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July 24, 2024

Franklin
Planning Board
355 Central Street
Franklin, MA 02038

Ref: Autumn Hill Senior Village
Peer Review Response

Dear Members of the Board:

I am writing to respond to comments from the BETA dated May 13, 2024. Please find enclosed the following;

- Two full-size and five 11x17 copies of a revised site plan;
- One copy of a revised Stormwater Report;
- Seven copies of a project narrative; and
- EPA performance curves for stormwater BMPs.

We offer the following responses to the BETA's comments for the Board's consideration:

GENERAL:

G1. Comment: A P.L.S. stamp is needed on the existing conditions plan.

Response: The existing conditions plan is stamped in the latest revision.

SENIOR VILLAGE:

Senior Village Application Requirements (185-48.E)

SV1. *Comment: In accordance with Par 1 The applicant is **strongly** encouraged to request pre-application review. The applicant failed to take advantage of this recommendation.*

Response: No response needed.

SV2. *Comment: In accordance with par (ii)a. A vertical aerial photograph enlarged to a scale not less detailed than 1 inch equals 400 feet, with site boundaries clearly marked; An aerial*



image has been provided on sheet C-0 but is at a scale of 1"=500'. The scale of the image should be corrected to conform to the requirements of the bylaw.

Response: The scale has been modified to 1"=400'.

SV3. *Comment: In accordance with par (ii)d. Vegetative cover conditions on the property according to general cover type including cultivated land, meadow, pasture, woodland, and wetland; trees with a diameter at breast height (DBH) in excess of 15 inches, the actual canopy line of existing trees and woodlands. This information is required and has not been provided.*

Response: A more detailed aerial view of the site and surrounding areas has been added to sheet C-1. Aside from the two existing house areas, the site is wooded with a mixture of deciduous and evergreen trees and deciduous undergrowth. The areas around each of the two existing homes consist of a mixture of lawn and landscape planting beds. The existing treeline has been added to sheet C-2. Given the size of the site, the Applicant requests a waiver from the requirement to locate 15" trees. This waiver request has been added to the cover sheet and is included in the enclosed narrative.

SV4. *Comment: In accordance with par (ii)g. A viewshed analysis showing the location and extent of views into the property from public roads and from public lands; This information is required and has not been provided.*

Response: A viewshed analysis has been included in the attached project narrative along with photos of existing views from Summer Street. The view from the adjacent Town land is wooded and will remain unchanged as the entire rear portion of the site will remain wooded. There are no views of note along the property frontage. In fact, views from Summer Street will not be significantly impacted due to the fact that the newly proposed units are at least 330 feet from Summer Street and will be at a lower elevation, and behind the existing homes.

SV5. *Comment: In accordance with par (ii) h. Geologic formations on the property, including rock outcroppings, cliffs, and sinkholes; This information is required and has not been provided.*

Response: There are no geological formations of note on the property. There are no significant rock outcrops, and while the rear portion of the site has a considerable slope, there are no cliffs or sinkholes. It is noted that there is a steep rocky slope in the vicinity of the northwesterly edge (rear) of the site. No work is proposed in this area, and the steep rocky slope is off-site on Town land. Note #2 has been added to sheet C-2.



SV6. *Comment: In accordance with par (ii) j. Locations of all historically significant sites or structures on the property, including but not limited to cellar holes, stone walls, earthworks, and graves; This information is required and has not been provided.*

Response: We are not aware of any historically significant sites or structures on the property. Note #3 has been added to sheet C-2.

SV7. *Comment: In accordance with par (iii) Primary and secondary open space lands and potentially developable lands shall be identified and delineated. This information has not been provided.*

Response: Sheet C-1 has been updated to delineate the primary and secondary open space land along with the potentially developable area. Sheet C-3 has been updated to delineate the primary and secondary open space land. Primary open space includes the wetland and riverfront areas at the rear of the site. Secondary open space includes the sloped rear portions of the site and areas where views of the adjacent Town land can be maintained. As stipulated in the bylaw, the areas in the central portion of the site have been selected for development given the modest topography and the most appropriate location for developed areas.

