of surplus material within the public right-of-way, trench safety system and dust control. Trench safety is a key and vital issue and Owners should take the necessary steps to ensure that the Contractor they use to construct infra-structure has included trench safety construction techniques and safety systems in the cost proposal.

All trenches or excavations shall be backfilled to the original surface of the ground, or such other grades as shown on the design plans or as directed. In general, the backfilling shall be carried along as speedily as possible and as soon as the concrete, mortar, and/or other masonry work and pipe joints have sufficient strength to resist the imposed load without damage.

## 2.02 SURFACE REMOVAL (Within Public Right-of-Way)

For construction of utilities as indicated on the approved Plans within the Public Right-of-Way, the Contractor shall remove the surface materials only to such widths as will permit a trench to be safely excavated, affording sufficient room for proper efficiency and proper construction. Where sidewalks, driveways, pavements, curb and/or gutters are encountered, care shall be taken to protect such against fracture or disturbance beyond reasonable working limits. All pavements shall be cut with an abrasive saw and concrete streets, driveways, walks, alleys, etc. cut to the nearest joint, and as required by the design plans and the Governing Bodies. Any areas damaged during construction shall be re-sawed to provide a clean surface for rehabilitation.

Excavated topsoil shall be stored in a designated location as approved by the Governing Bodies. The topsoil shall be protected in such a manner as to ensure the preservation of its quality. The topsoil shall be inspected by the Town of Lizton and/or Hendricks County personnel before being backfilled in the work.

## 2.03 TRENCH SAFETY SYSTEM

The Contractor and the Owner are responsible for ensuring that safe working conditions exist and safety procedures are being followed at the work site. The Contractor shall also be responsible for notifying the Indiana Occupational Safety and Health Administration (IOSHA), Indiana Department of Labor and all other applicable governmental agency requirements.

The Town and/or County's inspector is NOT responsible for policing the Contractor's safety program. If, in the opinion of the observer, an unsafe condition is noted, he will notify the Contractor of this condition and report it to the Owner. If the condition continues to exist the observer shall notify the Owner, document the unsafe condition in writing and/or through a photograph, and leave the job site. The Town and/or County Officials may contact IOSHA and request that they dispatch an inspector immediately.

Regarding Trench Safety Systems, the Contractor shall design, install and maintain a "Trench Safety Program" in strict compliance with OSHA (Occupational Safety and Health Administration) Part 1926 of the Code of Federal Regulations and all other applicable federal, state, and local regulations The contractor shall be responsible to continuously upgrade the Trench Safety Program with changing governmental regulations.

## 2.04 DUST CONTROL

The Contractor shall be responsible for maintaining the site and adjoining paved surfaces in a dust free condition. Fugitive dust control is the sole responsibility of the Contractor.

## 2.05 MAGNETIC LOCATOR WIRE

All PVC or non-metallic utilities shall be installed with a Type THWN #12 locator wire installed on top of the pipe.

End of Section 2
Excavation, Trench Safety, Dust Control

# SECTION 3: Surface Replacement and Site Restoration

## 3.01 GENERAL

This section pertains to the restoration of areas within the public Right-of-Way and/or acquired easements where infra-structure is being constructed. Surface restoration within the site being developed is per the direction of the Owner.

When the construction is complete, remove all surplus material and rubbish from the site or work. That portion of the surface disturbed by construction shall be rebuilt to as good condition as it was before the commencement of the work. The project site shall be promptly and regularly maintained. Contractor shall be responsible for repairs of unsatisfactory trench backfilling or other unsatisfactory contracted services.

## 3.02 PAVEMENT, CURB AND GUTTER REPLACEMENTS

In all streets, alleys or other areas that are to be paved, all backfilling shall be well compacted by hand held mechanical compaction machines per the requirements of the Indiana Department of Highways and all other governing bodies. After the trench or excavation has been backfilled, the subgrade for the new paving, curb and/or curb and gutter shall be further compacted by rolling the backfill at subgrade elevation. After examination of the backfill and subgrade compaction by the reviewing agencies, the pavement, curb and/or curb and gutter shall be replaced. Pavement and Drive Patch details are shown on Details 8F through 8J.

All pavements, curbs and/or gutters shall be replaced with the same materials as that removed in accordance with the latest revisions of Standards of the Indiana Department of Highways, Hendricks County, or these standards whichever is applicable.

## 3.03 TRAFFIC CONTROL

The Contractor shall maintain vehicular and pedestrian traffic during all paving operations, as required per the permit.

The Contractor shall provide flagmen, barricades and warning signs for the safe and expedient movement of traffic through construction zones within the right-of-way. This shall be in accordance with the principles and standards in the Indiana Department of Transportation, Standard Specifications, latest revision.

## 3.04 LAWN AND GRASS AREA REPLACEMENT

All lawn and grass areas disturbed or damaged during construction shall be restored to original or better condition. Backfills, fills and embankments shall be brought to a subgrade level six (6) inches below finished grade. When subgrades have settled, topsoil shall be placed to a finished depth of at least six (6) inches; fine raked, and prepared for seeding.

If the backfill, fill or embankment material is sand, an eight (8) inch layer of clay furnished by the Contractor at his expense shall be spread over the subgrade and thoroughly mixed into the sand subgrade. The clay shall be mixed into the sand subgrade, then leveled and smoothed. Topsoil shall be placed and spread to a finished depth of at least two (2) inches, and fine rake.

Commercial fertilizer 6-12-12 or equal shall be uniformly spread over the topsoil by a mechanical spreader and mixed into the soil for a depth of two (2) inches on areas to be seeded. This shall be done at least forty-eight (48) hours before the sowing of any seed at the rate of thirty-five (35) pounds per thousand square feet. The area shall then be lightly raked or harrowed until the surface of the finished grade is smooth, loose and pulverized.

Then, the grass seed shall be sown by a mechanical seeder, and lightly raked into the surface or sown with a standard agricultural drill. The seeded areas shall be thoroughly watered with a fine spray in such a manner as not to wash out the seed. The Contractor shall use care in raking in order to avoid disturbance of the finished grade and seed distribution.

Seeding shall be done only within the seasons extending from August 15 to October 15, and from April 1 to June 1, unless otherwise permitted by the Governing Agencies.

Contractor must submit a seed mixture certificate to the Governing Agencies before using. Grass seed shall be sown at the rate of not less than three (3) pounds per thousand square feet and shall consist of the following mixture:

35 parts Kentucky Bluegrass
30 parts Perennial Rye
30 parts Kentucky 31 Fescue
5 parts inert matter

Hydro seeding shall be done in accordance with the Indiana Department of Transportation Specifications, latest revision.

## 3.05 MULCHING

Adequate mulching material following seeding and fertilizing shall be applied, followed by cultipacking.

Mulch shall consist of:

1. Dry straw or hay of good quality and at the rate of two and one-half (2-1/2) tons per acre; or

2. Wood cellulose or cane fiber mulch at a rate of one thousand (1,000) pounds per acre;

3. A combination of good quality dry straw or hay free of seeds of competing plants at a rate of two and one-half (2-1/2) tons per acre and wood cellulose or cane fiber mulch at a rate of five hundred (500) pounds per acre; or

4. Manufactured mulch materials such as soil retention blankets, erosion control netting, or others that may be required on special areas of high water concentration or unstable soils. When these materials are used, follow the manufacturer's recommendation for installation. The seeded area shall be watered, maintained, and patched as directed by the Governing Agency until the Contractor's work is completed and accepted.

## 3.06 STAND OF GRASS

The Contractor shall be required to establish a satisfactory stand of grass to be full coverage without bare spots. This is not required for areas subject to agricultural activities.

Within one (1) year after work completion, the Contractor shall be required to correct any defective work, such as bare spots in grass coverage, erosion, gullies, etc. in a timely manner upon notification.

## 3.07 SODDING

The areas to be sodded shall be as shown on the plans and as required by the Governing Agencies.

The use of sod shall be in accordance with the Indiana Department of Highway Specifications, latest revision. At a minimum, sod shall be fibrous, well rooted bluegrass, or other approved sod, with the grass cut to a height of not more than three (3) inches. Edges of sod shall be cleanly cut, either by hand or machine, to a uniform thickness of not less than one and one-half (1-1/2) inches, to a uniform width of not less than sixteen (16) inches, and in strips of not less than three (3) feet in length.

Sod shall be free from all primary noxious weeds as defined by the Indiana State Seed Law.

Remediation of soils intended for agricultural use shall include the application of necessary macro- and micro-nutrients, including lime and organic material to return the soil to near pre-construction condition.

End of Section 3
Surface Replacement and Site Restoration

# Section 4: Record Drawings

## 4.01 RECORD DRAWINGS

The project Designer shall furnish to the Town two sets of as-built drawings and one set of computer files on compact disc or flash drive in AutoCAD ".DXF" and ".DWG" format for all projects dedicated to the Town and for all multi-family, industrial and commercial sites. All sheets shall have "Record Drawing" boldly printed on them with the date, stamp, and signature of the Professional Design Engineer, who must be registered in the State of Indiana. Drawings and computer files shall clearly differentiate between the original design and changes made to the design during the construction process. Each disk/drive shall be labeled with project name, property name, and date. Any auxiliary design program data files shall also be included and required subdirectory file structure and path relationships shall be maintained. All files shall be in readable format but shall be write protected. If auxiliary lettering fonts (fonts not supplied with standard AutoCAD Program) are used, then all necessary data files to support, import and utilize the applied fonts shall be included on the disk(s). An ASCII text file README.TXT shall be included in the files supplied. This file shall describe all files on the disk(s). This shall include creating program names, versions, and all other necessary details to allow the Town to fully understand and utilize the data files.

At a minimum the following information shall be provided on the plans:

1. Building pad elevations if applicable.

2. Structure elevations, pipe sizes and types fitting description, blocking details, hydrants valves.

3. Horizontal alignment of pipes, valves, hydrants, and structures to a minimum accuracy of +/- 1 foot.

End of Section 4
Record Drawings

# Section 5: Wastewater Collection System

## 5.01 BUILDING SEWERS

The following highlights the provisions and requirements pertaining to Building Sewers. If any conflict exists between these regulations and other Ordinances, the most stringent requirement shall apply.

A. Connection Permits

Connection permits must be issued by the Town's Building Inspector or designee for all repairs or modifications to a building sewer or for a connection to a public sewer owned and operated by the Town. All lateral connections must be inspected by the wastewater representative in charge of such or designee in accordance with these standards using a Town authorized form. (See Detail 5K)

B. Minimum Elevations for Gravity Connection

A sanitary sewer connection permit for a gravity connection shall not be granted to homes or buildings where the lowest elevation to have gravity sanitary services is less than one (1) foot above the top of the manhole casting elevation of either the first upstream or downstream manhole on the public sewer to which the connection is to be made. If the first upstream or downstream manhole is at a higher elevation a grinder lift station must be installed. (See Details 5H and 5I)

C. Fees

Permit and inspection fees are established by the Town of Lizton. This fee shall cover the costs of mandatory inspection, and any re-inspection that may be necessary because of remedial construction. The Town of may revise the amount of such fees as needed.

## 5.02 GENERAL DESIGN STANDARDS

Construction permits shall be obtained from the Town for the installation of all sanitary sewer facilities discharging into the sewers owned and operated by the Town of Lizton. Sanitary sewer facilities shall be designed and installed in accordance with these Standards, the Subdivision Ordinance and Ten States Standards for Sewage Works. All required permits from state and federal agencies shall be the responsibility of the Developer/Owner. Copies of all State and Federal permits required shall be delivered to the Town of Lizton prior to construction.

## 5.03 DESIGN CRITERIA

All sanitary sewers shall be designed to carry the estimated flow from the area ultimately contributing to the respective reach of the sanitary sewer. The required capacity shall be established by the Town. In no instance shall a gravity sewer, other than a building sewer, be less than eight (8) inches in diameter. The following design standards for

gravity sewers within or contributing to the Lizton Wastewater System have been established:

A. Population Density

Population density shall be in accordance with the actual count or character of the proposed development.

B. Average Family

For the purposes of design the average family unit is considered to be 3.1 persons per single family home.

C. Design Flow

The design of all sanitary sewer facilities shall be based on future area population growth and land development characteristics and figures provided by the Town of Lizton including the servicing of existing contiguous developed areas not currently served by sanitary sewers. The values of Average and Peak Flow and Design Population shall be the values which include the future flows and population. The Town reserves the right to review and determine the appropriateness/applicability of the estimated flow volumes provided.

The following shall be used as a guide:

1. Average Design Flows

    a. Single Family Residential: The average design flow for single family dwellings shall be one hundred (100) gallons per person per day, or 310 gpd per dwelling.

    b. Commercial/Industrial/Institutional: The average daily design flow for these facilities shall be based on Bulletin S.E. 13 from the Indiana State Board of Health, latest edition. Table 5-1 of these Standards itemizes estimated design flows for various non-residential facilities.

Bulletin 13 shall be used as a general guideline in determining average flow volumes anticipated from a proposed development. Based upon information submitted by the Owner, these flow volume guidelines may be modified at the Town's discretion. The Town may require sewers of greater capacity be installed for potential growth.

2. Peak Design Flow

a. Single Family Residential: The peak design flow for a single family development shall be calculated per Ten States Standards as follows:

$$\text{Peak Flow} = (\text{Avg. Flow}) \frac{18 + \sqrt{P}}{4 + \sqrt{P}}$$

Where P is equal to the total design population in thousands.

b. Commercial/Industrial/Institutional: The peak design flow from commercial, industrial or institutional developments shall be the average daily flow determined multiplied by 2.5. Industrial processes with greater peak flows shall be reviewed on a case-by-case base.

3. Infiltration

Sanitary sewer design capacity must include an allowance to carry unavoidable amounts of groundwater infiltration or seepage in addition to the peak sanitary flows. Collector and trunk sewers shall be designed to include an allowance of two hundred (200) gallons per day per inch diameter per mile of pipe.

D. Materials

Pipe materials acceptable for use as sanitary sewers and force mains shall be as noted in these standards unless approved otherwise by the Town. Pipelines subject to exposure to petroleum products shall be ductile iron with nitrile or other petroleum resistant gasket material.

## 5.04 MINIMUM SEWER STANDARDS

A. Pipe Diameter

The required diameter of gravity sewers shall be determined by Manning's formula using a roughness coefficient, "n", of 0.013 or the pipe manufacturer's recommendation, whichever is greater. The minimum pipe diameter for gravity sanitary sewers shall be eight (8) inches.

B. Minimum Slopes and Velocities

All sanitary collector and trunk sewers shall be designed and constructed to provide a minimum velocity when flowing full of two (2) feet per second. The slope of the sewer pipe shall be such that these minimum velocity requirements are attained. The minimum acceptable slopes for the design and construction of sanitary sewers are as follows:

| Pipe Size (inches) | Minimum Slope (Feet per 100 Feet, %) |
|---|---|
| 8 | 0.40 |
| 10 | 0.28 |
| 12 | 0.22 |
| 15 | 0.15 |
| 18 | 0.12 |
| 21 | 0.10 |
| 24 and greater | 0.08 |

SANITARY SEWERS FOUND TO HAVE LESS THAN THE MINIMUM SLOPE SHALL NOT BE ACCEPTED.

C. Minimum Depth

For the protection of the sanitary sewer lines from damage caused by utilities installed after the sanitary sewer has been constructed, the minimum depth to crown of all gravity sanitary sewers shall be 5.0 feet for alleys and roads and 4.0 feet everywhere else. The minimum depth to crown of all force main sanitary sewers shall be 5.0 feet.

D. Building Sewers

Building sewers shall conform to the latest edition of the Uniform Plumbing Code (UPC), the Indiana Department of Fire Protection and Building Safety. These Standards and the procedures set forth in appropriate Specifications of ASTM and WPCF Manual of Practice No. 9. Sewers shall not allow migration of groundwater into the system.

Building sewers shall connect to the public sewer at a mainline fitting. Each building sewer can only serve one building. Connections to manholes shall only be allowed at upstream terminating manholes unless approved by the Town. Inside drop connections to manholes are not allowable.

Building sewers within and outside of rights-of-way or easements shall be a minimum of six (6) inches in diameter and installed at a slope of no less than one-eighth (1/8) inch per foot. A tee wye cleanout shall be located within five (5) feet of the building's exterior wall and extended to grade. Cleanouts installed under concrete or asphalt paving shall be adequately protected and made accessible by yard boxes or extended flush with paving using approved materials.

Building sewers installed for future connections shall be terminated at the right-of-way or easement and plugged to ensure 100 percent water tightness. A #10 magnetic locator wire shall be installed along the entire length of the lateral to the cleanout.

E. Manholes

In areas where future residential, commercial and/or industrial growth can occur, all new manholes 15 feet deep or deeper shall be equipped with future precast outside drop connections of a size and at an elevation to be determined by the Town at the time of design to allow for future connections. The drops shall extend from the base to within 10 feet of the final graded surface elevation.

The energy gradient within manholes shall not increase. This shall be accomplished by keeping the crown elevation continuous where possible.

Manholes to be installed in unpaved grassy areas shall be designed and constructed such that the top of the casting is a minimum of six (6) inches above finished grade to prevent ponding of water. Positive drainage away from the manhole shall be provided.

In areas susceptible to flooding, the top of the manhole shall be above the 100 year flood elevation. The design Engineer shall identify the flood elevation on the plans and design the manhole to preclude the submergence of the manhole.

## 5.05 EASEMENTS

Whenever possible, sanitary sewers are to be constructed within the public right-of-way. Should construction extend beyond the right-of-way limits, sewer easements shall be acquired, dedicated and recorded solely for the benefit of the Town of Lizton. Proposed easement locations must be approved by the Town Engineer or Wastewater Superintendent to assure adequate access for maintenance and cleaning. Easement boundaries shall be shown on the plans and specifications as "Sanitary Sewer and Water Easement" in lieu of "Utility Easement." The minimum permanent easement widths to be dedicated are:

| Depth of Sewer from Finished Grade | Minimum Easement (ft.) |
|---|---|
| up to 15 feet | 20 |
| > 15 feet to 25 feet | 25 |
| greater than 25 feet | 30 |

A minimum 30 foot by 30 foot easement shall be provided for all submersible lift stations with wet wells up to 30 feet deep. Easements for lift stations with wet wells or wet well/ dry pits greater than 30 foot deep shall be handled on a case by case basis. The sewer easements shall provide for exclusive control by the Town, free and unobstructed use by Town crews at all times, and access from a public right of way or easement. Easements must include the Town's right to remove any structure, pavement, landscaping etc. as needed for inspection, maintenance, or repair purposes. No utility company will be permitted to use the Town's easements to install utility lines without the express written permission of the Town. All plan sheets shall clearly identify the sanitary sewer easement and the location of all other proposed utilities. The horizontal and vertical plans shall identify all utilities proposed to cross the sanitary sewer easement.

## 5.06 LATERAL LOCATIONS

Sanitary sewer plans submitted as record ("as-built") drawings shall have all laterals shown on the plan view with their locations properly scaled. Lateral measurements shall be indicated by their distance from the downstream manhole in the form of stationing. Lateral stationing shall begin at 0+00 at each downstream manhole.

## 5.07 PROTECTION OF WATER SUPPLIES

There shall be no physical connections between a public or private water supply system and a sanitary sewer or appurtenance which would permit the passage of any polluted water into the potable supply. Sanitary sewers shall be laid at least ten (10) feet horizontally from any existing or proposed water line. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten (10) foot separation, the appropriate reviewing agency may allow deviation on a case-by-case basis if supported by data from the design engineer. Such deviation may allow installation of the sewer closer to a water main provided that the water main is in a separate trench or on an undisturbed earth shelf located to one side of the sewer, and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer. Deviations must be approved in writing by the Town of Lizton.

Sanitary sewers crossing water mains shall be laid to provide a minimum vertical separation distance of 24 inches between the outside of the water main and the outside of the sewer. This shall be the case whether the water main is above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Adequate structural support shall be provided to prevent damage to the lower pipe. When it is not possible to obtain proper horizontal and vertical separation as stipulated above, the sewer shall be encased and/or designed and constructed equal to water pipe for a distance of 10 feet in either direction of the crossing. The line shall be pressure tested to assure water tightness prior to backfilling.

## 5.08 UTILITY COORDINATION

The plans shall show the location of overhead and underground utility lines and existing sewers according to the best information available. Plans shall be submitted to the utilities and shall have indicated to the best of their records the locations of their facilities in relation to the route of the proposed sewer.

It is the responsibility of the Owner or his authorized representative to coordinate with and get approval from the various utilities. Further, it is the responsibility of the Owner to get authorization to encroach upon any other utility's easement and secure such recorded encroachment as a requirement for dedication of the sanitary sewer to the Town.

## 5.09 SANITARY SEWERS CROSSING DRAINAGE WAYS

Sanitary sewers shall be constructed of ductile iron pipe or shall be encased in a minimum of 6" of concrete wherever the sanitary sewer crosses under a naturally occurring drainageway (i.e. creeks, river, streams, etc.). Wherever applicable, the sanitary sewer crossing the drainageway shall be pressure tested to assure 100% water tightness prior to backfilling. All applicable permits from the Indiana Department of Natural Resources (INDR) and the Army Corp. of Engineers shall be the Owner's responsibility. No construction will be allowed without acquiring the proper permits.

## 5.10 GRAVITY SANITARY SEWERS

The Town of Lizton currently allows the use of the following pipe materials meeting or exceeding the minimum requirements/specifications set forth herein for the construction of gravity sanitary sewers:

- Polyvinyl Chloride Pipe (PVC)
- Ductile Iron Pipe (DIP)
- High Density Polyethylene Pipe (HDPE)

VITRIFIED CLAY PIPE (VCP) is NOT an approved material for the construction of sanitary sewers discharging to the Lizton sewer system.

In general, all gravity sanitary sewer pipe shall be the bell and spigot type with elastomeric seal joints and smooth interior walls meeting or exceeding all requirements set forth in the latest ASTM Standard referenced herein.

THE TOWN DOES NOT ALLOW THE USE OF SOLVENT CEMENT JOINT FOR GRAVITY SANITARY SEWERS EIGHT (8) INCHES IN DIAMETER OR LARGER.

SADDLE CONNECTIONS ARE NOT ALLOWABLE FOR NEW CONSTRUCTION.

The Contractor shall upon request furnish the Town with manufacturer's certification stating that the pipe supplied meets or exceeds all requirements of the applicable ASTM/ANSI standards and these Standards.

### A. Polyvinyl Chloride Pipe

1. Polyvinyl chloride (PVC) gravity sanitary sewer pipe shall be the integral wall bell and spigot type with elastomeric seal joints and smooth inner walls meeting or exceeding all of the requirements set forth in ASTM D-3034 for pipe diameters 15-inches or less and meeting or exceeding all of the requirements set forth in ASTM F-679 for pipe diameters greater than 15-inches.

   Pipe diameters 15-inches or less shall have a minimum cell classification of 12454-B or 12454-C. Pipe diameters greater than 15-inches, shall have a minimum cell

classification of 12454-C. All pipe shall have a minimum tensile strength of 34.50 MPa as defined in ASTM D-1784.

PVC sanitary sewer pipe shall have a minimum pipe stiffness of 46 psi for each diameter when measured at 5% vertical ring deflection and tested in accordance with ASTM D-2412.

The minimum wall thickness for PVC sewer pipe and 15-inches or less in diameter shall conform to SDR-35 Type PSM as specified in ASTM D-3034. The minimum wall thickness for PVC sewer pipe greater than 15-inches in diameter shall conform to T-1 as specified in ASTM F-679

2. Joints: Flexible gasketed joints shall be compression type so that when assembled the gasket inside the bell will be compressed radically on the pipe spigot to form a watertight seal. The assembly of joints shall be in accordance with the pipe manufacturer's recommendations and ASTM D-3212. The gaskets sealing the joint shall be made of rubber of special composition having a texture to assure a watertight and permanent seal and shall be the product of a manufacturer having at least five (5) years experience in the manufacture of rubber gaskets for pipe joints.

   The gasket shall be a continuous ring of flexible joint rubber of a composition and texture that is resistant to common ingredients of sewage, industrial wastes and groundwater and that will endure permanently under the conditions likely to be imposed. The gasket shall conform to the requirements of ASTM F-477.

   All field-cutting of pipe shall be done in a neat, trim manner using a hand or power saw. The cut end shall be beveled using a file or wheel to produce a smooth bevel of approximately 15 degrees with a minimum depth of one-third the pipe wall thickness. Field cut pipe will only be allowed to be installed at manholes, at prefabricated tees and wyes, and at the connection of new sanitary sewer to existing sanitary sewer.

3. Fittings: Only manufactured fittings made of PVC plastic having a cell classification of 12454-B or 12454-C as defined in ASTM D-1784 shall be used.

