



**Planning & Zoning Board
Agenda for the Regular Meeting of September 3, 2026
Assembly Hall
395 Magnolia Road
Pinehurst, North Carolina
4:00 PM**

1. Call to Order
2. Approval of Minutes
 - A. Approval of 08-06-2026 P&Z Regular Meeting Minutes
3. Public Hearing
 - A. Updates to the Village's Flood Damage Prevention Ordinance
The purpose of this public hearing is to consider proposed updates to the Village's Flood Damage Prevention Ordinance.
 - B. Updates to the Village's Engineering Standards and Specifications Manual
The purpose of this public hearing is to consider proposed updates to the Village's Engineering Standards and Specifications Manual (ESSM).
4. Next Meeting Date
 - A. 10-01-2026 P&Z Regular Meeting
5. Motion to Adjourn

Vision: The Village of Pinehurst is a charming, vibrant community which reflects our rich history and traditions.

Mission: Promote, enhance, and sustain the quality of life for residents, businesses, and visitors.

Values: Service, Initiative, Teamwork, and Improvement.



Approval of 08-06-2026 P&Z Regular Meeting Minutes
ADDITIONAL AGENDA DETAILS:

FROM: Jeanann Dawson, Administrative Specialist
CC: Planning & Zoning Board;
DATE OF MEMO: 08/24/2026

MEMO DETAILS

ATTACHMENTS

1. 08-06-26 Draft PZ Minutes



**PLANNING AND ZONING BOARD
REGULAR MEETING
THURSDAY, August 6, 2026
ASSEMBLY HALL
395 MAGNOLIA ROAD
PINEHURST, NORTH CAROLINA
4:00 PM**

Board Members Present:

Matt Jones, Chair
Bill Colmer
Les Fleisher
Bruce Hironimus
Amy Foushee
Ed Krogulski

Board Members Absent:

Louise Mercuro
Carol Henry

Staff Present:

Alex Cameron, Planning & Inspections Director
Maria Klein, Senior Planner
Michael Mandeville, Senior Planner
Jeanann Dawson, Administrative Specialist

Approximately eight members of the public were in attendance.

I. Call to Order

Mr. Jones called the meeting to order at 4:01 PM. He explained there would be no public hearing tonight; however, staff would present information on upcoming business.

II. Approval of Minutes

A. 07-09-2026 Regular Meeting Minutes

Mr. Hironimus moved to approve the minutes of the July 9, 2026, Regular Meeting. Seconded by Mr. Colmer. Approved by a vote of 5-0.

III. New Business

A. Flood Damage Prevention

Mr. Mandeville gave an overview of the proposed update to the Flood Damage Prevention Ordinance, explaining that the revisions are intended to maintain compliance with the National Flood Insurance Program (NFIP). Mr. Mandeville and Mr. Cameron discussed the proposed policy with the Board and advised that a revised draft should be presented at the next meeting before forwarding it to the Village Council.

B. Engineering Standards and Specifications Manual Update

Mr. Cameron presented an overview of the proposed Engineering Standards and Specifications Manual (ESSM) update. He explained that he and Mike Apke, Public Services Director, have been working with Kimley-Horn, the consulting

firm that also updated the Village's PDO, to modernize the Village's engineering standards and update design, stormwater, and infrastructure requirements. Mr. Cameron advised that a draft ESSM should be presented to the Board for recommendation before being forwarded to the Village Council.

C. Text Amendment to the Pinehurst Development Ordinance for Plant Protection Devices

Mr. Cameron provided an overview of a proposed Chapter 10 PDO amendment regarding plant protection devices to address nuisance deer and landscaping damage. The amendment would allow these devices without permits while establishing standards for location, height, materials, color, and maintenance to balance property protection with the Village's character.

Mr. Cameron noted that Village Council reviewed the concept and provided positive feedback. Staff requested Board input on the proposed standards before moving the amendment forward.

IV. Next Meeting Date

A. 09-03-2026 Regular Meeting

Mr. Jones acknowledged Devin Macfarlane's departure from the Board due to his relocation and expressed appreciation for his contributions to the Village.

V. Motion to Adjourn

Ms. Foushee moved to adjourn the Regular Meeting at 5:07 PM. Seconded by Mr. Fleisher. Approved by a vote of 5-0.

Respectfully Submitted,

Jeanann Dawson
Clerk to the Board &
Planning Administrative Specialist
Village of Pinehurst

A recording of this meeting is located on the Village website: www.vopnc.org

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Updates to the Village's Flood Damage Prevention Ordinance

ADDITIONAL AGENDA DETAILS:

The purpose of this public hearing is to consider proposed updates to the Village's Flood Damage Prevention Ordinance.

FROM: Michael Mandeville, Senior Planner
CC: Planning & Zoning Board;
DATE OF MEMO: 08/27/2026

MEMO DETAILS

The purpose of this agenda item is for the Planning and Zoning Board to conduct a public hearing and consider a recommendation to Village Council regarding the adoption of the proposed updated Flood Damage Prevention Ordinance.

Background

Flood damage prevention regulations are authorized by federal and state law and are administered locally by municipalities and counties. Communities that participate in the National Flood Insurance Program (NFIP) are required to adopt and enforce floodplain management regulations that meet or exceed minimum federal standards. These regulations help protect public health and safety, reduce property damage from flooding, maintain eligibility for federally backed flood insurance, and minimize future public expenditures related to flood events.

The Village's current Flood Damage Prevention Ordinance was adopted in 2006. Since that time, the North Carolina Department of Public Safety, Division of Emergency Management, has updated its model ordinance to reflect changes in federal requirements, current terminology, administrative procedures, and best management practices. While Pinehurst's current Flood Insurance Rate Maps remain in effect, updating the ordinance ensures the Village remains consistent with current state and federal requirements and is prepared for future map revisions anticipated within the next several years.

Consistent with previous discussions, staff proposes adopting the Flood Damage Prevention Ordinance as a standalone development regulation separate from the Pinehurst Development Ordinance (PDO). This approach will simplify future amendments, allow updates to occur independently of the PDO, and maintain consistency with the State's model ordinance.

Analysis

The attached draft Flood Damage Prevention Ordinance is based on the North Carolina Division of Emergency Management's current model ordinance, with revisions to reflect Village administrative practices, local policy considerations, and comments received during the Planning and Zoning Board's previous review. The draft incorporates updated terminology, administrative procedures, permitting requirements, construction standards, and floodplain management practices necessary to maintain compliance with the National Flood Insurance Program (NFIP).

Since the Planning and Zoning Board's informational review last month, staff has considered the policy items and comments identified during that discussion. The following summarizes the primary items reviewed and the actions taken by staff:

- **Cumulative Substantial Improvement and Substantial Damage:** The Planning and Zoning Board discussed whether the Village should retain the current one-year cumulative timeframe or adopt a longer timeframe, as well as whether the 50% market value threshold for determining substantial improvement and substantial damage should be lowered to 30%. Based on that discussion, staff recommends a five-year cumulative timeframe and has incorporated that into the proposed ordinance while retaining the 50% threshold.
- **Enforcement Provisions and Penalties:** The proposed ordinance includes updated enforcement provisions

and establishes penalties for violations. Based on the feedback from the previous meeting, staff has incorporated language consistent with the PDO.

- **Regulatory Freeboard:** The Planning and Zoning Board reviewed the regulatory freeboard requirement and recommended keeping the current requirement at two (2) feet above the Base Flood Elevation as recommended by staff. The two-foot freeboard has been incorporated into the ordinance.

Consistency with Adopted Comprehensive Plan

NCGS 160D-604 requires the Planning and Zoning Board to advise and comment on whether a proposed development regulation is consistent with an adopted comprehensive plan. The proposed Flood Damage Prevention Ordinance is consistent with the following Comprehensive Plan goals, strategies, and recommendations:

- **Guiding Principle 6 – Supporting Infrastructure & Utilities:** The Comprehensive Plan calls for the Village to ensure that supporting infrastructure and community facilities meet the needs of existing and future residents, businesses, and visitors, and to partner with other providers to plan for and expand infrastructure as necessary. The updated Flood Damage Prevention Ordinance establishes current technical standards for flood damage prevention by promoting public health, safety, and general welfare and to minimize public and private losses due to flooding by establishing and enforcing provisions.
- **Strategic Opportunity 9 – Expand and Enhance Stormwater Management Efforts:** The Comprehensive Plan identifies stormwater management as a strategic opportunity and includes Implementation Strategies 6.8, 6.9, and 6.10 addressing stormwater management strategies, future stormwater infrastructure, and post-construction stormwater maintenance requirements. The proposed Flood Damage Prevention Ordinance supports these recommendations by establishing updated standards for development within Special Flood Hazard Areas that reduce the risk and impacts of flooding and promote resilient development practices.
- **Guiding Principal 7 - All things Green: Parks, Open Spaces & Natural Resources – Implementation Strategies 7.9 and 7.15:** The Comprehensive Plan recommends protecting water features and floodplains and encouraging land conservation through appropriate zoning and development regulations. The proposed Flood Damage Prevention Ordinance supports these recommendations by establishing standards for development and construction within flood hazard areas designed to minimize flood damage, reduce risks to life and property, and protect the Village's natural resources and floodplain functions.
- **Guiding Principal 3- Places to Live:** The Comprehensive Plan advocates for protecting the quality and character of Pinehurst's existing residential neighborhoods. The Flood Damage Prevention Ordinance establishes standards intended to reduce the potential for flood damage to homes and property, promote safer residential development and redevelopment, and protect residents from the long-term impacts associated with flooding. By incorporating updated floodplain management standards and construction requirements, the ordinance supports the continued protection and enhancement of Pinehurst neighborhoods and helps ensure that they remain safe, resilient, and desirable places to live.

Staff Recommendation

Staff recommends that the Planning and Zoning Board recommend approval of the proposed Flood Damage Prevention Ordinance to Village Council. The proposed ordinance updates the Village's floodplain management regulations, incorporates the North Carolina Division of Emergency Management's current model ordinance, and addresses local administrative practices and policy considerations identified during the review process. Adoption of the updated ordinance will help the Village maintain compliance with the requirements of the National Flood Insurance Program and provides a current and comprehensive regulatory framework for floodplain development within the Village.

Following the public hearing and deliberation, the Planning and Zoning Board may make one of the following recommendations to Village Council:

1. **Recommend approval** of the proposed Flood Damage Prevention Ordinance as presented;
2. **Recommend approval with changes** to the proposed Flood Damage Prevention Ordinance; or
3. **Recommend denial** of the proposed Flood Damage Prevention Ordinance.

Attachments:

- Updated Flood Damage Prevention Ordinance

- Draft Comprehensive Plan Consistency Statement

ATTACHMENTS

1. Flood Prevention Ordinance
2. Draft Comp Plan Consistency Statement FDPO Update

ORDINANCE NO. 26-18

FLOOD DAMAGE PREVENTION



1. FLOOD DAMAGE PREVENTION STANDARDS

1.1. STATUTORY AUTHORIZATION

- A. **Statutory Authorization.** In Chapter 160D of the North Carolina General Statutes, the NC Legislature has delegated to local governments the responsibility to adopt and enforce regulations meant to protect and promote public health, safety, and welfare.

1.2. FLOOD HAZARDS

- A. Flood-prone areas within the jurisdiction of the Village of Pinehurst are subject to periodic inundation which results in loss of life and damage to real property. The safety hazard posed by flooding also impairs the tax base, disrupt commerce and the provision of governmental services, and may result in extraordinary public expenditures.
- B. These flood losses are caused by the cumulative effect of obstructions, both inside and outside the identified Special Flood Hazard Areas, causing increases in flood heights and velocities and by the occupancy in flood-prone areas by uses vulnerable to floods or other hazards. These obstructions and occupancy by uses vulnerable to floods may be hazardous to other lands which are inadequately elevated, floodproofed, or otherwise unprotected from flood damages.

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1.3. STATEMENT OF PURPOSE

It is the purpose of this Ordinance to promote public health, safety, and general welfare and to minimize public and private losses due to flooding by establishing and enforcing provisions designed to:

- A. Restrict or prohibit uses that pose dangers to health, safety, and property due to water or erosion hazards or that result in damaging increases in erosion, flood heights or velocities;
- B. Require that uses and structures vulnerable to floods, including facilities that serve such uses, be protected against flood damage at the time of initial construction;
- C. Control the alteration of natural floodplains, stream channels, and natural protective barriers, which naturally mitigate floodwaters;
- D. Control filling, grading, dredging, and all other development that may increase erosion or flood damage; and
- E. Prevent or regulate the construction of flood barriers that will unnaturally divert floodwaters, or which may increase flood hazards to other lands.

1.4. OBJECTIVES

The objectives of this Ordinance are to:

- A. Protect human life;
- B. Minimize expenditure of public money for costly flood control projects;
- C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- D. Minimize prolonged business losses and interruptions;
- E. Minimize damage to public facilities and utilities that are located in flood-prone areas;
- F. Minimize damage to private and public property due to flooding;
- G. Make flood insurance available to the community through the National Flood Insurance Program;
- H. Maintain the natural and beneficial functions of floodplains;
- I. Help maintain a stable tax base by providing for the appropriate development of flood-prone areas; and
- J. Ensure that potential landowners are aware when real property is located in a special flood hazard area.

1.5. DEFINITIONS

Unless specifically defined below, words or phrases used in this Ordinance shall be interpreted to give them the meaning they have in common usage and to give this section of the Ordinance its most reasonable application.

A Zone. The Special Flood Hazard Area subject to inundation by the 1-percent (1%) annual chance flood where Base Flood Elevations have NOT been determined.

Accessory Structure /Appurtenant Structure. A structure located on the same parcel of property as the principal structure and the use of which is incidental to the use of the principal structure. Garages, carports and storage sheds are common urban accessory structures. Pole barns, hay sheds and the like qualify as accessory structures on farms and may or may not be located on the same parcel as the farm dwelling or shop building.

Addition (to an Existing Building). An extension or increase in the floor area or height of a building or structure.

AE Zone. The Special Flood Hazard Area subject to inundation by the 1-percent (1%) annual chance flood where Base Flood Elevations have been determined by detailed or limited detailed methods.

AH Zone. The Special Flood Hazard Area with a 1-percent (1%) annual chance of shallow flooding (usually areas of ponding), where average depths are between one (1) and three (3) feet. Base Flood Elevations derived from detailed hydraulic analyses are shown in this zone.

Alteration of a Watercourse. A dam, impoundment, channel relocation, change in channel alignment, channelization, or change in cross-area of the channel or the channel capacity, or any other form of modification which may alter, impede, retard or change the direction and/or velocity of the riverine flow of water during conditions of the base flood.

AO Zone. The Special Flood Hazard Area with a 1-percent (1%) annual chance of shallow flooding (usually sheet flow on sloping terrain) where average depths are between one (1) and three (3) feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone.

Appeal. A request for a review of the Floodplain Administrator's interpretation of any provision of this Ordinance.

Area of Shallow Flooding. A designated Zone AO on a community's Flood Insurance Rate Map (FIRM) with base flood depths determined to be from one to three (3) feet. These areas are located where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

Area of Special Flood Hazard. See Special Flood Hazard Area (SFHA).

Area of Future-Conditions Flood Hazard. Means the land area that would be inundated by the 1-percent (1%) annual-chance (100-year) flood based on future-conditions hydrology.

Artificial Obstruction. Any object or material which is not a natural obstruction, including any which, while not a significant obstruction, is capable of accumulating debris and thereby reducing the flood-carrying capacity of a stream.

Base Flood. The flood having a 1-percent (1%) chance of being equaled or exceeded in any given year.

Base Flood Elevation (BFE). A determination of the water surface elevations of the base flood as published in the Flood Insurance Study. When the BFE has not been provided in a special flood hazard area, it may be obtained from engineering studies available from a Federal, State, or other source using FEMA approved engineering methodologies. This elevation, when combined with the minimum freeboard, establishes the Regulatory Flood Protection Elevation (RFPE).

Basement. Any area of the building having its floor subgrade (below ground level) on all sides.

Building. See Structure.

Chemical Storage Facility. A building, portion of a building, or exterior area adjacent to a building used for the storage of any chemical or chemically reactive products.

Community. Means any State or area or political subdivision thereof, or any Indian tribe or authorized tribal organization, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

Community Flood Hazard Area (CFHA). Is an area that has been determined by the Floodplain Administrator (or other delegated, designated, or qualified community official) from available technical studies, historical flood information, and other available and reliable sources, which may be subject to periodic inundation by floodwaters that can adversely affect the public health, safety and general welfare. This includes areas downstream from dams.

Community Floodplain Management Map. Means any map produced by the community utilizing best available Base Flood Elevation and floodway data that is from a Federal, State, or other accepted technical source.

Community Rating System (CRS). Means a program developed by the Federal Insurance Administration to provide incentives for those communities in the Regular Program that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.

Critical facility (also called critical action). Means facilities for which the effects of even a slight chance of flooding would be too great. The minimum floodplain of concern for critical facilities is the 0.2-percent (0.2%) chance flood level. Critical facilities include, but are not limited to facilities critical to the health and safety of the public such as:

emergency operations centers, designated public shelters, schools, nursing homes, hospitals, police, fire, and emergency response installations, vital data storage centers, power generation and water and other utilities (including related infrastructure such as principal points of utility systems) and installations which produce, use, or store hazardous materials or hazardous waste.

Design Flood. See “Regulatory Flood Protection Elevation.”

Development. Any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.

Development Activity. Any activity defined as Development which will necessitate a Floodplain Development Permit. This includes buildings, structures, and non-structural items, including (but not limited to) fill, bulkheads, piers, pools, docks, landings, ramps, and erosion control/stabilization measures.

Digital Flood Insurance Rate Map (DFIRM). The digital official map of a community, issued by the Federal Emergency Management Agency (FEMA), on which both the Special Flood Hazard Areas and the risk premium zones applicable to the community are delineated.

Disposal. As defined in G.S. 130A-290(a)(6), the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste into or on any land or water so that the solid waste or any constituent part of the solid waste may enter the environment or be emitted into the air or discharged into any waters, including groundwaters.

Dry Floodproofing. means a combination of measures that make a building and attendant utilities and equipment watertight and substantially impermeable to floodwater, with structural components having the capacity to resist flood loads. Please refer to Technical Bulletin 3, Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings, and available from FEMA.

Elevated Building. A non-basement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns.

Encroachment. The advance or infringement of uses, fill, excavation, buildings, structures or development into a floodplain, which may impede or alter the flow capacity of a floodplain.

Existing Building and Existing Structure. Any building and/or structure for which the “start of construction” commenced before the effective date of the floodplain management regulations.

Existing Manufactured Home Park or Manufactured Home Subdivision. A manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) was completed before the initial effective date

of the floodplain management regulations adopted by the community.

Expansion to an Existing Manufactured Home Park or Subdivision. Means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

“Flood” or “Flooding” means:

- (a) A general and temporary condition of partial or complete inundation of normally dry land areas from:
 - (1) The overflow of inland or tidal waters.
 - (2) The unusual and rapid accumulation or runoff of surface waters from any source.
 - (3) Mudslides (i.e., mudflows) which are proximately caused by flooding as defined in paragraph (a)(2) of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.
- (b) The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (a)(1) of this definition.

Flood Boundary and Floodway Map (FBFM). An official map of a community, issued by the Federal Emergency Management Agency (FEMA), on which the Special Flood Hazard Areas and the floodways are delineated. This official map is a supplement to and shall be used in conjunction with the Flood Insurance Rate Map (FIRM).

Flood Hazard Boundary Map (FHBM). An official map of a community, issued by the Federal Emergency Management Agency, where the boundaries of the Special Flood Hazard Areas have been defined as Zone A.

Flood Insurance. The insurance coverage provided under the National Flood Insurance Program (NFIP).

Flood Insurance Rate Map (FIRM). An official map of a community, issued by the Federal Emergency Management Agency, on which both the Special Flood Hazard areas and the risk premium zones applicable to the community are delineated.

Flood Insurance Study (FIS). An examination, evaluation, and determination of flood hazards, corresponding water surface elevations (if appropriate), flood hazard risk

zones, and other flood data in a community issued by the Federal Emergency Management Agency. The Flood Insurance Study report includes Flood Insurance Rate Maps (FIRMs) and Flood Boundary and Floodway Maps (FBFMs), if published.

Flood-Prone Area. See Floodplain.

Flood Zone. A geographical area shown on a Flood Hazard Boundary Map or Flood Insurance Rate Map that reflects the severity or type of flooding in the area.

Floodplain. Any land area susceptible to being inundated by water from any source.

Floodplain Administrator. The individual appointed to administer and enforce the floodplain management regulations.

Floodplain Development Permit. Any type of permit that is required in conformance with the provisions of this Ordinance, prior to the commencement of any development activity.

Floodplain Management. The operation of an overall program of corrective and preventive measures for reducing flood damage and preserving and enhancing, where possible, natural resources in the floodplain, including, but not limited to, emergency preparedness plans, flood control works, floodplain management regulations, and open space plans.

Floodplain Management Regulations. This Ordinance and other ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances, and other applications of police power. This term describes Federal, State or local regulations, in any combination thereof, which provide standards for preventing and reducing flood loss and damage.

Floodproofing. Any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitation facilities, structures, and their contents.

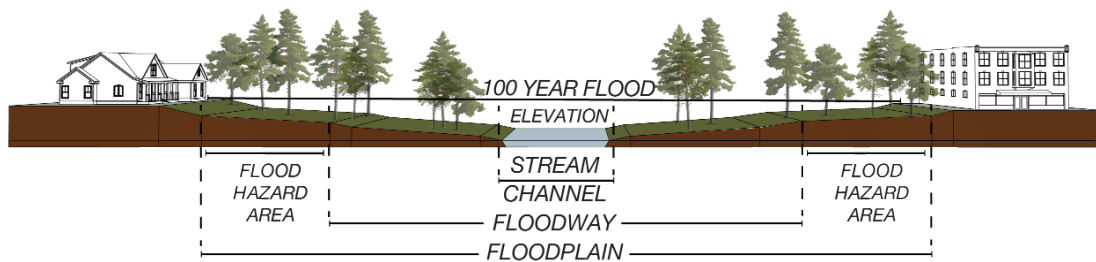
Flood-Resistant Material. Any building product [material, component or system] capable of withstanding direct and prolonged contact (minimum 72 hours) with floodwaters without sustaining damage that requires more than low-cost cosmetic repair. Any material that is water-soluble or is not resistant to alkali or acid in water, including normal adhesives for above-grade use, is not flood-resistant. Pressure-treated lumber or naturally decay-resistant lumbers are acceptable flooring materials. Sheet-type flooring coverings that restrict evaporation from below and materials that are impervious, but dimensionally unstable are not acceptable. Materials that absorb or retain water excessively after submergence are not flood resistant. Please refer to Technical Bulletin 2, Flood Damage-Resistant Materials Requirements, and available from FEMA. Class 4 and 5 materials, referenced therein, are acceptable flood-resistant materials.

Floodway. The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing

the water surface elevation more than one foot.

Floodway Encroachment Analysis. An engineering analysis of the impact that a proposed encroachment into a floodway or non-encroachment area is expected to have on the floodway boundaries and flood levels during the occurrence of the base flood discharge. The evaluation shall be prepared by a qualified North Carolina licensed engineer using standard engineering methods and hydraulic models meeting the minimum requirements of the National Flood Insurance Program.

Flood Hazard Area. The area designated by a local government as an area where development must be regulated to prevent damage from flooding. The flood hazard area must include and may exceed the base floodplain.



Freeboard. The height added to the Base Flood Elevation (BFE) to account for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, blockage of bridge openings, and the hydrological effect of urbanization of the watershed. The Base Flood Elevation (BFE) plus the freeboard establishes the Regulatory Flood Protection Elevation (RFPE). The minimum freeboard to be established is two (2) feet.

Functionally Dependent Facility. Means a facility which cannot be used for its intended purpose unless it is located in close proximity to water, limited to a docking or port facility necessary for the loading and unloading of cargo or passengers, shipbuilding, or ship repair. The term does not include long-term storage, manufacture, sales, or service facilities.

Hazardous Waste Management Facility. As defined in G.S. 130A, Article 9, a facility for the collection, storage, processing, treatment, recycling, recovery, or disposal of hazardous waste.

Highest Adjacent Grade (HAG). The highest natural elevation of the ground surface, prior to construction, immediately next to the proposed walls of the structure.

Historic Structure. Any structure that is:

- A. Listed individually in the National Register of Historic Places (a listing maintained by the U.S. Department of Interior) or preliminarily determined by the Secretary of Interior as meeting the requirements for individual listing on the National

Register;

- B. Certified or preliminarily determined by the Secretary of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
- C. Individually listed on a local inventory of historic landmarks in communities with a Certified Local Government (CLG) Program; or
- D. Certified as contributing to the historical significance of a historic district designated by a community with a Certified Local Government (CLG) Program.

Certified Local Government (CLG) Programs are approved by the U.S. Department of the Interior in cooperation with the North Carolina Department of Cultural Resources through the State Historic Preservation Officer as having met the requirements of the National Historic Preservation Act of 1966 as amended in 1980.

Letter of Map Change (LOMC). An official determination issued by FEMA that amends or revises an effective Flood Insurance Rate Map or Flood Insurance Study. Letters of Map Change include:

- A. **Letter of Map Amendment (LOMA).** An official amendment, by letter, to an effective National Flood Insurance Program map. A LOMA is based on technical data showing that a property had been inadvertently mapped as being in the floodplain but is actually on natural high ground above the Base Flood Elevation. A LOMA amends the current effective Flood Insurance Rate Map and establishes that a specific property, portion of a property, or structure is not located in a Special Flood Hazard Area.
- B. **Letter of Map Revision (LOMR).** A revision based on technical data that may show changes to flood zones, flood elevations, Special Flood Hazard Area boundaries and floodway delineations, and other planimetric features.
- C. **Letter of Map Revision Based on Fill (LOMR-F).** A determination that a structure or parcel of land has been elevated by fill above the BFE and is, therefore, no longer located within the Special Flood Hazard Area. To qualify for this determination, the fill must have been permitted and placed in accordance with the community's floodplain management regulations.
- D. **Conditional Letter of Map Revision (CLOMR).** A formal review and comment as to whether a proposed project complies with the minimum NFIP requirements for such projects with respect to delineation of Special Flood Hazard Areas. A CLOMR does not revise the effective Flood Insurance Rate Map or Flood Insurance Study; upon submission and approval of certified as-built documentation, a Letter of Map Revision may be issued by FEMA to revise the effective FIRM.

Light Duty Truck. Any motor vehicle rated at 8,500 pounds Gross Vehicular Weight Rating or less which has a vehicular curb weight of 6,000 pounds or less and which has a basic vehicle frontal area of 45 square feet or less as defined in 40 CFR 86.082-2 and is:

- A. Designed primarily for purposes of transportation of property or is a derivation of such a vehicle, or

- B. Designed primarily for transportation of persons and has a capacity of more than 12 persons; or
- C. Available with special features enabling off-street or off-highway operation and use.

Lowest Adjacent Grade (LAG). The elevation of the ground, sidewalk or patio slab immediately next to the building, or deck support, after completion of the building.

Lowest Floor. The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access, or limited storage in an area other than a basement area is not considered a building's lowest floor, provided that such an enclosure is not built to render the structure in violation of the applicable non-elevation design requirements of this Ordinance.

Manufactured Home. A structure, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. The term "manufactured home" does not include a "recreational vehicle".

Manufactured Home Park or Subdivision. A parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale.

Map Repository. The location of the official flood hazard data to be applied for floodplain management. It is a central location in which flood data is stored and managed; in North Carolina, FEMA has recognized that the application of digital flood hazard data products has the same authority as hard copy products. Therefore, the NCEM's Floodplain Mapping Program websites house current and historical flood hazard data. For effective flood hazard data, the NC FRIS website (<http://fris.nc.gov/fris>) is the map repository, and for historical flood hazard data the Flood NC website (<http://floodnc.gov/ncflood>) and the FEMA Flood Map Service Center website (<https://msc.fema.gov/portal/home>).

Market Value. The building value, not including the land value and that of any accessory structures or other improvements on the lot. Market value may be established by independent certified appraisal; replacement cost depreciated for age of building and quality of construction (Actual Cash Value); or adjusted tax assessed values.

Mean Sea Level. For purposes of this Ordinance, the National Geodetic Vertical Datum (NGVD) as corrected in 1929, the North American Vertical Datum (NAVD) as corrected in 1988, or other vertical control datum used as a reference for establishing varying elevations within the floodplain, to which Base Flood Elevations (BFEs) shown on a FIRM are referenced. Refer to each FIRM panel to determine datum used.

Natural Obstruction. Any rock, tree, gravel, or similar natural matter which is an obstruction and has been located within the floodway by a non-human cause.

New Construction. Structures for which the start of construction commenced on or after the effective date of the initial floodplain management regulations and includes any

subsequent improvements to such structures.

New Manufactured Home Park or Subdivision. Means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of floodplain management regulations adopted by a community.

Non-Encroachment Area (NEA). The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot as designated in the Flood Insurance Study report.

Post-Firm. Construction or other development for which the start of construction occurred on or after 12/15/1989 the effective date of the initial Flood Insurance Rate Map.

Pre-Firm. Construction or other development for which the start of construction occurred before 12/15/1989 the initial Flood Insurance Rate Map.

Principally Above Ground. At least fifty-one percent (51%) of the actual cash value of the structure is above ground.

Public Safety and/or Nuisance. Anything which is injurious to the safety or health of an entire community or neighborhood, or any considerable number of persons, or unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, bay, stream, canal, or basin.

Recreational Vehicle (RV). A vehicle which is:

- A. Built on a single chassis (supporting frame of vehicular structure);
- B. Four hundred (400) square feet or less when measured at the largest horizontal projection;
- C. Designed to be self-propelled or permanently towable by a light duty truck; and
- D. Designed primarily not for use as a permanent dwelling, but as temporary living quarters for recreational, camping, travel, or seasonal use.
- E. Is fully licensed and ready for highway use.
- F. Has no attached deck, porch, or shed, and
- G. Has quick-disconnect sewage, water, and electrical connectors.

For the purpose of this Ordinance: "Tiny Homes/Houses" and Park Models that do not meet the items listed above are not considered Recreational Vehicles and should meet the standards of and be permitted as Residential Structures under this Ordinance.

Reference Level. Is the bottom of the lowest horizontal structural member of the lowest floor for structures within all Special Flood Hazard Areas.

Regulatory Flood Protection Elevation. The Base Flood Elevation plus the freeboard.

In Special Flood Hazard areas where Base Flood Elevations (BFEs) have been determined, this elevation shall be the BFE plus two (2) feet of freeboard. In Special Flood Hazard Areas where no BFE has been established, this elevation shall be at least two (2) feet above the highest adjacent grade.

Remedy a Violation. To bring the structure or other development into compliance with State and community floodplain management regulations, or, if this is not possible, to reduce the impacts of its noncompliance. Ways that impacts may be reduced include protecting the structure or other affected development from flood damages, implementing the enforcement provisions of this Ordinance or otherwise deterring future similar violations, or reducing Federal financial exposure regarding the structure or other development.

Repetitive Loss. Means flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25 percent (25 %) of the market value of the structure before the damage occurred.

Repetitive Loss Property (RL Property). Means any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling 10-year period, since 1978. At least two of the claims must be more than ten days apart but, within ten years of each other. A RL property may or may not be currently insured by the NFIP.

Riverine. Relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

Salvage Yard. Any nonresidential property used for the storage, collection, and/or recycling of any type of equipment, and including but not limited to vehicles, appliances, and related machinery.

Section 1316. Means that section of the National Flood Insurance Act of 1968, as amended, which states that no new flood insurance coverage shall be provided for any property that FEMA finds has been declared by a duly constituted State or local zoning authority or other authorized public body to be in violation of State or local laws, regulations, or ordinances that are intended to discourage or otherwise restrict land development or occupancy in flood-prone areas.

Severe Repetitive Loss Structure. Means any insured property that has met at least one of the following paid flood loss criteria since 1978, regardless of ownership. In either case, two of the claim payments must have occurred within ten years of each other. Multiple losses at the same location within ten days of each other are counted as one loss, with the payment amounts added together.

1. Four or more separate claim payments of more than \$5,000 each (including building and contents payments); or
2. Two or more separate claim payments (building payments only) where the total of the payments exceeds the current market value of the property.

Solid Waste Disposal Facility. Any facility involved in the disposal of solid waste, as defined in G.S. 130A-290(a)(35).

Solid Waste Disposal Site. As defined in G.S. 130A-290(a)(36), any place at which solid wastes are disposed of by incineration, sanitary landfill, or any other method.

Special Flood Hazard Area (SFHA). Defined by FEMA as an area having special flood, mudflow or flood-related erosion hazards and shown on a Flood Hazard Boundary Map (FHBM) or a Flood Insurance Rate Map (FIRM) Zone A, AO, A1-A30, AE, A99, AH, AR, AR/A, AR/AE, AR/AH, AR/AO, AR/A1-A30, V1-V30, VE or V. The SFHA is the area where the National Flood Insurance Program's (NFIP's) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. For determining Community Rating System (CRS) premium discounts, all AR and A99 zones are treated as non-SFHAs.

Start of Construction. Includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement, or other improvement was within one hundred eighty (180) days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of the building, whether or not that alteration affects the external dimensions of the building.

Structure. A walled and roofed building, a manufactured home, or a gas, liquid, or liquefied gas storage tank that is principally above ground.

Substantial Damage. Means damage of any origin sustained by a structure during any five-year period whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent (50%) of the market value of the structure before the damage occurred.

Substantial Improvement. Means any combination of repairs, reconstruction, rehabilitation, addition, or other improvement of a structure, taking place during any five-year period for which the cost equals or exceeds 50 percent (50%) (of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage", regardless of the actual repair work performed. The term does not, however, include either:

- A. Any correction of existing violations of State or community health, sanitary, or safety code specifications which have been identified by the community code

enforcement official and which are the minimum necessary to assure safe living conditions; or

- B. Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure and the alteration is approved by variance issued pursuant to *Section 2.6* of this Ordinance.

Technical Bulletin and Technical Fact Sheet. Means a FEMA publication that provides guidance concerning the building performance standards of the NFIP, which are contained in Title 44 of the U.S. Code of Federal Regulations at Section 60.3. The bulletins and fact sheets are intended for use primarily by State and local officials responsible for interpreting and enforcing NFIP regulations and by members of the development community, such as design professionals and builders. New bulletins, as well as updates of existing bulletins, are issued periodically as needed. The bulletins do not create regulations; rather they provide specific guidance for complying with the minimum requirements of existing NFIP regulations.

It should be noted that Technical Bulletins and Technical Fact Sheets provide guidance on the minimum requirements of the NFIP regulations. State or community requirements that exceed those of the NFIP take precedence. Design professionals should contact the community officials to determine whether more restrictive State or local regulations apply to the building or site in question. All applicable standards of the State or local building code must also be met for any building in a flood hazard area

Temperature Control. Having the temperature regulated by a heating and/or cooling system, built-in or appliance.

Variance. A grant of relief from the requirements of this Ordinance.

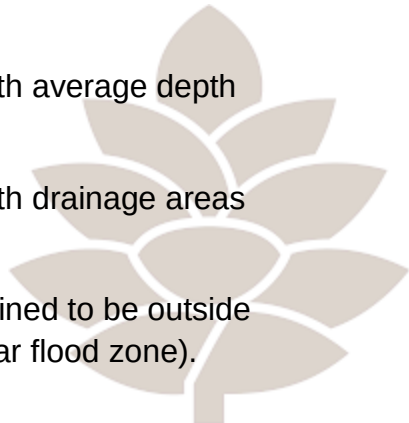
Violation. The failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in *Section 2 Administration* and *Section 3 Provisions for Flood Hazard Reduction* is presumed to be in violation until such time as that documentation is provided.

Water Surface Elevation (WSE). The height, in relation to mean sea level, of floods of various magnitudes and frequencies in the floodplains of riverine areas.

Watercourse. A lake, river, creek, stream, wash, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

X Zones. Means areas determined to be low to moderate risk flood zones and are located outside the community's delineated Special Flood Hazard Area (SFHA) and include the following:

- (a) Shaded - is the area of moderate flood hazard and can represent:

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- (1) 0.2-percent (0.2%) annual chance flood hazard area (500-year flood zone),
 - (2) Areas of 1-percent (1%) annual chance flood with average depth less than one (1) foot, or
 - (3) Areas of 1-percent (1%) annual chance flood with drainage areas of less than one (1) square mile
- (b) Unshaded - is the area of minimal flood hazard determined to be outside of the 0.2-percent (0.2%) annual chance flood (500-year flood zone).

1.6. LANDS TO WHICH THIS ORDINANCE APPLIES

This Ordinance shall apply to all Special Flood Hazard Areas and Community Flood Hazard Areas (CFHAs) as defined in *Section 1.5 Definitions* within the jurisdiction, including Extra-Territorial Jurisdictions (ETJs) and Bona Fide Farms as allowed by law, of the Village of Pinehurst.

1.7. BASIS FOR ESTABLISHING THE SPECIAL FLOOD HAZARD AREAS AND COMMUNITY FLOOD HAZARD AREAS

The Special Flood Hazard Areas are those identified under the Cooperating Technical State (CTS) agreement between the State of North Carolina and FEMA in its Flood Insurance Study (FIS) and its accompanying Flood Insurance Rate Maps (FIRM), for Moore County dated 10/17/2006, or latest, as may be amended.

When Preliminary Flood Insurance Studies and Flood Insurance Rate Maps have been provided by FEMA to the Village of Pinehurst:

- (1) Prior to the issuance of a Letter of Final Determination (LFD) by FEMA, the use of the preliminary flood hazard data shall only be required where no Base Flood Elevations and/or floodway areas exist or where the preliminary Base Flood Elevations or floodway area exceed the Base Flood Elevations and/or floodway widths in the effective flood hazard data provided by FEMA. Such preliminary data may be subject to revision through valid appeals.
- (2) Upon the issuance of a Letter of Final Determination (LFD) by FEMA, the revised flood hazard data shall be used and replace all previously effective flood hazard data provided by FEMA for the purposes of administering these regulations.

When Advisory Flood Studies have been provided by the North Carolina Floodplain Mapping Program to the Village of Pinehurst:

- (1) The data, which are adopted by reference and declared a part of this Ordinance, shall be utilized where no Base Flood Elevations or floodway areas exist, or where the Advisory Flood Studies exceed the Base Flood Elevations and/or floodway widths in the effective flood hazard data provided by FEMA, or
- (2) The applicant shall provide a more detailed analysis of the flood

hazards for the site for floodplain management purposes.

The community reserves the right to require further studies for any development within its jurisdiction, if there is evidence that a potential flood hazard exists. Studies can be used to designate Community Flood Hazard Areas (CFHA). Such evidence may include but shall not be limited to:

- (1) Eyewitness accounts of historic flooding or other reports of historic flooding deemed credible by the community;
- (2) Surveyed high-water marks;
- (3) Geologic features observed that resemble floodplains (such as flat areas along streams);
- (4) Proximity to manmade or natural constrictions in or along a watercourse (such as road crossings that can cause backwater effects), and;
- (5) Drainage basin characteristics (such as drainage area, slope, percent impervious cover, land use, etc.).

Where regulatory standards conflict, the more stringent Base Flood Elevation shall prevail.

1.8. ESTABLISHMENT OF FLOODPLAIN DEVELOPMENT PERMIT

A floodplain development permit shall be required in conformance with the provisions of this Section prior to the commencement of any development activities within Special Flood Hazard Areas and Community Flood Hazard Areas determined in accordance with the provisions of *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas* of this Ordinance.

1.9. COMPLIANCE

No structure or land shall hereafter be located, extended, converted, altered, or developed in any way without full compliance with the terms of this Ordinance and other applicable regulations.

1.10. ABROGATION AND GREATER RESTRICTIONS

This Ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this Ordinance and another conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

1.11. INTERPRETATION

In the interpretation and application of this Ordinance, all provisions shall be:

- A. Considered as minimum requirements;
- B. Liberally construed in favor of the governing body; and
- C. Deemed neither to limit nor repeal any other powers granted under State statutes.

1.12. WARNING AND DISCLAIMER OF LIABILITY

The degree of flood protection required by this Ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering consideration. Larger

floods can and will occur. Actual flood heights may be increased by man-made or natural causes. This Ordinance does not imply that land outside the Special Flood Hazard Areas or uses permitted within such areas will be free from flooding or flood damages. This Ordinance shall not create liability on the part of the Village of Pinehurst or by any officer or employee thereof for any flood damages that result from reliance on this Ordinance, or any administrative decision lawfully made hereunder.



2. ADMINISTRATION

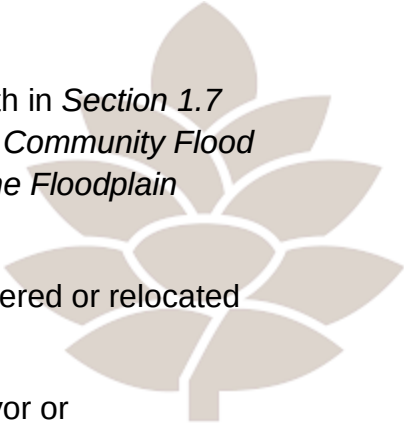
2.1. DESIGNATION OF FLOODPLAIN ADMINISTRATOR

- A. The Village Planner, or designee, hereinafter referred to as the "Floodplain Administrator", is hereby appointed to administer and implement the provisions of this Ordinance.
- B. The Floodplain Administrator shall coordinate with Moore County, the Army Corps of Engineers and any other local, State, or Federal officials involved in the administration of this Ordinance.

2.2. FLOODPLAIN DEVELOPMENT APPLICATION, PERMIT AND CERTIFICATION REQUIREMENTS

- A. **Application Requirements.** Application for a floodplain development permit shall be made to the Floodplain Administrator prior to any development activities located within Special Flood Hazard Areas and Community Flood Hazard Areas. The following items shall be presented to the Floodplain Administrator to apply for a floodplain development permit:

1. A plot plan drawn to scale which shall include, but shall not be limited to, the following specific details of the proposed floodplain development:
 - (1) The nature, location, dimensions, and elevations of the area of development/disturbance; existing and proposed structures, utility systems, grading/pavement areas, fill materials, storage areas, drainage facilities, and other development;
 - (2) The boundary of the Special Flood Hazard Area as delineated on the FIRM, Community Flood Hazard Areas, or other flood map as determined in *Section*
 - (3) *1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas*, or a statement that the entire lot is within the Special Flood Hazard Area;
 - (4) Flood zone(s) designation of the proposed development area as determined on the FIRM or other flood map as determined in *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas*;
 - (5) The boundary of the floodway(s) or non-encroachment area(s) as determined

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- (6) The Base Flood Elevation (BFE) where provided as set forth in *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas, Section 2.3 Duties and Responsibilities of the Floodplain Administrator*.
 - (7) The old and new location of any watercourse that will be altered or relocated because of proposed development; and
 - (8) The certification of the plot plan by a registered land surveyor or professional engineer.
2. Proposed elevation, and method thereof, of all development within a Special Flood Hazard Area or Community Flood Hazard Area including but not limited to:
 - (1) Elevation in relation to mean sea level of the proposed reference level (including basement) of all structures;
 - (2) Elevation in relation to mean sea level to which any nonresidential structure in Zone AE, A, AO, AH, or A99 will be floodproofed; and
 - (3) Elevation in relation to mean sea level to which any proposed utility systems will be elevated or floodproofed.
 3. If floodproofing, a Floodproofing Certificate (FEMA Form 81-65) with supporting data, an operational plan, and an inspection and maintenance plan that include, but are not limited to, installation, exercise, and maintenance of floodproofing measures.
 4. A foundation plan, drawn to scale, which shall include details of the proposed foundation system to ensure all provisions of this Ordinance are met. These details include but are not limited to:
 - (1) The proposed method of elevation, if applicable (i.e., fill, solid foundation perimeter wall, solid backfilled foundation, open foundation on columns/posts/piers/piles/shear walls); and
 - (2) Openings to facilitate automatic equalization of hydrostatic flood forces on walls in accordance with *Section 3.2(D) Elevated Buildings* when solid foundation perimeter walls are used in Zones A, AE, AH, AO, and A99.
 5. Usage details of any enclosed areas below the lowest floor.
 6. Plans and/or details for the protection of public utilities and facilities such as sewer, gas, electrical, and water systems to be located and constructed to minimize flood damage.
 7. Certification that all other local, State and Federal permits required prior

to floodplain development permit issuance have been received.

8. Documentation for placement of recreational vehicles and/or temporary structures, when applicable, to ensure that the provisions of *Section 3.2(F) Recreational Vehicles* and *Section 3.2(G) Temporary Nonresidential Structures* are met.
9. A description of proposed watercourse alteration or relocation, when applicable, including an engineering report on the effects of the proposed project on the flood- carrying capacity of the watercourse and the effects to properties located both upstream and downstream; and a map (if not shown on plot plan) showing the location of the proposed watercourse alteration or relocation.

B. Permit Requirements. The floodplain development permit shall include, but not be limited to:

1. A complete description of all the development to be permitted under the floodplain development permit (e.g. house, garage, pool, septic, bulkhead, cabana, pier, bridge, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials, etc.) including a cost estimate.
2. The Special Flood Hazard area determination for the proposed development in accordance with available data specified in *Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas*.
3. The Regulatory Flood Protection Elevation required for the reference level and all attendant utilities.
4. The Regulatory Flood Protection Elevation required for the protection of all public utilities.
5. All certification submittal requirements with timelines.
6. A statement that no fill material or other development shall encroach into the floodway or non-encroachment area of any watercourse, as applicable.
7. The flood opening requirements, if in Zones A, AO, AE or A1-A30.
8. Limitations of below BFE enclosure uses (if applicable). (i.e., parking, building access and limited storage only).
9. A statement that all materials that are BFE/RFPE must be flood resistant.

C. Certification Requirements.

1. Elevation Certificates.

- 1) An Elevation Certificate (FEMA Form FF-206-FY-22-152) is required prior to the actual start of any new construction. It shall be the duty of the permit holder to

submit to the Floodplain Administrator a certification of the elevation of the reference level, in relation to mean sea level. The Floodplain Administrator shall review the certificate data submitted. Deficiencies detected by such review shall be corrected by the permit holder prior to the beginning of construction. Failure to submit the certification or failure to make required corrections shall be cause to deny a floodplain development permit

- 2) An Elevation Certificate (FEMA Form FF-206-FY-22-152) is required after the reference level is established. Within seven (7) calendar days of establishment of the reference level elevation, it shall be the duty of the permit holder to submit to the Floodplain Administrator a certification of the elevation of the reference level, in relation to mean sea level. Any work done within the seven (7) day calendar period and prior to submission of the certification shall be at the permit holder's risk. The Floodplain Administrator shall review the certificate data submitted. Deficiencies detected by such review shall be corrected by the permit holder immediately and prior to further work being permitted to proceed. Failure to submit the certification or failure to make required corrections shall be cause to issue a stop-work order for the project.
- 3) A final Finished Construction Elevation Certificate (FEMA Form FF-206-FY-22-152) is required after construction is completed and prior to Certificate of Compliance/Occupancy issuance. It shall be the duty of the permit holder to submit to the Floodplain Administrator a certification of final as-built construction of the elevation of the reference level and all attendant utilities. The Floodplain Administrator shall review the certificate data submitted. Deficiencies detected by such review shall be corrected by the permit holder immediately and prior to Certificate of Compliance/Occupancy issuance. In some instances, another certification may be required to certify corrected as-built construction. Failure to submit the certification or failure to make required corrections shall be cause to withhold the issuance of a Certificate of Compliance/Occupancy.

2. Floodproofing Certificate.

- (1) If non-residential floodproofing is used to meet the Regulatory Flood Protection Elevation requirements, a Floodproofing Certificate (FEMA Form FF-206-FY-22-153), with supporting data, an operational plan, and an inspection and maintenance plan are required prior to the actual start of any new construction. It shall be the duty of the permit holder to submit to the Floodplain Administrator a certification of the floodproofed design elevation of the reference level and all attendant utilities, in relation to mean sea level. Floodproofing certification shall be prepared by or under the direct supervision of a professional engineer or architect and certified by same. The Floodplain Administrator shall review the certificate data, the operational plan, and the inspection and maintenance plan. Deficiencies detected by such review shall be corrected by the applicant prior to permit approval. Failure to submit the certification or failure to make required corrections shall be cause to deny a Floodplain Development Permit. Failure to construct in accordance with the

certified design shall be cause to withhold the issuance of a Certificate of Compliance/Occupancy.

(2) A final Finished Construction Floodproofing Certificate (FEMA Form FF-206-FY-22-153), with supporting data, an operational plan, and an inspection and maintenance plan are required prior to the issuance of a Certificate of Compliance/Occupancy. It shall be the duty of the permit holder to submit to the Floodplain Administrator a certification of the floodproofed design elevation of the reference level and all attendant utilities, in relation to mean sea level. Floodproofing certificate shall be prepared by or under the direct supervision of a professional engineer or architect and certified by same. The Floodplain Administrator shall review the certificate data, the operational plan, and the inspection and maintenance plan. Deficiencies detected by such review shall be corrected by the applicant prior to Certificate of Occupancy. Failure to submit the certification or failure to make required corrections shall be cause to deny a Floodplain Development Permit. Failure to construct in accordance with the certified design shall be cause to deny a Certificate of Compliance/Occupancy.

3. If a manufactured home is placed within Zone A, AO, AE, AH or A99 and the elevation of the chassis is more than thirty-six (36) inches in height above grade, an engineered foundation certification is required in accordance with the provisions of *Section 3.2(C) Manufactured Homes*.
4. If a watercourse is to be altered or relocated, a description of the extent of watercourse alteration or relocation; a professional engineer's certified report on the effects of the proposed project on the flood-carrying capacity of the watercourse and the effects to properties located both upstream and downstream; and a map showing the location of the proposed watercourse alteration or relocation shall all be submitted by the permit applicant prior to issuance of a floodplain development permit.

D. Certification Exemptions. The following structures, if located within Zone A, AO, AE, AH or A99, are exempt from the elevation/floodproofing certification requirements specified in items (1) and (2) of this subsection:

1. Recreational vehicles meeting requirements of *Section 3.2(F) Recreational Vehicles*.
2. Temporary structures meeting requirements of *Section 3.2(G) Temporary Nonresidential Structures*; and
3. Accessory structures less than one hundred fifty (150) square feet meeting requirements of *Section 3.2(H) Accessory Structures*.
4. Substantial Improvement/Damage determinations for existing buildings and structures.

For applications for building permits to improve buildings and structures.