SV8. *Comment: In accordance with par (2) Application, a brief written description of the proposed project detailing the items listed in the bylaws is required and has not been submitted.*

Response: A project narrative is attached containing this information. The Applicant's Counsel is also preparing a separate submission addressing the Town Planner's comments that will provide additional information.

Senior Village Standards (185-48.F)

SV9. *Comment: In accordance with par. 1b. a minimum of 40% of the required open space shall be suitable for use for passive and/or (active) recreational purposes. This area should be delineated on the plans.*

Response: The entire open space area is suitable for either passive or active recreational purposes. Proposed trails have been added around the proposed development area to provide for active recreation. The rear of the site contains an existing trail that connects to adjacent Town land, which also provides for active recreation. Two pocket parks have been added to the site design. The sloped areas in the central eastern portions of the open space provide an excellent opportunity for passive uses such as bird watching and scenic viewing. The two pocket parks are specifically intended to provide scenic overlook viewing areas to take advantage of the site's topography and views to the east towards the Town land. The open space area delineations are included on sheet C-3 (shaded area), calculations for which can be found under the "Senior Village notes" on the same sheet.



SV10. Comment: In accordance with par 1c. The percentage of open space that is wetland resource areas as defined and regulated pursuant to the Massachusetts Wetlands Protection Act (MGL c. shall not normally exceed the percentage of the tract that is wetlands; This data should be calculated and shown on the site plans. The calculation as shown on sheet for open space does not conform to this definition.

Response: The notes on sheet C-3 have been revised for clarity and updated per the revised design. The total proposed open space is 5.29 acres (42.7%). However, that includes the existing 1.06 acres of wetland resource areas (mostly Riverfront Area). The existing percentage of resource area on the site is 8.6%. When the same percentage of open space is allowed, the “credited” open space area is 4.67 acres (37.8%).

SV11. Comment: In accordance with 1f. the plan should take into account any Town of Franklin or other public lands for preservation or improvements. There are no paths walkways or other appropriate physical connections to the adjacent open space at the rear of the parcel identified on the site plans. BETA recommends that potential linkage and access to the adjacent public lands be developed and shown in compliance with the bylaw.

Response: The proposed design leaves the rear portion of the site, which abuts the Town Forest, in a natural and undisturbed state. There is an existing trail through area, which has been added to the plan, and which will be available for public use to integrate the open space with the adjacent Town Forest. Proposed walking paths have been added through areas of the site that are of a reasonable slope. Given the topography at the rear of the site, it is not realistic to create trails that would interconnect to the existing rear trail, as this is a Senior Village development and the slopes are too steep for some seniors to traverse without significant alteration to the open space and natural landscape.

SV12. Comment: In accordance with par 2 at the owner’s option, all areas to be protected shall be conveyed to a separate entity subject to the approval of the Board. The plans should delineate the boundaries of the proposed open space area including any and all associated monumentation. In addition, the owners are required at the time of application to provide a management plan for the open space which has not been provided.

Response: For much of the site, the proposed walls act as the open space boundaries. Where walls aren’t located at the open space boundary, monumentation has been added to the plans. A management plan for the open space will be included in draft documents to be provided by the Applicant’s Counsel. The open space is proposed to be owned and maintained by the condominium association that will own the site.





SV13. *Comment: In accordance with 3.A.v. Each home site shall be a minimum of 6,000 square feet in area. In addition, construction shall comply with the Town of Franklin Subdivision Rules and Regulations. The proposed buildings are all multifamily townhouses. Thus, as a minimum, BETA recommends that the design provide a right of way layout in accordance with the subdivision standards and identify overall lot layout areas to confirm that the development areas surrounding each townhouse meets this minimum.*

Response: We do not believe that this provision applies to this site as this proposed development is not a “senior village residential subdivision” as defined in the Bylaw. See below for further discussion of subdivision related comments.