4. Marking: The date of manufacture, class of pipe, specification designation, size of pipe, name or trademark of manufacturer, and identification of plant/location shall be legibly marked on the outside of each pipe section in accordance with ASTM D-3034.

B. Ductile Iron Pipe

1. Pipe: Ductile Iron Pipe in diameters from eight (8) inches through thirty six (36) inches shall be centrifugally cast and shall conform to ANSI Specifications A21.51 and AWWA C-151, latest revision. Ductile Iron Pipe shall be pressure class 350, 300, 250, 200 or 150 depending upon site conditions and shall be provided in minimum laying lengths of eighteen (18) feet. Pressure class pipe shall be reviewed for integrity at the plan submittal stage.

2. Joints: Mechanical joints, slip or flanged joints shall be provided.

   Mechanical joints and accessories shall conform to AWWA Standard C-111, ANSI A-21.11. The bolts and nuts shall be corrosion resistant high strength alloy steel. Slip joints with rubber O-ring gaskets shall comply with AWWA Standard C-111 (ANSI A-2111). O-ring gaskets sealing the slip joint shall be made of rubber of special composition having a texture to assure a watertight and permanent seal and shall be the product of a manufacturer having at least five (5) years experience in the manufacturer of rubber gaskets for pipe joints. The gasket shall be a continuous ring of flexible joint rubber of a composition and texture which is resistant to common ingredients of sewage, industrial wastes and groundwater, which will endure permanently under the conditions likely to be imposed by this service. The gasket shall conform to the requirements of AWWA C-111 (ANSI A-21.11).

   Flanged joints shall be manufactured with laying dimensions, facing and flange details in accordance with AWWA Standard C-115 (ANSI A-21.15) Class 125.

3. Fittings: Fittings shall be standardized for the type of pipe and joint specified and shall comply with ANSI A-21.10, AWWA C-110 and AWWA C-153, ANSI A-21.53.

4. Weights of pipe fittings shall conform strictly to the requirements of ANSI Specifications. The class designations for the various classes of pipe and fittings shall be cast onto fittings in raised numerals, and cast or stamped on the outside of each joint of pipe. Weights shall be plainly and conspicuously painted in white on the outside of each joint of pipe and each fitting after the exterior coating has hardened.

5. Pipe shall be standard cement lined and seal coated with an approved bituminous seal coat in accordance with AWWA C-104 (ANSI A21.4).

C. High Density Polyethylene Pipe (HDPE)

1. Pipe and fittings: HDPE pipe shall be the wall bell and spigot type with elastomeric seal joints and smooth interior walls. Pipe and fittings shall be made from high molecular weight high density polyethylene material meeting the requirements of ASTM D-3350 Call Class PE 334433C. All material shall be virgin resin.

   All HDPE pipe shall have a minimum pipe stiffness of 46 psi when measured in complete accordance with ASTM D-2412. The Ring Stiffness Constant (RSC) classification value for the pipe between bell and spigot shall comply with the minimum value of 57 lb/ft.

2. Joints: Flexible gasketed joints shall be compression type so that when assembled, the gasket inside the machined groove on the pipe spigot will be compressed radially in the pipe bell to form a watertight seal. Joints shall meet the requirements of ASTM D-3212.

3. Gaskets: The gaskets shall be made of a rubber of special composition having a texture to assure a watertight and permanent seal and shall be the product of a manufacturer having at least five (5) years experience in the manufacture of rubber gaskets for pipe joints. The gasket shall be a continuous ring of flexible joint rubber of a composition and texture which is resistant to common ingredients of sewage, industrial wastes and groundwater, which will endure permanently under the conditions likely to be imposed by this service. The gasket shall conform to all requirements of ASTM F-477.

4. Installation: The installation shall be in conformance with all applicable ASTM requirements including F-412, D-2321, D-2412, D-3212, and D-3350. After installation, a Hydrostatic Pressure and Leakage test shall be conducted.

## 5.11 HORIZONTAL DIRECTIONAL DRILLING

Sanitary sewers installed by the horizontal directional drilling method must be High Density Polyethylene Pipe (HDPE). Pipe shall be fused together in one length if space permits. Pipe will be placed on pipe rollers before pulling into bore hole with rollers spaced close enough to prevent excessive sagging of the pipe. Pilot hole shall be drilled on the bore path with no allowable deviations greater than 8% of the depth over a length of 100 feet. Upon completion a Hydrostatic Pressure and Leakage test shall be performed.

## 5.12 SANITARY SEWER FORCE MAINS

A. Materials

The Town of Lizton currently allows the use of the following pipe materials, meeting or exceeding the minimum requirements set forth herein, for the construction of sanitary sewer force mains:

- Polyvinyl Chloride Pipe
- Ductile Iron Pipe

The Contractor upon request shall furnish the Town with manufacturer's certification stating that the pipe supplied meets or exceeds all requirements of the application ASTM, AWWA and/or ANSI standard.

Each pipe segment shall be clearly marked per the requirement of the respective ASTM, AWWA and/or ANSI Standard.

B. Anchorage

Force mains shall be anchored to resist thrusts that develop at bends, angles, tees, etc. in the force main pipe. The magnitude of the forces to be resisted shall be calculated and provided as part of the Engineer's design submittal. The required anchorage shall be

attained by installing restrained pipe joints, concrete thrust blocks or anchor blocks based upon sound engineering practices. Anchorage design at force main fittings shall be based on pipeline pressures of at least 25 percent greater than the maximum pump design shut off head plus a water hammer allowance with an appropriate factor of safety.

C. Air/Release Valve

Sanitary sewer force mains shall be designed without high points and with the top of the force main below the hydraulic grade line at the minimum pumping rate, so that air release valves are not be needed, if possible.

If high points in the force main cannot be eliminated, an APCO air release valve or approved equal shall be installed at each significant high point where air could become trapped. The air release valve shall be installed in a manhole structure in accordance with these Standards. Provisions shall be required for draining the structure. A high point shall be considered significant if it is 2 feet or more above the minimum hydraulic grade line, or, when pumping is intermittent, above the static head line.

Air release valves must be equipped with an exhaust pipe extending to a downward facing elbow with a corrosion resistant, twenty-four (24) mesh screened opening at an elevation of eighteen (18) inches above the ground. See Detail 5G.

D. Polyvinyl Chloride (PVC) Force Main

1. Pipes: PVC force main pipe shall conform to ASTM Specification D-2241, Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe (SDR SPR). The material used shall conform to ASTM D-1784, Standard Specification of Rigid Polyvinyl Chloride and Chlorinated Polyvinyl Chloride compounds, class 12454-B (PVC 1120). The minimum pressure class/SDR rating acceptable shall be Class 200/SDR 21.

   Pressure class and standard dimension ratios (SDR) shall be as follows:

   | | |
   |---|---|
   | Class 200: | SDR 21 |
   | Class 250: | SDR 17 |
   | Class 315: | SDR 13.5 |

   All plastic pipe and couplings shall bear identification markings in accordance with AWWA C-900, which shall include the National Sanitation Foundation (NSF) seal of approval. In addition, the plain end of each pipe length shall have two (2) rings, one (1) inch apart, painted around the pipe at the proper location to allow field checking of the correct setting depth of the pipe in the bell or coupling.
2. Joints: Joints shall be bell end or coupling push-on type.

   The push-on joint and joint components shall meet the requirements for ASTM Specification D-3139, joint for Plastic Pressure Pipe using Flexible Elastomeric Seals. The joint shall be designed so as to provide for the thermal expansion and contraction experienced with a total temperature change of seventy-five (75) degrees F in each

joint of pipe. Details of the joint design and assembly shall be in accordance with joint manufacturer's standard practice.

The lubricant shall have no deteriorating effects on the gasket or the pipe. The lubricant containers shall be labeled with manufacturer's name.

The gasket shall be a continuous ring of flexible joint rubber of a composition and texture which is resistant to common ingredients of sewage, industrial wastes and groundwater, which will endure permanently under the conditions likely to be imposed by this service. The gasket shall conform to the requirements of ASTM F-477 and ANSI Standard A-21.11.

3. Fittings: Fittings shall be of the same material and class as the pipe with joints and gaskets to properly fit the PVC pipe.

4. Marking: The date of manufacture, class of pipe, specification designation, size of pipe, name or trademark of manufacturer, and identification of plant/location shall be legibly marked on the outside of each pipe section in accordance with ASTM D-3034.

E. Ductile Iron Force Main Pipe

1. Pipe: Ductile Iron Pipe in diameters from eight (8) inches through thirty six (36) inches shall be centrifugally cast and shall conform to ANSI Specifications A21.51 and AWWA C-151, latest revision. Ductile Iron Pipe shall be pressure class 350, 300, 250, 200 or 150 depending upon site conditions. Pipe shall be provided in minimum laying lengths of eighteen (18) feet.

2. Fittings: Fittings shall be standardized for the type of pipe and joint specified and shall comply with ANSI A-21.10, AWWA C-110.

3. Joints: Mechanical joints, slip or flanged joints shall be provided.

Mechanical joints and accessories shall conform to AWWA Standard C-111, ANSI A-21.11. The bolts and nuts shall be corrosive resistant high strength alloy steel.

Slip joints with rubber O-ring gaskets shall comply with AWWA Standard C-111 (ANSI A-2111). O-ring gaskets sealing the slip joint shall be made of rubber of special composition having a texture to assure a watertight and permanent seal and shall be the product of a manufacturer having at least five (5) years experience in the manufacturer of rubber gaskets for pipe joints. The gasket shall be a continuous ring of flexible joint rubber of a composition and texture which is resistant to common ingredients of sewage, industrial wastes and groundwater, which will endure permanently under the conditions likely to be imposed by this service.

Flanged joints shall be manufactured with laying dimensions, facing and flanges detailed in accordance with AWWA Standard C-115 (ANSI A-21.15) Class 125.

Where indicated on plans, restrained joint pipe shall be provided which is in compliance with AWWA C-111. Joints shall permit horizontal and/or vertical deflection after assembly, yet adequately restrain the joint at the full design pressure.

4. Marking: Weights of pipe and fittings shall conform strictly to the requirements of ANSI Specifications. The designations for the various classes of pipe and fittings shall be cast onto fittings in raised numerals, and cast or stamped on the outside of each joint of pipe. Weights shall be plainly and conspicuously painted in white on the outside of each joint of pipe and each fitting after the exterior coating has hardened.

## 5.13 SANITARY SEWER MANHOLES

Sanitary sewer manholes shall be installed at the end of each line segment; at all changes in grade, size, materials and/or alignment; at all intersections; and at distances not greater than 400 feet for sewers 18 inches or less and 500 feet for sewers greater than 18 inches. Cleanouts shall not be substituted for manholes. All manhole extensions shall be coated with an approved factory applied bitumastic coating.

### A. Types of Manholes

The Town will accept/allow either Monolithic (Cast-in-Place) and/or Precast manholes conforming to the specifications herein.

1. Monolithic (cast-in-place) Manholes

Should a Contractor elect to build monolithic manholes, shop drawings showing at a minimum the concrete mix, steel reinforcement details, pipe connections and manhole dimensions shall be submitted to the Town for approval for each type of structure to be built. The shop drawings shall have been reviewed and certified by a registered Professional Engineer prior to submittal to the Town.

2. Precast Manholes

Precast reinforced concrete manholes including bases, risers/barrels, cones and flat slabs shall be constructed of either wet or dry cast Class A concrete meeting or exceeding the requirements of ASTM C-478, latest revision. See details 5B and 5C. Precast reinforced concrete manholes shall be manufactured, tested and marked in accordance with ASTM C-478 and shall be constructed with the base and the first riser section as one complete precast unit. Where used, precast manhole cones shall be the eccentric cone type.

No "see through" lift holes shall be allowed on precast concrete manholes 48 inches in diameter or less. All lift holes shall be thoroughly wetted and completely filled

with non-shrink mortar or epoxy gout; then smoothed and covered, both inside and out, with a trowelable grade butyl rubber base backplaster material to ensure water tightness.

All joints between precast manhole elements shall be made with an approved rubber gasket in accordance with ASTM C-443, latest edition, and a 1/2-inch diameter non-asphaltic mastic (Kent Seal or approved equal) conforming to AASHTO M-198 and Federal Specifications SS-521-A.

B. Manholes Bases, Inverts and Flow Channels/Bench Walls

Monolithic or precast manhole bases shall be of 6" minimum thickness for 4' diameter and 8" minimum thickness for larger diameters, and shall be constructed of Class A concrete having a minimum compressive strength of 4,000 psi.

The bottom invert of all pipe entering a manhole shall be at least three (3) inches above the top of the base slab so that the finished sewer channel may be installed and shaped. The installation of the final sewer channel may be done at the point of fabrication of the precast base or cast-in-place.

Flow channels within manholes shall be an integral part of the precast base. The channels shall be shaped and formed for a clean transition with proper hydraulics to allow for smooth conveyance. The bench wall shall be formed to the crown of the inlet and outlet pipes to form a "U" shaped channel as shown in Details in these Standards. The bench wall shall slope back from the crown at a minimum 1/2-inch per foot to the manhole wall.

For connections to existing manholes, flow channels and bench walls shall be required and shaped as if it were a new manhole.

C. Adjusting Rings

No brick or block shall be used in the construction of a manhole or to adjust the elevation of the frame and cover. Where one (1) solid riser or barrel section cannot be used, final adjustments in elevation of the frame and cover shall only be accomplished by the use of precast concrete adjusting rings conforming to ASTM C-478. Rings shall be of a nominal thickness of not less than four (4) inches. Not more than twelve (12) inches total of adjusting rings shall be allowed for adjustment of the manhole frame and cover to the required elevation.
A watertight seal shall be provided between the cone and riser ring, each adjoining riser ring, and riser ring and casting, by the use of two (2) rows of 1/2-inch extrudable preformed gasket material. Material shall be placed in keyways and shall completely fill all cavities.

D. Casting, Frame and Cover

The type of frame and cover to be used shall be 24" (5900-007 and 5900-0265) Neenah R-1712-B-SP, Model 1022-1AGSMD with machined bearing surface and Type F concealed pickhole. Sanitary sewer manhole covers shall have the words "Sanitary Sewer" cast in the cover.

E. Extrudable Preformed Gasket Material

Two (2) 1/2-inch wide nominal size butyl rubber base gasket material, conforming to AASHTO M-198 and Federal Specification SS-S-210A, shall be used for adjusting ring grooves; between adjusting ring and cone; between adjusting ring and casting; and in joints of precast manhole sections. The gasket material shall be as manufactured by Hamilton Kent-Seal, RUB'R-NEK L-T-M by K.T. Snyder Company, or an approved equal. A compatible primer or solvent as recommended by the manufacturer of the butyl base material shall be used to prepare surfaces prior to application of butyl base material.

F. Trowelable Butyl Rubber Backplaster

The exterior of the manhole from two (2) inches below the bottom riser ring on the cone section to and covering the base of the casting, including the voids on the outside joints of the riser rings shall be sealed with a trowelable grade butyl rubber base exterior backplaster material, 1/4 inch minimum thickness when dry. All interior risers shall be fitted with an approved chimney seal.

G. Outside Drop manholes

No inside drop manhole connections shall be allowed for new sewer construction. Inside drop connections to existing manholes shall only be allowed upon written approval of the Town.

Where a sanitary sewer or sanitary sewer lateral enters a manhole 24 inches or more above the invert of the outgoing sewer, the incoming sewer shall be connected to the manhole by means of an outside drop connection. All new sanitary sewers requiring a drop connection shall be constructed with an outside drop connection per Detail 5-C. Outside drop connections may be either precast or monolithically poured. Detailed drawings shall be submitted for approval for all field fabricated drop connections.

The footing for the portion of the manhole under the drop shall be connected to the manhole base. A minimum of three (3) 1/2 inch diameter reinforcing rods shall be placed as dowels into the manhole base. These rods shall be tied to the reinforcements. The rods shall be tied to the reinforcement as specified in ACI Building Code Requirements. The rods shall be extended as the vertical part of the drop is constructed. In addition, the drop shall be tied into each joint of precast concrete manhole with a minimum 3/8 inch rod to prevent any separation of the drop from the precast manhole.

H. Manhole Diameters

The following are minimum manhole diameters for sanitary sewers entering/exiting a manhole at the following angles:

| | MANHOLE DIAMETERS | |
|---|---|---|
| Pipe Size | Pipes Entering/Leaving at 0 deg.-45deg. Bend | Pipes Entering/Leaving at 45deg.-90deg. Bend |
| 8"-21" | 48" | 48" |
| 24" | 48" | 60" |
| 27"-30" | 60" | 60" |
| 33"-36" | 60" | 72" |

I. Steps

Manhole steps shall be polypropylene coated steel reinforcing or an approved non-corrosive fiberglass material. The copolymer polypropylene shall meet the requirements of ASTM D4101 reinforced with deformed 3/8 inch minimum diameter reinforcing steel conforming to ASTM A615, Grade 60. Steps shall be 12” on center and not more than 24” from the top or invert. See Details 5B and 5C for location.

J. Sewer Pipes to Manhole Connections

To connect a sanitary sewer to a manhole, either a flexible boot KOR-N-SEAL 1 or 2, flexible connector, cast-in-place Dura-Seal gasket, "A"-lock gasket or an approved equal shall be used. Connections to an existing manhole shall be a flexible boot KOR-N-SEAL or approved equal. If the flexible boot connection is used, it shall be placed in the reinforced concrete manhole base and secured to the pipe by a stainless steel clamp. Flexible connectors shall conform to ASTM C-923. The cast-in-place inflatable gasket shall conform to ASTM C-923.

Where connection is made to an existing manhole, that manhole shall be rehabilitated to the current standards of the Town. This shall include rehabilitating flow channel and taking prescribed repair measures to reduce infiltration.

All connections shall provide for a watertight seal between the pipe and manhole. The connector shall be the sole element relied upon to assure a flexible watertight seal of the pipe to the manhole. The rubber for the connector shall comply with ASTM C-923 and shall be resistant to ozone, weather elements, chemicals, including acids and alkalis, animal and vegetable fats, oils and petroleum products.

The stainless steel elements of the connector shall be totally non-magnetic Series 305 stainless steel. The stainless steel clamp shall be capable of sustaining applied torque in excess of eighty (80) inch-pounds. It shall be the responsibility of the Contractor to submit details of the proposed connection to the Town for approval. Connections not

approved by the Town shall be subject to removal and replacement with an approved adapter.

K. Rejection of Precast Manhole Sections

Precast reinforced concrete manholes, risers and tops shall be subject to rejection for failure to conform to any of the following requirements:

1. Fractures or cracks passing through the shell, except for a single end crack that does not exceed the depth of the joint
2. Defects that indicate imperfect proportioning, mixing and molding
3. Surface defects indicating honeycombed or open texture.
4. Damaged ends, where such damage would prevent making a satisfactory joint.
5. Infiltration into manhole exceeding allowed limits
6. The internal diameter of the manhole section varying by more than one (1) percent from the nominal diameter.
7. Not installed in conformance with these standards.
8. Not clearly marked as of date of manufacturer, trade name, size designation part number, and ASTM number.
9. Having a deviation more than 1/4" from the straight edge at any point across the top of manhole cone section or riser ring; and/or
10. Having any visible steel bars along the inside or outside surface of the manhole except for reinforcement stirrups or spacers used to position the cage during manufacture

## 5.14 BUILDING SEWERS

Building sewers shall be SDR 35, Schedule 80 or Schedule 40 PVC bell and spigot type pipe conforming to ASTM D2241. Joints shall be flexible gasket push-on compression type assembled and installed in accordance with the manufacturer's recommendations.

Any part of a building sewer that is located within ten (10) feet of a water service pipe shall be constructed of water works grade pressure pipe. VITRIFIED CLAY PIPE (VCP) shall NOT be permitted for building sewer construction.

## 5.15 SEWER INSTALLATION

Suitable tools and equipment shall be used for the safe and convenient handling and laying of pipe. Great care shall be taken to prevent pipe coatings or wrappings from being damaged. Carefully examine all pipe for cracks and other defects. No pipe or fittings shall be laid which are known to be defective. If pipe or fittings are discovered to be cracked, broken or defective after being laid, they shall be removed and replaced with sound material. Thoroughly clean all pipe and fittings before installation. All pipe and appurtenances should be kept clean until accepted as completed work.

# Section 5: Wastewater Collection System

A. Line and Grade

The Contractor shall furnish and set all line and grade stakes (HUB) and stakes for bench marks. The bench marks shall be set in strategic locations of the project in order to facilitate the Contractor's installation of the line and grade stakes for each pipeline. Only the laser method shall be used to set the grade of the pipeline. The Contractor shall constantly check line and grade of the laser beam and the pipe.

B. Point of Commencement and Laying of Pipe

Pipe laying shall commence at the lowest point in the proposed sewer line. Lay the pipe with the bell end of bell and spigot pipe or with the receiving groove end of tongue and groove pipe pointing upgrade. Any other procedure shall be followed only with permission of the Town.

Lay each pipe on an even firm bed as specified so that no uneven strain will come in contact with any part of the pipe. Particular care shall be exercised to prevent the pipes from bearing on the sockets. Hand dig all bell holes for bell and spigot pipe.

Completely shove home all pipe (to the assembly mark) in accordance with manufacturers recommendations. On tongue and groove type pipe thirty (30) inches and larger in diameter, pressure must be applied to the center of each pipe as it is laid by a winch and cable or other mechanical means.

All connection fittings shall be sealed with a watertight stopper.

The Contractor shall extend the building wye lateral to the right-of-way line. A #10 magnetic locator wire shall be placed above the end of the pipe to within three (3) feet of the ground surface, from the main to the top of cleanout.

C. Construction Bulkheads

Before extending a sanitary sewer, the Contractor shall provide a watertight bulkhead in the existing sewer immediately downstream of the point of connection. This bulkhead shall be left in place until the new sanitary sewer has been cleaned of all accumulated water and debris and accepted by the Town. During all intermissions in construction of the sanitary sewer pipe, the open face of the last pipe laid shall be plugged, covered or bulkheaded so as to prevent sand, water, earth or other materials from entering the pipe.

Whenever pipe and special castings are required to be cut, the cutting shall be done by skilled workmen in such manner as to leave a smooth end at right angles to the axis of the pipe without damage to the pipe casting or cement lining. Cutting torches shall not be used.

D. Laying of Pipe in Cold Weather

The Town reserves the right to order pipe installation discontinued whenever, in its opinion, there is danger of the quality of work being impaired because of cold weather. The Contractor shall be responsible for heating the pipe and jointing material so as to prevent freezing of joints. The heating of the pipe shall be done immediately before the joining of the pipe sections. Do not lay any pipe on frozen ground. No flexible or semi-rigid pipe shall be laid when the air temperature is less than 32 degrees F unless proper precautions per the manufacturer's recommendations are taken by the Contractor and the method is approved by the Town.

When pipes with rubber gaskets or resilient-type joints are to be laid in cold weather, sufficiently warm the gasket or joint material to facilitate making a proper joint.

E. Abandoned Sewers and Structures

Sewers and storm water drains which are to be abandoned shall be bulkheaded with mortar and an eight (8) inch thick brick wall. Sewers, storm water drains, and structures which are to be abandoned in place shall be filled with sand or Cellular Concrete and plugged, unless otherwise indicated on the Plans. Service shall be maintained in such sewers and drains until the Town orders bulkheads placed. No timber bulkheads shall be allowed. All castings on such abandoned structures are the property of the Town and shall be salvaged by the Contractor and delivered as directed. Unless otherwise specified, all abandoned manholes, catch basins and inlets shall be removed to a depth of three (3) feet below the proposed or established grade or existing street grade, whichever is lower.

## 5.16 DEWATERING AND CONTROL OF SURFACE WATER

Where groundwater is encountered, the Contractor shall make every effort necessary to secure a dry trench bottom before laying pipe. The Contractor shall provide, install and operate sufficient sumps, pumps, hose, piping, wellpoints, etc., necessary to depress and maintain the groundwater level below the base of the excavation. If the Contractor is unable to remove the standing water in the trench, the Contractor shall over-excavate the proposed bottom grade of the sewer bedding, and place not less than three (3) inches of Class No. 2 crushed stone (Indiana Department of Highway Aggregate Classification) in the over-excavated area. The Contractor and/or Owner shall be liable for all lawsuits which may arise as a result of the Contractor's dewatering efforts.

The Contractor shall keep the site free of surface water at all times and shall install drainage ditches, dikes, pumps, and perform other work necessary to divert or remove rainfall and other accumulated surface water from excavations. The diversion and removal of surface and/or groundwater shall be performed in a manner which will prevent water from accumulating within the construction area.

UNDER NO CIRCUMSTANCES SHALL SURFACE WATER OR GROUNDWATER BE DISCHARGED TO, DISPOSED OF, OR ALLOWED TO FLOW INTO THE TOWN'S SANITARY SEWER SYSTEM.