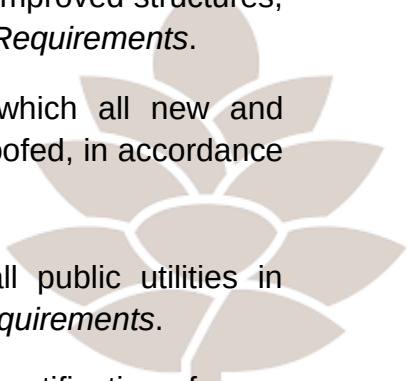
including alterations, movement, enlargement, replacement, repair, change of occupancy, additions, rehabilitations, renovations, substantial improvements, repairs of substantial damage, and any other improvement of or work on such buildings and structures, the Floodplain Administrator, in coordination with the Building Official, shall:

- (a) Estimate the market value, or require the applicant to obtain an appraisal of the market value prepared by a qualified independent appraiser, of the building or structure before the start of construction of the proposed work; in the case of repair, the market value of the building or structure shall be the market value before the damage occurred and before any repairs are made;
- (b) Compare the cost to perform the improvement, the cost to repair a damaged building to its pre-damaged condition, or the combined costs of improvements and repairs, if applicable, to the market value of the building or structure;
- (c) Determine and document whether the proposed work constitutes substantial improvement or repair of substantial damage; and
- (d) Notify the applicant if it is determined that the work constitutes substantial improvement or repair of substantial damage and that compliance with the flood resistant construction requirements of the NC Building Code and this Ordinance is required.

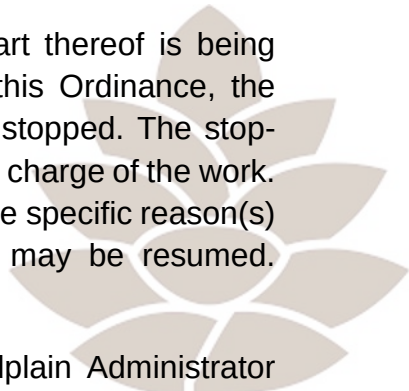
2.3. DUTIES AND RESPONSIBILITIES OF THE FLOODPLAIN ADMINISTRATOR

The Floodplain Administrator shall perform, but not be limited to, the following duties:

- A. Review all floodplain development applications and issue permits for all proposed development within Special Flood Hazard Areas or Community Flood Hazard Areas to assure that the requirements of this Ordinance have been satisfied.
- B. Review all proposed development within Special Flood Hazard Areas or Community Flood Hazard Areas to assure that all necessary local, State and Federal permits have been received.
- C. Notify adjacent communities and the North Carolina Department of Public Safety, Division of Emergency Management, State Coordinator for the National Flood Insurance Program prior to any alteration or relocation of a watercourse and submit evidence of such notification to the Federal Emergency Management Agency (FEMA).
- D. Assure that maintenance is provided within the altered or relocated portion of said watercourse so that the flood-carrying capacity is maintained.
- E. Prevent encroachments into floodways and non-encroachment areas unless the certification and flood hazard reduction provisions of *Section 3.5 Floodways and Non-Encroachment Areas* are met.

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- F. Obtain actual elevation (in relation to mean sea level) of the reference level (including basement) and all attendant utilities of all new and substantially improved structures, in accordance with the provisions of *Section 2.2(C) Certification Requirements*.
 - G. Obtain actual elevation (in relation to mean sea level) to which all new and substantially improved structures and utilities have been floodproofed, in accordance with the provisions of *Section 2.2(C) Certification Requirements*.
 - H. Obtain actual elevation (in relation to mean sea level) of all public utilities in accordance with the provisions of *Section 2.2(C) Certification Requirements*.
 - I. When floodproofing is utilized for a particular structure, obtain certifications from a registered professional engineer or architect in accordance with the provisions of *Section 2.2(C) Certification Requirements* and *Section 3.2(B) Nonresidential Construction*.
 - J. Where interpretation is needed as to the exact location of boundaries of the Special Flood Hazard Areas, floodways, or non-encroachment areas (for example, where there appears to be a conflict between a mapped boundary and actual field conditions), make the necessary interpretation. The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in this Ordinance.
 - K. When Base Flood Elevation (BFE) data has not been provided in accordance with the provisions of *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas*, obtain, review, and reasonably utilize any BFE data, along with floodway data or non-encroachment area data available from a Federal, State, or other source, including Community Flood Hazard data developed pursuant to *Section 3.5 Floodways and Non-Encroachment Areas*, in order to administer the provisions of this Ordinance.
 - L. When Base Flood Elevation (BFE) data is provided but no floodway or non-encroachment area data has been provided in accordance with the provisions of *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas*, obtain, review, and reasonably utilize any floodway data or non-encroachment area data available from a Federal, State, or other source in order to administer the provisions of this Ordinance.
 - M. Permanently maintain all records that pertain to the administration of this Ordinance and make these records available for public inspection, recognizing that such information may be subject to the Privacy Act of 1974, as amended.
 - N. Make on-site inspections of work in progress. As the work pursuant to a floodplain development permit progresses, the Floodplain Administrator shall make as many inspections of the work as may be necessary to ensure that the work is being done according to the provisions of the local ordinance and the terms of the permit. In exercising this power, the Floodplain Administrator has a right, upon presentation of proper credentials, to enter on any premises within the jurisdiction of the community

at any reasonable hour for the purposes of inspection or other enforcement action.

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- O. Issue stop-work orders as required. Whenever a building or part thereof is being constructed, reconstructed, altered, or repaired in violation of this Ordinance, the Floodplain Administrator may order the work to be immediately stopped. The stop-work order shall be in writing and directed to the person doing or in charge of the work. The stop-work order shall state the specific work to be stopped, the specific reason(s) for the stoppage, and the condition(s) under which the work may be resumed. Violation of a stop-work order constitutes a misdemeanor.
- P. Revoke floodplain development permits as required. The Floodplain Administrator may revoke and require the return of the floodplain development permit by notifying the permit holder in writing stating the reason(s) for the revocation. Permits shall be revoked for any substantial departure from the approved application, plans, and specifications; for refusal or failure to comply with the requirements of State or local laws; or for false statements or misrepresentations made in securing the permit. Any floodplain development permit mistakenly issued in violation of an applicable State or local law may also be revoked.
- Q. Make periodic inspections throughout the Special Flood Hazard areas or Community Flood Hazard Areas within the jurisdiction of the community. The Floodplain Administrator and each member of his or her inspections department shall have a right, upon presentation of proper credentials, to enter on any premises within the territorial jurisdiction of the department at any reasonable hour for the purposes of inspection or other enforcement action.
- R. Follow through with corrective procedures of *Section 2.5 Corrective Procedures*.
- S. Review, provide input, and make recommendations for variance requests.
- T. Maintain a current map repository to include, but not limited to, the FIS Report, FIRM and other official flood maps and studies adopted in accordance with the provisions of *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas* of this Ordinance, including any revisions thereto, including Letters of Map Change, issued by FEMA. Notify State and FEMA of mapping needs.
- U. Coordinate revisions to FIS reports and FIRMs, including Letters of Map Revision Based on Fill (LOMR-Fs) and Letters of Map Revision (LOMRs).
- V. Make substantial improvement and post event damage assessments and determinations:
- Conduct damage assessments for damaged structures located within the SFHA or Community Flood Hazard Area.
 - Complete substantial improvement/damage determinations in accordance with the provisions of *Section 3.2 Specific Standards*.

W. When the lowest floor and the lowest adjacent grade of a structure or the lowest ground elevation of a parcel in a Special Flood Hazard Area is above the BFE, advise the property owner of the option to apply for a Letter of Map Amendment (LOMA) from FEMA. Maintain a copy of the LOMA issued by FEMA in the floodplain development permit file.

2.4. PENALTIES FOR VIOLATION

A. Violations.

1. Violation of the provisions of this Ordinance or failure to comply with any of its requirements, including violation of conditions and safeguards established in connection with grants of variance or special exceptions, shall constitute a Class 1 misdemeanor, each day such violation continues shall be considered a separate offense. Nothing herein contained shall prevent the Village of Pinehurst from taking such other lawful action as is necessary to prevent or remedy any violation.

B. Penalties. The following penalties may be imposed:

1. **Stop Work Order.** The Floodplain Administrator, or designee, may order work on any site within a Special Flood Hazard Area to be immediately stopped whenever a building or part thereof is being constructed, reconstructed, altered, or repaired in violation of this Ordinance. The stop work order shall be in writing and directed to the person doing the work. The stop work order shall state the specific work to be stopped, the specific reasons for the stoppage, and the conditions under which the work may be resumed. Violation of a stop work order shall constitute a misdemeanor.
2. **Revocation of Permits.** The Floodplain Administrator, or designee, may revoke and require the return of a permit by notifying the permit holder in writing stating the reason for the revocation. Permits shall be revoked for any substantial departure from the approved application, plans, or specifications; for refusal or failure to comply with the requirements of State or local laws; or for false statements or misrepresentations made in securing the permit. Any permit mistakenly issued in violation of an applicable State or local law may also be revoked.

2.5. CORRECTIVE PROCEDURES

- A. **Stop Work Order.** The floodplain administrator may issue a stop work order, which shall be served on the applicant or other responsible person. The stop work order shall remain in effect until the applicant or other responsible person has taken the remedial measures set forth in the notice of violation or has otherwise remedied the violation or violations described therein, provided the stop work order may be withdrawn or modified to enable the applicant or other responsible person to take the necessary remedial measures to remedy such violation or violations.

B. **Notice of Violation.** If the floodplain administrator determines that an owner, occupant, applicant or other responsible person has failed to comply with the terms and conditions of a permit, or the provisions of this Ordinance, it shall issue a written notice of violation, by certified return receipt mail, to such applicant or other responsible person. Where the person is engaged in activity covered by this Ordinance without having first secured a permit, the notice shall be served on the owner or the responsible person in charge of the activity being conducted on the site. The notice of violation shall contain:

- a) The name and address of the owner or the applicant or the responsible person;
- b) The address or other description of the site upon which the violation is occurring;
- c) A statement specifying the nature of the violation;
- d) A description of the remedial measures necessary to bring the action or inaction into compliance with the permit or this Ordinance and the date for the completion of such remedial action;
- e) A statement of the penalty or penalties that may be assessed against the person to whom the notice of violation is directed, and;
- f) A statement that the determination of violation may be appealed to the Board of Adjustment by filing a written notice of appeal within thirty days after the notice of violation (except that, in the event the violation constitutes an immediate danger to public health or public safety, 24-hour notice shall be sufficient).

C. **Additional Enforcement Actions.** If the remedial measures described in the Notice of Violation have not been completed by the date set forth for such completion in the Notice of Violation, any one or more of the following enforcement actions may be enacted against the person to whom the Notice of Violation was directed. Before taking any of the following actions or imposing any of the following penalties, the Village of Pinehurst shall first notify the owner, applicant or other responsible person in writing of its intended action. The Village of Pinehurst shall provide reasonable opportunity, of not less than ten days (except, in the event the violation constitutes an immediate danger to public health or public safety, 24-hour notice shall be sufficient) to remedy such violation. In the event the applicant or other responsible person fails to remedy such violation after such notice and remedial period, the Village of Pinehurst may take or impose any one or more of the following enforcement actions or penalties:

- Termination of utility service and/or withhold or revoke Certificate of Occupancy: The community may terminate utilities and/or refuse to issue and/or revoke a certificate of occupancy for the building or

other improvements and/or repairs conducted or being conducted on the site until the applicant or other responsible person has taken the remedial measures set forth in the notice of violation or has otherwise remedied the violation or violations described therein.

- Suspension, revocation, or modifications of permit: The community may suspend, revoke, or modify the permit authorizing the development project. A suspended, revoked, or modified permit may be reinstated after the applicant or other responsible person has taken the remedial measures set forth in the notice of violation or has otherwise remedied the violations described therein, provided such permit may be reinstated (upon such conditions as the community may deem necessary) to enable the applicant or other responsible person to take the necessary remedial measures to cure such violations.
- Civil penalties: Violation of the provisions of this Ordinance or failure to comply with any of its requirements, including violation of conditions and safeguards established in connection with grants of variance or special exceptions shall constitute a Class 1 misdemeanor pursuant to North Carolina General Statute § 143-215.58.
 - Any person who violates this Ordinance or fails to comply with any of its requirements shall, upon conviction thereof, be fined not more than **\$500**. Each day such violation continues shall be considered a separate offense. Nothing herein contained shall prevent the Village of Pinehurst from taking such other lawful actions, pursuant to North Carolina General Statute § 153A, 160A, and 160D, as is necessary to prevent or remedy any violation.
 - Enforcement by an appropriate equitable remedy issuing from a court of competent jurisdiction may be pursued if the offender fails to remedy the violation, pays assessed fines, and/or fails to file an appeal within the prescribed period of time. In such case, the general court of justice shall have jurisdiction to issue such orders as may be appropriate.

D. Administrative appeal; judicial review. Any person receiving a Notice of Violation may appeal the determination of the community, including but not limited to the issuance of a stop work order, the assessment of an administratively-imposed monetary penalty, the suspension, revocation, modification, or grant with condition of a permit by the community upon finding that the holder is in violation of permit conditions, or that the holder is in violation

of any applicable ordinance or any of the community's rules and regulations, or the issuance of a notice of bond forfeiture.

- Any person receiving a Notice of Violation may appeal the determination of the floodplain administrator to the Board of Adjustment. The Notice of Appeal must be in writing and be received by the floodplain administrator and the clerk to the Board of Adjustment within thirty (30) days of the date of the Notice of Violation. In the absence of an appeal, the determination of the floodplain administrator shall be final.
- All appeals shall be heard and decided by the Board of Adjustment. The Board of Adjustment shall hear an appeal within a reasonable time and shall have the power to affirm, modify, or reject the original penalty, including the right to increase or decrease the amount of any monetary penalty and the right to add or delete remedial actions required for correction of the violation and compliance with the community's Flood Damage Prevention Ordinance, and any other applicable local, State, or Federal requirements. In the absence of a petition for review of a quasi-judicial decision, the decision of the Appeal Board shall be final.
- A petition for review of a quasi-judicial decision can be requested by any person with standing aggrieved by a decision or order of the community, after exhausting his/her administrative remedies. The petition shall be received by the clerk of superior court within 30 days of the date of the local governing body decision.

E. **Section 1316 Declaration.** Section 1316 of the National Flood Insurance Act authorizes FEMA to deny flood insurance to a property declared by the State, County, or Municipal government to be in violation of the local floodplain management ordinance. A Section 1316 declaration shall be used when all other legal means to remedy a violation have been exhausted and the structure remains noncompliant. The community must coordinate a request for Section 1316 declaration to the FEMA Regional Office through the State NFIP Coordinator.

Once invoked, the property's flood insurance coverage will be terminated and no new or renewal policy can be issued; no flood insurance claim can be paid on any policy on the property, and disaster assistance will be denied. If a structure that has received a Section 1316 declaration is made compliant with the community's floodplain management ordinance, then the Section 1316 declaration can be rescinded by FEMA and flood insurance eligibility restored.

2.6.VARIANCE PROCEDURES

A. The Board of Adjustment, established by the Village of Pinehurst hereinafter referred to as the "appeal board", shall hear and decide requests for variances from the requirements of this Ordinance.

B. Any person aggrieved by the decision of the appeal board may appeal such decision to the court, as provided in G.S. Ch. 7A and 160D.

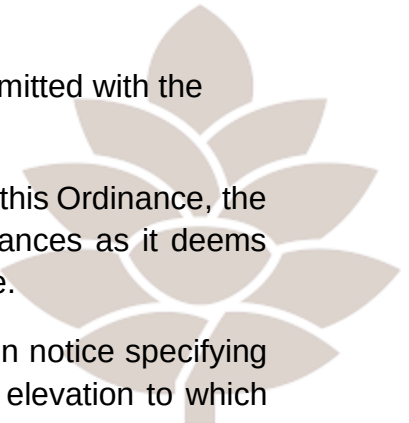
C. Variances may be issued for:

1. The repair or rehabilitation of historic structures upon the determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and that the variance is the minimum necessary to preserve the historic character and design of the structure;
2. Functionally dependent facilities if determined to meet the definition as stated in *Section 1.5 Definitions*, provided the provisions of *Section 2.6(I) Conditions for Variances* have been satisfied, and such facilities are protected by methods that minimize flood damages during the base flood and create no additional threats to public safety; or
3. Any other type of development, provided it meets the requirements of this Section.

D. In passing upon variances, the appeal board shall consider all technical evaluations, all relevant factors, all standards specified in other sections of this Ordinance, and:

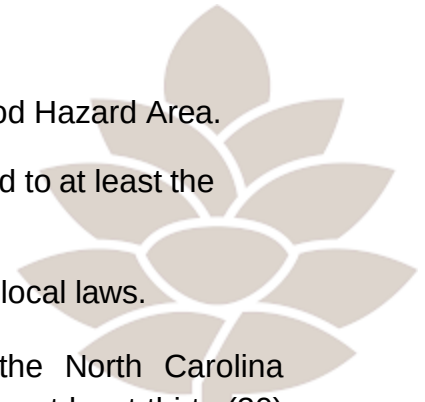
1. The danger that materials may be swept onto other lands to the injury of others;
2. The danger to life and property due to flooding or erosion damage;
3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. The importance of the services provided by the proposed facility to the community;
5. The necessity to the facility of a waterfront location as defined under *Section 1.5 Definitions* of this Ordinance as a functionally dependent facility, where applicable;
6. The availability of alternative locations, not subject to flooding or erosion damage, for the proposed use;
7. The compatibility of the proposed use with existing and anticipated development;
8. The relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
9. The safety of access to the property in times of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site; and
11. The costs of providing governmental services during and after flood conditions

including maintenance and repair of public utilities and facilities such as sewer, gas, electrical and water systems, and streets and bridges.

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- E. A written report addressing each of the above factors shall be submitted with the application for a variance.
 - F. Upon consideration of the factors listed above and the purposes of this Ordinance, the appeal board may attach such conditions to the granting of variances as it deems necessary to further the purposes and objectives of this Ordinance.
 - G. Any applicant to whom a variance is granted shall be given written notice specifying the difference between the Base Flood Elevation (BFE) and the elevation to which the structure is to be built and that such construction below the BFE increases risks to life and property, and that the issuance of a variance to construct a structure below the BFE will result in increased premium rates for flood insurance up to \$25 per \$100 of insurance coverage. Such notification shall be maintained with a record of all variance actions, including justification for their issuance.
 - H. The Floodplain Administrator shall maintain the records of all appeal actions and report any variances to the Federal Emergency Management Agency and the State of North Carolina upon request.
 - I. **Conditions for Variances.**
 - 1. Variances shall not be issued when the variance will make the structure in violation of other Federal, State, or local laws, regulations, or ordinances.
 - 2. Variances shall not be issued within any designated floodway or non-encroachment area if the variance would result in any increase in flood levels during the base flood discharge.
 - 3. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
 - 4. Variances shall only be issued prior to development permit approval.
 - 5. Variances shall only be issued upon:
 - (1) A showing of good and sufficient cause;
 - (2) A determination that failure to grant the variance would result in exceptional hardship; and
 - (3) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, or extraordinary public expense, create nuisance, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
 - J. A variance may be issued for solid waste disposal facilities or sites, hazardous waste management facilities, salvage yards, and chemical storage facilities that are located

in Special Flood Hazard Areas if all of the following conditions are met:

1. The use serves a critical need in the community.
2. No feasible location exists for the use outside the Special Flood Hazard Area.
3. The reference level of any structure is elevated or floodproofed to at least the Regulatory Flood Protection Elevation.
4. The use complies with all other applicable Federal, State and local laws.
5. The Village of Pinehurst has notified the Secretary of the North Carolina Department of Public Safety of its intention to grant a variance at least thirty (30) calendar days prior to granting the variance, in accordance with North Carolina General Statutes §143-215.54A(b).



3. PROVISIONS FOR FLOOD HAZARD REDUCTION

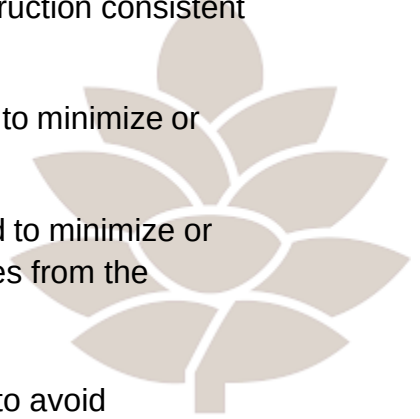
3.1. GENERAL STANDARDS

In all Special Flood Hazard Areas, the following provisions are required:

- A. All new construction and substantial improvements shall be designed (or modified) and adequately anchored to prevent flotation, collapse, and lateral movement of the structure.
- B. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage, in accordance with FEMA Technical Bulletin 2, *Flood Damage-Resistant Materials Requirements*.
- C. All new construction and substantial improvements shall be constructed by methods and practices that minimize flood damages.
- D. All new electrical, heating, ventilation, air-conditioning, plumbing, duct systems, and other building utility systems, equipment, and service facilities must be located at or above the Regulatory Flood Protection Elevation (RFPE) and/or specially designed to prevent water from entering or accumulating within the components and installed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation. Utility systems, equipment, and service facilities include, but are not limited to, HVAC equipment, water softener units, bath/kitchen plumbing fixtures, ductwork, electric/gas meter panels/boxes, utility/cable boxes, water heaters, fuel tanks, and electric outlets/switches.
 1. Replacements that are part of a substantial improvement must also meet the above provisions.
 2. Replacements that are for maintenance and not part of a substantial

improvement may be installed at the original location provided the addition and/or improvements comply with the standards for new construction consistent with the code and requirements for the original structure.

- E. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system.
- F. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into floodwaters.
- G. On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during flooding.
- H. Nothing in this Ordinance shall prevent the repair, reconstruction, or replacement of a building or structure existing on the effective date of this Ordinance and located totally or partially within the floodway, non-encroachment area, or stream setback, provided there is no additional encroachment below the Regulatory Flood Protection Elevation in the floodway, non-encroachment area, or stream setback, and provided that such repair, reconstruction, or replacement meets all of the other requirements of this Ordinance.
- I. New solid waste disposal facilities and sites, hazardous waste management facilities, salvage yards, and chemical storage facilities shall not be permitted, except by variance as specified in *Section 2.6 Variance Procedures*. A structure or tank for chemical or fuel storage incidental to an allowed use or to the operation of a water treatment plant or wastewater treatment facility may be in a Special Flood Hazard Area only if the structure or tank is either elevated or floodproofed to at least the Regulatory Flood Protection Elevation and certified in accordance with the provisions of *Section 2.2(C) Certification Requirements*.
- J. All subdivision proposals and other development proposals shall be consistent with the need to minimize flood damage.
- K. All subdivision proposals and other development proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.
- L. All subdivision proposals and other development proposals shall have adequate drainage provided to reduce exposure to flood hazards.
- M. All subdivision proposals and other development proposals shall have received all necessary permits from those governmental agencies for which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334.
- N. When a structure is partially located in a flood hazard risk zone with multiple Base Flood Elevations, the provisions for the more restrictive flood hazard risk zone and the highest BFE shall apply.



- O. When a building or structure is located in more than one flood hazard zone or in a flood hazard zone with multiple Base Flood Elevations, the provisions for the more restrictive flood hazard zone and the highest BFE shall apply.

3.2. SPECIFIC STANDARDS

In all Special Flood Hazard Areas where Base Flood Elevation (BFE) data has been provided, as set forth in *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas*, or *Section 3.3 Standards for Floodplains Without Established Base Flood Elevations*, the following provisions, in addition to the provisions of *Section 3.1 General Standards*, are required:

- A. **Residential Construction.** New construction and substantial improvement of any residential structure (including manufactured homes) shall have the reference level, including basement, elevated no lower than the Regulatory Flood Protection Elevation, as defined in *Section 1.5 Definitions* of this Ordinance.
- B. **Nonresidential Construction.** New construction and substantial improvement of any commercial, industrial, or other nonresidential structure shall have the reference level, including basement, elevated no lower than the Regulatory Flood Protection Elevation, as defined in *Section 1.5 Definitions* of this Ordinance. Structures located in A, AE, AO, AH and A99 Zones may be floodproofed to the Regulatory Flood Protection Elevation in lieu of elevation provided that all areas of the structure, together with attendant utility and sanitary facilities, below the Regulatory Flood Protection Elevation are watertight with walls substantially impermeable to the passage of water, using structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy. For AO Zones, the floodproofing elevation shall be in accordance with *Section 3.5 Floodways and Non-Encroachment Areas*. A registered professional engineer or architect shall certify that the floodproofing standards of this subsection are satisfied. Such certification shall be provided to the Floodplain Administrator as set forth in *Section 2.2(C) Certification Requirements*, along with the operational plan and the inspection and maintenance plan.
- C. **Manufactured Homes.**
1. New and replacement manufactured homes shall be elevated so that the reference level of the manufactured home is no lower than the Regulatory Flood Protection Elevation, as defined in *Section 1.5 Definitions* of this Ordinance.
 2. Manufactured homes shall be securely anchored to an adequately anchored foundation to resist flotation, collapse, and lateral movement, either by certified engineered foundation system, or in accordance with the most current edition of the State of North Carolina Regulations for Manufactured Homes adopted by the Commissioner of Insurance pursuant to G.S. 143-143.15. Additionally, when the elevation would be met by an elevation of the chassis thirty-six (36) inches or less above the grade at the site, the chassis shall be supported by reinforced

piers or engineered foundation. When the elevation of the chassis is above thirty-six (36) inches in height, an engineering certification is required.

3. All enclosures or skirting below the lowest floor shall meet the requirements of *Section 3.2(D) Elevated Buildings*.
4. An evacuation plan must be developed for evacuation of all residents of all new, substantially improved or substantially damaged manufactured home parks or subdivisions located within flood-prone areas. This plan shall be filed with and approved by the Floodplain Administrator and the local Emergency Management Coordinator.

D. Elevated Buildings. Fully enclosed areas of new construction and substantially improved structures that are below the lowest floor:

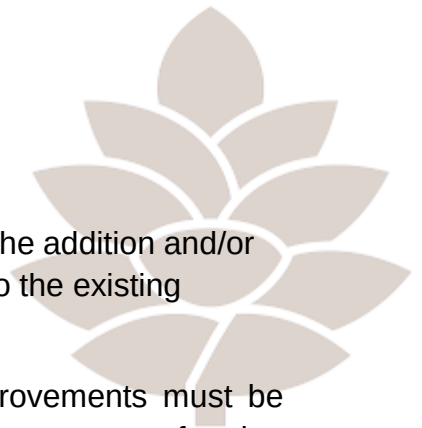
1. Shall not be designed or used for human habitation, but shall only be used for parking of vehicles, building access, or limited storage of maintenance equipment used in connection with the premises. Access to the enclosed area shall be the minimum necessary to allow for parking of vehicles (garage door) or limited storage of maintenance equipment (standard exterior door), or entry to the living area (stairway or elevator). The interior portion of such enclosed area shall not be finished or partitioned into separate rooms, except to enclose storage areas;
2. Shall be constructed entirely of flood resistant materials at least to the Regulatory Flood Protection Elevation; and
3. Shall include flood openings to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters. To meet this requirement, the openings must either be certified by a professional engineer or architect or meet or exceed the following minimum design criteria:
 - (1) A minimum of two (2) flood openings on different sides of each enclosed area subject to flooding;
 - (2) The total net area of all flood openings must be at least one (1) square inch for each square foot of enclosed area subject to flooding;
 - (3) If a building has more than one (1) enclosed area, each enclosed area must have flood openings to allow floodwaters to automatically enter and exit;
 - (4) The bottom of all required flood openings shall be no higher than one (1) foot above the adjacent grade;
 - (5) Flood openings may be equipped with screens, louvers, or other coverings or devices, provided they permit the automatic flow of floodwaters in both directions; and
 - (6) Enclosures made of flexible skirting are not considered enclosures for regulatory purposes, and, therefore, do not require flood openings. Masonry

or wood underpinning, regardless of structural status, is considered an enclosure and requires flood openings as outlined above.

4. Shall not be temperature-controlled or conditioned

E. Additions/Improvements.

1. Additions and/or improvements to pre-FIRM structures when the addition and/or improvements in combination with any interior modifications to the existing structure are:
 - (1) Not a substantial improvement, the addition and/or improvements must be designed to minimize flood damages and must not be any more nonconforming than the existing structure.
 - (2) A substantial improvement, with modifications/rehabilitations/improvements to the existing structure or the common wall is structurally modified more than installing a doorway, both the existing structure and the addition must comply with the standards for new construction.
2. Additions to post-FIRM structures with no modifications to the existing structure other than a standard door in the common wall shall require only the addition to comply with the standards for new construction.
3. Additions and/or improvements to post-FIRM structures when the addition and/or improvements in combination with any interior modifications to the existing structure are:
 - (1) Not a substantial improvement, the addition and/or improvements only must comply with the standards for new construction.
 - (2) A substantial improvement, both the existing structure and the addition and/or improvements must comply with the standards for new construction.
4. Any combination of repair, reconstruction, rehabilitation, addition or improvement of a building or structure taking place during any five (5) year period, the cumulative cost of which equals or exceeds 50 percent (50%) of the market value of the structure before the improvement or repair is started must comply with the standards for new construction. For each building or structure, the five (5) year period begins on the date of the first improvement or repair of that building or structure after the effective date of this Ordinance. Substantial damage also means flood-related damage sustained by a structure on two separate occasions during a 5-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25 percent (25%) of the market value of the structure before the damage occurred. If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. The requirement does not, however, include either:



(1) Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to assure safe living conditions.

(2) Any alteration of a historic structure provided that the alteration will not preclude the structure's continued designation as a historic structure.

F. Recreational Vehicles. Recreational vehicles shall either:

1. Placement of a Recreational Vehicle in the Regulatory Floodway or Non-Encroachment Area is prohibited. This includes both temporary and permanent placement.
2. Temporary Placement
 - (i) Be on site for fewer than 180 consecutive days; or
 - (ii) Be fully licensed and ready for highway use. (A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and has no permanently attached additions.)
3. Permanent Placement. Recreational vehicles that do not meet the limitations of Temporary Placement shall meet all the requirements for new construction.

G. Temporary Nonresidential Structures. Prior to the issuance of a floodplain development permit for a temporary structure, the applicant must submit to the Floodplain Administrator a plan for the removal of such structure(s) in the event of a hurricane, flash flood or other type of flood warning notification. The following information shall be submitted in writing to the Floodplain Administrator for review and written approval:

1. A specified time period for which the temporary use will be permitted. Time specified may not exceed three (3) months, renewable up to one year;
2. The name, address, and phone number of the individual responsible for the removal of the temporary structure;
3. The time frame prior to the event at which a structure will be removed (i.e., minimum of seventy-two (72) hours before landfall of a hurricane or immediately upon flood warning notification);
4. A copy of the contract or other suitable instrument with the entity responsible for physical removal of the structure; and
5. Designation, accompanied by documentation, of a location outside the Special Flood Hazard Area, to which the temporary structure will be moved.

H. Accessory Structures. When accessory structures (sheds, detached garages, etc.) are to be placed within a Special Flood Hazard Area, the following criteria shall be met:

1. When accessory structures (sheds, detached garages, etc.) with a footprint of no more than 600 square feet are placed within A, AO, AH, AE and A99 flood

zones, wet floodproofing may be permitted when the following criteria are met:

- (1) Accessory structures shall not be used for human habitation (including working, sleeping, living, cooking or restroom areas);
- (2) Accessory structures shall not be temperature-controlled;
- (3) Accessory structures shall be designed to have low flood damage potential;
- (4) Accessory structures shall be constructed and placed on the building site so as to offer the minimum resistance to the flow of floodwaters;
- (5) Accessory structures shall be firmly anchored in accordance with the provisions of *Section 3.1 General Standards*.
- (6) All service facilities such as electrical shall be installed in accordance with the provisions of *Section 3.1 General Standards*.
- (7) Flood openings to facilitate automatic equalization of hydrostatic flood forces shall be provided below Regulatory Flood Protection Elevation in conformance with the provisions of *Section 3.2(D) Elevated Buildings*.

2. All other accessory structures exceeding the size restrictions in *Section 3.2(H) Accessory Structures* must comply with the elevation or floodproofing standards and certification requirements in accordance with *Section 2.2(C) Certification Requirements*.

An accessory structure with a footprint of 150 square feet or less in A, AO, AH, AE and A99 zones satisfying the criteria outlined above in *Section 3.2(H) Accessory Structures* is not required to meet the elevation or floodproofing certification requirements of *Section 2.2(C) Certification Requirements*. All other accessory structures must comply with the elevation or floodproofing certification requirements in accordance with *Section 2.2(C) Certification Requirements*.

- I. **Tanks.** When gas and liquid storage tanks are to be placed within a Special Flood Hazard Area, the following criteria shall be met:

1. **Underground Tanks.** Underground tanks in flood hazard areas shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic loads during conditions of the design flood, including the effects of buoyancy assuming the tank is empty.
2. **Above-Ground Tanks, elevated.** Above-ground tanks in flood hazard areas shall be elevated to or above the Regulatory Flood Protection Elevation on a supporting structure that is designed to prevent flotation, collapse or lateral movement during conditions of the design flood. Tank-supporting structures shall meet the foundation requirements of the applicable flood hazard area.
3. **Above-ground Tanks Not Elevated.** Above-ground tanks that do not meet the elevation requirements of *Section 3.2(B) Nonresidential Construction* of this

Ordinance shall be permitted in flood hazard areas provided the tanks are designed, constructed, installed, and anchored to resist all flood-related and other loads, including the effects of buoyancy, during conditions of the design flood and without release of contents in the floodwaters or infiltration by floodwaters into the tanks. Tanks shall be designed, constructed, installed, and anchored to resist the potential buoyant and other flood forces acting on an empty tank during design flood conditions.

4. **Tank Inlets and Vents.** Tank inlets, fill openings, outlets and vents shall be:

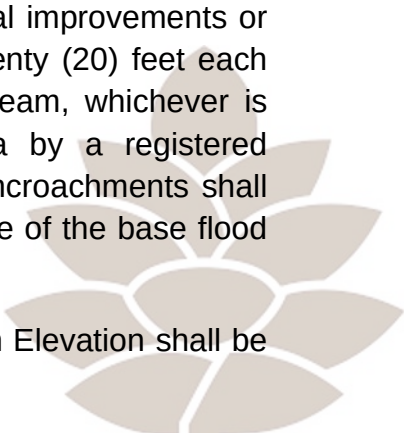
- (1) At or above the Regulatory Flood Protection Elevation or fitted with covers designed to prevent the inflow of floodwater or outflow of the contents of the tanks during conditions of the design flood; and
- (2) Anchored to prevent lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the design flood.

J. **Other Development.**

1. Fences in regulated floodways and NEAs that have the potential to block the passage of floodwaters, such as stockade fences and wire mesh fences, shall meet the limitations of *Section 3.5 Floodways and Non-Encroachment Areas* of this Ordinance.
2. Retaining walls, sidewalks and driveways in regulated floodways and NEAs. Retaining walls, sidewalks and driveways that involve the placement of fill in regulated floodways shall meet the limitations of *Section 3.5 Floodways and Non-Encroachment Areas* of this Ordinance.
3. Roads and watercourse crossings in regulated floodways and NEAs. Roads and watercourse crossings, including roads, bridges, culverts, low-water crossings and similar means for vehicles or pedestrians to travel from one side of a watercourse to the other side, that encroach into regulated floodways shall meet the limitations of *Section 3.5 Floodways and Non-Encroachment Areas* of this Ordinance.
4. Commercial storage facilities are not considered “limited storage” as noted in this Ordinance and shall be protected to the Regulatory Flood Protection Elevation as required for non-residential structures.

3.3 STANDARDS FOR FLOODPLAINS WITHOUT ESTABLISHED BASE FLOOD ELEVATIONS

A. Within the special flood hazard areas designated as Approximate Zone A and established in *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas*, where no Base Flood Elevation (BFE) data has been provided by FEMA, the following provisions, in addition to the provisions of *Section 3.1 General Standards*, shall apply:

- 
1. No encroachments, including fill, new construction, substantial improvements or new development shall be permitted within a distance of twenty (20) feet each side from top of bank or five (5) times the width of the stream, whichever is greater, unless certification with supporting technical data by a registered professional engineer is provided demonstrating that such encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.
 2. The BFE used in determining the Regulatory Flood Protection Elevation shall be determined based on the following criteria:
 - (1) When Base Flood Elevation (BFE) data is available from other sources, all new construction and substantial improvements within such areas shall also comply with all applicable provisions of this Ordinance and shall be elevated or floodproofed in accordance with standards in *Section 3.1 General Standards* and *Section 3.2 Specific Standards*.
 - (2) When floodway or non-encroachment data is available from a federal, State, or other source, all new construction and substantial improvements within floodway and non-encroachment areas shall also comply with the requirements of *Section 3.2 Specific Standards* and *Section 3.5 Floodways and Non-Encroachment Areas*.
 - (3) All subdivision, manufactured home park and other development proposals shall provide Base Flood Elevation (BFE) data if development is greater than five (5) acres or has more than fifty (50) lots/manufactured home sites. Such Base Flood Elevation (BFE) data shall be adopted by reference in accordance with *Section 1.7 Basis for Establishing the Special Flood Hazard Areas* and utilized in implementing this Ordinance.
 - (4) (4) When Base Flood Elevation (BFE) data is not available from a federal, State, or other source as outlined above, the reference level shall be elevated or floodproofed (nonresidential) to or above the Regulatory Flood Protection Elevation, as defined in *Section 1.5 Definitions*. All other applicable provisions of *Section 3.2 Specific Standards* shall also apply.

3.4. STANDARDS FOR RIVERINE FLOODPLAINS WITH BASE FLOOD ELEVATIONS BUT WITHOUT ESTABLISHED FLOODWAYS OR NON-ENCROACHMENT AREAS

- A. Along rivers and streams where Base Flood Elevation (BFE) data is provided by FEMA or is available from another source but neither floodway nor non-encroachment areas are identified for a Special Flood Hazard Area on the FIRM or in the FIS report, the following requirements shall apply to all development within such areas:
 1. Standards of *Section 3.1 General Standards* and *Section 3.2 Specific Standards*;
 2. Until a regulatory floodway or non-encroachment area is designated, no

encroachments, including fill, new construction, substantial improvements, or other development, shall be permitted unless certification with supporting technical data by a registered professional engineer is provided demonstrating that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

3.5. FLOODWAYS AND NON-ENCROACHMENT AREAS

A. Areas designated as floodways or non-encroachment areas are located within the Special Flood Hazard Areas established in *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas*. The floodways and non-encroachment areas are extremely hazardous areas due to the velocity of floodwaters that have erosion potential and carry debris and potential projectiles. The following provisions, in addition to standards outlined in *Section 3.1 General Standards* and *Section 3.2 Specific Standards*, shall apply to all development within such areas:

1. No encroachments, including fill, new construction, substantial improvements and other developments shall be permitted unless:

(1) It is demonstrated that the proposed encroachment would not result in any increase in the flood levels during the occurrence of the base flood, based on hydrologic and hydraulic analyses performed in accordance with standard engineering practice and presented to the Floodplain Administrator prior to issuance of floodplain development permit, or

(2) A Conditional Letter of Map Revision (CLOMR) has been issued by FEMA for proposed encroachments resulting in increases in the flood levels during the occurrence of the base flood discharge. A Letter of Map Revision (LOMR) must be obtained within six months of completion of the proposed encroachment.

(3) A Letter of Map Revision (LOMR) must be obtained within six months of completion of the proposed encroachment, permitted in accordance with *Section 3.5 Floodways and Non-Encroachment Areas*, if the encroachment results in changes to the floodway/non-encroachment area widths, and/or changes to the stream location.

B. If *Section 3.5 Floodways and Non-Encroachment Areas* is satisfied, all development shall comply with all applicable flood hazard reduction provisions of this Ordinance.

C. Manufactured homes may be permitted providing the following provisions are met:

1. The anchoring and the elevation standards of *Section 3.2 Specific Standards*; and

2. The encroachment standards of *Section 3.5 Floodways and Non-Encroachment Areas*.

D. Placement of recreational vehicles in the regulatory floodway or non-encroachment

area is prohibited.

3.6. STANDARDS FOR AREAS OF SHALLOW FLOODING (ZONE AO)

- A. Located within the Special Flood Hazard Areas established in *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas*, are areas designated as shallow flooding areas. These areas have Special Flood Hazards associated with base flood depths of one (1) to three (3) feet where a clearly defined channel does not exist and where the path of flooding is unpredictable and indeterminate. In addition to *Section 3.1 General Standards* and *Section 3.2 Specific Standards*, all new construction and substantial improvements shall meet the following requirements:
1. The reference level shall be elevated at least as high as the depth number specified on the Flood Insurance Rate Map (FIRM), in feet, plus a freeboard of two (2) feet, above the highest adjacent grade; or at least two (2) feet above the highest adjacent grade if no depth number is specified.
- B. Nonresidential structures may, in lieu of elevation, be floodproofed to the same level as required in *Section 3.6 Standards for Areas of Shallow Flooding (Zone AO)* so that the structure, together with attendant utility and sanitary facilities, below that level shall be watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. Certification is required in accordance with *Section 2.2(C) Certification Requirements* and *Section 3.2(B) Nonresidential Construction*.
- C. Adequate drainage paths shall be provided around structures on slopes, to guide floodwaters around and away from proposed structures.

3.7. STANDARDS FOR AREAS OF SHALLOW FLOODING (ZONE AH)

Located within the Special Flood Hazard Areas established in *Section 1.7 Basis for Establishing the Special Flood Hazard Areas and Community Flood Hazard Areas* are areas designated as shallow flooding areas. These areas are subject to inundation by 1-percent (1%) annual-chance shallow flooding (usually areas of ponding) where average depths are one (1) to three (3) feet. Base Flood Elevations are derived from detailed hydraulic analyses. In addition to *Section 3.1 and 3.2*, all new construction and substantial improvements shall meet the following requirements:

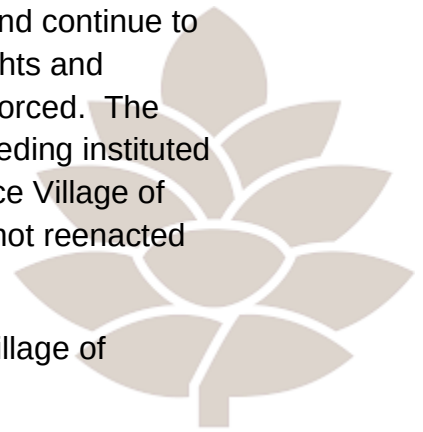
- (1) Adequate drainage paths shall be provided around structures on slopes, to guide floodwaters around and away from proposed structures.

4. LEGAL STATUS PROVISIONS

4.1. EFFECT ON RIGHTS AND LIABILITIES UNDER THE EXISTING FLOOD DAMAGE PREVENTION ORDINANCE.

This Ordinance in part comes forward by re-enactment of some of the provisions of

the Flood Damage Prevention Ordinance enacted September 17, 1990, as amended, and it is not the intention to repeal but rather to re-enact and continue to enforce without interruption of such existing provisions, so that all rights and liabilities that have accrued thereunder are reserved and may be enforced. The enactment of this Ordinance shall not affect any action, suit or proceeding instituted or pending. All provisions of the Flood Damage Prevention Ordinance Village of Pinehurst enacted on September 17, 1990, as amended, which are not reenacted herein are repealed.



The date of the initial Flood Damage Prevention Ordinance for the Village of Pinehurst is September 17, 1990.

4.2. EFFECT UPON OUTSTANDING FLOODPLAIN DEVELOPMENT PERMITS.

Nothing herein contained shall require any change in the plans, construction, size, or designated use of any development or any part thereof for which a floodplain development permit has been granted by the Floodplain Administrator or his or her authorized agents before the time of passage of this Ordinance; provided, however, that when construction is not begun under such outstanding permit within a period of six (6) months subsequent to the date of issuance of the outstanding permit, construction or use shall be in conformity with the provisions of this Ordinance.

4.3 SEVERABILITY.

If any section, clause, sentence, or phrase of the Ordinance is held to be invalid or unconstitutional by any court of competent jurisdiction, then said holding shall in no way affect the validity of the remaining portions of this Ordinance.

4.4. EFFECTIVE DATE.

This Ordinance shall become effective September 22, 2026.

4.5. ADOPTION CERTIFICATION.

I hereby certify that this is a true and correct copy of the Flood Damage Prevention Ordinance as adopted by the Village Council of Pinehurst, North Carolina, on the 22nd of September 2026.

WITNESS my hand and the official seal of the Village of Pinehurst, this the 22nd day of September 2026.

Shannon Bonecutter, Village of Pinehurst Clerk



**Planning and Zoning Board Statement of Consistency
with the 2019 Comprehensive Plan
September 3, 2026 Regular Meeting**

**Recommendation to Village Council on Updates to the
Flood Damage Prevention Ordinance**

The Village of Pinehurst Planning and Zoning Board finds that:

The proposed updates to the Flood Damage Prevention Ordinance **IS** consistent with the following Comprehensive Plan goals, strategies, and recommendations:

- **Guiding Principle 6 – Supporting Infrastructure & Utilities:** The Comprehensive Plan calls for the Village to ensure that supporting infrastructure and community facilities meet the needs of existing and future residents, businesses, and visitors, and to partner with other providers to plan for and expand infrastructure as necessary. The updated Flood Damage Prevention Ordinance establishes current technical standards for flood damage prevention by promoting public health, safety, and general welfare and to minimize public and private losses due to flooding by establishing and enforcing provisions.
- **Strategic Opportunity 9 – Expand and Enhance Stormwater Management Efforts:** The Comprehensive Plan identifies stormwater management as a strategic opportunity and includes Implementation Strategies 6.8, 6.9, and 6.10 addressing stormwater management strategies, future stormwater infrastructure, and post-construction stormwater maintenance requirements. The proposed Flood Damage Prevention Ordinance supports these recommendations by establishing updated standards for development within Special Flood Hazard Areas that reduce the risk and impacts of flooding and promote resilient development practices.
- **Guiding Principal 7 - All things Green: Parks, Open Spaces & Natural Resources – Implementation Strategies 7.9 and 7.15:** The Comprehensive Plan recommends protecting water features and floodplains and encouraging land conservation through appropriate zoning and development regulations. The proposed Flood Damage Prevention Ordinance supports these recommendations by establishing standards for development and construction within flood hazard areas designed to minimize flood damage, reduce risks to life and property, and protect the Village's natural resources and floodplain functions.
- **Guiding Principal 3- Places to Live:** The Comprehensive Plan advocates for protecting the quality and character of Pinehurst's existing residential neighborhoods. The Flood Damage Prevention Ordinance establishes standards intended to reduce the potential for flood damage to homes and property, promote safer residential development and redevelopment, and protect residents from the long-term impacts associated with flooding. By incorporating updated floodplain management standards and construction requirements, the ordinance supports the continued protection and enhancement of Pinehurst neighborhoods and helps ensure that they



HISTORY, CHARM, AND SOUTHERN HOSPITALITY_____

remain safe, resilient, and desirable places to live.

Therefore, the Village of Pinehurst Planning and Zoning Board recommends **APPROVAL** of the updates to the Flood Damage Prevention Ordinance.

This is the 3rd day of September, 2026

Chair of the Planning and Zoning Board

Cc: Michael Mandeville

DRAFT



Updates to the Village's Engineering Standards and Specifications Manual

ADDITIONAL AGENDA DETAILS:

The purpose of this public hearing is to consider proposed updates to the Village's Engineering Standards and Specifications Manual (ESSM).

FROM: Alex Cameron, Planning & Inspections Director
CC: Planning & Zoning Board;
DATE OF MEMO: 08/27/2026

MEMO DETAILS

The purpose of this agenda item is for the Planning and Zoning Board to conduct a public hearing and consider a recommendation to the Village Council regarding the proposed updates to the Village's Engineering Standards and Specifications Manual (ESSM).

Background

The ESSM was originally adopted by the Village Council in August 2004, with the most recent amendments adopted in December 2015. As part of the Village's ongoing Pinehurst Development Ordinance (PDO) Update Project, Village staff has worked with Kimley-Horn to comprehensively review and update the manual to ensure it reflects current engineering practices, regulatory requirements, and development standards.

The ESSM establishes minimum site design and infrastructure standards for new commercial development, subdivisions, streets and rights-of-way, and other development activities. The proposed revisions are intended to:

- Modernize the document's format and organization;
- Remove outdated references and obsolete procedures;
- Improve consistency between the ESSM, the PDO, and other applicable codes and regulations;
- Update terminology; and
- Clarify processes and procedures.

The updated ESSM maintains the general structure of the current manual while revising section titles and content to improve clarity, organization, and consistency with current engineering practices.

Analysis

This topic was previously presented to the Planning and Zoning Board as an informational item in advance of the public hearing. The updates remain consistent with the material presented during the previous meeting. Since that meeting, staff and the consultant have completed a final review of the document and have incorporated minor grammatical and editorial revisions, along with final updates to the standard details.

The following summarizes the primary proposed revisions to the ESSM:

Section 1 – Preliminary Considerations and Instructions

- Expanded procedures for requesting waivers from engineering standards.

Section 2 – General Provisions

- Addition of a definition for an "improved" public or private street.

Section 3 – Streets and Public Rights-of-Way

- Delegation of curb and gutter waiver approvals to the Village Engineer when supported by the design engineer's justification.
- Addition of Traffic Impact Study requirements for developments generating 1,000 average daily trips or 100 peak-hour trips.

Section 4 – Curb and Gutter, Driveways, Greenways, and Sidewalks

- Updates to greenway construction standards to reflect current materials and construction practices.

Section 5 – Stormwater Conveyance and Management

- Incorporation of Water Supply Watershed requirements.
- Requirement that new development demonstrate compliance with 2-, 10-, and 25-year pre- and post-development stormwater runoff rates.
- Addition of Stormwater Operation and Maintenance Manual and Agreement requirements.
- Authorization of additional pipe materials, including HDPE and HP pipe, where appropriate.

Section 6 – Water Distribution and Wastewater Collection

- Updates to required fire flow provisions based on recommendations from the Fire Department.

Appendices

- Minor revisions to approval blocks, checklists, and standard detail drawings.
- Addition of a standard road closure notification procedure.