SV14. *Comment: In accordance with 3. (b), (iv) Low Impact development practices shall be utilized to the greatest extent possible. Based on the existing steep grades on the parcel, these practices would be limited to the area of the 2 existing dwellings. There are no LID measures proposed for the control of stormwater runoff on site.*

Response: As noted, the steep slopes on the site make it difficult to implement LID practices. We have added underground infiltration fields for Unit 15 (existing house #488) as well as expanded Infiltration Basin #1 to capture and treat more of the existing runoff from Unit 1 (existing house #496). Other LID measures have been incorporated into the design. The site has been developed on a small footprint relative to the number of units in an effort to minimize disturbance of wooded areas and to minimize impervious coverage, which is an LID design approach. Circulating driveways are proposed at modest widths to again minimize impervious coverage, which is an LID design approach. The small footprint of the development also allows for a substantial vegetated buffer between the developed portion of the site and the wetlands, which is an LID design approach.

SV15. *Comment: In accordance with par (c) Parking standards. § (i) a maximum of 2 spaces per unit shall be permitted. The 2nd space on each unit is in the driveway in front of the garage. There are no guest spaces provided. BETA will defer the requirement for guest spaces to the Board as noted in this section of the bylaw.*

Response: Per discussions with the Board, an additional 8 guest parking spaces have been added, which is one guest space per 5 units.

SV16. *Comment: Par. (c) § (i) also notes “All off-street parking shall be sited to the side or rear of buildings and shall minimize visibility from public and private streets.” Providing the second space between the garage and the street violates this requirement.*

Response: The site fronts on Summer Street and there are existing residential structures between the proposed development area and Summer Street. It is our view that the intent of the regulation is to minimize the view of parking areas from the adjacent public way. The proposed design achieves this objective as all new parking spaces are more than 390 feet from Summer Street and will not be visible from the public way. Interior circulating driveways provide vehicular access to the proposed



garage and parking spaces in a manner that is typical and appropriate for townhouse multifamily developments. Attached to this letter are photographs from other Senior Villages in Franklin that have similar driveway configurations and overall site design characteristics (Hidden Acres, Meadowbrook Heights, Palladini Village, and Villages at Oak Hill).

SV17. Comment: A Landscape Design should be submitted to document compliance with par (d) Landscaping, Shade trees and infrastructure.

Response: The applicant will engage a landscape architect to prepare a landscape plan for the Board’s review when the site layout is finalized.

SV18. Comment: In accordance with sub paragraph (vii) Solid waste storage, air conditioners, loading areas and the like shall be shielded from view by walls, dense vegetation, or fences. Each of these items should be identified on the plans including the method to be utilized to shield them from view. It should also be noted that the 12 units in the center of the proposed development will be in an island formed by the access roadway. Thus, the units and any outside utilities will be visible at some point as you drive through the development and landscaping and screening will become that much more important.

Response: There are no loading areas on the site. Trash collection will be by individual unit owners as is typical in a single-family home setting, and disposal will be by private curbside collection organized by the condominium association. A detail for typical air conditioner condenser screening (vegetation) has been added to sheet C-15.

SUBDIVISION OF LAND (CHAPTER 300):

According to 185-48.F.(3).(a).(v), “senior village residential subdivisions” (as defined in the Bylaw) must comply with the Franklin Subdivision Rules and Regulations. This development, while a “senior village planned unit development”, is not a “senior village residential subdivision,” and therefore is not required to meet the subdivision regulations. Senior Villages may be in the form of a “subdivision” (i.e. individual lots) or in the form of a townhouse development. This application proposed a townhouse condominium development.

Section 153-16.A of the Stormwater Management Regulations however does apply to this development, which requires adherence to the Stormwater management section of the Subdivision Regulations (Section 300-11). Below are our responses to the comments from this section of the regulations:

SC1-9 & SC13. **Response:** The term “subdivision” has a specific legal meaning and describes a development with individual lots and a separate roadway right of way (MGL Chapter 41, Section 81M). The proposed development is not a subdivision. It is a multifamily townhouse-style development on a single property that will be owned and controlled by a condominium





association. It is therefore our view that comments SC1-9 and SC13 are not applicable to this development.