## 5.17 TRENCHING

The width of the trench at and below the top of the sanitary sewer shall be only as wide as is necessary for proper installation and backfilling. The trench width shall be consistent with safety requirements and manufacturer's recommendations for the type of pipe. The minimum width of trench for sanitary sewers, and force mains, 42-inches in diameter and less shall be 1.25 times the outside diameter (O.D) plus 12-inches (See Detail 5A):

The design plans and specifications submitted to the Town for review, approval and issuance of a construction permit shall include a detailed trench drawing. Plastic pipe shall include manufacturer's product data indicating the type of trench for the size of pipe and depth of construction.

The design of the sewer pipe and structures is predicated upon the width of trench as indicated above. Should these limits be exceeded, the Contractor shall be responsible for the provision and installation of such remedial measures as may be required by the Engineer and/or the Town.

Bell holes shall be excavated for bell and spigot pipe and mechanical joint pipe, so that the entire barrel of the pipe is resting on the bedding.

The pipe trench shall not be excavated more than one hundred (100) feet in advance of laying pipe.

Whenever pipe trenches are excavated below the designed bedding bottom, the Contractor shall fill the over-excavation with mechanically compacted No. 8 (1/4-inch to 3/4-inch) crushed stone or No. 8 fractured face aggregate.

All rock, boulders and stones 6-inches in diameter and larger encountered in trenches shall be removed. Boulders or rocks are not to be used for trench backfill. Remove any rock encountered to six (6) inches below the pipe, and replace with No. 8 crushed stone or No. 8 fractured face aggregate, compacted. In cases where material is deposited along open trenches, the material shall be placed so that no damage will result to the work or adjacent property as a result of rain or other surface wash.

If the bottom of the trench is of undesirable material, an additional six (6) inches of trench bottom shall be excavated and filled with Class 2 crushed stone and compacted using a hand held mechanical tamper. Where the distance to stable ground is excessive, the Engineer shall order in writing, other types of foundation as deemed necessary, subject to the approval of the Town.

## 5.18 BEDDING

Bedding material shall be compacted No. 8 crushed stone or No. 8 fractured face aggregate and shall be placed in the trench bottom such that after the pipe has been placed, imbedded to grade and aligned, there remains a 4-inch minimum depth of material below the pipe barrel and a minimum of 3-inches below the bell (See Detail 5A).

A. Plastic or Flexible Pipe

Bedding shall be placed around the sides of the pipe up to the springline (1/2 the Outside Diameter). This material shall be shovel sliced or otherwise carefully placed and "walked" or hand tamped to ensure compaction of the haunch area and complete filling of all voids. From the springline to twelve (12) inches above the crown of the pipe, bedding shall be added in six (6) lifts and "walked" in for compaction. Backfilling of the remainder of the trench shall be as specified.

B. Ductile Iron

Bedding shall be placed around the sides of the pipe up to the springline (1/2 the Outside Diameter). This material shall be shovel sliced or otherwise carefully placed and "walked" or hand tamped to ensure compaction of the haunch area and complete filling of all voids. From the springline to the top of the pipe, bedding shall be added in six (6) lifts and "walked" in for compaction. Backfilling of the remainder of the trench shall be as specified.

## 5.19 BACKFILL

A. Materials

Materials shall be agreed upon prior to construction. No significant deviation from this standard will be permitted without authorization by the Town. The term "Select Fill" shall mean the use of Class II or III backfill materials as described below. The following materials shall be used as backfill.

| | |
|---|---|
| Class I | Angular, six (6) to forty (40) millimeters (1/4 to 1-1/2 inch) graded stone such as crushed stone. INDOT Classification No.5, No.8, No.9, and No. 53. A No. 8 gravel containing a minimum 50% mechanical crush count, and meeting the following nominal size and percents passing will be considered an equivalent Class I material: 100% passing 1” sieve, 75-95% passing 3/4” sieve, 40-70% passing 1/2” sieve and 0-15% passing No.4 Sieve. |
| Class II | Coarse sands and gravels with maximum particle size forty (40) millimeters (1-1/2 inch), including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil types GW, GP, SW and SP and |

INDOT classification for "B" borrow material are included in this class.

Class III — Fine sand and clay gravels, including fine sands, sand-clay mixtures and gravel-clay mixtures. Soil types GM GC, SM and SC are included in this class. These materials are not acceptable for pipe bedding,

Class IV — Silt, silly clays and clays, including organic clays and silts of medium to high plastiTown and liquid limits. Soil types MHO, ML, CHI and CL are included in this class. These materials are not acceptable for pipe bedding.

B. Placement

1. Areas Subject to Vehicular Traffic

In areas under proposed or existing paved roads or under or within five feet of pavement, sidewalks, curbs, gutters or similar structures, granular backfill material complying with the requirements of the Indiana Department of Highways Standard Specifications, most recent edition, shall be used.

The material shall be placed in uniform layers not exceeding six (6) inches, loose measurement. Within three (3) feet of the sanitary sewer pipe the backfill material shall be thoroughly and uniformly compacted with hand held mechanical tampers. The remaining backfill material shall be compacted with mechanical tampers. A minimum compaction of 95 percent Standard Proctor Density shall be achieved within the backfill material.

Jetting or flooding of the backfill or other alternative compaction methods and materials shall NOT be used without the approval of the Town or Indiana Department of Highways, depending upon jurisdictional authority.

2. Areas NOT Subject to Vehicular Traffic

Areas five (5) feet or more from the paved surfaces be carefully backfilled with clean fill material free of rocks larger than 6-inches in diameter, frozen lumps of soil, wood or other extraneous material and installed and compacted as noted above.

C. Flowable Fill

Upon approval, flowable mortar may be used to fill trenches for pipe structures, culverts, utility cuts and other work extending under pavement, to fill cavities beneath slopewalls and other locations. Installation, materials, and construction requirements shall be in accordance with INDOT Standards. A minimum 6" concrete cap shall be installed above flowable fill in all locations.

## 5.20 TRENCH BOX PULLING AND SHEETING

When required by the Occupational Safety and Health Act (OSHA) to protect life, property, or the work, sheet and brace all open cut trenches in accordance with CFR 1926. Upon completion of the work, all temporary forms, shores, and bracing shall be removed. All vacancies or voids left by the sheeting shall be carefully filled with proper bedding material.

Any damage to pavement or other structures due to sheeting, shoring, or bracing shall be repaired by the Contractor at his expense. Sheeting and bracing which is to remain in place shall be cut off at the elevation of 1.5 feet above the top of the sewer pipe unless otherwise directed by the Engineer

## 5.21 MANHOLE INSTALLATION

A. Preparation of Base

The bottom of the excavation/trench for the manhole shall be filled with a minimum of six (6) inches of No. 8 crushed stone mechanically compacted to form a stable base. Where poor or unstable soil conditions exist or over excavation has occurred, additional No. 2 crushed stone or Class B concrete shall be used to form a stable base.

B. Placement

Precast manhole sections shall be placed to provide properly aligned vertical sides. The completed manhole shall be rigid, true to dimensions and watertight. Tolerance shall not exceed 2 inches for manholes up to 16 feet in depth plus 1/8” per foot for manholes over 16 feet. Tolerances shall be checked with a plumb line.

The joints between manhole sections shall be made with an approved rubber O-ring in accordance with ASTM C-443 and a 1/2-inch diameter non-asphaltic mastic (Kent Seal or equal) conforming to AASHTO M-198 and Federal Specifications SS-521-A.

C. Backfill

Backfilling and compaction around manholes shall comply with the requirements specified for the connecting sewer.

## 5.22 INSTALLATION OF BUILDING SEWERS (LATERALS)

Building sewers shall be installed in accordance with Detail 5D. All building sewers shall have a cleanout located between 18” and 36” of the exterior building wall. (Detail 5E).

Service laterals shall terminate at a depth of no less than 4’ at the right-of-way.

Connection to new sanitary sewer shall be made at a manufactured fitting. The saddle connection shall only be allowed if a manufactured fitting does not exist based upon approved as-built plans. The location of the saddle connection must be approved by the Town. Installation of building sewers shall commence at the connection to the main sewer and shall be laid with the bell end pointing upgrade. Fittings and saddles shall be manufactured in accordance with ASTM D-3034, SDR 35, ASTM F-679 and ASTM F-1336.

Bedding shall be in accordance with PVC flexible pipe as noted in these standards.

When approved by the Town, building sewers may connect to a manhole, at an elevation of not more than 24 inches above the base.

## 5.23 BUILDING SEWER CONNECTIONS TO PRESSURE MAINS

Connections to pressure mains may be made upon written approval from the Town.

Vault shall be 30" I.D. X 4'-0" minimum depth Sono-Loc PVC valve box or an approved equal installed in accordance with Detail 5F. Connecting force main shall be a minimum 1-1/2" PVC SDR-21 equipped with a full ported ¼ turn plug valve.

Owner is responsible for verifying that the pump is sized adequately to pump against the existing force main head.

# Section 5: Wastewater Collection System

TABLE 5-1: WASTEWATER FLOWS FOR NON-RESIDENTIAL USES

| Type of Establishment* | | Gallons Per Person of Wastewater Per Day Unless Otherwise Noted |
|---|---|---|
| 1. | Institutions other than hospitals | 180-120 |
| 2. | Schools (without gym and showers) | 15 |
| 3. | Schools (with gyms and showers) | 25 |
| 4. | Organization camps only | |
| | a. With showers and handwashing facilities | 20+ |
| | b. With toilets, showers and handwashing facilities | 40+ |
| | + Cooking or central food service included | |
| 5. | Campgrounds | |
| | a. With individual sewer connections (per site) | 100 |
| | b. With community building only (per site) | 50 |
| 6. | Mobile home parks (per mobile home park space) | 200 |
| 7. | Motels and hotels (per room) | 100 |
| 8. | Restaurants along an interstate or major highway; 24 hour operation (per seat) | 70 |
| 9. | Restaurants; 24 hour operation (per seat) | 50 |
| 10. | Restaurants; less than 24 hour operation (per seat) | 35 |
| 11. | Bars and cocktail lounges (per seat) | 35 |
| 12. | Bowling alleys (per alley) | 100 |
| 13. | Places of employment (does not include industrial waste, per employee per shift) | 15-35 |
| 14. | Day workers at offices | 15 |
| 15. | Picnic parks and areas | 5 |
| 16. | Drive-in theaters (per ramp parking space) | 7 |
| 17. | Service stations (per vehicle served) | 10 |
| 18. | Swimming pool bathhouse (per person) | 10 |
| 19. | Private dwelling (per dwelling) | 310 |

| | | |
|---|---|---|
| 20. | Apartments | |
| | a. One bedroom (per apartment) | 200 |
| | b. Two bedroom (per apartment) | 310 |
| 21. | Shopping center (where stores are not known) per sq. ft. of building | 0.45 |
| 22. | Churches | |
| | a. Without kitchen (per sanctuary seat) | 3 |
| | b. With kitchen (per sanctuary seat) | 5 |
| 23. | Beauty salon | 35 |
| 24. | Day care center | 20 |

* The flows listed above indicate a reasonable approach for various types of establishments. Additional considerations will be necessary in some cases. Values listed are from Indiana State Board of Health Bulletin S.E. 13-1988. For uses not mentioned in this table, flow estimates should be submitted for preliminary design review and approval prior to proceeding with final plans.

End of Section 5
Wastewater Collection System

# Section 6: Inspection, Testing and Acceptance

## 6.01 GENERAL

This section describes the minimum requirements and general procedures for the inspection and testing of sewer systems to be dedicated to the Town of Lizton.

Sanitary sewer systems shall not be accepted nor will connection permits be issued until all requirements for inspection and testing, including the filing of affidavits and any other paperwork are completed. The Developer and/or Contractor is responsible for notifying applicable utilities prior to construction to request locating services and verify utility locations.

Any section of infra-structure not passing the tests prescribed herein shall be repaired to the satisfaction and approval of the Town, and then retested and reinspected at the Owner's expense.

## 6.02 INSPECTION COST AND FEES

Inspection of the construction shall occur throughout installation of the system and prior to the backfilling of the utilities.

A. General

Prior to the issuance of a Construction Permit and the commencement of construction, the Owner shall make arrangements with the Town to provide construction inspection services.

B. Estimated Cost

If inspector services are required by the Town, a letter shall be sent to the Owner stating the estimated amount of payment for inspection services to be rendered by the Town or the Town's representative. The amount provided in the letter shall be seventy-five (75) percent of the total estimated cost of the inspection services based on an estimated project completion time and approved construction plans. The Owner shall be responsible for fees associated with the County, if applicable, independently. Where a pumping station is involved, additional time for inspection during construction and final checkout of the station shall be added.

The inspection cost is a pre-construction estimate only. The actual observation time will vary from project to project and may exceed or be less than this estimate based upon actual project duration. Observation time at the site is verified by the Contractor and/or a representative of the Owner. Deviations from approved construction documents or Owner established schedules that create the necessity of additional inspections shall be at the Owner's expense.

Seventy five (75) percent of the cost shall be remitted prior to issuance of a construction permit. The balance of the cost for observation services, based on total actual observation hours, shall be paid prior to the Town's acceptance of the system.

C. Inspection Scheduling

Contractor and/or Owner shall provide notice to the Town of the planned commencement of construction at least two (2) weeks prior to such commencement.

Once the construction starts, the Contractor shall be responsible for informing and/or notifying the assigned Inspector of the following:

- Daily work schedule including any changes in schedule
- Date tests are to be performed, and
- Date as-built verification is to be performed.

The Town, upon written request by the Contractor and/or Owner, will schedule the Final Inspection.

All testing required shall be performed under the observation of the Town's Inspector(s). It shall be the Contractor's responsibility to schedule the testing with the Inspector. Test results not obtained in the presence of the Town's representative will not be accepted.

D. Inspection of Service Connections

A Connection Permit shall be obtained for any repair, modification or connection of a building sewer. Connection permits shall not be issued for connections to sanitary sewers not yet dedicated to and accepted by the Town.

Following the installation/repair/modification of a service line and prior to backfilling, the Contractor/Plumber shall notify the Town that the service line is ready to be inspected. The Town shall then have forty eight (48) hours to make the inspection, after which the Contractor/Plumber may backfill the trench. Inspections requested on Fridays or on a day proceeding a holiday may not be completed until the next normal business day.

If notification is not provided and the building sewer is backfilled prior to inspection by the Town, the Town may require that the Contractor/Plumber re-excavate the trench so an inspection can be made.

Protection of open trenches and compliance with applicable OSHA Standards is the responsibility of the Contractor/Plumber.

E. Final Grade

Manholes, water meters, fire hydrants, etc. shall be properly set at final grade. Costs associated with raising or lowering structures due to grade changes will be charged to the Contractor, Builder, or Property Owner.

## 6.03 GRAVITY SEWER TESTING

Once constructed, all sanitary sewers and manholes shall be watertight and free from leakage. The rate of infiltration into the sanitary sewer system between any two adjacent manholes or the entire system shall not be in excess of 100 gallons per inch of pipe diameter per mile per day (100 gpd/in/mi). The Contractor shall be required to repair all visible leaks to the satisfaction of the Town, even if the infiltration requirements are met.

Any leakage found during the infiltration test shall be corrected by the Contractor at his expense. The method of repair shall be approved by the Town. Grouting of the joint or crack to repair the leakage shall not be permitted. If the defective portion of the sanitary sewer cannot be located, the Contractor shall remove and reconstruct as much of the work as necessary to obtain a system that passes infiltration requirements.

All gravity sanitary sewers constructed of flexible pipe (PVC and HDPE) shall be mandrel tested no sooner than thirty (30) days after installation in accordance with these Standards.

The Contractor shall bear the complete cost and supply all equipment necessary to perform the required tests.

All tests shall be conducted under the observation of the Town's Inspector. It shall be the Contractor's responsibility to schedule testing with the Inspector.

A. Low Pressure Air Test

All gravity sanitary sewers shall be tested for infiltration by means of a low pressure air test as generally described herein. Alternate infiltration tests will only be allowed upon written approval by the Town.

1. Equipment

The Contractor shall be responsible for providing all equipment and supplies necessary to perform a Low Pressure Air Test including but not limited to the following:

Mechanical or pneumatic plugs; air control panel; shut-off valve, pressure regulative valve, pressure relief valve and input pressure gauge. The pressure regulator or relief valve set shall be set no higher than 10 psig to avoid over pressurization; and continuous monitoring pressure gauge having a range of 0 to at least 10 psi. The gauge shall be no

less than 4 inches in diameter with minimum divisions of 0.10 psi and an accuracy of ± 0.04 psi.

To reduce the potential for sewer line over-pressurization, two (2) separate hoses shall be used. One hole will connect the control panel to the sealed line for introducing low pressure air. The other will be used for constant monitoring of air pressure buildup in the line.

If pneumatic plugs are utilized, a separate hose shall be required to inflate the plugs.

a. Ground Water Level

The ground water level shall be determined by excavation by the Contractor.

b. Air Pressure Adjustment

The air pressure correction, which must be added to the 3.5 psig normal test starting pressure, shall be calculated by dividing the average vertical height, in feet of groundwater above the invert of the sewer pipe to be tested, by 2.31. The result gives the air pressure correction in pounds per square inch to be added. The allowable pressure drop of 1.0 psig (or 0.5 psig) and the minimum time periods are given in Table A.

c. Maximum Test Pressure

In no case should the starting test pressure exceed 9.0 psig. If the average vertical height of groundwater above the pipe invert is more than 12.7 feet, the section so submerged may be tested using 9.0 psig as the starting test pressure. The 9 psig limit is intended to further ensure workman safety and falls within the range of the pressure monitoring gauges normally used.

2. Test Procedure

Following are general procedures to be employed in the performance of the test. Test data sheets shall be submitted to the Town.

a. Plug Installation and Testing

After a segment of pipe has been backfilled to final grade, prepared for testing, and the specified waiting period has elapsed, the plugs shall be securely placed in the line at the ends of each segment to be tested.

Seal test all plugs before use. Seal testing may be accomplished by laying one length of pipe on the ground and sealing it at both ends with the plugs to be checked. The sealed pipe should be pressurized to 9 psig. The plugs shall hold against this pressure without bracing and without any movement of the plugs out of the pipe. No persons shall be allowed in the direct line of the pipe while the plugs are tested.

Plug the upstream end of the line first to prevent any upstream water from collecting in the test line. This is particularly important in high groundwater situations.

When plugs are being placed, the pipe adjacent to the manhole shall be visually inspected to detect any evidence of shear in the pipe due to differential settlement between the pipe and the manhole. A probable point of leakage is at the junction of the manhole and the pipe. This fault may be covered by the pipe plug, and thus not revealed by the air test.

b. Line Pressurization

Low pressure air shall be slowly introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any groundwater above the pipe, but not greater than 9.0 psig.

c. Pressure Stabilization

After a constant pressure of 4.0 psig (greater than the average groundwater back pressure) is reached, the air supply shall be throttled to maintain that internal pressure for at least 2 minutes. This time permits the temperature of the entering air to equalize with the temperature of the pipe wall.

d. Timing Pressure Loss

When temperatures have been equalized and the pressure stabilized at 4.0 psig (greater than the average groundwater back pressure), the air hose from the control panel to the air supply shall be shut off or disconnected. The continuous monitoring pressure gauge shall then be observed while the pressure is decreased to no less than 3.5 psig (greater than the average back pressure of any groundwater over the pipe). At a reading of 3.5 psig, or any convenient observed pressure reading between 3.5 psig and 4.0 psig (greater than the average groundwater back pressure), timing shall commence with a stop watch or other timing device that is at least 99.8% accurate.

A predetermined required time for a specified pressure drop shall be used to determine the lines acceptability. Traditionally, a pressure drop of 1.0 psig has been specified. However, other pressure drop values may be specified, provided that the required holding times are adjusted accordingly. If the specified pressure drop is 0.5 psig rather than the more traditional 1.0 psig, the required test times for a 1.0 psig pressure drop must be halved. Specifying a 0.5 psig pressure drop is desirable in that it can reduce the time needed to accomplish the air test without sacrificing test integrity. Therefore, the following sub-sections contain provisions for both the traditional 1.0 psig pressure drop and the more efficient 0.5 psig drop, which is given in parentheses.

e. Determination of Line Acceptance

If the time shown in Table A, for the designated pipe size and length elapses before the

air pressure drops 1.0 psig (or 0.5 psig), the section undergoing the test shall be deemed to have passed and shall be presumed to be free of defects. The test may be discontinued once the prescribed time has elapsed even though the 1.0 psig (or 0.5 psig) drop has not occurred.

f. Determination of Line Failure

If the pressure drops 1.0 psig (or 0.5 psig) before the appropriate time shown in Table A has elapsed, the air loss rate shall be considered excessive and the section of pipe shall be determined to have failed the test.

3. Test Times

a. Test Time Criteria

The Ramseier test time criteria requires that no test section shall be accepted if it loses more than "Q" cubic feet per minute per square foot of internal pipe surface area for any portion containing less than 625 square feet internal pipe surface area. The total leakage from any test section shall not exceed 625Q cubic feet per minute.

b. Allowable Air Loss Rate

A "Q" value of 0.0015 cubic feet per minute per square foot shall be utilized to assure the Owner of quality pipe materials, good workmanship, and tight joints.

c. Test Time Calculation

All test times shall be calculated using Ramseier's equation:

$T = (0.085) (D * K)/Q$(Equation 4.03-1)

Where:

T = Shortest time, in seconds, allowed for the air pressure to drop 1.0 psig
K = 0.000419 DL, but not less than 1.0
Q = 0.0015 cubic feet/minute/square feet of internal surface
D = Nominal pipe diameter in inches
L = Length of pipe being tested in feet

For more efficient testing of long test sections and/or sections of larger diameter pipes, a timed pressure drop of 0.5 psig may be used in lieu of the 1.0 psig timed pressure drop. If a 0.5 psig pressure drop is used, the appropriate required test times shall be exactly half as long as it is obtained using Ramseier's equation for "T" cited above.

B. Mandrel Test for Select Pipe

A five (5) percent "GO-NO-GO" Mandrel Deflection Test shall be performed on all HDPE and PVC gravity sanitary sewer pipe.

The mandrel test shall be conducted with a rigid device sized to pass five percent (5%) or less deflection (or deformation) of the base inside diameter of the pipe. The test shall be conducted no earlier than thirty (30) days after reaching final trench backfill grade, provided that, in the opinion of the Town, sufficient water densification or rainfall has occurred to thoroughly settle the soil throughout the entire trench depth. If, in the opinion of the Town, densification has not been achieved within the thirty (30) day time frame, the mandrel size shall be increased to measure a deflection limit of three percent (3%).

The mandrel (GO-NO-GO) device shall be cylindrical in shape and constructed with nine (9) or ten (10) evenly spaced arms or prongs. Mandrels with less than the required arms shall not be allowed. The mandrel diameter dimension "D" shall be equal to the inside diameter of the sanitary sewer. Allowances for pipe wall thickness tolerances or ovality (from heat, shipping, poor production, etc.) shall not be deducted from the "D" dimension but shall be counted as part of the 5% or less deflection allowance. Each pipe material or type required to be mandrel tested shall be tested with a mandrel approved by the pipe manufacturer, while meeting the requirements of this Section. The "D" mandrel dimension shall carry a tolerance of $\pm$ 0.01 inches.

The mandrel shall be hand pulled through all sewer lines. Any section of sewer not passing the mandrel shall be uncovered, replaced or repaired to the Town's satisfaction and then retested.

The contact length (L) shall be measured between points of contact on the mandrel arm. The length shall not be less than that shown in Table 4C.

The Contractor shall provide proving rings to check the mandrel. Drawings of mandrels with complete dimensions shall be furnished by the Contractor to the Town upon request for each diameter and specification of pipe.

## 6.04 LIFT STATION AND FORCE MAIN TESTING

The following section describes the testing that shall be performed on the lift station pumps, piping and force main for acceptance and dedication to the Town.

A. Force Main Testing

1. General

Under the observation of the Town’s Inspector, force mains shall be tested for leakage after installation and prior to final acceptance. The contractor shall be responsible for

conducting a hydrostatic pressure test in accordance with AWWA and ASTM standards for testing pressure pipe.

2. Testing Equipment

The Contractor shall be responsible for providing all of the equipment and tools necessary to conduct the hydrostatic test including, but not limited to, the following:

a. Hydrostatic test pump (jockey pump).
b. Four and one half (4 1/2") inch diameter calibrated pressure test gauge with a range of 0-150 psi graduated in 1 psi increments. The manufacturer's calibration papers and test date information shall be made available upon the request of the Town.
c. All pipe plugs and/or caps required to perform the hydrostatic test.
d. Calibrated/graduated container to measure quantity of water required to be added during the hydrostatic pressure test to maintain specified test pressure.