Consistency with Adopted Comprehensive Plan

NCGS 160D-604 requires the Planning and Zoning Board to advise and comment on whether a proposed development regulation is consistent with an adopted comprehensive plan. The proposed ESSM is consistent with the following Comprehensive Plan goals, strategies, and recommendations:

- Guiding Principle 6 – Supporting Infrastructure & Utilities: The Comprehensive Plan calls for the Village to ensure that supporting infrastructure and community facilities meet the needs of existing and future residents, businesses, and visitors, and to partner with other providers to plan for and expand infrastructure as necessary. The updated ESSM establishes current technical standards for streets, rights-of-way, stormwater, water distribution, wastewater collection, and other development infrastructure that support this objective.
- Strategic Opportunity 4 – Promote High Quality Development and Design: The Comprehensive Plan identifies the need to promote high-quality development and design through updated development standards. The proposed ESSM supports this objective by modernizing and clarifying the technical standards that govern the design and construction of development-related infrastructure.
- Strategic Opportunity 9 – Expand and Enhance Stormwater Management Efforts: The Comprehensive Plan identifies stormwater management as a strategic opportunity and includes Implementation Strategies 6.8, 6.9, and 6.10 addressing stormwater management strategies, future stormwater infrastructure, and post-construction stormwater maintenance requirements. The proposed ESSM supports these recommendations through updated stormwater conveyance and management standards, including pre- and post-development runoff requirements and Stormwater Operation and Maintenance Manual and Agreement requirements.
- Supporting Infrastructure & Utilities – Implementation Strategies 6.11 and 6.12: The Comprehensive Plan calls for adequate water and sewer infrastructure capacity and timely transportation system improvements to meet the needs of the community and anticipated development. The updated ESSM supports these strategies through revised standards for water distribution, wastewater collection, streets, rights-of-way, and traffic impact studies.
- Moving Around the Village: Transportation, Mobility & Parking: The Comprehensive Plan identifies streets, sidewalks, paths, and trails as important components of the Village's transportation system. The proposed ESSM updates standards for streets, public rights-of-way, sidewalks, greenways, and related infrastructure, supporting the Plan's objectives for a safe, connected, and functional transportation network.

Therefore, staff finds that the proposed Engineering Standards and Specifications Manual is consistent with the adopted Comprehensive Plan and supports the Plan's goals related to high-quality development, infrastructure, transportation, and stormwater management.

Staff Recommendation

Staff recommends that the Planning and Zoning Board recommend approval of the proposed updates to the Engineering Standards and Specifications Manual to the Village Council.

The proposed updated ESSM modernizes the Village's engineering standards, removes outdated provisions,

clarifies procedures, and improves consistency with the PDO and other applicable regulations. The update also incorporates current engineering practices and technical standards related to transportation, stormwater, utilities, greenways, sidewalks, and other public infrastructure.

Following the public hearing and deliberation, the Planning and Zoning Board may make one of the following recommendations to the Village Council:

1. Recommend approval of the proposed Engineering Standards and Specifications Manual as presented;
2. Recommend approval with changes to the proposed Engineering Standards and Specifications Manual; or
3. Recommend denial of the proposed Engineering Standards and Specifications Manual.

Attachments:

- Proposed ESSM in underline strike through format.
- Draft Comprehensive Plan Consistency Statement

ATTACHMENTS

1. ESSM Update Redline Strikethrough
2. Draft Comp Plan Consistency Statement ESSM Update



PINEHURST ENGINEERING STANDARDS AND SPECIFICATIONS MANUAL

August 24, 2026 DRAFT

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SECTION 1. PRELIMINARY CONSIDERATIONS AND INSTRUCTIONS



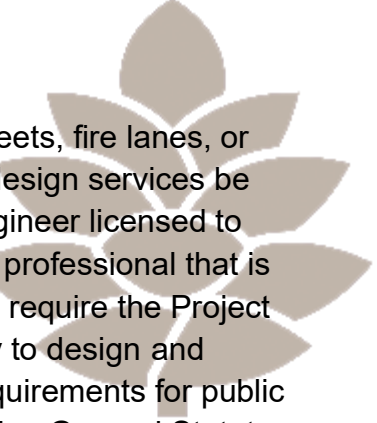
SECTION 1.1 GENERAL

The Standard Specifications as contained herein are to be utilized as the minimum standards for all new development within the jurisdiction of the Village of Pinehurst. New development shall include, but is not limited to, commercial building sites, subdivisions, improvements in the Village right-of-way and similar developments but shall expressly exclude in-fill lots and development on previously platted individual residential lots not part of a larger common plan of development.

All development projects shall also comply with the most recent version of the Village of Pinehurst ***“Pinehurst Development Ordinance”*** (PDO) and the Pinehurst Municipal Code of Ordinances, as well as all other applicable State and Federal codes, regulations and laws. Design and development standards for buildings, platted residential sites, and additional items (including but not limited to off-street parking, landscaping, setbacks and buffers, lighting, signage, etc.) are provided in the PDO and Municipal Code.

The purpose of these Specifications is to present **minimum** standards for typical conditions encountered. For infrastructure and engineering design matters not specifically covered in this Engineering Standards and Specifications Manual (~~Manual~~), the Project Designer should schedule a pre-design meeting with the Village Engineer to determine specific standards for those items. Failure on the part of the Project Designer to contact the Village Engineer ~~an adequate amount of time~~ prior to plan submittals for special standards and details may result in review and approval delays.

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All projects that include construction of storm drainage facilities, streets, fire lanes, or other improvements included within this ~~M~~Manual require that the design services be performed by, or under the direct supervision of, a Professional Engineer licensed to practice in the State of North Carolina, or an appropriately licensed professional that is qualified to provide such services. The Village reserves the right to require the Project Designer to submit evidence of professional licensure and authority to design and assume responsibility for proposed improvements. Design plan requirements for public water and public sewer shall be in accordance with the North Carolina General Statutes and ~~Moore County Public Works Standards~~ the utility provider's standards.

The existence of these Standard Specifications and Construction Details in no way relieves the Project Designer of the responsibility to correctly adapt these standards to the actual site conditions encountered on specific projects. The Project Designer shall review the applicable portions of these specifications and determine that these minimum standards will function correctly for the project.

There may be circumstances whereby the Project Designer may wish to ~~employ additional strength pipe, bedding requirements, reinforcing, etc~~ modify or request a waiver from certain standards included within this Manual. ~~-~~ In such situations where the designer wishes to propose any exceptions or deviations from these standards, the design professional should consult with the Village Engineer prior to plan submittal. The Village Engineer may require the design professional to provide written, sealed documentation detailing the requested change, explaining why the deviation is necessary, providing technical justification, and any additional supporting documentation. Failure to consult with the Village Engineer prior to plan submittal may result in delayed review times. If granted, such approvals must be clearly indicated on the construction drawings and noted on the Certification Block on the Cover Sheet. ~~In such situations where the designer wishes to propose any changes or modifications to these standards, the Village Engineer should be consulted prior to completion of final design and plan submittal. This will serve to help ensure that the plan review time is minimized. Such approval shall be clearly indicated at one location on the construction drawings and labeled "Exceptions to the Standard Specifications of the Village of Pinehurst."~~

These standards are available on the Village of Pinehurst website (www.vopnc.org) and periodic updates may also be posted on the website. It shall be the responsibility of the Project Designer to ensure that his/her copy of the ~~manual~~ Manual is current and kept up-to-date.

~~Projects shall be constructed according to the Standard Specifications in effect at the time the project receives final construction approval by the Village of Pinehurst.~~ The project contractor shall have at least one (1) complete set of approved plans at the job site at all times that work is being performed.

SECTION 1.2 SUBMITTAL REQUIREMENTS

Persons desiring to construct subdivisions, roadway, sidewalk, storm drainage, or utility extensions, or other site improvements within the jurisdiction of the Village of Pinehurst must submit final construction drawings sealed by an appropriately licensed professional in the State of North Carolina.

All plans shall include the Village's standard approval blocks as follows:

- Construction Plan Approval Block on all sheets
- Infrastructure Inspection Notice To Contractor Block on all sheets
- Signed and Sealed Certification Block on the Cover Sheet noting any and all deviations from Village Standards
- Authorization To Construction Improvements Block on the Cover Sheet including permit numbers and issue dates for all applicable state or federal permits.

Copies of these blocks are provided in the Appendix of this ~~manual~~ Manual for reference. Digital (~~AutoCAD~~) copies may be obtained by contacting the Village Engineer.

The submittal process for subdivisions and site plans (both Minor and Major) are identified in the PDO. For development not subject to subdivision or site plan review (such as a roadway extension within an existing platted area), please consult with the Village Engineer regarding submittal requirements.

~~The Village's standard Plan Review Fees Worksheet shall accompany all sets of final drawings presented to the Village for approval along with payment of the calculated review fee. This worksheet is available on the Village's website, and shall be signed, sealed, and dated by the North Carolina licensed design professional responsible for the project. No plans shall be reviewed until all plan review fees are paid in full.~~

~~The Village's standard Infrastructure Inspection Fees Worksheet shall also accompany all sets of final drawings presented to the Village for Construction Plan Approval. This worksheet is available on the Village's website, and shall be signed, sealed, and dated by the North Carolina licensed design professional responsible for the project. No plans will be granted Final Construction Approval until such time as all required fees are paid in full.~~

~~In the event the Village levies re-inspection fees due to dilatory progress or continued poor workmanship by any of the Contractors at the site thus necessitating repeated inspections, all re-inspection fees shall be promptly paid or the Village Engineer may issue a "Stop Work" order for all activities at the site until such time as the re-inspection fees are paid in full.~~

~~The above worksheets must be submitted in addition to the applicable worksheets and fees required for site plan and subdivision approval by the PDO.~~

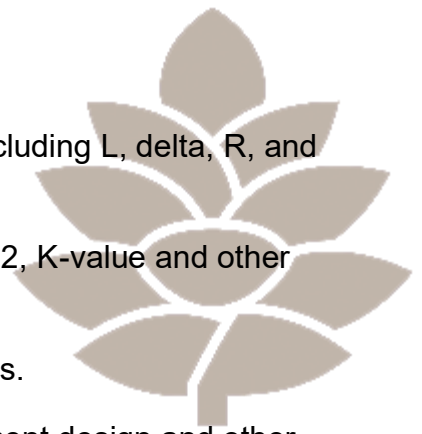
SECTION 1.3 PLAN REQUIREMENTS

SECTION 1.3.1 SUBDIVISIONS

All plan submittals for subdivision construction should, at a minimum, include the following elements. These elements are in addition to the specific requirements set forth in the PDO. More detailed information is contained in the pertinent sections for each type of infrastructure.

- A. Plans sealed and signed by an appropriately licensed design professional registered to practice in North Carolina. Plan size shall be 24" x 36" unless otherwise approved by the Village Engineer.
- B. Plan/profile drawings shall be provided for all street/sidewalk improvements, off-street sanitary sewers, storm sewers and culverts, water mains, sanitary sewer force mains, and for all utility extensions. All plan/profile drawings shall be prepared at a scale of not less than: 1" = 50' Horizontal and 1" = 5' Vertical (existing grades shall be based on field survey).
- C. Boundary of the tract with all ~~courses~~ bearings and distances indicated. At least one (1) corner of the tract shall be tied to the NC Plane Coordinate System with x, y, & z coordinates for that corner specified on the drawings. A tieline giving bearing and distance from the control corner specified to the NCGS monument used shall also be shown on the plans with the monument name and data called out.
- D. Vicinity Map, scale of drawings, and NC Grid North directional arrow.
- E. Master Plan(s) showing all improvements and including: existing contour elevations (1-foot intervals) and USGS datum with benchmarks indicated.
- F. 100-year flood plain limits and notation as to the NFIP-FIRM map/panel/community #, effective/index date.
- G. Owner, PIN #, and zoning of all properties adjoining the site shall be noted on each adjoining parcel shown in the drawings.
- H. Tract area and specific data required by the PDO.
- I. **Public & Private Streets.**
 - 1. Street width - back-to-back of curbs or edge of pavement.

NOTE: Street width shall conform to applicable Village Thoroughfare and Transportation Plans as well as the sections presented in the Standard Details.
 - 2. Right-of-way width.

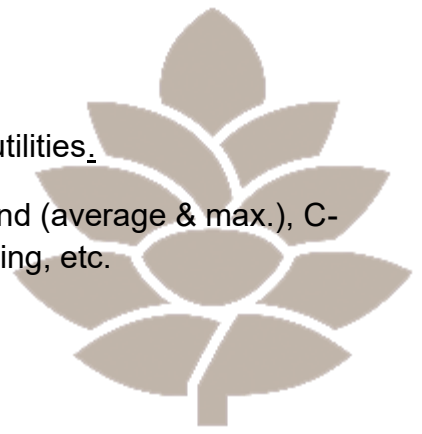


3. Horizontal curve data (centerline only) for each curve including L, delta, R, and other data as requested by the Village Engineer.
4. Vertical curve alignment and data including length, g1, g2, K-value and other pertinent data.
5. Distances to existing driveways, streets and intersections.
6. Typical section for each street showing proposed pavement design and other cross-sectional elements.
7. Street names as approved by Moore County.

J. Wastewater Facilities.

1. Pipe material, size, length, slope, invert and top elevations at all manholes, separation from other utilities, existing and proposed ground/cover profile above the pipe segment.
2. 100-year flood elevation at each manhole location.s
3. Special construction details - piers, boring, encasement, etc.
4. Easement widths.
5. Location, size, and material of all proposed & existing service laterals.
6. Location of lots where sewer service backflow valves may be required.
7. Pump station plans - including:
 - (1) 100-year flood elevation and source of this information
 - (2) Site layout plan, proposed lift station easement limits, and access road
 - (3) Detailed plan and elevation view of pump station facility
 - (4) Electrical equipment and wiring
8. Pump station and force main calculations - including:
 - (1) volume and cycle time calculations
 - (2) total discharge head calculations and pump selection curve
 - (3) hydrostatic uplift calculations
 - (4) stream classification
9. Additional information as required by the specific utility provider.

K. Water Distribution Facilities.



1. Pipe material, size, location, and separation from other utilities.
2. Hydraulic modeling data including estimated daily demand (average & max.), C-factors, ISO fire flow computations, ISO hydraulic modeling, etc.
3. Valves, fittings, blow offs including size.
4. Fire hydrant locations.
5. Service lateral locations.
6. Location of lots where pressure reducing valves may be required.
7. Special details - boring, etc.
8. Easement locations and widths. (if applicable — ~~NOTE: any proposal to locate a watermain outside of a Public Street Right of Way shall have the prior written approval of the Village Engineer.~~)
9. Permanent sampling stations.
10. Additional information as required by the specific utility provider.

L. Storm Drainage and Erosion Control.

1. Complete hydrologic and hydraulic calculations in accordance with Section 5:
 - (1) Open and closed system design calculations
 - i. Drainage areas and peak runoff discharge to each inlet
 - ii. HGL calculations for all pipe networks and open channels
 - (2) Peak runoff flow calculations (pre- and post-development)
 - (3) Water quality and quantity calculations for all SCMs receiving runoff from proposed development
 - (4) Exit velocity and details of velocity reduction facilities at each open outlet discharge location
2. Pipe material, size, length, slope, etc.
3. Numbering Plan, invert elevation, and top elevations ~~at for~~ for each structure - catch basin, curb inlet. Invert elevations for each flared end section, headwall, etc.
4. Special details ~~— open channels, etc.~~ as required
5. Easement widths clearly specified on the easement

- 
6. Minimum finish floor elevations for buildings ~~constructed~~ within regulatory floodplain
 7. Erosion control measures and calculations in accordance with NCDEQ Standards

M. **Miscellaneous Data.**

1. Owner/developer: name, address, and telephone and ~~fax number~~ email address
2. Engineer: name, address, and telephone and ~~fax number~~ email address
3. Limits of clearing and land disturbance
4. Landscaping including species. Special care should be taken when specifying landscaping that will be installed in any public or private right-of-way to ensure that as the plantings mature, they will not adversely affect sight distances.
5. General Notes as required, including a note - "All construction materials and methods shall conform to the **Standard Specifications & Construction Details** of the Village of Pinehurst."
6. Summary of quantities of infrastructure improvements ~~in Data Table Format~~, by project phase if applicable, i.e. linear feet of water mains (by size), sewer mains (by size and material), storm drainage pipe (by size & material), sidewalk (by material), and street (by owner and width).

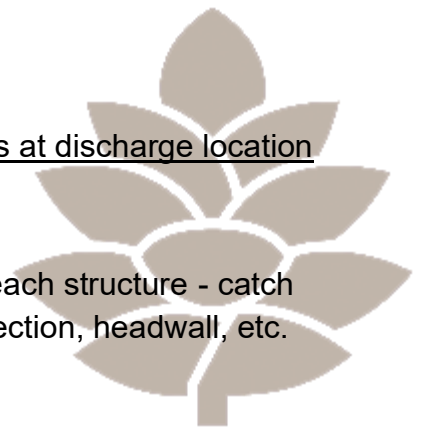
SECTION 1.3.2 SITE PLANS

All site plans submittals shall, at a minimum, include the following elements. These elements are in addition to the specific requirements set forth in the PDO.

- A. Plans sealed and signed by an appropriately licensed design professional, registered to practice in North Carolina. Plan size shall be 24" x 36" unless otherwise approved by the Village Engineer.
- B. Boundary of the tract with all ~~courses~~ bearings and distances indicated. One corner of the tract shall be tied both horizontally and vertically to the NC Plane Coordinate System with tie line and grid monument data provided to the corner. Total gross area of tract shall be indicated.
- C. Vicinity map, scale of drawing, and NC Grid North directional arrow.
- D. Existing and proposed contour elevations at minimum interval of 1-foot. Elevations based on USGS/NCGS Datum with benchmark indicated.



- E. 100 year flood plain and/or alluvial soils line. A note shall be placed on the plans indicating the NFIP-FIRM map/panel/community #, effective/index date, and soils mapping source information.
- F. Owner, PIN #, and zoning of all properties adjoining the site shall be noted on each adjoining parcel shown in the drawings.
- G. **Data on Adjoining Streets.**
 - 1. Street name.
 - 2. Street width and right-of-way dimensions.
 - 3. Existing utilities and storm drainage.
 - 4. Proposed and existing streets, and driveway entrances onto site and adjoining properties.
- H. **Building Site Data.**
 - 1. Number of buildings and dwelling units in each (for residential site plans).
 - 2. Building "footprint" dimensions and finished ground floor elevation.
 - 3. Front, side and rear yard setbacks.
- I. **Parking Data.**
 - ~~1. Number of parking spaces provided.~~
 - ~~2. Number of parking spaces required.~~
 - 3. Location and dimensions of parking areas (including ADA accessible parking) to include: angle of parking, typical width, length, aisle width, etc.
 - 4. Pavement striping and signage details
- J. **Storm Drainage and Erosion Control.**
 - 1. Complete hydrologic and hydraulic calculations in accordance with Section 5:
 - (1) Open and closed system design calculations
 - i. Drainage areas and peak runoff discharge to each inlet
 - ii. HGL calculations for all pipe networks and open channels
 - (2) Peak runoff flow calculations (pre- and post-development)
 - (3) Water quality and quantity calculations for all SCMs receiving runoff from proposed development



(4) Exit velocity and details of velocity reduction facilities at discharge location

2. Pipe material, size, length, slope, etc.
3. Numbering Plan, invert elevation, and top elevation for each structure - catch basin, curb inlet. Invert elevations for each flared end section, headwall, etc.
4. Special details as required.
5. Easement widths clearly specified on the easement.
6. Minimum finish floor elevations for buildings constructed within regulatory floodplain
7. Erosion control measures and calculations in accordance with NCDEQ Standards.

K. Utilities.

1. Waterline location and size.
2. ISO Fireflow computations for the proposed development and hydraulic modeling to support the proposed sizing of mains.
3. Water meter location and size; size of service branch
4. Backflow Preventer
5. Sewer line location and size
6. Sewer service lateral - size and location
7. Water and sewer easements
8. Fire hydrant locations (on and off site)
9. Backflow preventer for fire sprinkler line (if applicable)
10. Fire Department Connection (if applicable)
11. Additional information as required by the specific utility provider.

L. Landscaping.

1. Clearing limits
2. Landscaping plan
3. Summary of landscaping requirements as required by the PDO.

M. Signage.

1. Master sign plan per applicable provisions of the PDO.

SECTION 1.3.3 REVISIONS TO PREVIOUSLY APPROVED PLANS

Revised plans shall be resubmitted and approved by the Village and affected State regulatory agencies (if required) prior to construction of any facilities for which the revisions are proposed. The submittal procedure for revised plans shall be as previously specified for the original submittal. Developers shall consult with the Village Engineer to determine whether a proposed change to previously approved plans warrants a resubmittal, or if the change can be shown on the project Record Drawings without the need for resubmittal. If a resubmittal is required, the Developer shall indicate all changes to the plans by clouding revisions and numbering each to correspond to a revision block on each sheet. Failure to clearly highlight the revisions to the previously approved plans may result in delays with the review process.

SECTION 1.4 CONSTRUCTION OF PROPOSED IMPROVEMENTS

The Developer shall obtain all permits, encroachments, easements, right-of-ways, etc. associated with the approved plans prior to initiating any construction activities associated with the proposed improvements. ~~Prior to commencing any phase of construction of the proposed facilities, the Developer shall obtain all permits, encroachments, easements, right of ways, etc., which are required to complete the construction proposed in the approved plans.~~ The appropriate permit numbers and issue dates shall be included in the ATC Improvements block on the cover sheet, and copies of all permits shall be provided to the Village.

Once all permits, easements, and encroachments have been obtained, the Developer shall contact the Village ~~Engineer~~ Planning Department to schedule a pre-construction conference with Village officials, the utility provider, the Project Designer, and the selected contractor(s). NCDOT Representatives shall also be contacted to attend this meeting if any work is contemplated within NCDOT Rights-of-Way. All Conferences shall be scheduled at least five (5) business days in advance, unless otherwise approved by the Village ~~Engineer~~ Planning Department.

Unless otherwise approved by the Village Fire Marshal, the minimum required fire flow must be available on-site and verified by hydrant testing prior to combustible materials arriving on site. Hydrant tests shall be witnessed by the Village's Fire Department, and the results shall be summarized in a report that is signed and sealed by a North Carolina licensed professional engineer. A copy of the signed and sealed report shall be provided to the Village.

The Village of Pinehurst will perform periodic inspections of the work in progress to assure compliance with approved plans and Village specifications. Inspections will be

performed by Village personnel or by a duly authorized representative of the Village Engineer. Inspections performed by the Village shall be scheduled no less than 48 normal business hours in advance.

No infrastructure work shall be permitted outside of regular business hours per the Pinehurst Municipal Code without prior written approval from the Village Manager. The developer shall reimburse the Village for inspections performed at times other than during the Village's normal business hours at the rates ~~set by the Village Manager and Village Finance Director~~ noted in the Village's standard Fees and Charges Schedule.

Upon completion of the proposed improvements, the Developer shall request a comprehensive inspection by the Village to establish a list of deficient items, which must be corrected prior to final acceptance. Inspections such as this generally require a minimum of five (5) business days notice for scheduling. Failure to provide adequate notice may result in delays in issuance of the Certificate of Occupancy/Compliance.

Final acceptance by the Village will occur upon completion and confirmation of the following:

- A. Correction of all items found to be deficient during the previous comprehensive inspection, including erosion and sediment control measures.
- B. Submittal of record drawings per Section 1.055. Accuracy of the record drawings will be checked during the final inspection.
- C. Submittal of certifications by the Project Designer as required by the State Regulatory Agencies per Section 1.05. No certificates of occupancy shall be issued prior to proof of submission of these certifications.
- D. Submittal by the Developer of evidence from the NCDOT that any improvements constructed in DOT right-of-way have been completed to the satisfaction of the DOT inspector. This in no way relieves the Developer of his obligations to the DOT as outlined in the encroachment agreements.
- E. Submittal of the letter of warranty and supporting documents as required under paragraph 2.11 of these Specifications and in the Village's Codes and Ordinances.
- F. Submittal of the Operation and Maintenance Manual and an executed copy of the Operation and Maintenance Agreement for all Stormwater Control Measures as required under Section 5.2.3 of these Specifications.

SECTION 1.5 RECORD DRAWINGS AND CERTIFICATIONS (AS-BUILTS)

Record drawings, which reflect "as-built" conditions, must be submitted and approved prior to final acceptance by the Village of Pinehurst and Moore County Public Works. The record drawings must be labeled "RECORD DRAWINGS" and sealed by the

Project Designer. The record drawings submitted to the Village of Pinehurst shall be permanent, reproducible drawings and shall include a PDF copy ~~on a compact disc~~.

A checklist is contained in the Appendix to assist in development of Record Drawings for submission to the Village Engineer. Record drawings for water and wastewater improvements shall be provided to the appropriate system owner in accordance with current owner requirements.

Upon completion of the improvements, the Project Designer of record shall issue the certifications as required by the NC Department of Environmental Quality. Copies of the certifications shall also be submitted to the Village of Pinehurst if requested.

SECTION 1.6 STOP WORK ORDERS

The Village Engineer may issue a Stop Work Order (written or verbal with written follow-up) instructing that the Developer/Contractor to immediately cease (any or all) work if such work poses a threat or hazard to the public or to Village owned facilities or is being performed without proper approvals, or a current set of the approved plans onsite. In the event work is undertaken prior to appropriate approvals being secured or is not properly inspected by the Village Representative, the Village Engineer may require removal and reinstallation of all work not properly inspected or approved and may also issue a “Stop Work” order for all other construction at the site until the matter in question has been fully corrected to the satisfaction of the Village Engineer. The Stop Work Order may also include instructions for remedial work or repairs deemed necessary to correct such threats or hazards. In the event that corrective measures are not taken properly or in a timely manner, the Village reserves the right to implement such corrective measures and will pursue any and all legal means to seek reimbursement for any costs to the Village incurred as a result. The Village will not bear any responsibility for consequential damages incurred by the Developer/Contractor or others resulting from issuance of a Stop Work Order, such damages including, but limited to, lost time or liquidated damages, loss of materials, payroll and overhead costs, equipment rental costs, permit costs, fines or legal costs, etc.

SECTION 2. GENERAL PROVISIONS

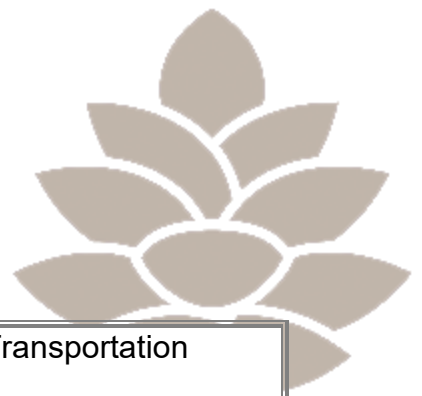
SECTION 2.1 GENERAL

All construction shall conform to the requirements and dimensions on the approved construction plans, Village Standard Details, the Municipal Code of the Village of Pinehurst, or as stated in these Specifications. The material requirements for stone, concrete, asphalt, and other construction products shall conform in full to the latest edition of the NCDOT “Standards and Specifications” unless otherwise modified by this manual or as directed by the Village Engineer.



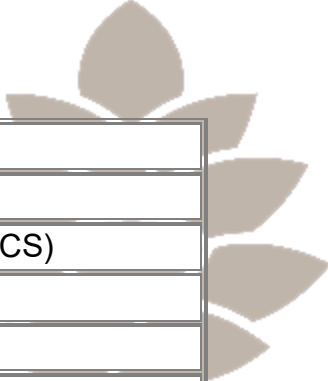
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SECTION 2.2 ABBREVIATIONS AND DEFINITIONS



SECTION 2.2.1 ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
A.F.F.	Above Finished Floor
AIA	American Institute of Architects
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
APWA	American Public Works Association
AWWA	American Water Works Association
CO	Certificate of Occupancy
°C	Degrees Celsius
°F	Degrees Fahrenheit
DIP	Ductile Iron Pipe
DIPRA	Ductile Iron Pipe Research Association
ETJ	Extraterritorial Jurisdiction
ft	foot
gpd	gallons per day
gpm	gallons per minute
ID	Inside Diameter
ISO	Insurance Services Office
lbs	pounds
MCPWD	Moore County Public Works Department
MSL	Mean Sea Level
MUTCD	Manual on Uniform Traffic Control Devices
NCDEH	North Carolina Division of Environmental Health
NCDEQ	North Carolina Department of Environmental Quality
NCDOT	North Carolina Department of Transportation
NCDWR	North Carolina Division of Water Resources
NCGS/USGS	North Carolina Geodetic Survey/United States Geodetic Survey
N-C-G-S-	North Carolina General Statutes
NCRLA	North Carolina Registered Landscape Architect
NCPE	North Carolina Registered Professional Engineer
NCPLS	North Carolina Professional Land Surveyor



N.E.C.	National Electric Code
NFPA	National Fire Protection Association
NRCS	Natural Resource Conservation Service (formerly SCS)
OD	Outside Diameter
OSHA	Occupational Safety and Health Administration
P.C.	Point of Horizontal Curvature
ppm	parts per million
psi	pounds per square inch
P.C.	Point of Curvature
P.I.	Point of Intersection
P.T.	Point of Tangency
PVC	Polyvinyl Chloride
P.V.C.	Point of Vertical Curvature
P.V.I.	Point of Vertical Intersection
P.V.T.	Point of Vertical Tangency
SCM	Stormwater Control Measure
SU	Single Unit Truck (with 20 foot wheelbase and 30 foot overall length)
UL	Underwriters' Laboratories, Inc.
V	Volts
VAC	Voltage – Alternating Current

SECTION 2.2.2 DEFINITIONS

CERTIFICATE OF OCCUPANCY - Approval granted by the Village for a new or renovated structure to be occupied.

CODE - The Village of Pinehurst Code of Ordinances, including the Municipal Code, Pinehurst Development Ordinance, and Pinehurst Flood Damage Prevention Ordinance.

COLLAPSE ZONE - The area around the perimeter of a structure that could contain debris if the building collapsed, equal to one and a half (1.5) times the height of the structure.

CONTRACTOR - The entity performing the work indicated in the plans. All Contractors performing construction or installation of any public facilities in the Village's jurisdiction shall be properly licensed for the work by the NC Licensing Board for General Contractors in accordance with N.C.G.S. 87. Prior to commencing work, the Contractor shall submit proof of licensure, if requested by the Village. The Contractor shall also submit information including mailing and street address for the firm, ownership infor-

mation, telephone numbers for contact during regular business hours and emergency telephone numbers for contact during nights, weekends and holidays.

COUNCIL - The Village Council of the Village of Pinehurst.

CULVERT – A structure that conveys a stream or drainage feature underneath or through an obstacle such as a roadway, railway, or embankment.

DETAILS - The drawings found within the Village of Pinehurst Engineering Standards and Specifications Manual.

DEVELOPER – The person or persons investing in and developing land associated with a particular project.

EASEMENT - An interest in land owned by another that entitles its holder to a specific use.

FIRE OFFICIAL/FIRE MARSHAL - The Fire Chief, an assistant or other representative duly authorized by the Village.

INSPECTOR - ~~The Infrastructure Superintendent, an assistant, or other representative~~ Village's representative on a construction site as duly authorized by the Village Engineer.

INVERT - The lowest point in the internal cross section of a pipe or culvert.

NEW DEVELOPMENT - Includes, but is not limited to, commercial building sites, subdivisions, improvements in the Village right-of-way and similar developments but shall expressly exclude in-fill lots and development on previously platted individual residential lots not part of a larger common plan of development.

PLANS - The approved design drawings that show the work to be done.

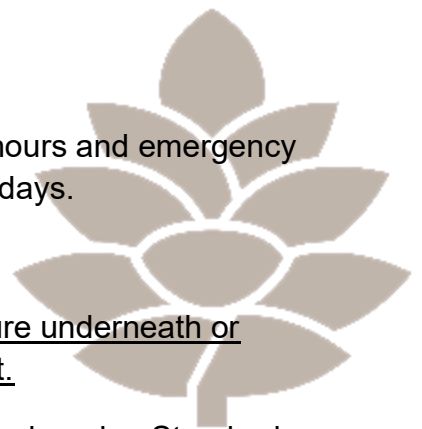
PROJECT DESIGNER - The design professional retained by the developer, and the person responsible for the preparation of the final construction drawings. All design professionals shall be properly licensed by and in current good standing with their respective licensing board.

PROJECT ENGINEER – see “PROJECT DESIGNER”

RIGHT OF WAY - The area which encompasses public streets, sidewalks, and utility strips.

SPECIFICATIONS - The "Village of Pinehurst Engineering Standards and Specifications" manual.

~~SUBBASE - See SUBGRADE~~ The compacted layer of aggregate material placed between the Subgrade and the base course or pavement surface.



SUBGRADE - That portion of the roadbed prepared as a foundation for the stone and asphalt or concrete pavement structure. The compacted native soil or imported material directly beneath the Subbase that forms the foundation of a pavement structure.

VILLAGE - The Village of Pinehurst, North Carolina

VILLAGE ENGINEER - The individual or consultant, ~~as selected by the Village Council~~ that is responsible for reviewing development plans and applications, determining compliance with the standards herein, and approving any deviations from the standards herein, on a specific project. Additional duties and powers of the Village Engineer are provided in the Pinehurst Development Ordinance.

VILLAGE MANAGER – The Village Manager appointed by the Village Council of the Village of Pinehurst.

VILLAGE REPRESENTATIVE – see “Inspector”, above.

If an item is not specifically defined in the listing above or elsewhere in this ~~manual~~ Manual, the definition established by the Village Engineer shall govern.

SECTION 2.3 INSURANCE REQUIREMENTS AND DAMAGE TO EXISTING FACILITIES

If work is to be performed within any Village street right-of-way or on Village owned property, the Developer/Contractor shall submit a current and valid certificate of insurance to the Village stating that such coverage is in effect during the project duration. The limits of coverage shall be at a minimum in accordance with the Schedule of Insurances as set by the Village.

Any damages caused to any existing infrastructure due to construction and/or development activities, shall be repaired by the party causing the damage to the full satisfaction of the Village Engineer prior to any further work occurring.- If the party in question fails to repair the damages in a timely manner as determined by the Village Engineer, a Stop-Work order may be issued until all repairs have been satisfactorily made. –The Village may also elect to have the repairs done by a third party or Village forces, in which case the party causing the damage shall be liable in full for all repair costs ~~plus an administrative fee determined by the Village.~~ -Any such costs shall be paid in full prior to re-initiation of any work associated with the project in question.

SECTION 2.4 EROSION AND SEDIMENTATION CONTROL

SECTION 2.4.1 GENERAL REQUIREMENTS

Erosion and sedimentation control plans that disturb more than one acre should be submitted directly by the owner to NCDEQ – Land Quality (NCDEQ-LQ Section), Fayetteville Regional Office. Copies of all submittals to and approvals from NCDEQ –

LQ shall be provided to the Village at the same time they are submitted to or received from NCDEQ-LQ by the developer or Project Engineer. Erosion and sedimentation control plans for New Development projects that disturb less than one acre shall be submitted to the Village for review.

Temporary and permanent erosion control measures shall be provided in accordance with the erosion control plan approved by either the Land Quality Section, NCDEQ, or the Village of Pinehurst, depending upon the amount of land disturbance proposed. The approved Erosion Control Plan and any Approval Certificates shall be kept on site by the Contractor at all times that work is being performed.

All permanent erosion control measures shall be incorporated into the work at the earliest practicable time, and in no case shall an area remain denuded for more than seven (7) calendar days. Temporary erosion control measures shall be coordinated with permanent erosion control measures and all other work on the project to ensure economical, effective and continuous erosion control throughout the construction and post construction period and to minimize siltation of streams, lakes, reservoirs, and other water impoundments, ground surfaces, roadways, or other property. In the event compliance with the timelines established in this section are not complied with or offsite siltation occurs, including tracking of mud onto public streets, the Village ~~may~~ reserves the right to issue a “Stop-Work” order as authorized under NCGS 160D-404 for all New Development projects until such time as all areas have been properly restored and all required erosion control measures installed or properly repaired.

All erosion control measures designed and installed within the Village’s jurisdiction shall comply with current NCDEQ regulations and the most recent version of the North Carolina Erosion and Sediment Control Planning and Design Manual.

SECTION 2.4.2 MAINTENANCE

It shall be the developer’s responsibility to ensure that all erosion and sediment control measures are properly maintained throughout construction of the project. In the event that erosion control measures fail or if mud and sediment travel off-site or into adjacent properties or streets, the developer shall be responsible for all costs associated with clean-up and restoration efforts.

SECTION 2.4.3 CLEARING LIMITS

All clearing limits shall be clearly identified and staked prior to any construction. The Village shall be given 48-hour notice prior to beginning clearing operations.

SECTION 2.5 EARTHWORK

SECTION 2.5.1 GENERAL

Earthwork shall be defined as the removal of soil (including rock) from its natural location and the depositing of such material into the proper fill areas as indicated on the plan.

SECTION 2.5.2 ROCK EXCAVATION – BY BLASTING

Blasting is not permitted within the jurisdiction of the Village of Pinehurst unless written approval is obtained from the Village Manager. In the event blasting operations are desired, the developer or contractor shall notify the Village Engineer of the request, in writing.

SECTION 2.5.3 REMOVAL OF UNSTABLE MATERIAL

Where unstable material, including organic material ("muck"), is encountered in trenches or in roadways, the material shall be completely removed and replaced with suitable material as approved by the Village Engineer or Village Representative and thoroughly compacted. The Village reserves the right to require appropriate geotechnical testing of all materials used to replace unsuitable materials.

SECTION 2.6 WORK ZONE SAFETY

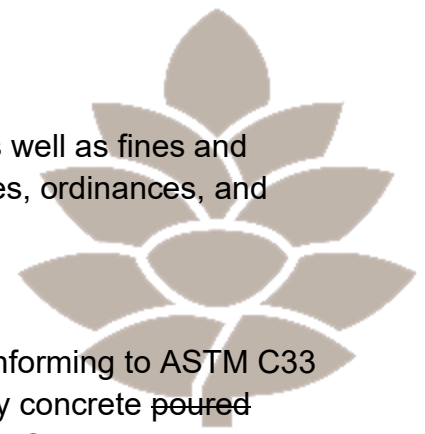
The Contractor shall provide for and maintain safety measures necessary for the protection of all persons on the work; and shall fully comply with all laws and regulations and building code requirements to prevent accident or injury to persons on or about the location of the work, including all applicable provisions of OSHA regulations. The Contractor shall protect all trees and shrubs designated to remain in the vicinity of the operations and barricade all walks, roads, and areas to keep the public away from the construction. All trenches, excavations, or other hazards in the vicinity of the work shall be well barricaded, and properly lighted at night.

The Contractor shall be responsible for the entire site and the necessary protection as required by the Village and by laws or ordinances governing such conditions. He shall be responsible for any damage to Village property, or that of others, by the Contractor, his employees, subcontractors or their employees, and shall correct and/or repair such damages to the satisfaction of the Village of Pinehurst and/or other affected parties. He shall be responsible for and pay for any such claims against the Village.

SECTION 2.7 MAINTENANCE OF TRAFFIC AND WORK ZONE TRAFFIC CONTROL

Existing public streets or highways shall be kept open to traffic at all times by the Contractor unless permission to close the streets, or portions thereof, is granted by the Village Representative Engineer. The Village Public Services Department of Pinehurst ~~Police Department~~ must also be contacted by the Contractor a minimum of 48 hours before any streets are to be temporarily closed or partially closed, per the Road Closure Notification Process located in the Appendix. Proper and sufficient barricades, lights, signing and other protective devices shall be required to be installed when deemed necessary by the ~~Police Department~~ Village Engineer or the Village Representative. All traffic control shall conform to the standards set forth in the MUTCD, and any NCDOT amendments to the MUTCD.

Failure to comply will result in issuance of a Stop Work Order as well as fines and penalties as specified in the various Village and/or NCDOT codes, ordinances, and laws.



SECTION 2.8 CONCRETE

Concrete shall be ~~only~~ plant-mixed or transit-mixed concrete conforming to ASTM C33 for aggregates and to ASTM C94 for ready-mixed concrete. Any concrete ~~poured~~ delivered to the site that has a slump over 4 inches as per ASTM C143, or has a batched time of more than 90 minutes, will be considered unacceptable and shall be immediately ~~removed~~ rejected. All concrete shall meet the requirements of the most recent edition of the NCDOT “Standard Specifications for Roads and Structures” for the ~~use~~ application intended.

Concrete shall not be deposited on frozen subgrade. Concrete shall not be poured when the air temperature is ~~falling and~~ below 40 degrees F and falling, and the predicted low temperature for the succeeding 24-hour period is less than 32 degrees F, unless cold weather protection measures in accordance with ACI 306R are implemented and approved by the Village Representative. All concrete when placed in the forms shall have a temperature of between 50 and 90 degrees F and shall be maintained at a temperature of not less than 50 degrees F for at least 72 hours for normal concrete and 24 hours for high-early strength concrete, or ~~for as much time as is necessary to secure proper rate of curing and designed as required to achieve the specified minimum~~ as required to achieve the specified minimum compressive strength. The Village Representative may require use of insulating blankets or other measures as deemed appropriate to minimize the possibility of the concrete freezing.

All formwork and subgrades shall be inspected and approved by the Village Engineer or Village Representative prior to placement of any concrete. Any forms or subgrades found to be deficient shall be corrected to the satisfaction of the Village Representative and re-inspected prior to placement of any concrete. All forms shall be properly oiled to ensure clean release when removed. All reinforcing steel and forms shall be fully inspected and approved by the Village Representative prior to placement of any concrete.

Concrete shall be air entrained at 5% ($\pm 1\%$) for exterior concrete exposed to freezing and thawing in accordance with ASTM C231 or ASTM C494. Retarding and accelerating admixtures shall conform to ASTM C494 and shall be used only upon prior approval of the Village Representative.

SECTION 2.9 INSTALLATION OF UTILITIES

The Developer shall arrange for the installation of all utilities. Restoration of Village right-of-way disturbed by utility installation shall be the ultimate responsibility of the Developer. The Developer shall provide the Village Engineer with a copy of the

installation plan and the appropriate Encroachment Agreement for utilities at least ten (10) business days prior to actual installation of utilities taking place.

SECTION 2.10 MATERIALS

All materials incorporated in work within the Village's jurisdiction ~~to be accepted by the Village of Pinehurst for maintenance~~ shall be new, first quality material installed in accordance with the manufacturer's instructions or these Specifications, whichever is more stringent.

Shop drawings for items not related to public water or sewer shall be provided by the developer or contractor to the Village Engineer or Village Representative for review and approval prior to acceptance of materials on site. Shop drawings for public water and sewer infrastructure shall be provided to ~~Moore County Public Works~~ the specific utility provider/owner for review and approval prior to acceptance of materials on the site.

It is the intent of this Specification to provide materials and construction methods of high standard and quality; and to provide materials free from defects in workmanship and product. Equal materials not specified herein may be submitted for consideration of use in the project provided documentation (shop drawings) and samples are furnished to the Village not less than twenty-one (21) days before their delivery to the construction site. ~~A sufficient number of copies shall be submitted such that the Village may retain three (3) copies.~~ The Village Engineer will issue written approval or disapproval of the proposed alternate materials. The current Village Specifications and/or the latest revisions of the material manufacturer shall apply in all cases where materials are described by these Specifications.

SECTION 2.11 WARRANTY PERIODS AND FINANCIAL GUARANTEES

The Developer shall provide a written guarantee on workmanship and materials for a period of at least one (1) year after the date of acceptance by the Village of Pinehurst. Any defects observed within the one (1) year guarantee period shall be repaired and/or replaced to the Village's satisfaction. The guarantee shall apply to any improvements proposed by the approved plans and any revisions of the plans approved by the Village Engineer including, but not limited to, - ~~The guarantee shall apply to street and sidewalk construction, storm sewers and structures (including ditches, drainage channels, etc.), and appurtenances.~~ The guarantee shall specifically include the final asphalt surface lift (wearing course), including all tie-ins, patches, utility trench repairs, and transitions, which shall be free from rutting, raveling, cracking, settlement, or other surface defects during the warranty period. The Village Engineer, in consultation with the Village Manager, may elect to require an extended warranty period on any or all of the improvements constructed as part of any project.

The Village reserves the right to delay final acceptance and assuming maintenance responsibility for infrastructure (roads, sidewalks, drainage, etc.) if defects observed

within the warranty period are not repaired and/or replaced to the Village's satisfaction by the Developer.

Warranty periods for water lines and appurtenances, sanitary sewer lines and appurtenances, lift stations, force mains, controls and related appurtenances shall be coordinated with the appropriate ~~system~~utility owner.



SECTION 3. STREETS AND PUBLIC RIGHTS-OF- WAY

SECTION 3.1 GENERAL

Unless otherwise provided herein, all materials and street construction methods shall at a minimum conform to the applicable requirements as outlined in the ***Standard Specifications for Roads & Structures***, latest edition, as published by the North Carolina Department of Transportation.

Whenever the following terms are used in said NCDOT specifications, the intended meaning of such terms shall be as follows:

"State" or "Commission" shall be replaced by the words "Village or its authorized testing agent."

"Inspection by Commission" shall be replaced by "inspection by Village or its duly authorized representative."

SECTION 3.2 DESIGN

SECTION 3.2.1 GENERAL

Street design shall conform to the standards and typical sections set forth in the applicable sections of this manual, current NCDOT, AASHTO and MUTCD manuals, and any direction provided by the Village Engineer. Information on specific design criteria is shown in ~~Figure 3-4~~Table 3.1 at the end of this section. Private streets shall meet in full the same design, construction, and inspection standards as set forth herein for Public Streets.

For new streets in form-based districts, additional guidance can be found in the Form-Based Guidance Plans.



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At intersections in residential areas, all streets shall be rounded with radii not less than:

<u>Curb Radius</u>	<u>30 Feet (at back of curb or edge of pavement)</u>
<u>Property Lines</u>	<u>20 Feet</u>

~~Curb Radius 30 Feet (at back of curb or edge of pavement)~~

~~Property Lines 20 Feet~~

In non-residential areas, the curb and right-of-way radii shall be increased as directed by the Village Engineer to accommodate anticipated truck traffic.—The NCDOT Roadway Design Manual shall be followed for preliminary design of intersections in non-residential areas.

The minimum clear roadway width (exclusive of gutter width) shall be 20 feet with greater widths as required by the Village Engineer to meet roadway classification standards and traffic conditions.—All streets, except those in the Historic Preservation Overlay District, shall have curb & gutter conforming to the standards set forth in Section 4 of this manual ~~unless a waiver is obtained from Village Council.~~ A waiver from this requirement may be approved by the Village Engineer where the Design Engineer provides justification that due to density, stormwater flow, and/or existing neighborhood character, curb & gutter is not necessary or would be incompatible with the surrounding development pattern.

For areas within the Historic Preservation Overlay District and areas that receive a waiver from ~~the Village Council Engineer~~ and utilize ‘ribbon’ asphalt paving, the minimum width of paving shall be 20¹ ~~feet~~ with grassed swales provided on the road shoulder in accordance with the standard details.—Alternate types of curb & gutter upon approval by the Village Engineer may be used in the Historic Preservation Overlay District.

A sight triangle easement shall be provided at all intersections of new streets with existing or proposed collector streets, highways, or other major street classifications. Sight triangle easements shall ~~meet NCDOT standards~~ be not less than 10 feet by 70 feet. ~~The 10-foot dimension shall be the setback from the right-of-way edge of pavement of the major street, and the 70-foot dimension shall be measured along the right-of-way of the major street.~~—Such sight triangle easements shall be shown on the preliminary and final plat for the subdivision.—Landscape & planting materials placed within the sight triangle shall be limited to a height of 30 ~~inches~~ inches at maturity.

Stopping Sight Distance (SSD) shall apply to both Horizontal and Vertical elements of the street geometry and shall at a minimum, meet the criteria set forth in the AASHTO “Greenbook:., latest edition.—The Village Engineer may increase or modify these requirements on a project-by-project basis.

Intersection Sight Distance (ISD) shall apply to all streets covered by this manual. Intersection sight distance shall at a minimum meet the criteria set forth in the AASHTO “Greenbook”, latest edition.—The Village Engineer may increase or modify these requirements on a case-by-case basis.

SECTION 3.2.2 SOILS EVALUATION AND PAVEMENT DESIGN

Pavement design for all new streets shall be based upon subgrade soil conditions, a 20-year (minimum) design life and projected traffic loadings (ADT and percent trucks).

Soils testing work shall be performed by a qualified geotechnical engineering firm. Standard penetration test borings shall be obtained along the centerline of all roadways at intervals not greater than 300 feet, and shall extend a minimum of five feet below proposed subgrade elevations, or in the case of fill sections to a depth of five feet below existing grade. The pavement designs shall be performed by a qualified professional engineer using standard methods developed by the NCDOT, AASHTO, The Asphalt Institute, or other similar methods as may be approved by the Village Engineer.

Two (2) copies of the Laboratory Soil Test Report and the Pavement Design Calculations shall be submitted with the initial design documents.

The final pavement thickness shall be the calculated thickness, but in no case shall the thickness be less than that shown in the standard street section details, or that required by the NCDOT for streets to be maintained by the State, with the most stringent condition governing.

The *minimum* pavement section for local and cul-de-sac Public and Private Streets within the Village's jurisdiction shall be six (6”) inches compacted thickness ABC with a two and one-half inch (2-1/2”) ~~S9.5B~~SF9.5A asphalt surface course overlay, placed in an initial lift of 1-1/2 inches with the final 1-inch lift being placed once all conditions specified in Section ~~3.03(c)~~3.3.3 have been met in full.

The *minimum* pavement section for all Public and Private Streets other than local and cul-de-sac streets within the Village's jurisdiction shall be eight (8”) inches compacted thickness ABC with a two and one-half inch (2-1/2”) ~~SF9.5A~~B asphalt surface course overlay, placed in an initial lift of 1-1/2 inches with the final 1-inch lift being placed once all conditions specified in Section ~~3.03(c)~~3.3.3 have been met in full.

The Village may require the use of full-depth asphalt in lieu of ABC base courses or additional thickness pavement sections in certain situations (such as major collector streets, thoroughfares, etc.).—In these instances, a signed and sealed pavement design by an appropriately licensed professional engineer shall be submitted to the Village.

A full width asphalt surface course overlay shall be provided as a final wearing surface in all cases where additional lanes, roadway widening, or other improvements to an existing road are required.—The overlay shall cover the full width of the street, both the

pre-existing section and the new improvements and shall extend at least 50 feet each way beyond the limits of improvements.

SECTION 3.3 CONSTRUCTION REQUIREMENTS

SECTION 3.3.1 GENERAL

All roadway subgrade, and storm sewer construction shall be inspected and approved by the Village Representative and all water/sewer construction shall be inspected and approved by the utility owner ~~Moore County~~ prior to placement of the base course materials.

All streets shall be cleared and graded for the full width of the right-of-way within 50 feet of any street intersection, unless otherwise approved by the Village Engineer.