SC10. Comment: In accordance with §300-11. A. (7) Setbacks. a) the minimum setback distance for a stormwater basin embankment to the property line is 10'. The embankment that forms Infiltration Basin #1 is adjacent to the property line with no setback. Either request the waiver or show the setback and bring the basin into conformance with the standard.

Response: The basin has been reconfigured to meet this requirement. Setback labels have been added to sheet C-3.

SC11. Comment: In accordance with §300-11. A. (7) Setbacks. a) the minimum setback distance for a stormwater pond to the property line is 20'. Infiltration Basin #1 measures only 13'+. Either request the waiver or bring the basin into conformance with the standard.

Response: The basin has been reconfigured to meet this requirement. Setback labels have been added to sheet C-3.

SITE PLAN AND DESIGN REVIEW:

S1. Comment: A Landscaping Plan is required. (§185-31.C.3(k)).

Response: The applicant will engage a landscape architect to prepare a landscape plan for the Board's review when the site layout is finalized.

S2. Comment: Indicate means of waste disposal and proposed dumpster locations, if applicable (§185-31.C.3(i)).

Response: The condominium association will arrange for private curbside collection. Trash will be accumulated by each individual unit owner within their unit and placed on the curb at the time of collection. A note has been added to sheet C-3.

S3. Comment: In accordance with §185-31.C.3. (s) Description of traffic circulation, safety and capacity in sufficient enough detail for the Board to make a determination of whether a traffic impact analysis is necessary. If information is not sufficient, upon the request of the Planning Board, an applicant may be required to provide a comprehensive traffic study detailing the effects of the proposed development. This information is required and has not been provided to the Board to allow them the ability to make this determination.

Response: A traffic discussion is included as part of the enclosed project narrative.





STORMWATER:

SW1. Comment: The design of Infiltration Basins 2 & 3 utilizes a large block retaining wall to create the embankment which forms the basin both on the upgradient and in the case of basin 2 on the downgradient side. Based upon their height, the only means available to maintain these basins is to physically drive into the basins and maintain them from the inside out. Volume 2, Chapter 2 of the handbook is clear in that maintenance of these basins would occur from the crest of the dike which forms the basin. BETA does not agree with the design that it meets the design requirement of the standards for an infiltration basin as shown in Volume 2, Chapter 2.

Response: In our experience, walls are a common feature in stormwater infiltration basins in order to maximize the open bottom area for a widely distributed infiltration surface. As a practical matter, stormwater infiltration basins require minimal maintenance. Normal maintenance tasks include mowing and removal of debris and accumulated organic matter. That work traditionally occurs from the basin bottom and would not be completed from the basin berm. Any necessary sediment removal would also occur from the basin bottom, not from the adjacent berm. An access ramp has been provided for each basin per the Handbook. Note, however, that we have reconfigured Infiltration Basin #2 with slopes instead of wall on the interior of the basin.

SW2. Comment: There is runoff from over 100,000 square feet of impervious surfaces being collected by 10 catch basins. In accordance with Volume 2, Chapter 2, page 4 of the handbook, the impervious surface area tributary to a deep sump catch basin cannot exceed 0.25 acres. BETA recommends that the designer review the tributary areas of impervious surfaces to each basin and document that this design requirement has been met.

Response: Additional catch basins have been added at stations 7+64, 8+78 and 11+84, and other catch basins have been relocated as needed to keep associated watershed impervious surface areas below 0.25 acres.

SW3. Comment: The soil descriptions in the test pits for each basin indicate that the soils are all Class 1 soils with rapid infiltration rates as defined by the handbook. In accordance with Volume 1, Chapter 1 page 9 of the handbook, the Water quality volume in accordance with the standards is 1". Thus, the statement on page 12 of the stormwater report that the water quality volume is 0.5" as defined by the Massachusetts Stormwater standards is incorrect and should be corrected.