3. Hydrostatic Pressure Testing

The hydrostatic pressure test shall be conducted in accordance with the applicable AWWA standard based on force main material and in accordance with ASTM E103 - "Standard Method for Hydrostatic Leak Testing." In conjunction with and in addition to the aforementioned standards, the hydrostatic pressure test shall proceed as follows:

a. The force main shall be completely backfilled prior to testing.
b. The influent line and effluent discharge shall be appropriately plugged or bulkheaded. The plugs/bulkheads shall be equipped with a minimum of two (2) openings for filling/draining the pipeline and for bleeding air from the line. Thrust blocking restraints are required at each bulkhead and shall be installed in accordance with the bulkhead manufacturer's requirements.
c. The test line shall be filled with water at a slow rate to prevent air entrapment.
d. Trapped air shall be expelled through high point bleed off valves as theline is being filled.
e. The test line shall be pressurized to 1.5 times the pump shut-off head as determined from the pump manufacturer's performance curves or to 100psi, whichever is greater.
f. Water shall be added to the test segment to maintain the test pressure for a period of no less than 2 hours and no more than 8 hours. The Town's Inspector must be present for at least the first 2 hours of testing.
g. The maximum allowable apparent leakage shall be 10 gallons per inch diameter per mile per day; however, meeting this criteria shall not preclude the Town from requiring repair of any/all visible leakage identified during the test period.
h. If the force main or any portion thereof fails the hydrostatic pressure test, the Contractor shall remove and replace or otherwise repair the force main to the satisfaction of the Town, and the force main shall be retested.

B. Wet Well Leakage Testing

Leakage tests of the wet well shall be observed by the Town's Inspector. The wet well shall be tested using the exfiltration test as described below:

After the wet well has been assembled in place, all lifting holes shall be filled with an approved non-shrinking mortar. The test shall be made prior to placing any fill material. If the ground water table has been allowed to rise above the bottom of the wet well, it shall be lowered for the duration of the test. All pipes and other openings into the wet well shall be suitably plugged and the plugs braced to prevent blow out.

The wet well shall then be filled with water. If the excavation has not yet been backfilled and observation indicates no visible leakage after 1 hour; the wet well may be considered to be satisfactorily water-tight. If the test described above is unsatisfactory or if the wet well excavation has been backfilled, the test shall be continued. A period of time up to 24 hours may be permitted, if the Contractor so wishes, to allow for absorption. At the end of this period, the wet well shall be refilled to the top, if necessary; and a measuring time of at least 8 hours begun. At end of the test period, the wet well shall be refilled to the top and the volume of water added shall be measured. This amount shall be extrapolated to a 24-hour rate and the leakage determined on the basis of depth.

The leakage for each wet well shall not exceed 1 gallon per vertical foot for a 24-hour period. If the test fails this requirement, but the leakage does not exceed 2 gallons per vertical foot per day, repairs by approved methods may be made as directed by the Town to bring the leakage within the allowable rate of 1 gallon per foot per day. Leakage due to a defective section or joint or exceeding the 2 gallon per vertical foot per day maximum shall be cause for rejection of the wet well. It shall be the Contractor's responsibility to uncover the wet well as necessary and to disassemble, reconstruct, or replace it as directed by the Town. The wet well shall then be retested at the Owner's expense.

No adjustment in the leakage allowance will be made for unknown causes such as leaking plugs, absorption, etc.; i.e., It will be assumed that all loss of water during the test is a result of leaks through the joints or through the concrete. The Contractor shall take any steps necessary to assure that the water table is below the bottom of the wet well throughout the test.

C. Manufacturer's Start-Up

Prior to the Town's final inspection of the lift station equipment, the Contractor shall coordinate start-up activities with the pump manufacturer's representative. The Town's Inspector **must** be present at the time of manufacturer's start-up.

The manufacturer's representative shall thoroughly test and inspect all components of the system. Any deficiencies in equipment and/or workmanship noted during the manufacturer's start-up shall be remedied by the Contractor prior to final inspection.

Upon successful completion of the manufacturer's start-up, the manufacturer shall deliver to the Contractor:

1. Three (3) copies of the completed, witnessed report with cover letter certifying that all pumping and electrical equipment has been installed and is operating in accordance with the manufacturer's requirement.
2. Three (3) sets of Operation and Maintenance Manuals
3. One (1) complete set of Spare Parts as specified in these Standards.

D. Final Inspection

Contractor shall deliver three (3) copies of the manufacturer's start-up report at the time of final inspection. In addition, the Contractor shall provide the following pump test equipment and materials:

1. Water to conduct test
2. Amp/volt meter
3. Stop watch
4. Tape or level rod to measure float settings
5. Keel to mark float settings on lift station wall
6. Calibrated test gauge to measure operating head. The gauge shall be calibrated in feet of water from 0 to 100 feet in one foot increments
7. Manufacturer's pump performance curves

Contractor shall provide a connection for the test gauge on the blind flanged tee in the valve vault. The stem connection shall be equipped with a plug valve to close the connection after testing is complete. The connection shall be left in place and shall be suitable for use as an air bleed off. At a minimum, pump testing shall include a manual check of all on-off operations, alarm and run lights; determination of pump capacity for each pump and both/all pumps simultaneously; and determination of pump capacity with the force main full. Full force main shall be verified by a pressure gauge.

The pumping test results must meet or exceed the design pumping criteria approved by the Town to successfully pass the final inspection. Any deficiencies noted during the final inspection shall be repaired or replaced by the Contractor to the satisfaction of the Town and then reinspected and retested prior to final acceptance.

## 6.05 MANHOLE TESTING AND INSPECTION

Each manhole shall be visually inspected for leakage or evidence thereof. If the manhole shows leakage it shall be repaired to the satisfaction of the Town and re-inspected and re-tested at the Contractors expense.

Manholes will be checked by the Town after installation and again before the one (1) year warranty period ends. If manholes show signs of leakage, they shall be vacuum tested by an approved company and repaired at the Contractor’s expense.

# Section 6: Inspection, Testing and Acceptance

Contractor shall test all manholes using the Standard Test Method for Concrete Sewer Manholes by the Negative Air pressure (Vacuum) Test.

A. Scope

This section covers procedures for testing precast concrete manhole sections using the vacuum test method to demonstrate the integrity of the installed materials and the construction procedures. This test method is used for testing concrete manhole sections utilizing mortar, mastic, or gasketed joints and is intended to be used as a preliminary test to enable the Contractor to demonstrate the condition of the concrete manholes prior to backfill. It may also be used to test manholes after backfilling; however, Contractor must correlate the testing with the connector supplier.

This test method is the companion to metric Test Method C1244M; therefore no SI equivalents are shown in this test method.

B. Reference Documents

ASTM Standards

C822, Terminology Relating to Concrete Pipe and Related Products/2

C924, Practice for Testing Concrete Pipe Sewer Lines by Low-pressure Air Test Method/2

C969, Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines/2

This practice is under the jurisdiction of ASTM C-13 on Concrete Pipe, most recent edition.

C. Procedures

1. All lift holes and any pipes entering the manholes are to be plugged. A vacuum will then be drawn and the vacuum drop over a specified time period will be used to determine the acceptability of the manhole.

2. The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.

3. A vacuum of 10 in. of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head will be closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 in. of mercury.

4. The manhole shall be considered to pass if the time for the vacuum reading to drop from 10 in. of mercury to 9 in. of mercury meets or exceeds the values indicated in Table B.

5. If the manhole fails the initial test, necessary repairs shall be made using an approved method. The manhole shall then be re-tested until a satisfactory test result is obtained.

Use or failure of this vacuum test shall not preclude acceptance by appropriate water infiltration or exfiltration testing if approved by the Town.

End of Section
Inspection, Testing and Acceptance

## TABLE A

| pipe diam. (in) | minimum time (min:sec) | length for minimum time (ft) | time for longer length (sec) | Specification Time for Length (L) shown (min:sec) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | 100ft | 150ft | 200ft | 250ft | 300ft | 350ft | 400ft | 500ft |
| 6 | 2:50 | 398 | 0.427 L | 2:50 | 2:50 | 2:50 | 2:50 | 2:50 | 2:50 | 2:51 | 3:12 |
| pipe diam. (in) | minimum time (min:sec) | length for minimum time (ft) | time for longer length (sec) | Specification Time for Length (L) shown (min:sec) | | | | | | | |
| | | | | 100ft | 150ft | 200ft | 250ft | 300ft | 350ft | 400ft | 500ft |
| 8 | 3:47 | 298 | 0.760 L | 3:47 | 3:47 | 3:47 | 3:47 | 3:48 | 4:26 | 5:04 | 5:42 |
| 10 | 4:43 | 239 | 1.187 L | 4:43 | 4:43 | 4:43 | 4:57 | 5:56 | 6:55 | 7:54 | 8:54 |
| 12 | 5:40 | 199 | 1.709 L | 5:40 | 5:40 | 5:42 | 7:08 | 8:33 | 9:58 | 11:24 | 12:50 |
| 15 | 7:05 | 159 | 2.671 L | 7:05 | 7:05 | 8:54 | 11:08 | 13:21 | 15:35 | 17:48 | 20:02 |
| 18 | 8:30 | 133 | 3.846 L | 8:30 | 9:37 | 12:49 | 16:01 | 19:14 | 22:26 | 25:38 | 28:51 |

## TABLE B

| manhole depth (feet) | manhole diameter (inches) | | | | |
|---|---|---|---|---|---|
| | 48 | 54 | 60 | 66 | 72 |
| | time (seconds) | | | | |
| 8 | 20 | 23 | 26 | 29 | 33 |
| 10 | 25 | 29 | 33 | 36 | 41 |
| 12 | 30 | 35 | 39 | 43 | 49 |
| 14 | 35 | 41 | 46 | 51 | 57 |
| 16 | 40 | 46 | 52 | 58 | 67 |
| 18 | 45 | 52 | 59 | 65 | 73 |
| 20 | 50 | 53 | 65 | 72 | 81 |
| 22 | 55 | 64 | 72 | 79 | 89 |
| 24 | 59 | 64 | 78 | 87 | 97 |
| 26 | 64 | 75 | 85 | 94 | 105 |
| 28 | 69 | 81 | 91 | 101 | 113 |

SUBMERSIBLE LIFT STATION
GENERAL SPECIFICATION

## I. Scope of Work:

A. Lift stations, in general, shall be submersible type including, a minimum of two (2) pumps and motors with the proper capacity to pump sewage under site operating conditions, wet basin, separate valve pit, valves, piping, hatches, guide rails, pump removal components, control center, float switches, remote monitor package, interconnecting electrical wiring, incoming power and telephone supply, and other features regularly and normally required as a part of a complete and functional facility. All work shall be in accordance with site requirements, these Standards and the manufacturer's recommendations.
B. All lift stations shall be designed for and operate on three (3) phase power. No deviation from this requirement shall be permitted without the express written approval of the Town Engineer.

## II. General Requirements:

A. All of the mechanical and electrical equipment shall be an integral package supplied by the pump manufacturer with local representation so as to provide undivided responsibility. The package shall be equal in construction and performance to Hydromatic Pump equipment and other specific requirements set forth herein.
B. The contractor shall submit to the Town for review and approval, three (3) sets of shop drawings, detailed specifications, pump warranty and performance characteristics for all of the equipment and fixtures to be furnished and installed. The shop drawings and equipment data shall be submitted with a cover letter or Contractor's stamp of approval, indicating that he has reviewed, checked and approved the data submitted. The Town will review the submittal and render a decision in writing as to the acceptability of the equipment. Without prior written Town approval, the item of work may not be accepted.
C. Any exceptions to this standard or associated approved plans shall be submitted in writing and clearly stated. The exceptions must be approved by the Engineer and the Town prior to proceeding with the work.
D. All components of the lift station that are exposed to weather shall be constructed of material that is resistant to corrosion throughout the expected life of the lift station. In general, these materials are stainless steel, aluminum, fiberglass reinforced polyester (FRP) and ultraviolet stabilized PVC.
E. All valves and piping coming in contact with sewage or installed in the pump or valve chambers shall be coated with 14 mil coal tar epoxy.

## III. Operating Conditions:

A. Each pump shall have a capacity in gallons per minute at a total dynamic head calculated by the design engineer. In general, pumps shall be sized to meet the expected GPM of the entity or development being served. The calculation shall be based on total gallons per day/1,440 x peaking factor of 4. The pump shall be equal to a pump as manufactured by Hydromatic Pump Company.

## IV. Pumping Equipment:

### A. CONSTRUCTION

a. Castings – Cord Cap / Motor Housing / Bearing Housing / Seal Plate shall be ASTM A48 Class 30 Cast Iron
b. Shaft shall be 416 Stainless Steel
c. Impeller- ASTM A48 Cast Iron Class 30 or ASTM A536 Ductile Iron Class 65
d. Fasteners / Hardware shall be 300 series Stainless Steel
e. Elastomers – O-Rings / Mechanical Seals / Cord Grip Grommets shall be Nitrile with optional Fluoropolymer Elastomer
f. Mechanical Seals shall be Carbon / Silicon Carbide
g. Power Cable shall be type SOOW or W while Control Cable shall be SOOW
h. Lifting Bail shall be welded or forged 300 Series Stainless

### B. ELECTRICAL POWER CORD

a. The power cord will be SOOW or W, oil and water resistant 600v, 90C, UL and CSA approved and applied per NEC ampacities ratings at the cables rated temperature for intermittent / continuous duty. The pump shall be double protected with a compression fitting and an epoxy potted area that seals each conductor at the power cord entry to the pump. The power cable entry into the cord cap assembly shall first be made with a compression fitting. Each individual lead shall be stripped down to bare wire at staggered intervals and each strand individually separated. This area of the cord cap shall then be filled with an epoxy compound potting. This assembly will prevent water contamination from gaining entry even in the event of wicking or capillary action. The power cord leads shall be connected to the motor leads with a terminal block or extra heavy connectors. The cord cap assembly where bolted to the motor housing shall be sealed with a Nitrile O-ring on a beveled edge to assure proper sealing. Wiring connection shall be done through a terminal block eliminating wire nuts or use of heavy-duty crimp connectors.

### C. MOTOR

a. The motors shall meet premium efficiency in accordance with IEC 60034-30, level IE3 and NEMA MG1 [NEMA 12.60 Enclosed motor]. Motor rating tests shall be conducted in accordance with CSA C390-10 requirements. A certificate shall be available upon request. The motors are submerged in non-toxic, oil filled, cool running design providing significantly reduced operating temperatures. Pump designs requiring a secondary cooling apparatus shall be deemed unapproved and not equal. Air filled pump designs shall not be considered equal or approved.
b. Motor will be of the squirrel-cage induction design, NEMA type A or B for 3 Phase [Per NEMA MG1 1.19] & NEMA type L for 1 Phase [Per NEMA MG1 1.20]

c. The copper stator windings shall be insulated with moisture resistant Class H insulation materials, rated for 180° C (356° F). [Per NEMA MG1 1.66]
d. The service factor shall be 1.3 in wet pit service and 1.0 for VFD operation (as defined by MG1 standard). The motor shall have a voltage tolerance of +/- 10% from nominal, and a phase-to-phase voltage imbalance tolerance of 1%.
e. The rotor bars and short circuit rings shall be made of cast aluminum.
f. The motor shall be designed for continuous duty. The maximum continuous temperature of the pumped liquid shall be 40 C (104 F), and intermittently up to 50 C (122 F). Each of the three phases will have a UL/FM approved thermostat or thermistor. The winding operating temperature at rated horsepower and service factor will be a maximum of 130 C @ 40 C ambient. (Maximum of 150 C for 320/360 frame HPE product)
g. The motor shall be capable of handling up to 15 (>=20kW) and 20 (<20kW) evenly spaced starts per hour without overheating. [Per NEMA MG1 12.54]
h. The motor shall meet the requirements of NEMA MG1 Part 30 and 31 for operation on PWM type Variable Frequency Drives. The rotors will have high efficiency laminated steel with die cast bars and shorting rings. The stators will have high efficiency laminated steel (if required to meet premium efficiency), with inverter duty rated, Class H magnet wire & insulation materials. Each of the three phases will have a UL/FM approved thermostat or thermistor set for 130C +/-5. (150C +/-5 for 320/360 frame HPE product)

**D. BEARINGS**

a. The upper bearing shall be a heavy-duty radial single row ball bearing while the lower bearing shall be a double row heavy-duty angular contact ball bearing of the thrust limiting design. Minimum of 50,000 hours of B10 bearing life for radial & thrust bearings while operating across entire hydraulic operating range of the pump. Any Pumps having rated B10 life only at the BEP shall not be considered equal or approved. Bearing shall be lubricated for life from the factory and will be accomplished through the non-toxic, low viscous, dielectric oil in the frame. Pump designs requiring periodic scheduled bearing service shall not be considered equal or approved. Single row or sleeve lower bearings shall not be acceptable.

**E. SHAFT**

a. The pump shaft shall be an integral, one-piece unit adequately designed to meet the maximum torque required at any normal start up condition or operating point in the system. Shafts of carbon steel, chrome plated, or spin welded shafts shall not be considered adequate or equal. Material of shaft shall be 416 stainless steel conforming to ASTM 8582.

**F. FLUID END**

a. The impeller shall be ASTM Class 30 Cast Iron or ASTM Class 65 Ductile Iron with optional SST available. The impeller mounting is to be a slip fit onto a tapered shaft and a drive key. The impeller shall be attached to the shaft by a SST fastener and impeller washer. The impeller is to be balanced to ISO1940-1 Grade G6.3 standard. Impeller designs that rely on fins or pins protruding into the suction path to assist in the handling of fibrous material shall not be considered equal. Impellers shall be of the radial single or two vane type or a vortex impeller having the ability to pass a wide range of solids. Any impeller design requiring mechanical bypass mechanism located in the volute in order to handle solids shall not be considered equal or acceptable.

b. The volute shall be ASTM Class 30 also with optional SST. It will consist of a centerline discharge one piece design. The passages are to be large enough to pass the same solid size as the impeller. The discharge and inlet flanges shall be ANSI Class 125 and be integrated into the volute case. The wear rings shall be replaceable radial wear rings constructed of 85-5-5-5 bronze that come standard in the volute case with optional SST available in 304, 316 or 410.

**G. SEALS**

a. Each pump must be equipped with a switchable seal design allowing for the use of either tandem mechanical seals or a cartridge dual seal design (on 210 frame HPE product) without voiding the agency rating of the pump. Pumps utilizing one seal technology shall not be considered equal or approved. In the standard tandem mechanical seal configuration, the lower seal shall be of the type 2 design and constructed of Carbon/ Silicon Carbide and be replaceable without disassembly of the seal chamber and without the use of special tools. The upper seal shall of the type 2100 design and constructed of Carbon/Silicon Carbide. Each seal will not require routine maintenance or adjustment. For ease of maintenance both the lower and upper seals shall be locally available and of a standard design. For ease of service the pumps shall be available with a drop in cartridge seal constructed of Silicon Carbide/Carbon. The cartridge seal design shall fit into the seal chamber with a switchable seal plate allowing for retrofit in the field. Units equipped with opposing mechanical seals shall not be acceptable. All lower seals shall be optionally available in tungsten carbide construction.

**H. EQUIPMENT MONITORING**

a. The integrity of the mechanical seal system shall be continuously monitored during pump operation and stand by time. Two electrical probes shall be provided in a sensing chamber positioned between the primary and secondary mechanical seal for detecting the presence of water contamination within the chamber. The sensing chamber shall be fitted with environmentally safe nontoxic oil. A solid-state relay mounted in the

pump control panel or in a separate enclosure shall send a low voltage, low amperage signal to the probe, continuously monitoring the conductivity of the liquid in the sensing chamber. If sufficient water enters the sensing chamber through the primary mechanical seal, the probe shall sense the increase in conductivity and signal the solid-state relay in the control panel. The relay shall then energize a warning light on the control panel, or optionally, cause the pump to shut down. This system shall provide an early warning of mechanical seal leakage, thereby preventing damage to the submersible pump and allowing scheduled rather than emergency maintenance. Systems utilizing float switches or any other monitoring devices located in the stator housing rather than in a sensing chamber between the mechanical seals are not considered to be early warning system and shall not be considered equal.

**I. SERVICEABILITY**

a. The complete rotating assembly shall be capable of being removed from the volute without disturbing the suction piping, discharge piping, and volute. The motor housing, seal housing with seal plate and impeller still attached to the shaft shall be capable of being lifted out of the volute case from the top as one assembly. For ease of repair, the motor stator shall be securely held in place by an end ring so it can be easily removed without the use of heat or a press. No special tools shall be required for pump and motor disassembly. Stators held in place by heat shrink fit shall not be acceptable.

**J. PAINT**

a. The pump shall be painted with waterborne hybrid acrylic/alkyd paint. This custom engineered, quick dry, low VOC paint shall provide superior levels of corrosion and chemical protection. Optional coatings are available through the factory of chlorinated rubber, coal tar epoxy and polyamide epoxy.

**K. Warranty**

a. Pump warranty shall be provided by the pump manufacturer and shall warrant the units being supplied to the Owner against defects in workmanship and materials for a period of five (5) years under normal use, operation, and service. The warranty shall be in printed form and apply to all similar units. A copy of the warranty statement shall be submitted with the approval drawings.

## V. Pump Removal Equipment

A. The pump mounting base shall include adjustable guide rail supports and a discharge connection with a one hundred twenty-five (125) pound standard flange. The base and the discharge piping shall be permanently mounted in place.

The base plates shall be anchored in place utilizing epoxy type anchors with stainless steel studs and nuts as manufactured by HILTI Fasteners, Inc. or equal.

B. A rail system shall be provided for easy removal of the pump and motor assembly for inspection and service. The system shall not require a man to enter the wet well to remove the pump and motor assembly. Two (2) rails of two-inch stainless-steel pipe shall be provided for each pump. The guide rails shall be positioned and supported by the pump mounting base. The guide rails shall be aligned vertically and supported at the top by an attachment to the access hatch frame. One (1) intermediate guide rail support is required for each fifteen (15) feet of guide rail length for stainless steel pipe rail.
C. The pumps shall be equipped with sliding brackets or rail guides. To ensure easy removal of the pumps, the rail guides attached to each pump shall not encircle the rails. A stainless-steel lifting chain of adequate length for the basin depth shall be provided for each pump. Each pump shall be equipped with a permanent stationary lifting handle with a minimum clearance of 12" between the top of the pump and bottom of the handle.
D. The rails and rail guides shall function to allow the complete weight of the pumping unit to be lifted on dead center without binding and stressing the pump housing. The rail system shall function to automatically align the pumping unit to the discharge connection by a simple downward movement of the pump. No twisting or angle approach will be considered acceptable. The actual sealing of the discharge interface will be of the metal-to metal contact.

**VI. Basin, Valve Pit and Accessories:**

A. The basin and valve pit are to be constructed of precast concrete meeting the requirements of ASTM C-478. Cast-in-place monolithic structures may be substituted with prior written approval of the Department. Minimum valve vault and wet well diameter shall be 6‘ 0". The actual arrangement of the structures is to be as shown in the approved plans. The wet well basin top shall be provided with a four (4) inch PVC vent having a downward pointing inlet and screen over the inlet opening.
B. The basin, valve pit, flat tops and base slabs are to be constructed of precast reinforced concrete manhole sections conforming to ASTM C-478. All joints between precast sections shall be made with an approved rubber O-ring in accordance with ASTM C-443 and a 1/2-inch diameter non-asphaltic mastic conforming to AASHTO M-198 and Federal Specification SS-521-A. In addition, the outside wall below grade is to be coated with bituminous waterproofing material. The top and bottom of the chambers shall be precast or may be poured in place concrete if approved by the Engineer and the Owner.
C. The wet well pump basin and the valve pit chamber shall be enclosed at grade level with a reinforced concrete pad rectangular in shape and extending a minimum of 1'0" from the chambers outside dimension.
D. The lift station shall be provided with an access drive to the nearest public right-of-way conforming to the latest DOT Standards for Design of Driveways.
E. The pump supplier shall provide an aluminum two (2) door access hatch frame and door assembly to be installed in the concrete basin top. This door assembly

shall provide access for removal of the pumps and shall support the guide rails. Both the hatch lid and safety grate shall be 300PSF load rated. The doors shall be provided with lifting handle, safety latch to hold door in the open position, safety grating, slamlock, bituminous coating, and an oversized recessed padlock hasp. The doors shall have a non-skid finish.

F. An aluminum single door access hatch frame and door assembly, similar to the wet well hatch, shall be provided for use as entry to the valve pit. Minimum opening for the valve box entry shall be thirty-six (36) inches by thirty-six (36) inches.