~~Additional street clearing and grading shall be as follows:~~

~~Major Thoroughfare – the full width of the right-of-way, generally 90 feet'.~~

~~Principal Arterial – the full width of the right-of-way, generally 80 feet'.~~

~~Major Collector – the full width of the right-of-way, generally 70 feet'.~~

~~Minor Collector – the full width of the right-of-way, generally 65 feet'.~~

~~Minor Commercial – the full width of the right-of-way, generally 65 feet'.~~

~~Major Local, Local & Cul-De-Sac Streets – the full width of the right-of-way on the sidewalk side and a minimum of eight (8) feet from back of the curb on the non-sidewalk side to accommodate street trees. Right of way for this class of streets is generally 60 feet', unless otherwise noted on the Village's standard details. The Village Engineer may allow lesser right of way widths for minor cul-de-sacs and residential streets on a case-by-case basis.~~

SECTION 3.3.2 PLACEMENT OF AGGREGATE BASE COURSE

No Base Material shall be placed on any roadway or fire lane until the subgrade, stormdrainage storm drainage system and structures, water & sewer system, and all other conflicting items have been inspected and approved by the Village Representative and other appropriate review agency.

Aggregate base course shall be placed and compacted in strict conformance with the requirements of the NCDOT. – Each layer shall be compacted to a density equal to at least 100 percent of the maximum dry density as determined by AASHTO Method T-180 as modified by the NCDOT.

SECTION 3.3.3 PLACEMENT OF BITUMINOUS SURFACE COURSE

No Bituminous surface courses shall be placed on any roadway or fire lane until all Base Course materials have been placed and approved by the Village Engineer or Village Representative.

For public streets to be conveyed to the Village, the second lift shall be 1-inch nominal thickness and its placement shall be delayed during the period of initial residential or commercial site construction activity and until such time as all defects to the first lift have been completed and approved by the Village Engineer and 75% buildout of the area serviced has been attained.—The final lift shall be covered by a financial guarantee posted by the Owner/Developer in an amount approved by the Village Engineer and in accordance with the Pinehurst Development Ordinance.

The contractor shall provide ~~temporary~~ drains through the concrete gutter at all low points to allow the first lift to drain and to eliminate ponding at the low points.—Prior to placing the final lift of SF9.5BA surface course, the initial course shall be thoroughly cleaned and repaired.—Bituminous tack shall be applied prior to surfacing to assure bond between lifts, along gutters and around castings.

SECTION 3.4 INSPECTION

SECTION 3.4.1 PROOF-ROLLING

Street embankments shall be graded and compacted as noted below. Fill material for roadway embankments shall be free from stones greater than 4 inches in size, construction material debris, frozen material, organic matter or other unstable material. Fill material placed in roadway embankments shall be placed in lifts of 8 inches or less and compacted to a density of not less than 95% of maximum dry density as measured by AASHTO Method T-99.—The compaction requirement shall be increased to 100% in the uppermost 12 inches" of subgrade.—These compaction requirements shall apply for that portion of the roadway measured from the back of curb and extending on a slope of 1 to 1, limits may be compacted to a density of not less than 90% of maximum dry density as measured by AASHTO T-99.

After all utilities and storm sewers have been installed, the subgrade shall be fine graded and restored to required grade, and then proof rolled, utilizing a fully loaded tandem axle truck having a gross weight not less than 40,000 pounds and with the tires inflated to not less than 70 psi.—The Village Engineer reserves the right to require presentation of weight tickets prepared by a State of North Carolina- Certified "Scalemaster" verifying the loaded weight of the proof roll truck. The Village Engineer, Village Representative or their designee shall witness the proof roll on behalf of the Village.

Should any "pumping" or displacement be observed by the Village during the proof-rolling, the defective area(s) shall be repaired based on the recommendations of an appropriately licensed geotechnical engineer.—If deemed appropriate by a licensed geotechnical engineer, geotextile fabric may be utilized below base course material. The geotextile shall be installed in strict accordance to the manufacturer's recommendations with respect to overlap, depth of cover, etc.—Prior to installing geotextile fabric, a copy of the manufacturer's literature shall be submitted to the Village,

along with the geotechnical engineer's recommendations.—The locations of geotechnical fabric shall be indicated on the Record Drawings.

Proof-rolling shall be repeated until there is no evidence of "pumping" or displacement.

SECTION 3.4.2 COMPACTION TESTING – SUBGRADE

Upon completion of the proof-rolling, the Developer/Contractor shall furnish to the Village Representative a report from a certified soils testing laboratory.—The report shall present the results of a Proctor analysis demonstrating that the subgrade compaction is acceptable in accordance with standard requirements of the NCDOT.—The subgrade shall then be inspected by the Village Representative, and upon its acceptance and approval, the stone base course may be placed.—However, no stone base may be placed prior to backfilling behind the curb.

One field density (compaction) test shall be required for 3,000 SY of street surface - for each lift of fill material placed into the roadway embankment.—The Village Engineer may require additional testing beyond that specified above.

All compaction testing shall be performed by a certified testing laboratory with all results sealed by a North Carolina Professional Engineer with specific experience in Geotechnical Engineering.—The cost of such testing shall be borne by the developer.

SECTION 3.4.3 BASE COURSE AND SURFACE COURSE INSPECTION REQUIREMENTS

Prior to placement of bituminous surface course material, a Proctor analysis shall be furnished on the Aggregate Base Course placed in the roadway.—The report shall be prepared by a certified testing laboratory and shall evidence compliance with the compaction requirements.—Quarry tickets shall also be presented to the Village Representative to enable a check for yield at the specified final thickness.—The base material shall then be inspected by the Village Representative, and upon acceptance and approval, the bituminous surface course may be placed.

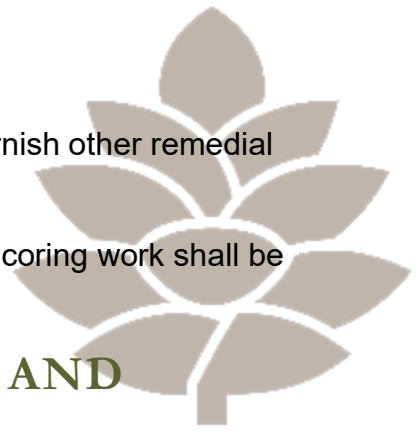
The frequency and number of base course field density tests shall be in accordance with requirements of the NCDOT or as may otherwise be directed by the Village Representative or the Village Engineer.

Bituminous surface course material shall be placed and compacted in accordance with NCDOT requirements.—Copies of delivery tickets shall be furnished to the Village Representative to enable a check for yield at the specified final thickness.

Should there be a question as to the final thickness of Aggregate Base Course or bituminous surface course, the Village Representative reserves the right to require the Developer/ Contractor to provide random corings by an independent testing laboratory to demonstrate actual thickness of base and surface courses.—Core samples shall be taken by a certified testing laboratory and the results shall be presented to the Village Representative.—Should the corings reveal insufficient thickness, the Contractor shall

provide additional surface course as may be required or shall furnish other remedial measures as may be acceptable to the Village Representative.

The cost of all ABC and asphalt product compaction testing and coring work shall be borne by the Developer.



SECTION 3.5 PAVEMENT MARKING AND SIGNAGE

The Developer shall be responsible for furnishing and installing all street identification (name) and regulatory signs.—Signs materials shall conform to those specified by the Village. In general, all street name, regulatory, and warning signs shall be installed on treated wood posts as specified by the Village. The Developer shall also be responsible for striping and markings required by the Village as part of the project on all public streets constructed and/or modified as part of the development project as follows:

- A. Stop Bars and Crosswalks - all streets in accordance with the Village's Standard Details and the MUTCD, latest edition.
- B. Continuous Centerline Striping – double yellow line on all collector, thoroughfare and marginal access streets as designated by the Village.
- C. Edgelines – 4" inch white edge lines on all collector, thoroughfare, and marginal access streets as designated by the Village.

SECTION 3.5.1 PAVEMENT MARKINGS – MATERIALS

Pavement markings for public and private streets shall be made with reflectorized thermoplastic.—The thermoplastic marking material shall be applied by fusing to the pavement surface by application of heat.—Materials and application methods shall comply fully with the requirements set forth in latest edition of the **Standard Specifications for Roads & Structures**, as published by the NCDOT.—Use of markings shall conform to the latest edition of the MUTCD, any modifications or clarifications of the MUTCD promulgated by NCDOT, and the direction of the Village Engineer with the most stringent governing. The Village Engineer may require use of alternate methods or materials when determined by the Village Engineer to be in the best interest of the Village.

SECTION 3.5.2 STREET IDENTIFICATION SIGNS

Street identification signs shall be placed at each intersection and shall clearly identify each street.—On Village maintained streets, such signs shall be reflective and comply with standards set by the Village Public Services Director.—On State-maintained routes, identification signs shall conform to NCDOT standards.—Sign location placement shall be as directed by the Village.—All required signs shall be placed by the developer/owner at no cost to the Village.

SECTION 3.5.3 REGULATORY SIGNS

Regulatory signs shall meet the requirements of the *Manual on Uniform Traffic Control Devices*, latest edition and any modifications thereto established by the NCDOT. Materials shall meet the requirements set forth in the applicable Sections of the *Standard Specifications for Roads & Structures*, latest edition, as published by the North Carolina Department of Transportation.—The location and types of regulatory signs shall be indicated on the construction drawings.

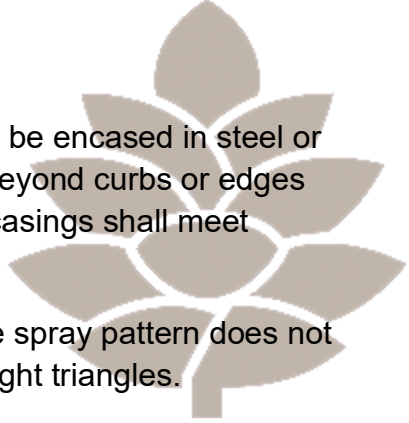
SECTION 3.5.4 SIGN POSTS AND PLACEMENT

No signage may be placed in the right-of-way without prior written approval by the Village, ~~including submission of a completed Right of Way Encroachment agreement.~~ On Village maintained routes, regulatory signs shall be mounted on Wolmanized 4" x 4" southern yellow pine (SYP) posts and street signs shall be mounted on Wolmanized 6" x 6" SYP posts.—Posts shall be furnished in 9 foot' lengths and driven 2 feet' into the ground.

On NCDOT-maintained routes, signs posts shall be in accordance with NCDOT Standards and specifications unless deviations are approved by both NCDOT and the Village.—Sign placement on all routes shall be in accordance with the "Manual on Uniform Traffic Control Devices (MUTCD)", latest edition.

SECTION 3.6 PRIVATE IRRIGATION SYSTEMS WITHIN PUBLIC-RIGHTS-OF-WAY

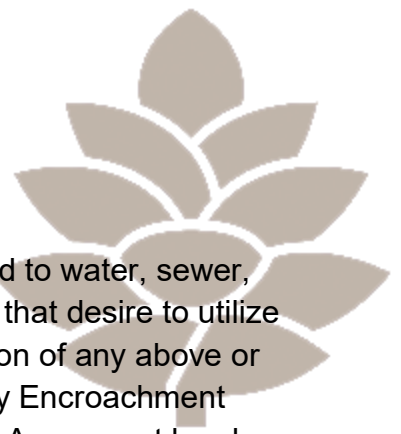
- A. Private irrigation systems proposed to be located within existing or proposed Village right-of-way shall not be installed unless a plan for the proposed system is submitted to the Village for review, and a Right-of-Way Encroachment Agreement is executed by the Village and the system's owner.—The following requirements or features must be indicated on the plan:
1. All irrigation systems shall be equipped with a Village-approved backflow preventer located in a freeze-proof enclosure.—This requirement shall apply to all systems within the Village limits and Pinehurst ETJ whether supplied by a public water system or by a private water system.
 2. All backflow preventers, control boxes, and other above ground devices shall be located outside of Village right-of-way.—Only sprinkler heads, buried piping and control wiring may be located within the Village right-of-way.—No sprinkler heads or other devices shall be installed within 10 feet of curbs or edges of pavement unless otherwise approved by the Village.
 3. Within the Village right-of-way, all control wiring shall be in electrical conduits and installed with no less than 24 inches" of cover, unless greater cover is required by either the applicable electrical codes or the Village Engineer.

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4. All irrigation piping crossing beneath Village streets shall be encased in steel or ductile iron casing pipe, extending no less than 10 feet beyond curbs or edges of pavement with no less than 24 inches" of cover.—All casings shall meet NCDOT standards & specifications.
 5. Sprinkler heads shall be located and adjusted so that the spray pattern does not enter the roadway or create a visual obstruction within sight triangles.
 6. The owner of the irrigation system shall be fully responsible for operation, maintenance and repair of the system.—The owner shall also be responsible for any damage to Village streets or utilities (Village or Moore County) resulting from failure of or repair to the irrigation system.— *The Village shall not be responsible for damage of any kind to private irrigation systems or components located within Village right-of-way for any reason.*
- B. In the event that the Village Representative deems that the owner failed to properly install, operate or maintain a private irrigation system within Village right-of-way, he/she will contact the Village Manager, who may revoke permission for the encroachment upon Village right-of-way.—Upon revocation of permission to encroach upon Village right-of-way, the encroaching facilities shall be removed by the owner, at the expense of the owner, within 30 calendar days following said revocation.—Failure to remove the encroaching facilities within the specified time period shall be cause for the Village to remove the facilities with all costs to the Village being billed to the owner and execution of other remedies as provided for in the Village's Municipal Code.

SECTION 3.7 MAILBOXES IN PUBLIC RIGHTS-OF-WAYS

Mailboxes located within Village right-of-way for the purpose of receiving delivery from the US Postal Service shall conform to the requirements set forth by the US Postal Service.—All portions of the mailbox, support or any appurtenance thereto shall be no less than 12 inches" from the back of curb (where streets have curb & gutter) or 24 inches" from the edge of pavement along non-curb & gutter section streets.—No brick or other "hardened" structures shall be used to support the mailbox for any installation within a Village-owned right-of-way. The Village reserves the right to require submission of installation details prior to mailbox installation and to require modification or removal of any mailbox structure deemed to constitute a safety hazard.

Cluster mailbox units shall be located on private property, outside of the Village right-of-way.



SECTION 3.8 PUBLIC UTILITY ENCROACHMENTS

All public utilities not owned by the Village (including but not limited to water, sewer, natural gas, electric, telecommunications and ~~cable TV~~ fiber optic) that desire to utilize any portion of the Village's right-of-way or easements for installation of any above or below ground facilities shall be required to execute a Right-of-Way Encroachment Agreement with the Village for each installation unless a "blanket" Agreement has been issued by the Village.—The installation shall, at a minimum, comply with the latest edition of the NCDOT "*Policies and Procedures Manual for Accommodating Utilities on Highway Right-of-Ways*" Manual and in accordance with the Standard Details contained in this manual and any Special Provisions issued by the Village as part of the Encroachment Agreement.—The Village may require additional depths of bury, alternate materials, or other installation modifications on a case-by-case basis.

Failure to comply fully with all specified conditions shall be grounds for revocation of the Encroachment Agreement and refusal for consideration of any further encroachment requests until the non-compliant installation has been brought into full compliance. Further, the Village may elect pursue all remedies against the encroaching party as allowed under all local, State, and Federal codes, laws, and rules.

SECTION 3.9 PRIVATE UTILITY AND PRIVATE STRUCTURE ENCROACHMENTS

No privately owned utilities or structures, including ~~for~~ remains force mains, pumps, cables, pipes, fences, sheds, or any other associated private utility facility or privately owned structure shall be allowed within any Village right-of-way or easement, unless an Encroachment Agreement has been executed by the Village.—In the event such an installation is found, the encroaching party shall promptly and completely remove the facility and restore the easement or right-of-way to the satisfaction of the Village. Failure on the part of the encroaching party to remove the facility within 30 business days shall result in removal by the Village with all costs being born by the encroaching party.—Further, the Village shall not be liable for any damages to the encroaching facility or any associated facilities removed by the Village.—The Village may also elect to seek other remedies as provided for in various Village, State, and Federal codes and laws.

SECTION 3.10 FIRE LANES

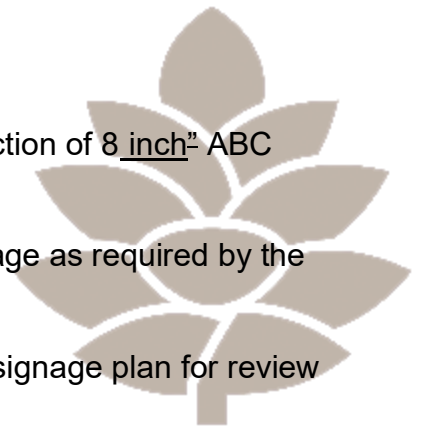
All fire lanes shall be installed by the contractor and inspected by the Village in accordance with the Public Street requirements contained in this manual.—Fire Lanes shall be provided as required by the Village Fire Marshal.

Fire Lanes shall be at least 20 feet in width, with the edge closest to a building or fire hazard located at least 25 feet away from said hazard, unless otherwise directed by the

Fire Marshal.—All fire lanes shall have a minimum pavement section of 8 inch ABC stone and 2 inches of SF9.5BA asphalt.

Fire Lanes shall be designated by pavement markings and signage as required by the Fire Marshal.

All site plans shall include a fire lane plan and fire lane marking/signage plan for review by the Village Engineer and Fire Marshal.



SECTION 3.11 TRAFFIC IMPACT STUDIES

Where required, all Traffic Impact Studies (TIS) shall conform to the standards ~~set by the Village Engineer noted below. Any proposed improvements cited in these studies shall be constructed by the Developer/Owner at no charge to the Village in conformance with Village and NCDOT standards and specifications.~~

~~It shall be the responsibility of the Developer/Owner to contact the Village in advance.~~ Developers/owners are encouraged to contact the Village in advance of completing their study to determine the specific study requirements for their proposed project.

SECTION 3.11.1 WHEN A TIS IS REQUIRED

A TIS will be required for any development that is expected to generate more than 1,000 new external daily trips or 100 new external peak hour trips at full occupancy based on the most recent version of the ITE Trip Generation Manual or comparable data approved by the Village Engineer. Examples of land use intensities that may require a TIS include:

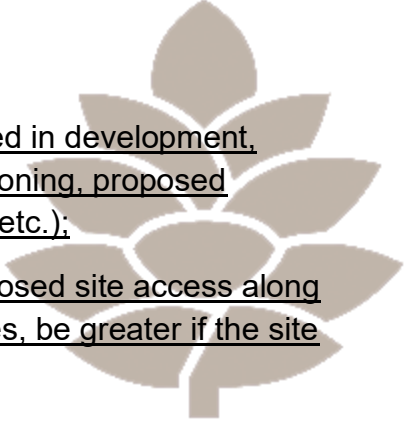
1. 100 Single Family Residential Units
2. 150 Townhome or Apartment Units
3. 175 Hotel Rooms
4. 75,000 square feet of General Office Space
5. 15,000 square feet of Retail Space

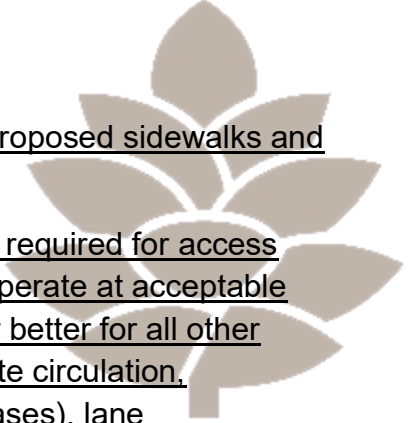
The Village Engineer reserves the right to require additional or alternative studies on a case-by-case basis including, but not limited to, scenarios in which development is proposed near schools, in areas of significant crash history, or where known severe traffic conditions or other safety concerns exist currently.

SECTION 3.11.2 TIS REQUIREMENTS

A TIS includes the following elements:

1. **Abstract or Summary:** Summarize description of proposed development, location, traffic generation, existing and future conditions (level of service), and recommended improvements. Evaluate the impact of site-generated traffic on affected intersections in the impact area;

- 
2. **Description of Development:** Describe acreage included in development, existing and proposed land use, existing and proposed zoning, proposed density (number of houses, square feet of development, etc.);
 3. **Study Area:** Generally, ¼ mile to ½ mile from each proposed site access along roads accessed by the site. This area may, in a few cases, be greater if the site is on a road with no intersections within that distance.
 4. **Site Location:** Include location map showing site in relation to major streets and all study intersections.
 5. **Traffic Generation:** Indicate number of trips generated by site daily and in the AM and PM peak hours (AM peak hour may be omitted for retail uses which are not expected to generate significant traffic volumes during this period). Indicate internal or pass-by traffic generation if appropriate. For rezoning, indicate traffic generation under existing zoning as well as proposed zoning. Indicate source of trip generation rate, land use code, and units used to derive generation.
 6. **Trip Distribution:** Indicate percentage distribution of trips, by direction, within study area and method used to obtain.
 7. **Access Location(s):** Location of planned streets or driveways and access to existing streets. Indicate other streets or driveways within study area, including those across the street. Indicate coordination with NCDOT where appropriate.
 8. **Internal Circulation:** Review internal circulation patterns and note recommended changes;
 9. **Existing Road and Traffic Conditions:** Street laneage and classification, traffic control devices, existing daily traffic volumes within study area. Show traffic volumes and level of service of signalized intersections and proposed site access points within study area during AM and PM peak hour (PM only for retail). Include work sheets or computer printouts showing counted traffic volumes and level-of service. Illustrate in figure(s) showing peak hour volumes, lanes, and level of service. For unsignalized intersections, show level-of-service for individual movements. Discuss transit service if applicable. Provide a review and discussion of crash history in the study area.
 10. **Planned Improvements:** Discuss and describe any planned road improvements in the study area which could affect future traffic. Note whether project is shown on thoroughfare plan, collector street plan, or NCDOT TIP.
 11. **Future Conditions:** Same as for existing conditions, plus site traffic assigned to driveways or access points, for condition with full build-out of project, at build-out year. Include growth in background traffic due to other approved developments or to general growth in area. May show more than one phase, if project is to be phased. Discuss any conflict with other driveways or streets, queueing problems, potential safety problems.

- 
12. **Pedestrian Facilities:** Indicate location of existing and proposed sidewalks and crosswalks and internal pedestrian paths.
 13. **Recommended Improvements:** Indicate improvements required for access points and signalized intersections within study area to operate at acceptable level of service (D or better for arterial intersections, C or better for all other intersections). These may include site access, internal site circulation, signalization, signal modification (retiming, additional phases), lane modifications or additions, or street widening. A signal warrant study is not required but may be included as supporting documentation where a traffic signal is requested. Note: showing recommended improvements does not necessarily indicate responsibility for improvement. Report may indicate which improvements are due to development and which are due to existing problems or other growth in traffic, and may suggest responsibility of developer or of other parties for improvements. Proposed improvements should be shown schematically on figure.
 14. **Engineer's Seal:** All TIAs are to be prepared and sealed by an engineer registered in the State of North Carolina and specializing in traffic or transportation, with experience in preparing TIAs

SECTION 3.11.3 IMPROVEMENTS MAY BE REQUIRED

Based on the findings of the analysis, if a proposed development does not meet the applicable service level standards, the TIS shall identify mitigation measures to bring the facilities in accordance with the adopted level-of-service standards. Mitigation measures may involve strategies other than roadway construction or other physical improvements such as changes to traffic signal timing or phasing, and transportation management strategies. The Village Engineer will be responsible for determination of mitigation improvements to be constructed by the applicant.

SECTION 3.11.4 THRESHOLDS FOR MITIGATION

Development has the responsibility to not create unsafe or inefficient traffic conditions.

- A. Based on TIS findings, identified improvements, and staff review, the TIS shall identify improvements to the transportation network if at least one of the following conditions exists when comparing background network conditions to project build-out conditions:
 1. The overall average delay at an intersection or individual approach increases by 25 percent or greater during the peak hour of analysis, while maintaining the same level of service or degrading to a LOS D.
 2. The overall or individual approach LOS degrades to E or F.
 3. When the analysis of a turning lane indicates that the 95th percentile queue or SimTraffic maximum queue exceeds the storage capacity of the existing lane.

- B. At new site driveways and intersections, a turn lane warrant analysis shall be performed in accordance with the NCDOT Manual or other approved industry standards.

SECTION 3.12 PARKING

Parking facilities shall be provided in accordance with the standards set forth in the Village's PDO. -The Layout and design of all parking facilities shall conform to the standards and guidelines set forth by ITE for the type of facility being serviced. -All parking facilities shall have, at a minimum, the dimensions as outlined ~~on Figure 3-2 in~~ Table 3.2 at the end of this Section.

Parking lots shall be designed to provide safe maneuverability of vehicles. A minimum parking stall dimension of 9' x 18' shall be provided. Accessible parking spaces shall be a minimum dimension of 8 feet with a five (5) foot lane adjacent to the space (or minimum lane width of eight (8) feet where van accessibility is required) and properly marked with signage in accordance with the N.C. Building Code and Americans with Disabilities Act (ADA) standards.

Where sidewalks abut an 18 foot deep parking bay, the sidewalk shall be a minimum width of ~~six (6)~~ feet, unless the bay depth is increased to allow use of standard concrete wheelstops to prevent vehicular overhang from obstructing any portion of the sidewalk.

A minimum pavement structure consisting of 6 inches of ABC and 2 inches of SF9.5BA ~~or S9.5A~~ shall be used along the travel aisle on parking facilities for multi-family and nonresidential developments. -Access drives for these facilities shall also meet this minimum pavement standard. -In the event any travel aisle or access drive areas are determined by the Fire Marshal to be 'fire_lanes', the paving section of those areas shall be increased to meet the fire_lane paving requirements set forth in this manual.

All minimum stall depths and module widths shall be measured to the face of curb when curb and gutter is used. -For non-curb & gutter facilities, the Village Engineer may require additional stall depth and use of concrete wheelstops.

All paved parking facilities shall be striped in accordance with the MUTCD with ~~four (4)~~ inch white lines. -All fire_lane areas within any parking facility shall be marked and signed in accordance with guidance provided by the Fire Marshal. -Accessible parking facilities and isles shall be marked in accordance with ADA standards.

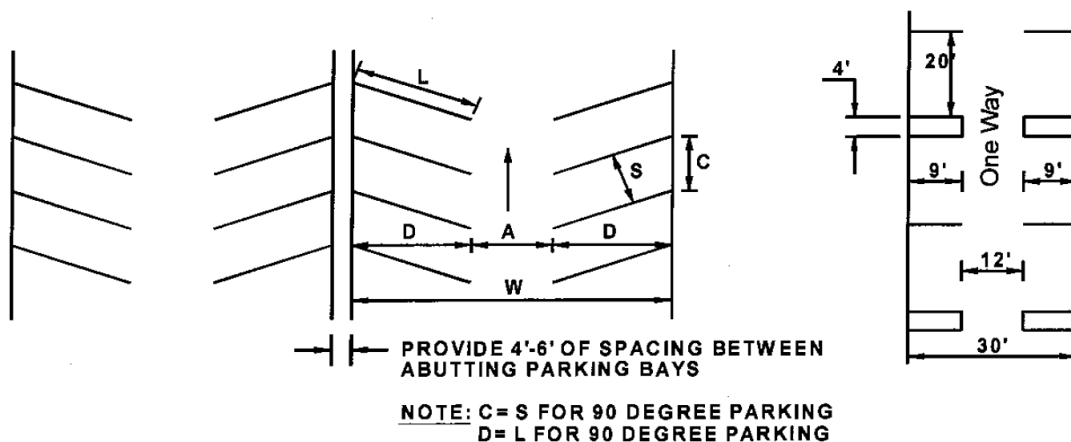


Figure 3-1 Table 3.1. Street Design Criteria

	Horizontal Curve Controls				Vertical Curve Controls		
	Minimum Design Speed (MPH)*	Maximum Superelevation (ft/ft)**	Maximum Radii (ft)	Maximum Grade (%)	Length Crest	Length Sag (ft)	Minimum Length (ft)
Major Streets (Thoroughfares)	Design Standards need to be determined for each case individually by a Professional Engineer using AASHTO guidelines & the NCDOT Roadway Design Manual with approval by the Village & NCDOT.						
Collector Street – Non-Residential	40	0.04	500	6	55A	55A	150
Collector Streets – Residential	35	0.04	300	7	35A	35A	125
Non-Residential Local Streets	30	reverse crown	300	7	30A	40A	100
Residential Local Streets	30	normal crown	150	8	30A	30A	100
Cul-de-sacs	25	normal crown	100	8	25A	25A	75
Notes: 1. The Village Engineer may allow a lower design speed on residential streets. Approval must be given on a case by case basis. 2. The minimum clear section for local streets shall be 20 feet, exclusive of the gutter section, with 24' required for ribbon paving. 3. A minimum tangent of 100 feet shall be provided between all horizontal curves with a minimum of 150 feet for collector level and higher classification streets. 4. The minimum grade for any street shall be 0.5%. the maximum grade allowed for streets when approaching an intersection shall be limited to 3% for the last 100 feet of pavement prior to the intersection. 5. The minimum curb radius return shall be 30' with longer returns required as determined by the Village Engineer in non-residential areas and on Major Streets. 6. Special typical section standards apply in the Historic Preservation Overlay District. Contact the Village Engineer for specific guidance. *-Design Speed to be at least 5 mph greater than posted speed except for cul-de-sacs in which case the design speed shall be the posed speed. ** -The superelevation tables found in the AASHTO "Greenbook" latest edition will be used for determining the actual "e" for various centerline radii.							

Figure 3-2 Table 3.2 Recommended Parking Lot Stall Dimensions

Application		(S) Stall Width (ft)	(C) Stall Length (ft)	(D) Stall Depth (ft)	(L) Linear Depth (ft)	(A) Aisle Width (ft)	(W) Module Width (ft)
Dimensions for 90-Degree Parking							
Customer, high turnover	Standard	9	9.5	18	18	24	60
Customer and Employee, low turnover	Standard	9	9	18	18	24	60
Dimensions for 60-Degree Parking							
Customer, high turnover	Standard	9	11	15.6	18	22.8	54
Customer and Employee, low turnover	Standard	9	10.4	15.6	18	20.8	52
Dimensions for 45-Degree Parking							
Customer, high turnover	Standard	9	13.4	12.7	18	22.6	48
Customer and Employee, low turnover	Standard	9	12.7	12.7	18	21.6	47
Dimensions for Parallel Parking							
Customer	Standard	9	20**			12*	30*
*One-Way Only **Minimum, See Detail							



SECTION 4. CURB AND GUTTER, DRIVEWAYS, GREENWAYS, AND SIDEWALKS

SECTION 4.1 MATERIALS

SECTION 4.1.1 CONCRETE

Concrete for curb and gutter, driveways, or sidewalks shall be Portland cement concrete having a minimum 28-day strength of 3,000 psi when tested in accordance with ASTM C39.—Detailed specifications for concrete shall conform to the specifications contained in Section 2.08 hereof and with applicable sections of NCDOT “Standard Specifications for Roads and Structures”, latest edition.

SECTION 4.1.2 BITUMINOUS CONCRETE (ASPHALT)

Asphalt for driveways shall meet the requirements as set forth in the latest edition of NCDOT’s Standard Specifications for Roads and Structures for ~~SF9.5A-5B~~ asphalt.—PG64-22 liquid binder may be used.

SECTION 4.1.3 JOINT FILLERS

Joint fillers shall be a non-extruding joint material conforming to ASTM D1751.

SECTION 4.2 DIMENSIONS

The minimum thickness of a sidewalk shall be 4 inches, except at driveway crossings where the sidewalk shall be a minimum of 6” inch in thickness.—Sidewalks shall have a uniform slope perpendicular to the curb or edge of pavement of not less than ~~4~~¹/₄ inch per foot and the utility/street tree strip between the sidewalk and the back of curb shall have a slope of not less than ¹/₄ inch” per foot nor greater than ¹/₂ inch” per foot toward the back of curb.—All sidewalks shall be at least ~~5~~^{five} (5)



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feet in clear width.—All sidewalks shall be within the Village street right of way unless installed within a dedicated and platted Sidewalk Easement that is approved in advance by the Village Engineer.

Curb and gutter shall be standard 24 inch" combination curb and gutter in accordance with the Village's Standard Details. —Standard median curb (18 inch) may be used on entrance islands and medians. For a 24 inch" curb, a *back of curb* transition section into and ~~existing~~ all catch basins shall be required. —The length of the transition section shall be at least ~~5 feet~~ five feet (5') on each side of the catch basin. —Rolled or valley type concrete curb & gutter shall not be used unless specifically authorized in writing by the Village Engineer.—No asphalt 'wedge' curbing shall be permitted within the Village's jurisdiction unless approved by the Village. —Brick curbing, conforming to special standards prepared by the Village, may be used in Commercial Areas of the Historic Preservation Overlay District or in other areas as determined acceptable by the Village.

SECTION 4.3 CONSTRUCTION METHODS

SECTION 4.3.1 SUBGRADE

The subgrade shall be excavated to the required depth to allow placement a minimum of 3 inches" of aggregate base course beneath the curb, and shaped to the proper cross-section. —Where tree roots are encountered, they shall be removed to a depth of 1 foot for the full width of the excavation. —The subgrade shall be stable and thoroughly compacted, as specified in Section 3.04.

SECTION 4.3.2 FORMS

Forms shall be set and maintained true to the required lines, grades, and cross sectional dimensions as shown on the Standard Details and on the Drawings. —Forms shall be constructed with material of such strength and with such rigidity to prevent any appreciable deflection between supports. —Straight forms shall be within a tolerance of ¼ inch in 10 feet from a true line horizontally. —Vertical grade control of the forms shall be conducted by use of stringlines tied to adequate offset grade staking. Offsets shall be at least ~~5 feet~~ five feet (5') from the proposed back of curb. —Forms shall be thoroughly cleaned of all dirt, mortar and foreign material before being used. —All inside form surfaces shall be thoroughly coated with commercial quality form oil.

Curbing forms or "stringline" guides shall be carefully placed to assure that the curbing will be constructed to accurate grades and no depressions or "bird baths" are created. Curved sections shall be placed such that the radii are smooth and continuous, without abrupt bends.

SECTION 4.3.3 EXPANSION, CONTRACTION AND CONTROL JOINTS

Contraction and control joints shall be cut to a depth equal to at least 1/3 of the total concrete thickness. —Contraction or control joint spacing shall be 10 feet maximum for curbing and driveway aprons. —Expansion joints for curbing shall be no more than 50 feet on centers, with the joint material extending the full depth of the concrete with the

top of the filler 1/8-1/8-inch below the finished surface.- Expansion and contraction joints shall be spaced such that no final curb section shall be less than 5 feet long (including repair sections). -Expansion joints for sidewalks shall be spaced no greater than 50 feet apart.-_Sidewalks shall be finished to grade and cross-section with a float, troweled smooth, and finished with a broom. -Contraction joints shall be no less than 1/8_-inch in width and cut at intervals equal to the width of sidewalk.

SECTION 4.3.4 DRIVEWAY APRONS

Where driveway aprons are to be installed in an existing curb, the entire curb and gutter section shall be removed. -Saw cutting and removing the curbing, and leaving the existing gutter in place, shall not be allowed. -Contraction, control and expansion joints shall be located as previously specified and shown in the Village's Standard Details.

The flow line of the gutter shall be maintained across driveway aprons. Driveway aprons shall be a minimum of 6 inches thick and constructed in accordance with the Village's Standard Details contained in this manual.

SECTION 4.4 PEDESTRIAN CROSSINGS

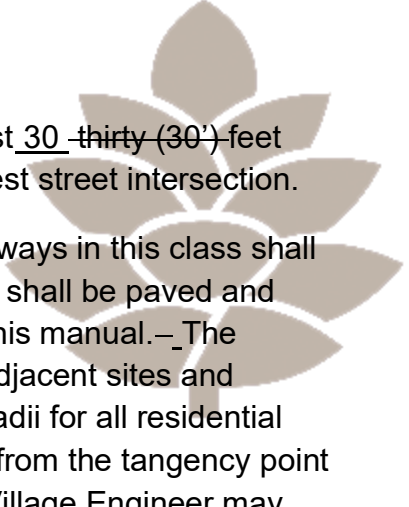
Pedestrian crossings, curb cuts and ramps shall be provided at all intersections in accordance with NCGS 136-44.14.-_Construction, pavement marking, etc. shall conform to the Village's standard details.

SECTION 4.5 DRIVEWAY CRITERIA

No property shall have more than two (2) driveway cuts or turnouts onto any street. -The spacing of all drives shall be as approved by the Village Engineer or Village Representative. -The Village Engineer or Village Representative may restrict the location and/or number of driveways to a parcel when felt to be in the best interest of the overall safety of the Village. The edge of all driveways shall be offset at least 10 feet from any adjacent property lines at the right-of-way lines. ~~adjacent property lines.~~ Greater offsets may be required in multi-family, commercial, and other non-residential zoning districts.

If required by the Village Representative, a minimum 15 inch" RCP shall be installed beneath the driveway to accommodate positive drainage.-_In addition, sod shall be provided as directed by the Village Representative within the right of way to prevent erosion. -Sod shall be 1 inch" below the edge of the roadway.

- A. Residential, Single Family – on curb & gutter streets, all residential driveways shall be installed and inspected in accordance with the standards and specifications contained herein and any direction provided by the Village Engineer or Village Representative.-_On non-curb& gutter streets, the driveways shall be installed in accordance with the Village's standard details and shall include an asphalt or concrete paved apron that extends at least fifteen (15) feet from the edge of the roadway back into the right of way.-_Residential driveways shall be at least 12 feet wide and no more than 46-18 feet wide at the right-of-way line.-_The end point of



the driveway radii for all residential driveways shall be at least ~~30~~ thirty (30') feet back from the tangency point of the radii formed by the nearest street intersection.

- B. Commercial, Institutional, Residential Multi-Family – all driveways in this class shall be fully paved.–_For sites requiring a Fire Lane, the driveway shall be paved and constructed to meet the Fire Lane requirements set forth in this manual.–_The arrangement of driveways shall be related to driveways for adjacent sites and nearby street intersections.–_The end point of the driveway radii for all residential driveways shall be at least ~~100~~ one hundred (100') feet back from the tangency point of the radii formed by the nearest street intersection.–_ The Village Engineer may require greater setback distances on a site-by-site basis.

Where two driveways are proposed along a single property frontage to facilitate operations, the minimum distance between the centerlines of the two driveways shall be at least 300 feet, unless otherwise approved by the Village with greater offset distances as required by the Village Engineer and/or NCDOT.–_A Street-type turnout shall be utilized when the estimated ADT of the site is greater than 100 vehicles/day, large vehicles such as fire apparatus must be accommodated, or as required by the Village Engineer.

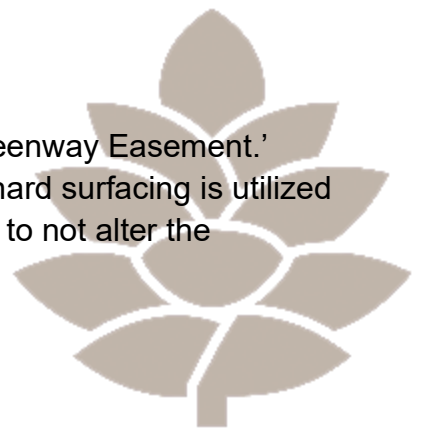
SECTION 4.6 INSPECTION

No concrete or other paving shall be placed until all forms, subgrades, and base courses have been inspected and approved by the Village Representative.–_Offset or reference points shall be maintained in place to allow for proper inspection of the forms by the Village Representative.–_Where machine extruded curbing is used, the "stringline" shall be inspected and approved by the Village Representative prior to placement of any curbing.–_A minimum of ~~5~~ five (5') foot offset shall be used for all hubs, reference points, etc to allow for adequate room to install stringlines while minimizing the disturbance of the reference points.

SECTION 4.7 GREENWAYS AND PATHWAYS

~~All greenways shall have a minimum section of 4 inch" compacted thickness stone screenings. Hard surfacing such as asphalt paving may be required by the Director of Parks & Recreation if felt to be in the best interest of the Village.~~Surface materials for greenways and pathways shall be as required by the Director of Parks and Recreation. The minimum width of all greenways shall be 6 feet clear width, with a 3 foot shoulder/swale area on each side, with additional width as required by the Director of Parks & Recreation to meet the requirements of specific sites or areas, such as high pedestrian counts, or to accommodate other needs.–_All greenways shall be crowned or sloped to ~~provide for~~ provide proper drainage.–_The maximum allowable longitudinal gradient shall be 10%.–_Drainage shall be provided at all crossings and shall accommodate at least the 10-year storm event, with increased drainage requirements as determined by the Village Engineer and the Director of Parks & Recreation.–_All greenways on private property that are to be maintained by the Village shall be located

within a platted 15 feet wide (minimum) 'Village of Pinehurst Greenway Easement.' Greenways may be placed in Floodzone areas, provided that a hard surfacing is utilized and that the greenway shall be constructed in such a manner as to not alter the Floodzone elevations.



SECTION 5. STORMWATER CONVEYANCE & MANAGEMENT DRAINAGE



SECTION 5.1 DESIGN

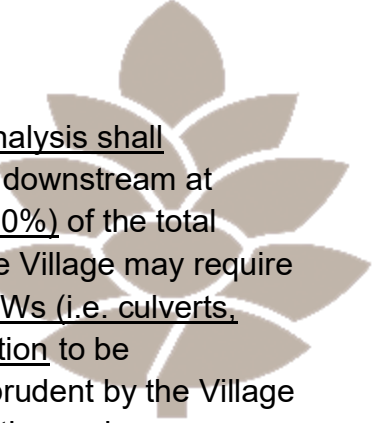
SECTION 5.1.1 GENERAL

Storm drainage facilities shall be designed to collect and dispose of stormwater generated upon or passing through the project location. Stormwater drainage facilities include structures (inlets, junction boxes, etc.), pipes, culverts, bridges, gutters, and constructed open channels that convey runoff from public and private lands. The determination of the quantities of water that must be accommodated will be based upon calculated peak flows from storms of various return periods. Note that roof drainage or foundation drainage systems are considered building systems until they are connected to a drainage structure, gutter, or channel that is part of the storm drainage facilities. Building systems are subject to building codes and not subject to the requirements of this manual.~~The determination of the quantities of water that must be accommodated will be based upon peak flows from storms having the following return periods:~~

All stormwater drainage facilities shall flow by gravity. No pumping will be allowed for any stormwater conveyance system unless approved by the Village Engineer.

~~All storm drainage facilities shall be designed in a manner such that upstream and downstream properties are not adversely affected.~~—The Village Engineer may also require submission of an engineering Downstream Impact Analysis in order to illustrate that upstream and downstream properties are not adversely affected by

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runoff from the proposed development. The Downstream Impact Analysis shall be include assessment of the overall receiving watershed to a point downstream at which the runoff from the site in question is less than ten percent (10%) of the total predicted return period event flow for the receiving watershed. –The Village may require offsite improvements to downstream infrastructure within public ROWs (i.e. culverts, bridges or drainage facilities) or additional onsite peak flow attenuation to be implemented made by the developer down to this point if deemed prudent by the Village to minimize the impact of increased runoff to on downstream properties and infrastructure.

All public storm drainage facilities, with the exception of Stormwater Control Measures (SCMs), shall be installed in dedicated street rights-of-way (i.e. pipe inlets and outlets shall be within street rights-of-way). If a property owner/developer desires to extend storm drainage piping to eliminate open channels on private property, such pipes shall be installed and maintained at the property owner's expense, with appropriate computations and plans submitted to the Village Engineer to ensure that such extensions will not adversely affect the performance of the existing system. No off right-of-way extension of any stormdrain system serving a public right-of-way shall be made until such time as all computations and plans for the same have been reviewed and approved. A manhole or junction box shall be provided at the public right-of-way boundary.

SECTION 5.1.2 PEAK RUNOFF FLOW CALCULATIONS

Prediction of the peak flow rates shall be calculated using the procedure in the USDA Soil Conservation Service Natural Resources Conservation Service (NRCS) Method TR-55, the Rational Method, or other calculation methods as approved by the Village Engineer. The same method must be used when comparing pre- and post-development conditions. The size of stormwater culverts shall be determined by utilizing the standard energy equation for inlet control or outlet control.

The Rational Method may only be used for drainage areas equal to or less than 100 acres. Intensity data used in computations (inches/hour) for various return period and duration storms shall be based upon data specific to the Village of Pinehurst. If an automated software program other than those specifically developed by SCS/NRCS is used, adequate data regarding the program shall be submitted to the Village Engineer for review and approval.

Calculation submittals demonstrating onsite peak runoff flows shall include analyses of pre and post development run-off runoff rates for the 2, 10, 25, and 100-year storm events. The same method of calculating peak stormwater runoff must be used for both pre and post development conditions. All calculations shall be performed under the responsible charge of an appropriately licensed design professional and sealed by that professional. All submittals shall include a full analysis and justification for the determination of rational composite runoff coefficients (C)C or Curve Number (CN)

factors, time of concentration (Tc), and other data used in the development of the computations.

SECTION 5.1.3 CLOSED STORMWATER CONVEYANCE SYSTEM DESIGN

Closed stormwater conveyance systems shall be sized based upon the criteria listed in Table 5.1 below:

~~***For areas up to 100 acres, the Rational Method may be used. Intensity data used in computations (inches/hour) for various return period and duration storms shall be based upon data specific to the Village of Pinehurst. For areas greater than 100 acres, SCS methods shall be used. If an automated software program other than those specifically developed by SCS/NRCS is used, adequate data regarding the program shall be submitted to the Village Engineer for review and approval.***~~

Table 5.10-2. Sizing Criteria for Closed Stormwater Conveyance Systems

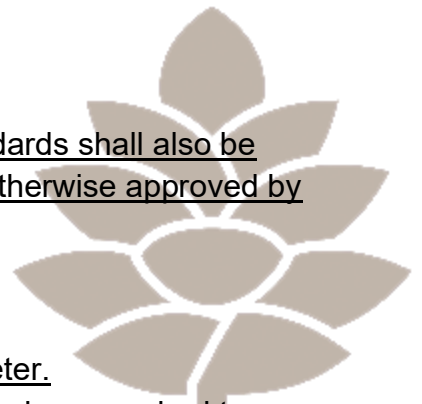
<u>Structure Type</u>	<u>Design Storm</u>	<u>Design Criteria</u>
<u>Inlets & Gutters¹</u>	<u>10-Year</u>	• <u>Gutter Spread $\leq$ 4 ft in travel lane (excludes gutter width)²</u>
<u>Closed Conveyance Systems²</u>	<u>10-Year</u>	• <u>HGL for entire system at or below the crown of all pipes.</u>
	<u>25-Year</u>	• <u>HGL shall not exceed top of structures or gutter elevations, whichever is less.</u>

Notes:

1. Assuming 50% blockage for all grate inlets located within a sag. For combination inlets, only the grate portion needs to be assumed as 50% blocked.
2. For all local streets. The inlets shall be spaced on other classification streets using the standards set forth in the NCDOT's Hydraulic Design Guidelines, latest edition, as modified by the Village.

Hydraulic Grade Line (HGL) calculations shall consider all head losses, friction factors, and bypass flows. If discharging into a SCM, the downstream HGL at the outlet end of the stormwater conveyance system shall begin at 10-year or 25-year design storm peak water surface elevation of the SCM.

Design of stormwater collection systems for public and private streets shall include inlet spread/capture computations ~~based upon 'just full' flow (gravity flow) in accordance with the Manning Equation,~~ and a hydraulic grade line analysis to verify the system performance. Such computations shall be submitted in a neat, tabular format under the signature and seal of the North Carolina licensed design professional and include a clear numbering/labeling scheme for all structures shown on the plans as part of the proposed system. In the event software programs are used to determine inlet location and spread, such programs shall be approved by the Village Engineer.



In addition to the above-sizing criteria, the following design standards shall also be required for all closed stormwater conveyance systems unless otherwise approved by the Village Engineer:

Pipes

- The minimum pipe size to be used shall be 15-inch diameter.
- The minimum pipe grade in all cases shall be 0.5% or the slope required to develop a 2.5 fps flow velocity at the design condition
- The maximum allowed pipe grade shall be 8.0% unless special anchoring details are approved by the Village Engineer.
- The minimum depth of cover over pipes shall be 2 feet below finished subgrade for all traffic bearing areas and 1 foot below finished grade for all non-load bearing areas. High strength pipe may be used upon approval by the Village Engineer in areas that cannot meet the minimum cover requirements.

Structures

- Manholes or junction boxes shall be installed at each deflection of line or grade. No "blind" junction boxes shall be permitted.
- All tie-ins must occur at a structure. No "break-ins" or taps to pipes are allowed with out prior approval of the Village Engineer.
- All drainage structures shall allow for access via a manhole cover, grate, or lid.
- Minimum invert drop across drainage structures shall be 0.1 feet unless approved by the Village Engineer
- At drainage structures where pipe diameters increase, the crown elevation of the incoming pipe shall match or exceed that of the outgoing pipe.
- Waffle boxes (i.e. knock-out boxes) shall be ≤5 feet in depth and shall not be allowed within areas expected to experience traffic-bearing loads.

Inlets and Gutters~~The minimum pipe size to be used shall be 15-inch diameter. The minimum size for a culvert crossing under a public or private street shall be 18 inches. The minimum pipe grade in all cases shall be 0.5% or the slope required to develop a 2.5 fps flow velocity at the design condition and the maximum pipe grade shall be 8% unless special anchoring details are approved by the Village Engineer.~~

- Stormwater conveyance systems shall be designed to mitigate flow across streets. Inlets shall be provided to intercept flow at the following locations:
 - Upgrade of the radius point(-s) of an intersection, or the design of the street shall indicate a continuous grade around the radius to allow the flow to continue down the intersecting street.
 - Upgrade of superelevation crossovers
 - Any location where greater than 3 cfs will reach a ROW from a private site during the 10-Year design storm.
- No curb inlets shall be installed in the curb radius of any intersection unless approved by the Village Engineer.

SECTION 5.1.4 OPEN STORMWATER CONVEYANCE SYSTEM DESIGN

Open conveyance systems include ditches, swales, and other constructed channels used to convey stormwater. These requirements do not apply to natural stream channels. Open stormwater conveyance systems shall be sized based upon the criteria listed in Table 5.2 below:

Table 5.20.4. Sizing Criteria for Open Stormwater Conveyance Systems

<u>Structure Type</u>	<u>Design Storm</u>	<u>Design Criteria</u>
<u>Roadside Swales/Ditches within ROW</u>	<u>25-Year</u>	• <u>Water surface elevation does not exceed top of banks</u> • <u>Vegetation and/or armoring designed that channel does not erode during peak flows</u>
<u>Open Conveyances Outside of ROW</u>	<u>10-Year</u>	• <u>Water surface elevation does not exceed top of banks</u>
	<u>25-Year</u>	• <u>Inundation does not exceed the limits of the Drainage Easement</u> • <u>Vegetation and/or armoring designed that channel does not erode during peak flows</u>

No channel within an easement or right-of-way may have side slopes that exceed 3:1 (H:V) and flatter side slopes are encouraged in all cases. Channels shall be designed to have a minimum velocity of 1.5 fps to avoid siltation and capacity reduction.