Response: The site is comprised predominately of loamy sand soils, which, in our experience, are not considered to be soils with rapid infiltration rates. Regardless, the Water Quality Volume has been designed for 1-inch of runoff as required by the Town of Franklin regulations. The Stormwater Report Narrative has been re-worded for clarification.





SW4. Comment: Except for a few test pits where bedrock was shallow, all the soil descriptions indicate that the soils on site are primarily Class 1 soils. Without the presence of exposed ledge, it is BETA's opinion that the soils on site should be considered HSG B. The HSG C and D soil classification is not supported by the test pit data and should be modified accordingly. Those areas of exposed ledge should be shown and separated out as a CN value of 98.

Response: There are no known areas of exposed ledge. The soils across the site have been reclassified as Class B in the revised stormwater report as requested.

SW5. Comment: In accordance with Volume 2, Chapter 2 of the standards, the infiltration basins need emergency dewatering capability and monitoring wells. Each of these should be designed into the proposed basins.

Response: Monitoring wells have been added to the plans and note #4 has been added to the basin detail on sheet C-14 regarding monitoring wells. The outlet pipes for each basin have been relocated to the bottom of each basin with a removable cap for drawdown.

SW6. Comment: The plans need to show how the runoff from the roof areas at the rear of units 17-27 is collected and directed to an infiltration and/or treatment train.

Response: This runoff is not collected. The Stormwater Handbook allows for some impervious runoff to be left untreated so long as it meets the requirements to be considered de minimis. The stormwater report demonstrates compliance with the de minimis provision.

SW7. Comment: The plans need to document the location of the exposed ledge on site relative to the discharge locations from infiltration basins 2 & 3. If these discharge points cascade over the exposed ledge they could potentially cause erosion along the toe of the face, it must be addressed.

Response: There are no substantive areas of exposed ledge on the site and there are no known areas of exposed ledge downslope of infiltration basins 2 & 3.

SW8. Comment: The TSS Removal calculations assume a Removal rate of 80% for the "First Defender" proprietary separator. BETA and the Franklin DPW have consistently considered these units regardless of manufacturer as providing a maximum of 44% TSS Removal. It should be noted that this is consistent with the draft revised standards. In addition, these units have been accepted as providing the pretreatment required for the infiltration basins. Thus, the TSS Removal calculations should be revised accordingly.

Response: Published test data for First Defense Units indicate TSS removal rates that are significantly higher than 44% removal. However, as a conservative measure, the TSS removal by these units has been reduced to 44% for all calculations.





SW9. *Comment: The pretreatment for the infiltration basins cannot be included in the total TSS Removal Rate. The calculations should be revised accordingly.*

Response: According to the Stormwater Handbook, infiltration facilities provide 80% TSS removal when combined with “a” pretreatment device. Additional pretreatment devices therefore provide additional treatment. It is our experience that the Handbook provides for consideration of various BMPs in a treatment train when calculating TSS removal rates (with one pretreatment device being excluded for BMPs like infiltration basins).

We also note that the EPA performance curves for infiltration basins (attached) indicate that the TSS removal rate for infiltration basins is much higher than is indicated in the current DEP Stormwater handbook. For all proposed infiltration BMPs (including the pretreatment devices), the TSS removal rate is 100% according to the enclosed EPA performance curves, which are the basis for TSS removal calculations in the draft Stormwater Handbook referenced in comment SW8. Including any additional pretreatment to these basins is therefore unnecessary in our view. However, since concern has been expressed by the peer reviewer, additional pretreatment BMPs have been added across the site and TSS removal rates are calculated according to the current Stormwater Handbook.

SW10. *Comment: The discharge pipe from the DMH at STA 6+54 into Infiltration Basin #2 does not flow through the first defender proprietary separator. Thus, this treatment train does not meet 44% TSS Removal rate required for pretreatment into the basin.*

Response: The design has been revised such that incoming flows pass through both a sediment forebay and a deep sump catch basin.