G. A swing check valve with external swing arm and an eccentric plug valve shall be installed in the valve pit in each pump's discharge piping. A minimum clearance of twelve (12) inches shall be allowed from the bottom of the valves to invert of the pit. A drainpipe and check valve or gate valve shall be installed to drain the valve pit back to the wet basin, but not allow the wet basin liquid to enter the valve pit. In addition to a tee or cross with bleedable blind flange shall be provided in the valve pit.

## VII. Disconnect Switch:

A. A single main fusible or breaker disconnect switch of adequate size to provide power for the 'Control Center' and its related components shall be provided by the Contractor.

B. The disconnect switch shall be housed in a NEMA 4X stainless steel enclosure with an external operation handle capable of being locked in the ON position.

## VIII. Control Center:

A. The control center shall be built in a NEMA 4X stainless steel floor mount enclosure and shall be suitable for the specified horsepower and voltage for the pumping equipment. It shall be manufactured by USEMCO in Tomah, WI. The control center shall bear the U.L. listed label as an assembly after manufacturing of a U.L. 508 shop without exception. The outer door of the panel shall be hinged dead front with provisions for locking and have a 3-point door latch assembly. The inner door shall be where HOA switches, Pilot lights, and reset buttons are mounted. Enclosure shall be Hoffman or equal.

B. A circuit breaker and NEMA rated magnetic starter with three (3) leg overload protection and manual reset shall be provided for each pump. Starters shall have auxiliary contacts, on three phase applications, to operate both pumps on over-ride condition. Pump breakers shall be Square D "HDL" series and motor starters shall be Square D #8536 series. A separate circuit breaker shall be supplied for power to the control circuit. The control center shall include an extra circuit breaker of adequate size to provide 115-volt, single (1) phase power for remote monitor panel. The control center shall include a minimum 2 KVA control transformer to reduce supply to 115-volt, single (1) phase to be used for all control functions except the float circuit and associated relays which shall be provided with 24-volt control voltage. Transformers shall be ACME and be

remote mounted. A terminal strip shall be provided to make field connections of pump power leads, float switches, seal sensor leads, and remote monitor panel interconnections.

C. The control center shall incorporate connections for heat sensors which are installed in the pumps. The connection shall disconnect the starter upon high temperature signal and activate an alarm light. The circuit will automatically reconnect when condition has been corrected.

D. The control center shall incorporate connections for seal failure sensors which are installed in the pumps. The panel will have a seal failure alarm light for each pump. This alarm indicates failure of the lower mechanical seal in the pump. This will be an alarm light only and will not shut down the pump. Seal failure relays shall be Diversified #SPM-120-AAA-100K.

E. The control center shall include an hour meter for each pump to register the elapsed operating time of each pump.

F. The control center shall have a highwater alarm. The highwater alarm shall consist of a flashing alarm light with red Lexan plastic cover mounted on top of the enclosure such that it is visible from all directions. An alarm horn shall be mounted on the side of the enclosure. A push to silence horn button shall be provided and mounted on the side of the enclosure.

G. The control center shall include a 800 Watt {Hoffman "DAH" series} condensate heater to protect against condensation inside the enclosure. The heater shall be placed so as not to damage any other component or wiring in the control center.

H. The control center shall include an SPD and a phase monitor relay (Diversified) to shut down the control circuit and protect the equipment due to loss of phase or phase reversal. Both the TVSS and phase monitor shall be protected by fuses.

I. The control center shall incorporate an alternator selector switch to allow selection of automatic alternation or manual selection of the lead pump.

J. The control center shall include a GFI convenience outlet with a 15 AMP breaker and suitable transformer or power supply to provide 115 single (1) phase power to the convenience outlet.

K. The control center shall be provided with the following Hand-Off-Auto switches:
    1. Pump #1 HOA
    2. Pump #2 HOA
    3. Lead Selector – Pump #1 – Auto – Pump #2

L. The control center shall be provided with the following Push Buttons:
    1. Alarm Silence

2. Backup Reset

M. The control center shall be provided with the following Pilot Lights:
   1. Pump 1 Run {Green}
   2. Pump 2 Run {Green}
   3. Pump 1 Fail {Yellow}
   4. Pump 2 Fail {Yellow}
   5. Motor 1 Seal Fail {Red}
   6. Motor 2 Seal Fail {Red}
   7. Back up on {Red}

N. The control center shall be provided with an adjustable time delay relay for lag pump delay. The delay shall be for either primary or backup level control. Control relays provided/required shall be IDEC "RH" series.

O. Level Control - Primary level control shall be provided by a Fogrod probe and LIT-100 controller by BBC Pump & Equipment Co. Backup level control shall be provided by {2} Intrinsically safe float switches. The floats shall be for pump{s} off, and lead on/alarm. The floats shall automatically become active once water level reaches the lead on/alarm float. The backup floats shall be wired in such a manner to create a latching circuit to allow pumps to cycle in event of primary level control failure. A reset button must be pressed to return station to primary level control.

P. Remote Monitor Package - The control center shall be provided with an Omnisite Crystal Ball by BBC Pump & Equipment Co. The remote monitor shall be wired for the following:
   1. High Level {Fogrod}
   2. Backup Float on
   3. Pump 1 Fail
   4. Pump 2 Fail
   5. Motor 1 Seal Fail
   6. Motor 2 Seal Fail
   7. Both Pumps Running
   8. Phase Fail
   9. Pump 1 Run
   10. Pump 2 Run

Q. Terminal strips shall be provided for all incoming field wiring terminations. All components mounted on the inner- door shall be identified with engraved plastic labels. The control panel assembly shall be completely factory tested and shall be "UL" 508 listed and label

R. A minimum four (4) inch PVC schedule 40 wall conduit shall be provided from the wet well basin to the control center which will allow the pump power cables, sensor cables and float switch cables to be pulled through without difficulty and

allow the use of one (1) piece cables from the pumps and float switches to the control center. The conduit shall be sealed at the control center to avoid entrance of sewer gases into the control panel.

JUNCTION BOXES SHALL NOT BE USED.

S. The control center and associated components shall be mounted on a non-maintenance type pedestal or mounting stand constructed of aluminum. The control center shall be located to provide safe access to the panel while wet well hatch doors are opened and shall be positioned so as not to be between the access drive and the wet well.

T. All components of the control center shall be American made and available from local sources. Items such as circuit breakers, overload protection, relays, etc. shall be available and in stock by local sources.

U. In order to maintain unit responsibility and warranty on the pumping equipment and control center, the control center must be accepted in writing by the pump manufacturer, as suitable for operation with the pumping equipment.

## IX. Level Control:

A. The level control device shall work via conductivity, so the wetwell unit does not require any moving parts, nor any electronics, nor any sensing components

1. The unit installed in the wetwell shall be of tough physical construction
    a. Manufactured out of CPVC to be physically strong, resistant to any cracking and resistant to corrosion
    b. A drop test from 6 ft onto concrete will not break or crack the device
    c. The unit, hung from its cable, can sustain an additional weight of 100 lbs for 10 seconds
2. The wetwell unit will have 10 metal contacts exposed down its length
3. The 10 metal contacts shall be AL6XN or equivalent super-austenitic stainless steel for corrosion resistance over many decades
4. The multicore cable shall be shielded with a braided shield to minimize electrical interference from pumps and motors
5. The cable length shall be 50 ft or 100 ft
6. The manufacturer's warranty on the wetwell unit shall be 10 years
7. The wetwell unit shall be supplied with a mounting bracket that includes a polyurethane cleaning pad
8. The electronic unit to be installed in the control panel shall be:
    a. UL approved
    b. DIN rail mounted
    c. powered from 10-30v D.C. to minimize the risk of transient power surges damaging the unit
9. The electronic unit shall include LEDs to display:
    a. Level

b. Fault conditions
c. Power status

10. The electronic unit shall include:
    a. Ten relay contacts corresponding to each level in the wetwell, configurable as normally open (N/O) or normally closed (N/C)
    b. Two relay contacts corresponding to fault conditions, configurable as N/O or N/C
    c. Isolated 4-20mA output for level with 1mA steps for each level point

11. The electronic unit shall include Cable Integrity Failsafe logic:
    a. The unit will test at least every 10 seconds for:
        i. Open circuit condition - to identify cable breaks, for example, due to rats eating the cable
        ii. Short circuit condition between the electronic unit and the wetwell unit - to identify cable insulation stripping, for example, due to rats eating away the insulation in the cable conduit
    b. Either of these conditions will activate the Failsafe fault relay
    c. Each of these conditions will activate either the Failsafe Open-Circuit fault LED or the Failsafe Short-Circuit fault LED
12. The electronic unit shall include Pump Start Failsafe logic:
    a. The highest-level relay activated will also activate the relays below (dry contacts cannot exist in reality below wet contacts)
    b. This ensures the control system (e.g. PLC) always gets a start signal even if one level point is not functioning due to buildup, individual cable wire damage, or individual wiring fault
    c. This condition will activate the Wiring/Clean fault relay
    d. This condition will activate the Wiring / Contact fault LED and cause the relevant level LED to flash slowly, thereby indicating the problem wetwell unit contact or wire
13. The electronic unit shall include Cleaning Alert logic:
    a. When FOG (Fats, Oils & Grease) buildup on the wetwell unit is sufficiently bad that it affects the level reading
    b. This condition will activate the Wiring/Clean fault relay
    c. This condition will activate the Clean unit Alert LED
14. The manufacturer's warranty on the electronic unit shall be 2 years, extendable to 5 years
15. An example product which meets this specification is the FOGRod and LIT-100 from Wastewater Level LLC in Montana.

## X. Remote Monitor Package:

A. The Contractor shall furnish an XR-50 wireless cellular monitor as manufactured by Omni-Site and provided by BBC Pump and Equipment Co., Inc. The XR-50 shall be mounted in the Pump Control Enclosure.

B. Contacts to be Monitored
    1. Pump 1 Fail (Overtemp and Overload)
    2. Pump 2 Fail (Overtemp and Overload)
    3. Pump 1 Seal Fail
    4. Pump 2 Seal Fail
    5. High Water Level
    6. Control Power Fail
    7. Main Power Phase Fail
    8. Pump 1 Run (Shall be normally open contact)
    9. Pump 2 Run (Shall be normally open contact)

## XI. Operation and Maintenance Manuals:

A. Four (4) operation and maintenance manuals shall be submitted to the Department.
B. Manuals shall include, at a minimum:
    1. Operation instructions
    2. Maintenance instructions
    3. Recommended spare parts list
    4. Lubrication schedules
    5. Structural diagrams
    6. As-built wiring diagrams
    7. Bill of materials

…END GENERAL SPECIFICATION SUBMERSIBLE LIFT STATION

# TOWN OF LIZTON

# HENDRICKS COUNTY, INDIANA

# WATER STANDARDS


***Prepared by:***

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**Town of Lizton, Indiana**
**Water Standards**

## FOREWORD

The enclosed Standard Construction Details and Specifications are provided to outline the Town of Lizton's minimum Standards for water construction. All infrastructure projects which are to connect to or become part of the Town's system shall conform to these Standards. Construction drawings and specifications must be approved by the Town and a written permit obtained in accordance with existing ordinances prior to the start of construction.

The Owner/Developer is responsible for obtaining required permits and approvals from all applicable and associated governing agencies.

Construction observation shall be provided by the Town to assure compliance with these Standards. A minimum of 48 hours notice shall be given prior to starting construction. The Contractor is responsible for notifying applicable utilities to request locating services.

These Standards were prepared with the intent of obtaining the highest quality of construction possible and are consistent with accepted industry practices. The Standards may be revised and updated from time to time in order to incorporate new materials and construction methods.

Copies of the Standards may be obtained from the Town Hall, which is located at 106 N. Lebanon Street Lizton, Indiana 46149, telephone number 317-994-5500 during regular office hours. These Standards were approved and adopted by the Town Council of the Town of Lizton on ***June 13, 2022.***

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## 1.01 DEFINITIONS AND TERMS

Whenever in these Standards or in any documents or instruments where the Standards govern, the following terms, abbreviations, or definitions are used, the intent and meaning shall be interpreted as follows:

### A. ABBREVIATIONS

| | |
|---|---|
| ASTM | American Society of Testing and Materials |
| AASHTO | American Association of State Highway and Transportation Officials |
| AWWA | American Water Works Association |
| ANSI | American National Standards Institute |
| ASME | American Society of Mechanical Engineers |
| ACI | American Concrete Institute |
| AREA | American Railway Engineers Association |
| NEMA | National Electrical Manufacturers Association |
| INDOT | Indiana Department of Transportation |
| OSHA | Federal Occupational Safety and Health Act |
| WPCF | Water Pollution Control Federation |

### B. DEFINITIONS

1. ACCEPTANCE: The formal written acceptance by the Town of Lizton of an entire project which has been completed in all respects in accordance with the approved Plans, Specifications and these Standards including any previously approved modifications.

2. ANNEXATION: The inclusion of additional property into the Corporate Limits by proper legal procedures.

3. BACKFILL: Earth and/or other material used to replace material removed from trenches during construction which is above the pipe bedding.

4. BEDDING: That portion of the trench backfill which encases the sewer pipe to a minimum depth above and below the bell/barrel of the pipe, as provided in the BEDDING section of these Standards, for the purpose of properly supporting the pipe.

5. BUILDING SEWER (LATERAL): The conduit for transporting waste discharged from the building to the public sewer commencing three (3) feet outside the building walls and ending at and exclusive of the wye or tee fitting at the connection to the public sewer.

6. CONTRACTOR: Any Contractor who meets the Town's requirements to perform the work of installing sewers under the Town's jurisdiction.

7. COUNTY: The County of Hendricks, State of Indiana.

8. EASEMENT: Easements are areas along the line of all public water mains which are outside of dedicated water or road easements or rights-of-way, and are recorded and dedicated to the Town granting rights along the line of the water main. Easements shall be exclusively for water mains and no other utilities shall be constructed or encroach upon the easement except with the expressed written approval of the Town.

9. ENGINEER: The Engineer for the Owner or the Town of Lizton.

10. GOVERNING AGENCY/BODIES: Governing Agency having jurisdiction due to location or type of work being performed. Includes at a minimum the Town of Lizton, Hendricks County, and applicable State Agencies such as the Indiana Department of Transportation (INDOT), IDEM Etc.

11. INSPECTOR: A representative of the Town of Lizton assigned to make detailed inspection of any or all portions of the work and materials. The inspector has full authority to reject materials and/or any portion of the work not supplied and installed in accordance with these Standards and to stop work if the work is not proceeding in accordance with these Standards.

12. OTHER SPECIFICATIONS AND MATERIALS: Wherever in these Standards other specifications or regulations are mentioned, it shall be understood that the materials and methods mentioned therewith shall conform to all requirements of the latest revision of the specifications so mentioned.

13. OWNER: Any individual, partnership, firm, corporation or other entity who, as property owner, is initiating the work.

14. PERMITS: Clearance to perform specific work under specific conditions at specific locations. The Owner or his duly authorized representative shall furnish to the Town all necessary plans and documents required by the Town to make application for permits.

15. PLANS: Construction plans, including system maps, water plans, cross sections, utility plans, detailed drawings, etc., or reproductions thereof, approved or to be approved by the Town and the Ingalls Area Plan Commission, which show location, character, dimensions and details of the work to be done.

16. RECORD DRAWING (AS-BUILTS): Plans certified, signed and dated by a professional engineer registered in the State of Indiana, indicating that the Plans have been reviewed and revised, if necessary, to accurately show all as-built construction and installation details including, but not limited to, key elevations, locations and distances. Computer files as specified in Section 1.02 are required.

17. RIGHT-OF-WAY: All land or interest therein which by deed, conveyance, agreement, easement, dedication or process of law is reserved for or dedicated to the use of the general public, within which the Town shall have the right to install and maintain public utilities.

18. SEWER: A pipe or conduit for carrying wastewater (sanitary sewer), storm water (storm sewer) or a combination of both (combined sewer).

19. STANDARD DRAWINGS: The drawings of structures, sanitary sewer lines or devices commonly used and referred to on the plans and in these Standards.

20. STANDARDS: The Standards for Design and Construction within the Lizton Area as contained herein and all subsequent additions, deletions, or revisions.

21. TEN STATE STANDARDS: Recommended Standards for Sewage Works, latest edition, developed by the Committee of the Great Lakes - Upper Mississippi River board of State Sanitary Engineers.

22. TOWN: The Town of Lizton, the Town Council, or any dully authorized official acting on its behalf.

23. UNIFORM PLUMBING CODE: The Uniform Plumbing code adopted by the International Association of Plumbing and Mechanical Officials, current edition.

24. WORK: All the work to be done under Town's permit, in accordance with the approved Plans, Specifications, these Standards and permit conditions.

1.02 RECORD DRAWINGS

The project Designer shall furnish to the Town two sets of as-built drawings and one set of computer files on compact disc or flash drive in AutoCAD ".DXF" and ".DWG" format for all projects dedicated to the Town and for all multi-family, industrial and commercial sites. All sheets shall have "Record Drawing" boldly printed on them with the date, stamp, and signature of the Professional Design Engineer, who must be registered in the State of Indiana. Drawings and computer files shall clearly differentiate between the original design and changes made to the design during the construction process. Each disk/drive shall be labeled with project name, property name, and date. Any auxiliary design program data files shall also be included and required subdirectory file structure and path relationships shall be maintained. All files shall be in readable format but shall be write protected. If auxiliary lettering fonts (fonts not supplied with standard AutoCAD Program) are used, then all necessary data files to support, import and utilize the applied fonts shall be included on the disk(s). An ASCII text file README.TXT shall be included in the files supplied. This file shall describe all files on the disk(s). This shall include creating program names, versions, and all other necessary details to allow the Town to fully understand and utilize the data files.

At a minimum the following information shall be provided on the plans:

1. Building pad elevations if applicable.

2. Structure elevations, pipe sizes and types fitting description, blocking details, hydrants valves.

3. Horizontal alignment of pipes, valves, hydrants and structures to a minimum accuracy of +/- 1 foot.

End of Section 1
General Requirements

Town of Lizton
Water Standards

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## Section 2 - Excavation, Trench Safety and Dust Control

## 2.01 GENERAL

This section provides for all surface removal, excavation and disposal of surplus material within the public right-of-way, trench safety system and dust control. Trench safety is a key and vital issue and Owners should take the necessary steps to ensure that the Contractor they use to construct infra-structure has included trench safety construction techniques and safety systems in the cost proposal.

All trenches or excavations shall be backfilled to the original surface of the ground or such other grades as shown on the design plans or as directed. In general, the backfilling shall be carried along as speedily as possible and as soon as the concrete, mortar, and/or other masonry work and pipe joints have sufficient strength to resist the imposed load without damage.

## 2.02 SURFACE REMOVAL (Within Public Right-of-Way)

For construction of utilities as indicated on the approved Plans within the Public Right-of-Way, the Contractor shall remove the surface materials only to such widths as will permit a trench to be safely excavated, affording sufficient room for proper efficiency and proper construction. Where sidewalks, driveways, pavements, curb and/or gutters are encountered, care shall be taken to protect such against fracture or disturbance beyond reasonable working limits. All pavements shall be cut with an abrasive saw and concrete streets, driveways, walks, alleys, etc. cut to the nearest joint, and as required by the design plans and the Governing Bodies. Any areas damaged during construction shall be re-sawed to provide a clean surface for rehabilitation.

Excavated topsoil shall be stored in a designated location as approved by the Governing Bodies. The topsoil shall be protected in such a manner as to ensure the preservation of its quality. The topsoil shall be inspected by the Town of Lizton and/or Hendricks County personnel before being backfilled in the work.

## 2.03 TRENCH SAFETY SYSTEM

The Contractor and the Owner are responsible for ensuring that safe working conditions exist and safety procedures are being followed at the work site. The Contractor shall also be responsible for notifying the Indiana Occupational Safety and Health Administration (IOSHA), Indiana Department of Labor and all other applicable governmental agency requirements.

The Town and/or County's inspector is NOT responsible for policing the Contractor's safety program. If, in the opinion of the observer, an unsafe condition is noted, he will notify the Contractor of this condition and report it to the Owner. If the condition continues to exist the observer shall notify the Owner, document the unsafe condition in writing and/or through a photograph, and leave the job site. The Town and/or County Officials may contact IOSHA and request that they dispatch an inspector immediately.

Regarding Trench Safety Systems, the Contractor shall design, install and maintain a "Trench Safety Program" in strict compliance with OSHA (Occupational Safety and Health Administration) Part 1926 of the Code of Federal Regulations and all other applicable federal, state, and local regulations  The contractor shall be responsible to continuously upgrade the Trench Safety Program with changing governmental regulations.

2.04 DUST CONTROL

The Contractor shall be responsible for maintaining the site and adjoining paved surfaces in a dust free condition.  Fugitive dust control is the sole responsibility of the Contractor.

2.05 MAGNETIC LOCATOR WIRE

All PVC or non-metallic utilities shall be installed with a Type THWN #12 locator wire installed on top of the pipe.

End of Section 2
Excavation, Trench Safety, Dust Control

Town of Lizton
Water Standards

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## Section 3 - Surface Replacement and Site Restoration

## 3.01 GENERAL

This section pertains to the restoration of areas within the public Right-of-Way and/or acquired easements where infra-structure is being constructed. Surface restoration within the site being developed is per the direction of the Owner.

When the construction is complete, remove all surplus material and rubbish from the site or work. That portion of the surface disturbed by construction shall be rebuilt to as good condition as it was before the commencement of the work. The project site shall be promptly and regularly maintained. Contractor shall be responsible for repairs of unsatisfactory trench backfilling or other unsatisfactory contracted services.

## 3.02 PAVEMENT, CURB AND GUTTER REPLACEMENTS

In all streets, alleys or other areas that are to be paved, all backfilling shall be well compacted by hand held mechanical compaction machines per the requirements of the Indiana Department of Highways and all other governing bodies. After the trench or excavation has been backfilled, the subgrade for the new paving, curb and/or curb and gutter shall be further compacted by rolling the backfill at subgrade elevation. After examination of the backfill and subgrade compaction by the reviewing agencies, the pavement, curb and/or curb and gutter shall be replaced. Pavement and Drive Patch details are shown on Details 8F through 8J.

All pavements, curbs and/or gutters shall be replaced with the same materials as that removed in accordance with the latest revisions of Standards of the Indiana Department of Highways, Hendricks County, or these standards whichever is applicable.

## 3.03 TRAFFIC CONTROL

The Contractor shall maintain vehicular and pedestrian traffic during all paving operations, as required per the permit.

The Contractor shall provide flagmen, barricades and warning signs for the safe and expedient movement of traffic through construction zones within the right-of-way. This shall be in accordance with the principles and standards in the Indiana Department of Transportation, Standard Specifications, latest revision.

## 3.04 LAWN AND GRASS AREA REPLACEMENT

All lawn and grass areas disturbed or damaged during construction shall be restored to original or better condition. Backfills, fills and embankments shall be brought to a subgrade level six (6) inches below finished grade. When subgrades have settled, topsoil shall be placed to a finished depth of at least six (6) inches; fine raked, and prepared for seeding.

If the backfill, fill or embankment material is sand, an eight (8) inch layer of clay furnished by the Contractor at his expense shall be spread over the subgrade and thoroughly mixed into the sand subgrade. The clay shall be mixed into the sand subgrade, then leveled and smoothed. Topsoil shall be placed and spread to a finished depth of at least two (2) inches, and fine rake.

Commercial fertilizer 6-12-12 or equal shall be uniformly spread over the topsoil by a mechanical spreader and mixed into the soil for a depth of two (2) inches on areas to be seeded. This shall be done at least forty-eight (48) hours before the sowing of any seed at the rate of thirty-five (35) pounds per thousand square feet. The area shall then be lightly raked or harrowed until the surface of the finished grade is smooth, loose and pulverized.

Then, the grass seed shall be sown by a mechanical seeder, and lightly raked into the surface or sown with a standard agricultural drill. The seeded areas shall be thoroughly watered with a fine spray in such a manner as not to wash out the seed. The Contractor shall use care in raking in order to avoid disturbance of the finished grade and seed distribution.

Seeding shall be done only within the seasons extending from August 15 to October 15, and from April 1 to June 1, unless otherwise permitted by the Governing Agencies.

Contractor must submit a seed mixture certificate to the Governing Agencies before using. Grass seed shall be sown at the rate of not less than three (3) pounds per thousand square feet and shall consist of the following mixture:

35 parts Kentucky Bluegrass
30 parts Perennial Rye
30 parts Kentucky 31 Fescue
5 parts inert matter

Hydro seeding shall be done in accordance with the Indiana Department of Transportation Specifications, latest revision.

3.05 MULCHING

Adequate mulching material following seeding and fertilizing shall be applied, followed by cultipacking.