Maximum acceptable velocities are as shown in ~~Figure 5-1~~ Table 5.3 at the end of this sub-section.

For shoulder section streets, the roadway swales shall be sized to handle a minimum of the ~~25-10-Y year storm without erosion or overtopping. Preference shall be given to utilizing grass-lines swales in lieu of rip-rap for erosion control, and the maximum front and back slopes in these areas shall be ~~4~~5:1 (H:V) to allow for routine mowing and maintenance, with flatter side slopes encouraged in all cases.~~

Table 5.30-6. Maximum Permissible Velocities in Lined Channels*

<u>Cover</u>	<u>Slope Range (% Grade) (2)</u>	<u>Permissible Velocity (1)</u>	
		<u>Erosion Resistant Soils (ft/sec)</u>	<u>Easily Eroded Soils (ft/sec)</u>
<u>Bermuda grass</u>	<u>0-5</u> <u>5-10</u> <u>>10</u>	<u>8</u> <u>7</u> <u>6</u>	<u>6</u> <u>5</u> <u>4</u>
<u>Bahia</u> <u>Buffalo grass</u> <u>Kentucky Bluegrass</u> <u>Smooth Brome</u> <u>Blue Grama</u>	<u>0-5</u> <u>5-10</u> <u>>10</u>	<u>7</u> <u>6</u> <u>5</u>	<u>5</u> <u>4</u> <u>3</u>
<u>Grass Mixtures</u> <u>Reed Canary Grass</u>	<u>0-5 (1)</u> <u>5-10</u>	<u>5</u> <u>4</u>	<u>4</u> <u>3</u>
<u>Lespedeza Sericea</u> <u>Weeping Lovegrass</u> <u>Yellow Bluestem</u> <u>Redtop</u> <u>Alfalfa</u> <u>Red Fescue</u>	<u>0-5 (3)</u>	<u>3.4</u>	<u>2.5</u>
<u>Common Lespedeza</u> <u>Sudangrass</u>	<u>0-5 (4) (5)</u>	<u>3.5</u>	<u>2.5</u>

NOTES:

1. Use velocities exceeding 5 feet per second only where good covers and proper maintenance can be obtained.
2. Do not use on slopes steeper than 10% except for vegetated side slopes in combination with a stone, concrete or highly resistant vegetative center section.
3. Do not use on slopes steeper than 5% except for vegetated side slopes in combination with stone, concrete or highly resistant vegetative center section.
4. Annuals – use on mild slopes or as temporary protection until permanent covers are established.
5. Use on slopes steeper than 5% is not recommended.

* From USDA Soil Conservation Service, SCS-TP-61, *Handbook of Channel Design for Soil & Water Conservation*

SECTION 5.1.5 CULVERTS AND BRIDGE DESIGN

Culverts and bridges shall be sized based upon the criteria listed in Table 5.34 below:

Table 5.40.8 Culvert and Bridge Design Size

<u>Roadway Classification¹</u>	<u>Design Storm</u>	<u>Design Criteria</u>
<u>Major Thoroughfare & Principal Arterial</u>	<u>100-Year</u>	• <u>1' of Freeboard²</u>
<u>Any roadway that crosses a FEMA Floodplain</u>	<u>25-Year</u>	• <u>HW/D ≤ 1.2</u>
<u>Major & Minor Collector</u>	<u>50-Year</u>	• <u>1' of Freeboard</u>
	<u>25-Year</u>	• <u>HW/D ≤ 1.2</u>
<u>Commercial & Local Street</u>	<u>25-Year</u>	• <u>1' of Freeboard</u> • <u>HW/D ≤ 1.2</u>

Notes:

1. Street Classification to be determined by the Village Engineer.
2. Freeboard is measured from the upgrade shoulder and is defined as the lowest adjacent point where roadway inundation would occur. Bridge freeboard is measured from the deck elevation of the bridge, or the lowest adjacent point where roadway inundation would occur, whichever is lowest.
3. Roadways that cross a stream with FEMA established Special Flood Hazard Areas (SFHA) should be designed to pass the 1% Annual Chance Base flow without overtopping or sustaining damage. The roadway embankments shall be fully protected from flows that may occur during a 100-year event. The resulting backwater pool shall also be shown on the plans.

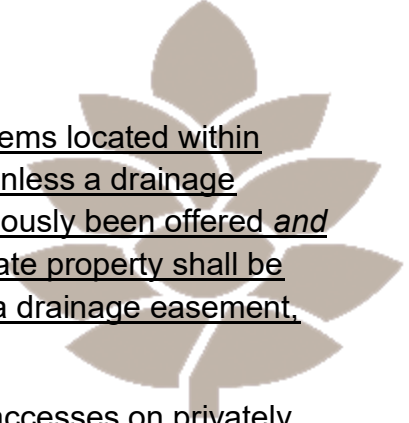
In addition to the above-sizing criteria, the following design standards shall also be required for all culverts and bridges:

- The minimum pipe size to be used shall be 18-inch diameter.
- All culverts and bridges shall comply with applicable local, state, and federal environmental permitting requirements.

SECTION 5.1.6 DRAINAGE EASEMENTS

Minimum widths of storm drainage easements shall be as dictated by the appropriate following configurations listed below:

- 20 feet for single pipes up to and including 36 inches in diameter or open channels up to 36 inches in top width
- 20 feet plus the maximum conduit or channel width (in feet) for single pipes or channels larger than 36 inches wide
- 10 feet from the edge line of the outside conduits where multiple, parallel pipes are installed.



The Village of Pinehurst shall maintain only the storm sewer systems located within Village maintained rights of way and on Village owned property unless a drainage easement meeting the criteria set forth in this Manual has previously been offered and accepted by the Village. Storm drainage systems located on private property shall be maintained by the property owner, including those shown within a drainage easement, unless the easement has been accepted by the Village.

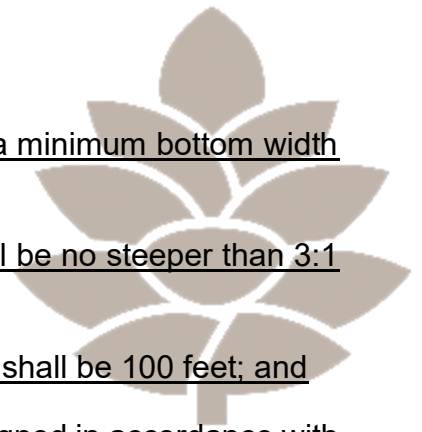
In addition to the above, all SCMs and associated maintenance accesses on privately owned land (except for those located on single family residential lots) shall be located within a permanent recorded maintenance and access easement. These easements shall be granted in favor of the Village and provide legal authority for inspections, maintenance personnel and equipment. No SCM shall be allowed within the proposed or platted public or private street right of way without prior approval by the Village Engineer.

SECTION 5.2 POST CONSTRUCTION STORMWATER MANAGEMENT

SECTION 5.2.1 WATER SUPPLY WATERSHED REQUIREMENTS

New development or redevelopment located within a Water Supply Watershed must meet either the low density or high-density option requirements described below:

- A. **Low Density Projects.** In addition to complying with the project density requirements outlined in Section 6.4.3 of the Pinehurst Development Ordinance, low density projects shall comply with the following:
1. **Vegetated Conveyances.** Stormwater runoff from the project shall be released to vegetated areas as dispersed flow or transported by vegetated conveyances to the maximum extent practicable. In determining whether this criteria has been met; the Village shall take into account site-specific factors such as topography and site layout as well as protection of water quality. Vegetated conveyances shall be maintained in perpetuity to ensure that they function as designed.
 2. **Curb Outlet Systems.** In lieu of vegetated conveyances, low density projects shall have the option to use curb and gutter with outlets to convey stormwater to grassed swales or vegetated areas. Requirements for these curb outlet systems shall be as follows:
 - (1) The curb outlets shall be located such that the swale or vegetated area can carry the peak flow from the 25-year storm and at a non-erosive velocity;
 - (2) The longitudinal slope of the swale or vegetated area shall not exceed five percent except where not practical due to physical constraints. In these cases, devices to slow the rate of runoff and encourage infiltration to reduce pollutant delivery shall be provided;



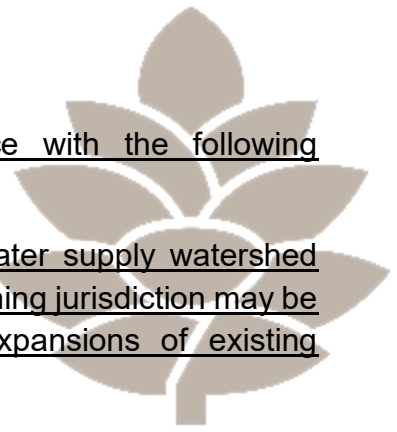
- (3) The swale's cross section shall be trapezoidal with a minimum bottom width of two feet;
- (4) The side slopes of the swale or vegetated area shall be no steeper than 3:1 (horizontal to vertical);
- (5) The minimum length of the swale or vegetated area shall be 100 feet; and
- (6) Low density projects may use treatment swales designed in accordance with 15A NCAC 02H .1061 in lieu of the requirements specified in Sub- Items (1) through (5) above.

B. **High-Density Projects.** In addition to complying with the project density requirements outlined in the Village of Pinehurst Development Ordinance, high density projects shall comply with the following:

1. Stormwater Control Measures (SCMs) shall be designed, constructed, and maintained so that the project achieves either "runoff treatment" or "runoff volume match" as those terms are defined in 15A NCAC 02B .0621;
2. For high density projects designed to achieve runoff treatment, the required storm depth shall be one inch. Applicants shall have the option to design projects to achieve runoff volume match in lieu of runoff treatment;
3. Stormwater runoff from off-site areas and Existing Development, shall not be required to be treated in the SCM. Runoff from off-site areas or existing development that is not bypassed shall be included in sizing of on-site SCMs;
4. SCMs shall meet the relevant Minimum Design Criteria set forth in 15A NCAC 02H.1050 through .1062; and
5. Stormwater outlets shall be designed so that they do not cause erosion downslope of the discharge point during the peak flow from the 10-year storm event as shown by engineering calculations.

C. **Implementing Project Density.** The Village of Pinehurst shall have the following options in place of or in addition to the requirements of *Table 6.2 Maximum Allowable Project Density or Minimum Lot Size* in the Village of Pinehurst Development Ordinance, as appropriate:

1. The Village of Pinehurst may regulate low density single-family detached residential development using the minimum lot size requirements, dwelling unit per acre requirements, built-upon area percentages, or some combination of these.
2. **Optional 10/70 Rule.** Outside of the WS-I watersheds and the critical areas of WS-II, WS-III, and WS-IV watersheds, the Village of Pinehurst may regulate new



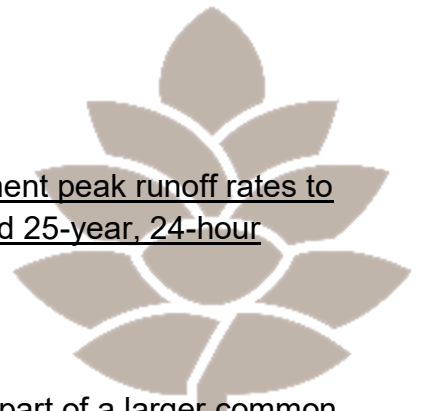
development under the “10/70 option” in accordance with the following requirements:

- (1) A maximum of 10 percent of the land area of a water supply watershed outside of the critical area and within Pinehurst’s planning jurisdiction may be developed with new development projects and expansions of existing development of up to 70 percent built-upon area.
- (2) In water supply watersheds classified on or before August 3, 1992, the beginning amount of acreage available under this option shall be based on a local government's jurisdiction as delineated on July 1, 1993. In water supply watersheds classified after August 3, 1992, the beginning amount of acreage available under this option shall be based on a local government's jurisdiction as delineated on the date the water supply watershed classification became effective. The acreage within the critical area shall not be counted towards the allowable 10/70 option acreage. Projects that are covered under the 10/70 option shall comply with the low-density requirements set forth above. Otherwise, they shall be classified and regulated as high-density projects according to the requirements set forth above. The maximum built-upon area allowed on any given new development project shall be 70 percent; The Village of Pinehurst may transfer, in whole or in part, its right to the 10/70 land area to another local government within the same water supply watershed upon submittal of a joint resolution and approval by the Commission; and
- (3) When the water supply watershed is composed of public lands, such as National Forest land, Pinehurst may count the public land acreage within the watershed outside of the critical area in calculating the acreage allowed under this provision.
3. New development shall meet the development requirements on a project-by-project basis except that the Village of Pinehurst may submit ordinances that use density or built-upon area criteria averaged throughout the local government's watershed jurisdiction instead of on a project-by-project basis within the watershed. Prior to approval of the Ordinance, the Pinehurst Village Council shall demonstrate to the Commission that the provisions as averaged meet or exceed the statewide minimum requirements and that a mechanism exists to ensure the planned distribution of development potential throughout the local government's jurisdiction within the watershed.
4. The Village of Pinehurst may administer oversight of future development activities in single-family detached residential developments that exceed the applicable low density requirements by tracking dwelling units rather than percentage built-upon area, as long as the SCM is sized to capture and treat runoff from 1) all pervious and built-upon surfaces shown on the development plan and 2) any off-site

drainage from pervious and built-upon surfaces, and when an additional safety factor of fifteen (15) percent of built-upon area of the project site is figured in.

D. **Density Averaging.**

1. An applicant may average development density on up to two noncontiguous properties for purpose of achieving compliance with the water supply watershed development standards if all of the following circumstances exist:
 - (1) The properties are within the same water supply watershed. However, if one of the properties is located in the critical area of the watershed, the critical area property shall not be developed beyond the applicable density requirements for its classification.
 - (2) Overall project density meets applicable density or stormwater control requirements under 15A NCAC 2B .0200.
 - (3) Vegetated setbacks on both properties meet the minimum statewide water supply watershed protection requirements.
 - (4) Built upon areas are designed and located to minimize stormwater runoff impact to the receiving waters, minimize concentrated stormwater flow, maximize the use of sheet flow through vegetated areas, and maximize the flow length through vegetated areas.
 - (5) Areas of concentrated density development are located in upland areas and, to the maximum extent practicable, away from surface waters and drainageways.
 - (6) The property or portions of the properties that are not being developed will remain in a vegetated or natural state and will be managed by a homeowners' association or similar entity as common area, conveyed to the Village of Pinehurst as a park or greenway, or placed under a permanent conservation or farmland preservation easement unless it can be demonstrated that Pinehurst can ensure long-term compliance through deed restrictions and an electronic permitting mechanism. A metes and bounds description of the areas to remain vegetated and limits on use shall be recorded on the subdivision plat, in homeowners' covenants, and on individual deeds. Any such limitations or restrictions on use shall be irrevocable.
 - (7) Development permitted under density averaging and meeting applicable low-density requirements shall transport stormwater runoff by vegetated conveyances to the maximum extent practicable. A special use permit shall be obtained from the Zoning Board of Adjustment to ensure that both properties considered together meet the standards of the watershed ordinance and that potential owners have record of how the watershed regulations were applied to the properties.



SECTION 5.2.2 PEAK RUNOFF CONTROL REQUIREMENTS

All new development or redevelopment shall limit post-development peak runoff rates to the pre-development peak runoff rate for the 2-year, 10-year, and 25-year, 24-hour design storm events.

A. Exemptions to Peak Runoff Control

1. Development of a single-family residential lot that is not part of a larger common plan of development or sale where multiple separate and distinct development activities may be taking place at different times but are governed by a single development plan.
2. Development or redevelopment that is exempt from the permit requirements of Section 404 of the federal Clean Water Act as specified in 40 CFR 232 (ie. ongoing farming and forestry activities).
3. Redevelopment which results in no net increase in the built-upon area from what previously existed and which provides equal or greater stormwater control than that provided by previous development.
4. Linear public roadway projects undertaken by a local government.

Deviations for small projects may be approved by the Village Engineer on a case-by-case basis. -The general design of all SCMs shall be in accordance with the Minimum Design Criteria outlined in the NCDEQ Stormwater Design Manual. Alternate types of stormwater management facilities may be allowed on a case-by-case basis. -It shall be the responsibility of the designer to contact the Village Engineer in advance to discuss such facilities and the applicable standards.

SECTION 5.2.3 SCM OPERATION & MAINTENANCE

All stormwater management facilities shall be properly maintained by the property owner. An Operations and Maintenance Manual (O&M Manual) that covers the maintenance requirements for the SCM including inlets, pretreatment areas, main treatment areas, spillways, vegetation, and discharge locations shall be submitted to the Village with record drawings.

An Operations and Maintenance Agreement shall be required for any site containing one or more SCMs. These agreements shall be signed, notarized, and recorded. The Agreement shall reference the O&M Manual. The minimum requirements and templates for acceptable O&M Agreements and Manuals can be found in the NCDEQ Stormwater Design Manual, Part A-7 and the Storm EZ O&M Supplement.

SECTION 5.2.4 STORMWATER DISCHARGE LOCATIONS

At all pipe outlets, flared end sections or head wall discharge locations shall be designed rip-rap or improved vegetated aprons designed to reduce velocity and dissipate energy so that downstream damage does not occur during a 25-Year design storm.

Pipes, drains, flumes or other concentrated stormwater devices shall not discharge across a sidewalk or greenway, but rather shall be piped to the downstream side.

Storm sewer systems shall not discharge into the front yards of lots but shall extend to within 20 feet of the rear property line in lots up to 1/2 acre in size and shall extend a minimum of 175 feet from right of way in lots larger than 1/2 acre.

The Village reserves the right to require use of Stormwater Control Measures (SCMs) at the outlet of all pipes to minimize the impact on sensitive receiving waterways such as wetlands and perennial streams as shown on USGS Quad mapping and/or NRCS (SCS) Soils mapping. Such SCMs shall be required in water supply watershed districts consistent with the requirements of the Watershed Protection Overlay District of the Village of Pinehurst Development Ordinance. Approved SCMs shall be in accordance with the most recent version of the NCDEQ Stormwater Design Manual. Design of these devices shall follow the criteria set forth by NCDEQ and shall not create a tailwater condition that allows for ponding or sedimentation within any pipe or piping system.

dsd Drainage Structure	Storm Event – Return Frequency
Curb inlets and Gutters	10-year storm (1)
Storm Sewer System Collector	10-year storm
Cross Street Drainage	25- to 100-year storm (2)
Roadways in Flood Plain	100-year storm (3)

(1) Assuming 50% blockage in sag inlets. Inlets shall also be located just prior to all points of 'rollover' to prevent runoff from running horizontally across the street section. Additional inlets may be required in high pedestrian traffic areas.

(2) Depending upon Street Classification, as determined by the Village Engineer.

(3) Roadways in flood plain areas should withstand the 100-year storm without overtopping or sustaining damage. The roadway embankments shall be fully protected from flows that may occur during a 100-year event. The backwater pool shall also be shown on the plans.

Manholes or structures shall be installed at each deflection of line or grade. No "blind" junction boxes shall be permitted.

Stormwater shall not be allowed to flow across streets. Drainage structures shall be provided to intercept flow prior to the radius point(s) of an intersection, or the design of the street shall indicate a continuous grade around the radius to allow the flow to continue down the intersecting street. Water shall be picked up before the spread into the street exceeds 4 feet for local residential class streets. The inlets shall be spaced

~~on other classification streets using the standards set forth in the NCDOT's Hydraulic Design Guidelines, latest edition, as modified by the Village. No curb inlets shall be installed in the curb radius of any intersection unless approved by the Village Engineer.~~

~~Storm sewer systems shall not discharge into the front yards of lots, but shall extend to within 20 feet of the rear property line in lots up to 1/2 acre in size and shall extend a minimum of 175 feet from right of way in lots larger than 1/2 acre.~~

~~Pipes, drains, flumes or other concentrated stormwater devices shall not discharge across a sidewalk or greenway, but rather shall be piped.~~

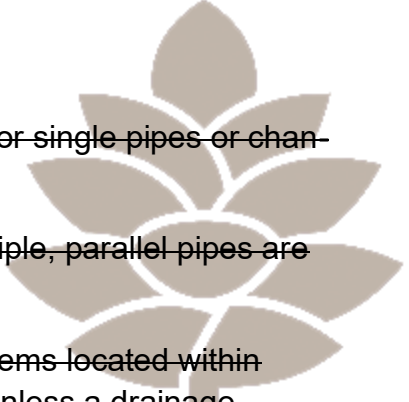
~~All public storm drainage facilities shall be installed in dedicated street rights of way (i.e. pipe inlets and outlets shall be within street rights of way). If a property owner/developer desires to extend storm drainage piping to eliminate open channels on private property, such pipes shall be installed and maintained at the property owner's expense, with appropriate computations and plans submitted to the Village Engineer to ensure that such extensions will not adversely affect the performance of the existing system. No off right of way extension of any storm drain system serving a public right of way shall be made until such time as all computations and plans for the same have been reviewed and approved. A manhole or junction box shall be provided at the public right of way boundary.~~

~~The minimum depth of cover shall be 2 feet below finished subgrade for all traffic bearing areas and 1 foot below finished grade for all non-load bearing areas. High strength pipe may be used upon approval by the Village Engineer in areas that cannot meet the minimum cover requirements.~~

~~The Village generally requires stormwater management facilities to be included as part of any project such that the post-development runoff rate does not exceed the pre-development rate for a 10-year storm event. Deviations for small projects may be approved by the Village Engineer on a case by case basis. The general design shall follow the standards set forth in the publication 'Elements of Urban Stormwater Design' by H. Rooney Malcolm, PhD., P.E. Alternate types of stormwater management facilities may be allowed on a case-by-case basis. It shall be the responsibility of the designer to contact the Village Engineer in advance to discuss such facilities and the applicable standards. All stormwater management facilities shall be properly maintained by the property owner.~~

~~Minimum widths of storm drainage easements shall be the greater of 1) the width as dictated by the appropriate following configurations listed below; or 2) the width necessary to contain the predicted 100-year water elevation plus two feet in depth:~~

~~A. 20 feet for single pipes up to and including 36 inches in diameter or open channels up to 36 inches in top width~~

- 
- B. ~~20 feet plus the maximum conduit or channel width (in feet) for single pipes or channels larger than 36 inches wide~~
- C. ~~10 feet from the edge line of the outside conduits where multiple, parallel pipes are installed.~~

~~The Village of Pinehurst shall maintain only the storm sewer systems located within Village maintained rights of way and on Village owned property unless a drainage easement meeting the criteria set forth in this manual has previously been offered and accepted by the Village. Storm drainage systems located on private property shall be maintained by the property owner, including those shown within a drainage easement, unless the easement has been accepted by the Village.~~

~~Erosion and sedimentation control measures shall be so designed to provide control from the calculated post-development peak rates from a 10-year frequency storm in non-HQW areas and a 25-year storm in HQW areas. Discharge from drainage systems shall not be of such a velocity as to cause damages after leaving the pipe.~~

SECTION 5.2-3 MATERIALS - PIPES MATERIALS

SECTION 5.23.1 GENERAL

~~All storm sewer pipes to be installed in projects within the public street rights of way belonging (or to be dedicated) to the Village of Pinehurst, within any Private Street right of way, under any driveway within the Village, or within the limits of any Fire Lane required by the Village Fire Marshal shall be reinforced concrete pipe (RCP). Approval to use any materials other than RCP may only be granted by the Village Engineer. Alternative pipe materials as noted below may be allowed in non-driveway or fire lane areas upon approval by the Village Engineer.~~

SECTION 5.23.2 REINFORCED CONCRETE PIPE (RCP)

~~RCP shall be as per ASTM C76, Table III, IV, or V with a minimum diameter of 15-inches. All RCP shall be of the highest quality materials, no seconds or lesser quality pipe shall be used. Joints shall be sealed with a plastic cement putty meeting Federal Specification SS-S-00210.~~

SECTION 5.3.3 POLYPROPYLENE PIPE (PP)

~~PP shall be double wall with a smooth interior pipe (Type S) and shall conform to AASHTO M330 or ASTM F2881 and installed per manufacturers specifications. Double gasketed bell and spigot joints with O-ring gasket shall be installed on all pipes. Bells shall cover two full corrugations on each section of pipe. Gaskets shall conform to ASTM F477. Joint performance shall meet the watertight joint performance requirements of ASTM D3212.~~

SECTION 5.3.4 HIGH DENSITY POLYETHYLENE (HDPE)

~~HDPE shall be double wall with a smooth interior pipe (Type S) and shall conform to AASHTO M294 and installed per manufacturers specifications. Gasketed bell and~~

spigot joints with O-ring gasket shall be installed on all pipes. Bells shall cover two full corrugations on each section of pipe. Gaskets shall conform to ASTM F477. Joint performance shall meet the watertight joint performance requirements of ASTM D3212.

SECTION 5.34 MATERIALS – STORM DRAINAGE STRUCTURES

SECTION 5.34.1 GENERAL

All structures - manholes, curb inlets, catch basins, junction boxes, etc. shall be constructed of concrete brick masonry units or pre-cast concrete. Endwalls and headwalls shall be constructed of reinforced pre-cast concrete, or structural cast-in-place concrete in accordance with NCDOT and Village Standards.

SECTION 5.34.2 CONCRETE BRICK MASONRY UNITS

Concrete brick masonry units shall be solid units meeting the requirements of ASTM C55, Grade S-II. All such units shall be color tinted in accordance with NCDOT standards and specifications.

SECTION 5.34.3 PRE-CAST CONCRETE STRUCTURES

Pre-cast concrete structures shall meet the requirements of ASTM C478. Structures shall have joints sealed with a pre-formed plastic gasket per Federal Specifications SS-S-00210. ~~Manholes shall be sized in accordance with the requirements set forth in Section 7.03.~~

SECTION 5.34.4 MORTAR

Mortar shall be proportioned as shown below for either Mix No. 1 or Mix No. 2. All proportions are by volume. Water shall be added only in the amount required to make a workable mixture.

MIX NO. 1: 1 part Portland Cement
 $\frac{1}{4}$ part Hydrated Lime
 $3\frac{3}{4}$ parts Mortar Sand (maximum)

MIX NO. 2: 1 part Portland Cement
 1 part Masonry Cement
 6 parts Mortar Sand (maximum)

Portland cement shall be ASTM C-150, Type 1. Hydrated lime shall conform to ASTM C207, Type S. Masonry cement shall meet the requirements of ASTM C91. Mortar sand shall be standard size 4S, per requirements of the NCDOT.

SECTION 5.34.5 CASTINGS

- A. General - Samples of casting(s) proposed for use shall be provided to the Village Representative for review and approval. In addition to samples, the names of other users of the castings shall be furnished along with names and telephone numbers of persons whom the Village Engineer may contact for an evaluation of the casting. All manufacturers shall be on NCDOT's Approved for Use status listing. All castings shall meet the requirements of ASTM A48, Grade 30 iron. All castings shall be of domestic origin.
- B. Curb Inlet Grate, Frame & Hood - Curb inlets shall be of the grate, frame and hood type conforming to NCDOT 840.03, Type E, F and G, based on flow direction. All Curb Inlet grates shall be of a 'bicycle-safe' type as per NCDOT. All castings shall be fully compliant with all NCDOT standards & specifications.
- C. Grates & Frames - Cast iron grates and frames for yard inlets shall conform to NCDOT 840.16 and be of the size indicated on the approved plans. Grates and frames shall only be used outside of street rights-of-way.
- D. Manhole Rings & Cover - Cast iron manhole rings and covers shall conform to NCDOT 840.54, with the words "STORM SEWER" cast on the cover. Covers shall have four 1-inch holes. Manhole castings shall be machined to provide a continuous bearing around the full periphery of the frame.
- E. Manhole Steps - shall be of polypropylene material reinforced with a 1/2 inch diameter reinforcing rod. They shall be designed for a vertical load of 400 pounds and a horizontal pullout load of 1000 pounds, and shall be set 16" on center. Holes for the installation of manhole steps shall not project through the manhole wall, but shall stop a minimum of one inch from the outside wall. Steps shall be at least 10 inches clear width and shall project at least 4 inches from the wall into which they are embedded. Steps in precast concrete structures shall be installed by the manufacturer.

SECTION 5.34.6 PORTLAND CEMENT CONCRETE

Portland cement concrete used for storm drainage structures, endwalls, etc. shall conform to the technical requirements presented in Section 2.0 of these Specifications. Concrete shall be 4,000 psi minimum at 28 days for all precast concrete structures.

SECTION 5.34.7 REINFORCING STEEL

Reinforcing steel shall be new billet steel conforming to ASTM A615 for grade 60. Reinforcing steel shall be deformed per ASTM A305.

SECTION 5.4-5 MISCELLANEOUS MATERIALS

SECTION 5.45.1 RIPRAP

Riprap shall be large aggregate of the size and class shown on the approved drawings. Riprap shall be supplied from a quarry certified by and in good standing with NCDOT.

SECTION 5.45.2 EROSION CONTROL MATERIALS

Any erosion control materials proposed for use shall be approved in advance by the Village Engineer and/or NCDEQ. Adequate information shall be submitted to the Village Engineer to allow for a complete evaluation to determine the suitability of the material in the intended. Such information shall include technical data, samples/swatches, and other data deemed necessary for evaluation.

SECTION 5.45.3 GEOTECHNICAL FABRICS/GEOTEXTILE FABRICS

Any ~~geotechnical~~ geotextile fabrics/materials proposed for use shall be approved in advance by the Village Engineer. Adequate information shall be submitted to the Village Engineer to allow for a complete evaluation to determine the suitability of the material in the intended. Such information shall include technical data, samples/swatches, and other data deemed necessary for evaluation.

SECTION 5.5-6 CONSTRUCTION METHODS

SECTION 5.56.1 TRENCHING AND BEDDING FOR STORM SEWERS

The trench shall be excavated to the line and grade indicated on the Drawings and in accordance with OSHA standards. The trench bottom shall provide a firm and uniform support for the pipe. Where bell and spigot type pipe is used, recesses shall be excavated to receive the pipe bell.

Where the foundation is found to be of poor supporting value, the pipe foundation shall be conditioned by undercutting the unacceptable material to the required depth as directed by the Village Representative, and backfilling with stone or other approved material. Where necessary, surface water shall be temporarily diverted in order to maintain the pipe foundation in a dry condition. The flow of water from such temporary diversions shall be directed into suitable erosion control devices.

SECTION 5.56.2 PIPE LAYING

~~Concrete pipe~~ Stormwater drainage pipe-culverts shall be laid carefully with bells or grooves up grade and ends fully and closely joined. Joints of concrete pipe shall be made with cement mortar or with plastic gasket material as specified. Where mortar is used, the joint shall be thoroughly wetted before making the mortar joint. Before succeeding sections of pipe are laid, the lower portions of the bell or groove of the pipe shall be filled on the inside with cement mortar of sufficient thickness to bring the inner surface of the abutting pipes flush and even. After the pipe is laid, the remainder of the joint shall be solidly filled with mortar and sufficient additional mortar used to form a bead or ring around the outside of the joint. The inside of the joint shall be wiped and

finished smooth. Pipe which is not true to alignment, or which shows any settlement after laying, shall be taken up and re-laid.

Multiple-barrel culvert installations shall be fully bedded and encased with #67 washed stone, up to the pipe crown. Stone shall be placed evenly on each side and tamped firm to fully support the pipe without displacement. Following the initial stone backfill, a layer of Village-approved geotextile shall be placed across the stone backfill to prevent migration of soil backfill and subgrade materials into the bedding and haunching stone. Installation of this separation layer shall be in accordance with the manufacturer's recommendations and any direction provided by the Village Engineer.

No pipe may enter through the corner of any pre-cast 'waffle box.'

SECTION 5.56.3 BACKFILLING

The storm sewer trench shall be backfilled with approved material free from large stones or clods in 6-inch layers, loose measurement, and compacted to 95% of maximum dry density (AASHTO T-99), where the trench is within an area to be paved, or where the trench is immediately behind the curb. In streets the compaction requirement shall be increased to 100% of maximum dry density within 12" of subgrade. ~~The backfilling shall be done on both sides of the pipe simultaneously to prevent displacement of the pipe.~~ The backfilling shall be done on both sides of the pipe simultaneously to prevent displacement of the pipe. The backfill materials shall be moistened when necessary in the opinion of the Project Engineer, to obtain maximum compaction. Water settling or puddling shall not be permitted. Backfill in trenches not within the limits to be paved may be compacted in 12-inch layers after backfill is one foot above the top of the pipe.

All trash, forms, debris, etc., shall be removed from the trench before backfilling. Backfilling around structures shall be done symmetrically and thoroughly compacted in 6-inch layers with mechanical tampers to the specified 95% density.

SECTION 5.56.4 MASONRY STRUCTURES

Excavations shall be made to the required depth, and the foundation on which the brick masonry is to be laid shall be approved by the Village Representative. The brick shall be laid so that they will be thoroughly bonded into the mortar by means of the "shove-joint" method. Buttered or plastered joints will not be permitted. The headers and stretchers shall be so arranged as to thoroughly bond the mass. Brickwork shall be of alternate headers and stretchers with consecutive courses breaking joint. All mortar joints shall be at least 3/8 inches in thickness. The joints shall be completely filled with mortar. No spalls or bats shall be used except for shaping around irregular openings or when unavoidable to finish out a course. Competent bricklayers shall be employed on the work and all details of construction shall be in accordance with approved practice and to the satisfaction of the Village Representative.

Steps as shown on the plans shall be placed in all catch basins and inlets when they are greater than four (4) feet in depth. The steps shall be set in the masonry as the work is built up, thoroughly bonded, and accurately spaced and aligned.

Inverts in the structures shall be shaped to form a smooth and regular surface free from sharp or jagged edges. They shall be sloped adequately to prevent sedimentation within the structure.

The castings shall be set in full mortar beds. All castings when set shall conform to the finish grade shown on the Drawings. Any castings not conforming shall be adjusted to the correct grade.

SECTION 5.56.5 CONCRETE CONSTRUCTION

The forming, placing, finishing and during of Portland cement concrete shall be performed in strict accordance with all applicable requirements as contained in the ***Standard Specifications for Road & Structures***, latest edition, as published by the NCDOT, and as modified by the Village Engineer.

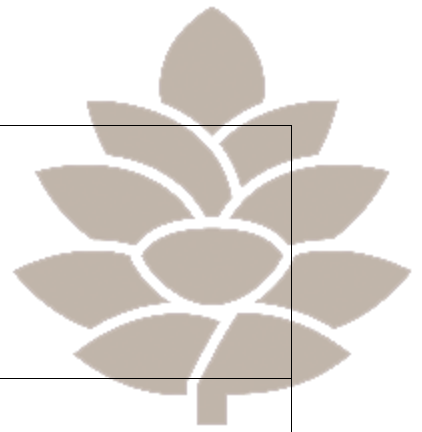
SECTION 5.56.6 INSTALLATION OF PRE-CAST CONCRETE STRUCTURES

Pre-cast concrete manholes, junction boxes, etc. shall be installed level and plumb upon a firm, dry foundation, consisting of a minimum of 6-inch-thick washed stone bedding to be a firm, dry foundation, as approved by the Village Representative. ~~The Village reserves the right to require the use of bedding stone under pre-cast structures when, in the opinion of the Village Engineer, poor subgrade conditions are encountered.~~ Structures shall be backfilled with suitable materials, symmetrically placed and thoroughly compacted so as to prevent displacement. Castings shall be set in full mortar beds to the required finished grade.

FIGURE 5—1

MAXIMUM PERMISSIBLE VELOCITIES IN LINED CHANNELS (1)

		PERMISSIBLE VELOCITY (See Note 1)	
Cover	Slope range	Erosion Resistant Soils	Easily Eroded Soils
	(% Grade)	(ft. per sec)	(ft. per sec)
Bermuda grass	0-5	8	6
	5-10	7	5
	over 10	6	4
Bahia	0-5	7	5
Buffalo grass			
Smooth Brome	5-10	6	4
Blue Grama	over 10	5	3
Grass Mixtures	0-5 (See Note 5)	5	4
Reed Canary grass	5-10	4	3



Lespedeza Sericea			
Weeping Lovegrass			
Redtop	0-5	3.4	2.5
Alfalfa	(See Note 2)		
Red Fescue			
Common Lespedeza			
Sudan grass	0-5	3.5	2.5
(See Note 3)	(See Note 4)		

NOTES:

1. ——— Do not use on slopes steeper than 10 percent except for vegetated side slopes in combination with a stone, concrete, or highly resistant vegetative center section.
2. ——— Do not use on slopes steeper than 5 percent except for vegetated side slopes in combination with a stone, concrete, or highly resistant vegetative center section.
3. ——— Annuals — use on mild slopes or as temporary protection until permanent covers are established.
4. ——— Use on slopes steeper than 5 percent is not recommended.

SECTION 6. WATER DISTRIBUTION AND WASTEWATER COLLECTION

SECTION 6.1 SYSTEM OWNERSHIP

The water distribution and wastewater collection systems that serve the Village of Pinehurst are owned and operated by Moore County, with the exception of portions within CCNC that are owned and operated by the Town of Southern Pines and isolated areas owned and operated by private entities. All water main extensions, water distribution facilities, wastewater collection system extensions, and wastewater collection system facilities (including lift stations) within the Village limits and ETJ shall comply with current NCDEQ regulations, and the most recent version of the Moore County Public Works (MCPW) Department Standards and Specifications Manuals. Water distribution and wastewater collection system installations or modifications within CCNC that are owned and operated by the Town of Southern Pines shall comply with Town of Southern Pines water and sewer standards. ~~Copies of the MCPW Manuals are available at www.moorecountync.gov or by calling 910-947-6315. For the purposes of this section, all references to Moore County or Moore County Public Utilities shall be modified to the Town of Southern Pines.~~

Additional requirements for water and sewer infrastructure installed within the Village's jurisdiction are specified herein. In the event of a discrepancy between the MCPW or Town of Southern Pines Standards and the Village Standards noted herein, the more stringent standard shall govern.

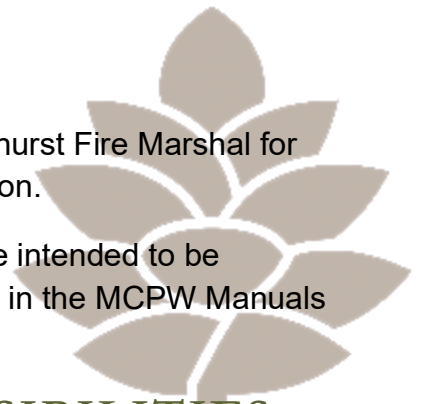
Water and sewer requirements for "Rural" areas noted within the MCPW Manuals do not apply to the Village's jurisdiction. In addition, references to the "Fire



Section 6. Water Distribution and Wastewater Collection	71
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Marshal” in the MCPW Manuals shall refer to the Village of Pinehurst Fire Marshal for water system infrastructure installed within the Village’s jurisdiction.

Water and sewer systems within the Village’s jurisdiction that are intended to be privately maintained are required to meet the standards set forth in the MCPW Manuals and herein.



SECTION 6.2 INSPECTION RESPONSIBILITIES

Inspections of all public water and sewer facilities that will become part of the public utility system owned and operated by Moore County will be performed by MCPW staff during construction. The Developer shall contact MCPW for determination of, and payment of, inspection fees to ~~Moore County~~Southern Pines for this infrastructure.

Inspections of all public water and sewer facilities that will become part of the public utility system owned and operated by the Town of Southern Pines will be performed by the Town of Southern Pines Public Work Department staff during construction. The Developer shall contact the Town of Southern Pines for determination of, and payment of, inspection fees to the Town of Southern Pines for this infrastructure.

Inspections of private water and sewer facilities that will not become part of ~~the a~~ public utility system ~~owned and operated by Moore County~~ will be performed by the Village of Pinehurst during construction. ~~The applicable fees shall be calculated using the Village’s Infrastructure Inspection Fees worksheet, and all fees shall be paid prior to construction plan approval.~~

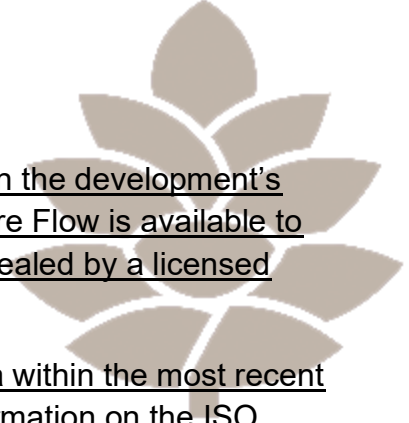
Privately-maintained service laterals installed on the customer’s side of the water meter or sewer clean-out assembly shall be inspected by the Village as part of the building permitting process.

SECTION 6.3 WATER DISTRIBUTION SYSTEM DESIGN

In addition to the MCPW and Town of Southern Pines water distribution system design requirements ~~contained within the MCPW Standards and Specifications Manuals~~, the following requirements shall apply to development within the Village’s jurisdiction.

SECTION 6.3.1 AVAILABLE FIRE FLOW

The Developer/Engineer shall be responsible for contacting ~~MCPW (910-947-6315)~~the utility owner to determine the Available Fire Flow at the point of connection to the ~~MCPW~~ water system, and to confirm whether the system can meet the Needed Fire Flow for the proposed development. ~~MCPW~~The utility owner, in coordination with the Village Fire Marshal, will provide fire flow information to the Developer/Engineer based on actual field data (hydrant tests) in the vicinity of the proposed development.



SECTION 6.3.2 NEEDED FIRE FLOW CALCULATIONS

The Developer/Engineer shall submit information to the Village on the development's Needed Fire Flow and calculations to confirm that the Needed Fire Flow is available to service the development. The calculations shall be signed and sealed by a licensed North Carolina Professional Engineer.

Needed Fire Flow calculations shall be based on the ISO formula within the most recent edition of the NFPA "Fire Protection Handbook". For further information on the ISO formula and its proper application, refer to the handbook or contact the Village Fire Marshal at 910-295-5575.

Pursuant to North Carolina Fire Prevention Code and applicable appendices, the **minimum** fire flow requirements for one and two family dwellings having a fire-flow calculation area which does not exceed 3,600 square feet shall be **1,000 gallons per minute (gpm)** while maintaining a minimum system pressure of 20 psi at all points in the existing distribution system.

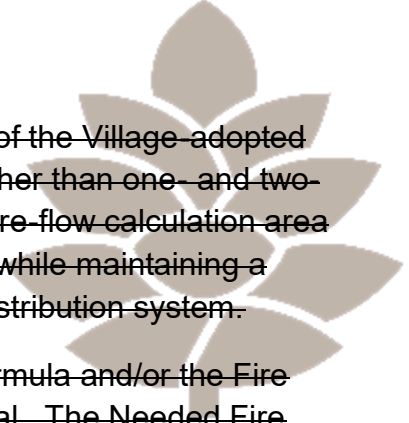
Pursuant to North Carolina Fire Prevention Code and applicable appendices, the minimum fire flow requirements for buildings other than one and two family dwellings, and for one and two family dwellings having a fire flow calculation area in excess 3,600 square feet shall not be less than **1,500 gpm** while maintaining a minimum system pressure of **20 pounds per square inch (psi)** at all points in the existing distribution system.

Greater amounts shall be provided where the required by the ISO formula and/or the Fire Code Requirements unless otherwise modified by the Village Fire Marshal. The Needed Fire Flow calculations shall be reviewed by the Village Engineer and the Village Fire Marshal and provided to the utility owner for hydraulic modeling.

~~The Developer/Engineer shall submit information to the Village on the development's Needed Fire Flow and calculations to confirm that the Needed Fire Flow is available to service the development. The calculations shall be signed and sealed by a licensed North Carolina Professional Engineer.~~

~~Needed Fire Flow calculations shall be based on the ISO formula within the most recent edition of the NFPA "Fire Protection Handbook". For further information on the ISO formula and its proper application, refer to the Handbook or contact the Village Fire Marshal at 910-295-5575.~~

~~Pursuant to Appendix B (Fire Flow Requirements For Buildings) of the Village adopted State of North Carolina Fire Code tables, the **minimum** fire flow requirements for one and two family dwellings having a fire flow calculation area which does not exceed 3,600 square feet shall be **1,000 gallons per minute (gpm)** while maintaining a minimum system pressure of 20 psi at all points in the existing distribution system.~~



Pursuant to Appendix B (Fire Flow Requirements For Buildings) of the Village adopted State of North Carolina Fire Code tables, fire flow for buildings other than one- and two-family dwellings, and for one- and two-family dwellings having a fire flow calculation area in excess of 3,600 square feet shall not be less than 1,500 gpm while maintaining a minimum system pressure of 20 psi at all points in the existing distribution system.

Greater amounts shall be provided where required by the ISO formula and/or the Fire Code tables unless otherwise modified by the Village Fire Marshal. The Needed Fire Flow calculations shall be reviewed by the Village Engineer and Village Fire Marshal and provided to MCPW for hydraulic modeling.

SECTION 6.3.3 FIRE SUPPRESSION BOOSTER PUMPS

If booster pumps are required to be installed on a fire suppression system, the Developer/Engineer shall contact the Village's Fire Marshal to determine the additional requirements that apply. The booster pumps should be clearly noted on the construction plans if they are required.

SECTION 6.3.4 PIPE MATERIALS

New water mains installed within the jurisdictional limits of the Village of Pinehurst shall be either Ductile Iron Pipe (DIP) or C-900 Polyvinyl Chloride (PVC) pipe. All new water mains located within the VC and HD Zoning Districts shall be DIP. Water mains shall be designed and manufactured in accordance with ANSI, AWWA, and MCPW standards.

In some instances, High-Density Polyethylene (HDPE) pipe may be allowed when installation by directional drilling is required. In these instances, the Developer/Engineer shall provide a written request for approval from the Village Engineer, with proposed specifications for the HDPE pipe to be used, and an explanation as to why the use of HDPE is necessary.

SECTION 6.3.5 FIRE HYDRANT LOCATIONS

Fire hydrants in the Village's jurisdiction shall be located at each street intersection. In addition, the maximum distance between fire hydrants, measured along street centerlines, shall not exceed 500 feet. In all cases, all parts of all buildings shall be within 300 feet of a hose run from a fire hydrant.

Hose run lengths shall be measured along a route not closer than 20 feet from the building(s). All fire hydrants shall have full vehicular access via durable, all weather paved surface meeting the specifications contained within this Manual and shall not be located within the anticipated "collapse zone" of any building or structure. Supplemental hydrant locations shall be as directed by the Village Fire Marshal.

A hydrant shall also be located within 50 feet of all automatic fire sprinkler system connections. The Fire Sprinkler System connection, also known as the "Fire Department Connection" (FDC) shall be a 5-inch "Storz" connection, located outside of the anticipated collapse zone of the building/structure to be served. The Fire Marshall

shall determine the final location for all FDC's. The Storz connections shall be installed in accordance with the Village's Standard Details. All piping for the fireline from the water supply main into the building and for that serving the FDC shall be DIP meeting the specifications contained herein unless otherwise approved in writing by the Village.

SECTION 6.4 CUTTING AND REPLACEMENT OF EXISTING PAVEMENTS

Open-cutting of existing bituminous pavement may be permitted on certain Village-maintained streets with prior written approval from the Village. Where bituminous pavements are allowed by the Village to be open-cut, the pavement shall be restored in conformance with the Village's standard details to the satisfaction of the Village Representative.

Open-cutting of existing concrete pavement may also be permitted with prior written approval from the Village at existing private driveways within the Village's right-of-way. Concrete pavement shall be restored in conformance with the Village's standard details to the satisfaction of the Village Representative.

The pavement shall be cut to true neat lines, in such a manner as not to damage the pavement outside of the cutting line. The cut pavement shall be removed from the site and properly disposed of by the Developer.

After completion of the trenching and pipe laying conditions, the backfill shall be filled to the required subgrade depth, from which point the remaining depth shall be backfilled with ABC stone, compacted in two lifts. Unless otherwise approved by the Village, the base course shall remain for a minimum of four (4) days prior to placement of paving to allow for further natural settlement. When final settlement is obtained, a portion of the ABC shall be removed to accommodate the final pavement section. All materials and pavement placement methods shall be in strict accordance with this Manual and NCDOT standard specifications for roadways.

No open-cutting of State-maintained roadways shall be performed within the Village's jurisdiction without written approval from NCDOT. The Developer is responsible for contacting and obtaining the necessary approvals from NCDOT prior to open-cutting a State-maintained road.

SECTION 6.5 FENCING AND LANDSCAPE BUFFERS FOR WATER AND SEWER FACILITIES

Any fencing installed at water and sewer facilities (lift stations, wells, storage tanks, etc.) shall comply with the requirements listed within the most recent version of the Pinehurst Development Ordinance (PDO). Landscape buffers installed at said facilities shall also comply with the requirements listed within the most recent version of the PDO.

APPENDIX



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STANDARD APPROVAL BLOCKS

BLOCKS TO BE INCLUDED ON ALL SHEETS

Construction Plan Approval Block



Village of Pinehurst Construction Plan Approval

These plans have been reviewed for compliance with the applicable development and engineering standards in the Village of Pinehurst. All Construction Methods and Materials shall be in accordance with the Village of Pinehurst, Moore County Public Utilities, and NCDOT Standards and Specifications. In the event of a conflict between standards, the more stringent shall govern unless a written waiver is issued by the Village Engineer. Utility Installations and other Public Facilities, including streets, sidewalks, and handicap ramps, have been approved by the Village of Pinehurst and shall be so installed unless a change is authorized by prior written approval. Public Sanitary Sewer and Utility Easements shall be recorded prior to final acceptance and/or issuance of a Certificate of Occupancy by the Village. Construction shall comply with the approved plans. Any proposed changes to the plans shall be coordinated with the Village and may require a resubmittal for review and approval. The Village may issue a Stop Work Order if work is being performed without proper approvals.