SW11. *Comment: See Comment SW2 above regarding the impervious surface area tributary to the deep sump catch basins.*

Response: See response to SW2 above.

SW12. *Comment: The “deminimus” calculations does not appear to account for all the untreated runoff from existing impervious surfaces which discharge towards Summer Street. BETA recommends that the designer review these calculations to ensure that all these areas are accounted for. It is also important to note that only the runoff which discharges towards Summer Street can be considered in the calculation.*

Response: As a partial redevelopment, the existing impervious areas are required to meet these requirements only to the maximum extent practicable. We have revised the calculations to include existing impervious coverage and we have added provisions in the design to capture runoff from as much of these existing impervious surfaces as is practicable and additional stormwater BMPs have been added around the existing houses.





- SW13. *Comment: Provide sequence of construction (§153-12.M).*
Response: Please refer to the Sediment & Erosion Control Notes on sheet C-1 for the construction sequence.
- SW14. *Comment: The applicant is reminded that a Stormwater permit from the Franklin DPW is required based upon the size of the disturbance.*
Response: The applicant will do so prior to construction.
- SW15. *Comment: BETA recommends that the stockpile area upgradient of Basin #2 be moved so it cannot impact the basins.*
Response: The stockpile area has been relocated.
- SW16. *Comment: Additional erosion control measures should be provided adjacent to the proposed retaining walls around the basins.*
Response: Additional erosion control measures have been added on top of the retaining walls.
- SW17. *Comment: Provide means of protecting proposed stormwater BMPs from construction-period sediment.*
Response: The proposed methods and controls for protecting stormwater BMPs can be found in the SWPPP sections 4.8 Soil Compaction and 4.9 Storm Drain Inlets, the Sediment & Erosion Control Notes sections "Soil Compaction" and "protection of Storm Drain inlets" on sheet C-1, and the Erosion Control Notes #3, 4, & 5 on Sheet C-1.
- SW18. *Comment: Provide means of maintaining existing flow patterns following the removal of the existing closed drainage system but prior to installation of the proposed system.*
Response: There is no existing closed drainage system on the site. Temporary sedimentary basins will be installed early in the first phase of construction as needed.
- SW20. *Comment: Provide owner signature (§153-18.B(5)).*
Response: The owner's signature has been added to the O&M in the enclosed revised stormwater report.
- SW21. *Comment: Include provision requiring a documentation submittal to the DPW confirming when maintenance has been satisfactory completed (§153-18.B(6)).*
Response: The maintenance reporting requirements can be found on page A-6 of the O&M. The text has been changed to require submittal to the DPW instead of the Town.
- SW22. *Comment: Indicate how future property owners will be notified of the presence of the stormwater management system and the need for maintenance.*
Response: The recorded condo association documents will have the O&M attached.
- SW23. *Comment: Provide estimated operations and maintenance budget.*
Response: The estimated O&M costs can be found on page A-10 of the O&M.
- SW24. *Comment: Provide owner's signature.*
Response: The owner's signature has been added to the Illicit Discharge Statement.



In addition, based on discussions with the Town, the following changes were made:

- ✓ Additional information has been added to the key sheet plan to give more context to the site.
- ✓ In response to comments provided by the Board, and in order to accommodate additional desired design features such as a secondary emergency access and community amenities (pocket parks, visitor parking, etc...), four units have been removed. The revised total number of units is 40.
- ✓ Visitor parking spaces have been added.
- ✓ The location of the proposed affordable units has been designated on the plan.

Do not hesitate to contact me should you have any questions or comments.