Mulch shall consist of:

1. Dry straw or hay of good quality and at the rate of two and one-half (2-1/2) tons per acre; or

2. Wood cellulose or cane fiber mulch at a rate of one thousand (1,000) pounds per acre; or

3. A combination of good quality dry straw or hay free of seeds of competing plants at a rate of two and one-half (2-1/2) tons per acre and wood cellulose or cane fiber mulch at a rate of five hundred (500) pounds per acre; or

4. Manufactured mulch materials such as soil retention blankets, erosion control netting, or others that may be required on special areas of high water concentration or unstable soils. When these materials are used, follow the manufacturer's recommendation for installation. The seeded area shall be watered, maintained, and patched as directed by the Governing Agency until the Contractor's work is completed and accepted.

## 3.06 STAND OF GRASS

The Contractor shall be required to establish a satisfactory stand of grass to be full coverage without bare spots. This is not required for areas subject to agricultural activities.

Within one (1) year after work completion, the Contractor shall be required to correct any defective work, such as bare spots in grass coverage, erosion, gullies, etc. in a timely manner upon notification.

## 3.07 SODDING

The areas to be sodded shall be as shown on the plans and as required by the Governing Agencies.

The use of sod shall be in accordance with the Indiana Department of Highway Specifications, latest revision. At a minimum, sod shall be fibrous, well rooted bluegrass, or other approved sod, with the grass cut to a height of not more than three (3) inches. Edges of sod shall be cleanly cut, either by hand or machine, to a uniform thickness of not less than one and one-half (1-1/2) inches, to a uniform width of not less than sixteen (16) inches, and in strips of not less than three (3) feet in length.

Sod shall be free from all primary noxious weeds as defined by the Indiana State Seed Law.

Remediation of soils intended for agricultural use shall include the application of necessary macro and micro nutrients, including lime and organic material to return the soil to near pre-construction condition.

End of Section 3
Surface Replacement and Site Restoration

Town of Lizton
Water Standards

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## Section 4 - Inspection, Testing and Acceptance

## 4.01 GENERAL

This section describes the minimum requirements and general procedures for the inspection and testing of domestic water systems to be dedicated to the Town of Lizton.

Water systems shall not be accepted nor will connection permits be issued until all requirements for inspection and testing, including the filing of affidavits and any other paperwork are completed. The Contractor is responsible for notifying applicable utilities prior to construction to request locating services and verify utility locations.

Any section of infra-structure not passing the tests prescribed herein shall be repaired to the satisfaction and approval of the Town, and then retested and re-inspected at the Owner's expense.

## 4.02 INSPECTION COST AND FEES

Inspection of the construction shall occur throughout installation of the system and prior to the backfilling of the utilities.

### A. General

Prior to the issuance of a Construction Permit and the commencement of construction, the Owner shall make arrangements with the Town of Lizton, and Hendricks County, if applicable, for construction inspection services to be provided.

### B. Estimated Cost

If inspector services are required by the Town, a letter shall be sent to the Owner stating the estimated amount of payment for inspection services to be rendered by representatives of the Town. The amount provided in the letter shall be seventy-five (75) percent of the total estimated cost of the inspection services based on an estimated project completion time and approved construction plans. The Owner shall be responsible for fees associated with Hendricks County independently. Where a pumping station is involved, additional time for the inspection during construction and final checkout of the station shall be added.

The inspection cost is a pre-construction estimate only. The actual observation time will vary from project to project and may exceed or be less than this estimate based upon actual project duration. Observation time at the site is verified by the Contractor and/or a representative of the Owner. Deviations from approved construction documents or Owner established schedules that create the necessity of additional inspection, shall be at the Owner's expense.

Seventy-five (75) percent of the cost shall be remitted prior to issuance of a construction permit. The balance of the cost for observation services, based on total actual observation hours, shall be paid prior to the Town 's acceptance of the system.

C. Inspection Scheduling

Contractor and/or Owner shall provide notice to the Town of the planned commencement of construction at least two (2) weeks prior to such commencement.

Once the construction starts, the Contractor shall be responsible for informing and/or notifying the Inspector assigned of the following:

- ➢ Daily work schedule including any changes in schedule,
- ➢ Prior notification if work is to be performed on weekends and/or holidays,
- ➢ Date tests are to be performed, and
- ➢ Date as-built verification is to be performed.

The Town, upon written request of the Contractor and/or Owner, will schedule the Final Inspection.

All testing required shall be performed under the observation of the Town's and/or the County's Inspector(s). It shall be the Contractor's responsibility to schedule the testing with the inspection(s). Test results obtained in the absence of the presence of the Town's representative will not be accepted.

D: Inspection of Service Connections

A Connection Permit shall be obtained for any repair, modification or connection of a building sewer or water line to a public utility. Connection permits shall not be issued for connections to sanitary sewers or water distribution systems not yet dedicated to and accepted by the Town.

Following the installation/repair/modification and prior to the backfilling of the Service line, the Contractor/Plumber shall notify the Town that the service line is ready to be inspected. The Town shall then have twenty-four (24) hours to make the inspection after which the Contractor/Plumber may backfill the trench. Inspections requested on Fridays or on a day proceeding a holiday may not be completed until the next normal business day.

If notification is not provided and the building sewer is backfilled prior to inspection, at the Town's request the Contractor/Plumber shall be required to re-excavate the trench so that an inspection can be made.

Protection of open trenches and compliance with applicable OSHA Standards is the responsibility of the Contractor/Plumber.

E. Final Grade

Manholes, water meters, fire hydrants, etc. shall be properly set at final grade. Costs associated with raising or lowering due to grade changes will be charged to the Contractor.

4.03 DOMESTIC WATERMAIN DISINFECTION AND TESTING

All domestic water lines will be pressure tested with the Town's Inspector present. The Owner/Contractor shall notify the Town's Water Department at least 72 hours in advance of testing. The Contractor shall provide all equipment necessary for the testing.

Each section of pipe shall pass a pressure and leakage test in accordance with the most recent requirements of AWWA Standard C600-93, Section 4.1 - Pressure and Leakage Test.

Thrust blocks, if used, shall have been in place for not less than 10 days prior to testing lines.

A. Test Restrictions

Test pressure shall not be less than 1.5 times the working pressure at the lowest point along the test section, or 100 psi, whichever is greater, but shall not exceed the pipe, fitting or thrust-restraint design pressures at any point. Test pressure shall not vary by more than $\pm$5 psi for the duration of the test.

Valves shall not be operated in either direction at differential pressure exceeding the rated valve working pressure. Use of a test pressure greater than the rated valve pressure can result in trapped test pressure between the gates of a double-disc gate valve. For tests at these pressures, the test setup should include provisions, independent of the valve, to reduce the line pressure to the rated valve pressure on completion of the test. The valve can then be opened enough to equalize the trapped pressure with the line pressure, or opened fully if desired.

Test pressure shall not exceed the rated pressure of the valves when the pressure boundary of the test section included closed, resilient-seated gate valves, or butterfly valves. No test sections shall exceed 5 miles in length without prior approval from the Engineer.

B. Test Procedures

All newly laid pipe or any newly valved section shall be subjected to a hydrostatic pressure of at least 1.5 times the working pressure at the point of testing. The specified test pressure, which is based on the elevation of the lowest point of the line or section being tested as corrected to the elevation of the test gauge, shall be applied by means of a

pump connection to the pipe in a manner satisfactory to the Town. Allow the system to stabilize at the test pressure before conducting the leakage test.

Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at high points, the Contractor shall install corporation cocks at such points so that air can be expelled as the line is slowly filled with water. After the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place if requested by the Town.

All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damaged components during or after the pressure test shall be repaired at the contractors expense. The test shall be repeated until the results are satisfactory to the Town.

C. Allowable Leakage

Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$\frac{L = SD \sqrt{P}}{133{,}200}$$

Where:
L = Allowable leakage, in gallons per hour
S = Length of pipe tested, in feet
D = Nominal diameter of the pipe, in inches
P = Average test pressure during leakage test, in pounds per square inch (gauge)

**ALLOWABLE LEAKAGE PER 1000 FT. OF PIPELINE***

| Avg. Test Pressure psi | Nominal Pipe Diameter. In. 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 | 42 | 48 | 54 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 450 | 0.48 | 0.64 | 0.95 | 1.27 | 1.50 | 1.91 | 2.23 | 2.56 | 2.87 | 3.18 | 3.82 | 4.78 | 5.73 | 6.69 | 7.64 | 8.60 |
| 400 | 0.45 | 0.60 | 0.90 | 1.20 | 1.50 | 1.80 | 2.10 | 2.40 | 2.70 | 3.00 | 3.60 | 4.60 | 5.41 | 6.31 | 7.21 | 8.11 |
| 350 | 0.42 | 0.56 | 0.84 | 1.12 | 1.40 | 1.69 | 1.97 | 2.25 | 2.53 | 2.81 | 3.37 | 4.21 | 5.06 | 5.90 | 6.74 | 7.58 |
| 300 | 0.30 | 0.52 | 0.78 | 1.04 | 1.30 | 1.56 | 1.82 | 2.08 | 2.34 | 2.50 | 3.12 | 3.90 | 4.68 | 5.46 | 6.24 | 7.02 |
| 275 | 0.37 | 0.50 | 0.75 | 1.00 | 1.24 | 1.40 | 1.74 | 1.99 | 2.24 | 2.40 | 2.99 | 3.73 | 4.48 | 5.23 | 5.98 | 6.72 |
| 250 | 0.36 | 0.47 | 0.71 | 0.95 | 1.19 | 1.42 | 1.56 | 1.90 | 2.14 | 2.37 | 2.85 | 3.56 | 4.27 | 4.99 | 5.70 | 6.41 |
| 225 | 0.34 | 0.45 | 0.68 | 0.90 | 1.13 | 1.35 | 1.58 | 1.80 | 2.03 | 2.25 | 2.70 | 3.38 | 4.05 | 4.73 | 5.41 | 6.03 |
| 200 | 0.32 | 0.43 | 0.64 | 0.85 | 1.06 | 1.28 | 1.48 | 1.70 | 1.91 | 2.12 | 2.55 | 3.19 | 3.82 | 4.48 | 5.09 | 5.73 |
| 175 | 0.30 | 0.40 | 0.59 | 0.80 | 0.99 | 1.19 | 1.39 | 1.50 | 1.79 | 1.98 | 2.38 | 2.98 | 3.68 | 4.17 | 4.77 | 5.36 |
| 150 | 0.28 | 0.37 | 0.55 | 0.74 | 0.92 | 1.10 | 1.29 | 1.47 | 1.56 | 1.84 | 2.21 | 2.76 | 3.31 | 3.86 | 4.41 | 4.97 |
| 125 | 0.25 | 0.34 | 0.50 | 0.87 | 0.84 | 1.01 | 1.18 | 1.34 | 1.51 | 1.68 | 2.01 | 2.52 | 3.02 | 3.53 | 4.03 | 4.53 |
| 100 | 0.23 | 0.30 | 0.45 | 0.50 | 0.75 | 0.90 | 1.05 | 1.20 | 1.35 | 1.60 | 1.80 | 2.25 | 2.70 | 3.15 | 3.60 | 4.05 |

*****If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size

When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gph/in. of nominal valve size shall be allowed.

When hydrants are in test section, the test shall be made against closed hydrant valves.

D. Acceptance of Testing

If test results disclose leakage greater than allowable limits, the Contractor shall, at his own expense, locate and make approved repairs as necessary until the leakage is within the specified allowance. Additional tests performed after the repairs will be at the Contractors expense. All visible leaks are to be repaired, regardless of the amount of leakage.

E. Disinfection of System

After construction is complete, the newly installed system shall be flushed to remove dirt and foreign material. The lines shall then be disinfected in accordance with procedures outlined by the American Water Works Association Standard AWWA C651.

F. Chlorinating Requirements

Water shall be supplied to the new system at a constant, measured rate. In the absence of a meter, the rate may be approximated by methods such as placing a Pitot gauge in the discharge and measuring the time to fill a container of known volume.

At a point not more than 10 ft. downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 50 mg/L free chlorine.

To assure that the correct concentration is provided, measure units shall be taken at regular intervals in accordance with the procedures described in the current edition of Standard Methods for the Examination of Water or Wastewater, AWWA Manual M12, or by using an appropriate chlorine test.

The following table lists the amount of chlorine required for each 100 feet for various diameters of pipe. Solutions of 1-percent chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. A solution using calcium hypochlorite requires 1 lb. per 8 gallons of water.

**CHLORINE REQUIRED TO PRODUCE 50 mg/l CONCENTRATION IN 100 FT. OF PIPE BY DIAMETER**

| Pipe Diameter in. | 100-Percent Chlorine lb. | 1-Percent Chlorine Solution gal. |
|---|---|---|
| 4 | 0.026 | 0.32 |
| 6 | 0.06 | 0.72 |
| 8 | 0.108 | 1.30 |
| 10 | 0.17 | 2.04 |
| 12 | 0.24 | 2.88 |
| 16 | 0.434 | 5.2 |

While chlorine is being applied, valves shall be positioned so that the strong chlorine solution will not flow into water mains in active service. Chlorine application shall not cease until the entire main is filled with heavily chlorinated water. The chlorinated water shall be retained in the main for at least 24 hours. During this time, all valves and hydrants in the section being treated shall be operated to ensure disinfection of all appurtenances. At the end of this period, the treated water in all portions of the main shall have a residual of not than 10 mg/L free chlorine.

G. Flushing

After the applicable testing period, heavily chlorinated water shall be removed in order to prevent damage to the pipe. The chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the water leaving the main is greater than 0.5 mg/L but less than 2.0 mg/L.

Chlorinated water shall be properly discharge to an approved sanitary sewer. If no sanitary sewer is available a reducing agent shall be applied to the water to be waste in order to thoroughly neutralize residual. The following table shows the amount of neutralizing chemicals required. Where necessary, federal, state and local regulatory agencies should be contacted to determine if there are special provisions for the disposal of heavily chlorinated water.

**POUNDS OF CHEMICALS REQUIRED TO NEUTRALIZE VARIOUS RESIDUAL CHLORINE CONCENTRATIONS IN 100,000 GALLONS OF WATER***

| Residual Chlorine Concentration mg/L | Sulfur Dioxide ($SO_2$) | Sodium Bisulfate ($NaHSO_3$) | Sodium Sulfite ($Na_2SO_3$) | Sodium Thiosulfate ($Na_2S_2O_35H_2O$) |
|---|---|---|---|---|
| 1 | 0.8 | 1.2 | 1.4 | 1.2 |
| 2 | 1.7 | 2.5 | 2.9 | 2.4 |
| 10 | 8.3 | 12.5 | 14.6 | 12.0 |
| 50 | 41.7 | 62.6 | 73.3 | 60.0 |

*Except for residual chlorine concentration, all amounts are in pounds.

H. Bacteriological Test

Satisfactory bacteriological test results approved by the Indiana State Board of Health shall be produced for two (2) successive sets of samples, collected at twenty-four (24) hour intervals, before the new mains are accepted for use.

Contractor shall notify the Town when the system and disinfection is complete and the water is ready for bacteriological testing. The Town representative will then collect the sample with the Contractor present. The Town will submit the sample to an independent certified laboratory for bacteriological analysis at the Contractor's expense.

Samples shall be collected from the end of the line and tested for bacteriological quality in accordance with Standard Methods for the Examination of Water and Wastewater. At least one set of samples shall be collected from the new main and one from each branch. In case of long mains, samples shall be collected along the length of the line, at reasonable intervals, as well as at its end. Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate. No hose or fire hydrant shall be used in the collection of samples.

I. Re-testing and Disinfection

If test results are unsatisfactory, Contractor shall reflush the lines and repeat the disinfection. Testing shall be repeated as noted above until the testing results are satisfactory and the mains are approved for service

End of Section 4
Inspection, Testing and Acceptance

Town of Lizton
Water Standards

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## Section 5 - Domestic Water Distribution System

## 5.01 GENERAL

All Domestic Water mains installed within existing or proposed rights-of-way shall conform to all applicable American Waterworks Association (AWWA) Standards. Any associated requirements of the Indiana Department of Environmental Management (IDEM) will be the responsibility of the developer. Acquisition of all necessary permits will also be the developer's responsibility. No construction will be allowed until the developer delivers copies of all permits to the Town of Lizton for review and approval.

## 5.02 GENERAL DESIGN STANDARDS

Design of all domestic water systems to be owned and operated by the Town of Lizton will be in accordance with all applicable standards. The Town, along with its Engineer, will dictate the size of the mains as necessary to provide adequate fire protection and to allow for future growth.

Water systems shall be designed and installed with fire hydrants at all intersections and at intervals no greater than 400 feet. Closer hydrant spacing may be required by the Town depending upon the nature of the development.

Systems shall be designed and installed with adequate valves to isolate areas of the system for routine maintenance and repair. Isolation valves will be required at all intersections and at intervals no greater than 600 feet. The Town reserves the right to require smaller valve intervals if it believes that the nature of the development necessitates such.

All domestic watermains shall be design and installed at depths no less than five feet.

## 5.03 VALVES

Valves shall comply with AWWA C-509 and shall be cast iron body with mechanical joint ends. The valves shall be Resilient Wedge Valves A2361 as manufactured by Mueller Co., or an approved equal. The valves shall be designed and constructed to withstand a working pressure of 200 psi shall be hydrostatic tested, without leakage or distortion, under a water pressure of not less than 400 psi.

Valve boxes shall be Clow F-2545 screw type two piece or F-2450 three-piece cast iron with removable cast iron lid, Tyler Union 29U Domestic Heavy or approved equal. Valve boxes shall be provided for all valves located in the distribution system and in other locations where required or necessary for the operation of the valves.

Valves shall be installed in accordance with Detail 5B included in these Standards.

## 5.04 HYDRANTS

All hydrants shall be 5 ¼" Mueller A423 Super Centurion "250" with two hose nozzles and one pumper nozzle. Color shall be yellow. Hydrants shall conform to AWWA C-502. Threads shall be the National Standard Thread or similar to that existing in the system and shall open in a counter clockwise rotation. See Detail 5C.

Hydrants shall be design so that the valve will remain closed if the upper portion is removed or broken off. The operating nut shall be pentagonal and shall turn counter-clockwise to open. The hose caps shall be secured to the hydrant with a chain. All hydrants shall have drain valves and shall be properly painted before shipment and after installation. Contractor shall provide an operating wrench for every 10 hydrants supplied. The hydrant branch main and watch valve shall be restrained against internal thrust with an approved restraint method.

## 5.05 MATERIALS

### A. Ductile Iron Pipe and Fittings

Pipe: Ductile Iron Pipe shall be centrifugal cast and shall conform to AWWA C-151 (ANSI A-21.51). Pipe shall be Pressure Class 250.

Lining and Coatings: The inside surfaces of all pipe and fittings shall be standard cement mortar lined and seal coated with an approved bituminous seal coat in accordance with AWWA C-104 (ANSI A21.4). Coat the exterior surfaces with an approved bituminous coating meeting the requirements of AWWA C 151 (ANSI-21.51).

Fittings: Fitting shall be cast iron or ductile iron and standardized for the type of pipe and joint specified. Fittings shall comply with AWWA C-110 (ANSI A21.10).

Joints: Mechanical joints or push-on slip joints shall be provided. Mechanical joints and accessories shall conform to AWWA Standard C-111, (ANSI A-21.11). The bolts and nuts shall be corrosion resistant high strength alloy steel. The O-ring gaskets sealing the slip joint shall be made of rubber of special composition having a texture to assure a watertight and permanent seal and shall be the product of a manufacturer having at least five (5) years' experience in the manufacturer of rubber gaskets for pipe joints. The gaskets shall be a continuous ring of flexible joint rubber of a composition and texture which is resistant to common ingredients of sewage, industrial waste, and groundwater, and which will endure permanently under the conditions likely to be imposed by this service. The gasket shall conform to the requirements of AWWA C-111 (ANSI A-2111).

For submerged crossings of rivers, lakes or streams, pipe shall be furnished with boltless ball and socket type joints with a pipe pressure class of 350 psi.

Restrained joints shall be designed in accordance with AWWA C-111 and shall permit horizontal and/or vertical deflection after assembly, yet adequately restrain the joint at the

full design pressure. Restrained joints shall be Lok-Fast, Lok-Tyte, or equal. Pipe connecting to restrained joint fittings shall also have restrained joints.

B. Polyvinyl Chloride Pipe (PVC) C-900 Rated

Pipe: PVC pipe C-900 rated shall conform to AWWA C-900-07. The material used shall conform to ASTM Specification D-1784, Class 12454-B. The pipe shall be pressure rated in accordance with AWWA C-900 and shall be DR-18.

Joints: Joints shall be bell end or coupling push-on type. The push-on joint components shall meet the requirements for ASTM Specification D-3139, Joint for the Plastic Pressure Pipe, using Flexible Elastomeric Seals. The joint shall be designed so as to provide for the thermal expansion and contraction experienced with a total temperature change of seventy-five (75) degrees F in each joint of pipe. The lubricant shall have no deteriorating effects on the gasket or the pipe. Gaskets shall meet all applicable requirements of ANSI Standard A-21-11. Solvent-cement joints are not permitted.

Fittings: Fittings shall be standard radius ductile iron meeting the requirements of AWWA C-110 (ANSI A-21.10) and AWWA C-153 (ANSI A-21.53). Fitting shall be encased with a 4 mil. high density cross linked polyethylene material in accordance with AWWA C-105 (ANSI A21.5).

C. Polyvinyl Chloride Pipe (PVC) - Smaller than 4-inch

Polyvinyl chloride pipe smaller than 4-inch shall meet the requirements of ASTM D2241.

Pipe and fittings shall be SDR26. Joints shall be socket solvent weld type.

Pipe and fittings shall be by the same manufacturer. Solvent joint cement shall meet the requirements of ASTM D2564. Cement containers shall be no larger than one pint and shall have a dauber secured to the container lid.

D. High Density Polyethylene Pipe (HDPE)

Pipe: Materials used for the manufacture of polyethylene pipe shall be extra high molecular weight, high density ethylene/hexane copolymer PE 3408 polyethylene resin meeting the requirements of ASTM D-3350 with a cell classification of PE: 345434C. The pipe shall contain no recycled compound except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All material shall be listed by the Plastic Pipe Industry in the name of the pipe manufacturer and be based on ASTM D2837 and PPI TR-3 testing and validation for samples of the pipe manufacturer's production pipe.

Pipe shall be designed, manufactured, and pressure rated in accordance with AWWA C-906. Pipe shall be Pressure Class 200 and DR 9.

Joining: Pipe shall be joined into continuous lengths on-site. The butt fusion method shall be used to join pipes and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but no limited to, temperature, alignment. and interracial fusion pressure. Socket fusion shall not be used.

E. Certa-Lok Pipe

Pipe: C900/RJIB Certa-Lok with Fluid-Tite Gasket PVC Pressure Pipe with Restrained Joint Integral Bell., DR 18-235 psi.

## 5.06 SERVICE LINES

Residential service lines shall be constructed using one (1) inch or larger CTS polyethylene flexible pipe from the tap to the meter pit with Mueller 110 compression fittings or an approved equal. Larger service lines may be necessary for larger water consumers.

## 5.07 METER PITS

The minimum diameter shall be 20" I.D. for single water settings. Lid shall be equipped with a Standard waterworks locking Pentagon nut indicating water service. Pits shall be set at the property line with a bottom depth of 36" and the lid at finish grade to allow easy access for Utility personnel. No. 8 stone bedding or concrete brick shall be utilized below pits to minimize settling. Lids shall be Vestal RMR 21 Ring with 32-460 RMRC RTR Cover.

Pre-manufactured dual meter pits are acceptable where two adjacent properties exist.

Single, PSBH-244-18H-48-Q-NA 18" Dia x 48" Bury, Heavy-Wall Pit-str; Aug Ball Valve x Chk Valve for 5/8x3/4 Meter; PVC Brace Pipe; Blk Plastic Ties; C14-33-Q Cplgs Not Assembled (loose).

Double, PDSBH-244-21H-48-Q-NA 21" Dia x 48" Bury, Heavy-Wall (SDR 51) Dual Pit-str; Ang Ball Valve x Chk Valve for 2 - 5/8x3/4 Meters; Parallel PVC Brace Pipes-Perpendicular to Meters; Blk Plastic Ties; C14-44-Q/C14-33-Q Cplgs Not Assembled.

1" single, PSBH-444-21H-48-Q-NA 21" Dia x 48" Bury, Heavy-Wall (SDR 51) Pit-str; Ang Ball Valve x Chk Valve for 1" Meter; PVC Brace Pipe; Blk Plastic Ties; C14-44-Q Cplgs Not Assembled.

Meters shall be Neptune 5/8" x 3/4" E R900i GAL. with 6 FT ANT. The serial number sticker shall be taken along with the address of the water service and turned in to the Lizton Water Clerk upon installation.