Plan Approval Number _____

Engineering _____

Fire Department _____

Planning _____

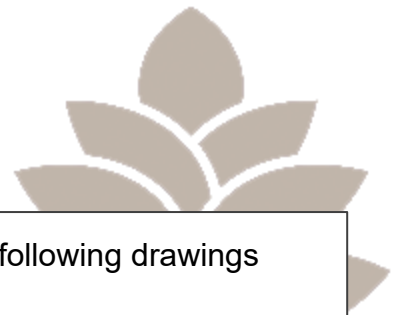
Moore Co. Public Utilities _____

INFRASTRUCTURE INSPECTION NOTICE TO CONTRACTOR

This is to advise you that the Village of Pinehurst ~~is now requiring~~ requires a **minimum** of forty-eight (48) hours of notice when requesting an Engineering Inspection. Inspection requests may be made by calling the Public Services Department at 295-5021. Items requiring an engineering inspection include, but are not limited to:

1. Subgrade inspection/proof rolling (streets, sidewalks, fire lanes, etc.) Density tests from an approved geotechnical engineering firm may be required.
2. Placement and inspection of base course materials including proof-rolling. Density tests from a Village approved geotechnical engineering firm may be required/accepted by the Village.
3. Placement and compaction of pavement materials including concrete and asphalt surface courses. Includes stringlines/grade control, paving & rolling operations, material inspections.
4. ~~Installation of water and sewer mains and services including pressure testing, pipe laying, chlorination of water mains, bacterial testing, mandrel pulls, etc. necessary to meet the Village's Utility ordinances: NOTE: The Contractor shall also contact Moore County Public Utilities Department Engineering Division at 947-6315 to schedule utility inspections as required by MCPUD.~~
5. Installation of formwork and placement of concrete (sidewalks, curb & gutter, etc.) within the public right of way.
6. Installation of storm drainage systems (pipes, trenches, catch basins, frames/grates, outlet protection, etc.)
7. Inspections of public water and sewer infrastructure shall be coordinated with and performed by the utility provider. Inspections of private water and sewer infrastructure shall be coordinated with and performed by the Village or their designee.

Failure to schedule the required inspections shall be grounds for rejection of all work not inspected and issuance of a stop-work order until the project is in compliance



BLOCKS TO BE INCLUDED ON THE COVER SHEET

Certification Block

These improvements shall be constructed in accordance with the following drawings and with the Standard specifications of the Village of Pinehurst.

I, _____, certify that the Standard Specifications of the Village of Pinehurst have been thoroughly checked and found to be applicable to this project. All exceptions to the applicable Village standards have been previously approved by the Village of Pinehurst and said exceptions are as follows: shown on Sheet(s) _____ of these drawings.

**PROFESSIONAL
SEAL**

By: _____

Date: _____

Authorization to Construct Improvements Block

AUTHORIZATION TO CONSTRUCT IMPROVEMENTS

PART 1 – Record of Permits Issued by Other Regulatory Agencies

Water System Extension:	Permit# _____	Issue Date: _____
Wastewater Collection System Extension:	Permit# _____	Issue Date: _____
Land Disturbing Permit:	Permit# _____	Issue Date: _____

ROAD CLOSURE NOTIFICATION PROCESS

For Non-Emergency/Planned Utility Work:

The Village of Pinehurst requires at least 48-hours of notice prior to closing any Village roadway to allow time for impacted parties (Police, Fire, EMS, Moore County Schools, Trash Collection, etc.) and the general public to be properly notified of the closure by the Village.

All road closure requests shall be directed to the Village's Public Services Department by calling **910-295-5021**. Please note that the Department's normal working hours are Monday through Friday from 7:00 a.m. to 3:30 p.m. Requests submitted outside of normal hours or on Village holidays will be evaluated and considered on the next business day. Roads shall not be closed until the Village provides written confirmation of approval.

For Emergency Utility Work:

Road Closures that are necessary during emergency situations do not require 48-hours of notice; however, the party closing the road must notify the Public Services Department at **910-295-5021** and the Village's Police Department at **910-295-3141** (select Option 1 for dispatch) during emergency situations as soon as possible so that proper notifications can be sent out by the Village. **Calling 911 does NOT satisfy this requirement.**

AS-BUILT CHECKLIST

Upon the completion of construction and **prior to acceptance of new infrastructure or issuance of a certificate of occupancy** by the Village, a signed and sealed as-built set of construction drawings shall be prepared and submitted to the Village for review and approval. The following check list is provided as a guide to indicate the items that are expected to be included on the as-built drawings. This checklist should be included with the as-built submittal, and each blank should be initialed by the applicant as being included on the as-builts or marked N/A if not applicable to the project.

All Final As-built Submittal Packages shall contain:

~~_____ 1 set of signed and sealed plan sheets — 24" X 36"~~

_____ 1 digital signed and sealed copy ~~on a CD or flash drive~~ in PDF format

A. As-built Information

Submitted by _____

Phone # _____

Transmittal Date _____

B. Site Data (Tabular Form)

Page # _____

____ A. Acreage in total tract

____ B. Average lot size

____ C. Total number of lots

____ D. Total linear footage of infrastructure chart, Page # _____

____ Streets (List individually in lengths)

____ Water mains (Identify size and length)

____ Sewer mains (Identify size and length)

____ Number of valves (For each size)

____ Number of fire hydrants

____ Number of manholes

____ Other (Any additional appurtenances)



C. General Information

Page # _____

- ___A. Copy of recorded plat or deed of easements, indicating easements and right of way
- ___B. Boundary of tract by courses and distance with references
- ___C. Tie to N.C. grid coordinate system (x,y,z). All sets shall be tied to grid with monument noted.
- ___D. 500 scale vicinity map
- ___E. Scale of drawings and bar scale
- ___F. North arrow
- ___G. Location of benchmark with M.S.L elevations
- ___H. Seal and signature of North Carolina registered professional on each sheet that performed as-builts.
- ___I. All easements identified and dimensioned
- ___J. Statement designating drawings are “as-built” on each sheet

D. Streets (Public or Private)

Page # _____

- ___A. Horizontal alignment with radii, P.C.’s, and P.T.’s of all curves
- ___B. Vertical alignment with centerline grades, vertical curve lengths and station and elevation of all PVC’s and PVT’s and centerline profile.
- ___C. Dimensioned right of way and street widths
- ___D. Pavement section
- ___E. Typical cross section

E. Storm Drainage

Page # _____

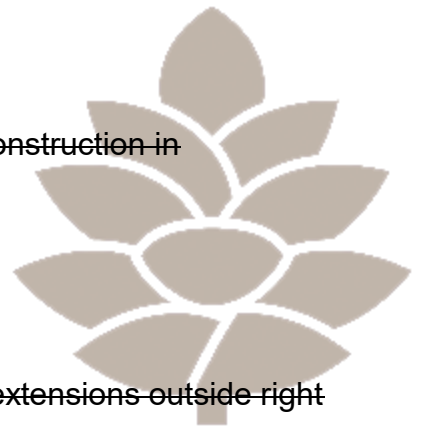
- ___A. Outline of 100 year flood plain (FEMA and/or culvert backwater profile)
- ___B. Pipe material



- ___ C. Structure invert and top elevations
 - ___ D. Pipe size
 - ___ E. Pipe slope and distance
 - ___ F. Size of riprap dissipation pad
 - ___ G. Statement of stormwater velocity at all outlets
 - ___ H. Show permanent stormwater best management practice
 - ___ I. A separate, recorded easement dedication plat for utility extensions outside right of way that are to be maintained by the Village
 - ___ J. ~~Maintenance agreement responsibility statement~~ Operation and Maintenance Manual and an executed copy of the Operation and Maintenance Agreement for all SCMs
 - ___ K. A separate, permanent recorded SCM maintenance and access easement
 - ___ L. Designer's sealed certification that all SCMs were constructed in accordance with the approved plans and comply with the Village's stormwater standards, including pre/post runoff rate requirements.
- F. Water and Sewer Systems. For public water and sewer infrastructure, refer to the utility provider's requirements for As-Built drawings. For private water and sewer infrastructure, contact the Village Engineer for specific requirements.

Page # _____

- ___ A. Pipe material labeled
- ___ B. Pipe size labeled
- ___ C. Separation from sanitary and storm sewer shown on plans
- ___ D. Locations with distance references (2 each per appurtenance)
 - ___ Valves
 - ___ Fire hydrants
 - ___ Blow offs
 - ___ Meters
 - ___ Air release valves



- ~~___E. Certification by a licensed NC Professional Engineer of construction in accordance with the water extension permits~~
 - ~~___ Certification on the plans~~
 - ~~___ A separate certification sheet is provided~~
- ~~___F. A separate, recorded easement dedication plat for utility extensions outside right of way~~

~~G. Sanitary Sewer System~~

Page # ~~___~~

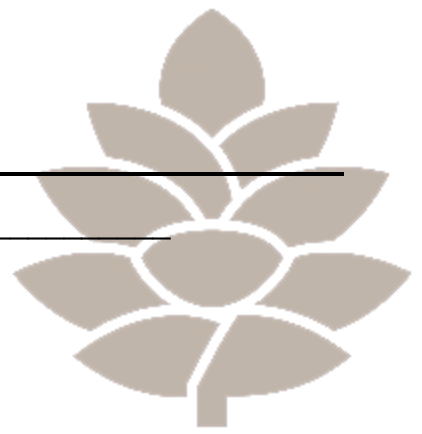
- ~~___A. Pipe material labeled~~
- ~~___B. Pipe size labeled~~
- ~~___C. Manhole top elevations~~
- ~~___D. Invert in and out elevations~~
- ~~___E. Pipe slope~~
- ~~___F. Locations with distance references (2 each appurtenance)~~
 - ~~___ Clean outs~~
 - ~~___ Air release valves~~
 - ~~___ Manholes~~
 - ~~___ Force main valves~~
- ~~___G. Horizontal control (angles at manholes)~~
- ~~___H. 100-year flood plain elevation~~
- ~~___I. Certification by NC Professional Engineer of construction in accordance with sanitary sewer extension permits~~
 - ~~___ Certification on the plans~~
 - ~~___ A separate certification sheet shall be provided~~
- ~~___J. A separate, recorded easement dedication form for utility extensions outside right of way~~

Village of Pinehurst Use Only

As-Builts Reviewed by _____ Date _____

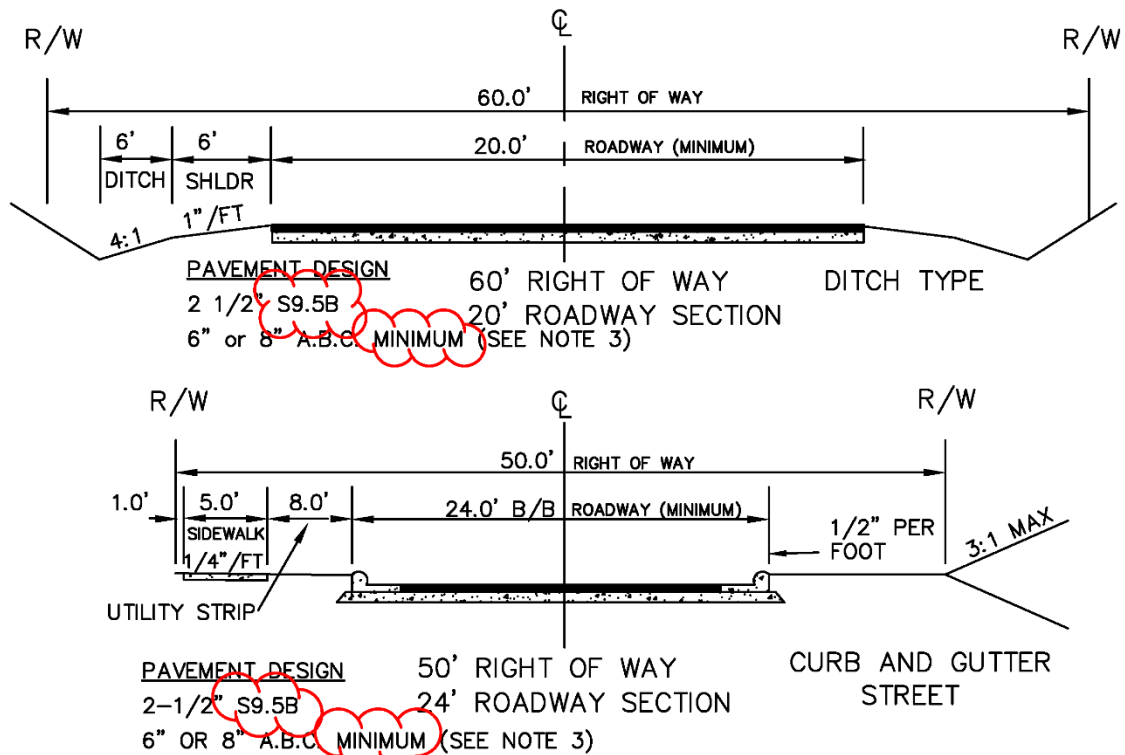
Approved _____

Returned _____



STANDARD DETAILS

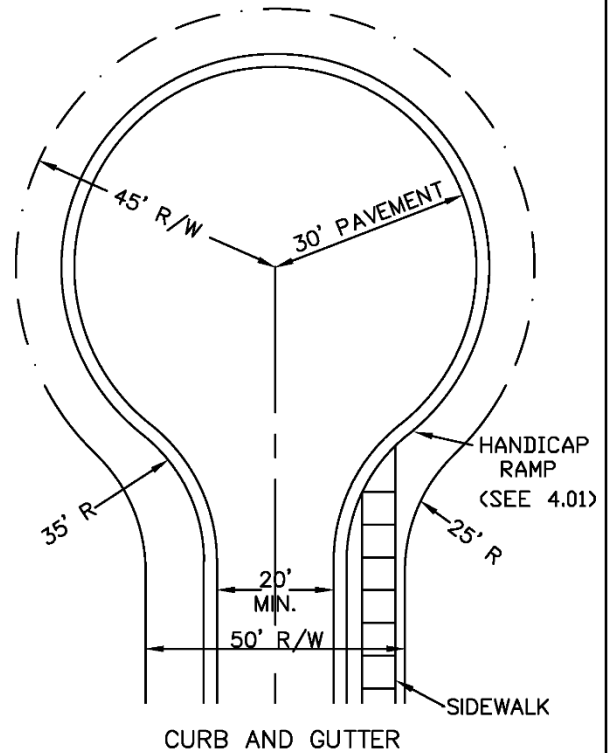
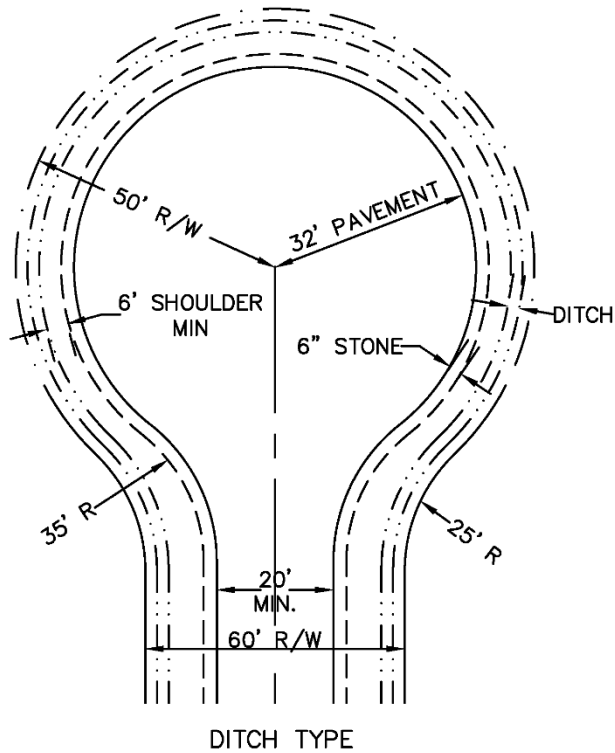




NOTES:

1. NORMAL CROWN OF 1/4" PER FOOT UNLESS OTHERWISE DIRECTED BY VILLAGE ENGINEER.
2. THE VILLAGE ENGINEER MAY WAVE THE REQUIREMENT FOR CURB AND GUTTER IN AREAS OUTSIDE OF "OLD TOWN" (HISTORIC PRESERVATION OVERLAY DISTRICT). PROPER DRAINAGE MEASURES SHALL BE INCORPORATED INTO THE ROADWAY DESIGN IN THESE AREAS AND APPROVED BY THE VILLAGE.
3. THE MINIMUM PAVEMENT SECTION FOR LOCAL AND CUL-DE-SAC PUBLIC AND PRIVATE STREETS SHALL BE 6' ABC. ALL OTHERS SHALL HAVE 8" MINIMUM ABC. REFER TO SECTION 3.2.2 OF THE ESSM FOR SOILS EVALUATION AND PAVEMENT DESIGN REQUIREMENTS.

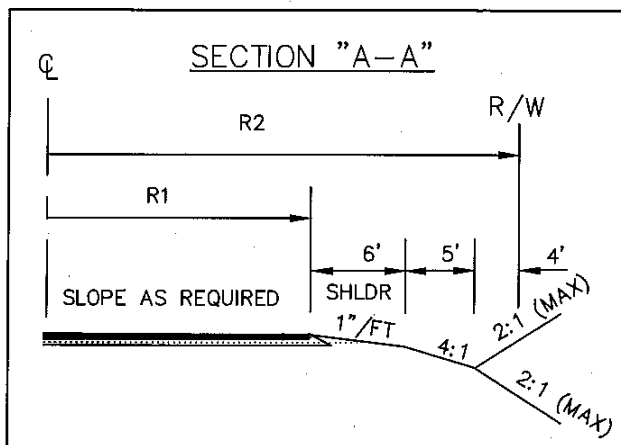
REV	DESCRIPTION	DATE	APPROVED BY	TYPICAL SECTIONS LOCAL RESIDENTIAL STREETS	
△		08/26	MSA		
NOT TO SCALE	DWG NO. 3.01		SHEET 1 OF 1		



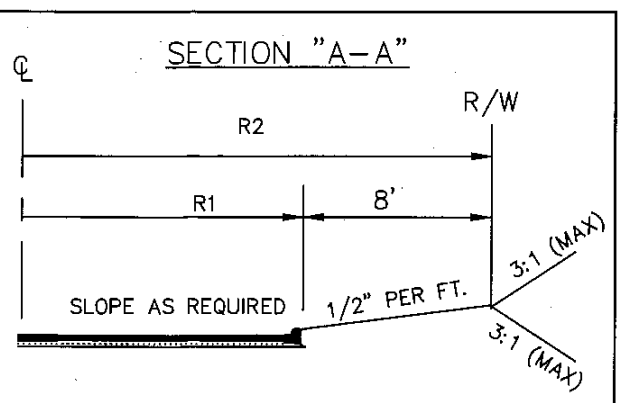
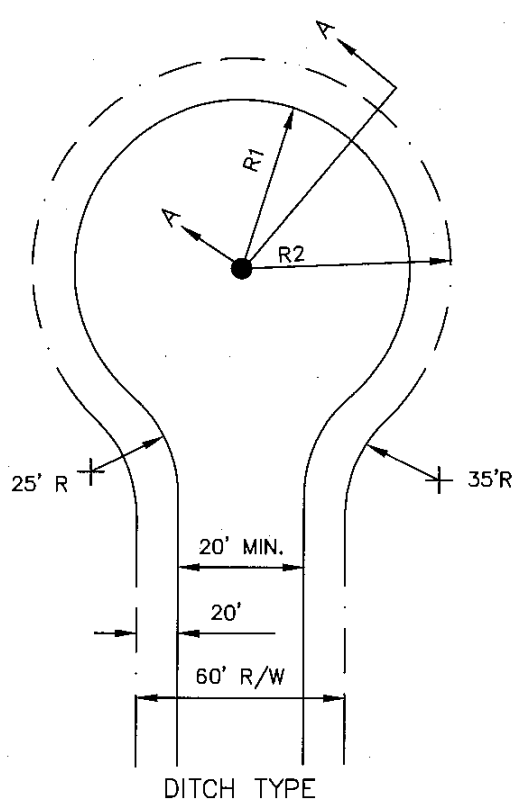
NOTES:

1. CURB AND GUTTER STREETS SHALL BE 24" STANDARD CURB AND GUTTER. (SEE DETAIL 4.03).
2. THE CROWN FOR PAVEMENT SHALL BE 1/4" PER FT FROM THE CENTER OF THE CUL-DE-SAC
3. MAXIMUM CUL-DE-SAC LENGTH IS 750' FROM THE NEAREST INTERSECTION UNLESS OTHERWISE APPROVED BY THE VILLAGE FIRE MARSHAL.

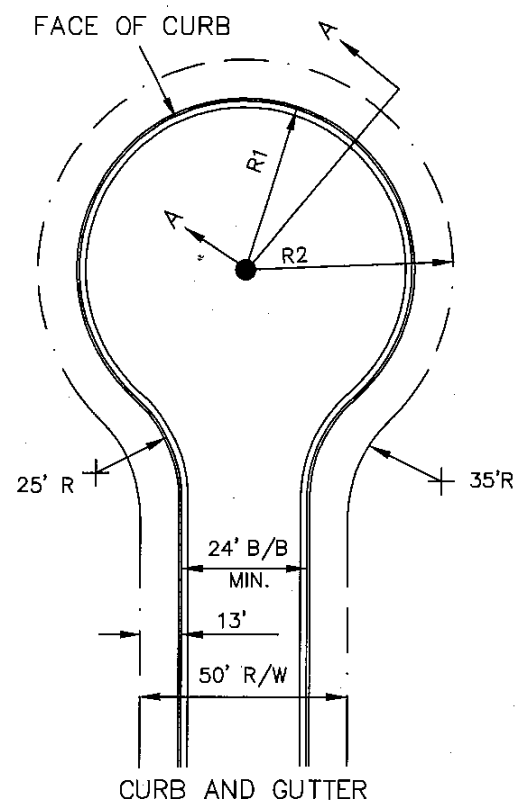
REV	DESCRIPTION	DATE	APPROVED BY	CUL-DE-SAC LOCAL RESIDENTIAL DETAIL	
		08/26	MSA		
NOT TO SCALE	DWG NO. 3.02-A		SHEET 1 OF 1		



TYPE	R1	R2
RESIDENTIAL	32'	50'



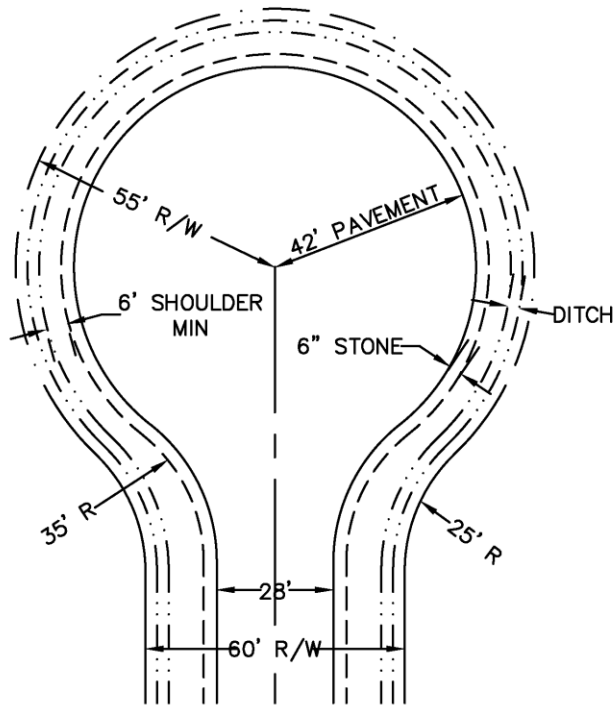
TYPE	R1	R2
RESIDENTIAL	32'	45'



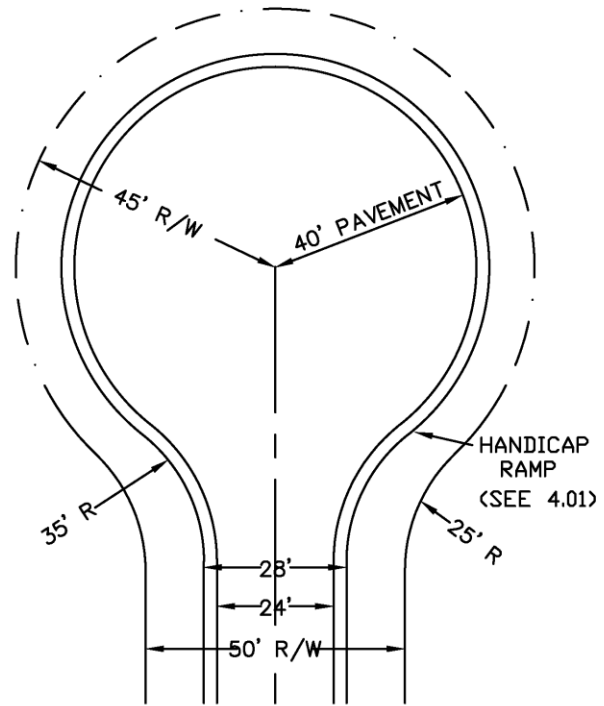
REV	DESCRIPTION	DATE	APPROVED BY
1		12/15	MSA
NOT TO SCALE		DWG NO. 3.02-B	SHEET 1 OF 1

TYPICAL SECTIONS
RESIDENTIAL
CUL-DE-SAC





DITCH TYPE

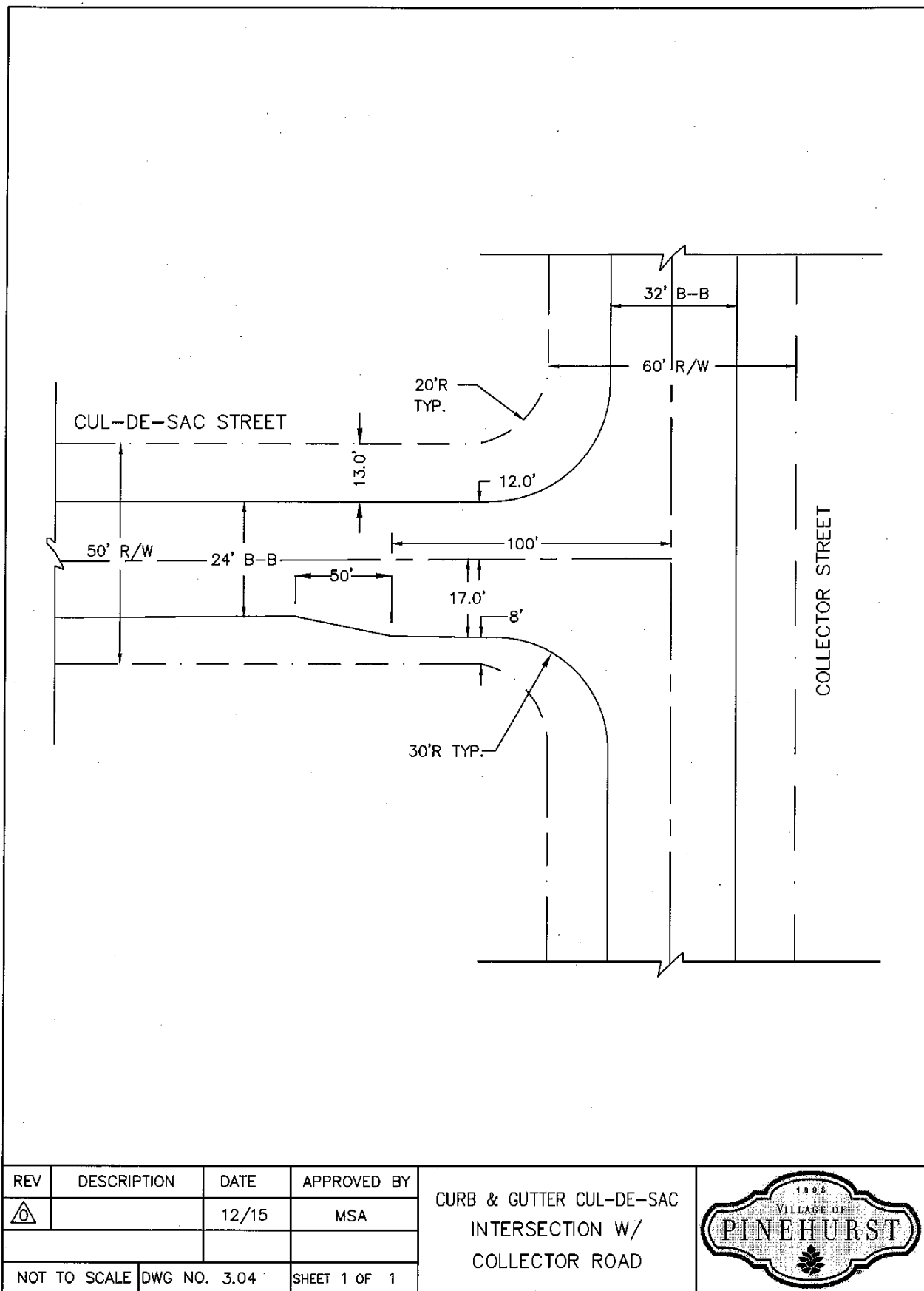


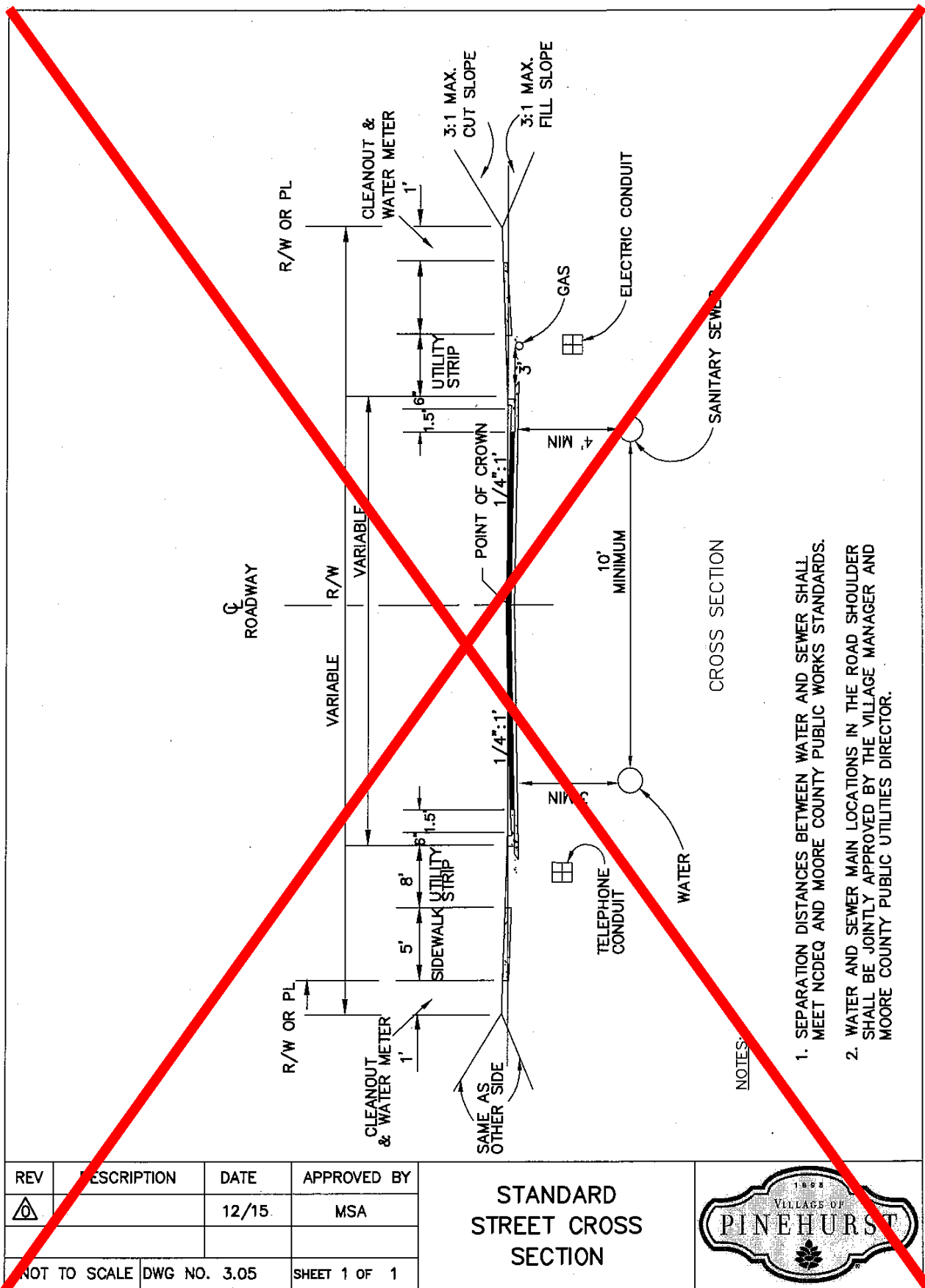
CURB AND GUTTER

NOTES:

1. CURB AND GUTTER STREETS SHALL BE 24" STANDARD CURB AND GUTTER. (SEE DETAIL 4.03)
2. THE CROWN FOR PAVEMENT SHALL BE 1/4" PER FT FROM THE CENTER OF THE CUL-DE-SAC.
3. MAXIMUM CUL-DE-SAC LENGTH IS 750' FROM THE NEAREST INTERSECTION. UNLESS OTHERWISE APPROVED BY THE VILLAGE FIRE MARSHALL.
4. ALTERNATIVE CUL-DE-SAC DESIGNS, INCLUDING ISLANDS SHALL BE SUBMITTED TO THE VILLAGE OF PINEHURST ENGINEERING DEPARTMENT FOR APPROVAL PRIOR TO PLAN SUBMITTAL.
5. PAVEMENT SECTION SHALL CONFORM WITH THE DESIGN REQUIREMENTS FOR COMMERCIAL STREETS.
6. THE CROWN FOR PAVEMENT SHALL BE 1/4" PER FT FROM THE CENTER OF THE CUL-DE-SAC.
7. THE TYPICAL SECTION DIMENSIONS SHOWN ARE MINIMUMS AND MAY BE INCREASED BY THE VILLAGE ENGINEER.

REV	DESCRIPTION	DATE	APPROVED BY	COMMERCIAL CUL-DE-SAC DETAIL	
		08/26	MSA		
NOT TO SCALE	DWG NO. 3.03		SHEET 1 OF 1		



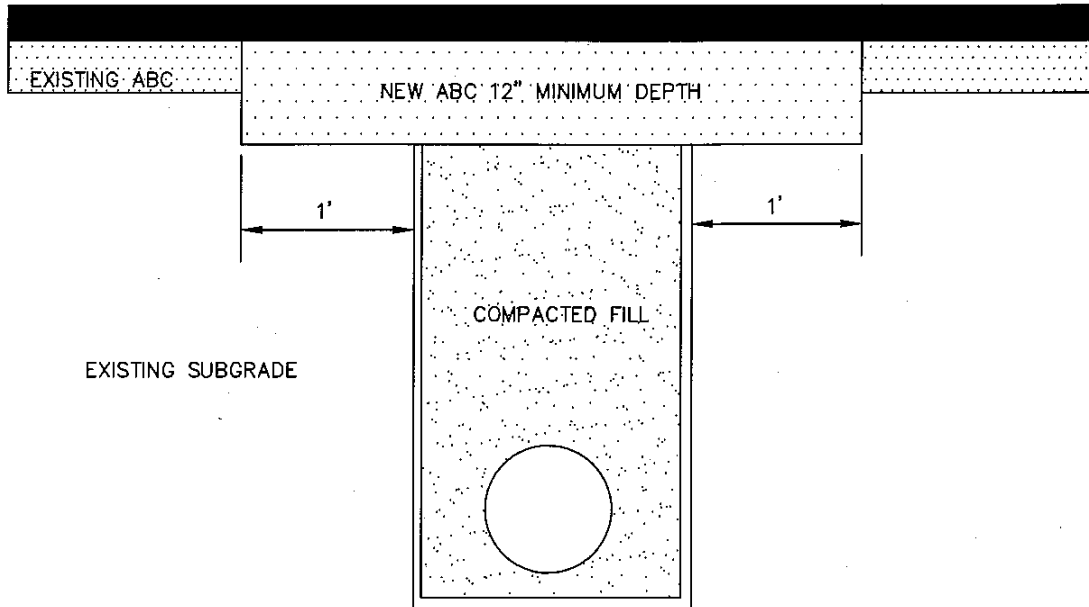


REV	DESCRIPTION	DATE	APPROVED BY
0		12/15	MSA
NOT TO SCALE		DWG NO. 3.05	SHEET 1 OF 1

STANDARD STREET CROSS SECTION



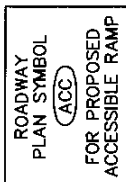
ASPHALT PAVEMENT PATCH



NOTES:

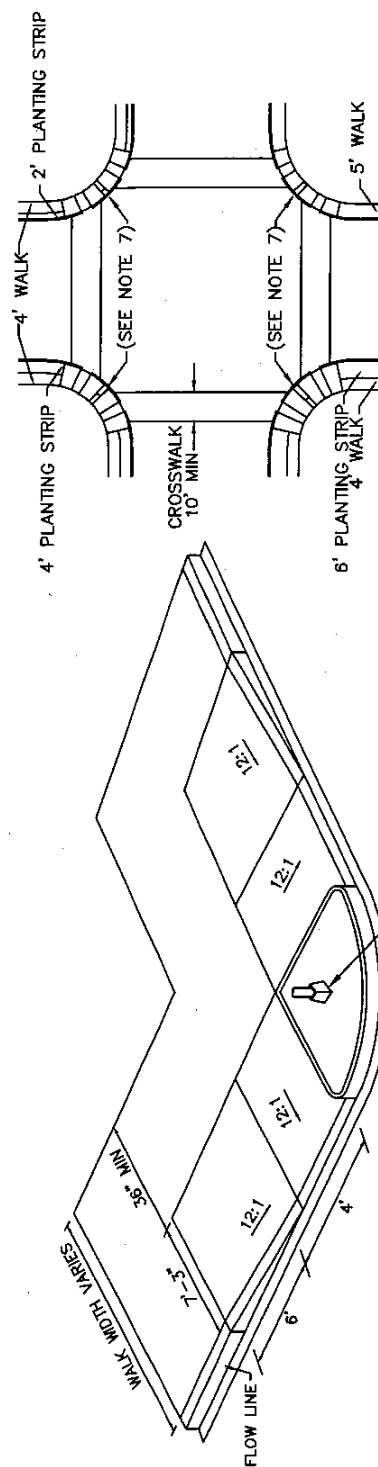
1. THE PAVEMENT SHALL BE DEFINED BY A STRAIGHT EDGE, PREFERABLY A MACHINED SAW CUT; TACKED.
2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
3. THE FINAL 1' OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-180 AS MODIFIED BY NCDOT. BITUMINOUS BASE OR BINDER MAY BE SUBSTITUTED IF APPROVED BY THE VILLAGE ENGINEER.
4. THE ENTIRE THICKNESS/VERTICAL EDGE OF THE CUT SHALL BE TACKED.
5. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 2" THICK.
6. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY TO ACHIEVE A SMOOTH LEVEL PATCH.

REV	DESCRIPTION	DATE	APPROVED BY	ASPHALT PAVEMENT PATCH	
		12/15	MSA		
NOT TO SCALE		DWG NO. 3.06	SHEET 1 OF 1		



NOTES:

1. RAMP AND WING SLOPES SHALL NOT BE STEEPER THAN 12:1.
2. GUTTER FLOW LINE AND PLAN PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA.
3. THE SURFACE OF THE RAMP SHALL BE FLUSH WITH THE FLOWLINE OF THE CURB AND GUTTER.
4. THE RAMP OPENING (AT THE FULLY DERESSED CURB) SHALL BE LOCATED WITHIN THE PARALLEL BOUNDARIES OF THE CROSSWALK MARKINGS. THE RAMP CENTERLINE SHALL BE LOCATED AT THE CORNER RADIUS CENTERLINE UNLESS OTHERWISE DIRECTED BY THE ENGINEER. DIAGONAL CURB RAMP SHALL HAVE A SEGMENT OF STRAIGHT CURB AT LEAST 24 INCHES LONG LOCATED ON EACH SIDE OF THE WING SLOPE AND WITHIN THE CROSSWALK MARKINGS.
5. THE WING AND RAMP SURFACES SHALL BE 3600 PSI CONCRETE WITH A SIDEWALK FINISH IN ACCORDANCE WITH CURRENT EDITION NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
6. DRAINAGE STRUCTURES, MAST ARMS, LIGHT POLES AND OTHER OBSTRUCTIONS SHALL NOT BE PLACED IN LINE WITH RAMP. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF OBSTRUCTIONS EXCEPT WHERE EXISTING OBSTRUCTIONS ARE BEING UTILIZED IN THE NEW CONSTRUCTION.
7. AT ALL LOCATIONS, NOT LESS THAN 2 FEET OF FULL HEIGHT CURB SHALL BE PLACED BETWEEN THE RAMP.



FOR TYPICAL LOCATION OF ACCESSIBLE RAMP AND PEDESTRIAN CROSSWALKS ON STATE SYSTEM STREETS
(SEE NCDOT STANDARD DRAWINGS)

PLACEMENT FOR OBSTRUCTED CORNER RADIUS OR CORNER RADIUS LESS THAN TEN FEET

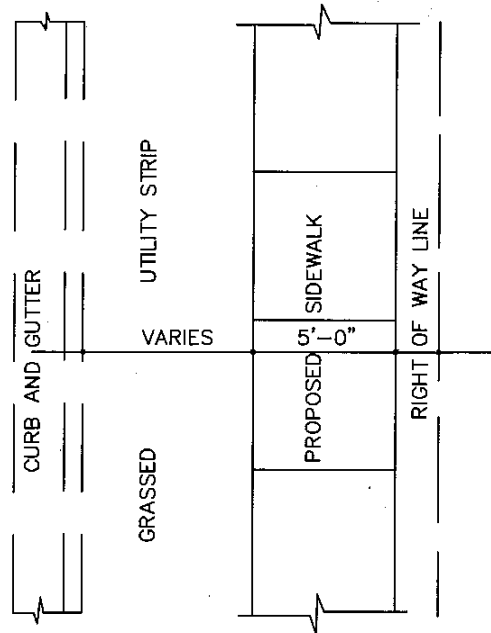
REV	DESCRIPTION	DATE	APPROVED BY
△		12/15	MSA
NOT TO SCALE		DWG NO. 4.01	SHEET 1 OF 1

STANDARD PLACEMENT
OF ACCESSIBLE RAMP
& GENERAL NOTES

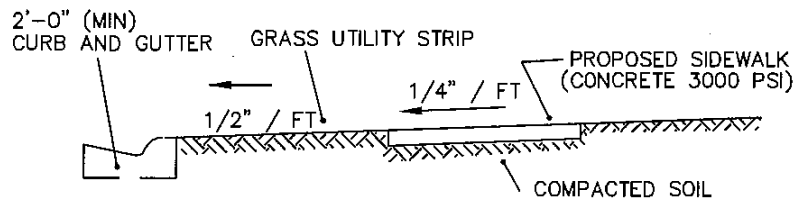


NOTES:

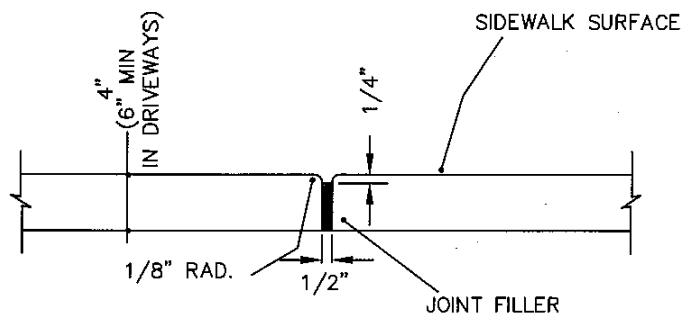
1. TRANSVERSE EXPANSION JOINT TO BE A MAXIMUM OF 50 FT.
(90' - EXTRUDED CURB).
2. ALL CONCRETE TO BE FINISHED WITH CURING COMPOUND.



PLAN VIEW



TYPICAL SECTION

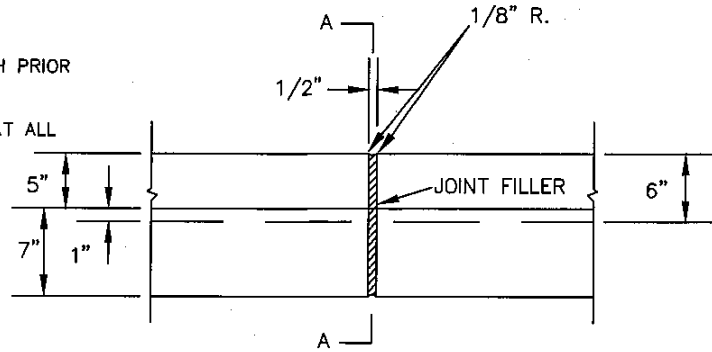


TRANSVERSE EXPANSION JOINT

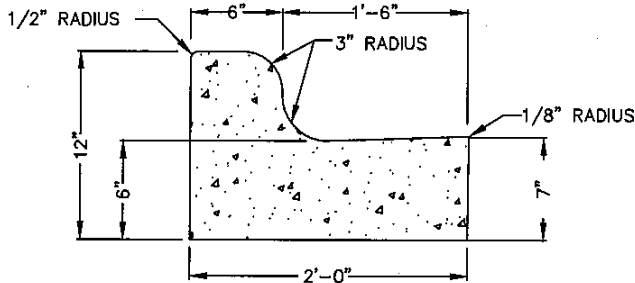
REV	DESCRIPTION	DATE	APPROVED BY	STANDARD CONCRETE SIDEWALK	
△		12/15	MSA		
NOT TO SCALE		DWG NO. 4.02	SHEET 1 OF 1		

NOTES:

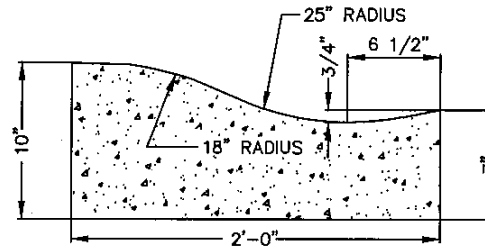
1. 2'-0" VALLEY GUTTER TO BE USED ONLY WITH PRIOR APPROVAL FROM VILLAGE ENGINEER.
2. MAINTAIN 50' MAXIMUM BETWEEN JOINTS OR AT ALL RIGID OBJECTS.



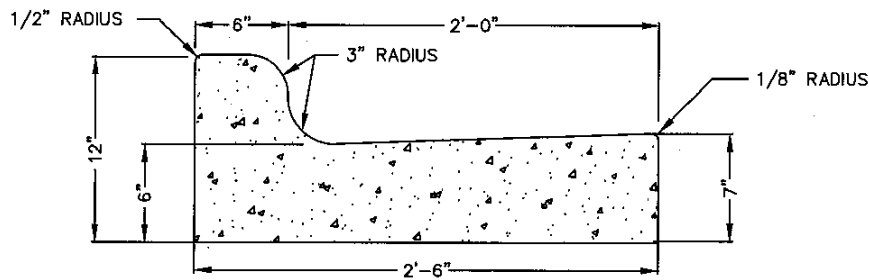
FRONT ELEVATION
TRANSVERSE EXPANSION JOINT



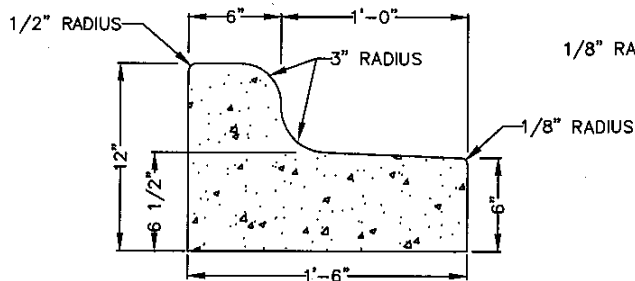
STANDARD 2'-0" CURB AND GUTTER



2'-0" VALLEY GUTTER

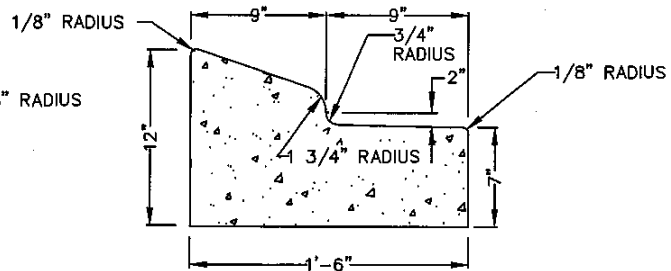


STANDARD 2'-6" CURB AND GUTTER (NCDOT STREETS)



1'-6" MEDIAN CURB AND GUTTER

TO BE USED IN MEDIANS WHEN LANES ARE SLOPED FROM ISLAND.



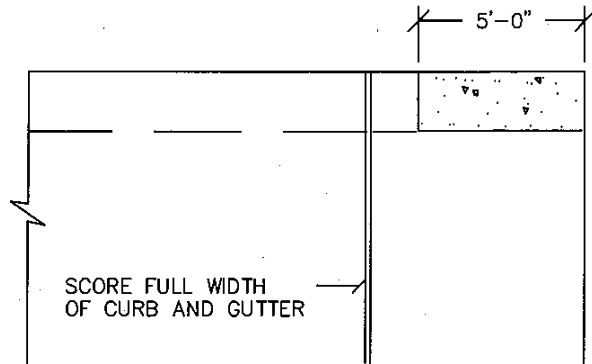
1'-6" MOUNTABLE CURB AND GUTTER

TO BE USED IN MEDIANS ONLY.

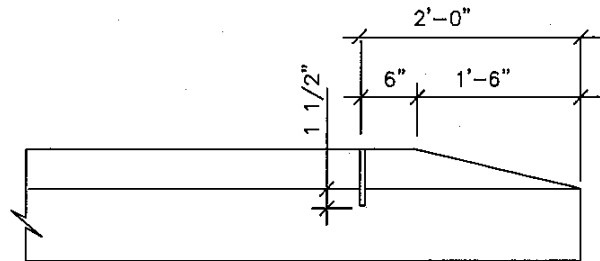
REV	DESCRIPTION	DATE	APPROVED BY
△		12/15	MSA
NOT TO SCALE		DWG NO. 4.03	SHEET 1 OF 1

CURB
AND
GUTTER

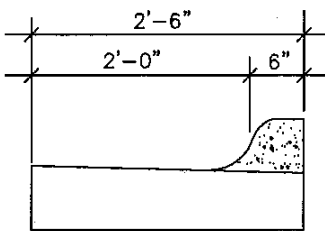




PLAN

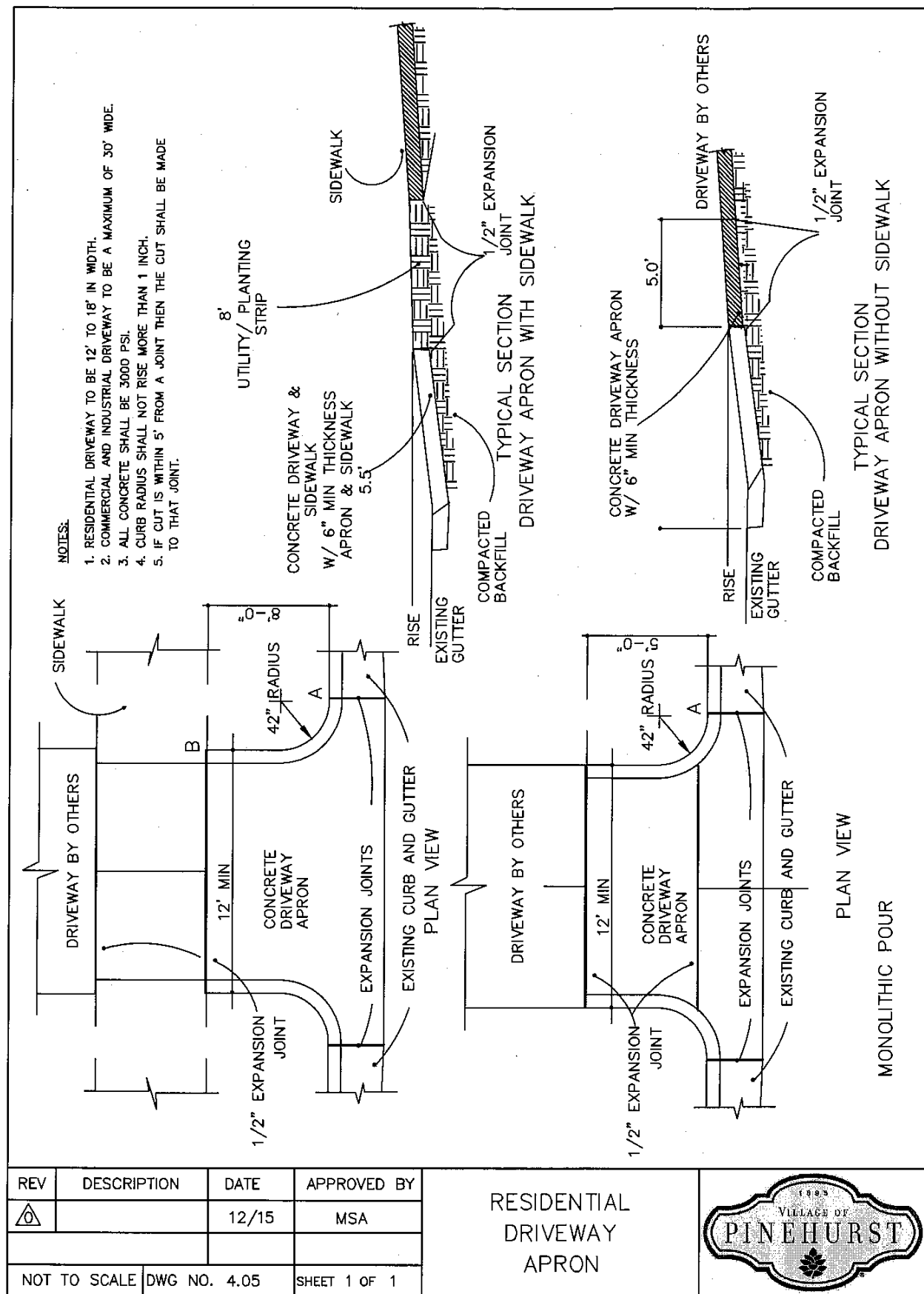


FRONT



END

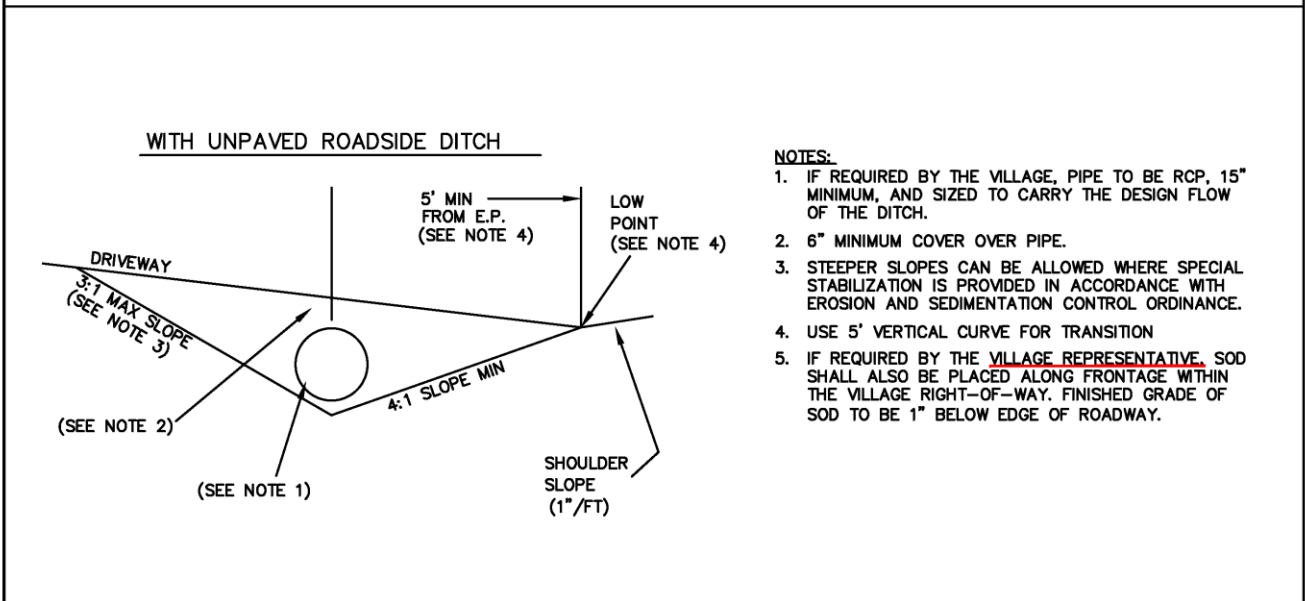
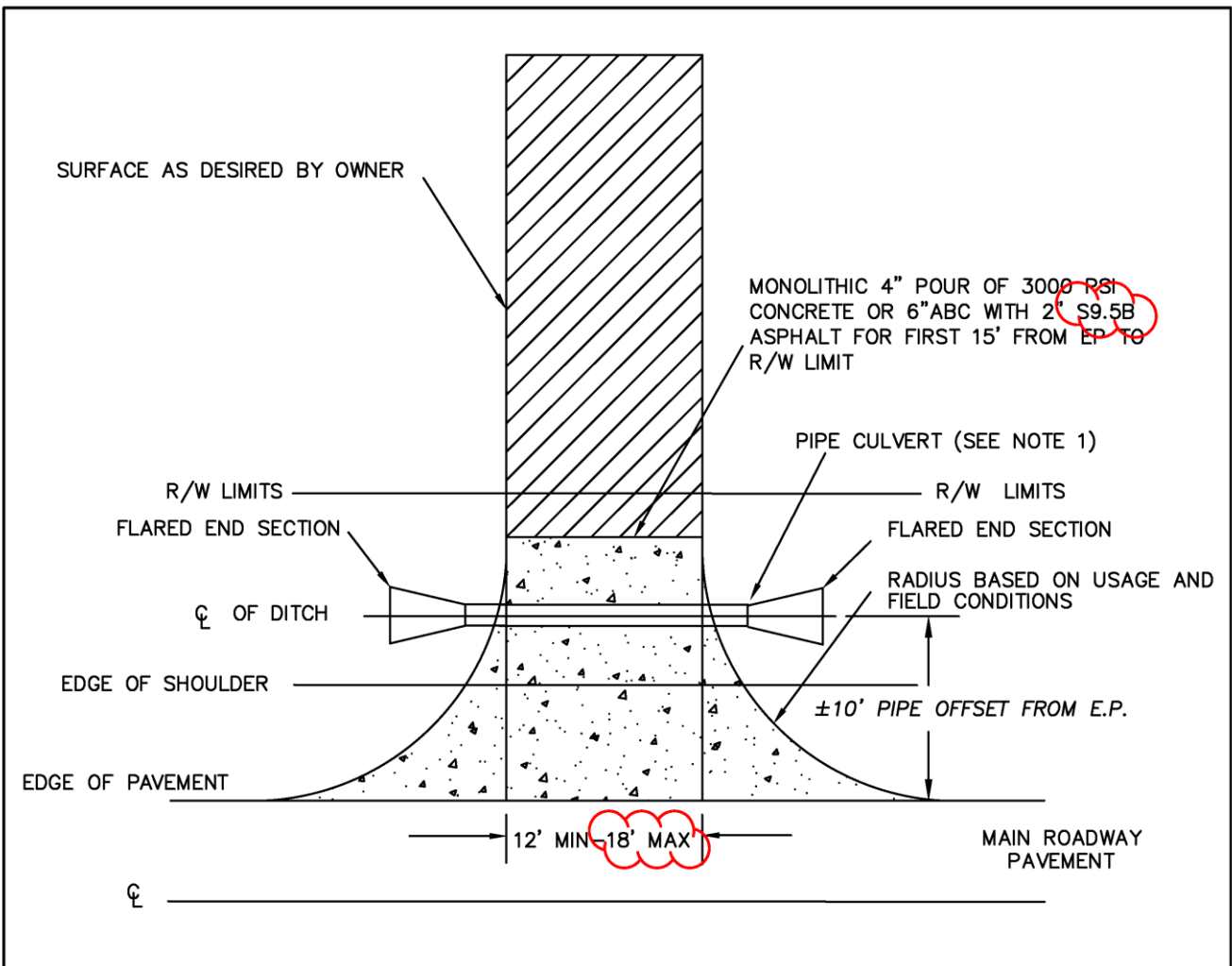
REV	DESCRIPTION	DATE	APPROVED BY	STANDARD METHOD ENDING CURB AND GUTTER	
0		12/15	MSA		
NOT TO SCALE		DWG NO. 4.04	SHEET 1 OF 1		



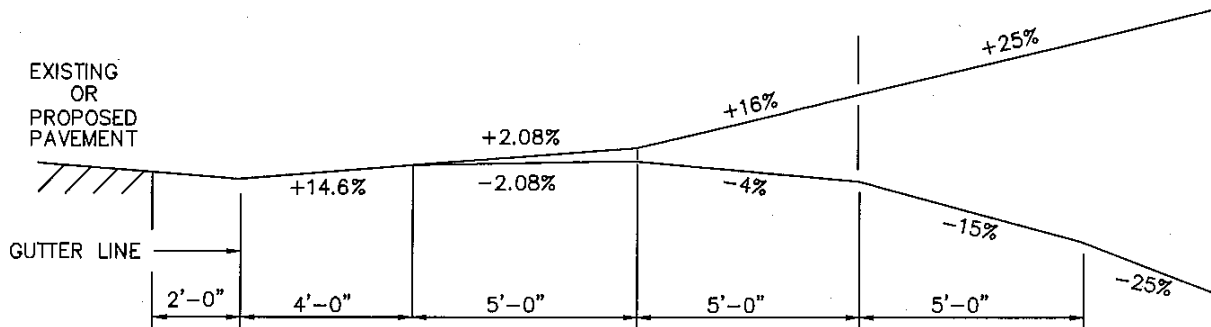
REV	DESCRIPTION	DATE	APPROVED BY
①		12/15	MSA
NOT TO SCALE		DWG NO. 4.05	SHEET 1 OF 1

RESIDENTIAL DRIVEWAY APRON

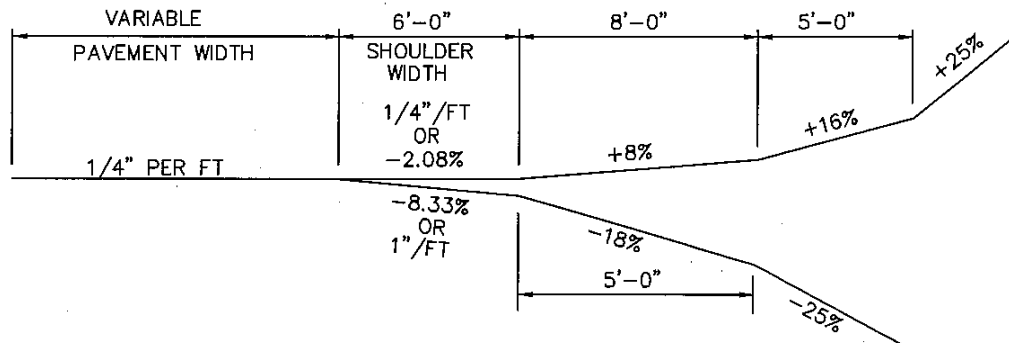




REV	DESCRIPTION	DATE	APPROVED BY	RESIDENTIAL DRIVEWAY APRON ON NON C&G STREETS	
△		08/26	MSA		
NOT TO SCALE	DWG NO. 4.06-A		SHEET 1 OF 1		



A) CURB & GUTTER, SIDEWALK SECTION

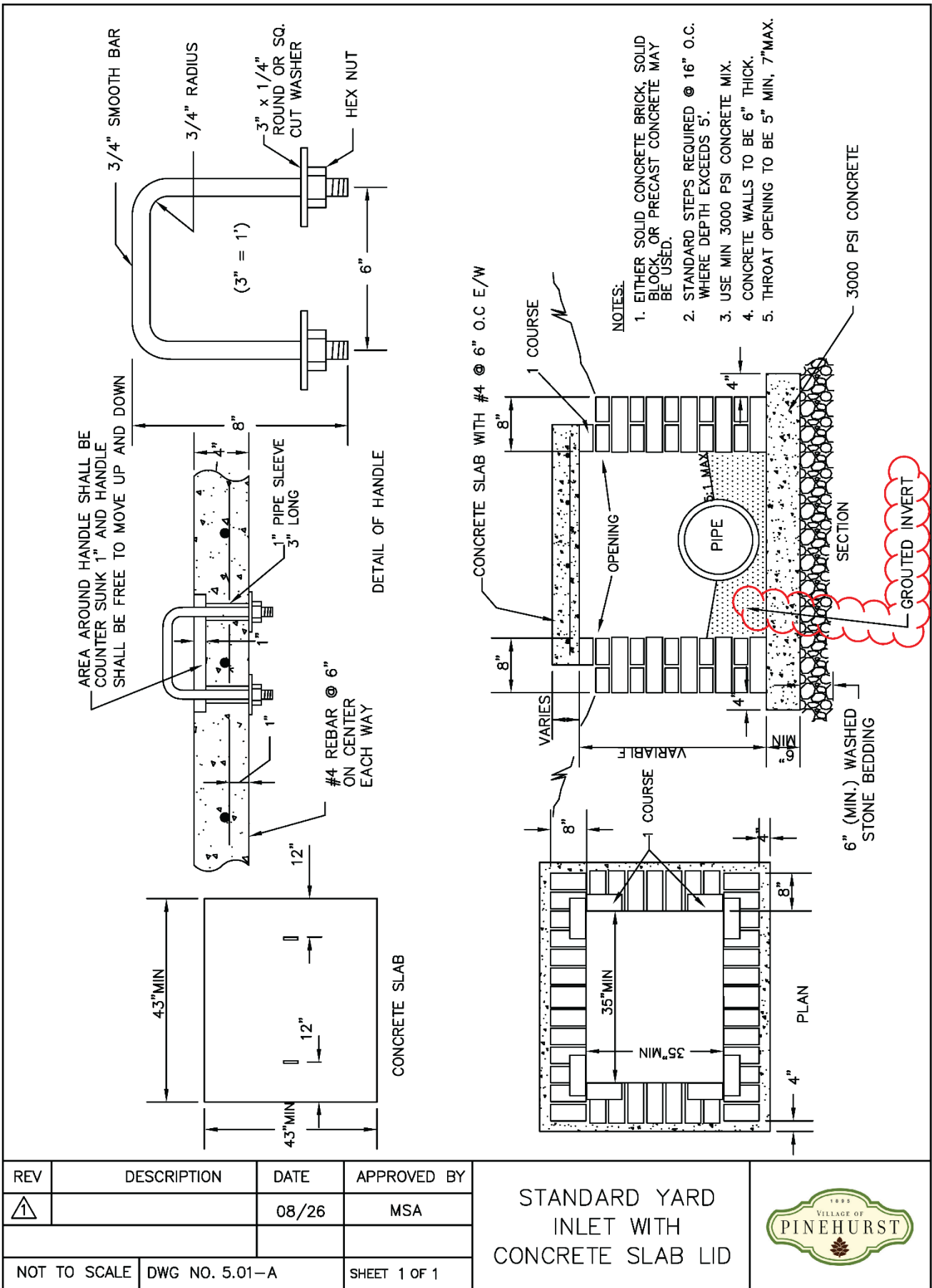


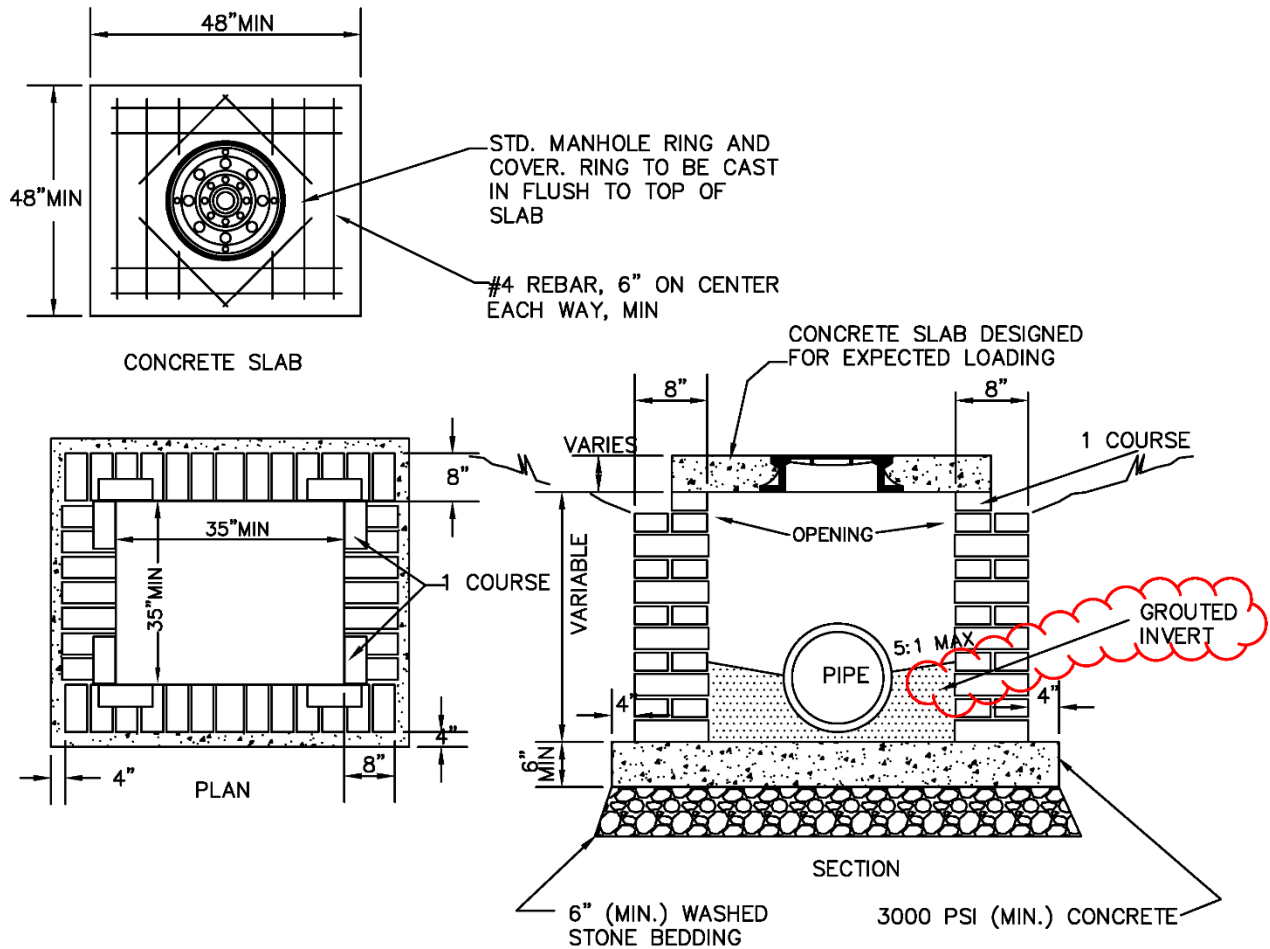
B) SHOULDER SECTION

NOTES:

- IF THE SLOPE BETWEEN THE TOP OF CURB AND GUTTER AND A POINT 30 FEET FROM THE CURB AND GUTTER EXCEEDS 20%, THIS SLOPE CAN BE ADJUSTED TO A MAXIMUM OF 8.33% (1"/FT) UP OR 4.17% (1/2"/FT) DOWN.

REV	DESCRIPTION	DATE	APPROVED BY	TYPICAL DRIVEWAY SECTIONS NON C&G	
△		12/15	MSA		
NOT TO SCALE		DWG NO. 4.06-B	SHEET 1 OF 1		

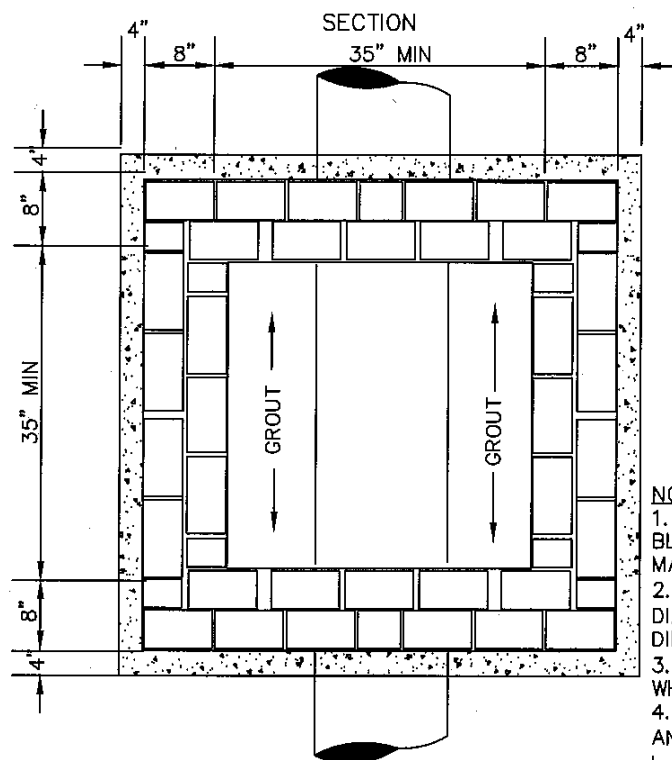
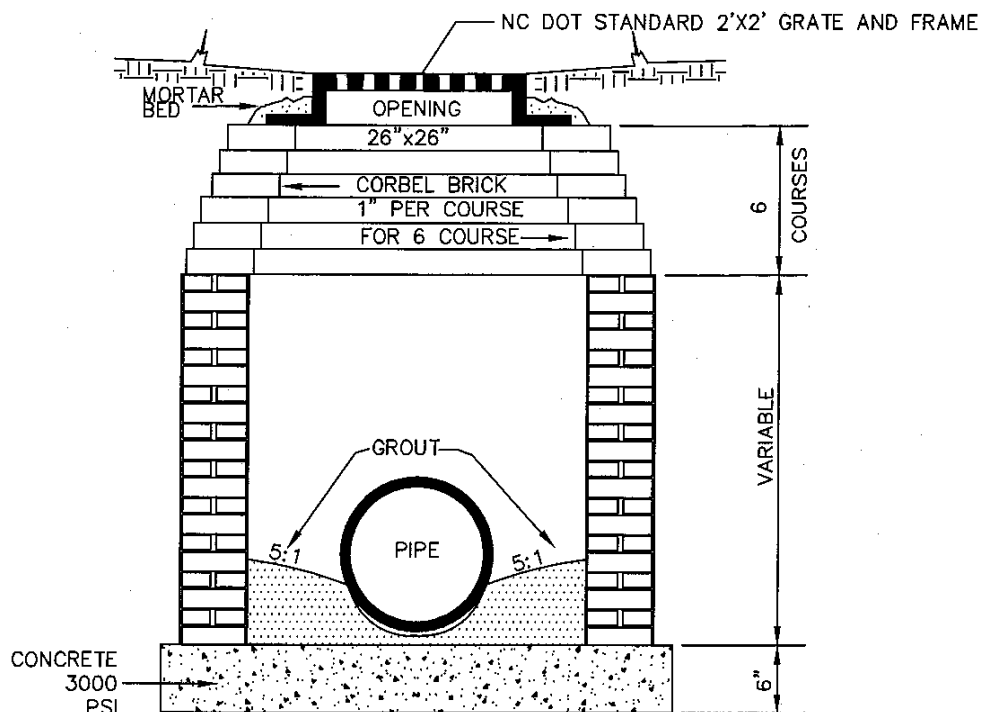




NOTES:

1. EITHER SOLID BRICK, SOLID BLOCK, OR PRECAST CONCRETE MAY BE USED.
2. STANDARD STEPS REQUIRED @ 16" O.C. WHERE DEPTH EXCEEDS 3'.
3. USE MIN 3000 PSI CONCRETE MIX
3. INSIDE DIMENSION FOR 24" PIPE AND GREATER USE PIPE DIA. PLUS 12".

REV	DESCRIPTION	DATE	APPROVED BY	STANDARD JUNCTION BOX	
△		08/26	MSA		
NOT TO SCALE	DWG NO. 5.01-B		SHEET 1 OF 1		



PLAN

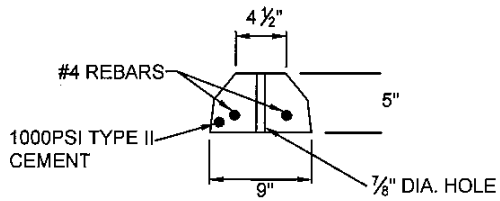
NOTES:

1. EITHER SOLID CONCRETE BRICK, SOLID BLOCK OR PRECAST CONCRETE BOX MAY BE USED.
2. FOR 24" R.C.P. AND LARGER USE PIPE DIA. PLUS 12" FOR MINIMUM INSIDE DIMENSION.
3. STANDARD STEPS REQUIRED @ 16" O.C. WHERE DEPTH EXCEEDS 3 FEET.
4. WHERE TRAFFIC WHEEL LOADS ARE ANTICIPATED, USE NCDOT 840.35 (Shaped Invert AS PER 5.02) & 840.22/840.24

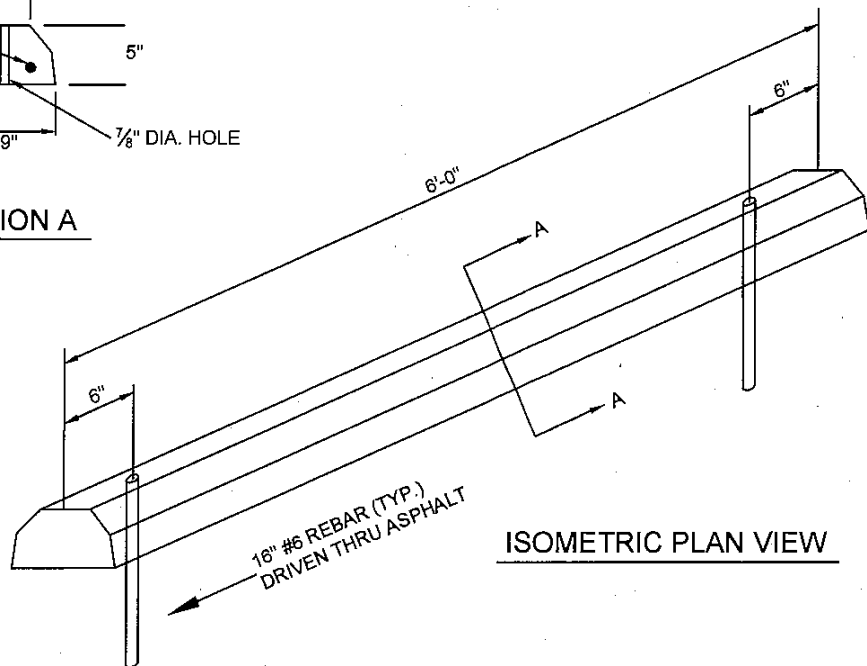
REV	DESCRIPTION	DATE	APPROVED BY
△		12/15	MSA
NOT TO SCALE		DWG NO. 5.02	SHEET 1 OF 1

STANDARD YARD
INLET WITH GRATE
AND FRAME





SECTION A

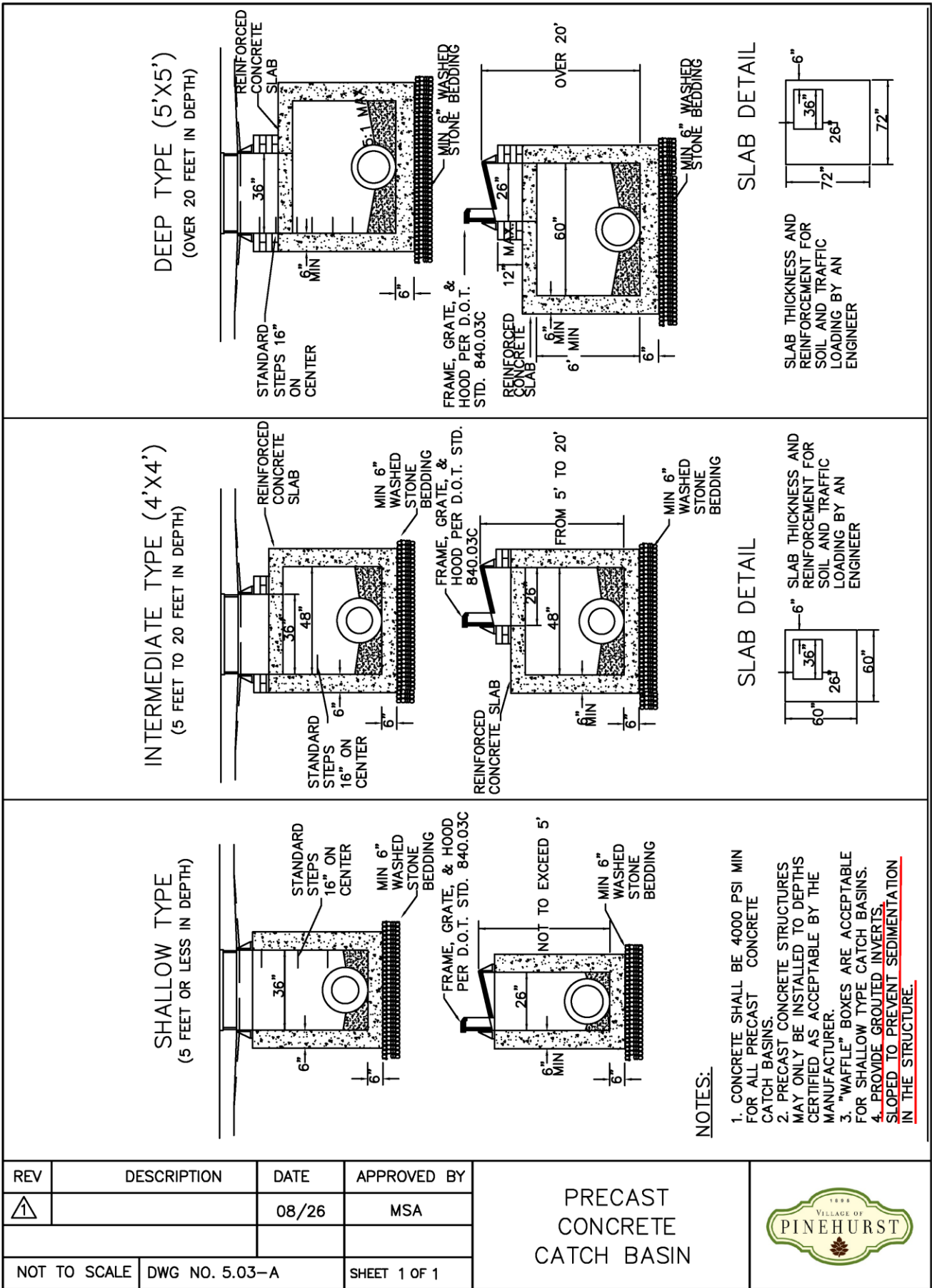


ISOMETRIC PLAN VIEW

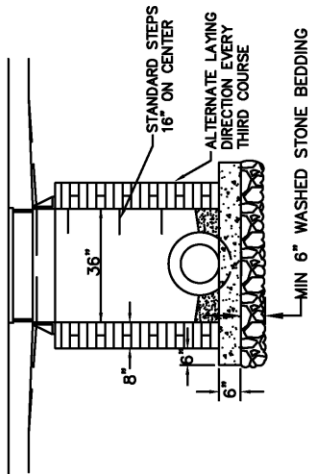
WHEEL STOP

NOT TO SCALE

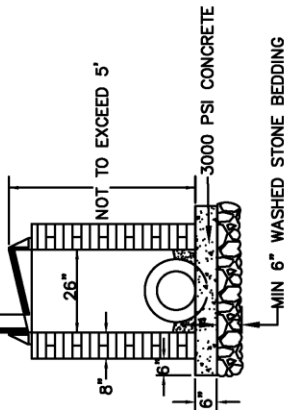
REV	DESCRIPTION	DATE	APPROVED BY	WHEEL STOP	
△		12/15	MSA		
NOT TO SCALE		DWG NO. 5.02-A	SHEET 1 OF 1		



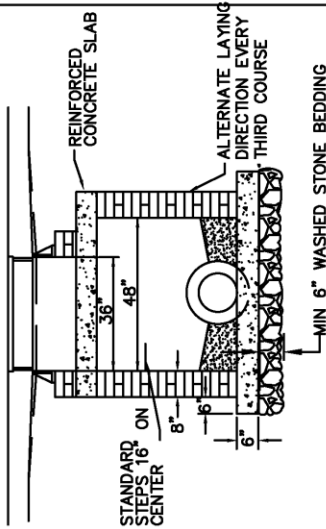
SHALLOW TYPE
(5 FEET OR LESS IN DEPTH)



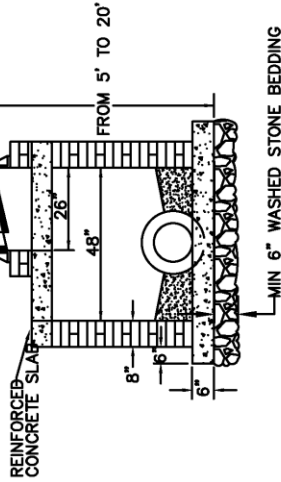
FRAME, GRATE, & HOOD
PER D.O.T. STD. 840.03C



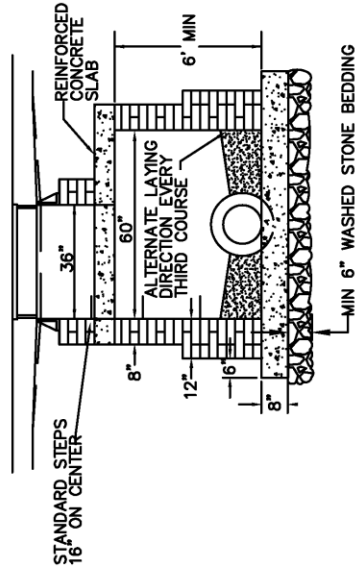
INTERMEDIATE TYPE (4'X4')
(5 FEET TO 20 FEET IN DEPTH)



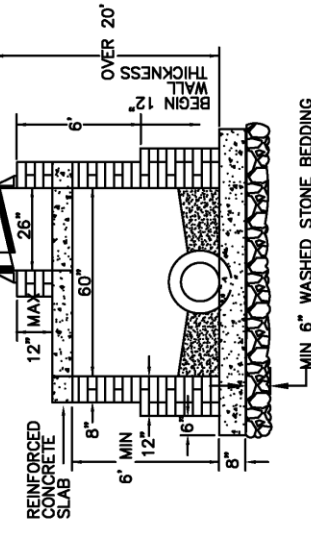
FRAME, GRATE, & HOOD
PER D.O.T. STD. 840.03C



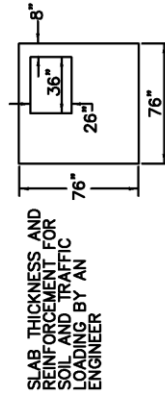
DEEP TYPE (5'X5')
(OVER 20 FEET IN DEPTH)



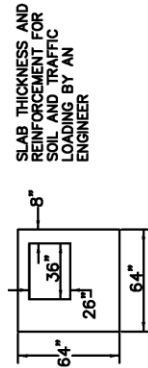
FRAME, GRATE, & HOOD
PER D.O.T. STD. 840.03C



SLAB DETAIL



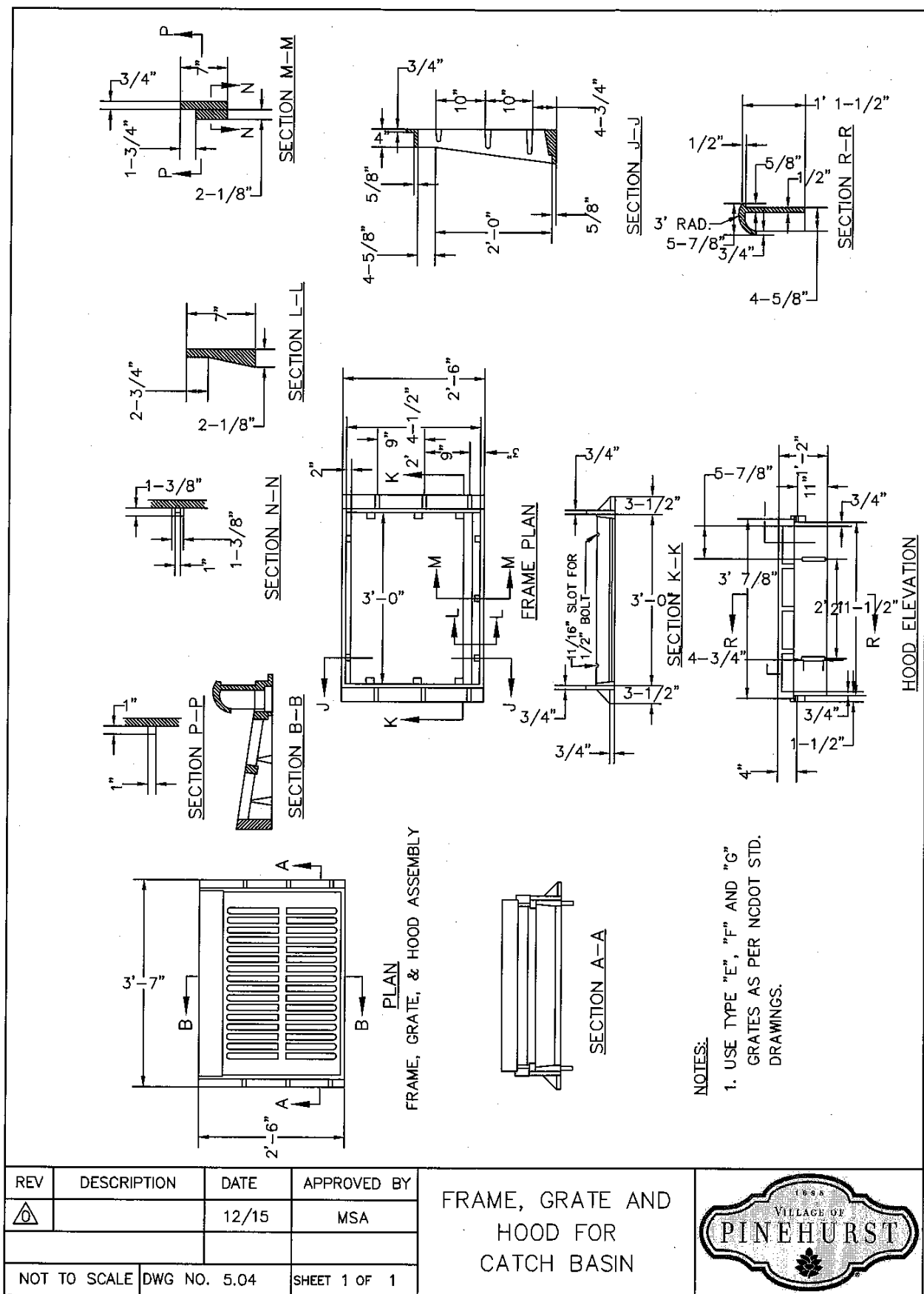
SLAB DETAIL

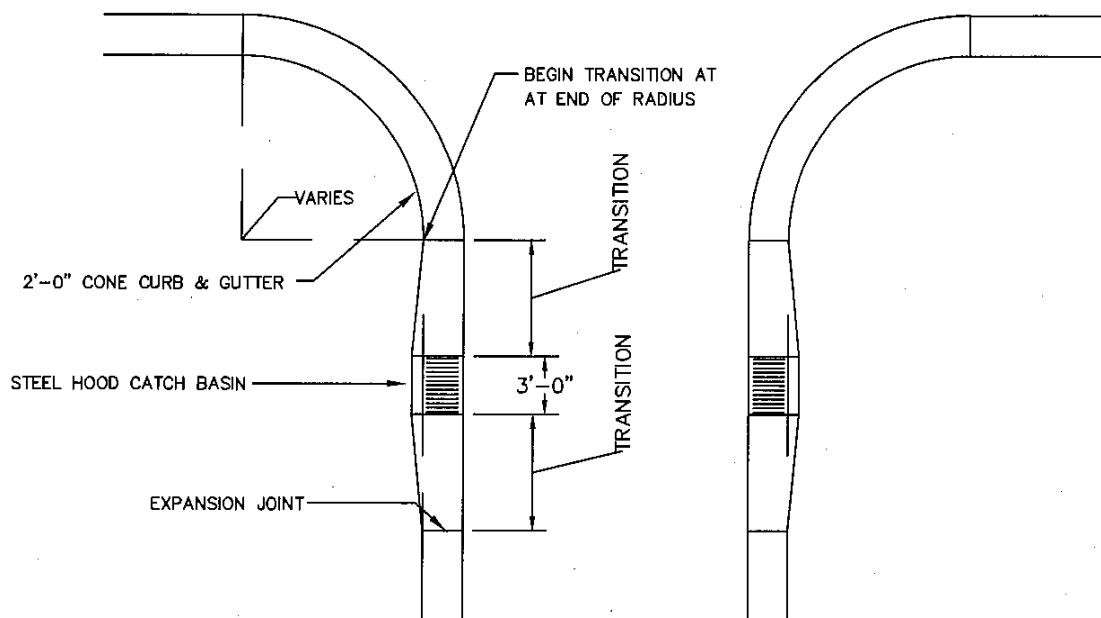


NOTES:

1. OVER 8' IN DEPTH, 12" WALL THICKNESS TO 6' FROM TOP OF WALL AND 8" BOTTOM SLAB SHALL BE USED.
2. PROVIDE GROUTED INVERTS, SLOPED TO PREVENT SEDIMENTATION IN THE STRUCTURE.

REV	DESCRIPTION	DATE	APPROVED BY	CONCRETE BLOCK OR BRICK CATCH BASIN	
△		08/26	MSA		
NOT TO SCALE	DWG NO. 5.03-B		SHEET 1 OF 1		



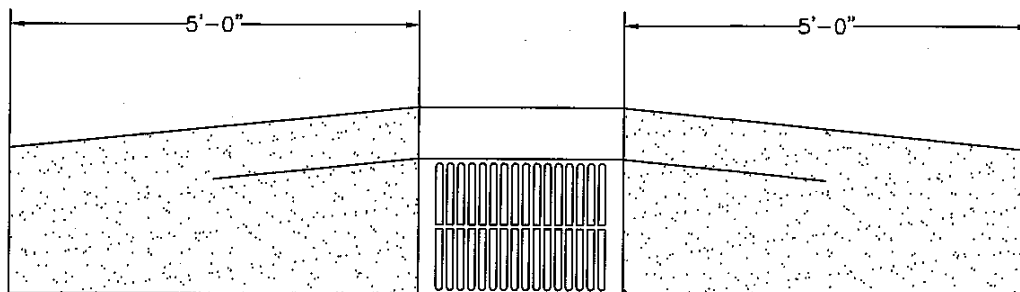


PLAN

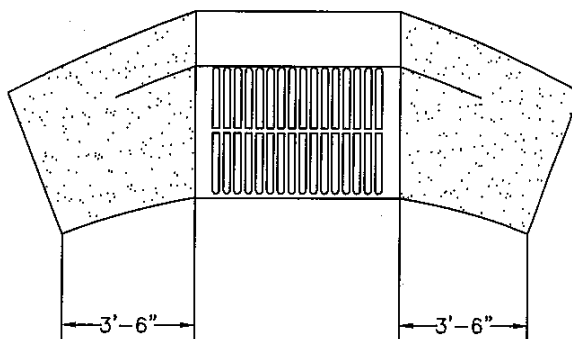
NOTES:

1. WHERE 2'-6" CURB AND GUTTER IS USED, CATCH BASINS MAY BE LOCATED AT END OF RADIUS.
2. RADIUS AT INTERSECTION MAY VARY.

REV	DESCRIPTION	DATE	APPROVED BY	CATCH BASIN PLACEMENT AT INTERSECTIONS	
		12/15	MSA		
NOT TO SCALE		DWG NO. 5.05-A	SHEET 1 OF 1		



PLAN FOR TANGENT SECTION

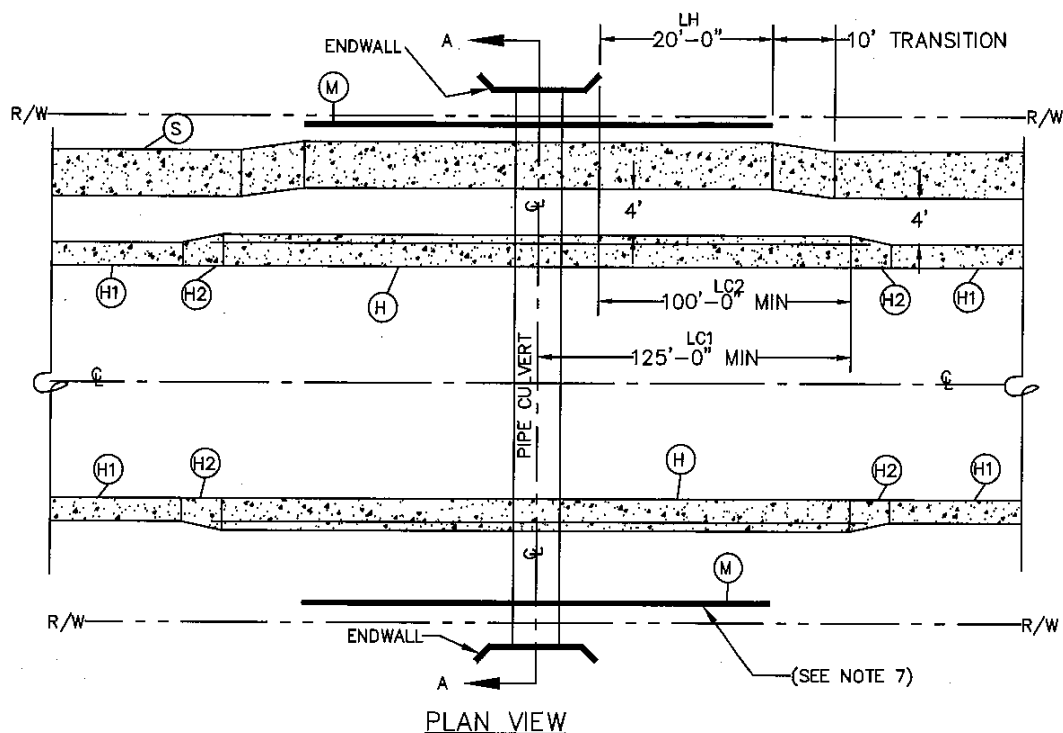
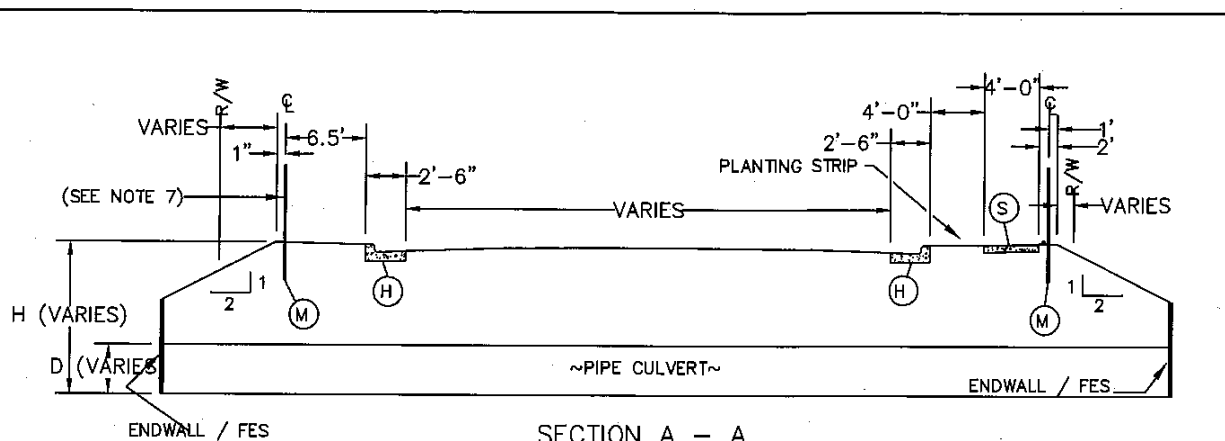


PLAN FOR RESIDENTIAL CUL-DE-SAC

NOTES:

1. TRANSITION FROM VALLEY GUTTER TO 2'-6" SECTION TO BE MADE OVER 10' LENGTH.

REV	DESCRIPTION	DATE	APPROVED BY	CATCH BASIN FRAME IN VALLEY CURB	
		12/15	MSA		
NOT TO SCALE		DWG NO. 5.05-B	SHEET 1 OF 1		



- (H) 2'-6" CURB AND GUTTER.
- (M) HANDRAIL.
- (S) 4'-0" SIDEWALK.
- (H1) 2'-0" VALLEY GUTTER.
- (H2) CURB TRANSITION 2'-6" CURB AND GUTTER TO 2'-0" VALLEY GUTTER.

LH = DISTANCE FROM END OF WINGWALL TO END OF HANDRAIL.

LC1 = DISTANCE FROM $\bar{C}$ OF CULVERT TO END OF 2'-6" CURB AND GUTTER.

LC2 = DISTANCE FROM END OF WINGWALL TO END OF 2'-6" CURB AND GUTTER.