## 5.08 BACKFLOW PREVENTOR

A backflow prevention device is required to be installed where an auxiliary water supply is connected to any facilities plumbing, where any water line from an auxiliary water supply enters or passes within one (1) foot of any part of any facility, all irrigation systems, or any service connections designated to have a potential cross connection hazard. See Detail 5E. The backflow prevention device shall be a University of Southern California (USC) or other IDEM or Town approved device and shall be installed in a location approved by the Town. The device must be periodically tested by a tester certified in Indiana at intervals determined by IDEM and paid for by the property owner. This section applies to any/all types of customers including residential, commercial, retail, governmental, or otherwise. No exclusions.

## 5.09 SPECIAL CROSSINGS

Steel Casing pipe shall be used when crossing State Highways, railroads, or where shown elsewhere on plans. The casing pipe shall be welded steel pipe, new and unused material in accordance with current ASTM Specifications A-139 Grade B for "Electric Fusion of Welded Steel Pipe" with a minimum yield of 35,000 psi. The diameter of the casing shall be 24" unless otherwise noted with a wall thickness of 0.407. Installation shall be in compliance with the American Water Works Association Standard C600-93, Section 6.

## 5.10 INSTALLATION

Pipe shall be laid in accordance with applicable requirements of ANSI/AWWA C600, these standards and the manufacturer’s recommendations. If any conflicts exist, the most stringent shall apply.

The Contractor shall provide proper implements, tools, and facilities for the safe and expeditious performance of the work.

Every pipe, fitting, and valve shall be cleaned of all debris, dirt, and other foreign material before being laid and shall be kept clean until accepted in the completed work.

The Contractor shall lay and maintain pipe to the lines and grades shown on the approved plans unless otherwise allowed by the Town. Install fittings, valves, and hydrants in the locations shown on the approved drawings.

Where the piping is to be constructed parallel to and close to existing buried utilities, the exact location of which is unknown, adjust the alignment of the piping to least interfere with these utilities.

Piping shall not be laid in water or when the trench or weather conditions are unsuitable for proper installation.

Pipe, fittings, and valves shall be lowered into the trench by hand, by means of hoists or ropes, or by other suitable tools or equipment which will not damage materials, coatings, or linings. Do not drop or dump pipe, fittings, or valves into the trench. Pipe laying shall begin at the lower end. As each length of pipe is placed in the trench, the joint shall be assembled, and the pipe brought to correct line and grade. Bell holes shall be excavated in advance of pipe laying so the entire barrel will bear uniformly.

A. Minimum Separation

Potable water piping shall be laid at least ten feet horizontally from any existing sanitary sewer or sewage force main. The distance shall be measured form edge of pipe to edge of pipe. Potable water piping crossing sanitary sewers or sewage force mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the potable water piping and the outside of the sewer force main. The 18-inch separation shall apply whether the potable water piping is over or under the sewer or force main. Lay potable water piping at crossings of sewers and force mains so a full length of pipe is centered on the sewer pass through or come in contact with any part of a sanitary sewer manhole.

B. Depth of Cover

Piping shall be installed so that not less than 5’-0” of cover is provided over pipe, unless approved otherwise in writing by the Town of Lizton. Cover shall be measured as the vertical distance from the top of the pipe to the finish grade elevation.

C. Thrust Restraint

Thrust restraint shall be provided at horizontal and vertical deflection fittings and at tees, caps, reducers, bends, plugs, tapping sleeves, and tapping saddles. General thrust blocking details are given in Detail 5D of these specifications.

D. Open Excavation

Open excavation shall be satisfactorily protected at all times. At the end of each day's work, the open ends of all pipes shall be protected against the entrance of animals, children, earth, or debris by bulkheads or stoppers. The bulkheads or stoppers shall be perforated to allow passage of water into the installed pipeline to prevent flotation of the pipeline. Any earth or other material that may find entrance into the water main through any such open end must be removed at the Contractor's expense.

E. Magnetic Locator Wire

A #12 magnetic locator wire shall be installed with all PVC or non-metallic utilities and service lines. Wire will be installed with the pipe and made electrically sound and water tight.

F. Sample Point

The Developer will be required to provide sample points to be installed within the system of the new development in locations and as approved by the Town. Sampling Stations shall be Eclipse No. 88 as manufactured by Kupferle Foundry.

## 5.11 PIPE BEDDING, HAUNCHING, AND BACKFILL

Each pipe section shall be laid in a firm foundation of bedding material and haunched and backfilled with care. Bedding material shall be carefully brought to grade along the entire length of pipe to be installed. Uniformly compacted clean sand bedding shall be installed below all water mains. Use hand or mechanical tamping to compact the bedding material to a minimum 95% Standard Proctor Density.

Slightly damp material will generally result in a maximum compaction with a minimum of effort. If water is added to improve compaction or if water exists in the trench, take care to avoid saturation of bedding material, which could result in the loss of stability. Check grade of bedding after compaction to assure conformity with plans. In yielding subsoils, the trench bottom shall be undercut to the depth necessary and backfilled with graded, crushed stone to form a firm foundation.

Where excavation occurs in rock or hard shale, the trench bottom shall be undercut, and a minimum of 6 inches crushed stone bedding placed prior to typical bedding installation.

Embodiment material, or haunching, shall be placed around flexible pipe. Crushed stone, pea gravel, graded gravel, or sand used as backfill between the bedding material and up to 12 inches over the top of the pipe, shall be hand placed. If fine sand, silt, or clayey gravels are used for initial backfilling over the pipe, it shall be hand placed in 6-to-8-inch layers and hand compacted on both sides of the pipe to an elevation 12 inches over the top of the pipe.

Trench widths and bedding requirements shall, conform to manufacturer's recommendation, AWWA/ASTM Standards, and these standards. Where conflicts exist, the most stringent shall apply.

Unless otherwise shown on plans, rigid pipe, such as concrete or ductile iron, shall be backfilled between the bedding material and a plane 12 inches over the top of the pipe with hand placed finely divided earth, free from debris and stones.

Granular backfill shall be used in accordance with INDOT Standard Specifications. Contractor shall place all granular fill in a manner as to achieve not less than 95% of the maximum dry density as determined in accordance with AASHTO T99, Method A (Std. Proctor) for the entire depth of the excavation. The manner in which the contractor achieves proper compaction shall be demonstrated at the beginning of the project (first 1,000 cu. yd.) and this method shall be used for the duration of the project. The contractor shall use an independent testing agency to verify proper compaction.

Backfill and bedding shall be in accordance with Detail 5A of these Standards unless approved in writing by the Town of Lizton.

## 5.12 PIPE ASSEMBLY

Joints shall be assembled in accordance with the manufacturer's instructions. The manufacturer's lubricant shall be properly applied where applicable. Spigot ends shall be centered in the bell and the pipe pushed home and brought to the correct line and grade. Pipe and fittings which do not allow a sufficient and uniform space for joints shall be removed and replaced with pipe or proper dimensions. Precautions shall be taken to prevent dirt or other materials from entering the joint space.

When it is necessary to deflect pipe from a straight line in either the horizontal or vertical plane, the amount of joint deflection shall not exceed 80% of the allowance recommended by the manufacturer. If alignment results in excess joint deflection, install additional fittings or shorter lengths of pipe. Cutting pipe for insertion of valves, fittings, or closure pieces shall be done in conformance with recommendations of the manufacturer of the pipe and cutting equipment. Cutting shall be done in a safe, workman like manner without creating damage to the pipe lining. An oxyacetylene torch shall not be used. Ends and rough edges shall be ground smooth. The cut ends of push-on joint connections shall be beveled by methods recommended by the manufacturer.

## 5.13 SERVICE LINE INSTALLATION

All Service lines within the public right-of-way shall be installed in accordance with these Standards. Portions of service lines installed on private property shall be installed in accordance with the latest addition of the *One and Two Family Dwelling Code* and the U*niform Plumbing Code* and shall utilize polyethylene pipe designed for 200 psi.

## 5.14 HYDRANT INSTALLATION:

### A. Placement

Hydrants shall be installed in locations as shown on plan and in such a manner to provide complete accessibility. Placement shall reduce the possibility of damage from vehicles or injury to pedestrians. When placed behind the curb, the hydrant barrel shall be set so that no portion of the hose nozzle cap will be less than 2 feet or more than 6 feet from the gutter face of the curb. When set in lawn space between the curb and the sidewalk, or between the sidewalk and property line, no portion of the hydrant or nozzle shall be within 6" of the sidewalks.

B. Installation

Hydrants shall stand plumb and shall be situated so that side nozzles face the curb at 90-degree angle. If located on private property or a rural road, the nozzle shall point to the nearest roadway. Each hydrant shall be connected to the main with not less than a 6" nominal diameter branch unless otherwise shown on plans.

If hydrant is placed on pervious soil drainage shall be provided by placing coarse gravel or crushed stone mixed with coarse sand from the bottom of the trench to a minimum of 6" above the waste opening in the hydrant elbow.

Hydrants shall be tied to the pipe with suitable steel tie rods, clamps, or restrained joints. Hydrants shall be painted in accordance with AWWA C-502.

C. Restraint

Hydrants and valves shall be installed with a manufactured thrust restraint system, or stainless steel all threads, to stabilize valve and hydrant under all operating conditions including removal and replacement activities.

## 5.15 TESTING AND DISINFECTION TAPS

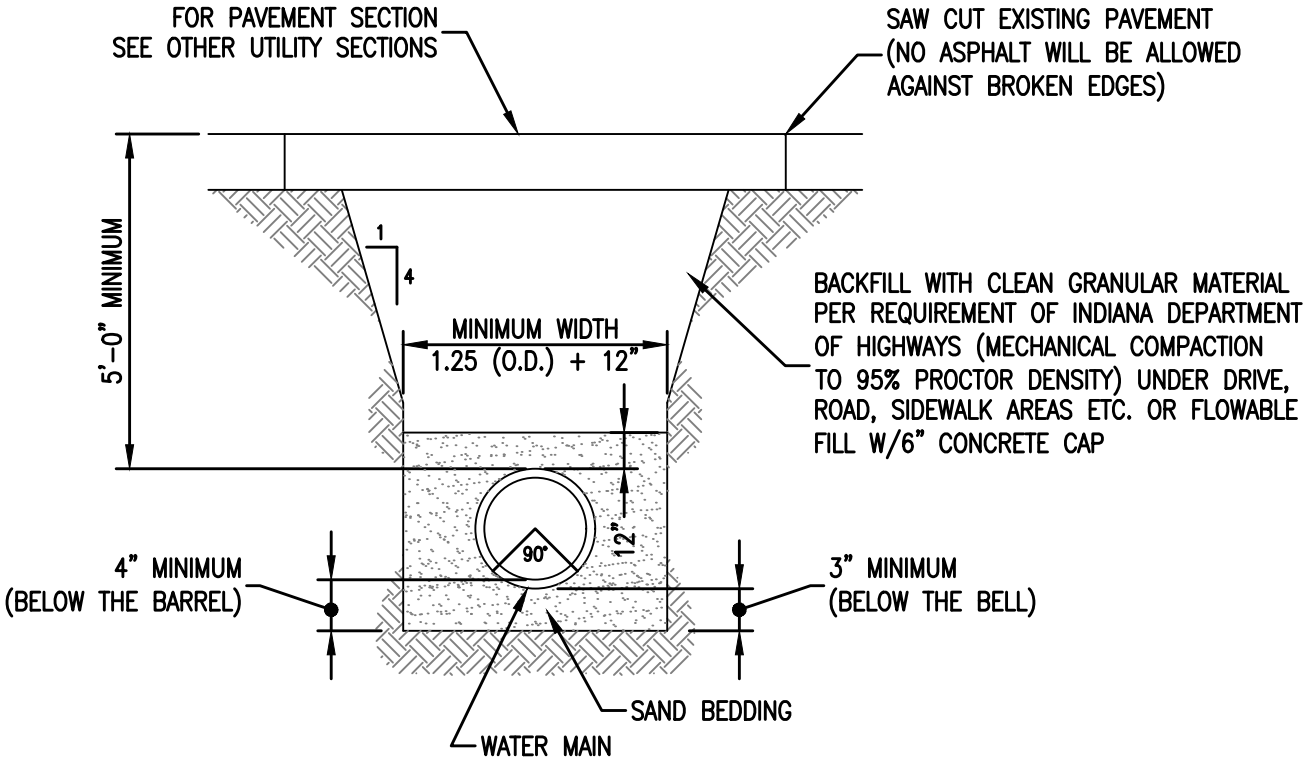
All domestic water mains shall be flushed, tested, and disinfected in accordance with Section 4.06 of these Standards.

## 5.16 WET TAPS

Wet Taps will be reviewed and approved by the Town on a case-by-case basis. Contractor shall obtain all necessary permits from associated governing agencies prior to beginning work. An inspector from the utility must be present during the tap. Appointments must be schedule 48 hours in advance of construction. Contractor shall submit a site plan showing, at a minimum the entrance to the structure, lateral location, sump discharge line, meter pit and location of proposed service line prior to issuance of a permit.

Excavation trench must comply with all OSHA requirements. A minimum of 36" shall be provided between the water main and trench wall during installation. The bottom of the trench must be a minimum of 12" below the bottom of the main and 6" behind the main. Stone, sand, or pea gravel shall be placed in unstable or wet trench bottoms. Contractor shall use appropriate methods to keep the trench bottom dry and free from water. No fittings or bells shall be installed within 3 pipe diameters of pipe. No taps shall be made within 7 feet of a hydrant. Excavations must be backfilled with sand or pea gravel to 12 inches above the main.

End of Section 5




NOTE:

1. BITUMINOUS PAVEMENT TACK COAT SHALL BE PLACED BETWEEN THE #53 STONE SURFACE AND ALONG THE SAW CUTS.
2. CLEAN GRANULAR BACKFILL MAY BE REQUIRED BY THE TOWN IF EXISTING SOIL CONDITIONS REQUIRE.
3. MINIMUM DEPTH TO TOP OF PIPE SHALL BE 5'-0".

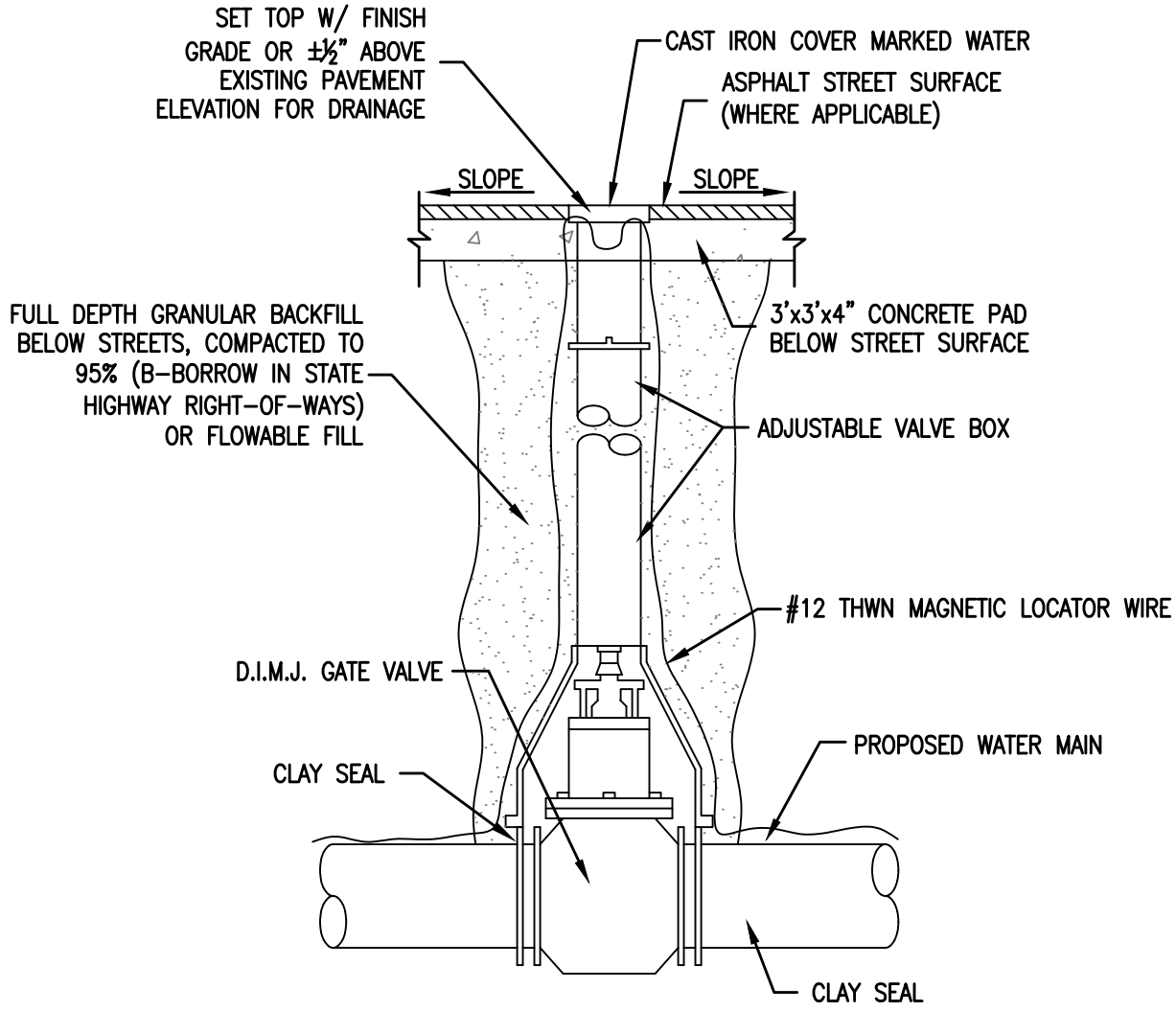
# TYPICAL WATERMAIN TRENCH DETAIL

SCALE: NONE

TRIAD ASSOCIATES INC.
5835 LAWTON LOOP EAST DRIVE
INDIANAPOLIS, INDIANA 46216
PHONE: 317-377-5230 FAX: 317-377-5241

**CONSTRUCTION STANDARDS**
**TOWN OF LIZTON, INDIANA**

**DETAIL 5A**



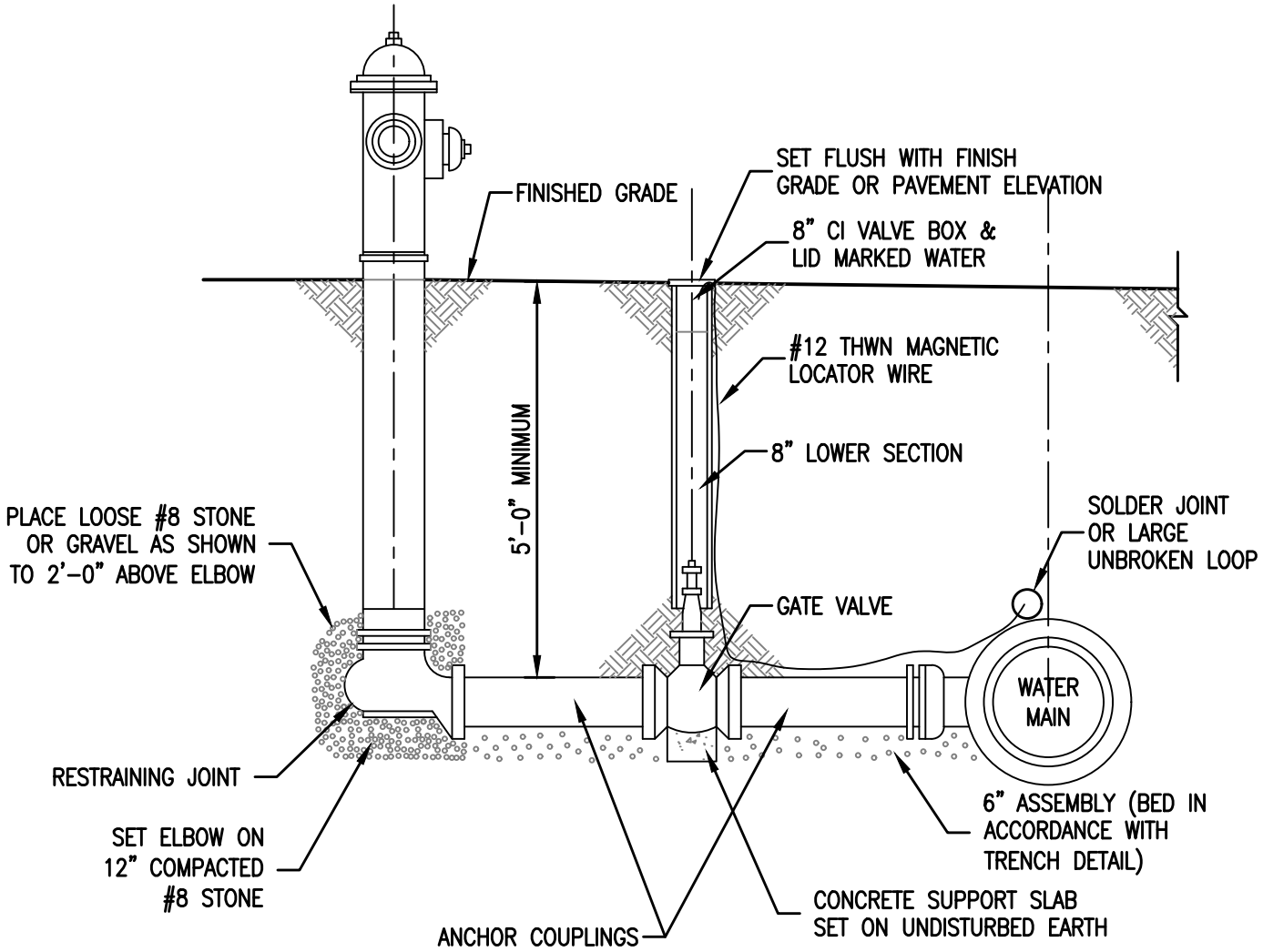

# VALVE AND BOX DETAIL

SCALE: NONE

TRIAD ASSOCIATES INC.
5835 LAWTON LOOP EAST DRIVE
INDIANAPOLIS, INDIANA 46216
PHONE: 317-377-5230 FAX: 317-377-5241

**CONSTRUCTION STANDARDS**
**TOWN OF LIZTON, INDIANA**

**DETAIL 5B**



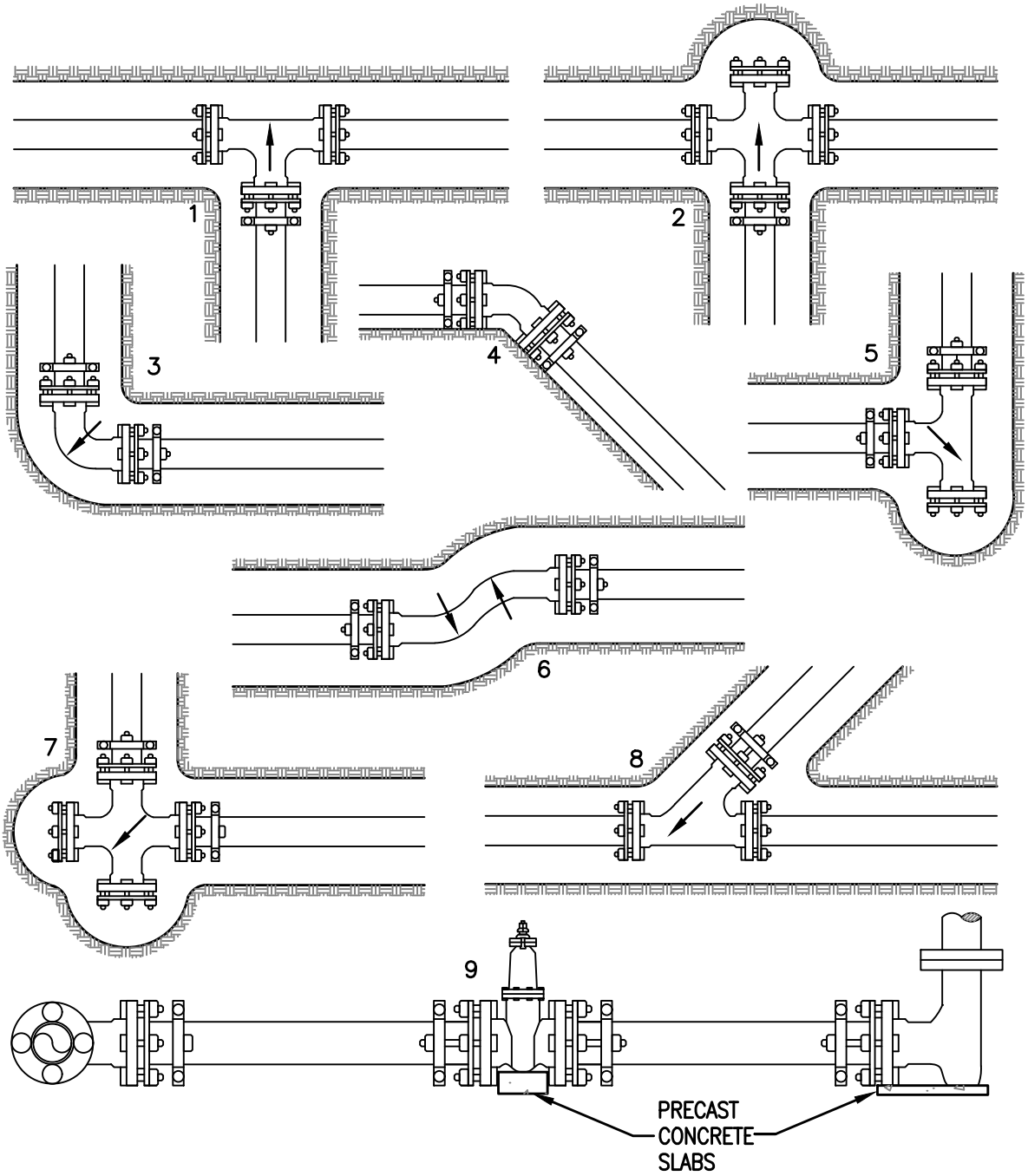

# FIRE HYDRANT INSTALLATION

SCALE: NONE

TRIAD ASSOCIATES INC.
5835 LAWTON LOOP EAST DRIVE
INDIANAPOLIS, INDIANA 46216
PHONE: 317-377-5230 FAX: 317-377-5241

**CONSTRUCTION STANDARDS**
**TOWN OF LIZTON, INDIANA**

**DETAIL 5C**




1. THRU LINE CONNECTION, TEE
2. THRU LINE CONNECTION, CROSS USED AS TEE
3. DIRECTION CHANGE, ELBOW
4. DIRECTION CHANGE VERTICAL, BAND
5. DIRECTION CHANGE, TEE USED AS ELBOW
6. DIRECTION CHANGE
7. DIRECTION CHANGE, CROSS USED AS ELBOW
8. THRU LINE CONNECTION, WYE
9. HYDRANT RUNOUT