REV	DESCRIPTION	DATE	APPROVED BY
△		12/15	MSA
NOT TO SCALE		DWG NO. 5.06-A	SHEET 1 OF 1

CULVERT CROSSINGS AT
RESIDENTIAL AND
COMMERCIAL STREETS



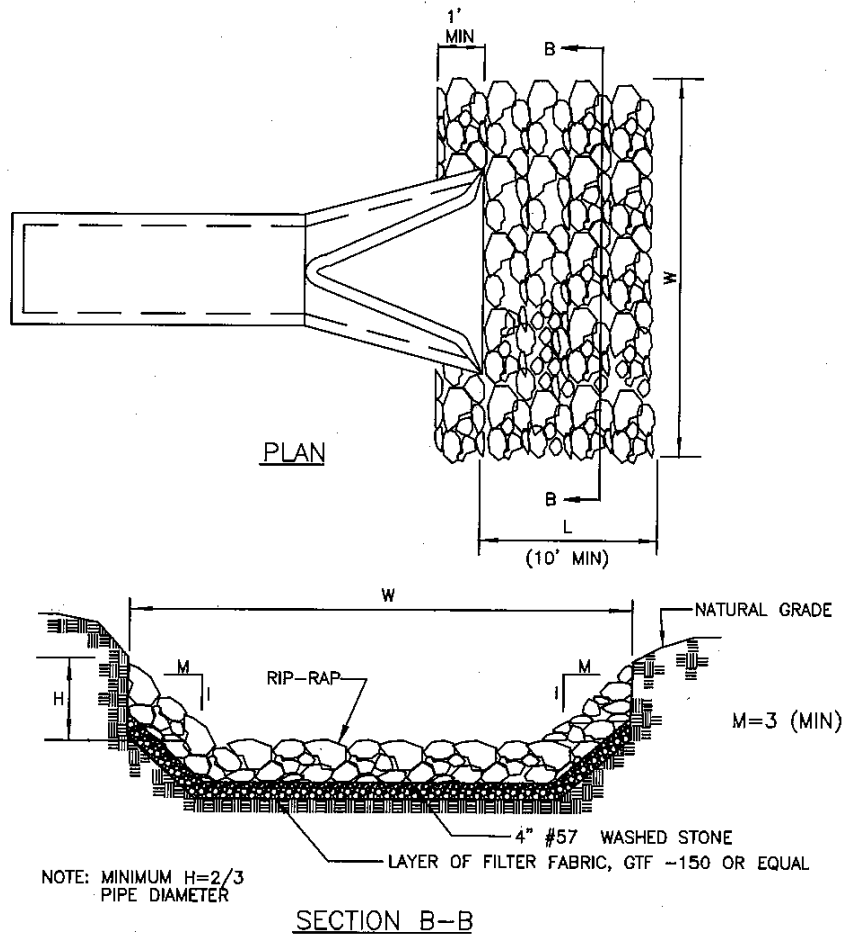
NOTES:

1. UNLESS OTHERWISE DETERMINED BY THE VILLAGE ENGINEER, THE MEASURES ILLUSTRATED SHALL BE USED WHEN CULVERT DIAMETER, D, IS GREATER THAN OR EQUAL TO 24 INCHES AND WHEN THE DIFFERENCE IN ELEVATION BETWEEN THE CULVERT INVERT AND THE TOP OF SLOPE, H, IS GREATER THAN OR EQUAL TO 5 FEET.
2. INSTALLATION OF 2'-6" CURB AND GUTTER MAY NOT BE REQUIRED WHEN AN ADEQUATE CLEAR ZONE IS PROVIDED FOR VEHICLES WITH A MAXIMUM OF 6:1 SLOPE (SEE TABLE 1).
3. INSTALLATION OF HANDRAIL MAY NOT BE REQUIRED WHEN A 10-FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE SIDEWALK WITH A MAXIMUM OF 6:1 SLOPE. WHERE NO SIDEWALK IS REQUIRED, INSTALLATION OF HANDRAIL MAY NOT BE REQUIRED WHEN A 15-FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE CURB WITH A MAXIMUM OF 6:1 SLOPE.
4. FOR CULVERT CROSSINGS WITHOUT ENDWALLS, LH AND LC2 SHALL BE MEASURED FROM THE OUTSIDE OF THE NEAREST WALL OF THE CULVERT BARREL.
5. FOR MULTIPLE BARREL CULVERT CROSSINGS, LC1 SHALL BE MEASURED FROM THE CENTERLINES OF THE OUTBOARD CULVERT BARRELS.
6. WHEN NECESSARY, AS DETERMINED BY THE VILLAGE ENGINEER, MEASURES ADDITIONAL TO THOSE ILLUSTRATED MAY BE REQUIRED.
7. INSTALLATION OF HANDRAIL IS REQUIRED ON THE SIDEWALK SIDE OF STREET IF SIDEWALK IS ONLY REQUIRED ON ONE SIDE OF STREET. INSTALLATION OF HANDRAIL IS REQUIRED ON BOTH SIDES OF STREET IF SIDEWALK IS REQUIRED ON BOTH SIDES OR IF NO SIDEWALK IS REQUIRED.
8. DESIGN ADT IS CALCULATED ASSUMING A TRIP GENERATION OF 13 DAILY TRIPS PER SINGLE FAMILY DWELLING UNIT.
9. ALL CULVERT CROSSINGS WITHOUT HEADWALLS SHALL HAVE FLARED END SECTIONS.

TABLE 1.
CLEAR ZONE DISTANCES
LOCAL, COLLECTOR, AND COMMERCIAL STREETS

DESIGN ADT	CLEAR ZONE FROM EDGE OF PAVEMENT	
	TANGENT SECTION	CURVE (WITHIN 125' OF CULVERT)
UNDER 750	10'	15'
750 - 1500	12'	18'
1501 - 6000	14'	21'
OVER 6000	16'	24'

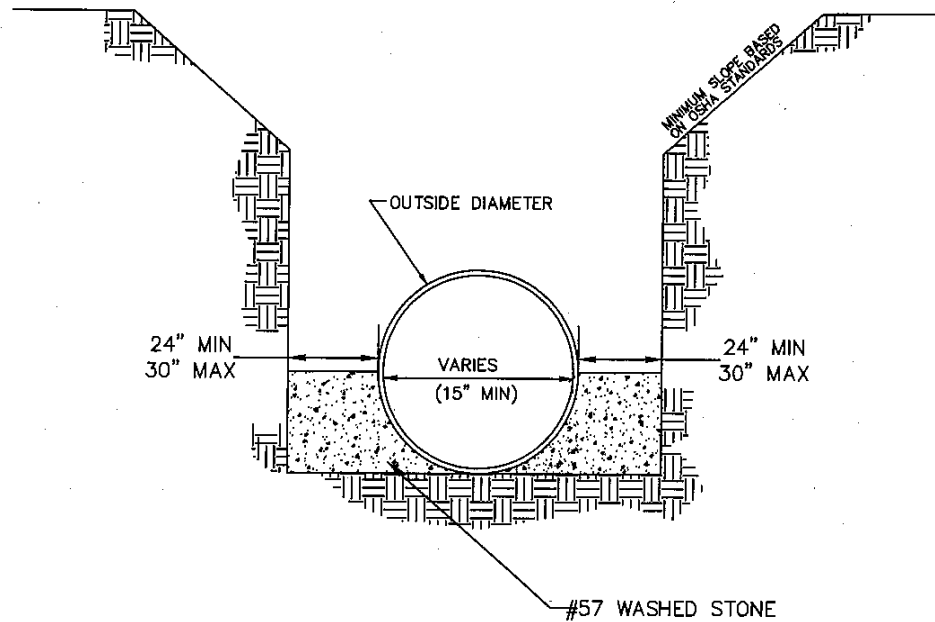
REV	DESCRIPTION	DATE	APPROVED BY	CULVERT CROSSINGS AT RESIDENTIAL AND COMMERCIAL STREETS	
		12/15	MSA		
NOT TO SCALE		DWG NO. 5.06-B	SHEET 2 OF 2		



NOTES:

1. CLASS OR MEDIAN SIZE OF RIP-RAP AND LENGTH, WIDTH AND DEPTH OF APRON TO BE DESIGNED BY THE ENGINEER.
2. NO BENDS OR CURVES IN THE HORIZONTAL ALIGNMENT OF THE APRON WILL BE PERMITTED.
3. RIP-RAP SHOULD EXTEND UP BOTH SIDES OF THE APRON AND AROUND THE END OF THE PIPE OR CULVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 3:1 AND A HEIGHT NOT LESS THAN TWO THIRDS THE PIPE DIAMETER OR CULVERT HEIGHT.
4. THERE SHALL BE NO OVERFLOW FROM THE END OF THE APRON TO THE SURFACE OF THE RECEIVING CHANNEL. THE AREA TO BE PAVED OR RIP-RAPPED SHALL BE UNDERCUT SO THAT THE INVERT OF THE APRON SHALL BE AT THE SAME GRADE (FLUSH) WITH THE SURFACE OF THE RECEIVING CHANNEL. THE APRON SHALL HAVE A CUTOFF OR TOE WALL AT THE DOWNSTREAM END.
5. THE WIDTH OF THE END OF THE APRON SHALL BE EQUAL TO THE BOTTOM WIDTH OF THE RECEIVING CHANNEL. MAXIMUM TAPER TO RECEIVING CHANNEL 5:1.
6. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.
7. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEIVING CHANNEL SHALL NOT BE ALLOWED.

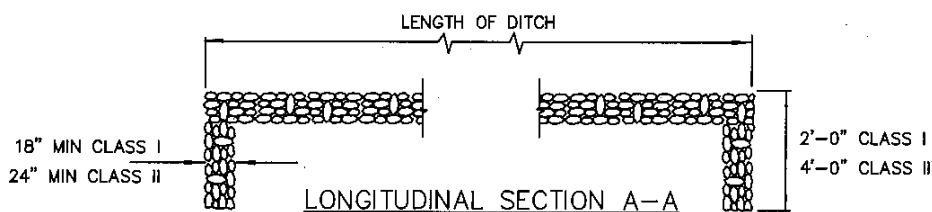
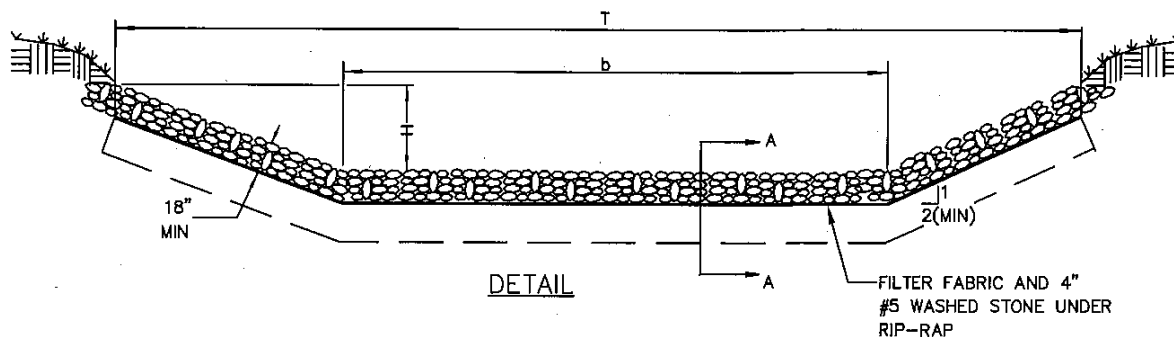
REV	DESCRIPTION	DATE	APPROVED BY	RIP-RAP APRON AT CULVERTS	
△		12/15	MSA		
NOT TO SCALE		DWG NO. 5.07	SHEET 1 OF 1		



NOTES:

1. A MINIMUM OF 24" FROM OUTSIDE DIAMETER OF PIPE TO SIDE OF TRENCH MUST BE ALLOWED FOR COMPACTION OF FILL MATERIAL. BACKFILLING OF TRENCHES SHALL BE ACCOMPLISHED IMMEDIATELY AFTER THE PIPE IS LAID. THE FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED 6". UNDER NO CIRCUMSTANCES SHALL WATER BE PERMITTED TO RISE IN UNBACKFILLED TRENCHES AFTER THE PIPE HAS BEEN PLACED. COMPACTION REQUIREMENTS SHALL BE ATTAINED BY THE USE OF THE MECHANICAL TAMPS ONLY. EACH AND EVERY LAYER OF BACKFILL SHALL BE PLACED LOOSE AND THOROUGHLY COMPACTED INTO PLACE.
2. ALL BACKFILL MATERIAL SHALL HAVE AN IN PLACE COMPACTED DENSITY OF 95% OF STANDARD PROCTOR. THE FINAL 2' BELOW FINISHED GRADE SHALL BE 100%.
3. ALL TRENCHING OPERATIONS SHALL MEET OSHA STANDARDS.
4. BACKFILL MATERIAL BENEATH ROADWAY SHALL BE SELECT BACKFILL MATERIAL.
5. HAUNCHING SHALL BE WITH #57 OR #67 WASHED STONE UNLESS OTHERWISE APPROVED BY THE VILLAGE ENGINEER.

REV	DESCRIPTION	DATE	APPROVED BY	TRENCH DETAIL FOR STORM DRAIN PIPES	
0		12/15	MSA		
NOT TO SCALE		DWG NO. 5.08	SHEET 1 OF 1		

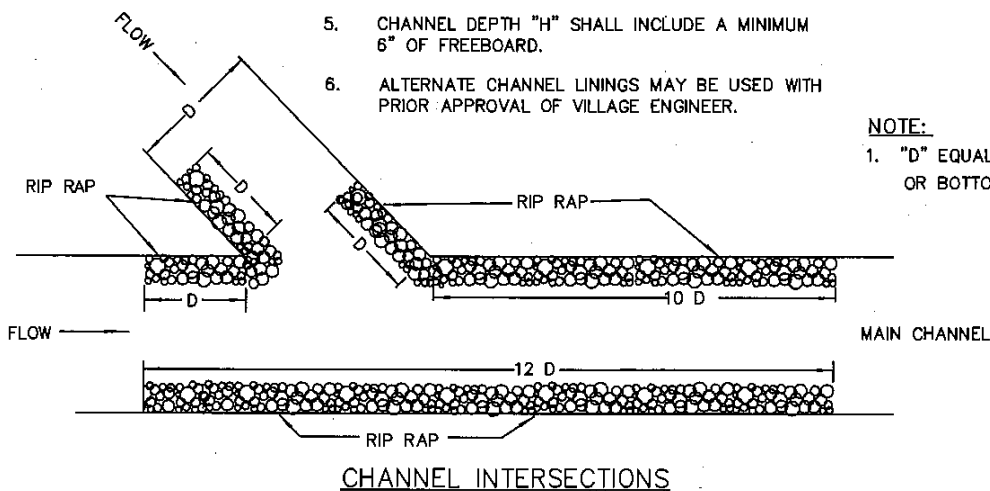


GENERAL NOTES:

1. IF BEDROCK IS ENCOUNTERED WITHIN THE LIMITS OF THE TOEWALL, BEGIN TOEWALL ON THE BEDROCK OR AS DIRECTED BY THE ENGINEER.
2. WHERE ONLY ONE SIDE REQUIRES RIP-RAP CLASS I OR II, LIST STATION AND SIDE OF SAME.
3. CHANNEL AND RIP-RAP SIZE TO BE DESIGNED BY THE ENGINEER.
4. DEPENDING ON SOIL CONDITIONS, WASHED STONE AND FILTER FABRIC MAY BE NECESSARY UNDER RIP-RAP.
5. CHANNEL DEPTH "H" SHALL INCLUDE A MINIMUM 6" OF FREEBOARD.
6. ALTERNATE CHANNEL LININGS MAY BE USED WITH PRIOR APPROVAL OF VILLAGE ENGINEER.

NOTE:

1. "D" EQUALS DIAMETER OF PIPE OR BOTTOM WIDTH OF CHANNEL.



REV	DESCRIPTION	DATE	APPROVED BY	RIP-RAP LINED DITCHES	
△		12/15	MSA		
NOT TO SCALE		DWG NO. 5.09	SHEET 1 OF 1		

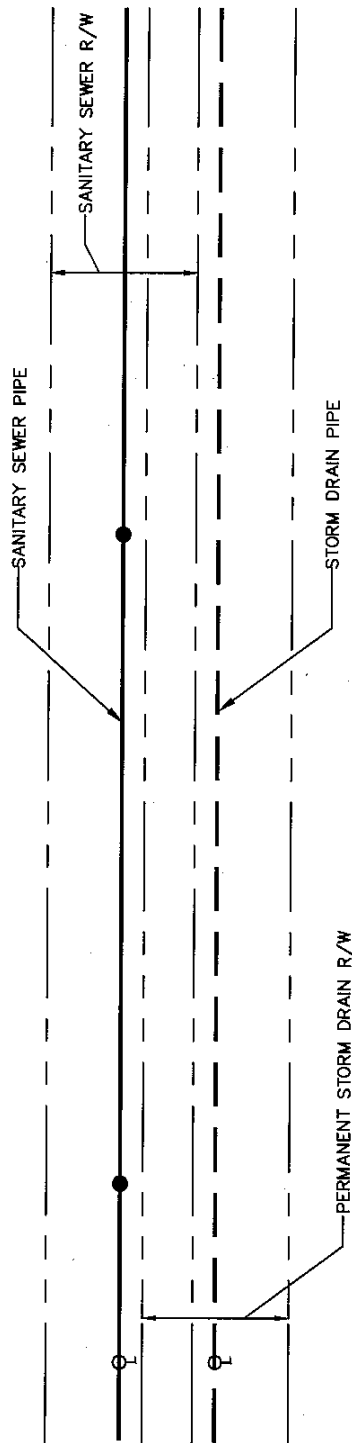
EASEMENT REQUIREMENTS FOR OPEN STORM DRAINAGE CHANNELS	
AREA IN ACREAGE	EASEMENT REQUIREMENT
0-45 AC.	20'
	20'
	20'
45-120 AC.	30'
120-500 AC.	40'
500 AC.+	(SEE NOTE)

EASEMENT REQUIREMENTS FOR STORM DRAIN PIPE	
PIPE SIZE	EASEMENT REQUIREMENT
15"	20'
18"	20'
24"	20'
30"	20'
36"	20'
42"	25'
48"	30'
54"+	30'MIN (VARIES)

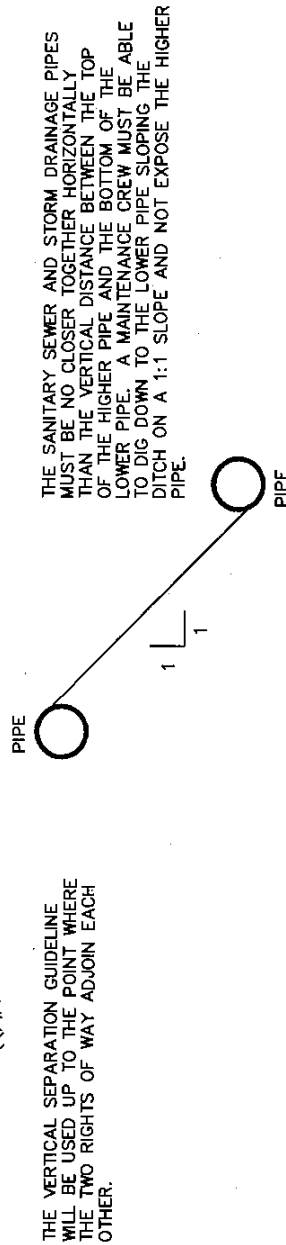
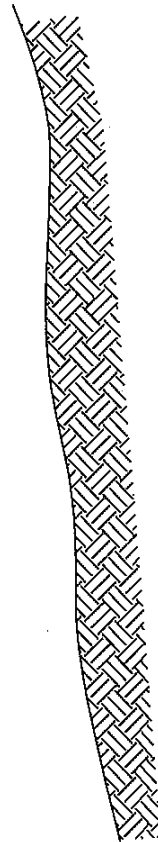
NOTES:

1. FOR STREAMS CARRYING 500 ACRES OR MORE OF SURFACE RUNOFF, THE EASEMENT REQUIREMENT IS TO BE THE WIDTH OF THE STREAM FROM TOP OF BANK TO TOP OF BANK, PLUS (+) 10' ON EACH SIDE OF STREAM. (40' MINIMUM WIDTH)
2. FOR OPEN CHANNELS, THE MINIMUM EASEMENT MUST CONTAIN THE WIDTH OF THE STREAM FROM TOP OF BANK TO TOP BANK.

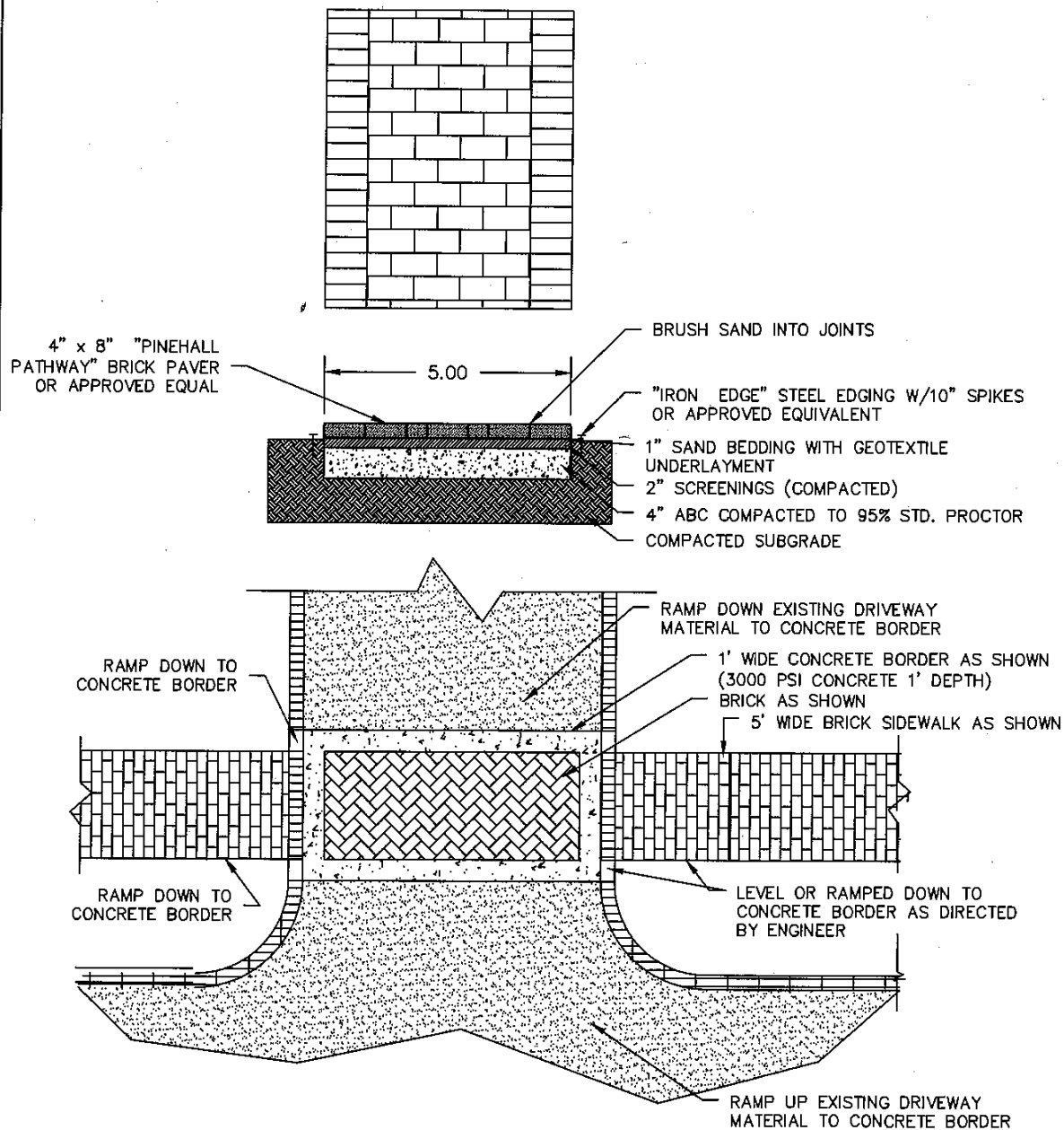
REV	DESCRIPTION	DATE	APPROVED BY	MINIMUM DRAINAGE EASEMENT REQUIREMENTS FOR STORM DRAIN PIPES AND OPEN CHANNELS	
△		12/15	MSA		
NOT TO SCALE		DWG NO. 5.10	SHEET 1 OF 1		



PLAN VIEW



REV	DESCRIPTION	DATE	APPROVED BY	OVERLAPPING STORM DRAIN/ SANITARY SEWER EASEMENTS	
△		12/15	MSA		
NOT TO SCALE		DWG NO. 5.11	SHEET 1 OF 1		



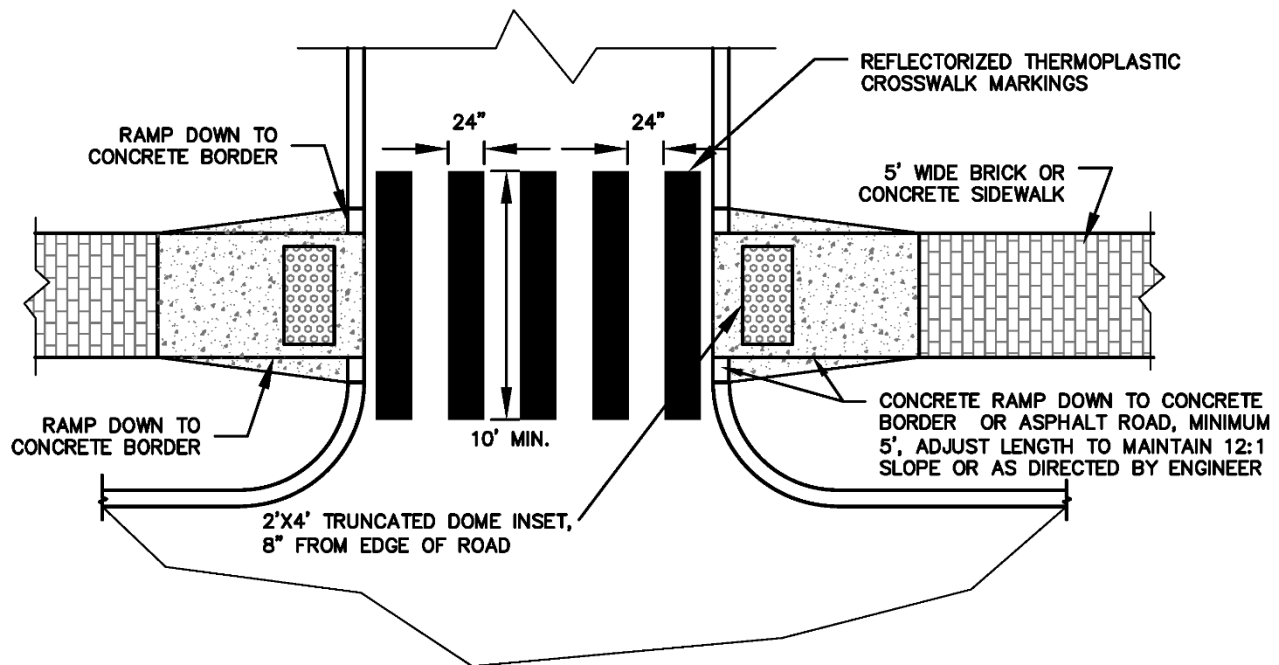
REV	DESCRIPTION	DATE	APPROVED BY
△		12/15	MSA
NOT TO SCALE		DWG NO. 5.12	SHEET 1 OF 1

BRICK
SIDEWALK



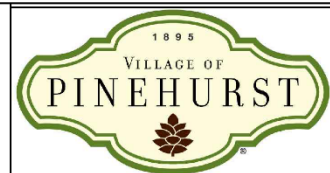
NOTES:

1. FOR BRICK OR CONCRETE SIDEWALKS, HD RAMP AT INTERSECTIONS AND DRIVE CROSSINGS SHALL BE CONSTRUCTED OF 4000PSI CONCRETE.
2. FOR BRICK SIDEWALKS, THE INITIAL 5' TO 10' FROM EDGE OF INTERSECTION OR DRIVE CROSSING SHALL BE CONCRETE FOR THE HD RAMP BEFORE TRANSITIONING TO THE BRICK SIDEWALK. EXACT LENGTH OF RAMP SHALL BE FIELD VERIFIED BY VILLAGE OF PINEHURST (VOP) STAFF AND WILL VARY BASED ON SITE CONDITIONS AND TOPOGRAPHY.
3. EACH HD RAMP MUST HAVE RAISED DOME TRUNCATED DETECTABLE WARNING PANELS MADE OF A HOMOGENOUS FIBERGLASS AND CARBON REINFORCED COMPOSITE CAST-IN PLACE (WET-SET) PANEL(S) IN GREYSTONE COLOR MEETING ADA REGULATIONS FOR DETECTABLE WARNINGS FOR CURB RAMP (SUCH AS ADA SOLUTIONS CAST-IN PLACE TACTILE PANELS OR EQUIVALENT). SHOP SAMPLE OF DOME PANEL MUST BE PROVIDED AND APPROVED BEFORE INSTALLATION.



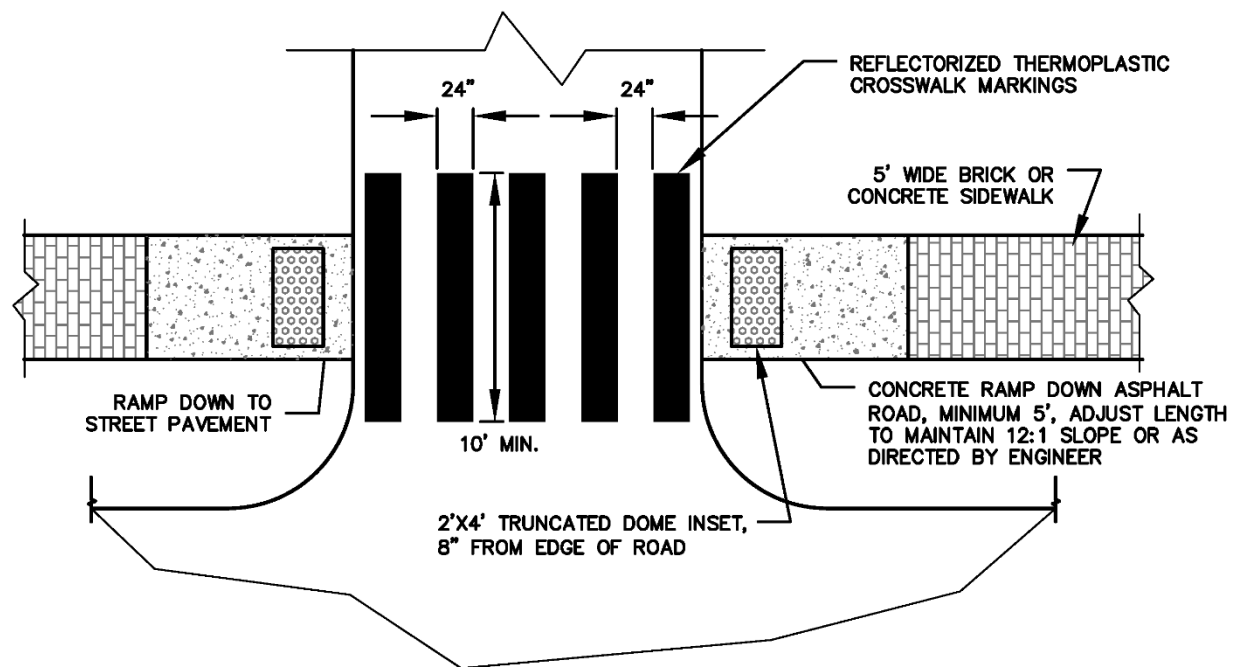
REV	DESCRIPTION	DATE	APPROVED BY
△		8/21	
NOT TO SCALE		DWG NO. 5.12A	SHEET 1 OF 1

**HANDICAP RAMP
DETAIL
WITH CURB**



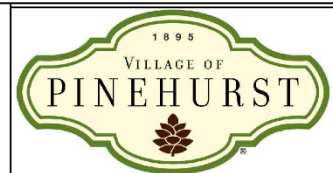
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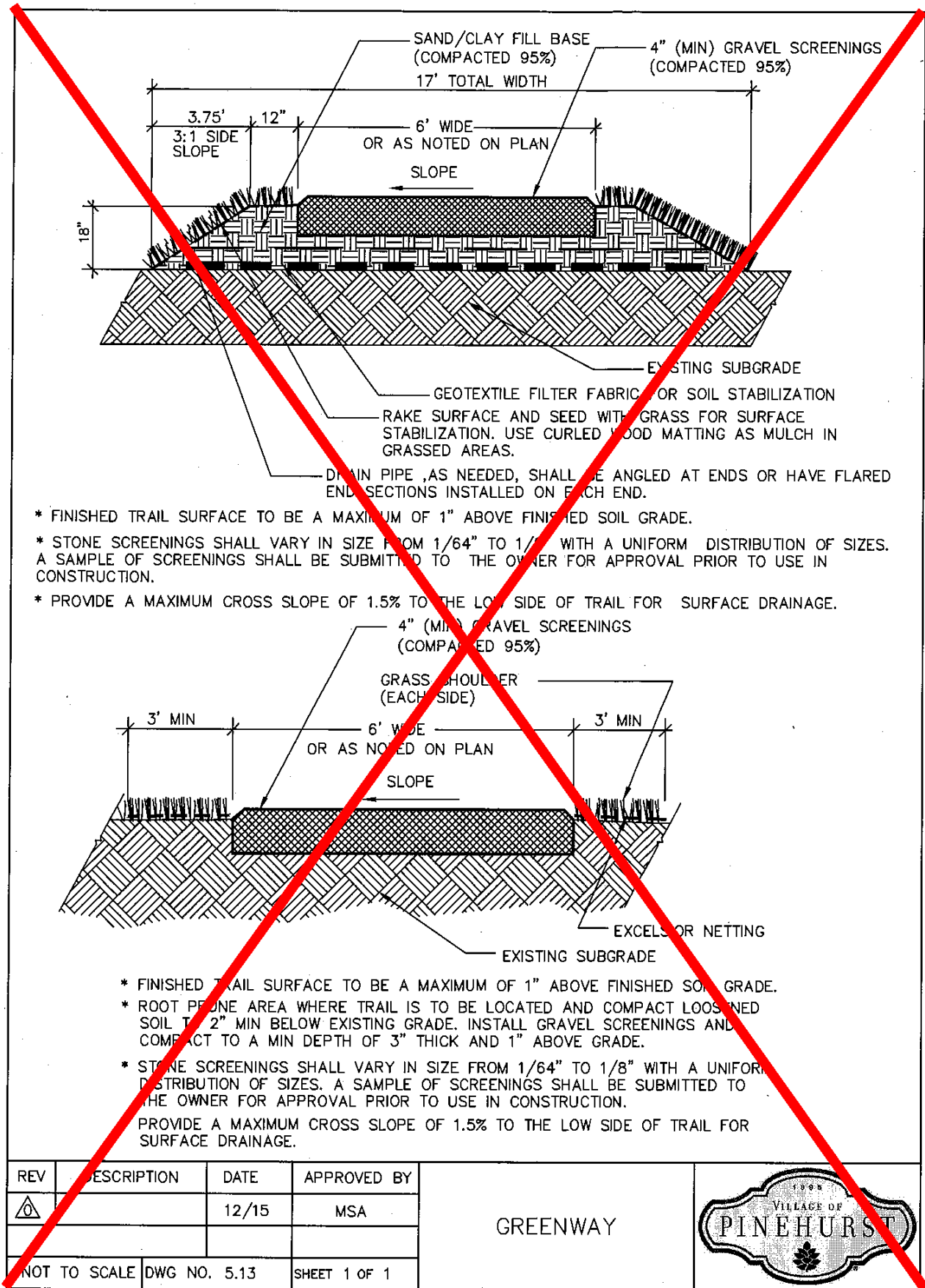
1. FOR BRICK OR CONCRETE SIDEWALKS, HD RAMP AT INTERSECTIONS AND DRIVE CROSSINGS SHALL BE CONSTRUCTED OF 4000PSI CONCRETE.
2. FOR BRICK SIDEWALKS, THE INITIAL 5' TO 10' FROM EDGE OF INTERSECTION OR DRIVE CROSSING SHALL BE CONCRETE FOR THE HD RAMP BEFORE TRANSITIONING TO THE BRICK SIDEWALK. EXACT LENGTH OF RAMP SHALL BE FIELD VERIFIED BY VILLAGE OF PINEHURST (VOP) STAFF AND WILL VARY BASED ON SITE CONDITIONS AND TOPOGRAPHY.
3. EACH HD RAMP MUST HAVE RAISED DOME TRUNCATED DETECTABLE WARNING PANELS MADE OF A HOMOGENOUS FIBERGLASS AND CARBON REINFORCED COMPOSITE CAST-IN PLACE (WET-SET) PANEL(S) IN GREYSTONE COLOR MEETING ADA REGULATIONS FOR DETECTABLE WARNINGS FOR CURB RAMP (SUCH AS ADA SOLUTIONS CAST-IN PLACE TACTILE PANELS OR EQUIVALENT). SHOP SAMPLE OF DOME PANEL MUST BE PROVIDED AND APPROVED BEFORE INSTALLATION.



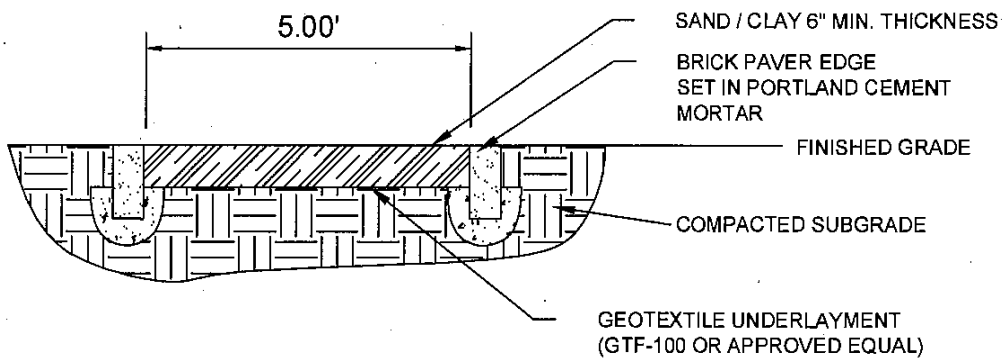
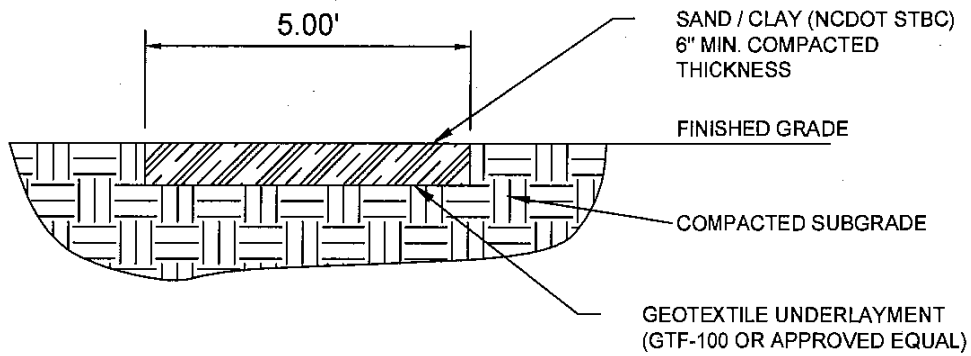
REV	DESCRIPTION	DATE	APPROVED BY
△		8/21	
NOT TO SCALE		DWG NO. 5.12B	SHEET 1 OF 1

**HANDICAP RAMP
DETAIL
NO CURB**

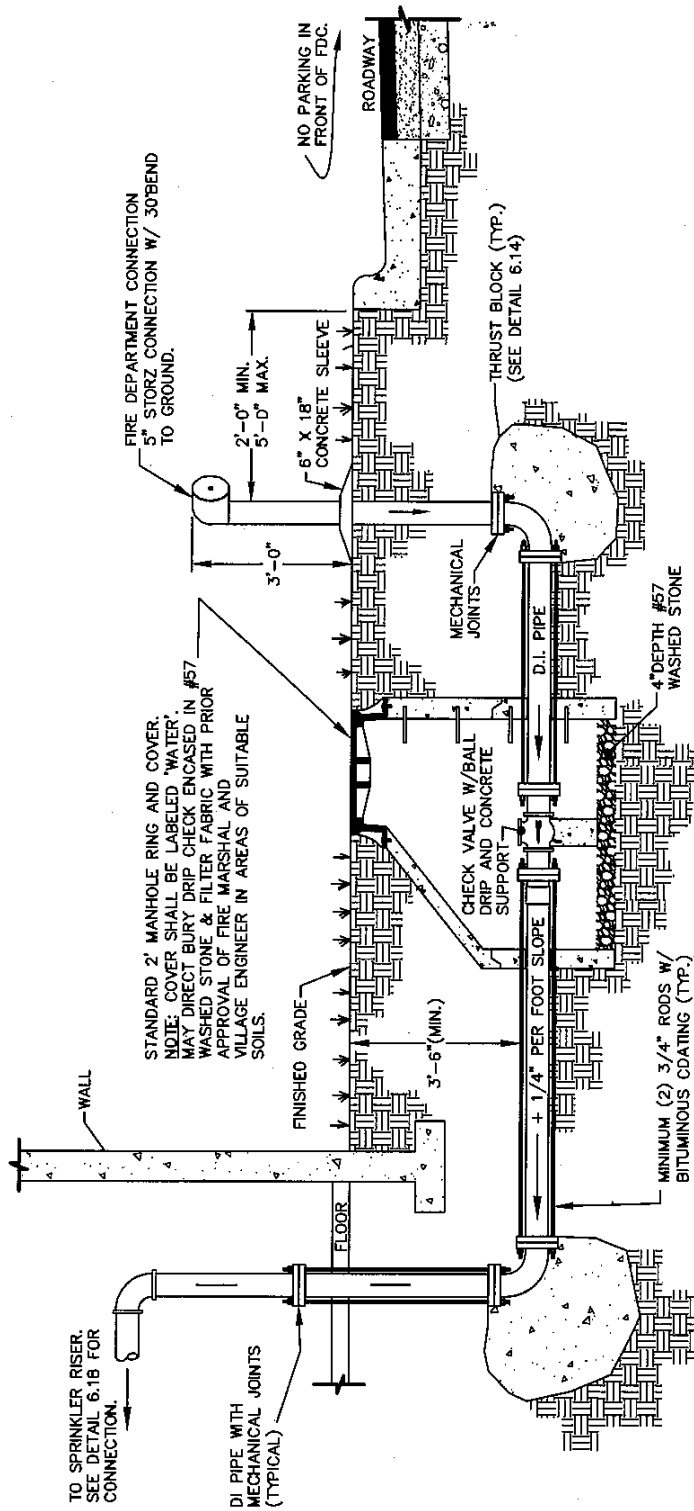




REV	DESCRIPTION	DATE	APPROVED BY	GREENWAY	
		12/15	MSA		
NOT TO SCALE		DWG NO. 5.13	SHEET 1 OF 1		



REV	DESCRIPTION	DATE	APPROVED BY	OLD TOWN SAND-CLAY SIDEWALKS	
△		12/15	MSA		
NOT TO SCALE		DWG NO. 5.14	SHEET 1 OF 1		



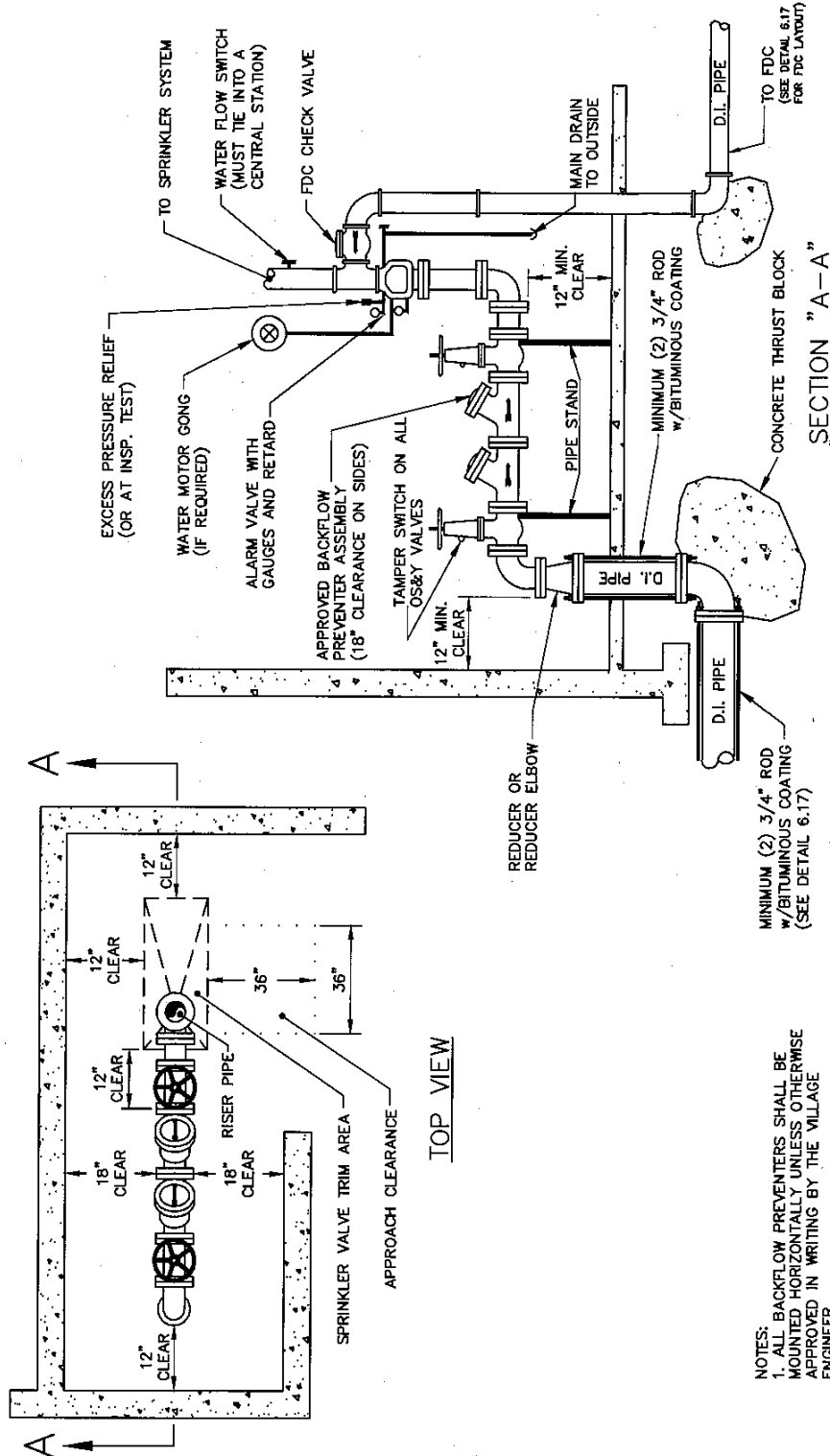
NOTES:

- 1) ALL FDC'S SHALL BE WITHIN 50 FEET OF A FIRE HYDRANT.
- 2) ALL FDC'S SHALL BE LOCATED OUTSIDE 'COLLAPSE ZONE' AS REQUIRED BY FIRE MARSHAL.
- 3) ON SHOULDER SECTIONS, FDC SHALL BE 5'(MIN) FROM TOP OF BACKSLOPE.

REV	DESCRIPTION	DATE	APPROVED BY
△		12/15	MSA/FF
DWG NO. 6.17		SHEET 1 OF 1	

FIRE DEPARTMENT
CONNECTION
(FDC) LAYOUT
DETAIL





REV	DESCRIPTION	DATE	APPROVED BY
△		12/15	MSA/FF
	DWG NO. 6.18	SHEET 1 OF 1	

STANDARD SPRINKLER RISER





**Planning and Zoning Board Statement of Consistency
with the 2019 Comprehensive Plan
September 3, 2026 Regular Meeting**

**Recommendation to Village Council on Updates to the
Engineering Standards and Specifications Manual (ESSM)**

The Village of Pinehurst Planning and Zoning Board finds that:

The proposed updates to the ESSM **IS** consistent with the following Comprehensive Plan goals, strategies, and recommendations:

- **Guiding Principle 6 – Supporting Infrastructure & Utilities:** The Comprehensive Plan calls for the Village to ensure that supporting infrastructure and community facilities meet the needs of existing and future residents, businesses, and visitors, and to partner with other providers to plan for and expand infrastructure as necessary. The updated ESSM establishes current technical standards for streets, rights-of-way, stormwater, water distribution, wastewater collection, and other development infrastructure that support this objective.
- **Strategic Opportunity 4 – Promote High Quality Development and Design:** The Comprehensive Plan identifies the need to promote high-quality development and design through updated development standards. The proposed ESSM supports this objective by modernizing and clarifying the technical standards that govern the design and construction of development-related infrastructure.
- **Strategic Opportunity 9 – Expand and Enhance Stormwater Management Efforts:** The Comprehensive Plan identifies stormwater management as a strategic opportunity and includes Implementation Strategies 6.8, 6.9, and 6.10 addressing stormwater management strategies, future stormwater infrastructure, and post-construction stormwater maintenance requirements. The proposed ESSM supports these recommendations through updated stormwater conveyance and management standards, including pre- and post-development runoff requirements and Stormwater Operation and Maintenance Manual and Agreement requirements.
- **Supporting Infrastructure & Utilities – Implementation Strategies 6.11 and 6.12:** The Comprehensive Plan calls for adequate water and sewer infrastructure capacity and timely transportation system improvements to meet the needs of the community and anticipated development. The updated ESSM supports these strategies through revised standards for water distribution, wastewater collection, streets, rights-of-way, and traffic impact studies.
- **Moving Around the Village: Transportation, Mobility & Parking:** The Comprehensive Plan identifies streets, sidewalks, paths, and trails as important components of the Village’s transportation system. The proposed ESSM updates standards for streets, public rights-of-way, sidewalks, greenways, and related infrastructure, supporting the Plan’s objectives for a safe, connected, and functional transportation network.



HISTORY, CHARM, AND SOUTHERN HOSPITALITY_____

Therefore, the Village of Pinehurst Planning and Zoning Board recommends **APPROVAL** of the updates to the ESSM.

This is the 3rd day of September, 2026

Chair of the Planning and Zoning Board

Cc: Alex Cameron

DRAFT