NOTE: ALL RESTRAINED JOINTS TO BE WRAPPED

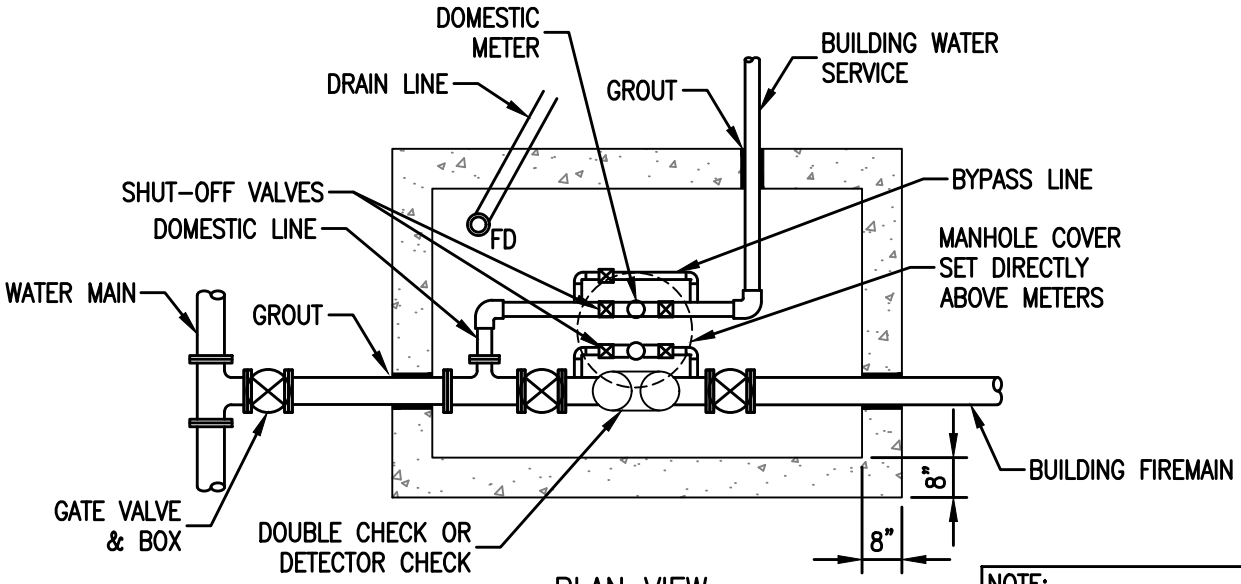
# JOINT RESTRAINING

SCALE: NONE

TRIAD ASSOCIATES INC.
5835 LAWTON LOOP EAST DRIVE
INDIANAPOLIS, INDIANA 46216
PHONE: 317-377-5230 FAX: 317-377-5241

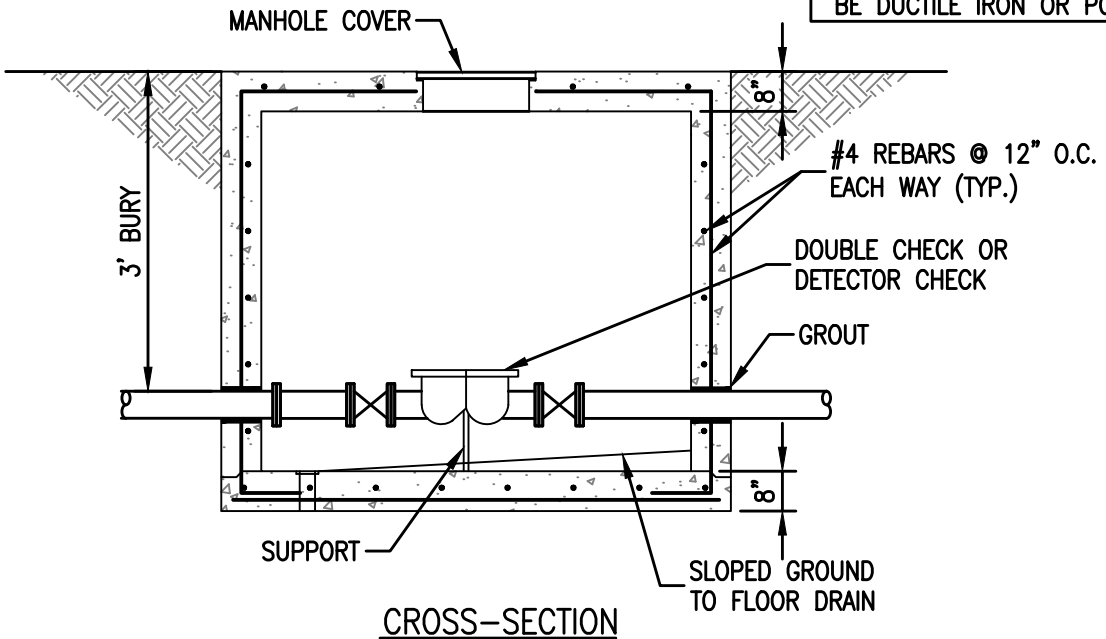
**CONSTRUCTION STANDARDS**
**TOWN OF LIZTON, INDIANA**

**DETAIL 5D**




PLAN VIEW

NOTE:
ALL PIPING TO, INSIDE, & THREE FEET BEYOND THE VAULT SHALL BE DUCTILE IRON OR POLY.




CROSS-SECTION

GENERAL NOTES:

1. THE DOMESTIC LINE WILL REQUIRE A REDUCED PRESSURE BACKFLOW PREVENTOR.
2. EXACT DIMENSIONS OF THE METER VAULT WILL DEPEND UPON THE SIZE OF THE WATER LINES.

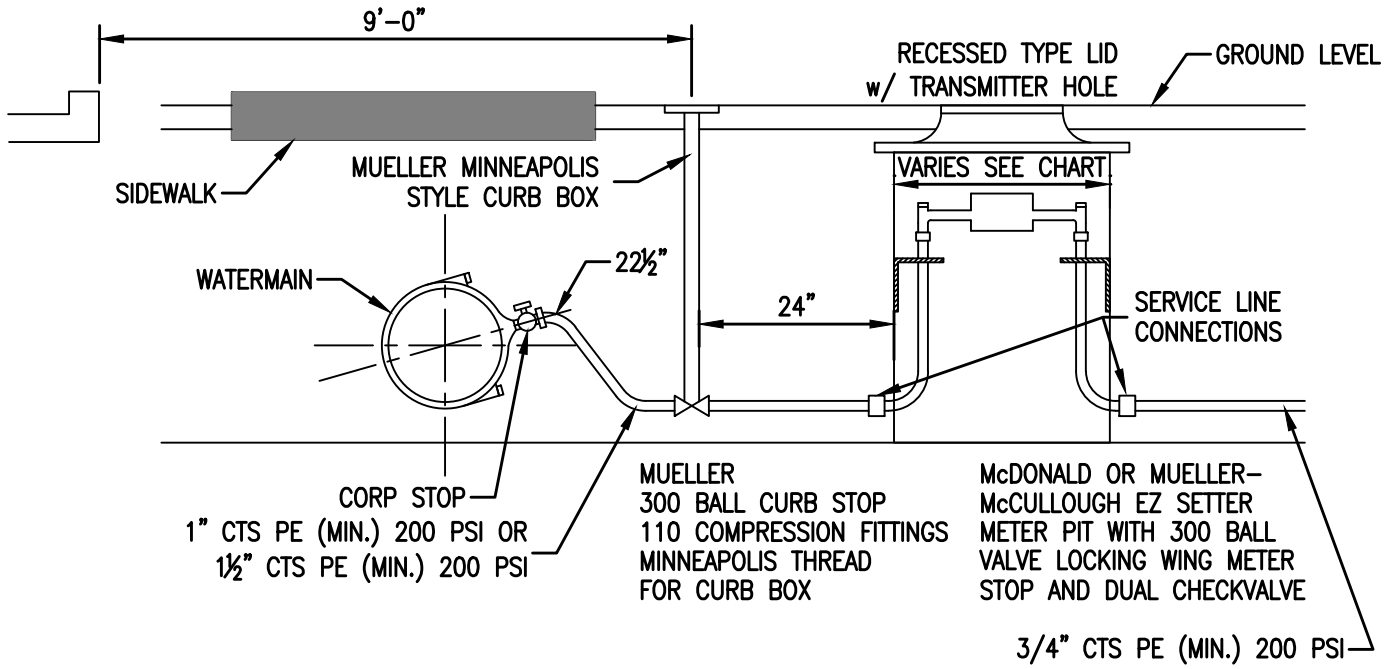
# BACKFLOW PREVENTION/SERVICE DETAIL

SCALE: NONE

TRIAD ASSOCIATES INC.
5835 LAWTON LOOP EAST DRIVE
INDIANAPOLIS, INDIANA 46216
PHONE: 317-377-5230 FAX: 317-377-5241

**CONSTRUCTION STANDARDS**
**TOWN OF LIZTON, INDIANA**

**DETAIL 5E**




WATERMAIN CONTRACTOR TO INSTALL SADDLE, CORPSTOP, SERVICE LINE AND CURBSTOP. RUN MARKER WIRE WITH WATERMAIN. EXTEND MARKER WIRE TO CURBSTOP AND LEAVE 7'-0" EXTRA TO EXTEND TO PIT. SERVICE LINE MARKER WIRE TO BE SOLDERED TO MAIN LINE MARKER WIRE. PLACE 2x4 AT END OF SERVICE LINE.

BUILDER TO SUPPLY MUELLER-McCULLOUGH OR McDONALD METER PIT, CURB BOX AND SERVICE LINE TO HOUSE. EXTEND MARKER WIRE FROM INSIDE OF METER PIT (AT TOP) TO HOUSE WITH SERVICE LINE.

SINGLE METER PITS SHALL HAVE 1" CTS PE 200 psi SERVICE LINE.
DUAL METER PITS SHALL HAVE 1 1/2" CTS PE 200 psi SERVICE LINE TO PIT AND 3/4" TO HOUSE.
MINIMUM 4'-0" BURY.

NOTES

1. PITS SHALL BE McDONALD OR MUELLER RISER EZ-SETTER METER BOX.
2. COVER SHALL BE LOCKING TYPE SINGLE LID, 4" RISE, SMALL OPERATING NUT, LID MUST HAVE HOLE FOR METER TRANSMITTER. LID MUST BE RECESSED TYPE.
3. SERVICE LINES SHALL BE POLYETHYLENE TUBING, 200 psi CTS.
4. BURY TRACING WIRE WITH ALL PLASTIC LINES.
5. CORPORATION STOP & SADDLES SHALL BE INSTALLED ON ALL TAPS AT A 22 1/2° ANGLE.
6. SERVICE LINES SHALL HAVE COMPRESSION FITTINGS FOR 1" CTS OR LARGER ON ALL CONNECTIONS.
7. PITS TO BE SET AT NO MORE THAN 6 FEET INSIDE THE SIDEWALK.
8. PITS ARE TO BE AT A DEPTH OF 48".
9. CONTRACTOR MUST FURNISH SUBMITTALS ON ALL MATERIAL TO BE INSTALLED.
10. ANY SUBSTITUTIONS MUST BE APPROVED.

| METER SIZE | MINIMUM METER PIT MODEL NO. |
|---|---|
| 5/8" x 3/4" | 203RS1848RBBN |
| 3/4" | 250RS1848RBBN |
| 1" | 330RS1848RBBN |
| 1 1/2" | 500VS2448FBB |
| 2" | 550VS2748FBB |

# WATER METER DETAIL

SCALE: NONE

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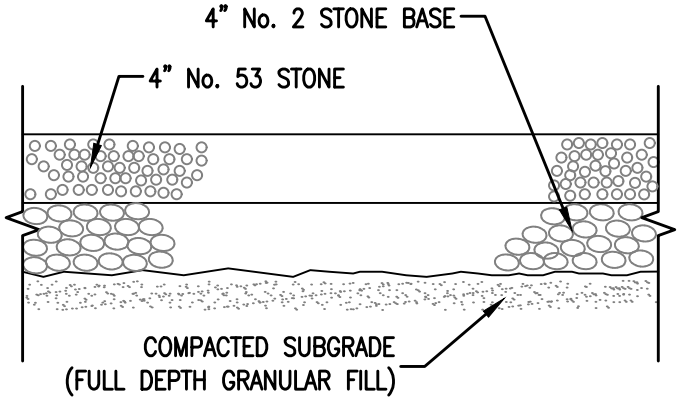
INDIANAPOLIS, INDIANA 46216
PHONE: 317-377-5230 FAX: 317-377-5241

**CONSTRUCTION STANDARDS**
**TOWN OF LIZTON, INDIANA**

**DETAIL 5F**




# STONE DRIVE PATCH DETAIL

SCALE: NONE

TRIAD ASSOCIATES INC.
5835 LAWTON LOOP EAST DRIVE
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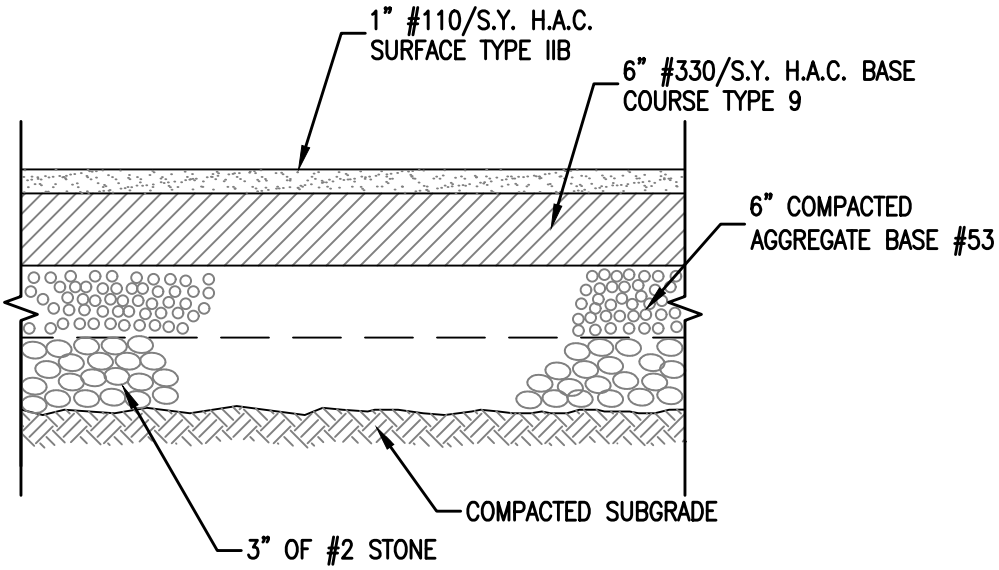
PHONE: 317-377-5230 FAX: 317-377-5241

CONSTRUCTION STANDARDS
TOWN OF LIZTON, INDIANA

DETAIL 5G




# ASPHALT DRIVE PATCH DETAIL

SCALE: NONE

TRIAD ASSOCIATES INC.
5835 LAWTON LOOP EAST DRIVE
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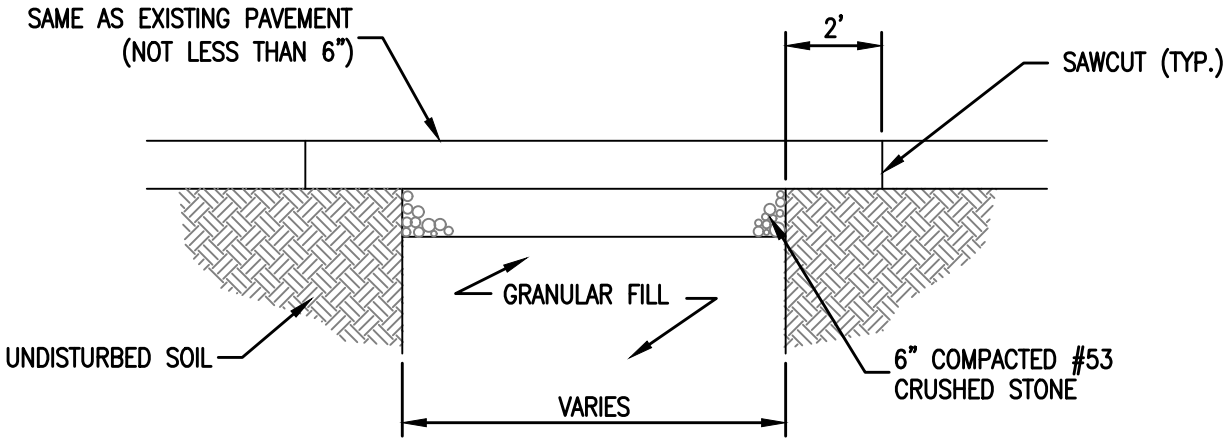
PHONE: 317-377-5230 FAX: 317-377-5241

**CONSTRUCTION STANDARDS**
**TOWN OF LIZTON, INDIANA**

**DETAIL 5H**



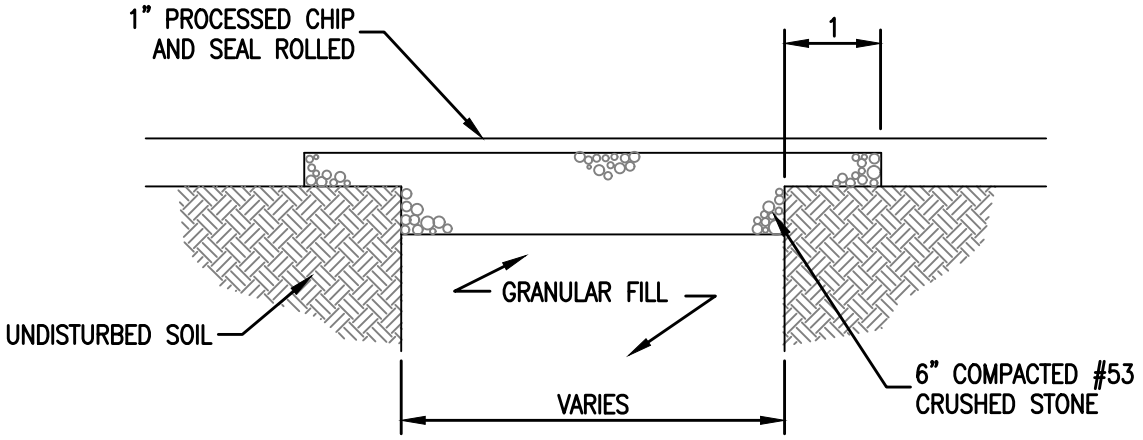

# BRICK OR CONCRETE PAVEMENT

SCALE: NONE

TRIAD ASSOCIATES INC.
5835 LAWTON LOOP EAST DRIVE
INDIANAPOLIS, INDIANA 46216
PHONE: 317-377-5230 FAX: 317-377-5241

CONSTRUCTION STANDARDS
TOWN OF LIZTON, INDIANA

DETAIL 5I




# CHIP AND SEAL SURFACE

SCALE: NONE

TRIAD ASSOCIATES INC.
5835 LAWTON LOOP EAST DRIVE
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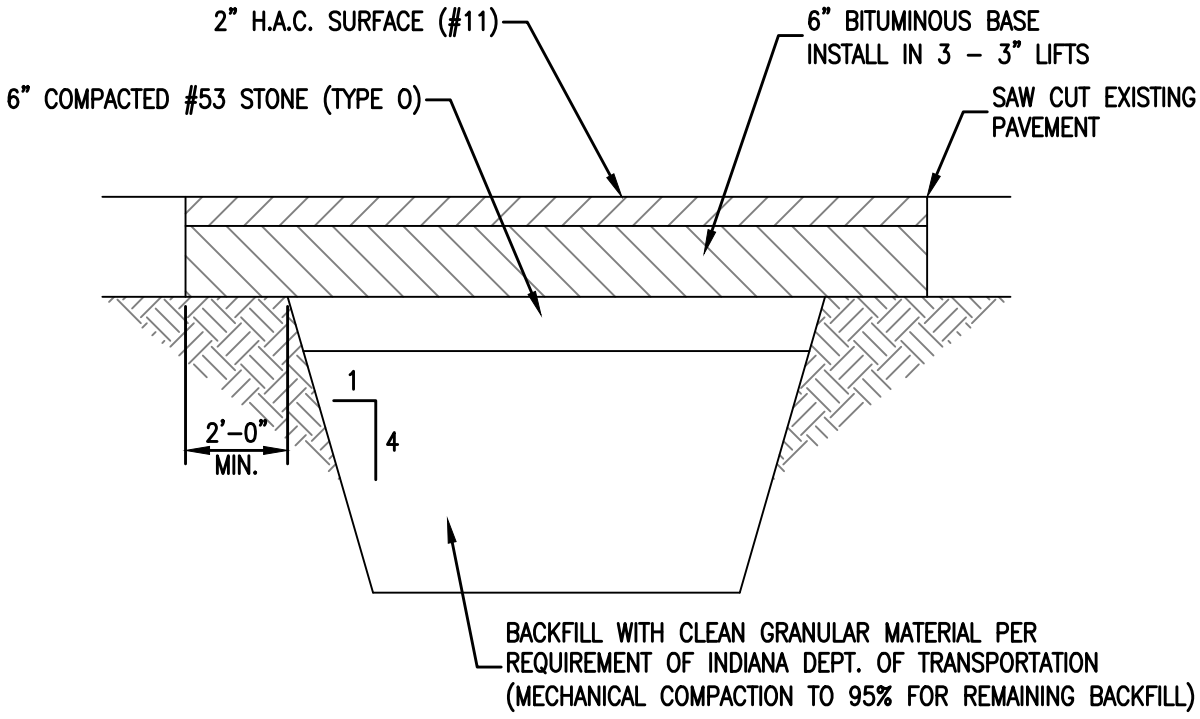
CONSTRUCTION STANDARDS
TOWN OF LIZTON, INDIANA

DETAIL 5J




NOTE:

1. BITUMINOUS PAVEMENT TACK COAT SHALL BE PLACED BETWEEN THE #53 STONE SURFACE AND ALONG THE SAW CUTS.

2. NEW SURFACE IS TO BE SLOPED AT THE SAME RATE AS THE EXISTING SURFACE.

3. TRENCH SPOIL IS TO BE REMOVED FROM THE WORK SITE.

4. BITUMINOUS TACK COAT APPLIED AS PER INDIANA DEPT. OF TRANSPORTATION STANDARD SPECIFICATIONS

# BITUMINOUS STREET REPAIR DETAIL

SCALE: NONE

TRIAD ASSOCIATES INC.
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**CONSTRUCTION STANDARDS**
**TOWN OF LIZTON, INDIANA**

**DETAIL 5K**