Yours Truly,

LEGACY ENGINEERING LLC

Daniel J. Merrikin, P.E.
President

cc: File



Hidden Acres Senior Village Parking & Driveway Configuration



Meadowbrook Heights Senior Village Parking & Driveway Configuration



Palladini Village Senior Village Parking & Driveway Configuration



Villages at Oak Hill Senior Village Parking & Driveway Configuration





ATTACHMENT

EPA STORMWATER BMP PERFORMANCE DATA



BMP Performance Curve: Infiltration Basin

BMP Performance Table

BMP Name: Infiltration Basin

Soil Infiltration Rate: 1.02 in/hr

Land Use	Pollutant	Depth of Runoff Treated (inches)							
		0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Commercial	TSS	67%	84%	96%	99%	100%	100%	100%	100%
	TP	40%	60%	81%	90%	94%	97%	99%	100%
	Zn	78%	92%	99%	100%	100%	100%	100%	100%
Industrial	TSS	68%	85%	96%	99%	100%	100%	100%	100%
	TP	41%	60%	81%	90%	94%	97%	99%	100%
	Zn	64%	83%	97%	99%	100%	100%	100%	100%
High Density Residential	TSS	68%	85%	97%	99%	100%	100%	100%	100%
	TP	41%	60%	81%	90%	94%	97%	99%	100%
	Zn	69%	86%	98%	99%	100%	100%	100%	100%
Medium Density Residential	TSS	74%	89%	98%	99%	100%	100%	100%	100%
	TP	41%	60%	81%	89%	94%	96%	99%	100%
	Zn	41%	62%	83%	92%	97%	99%	100%	100%
Low Density Residential	TSS	71%	86%	96%	99%	100%	100%	100%	100%
	TP	42%	61%	81%	89%	93%	96%	98%	99%
	Zn	36%	56%	79%	89%	94%	97%	100%	100%
Runoff Volume Reduction		24%	42%	66%	79%	87%	91%	96%	98%

Annual Pollutant Loading Rates

Land use	Pollutant load (lbs/acre-year)		
	TSS	TP	Zn
Commercial	1117.77	1.66	2.33
Industrial	745.22	1.43	0.45
High Density Residential	465.08	1.10	0.79
Medium Density Residential	274.63	0.55	0.11
Low Density Residential	72.11	0.042	0.043

BMP Performance Curve: Infiltration Basin

BMP Performance Table

BMP Name: Infiltration Basin

Soil Infiltration Rate: 2.41 in/hr

Land Use	Pollutant	Depth of Runoff Treated (inches)							
		0.1	0.2	0.4	0.6	0.8	1	1.5	2
Commercial	TSS	70%	88%	98%	100%	100%	100%	100%	100%
	TP	45%	67%	87%	94%	97%	98%	100%	100%
	Zn	82%	95%	100%	100%	100%	100%	100%	100%
Industrial	TSS	70%	88%	98%	100%	100%	100%	100%	100%
	TP	46%	67%	87%	94%	97%	99%	100%	100%
	Zn	69%	88%	99%	100%	100%	100%	100%	100%
High Density Residential	TSS	71%	88%	98%	100%	100%	100%	100%	100%
	TP	46%	67%	87%	94%	97%	98%	100%	100%
	Zn	74%	91%	99%	100%	100%	100%	100%	100%
Medium Density Residential	TSS	76%	91%	99%	100%	100%	100%	100%	100%
	TP	46%	67%	87%	94%	97%	98%	100%	100%
	Zn	45%	68%	89%	96%	99%	100%	100%	100%
Low Density Residential	TSS	74%	89%	98%	99%	100%	100%	100%	100%
	TP	48%	68%	87%	94%	97%	98%	100%	100%
	Zn	38%	61%	84%	94%	98%	99%	100%	100%
Runoff Volume Reduction		33%	54%	78%	88%	93%	96%	99%	100%

Annual Pollutant Loading Rates

Land use	Pollutant load (lbs/acre-year)		
	TSS	TP	Zn
Commercial	1117.77	1.66	2.33
Industrial	745.22	1.43	0.45
High Density Residential	465.08	1.10	0.79
Medium Density Residential	274.63	0.55	0.11
Low Density Residential	72.11	0.042	0.043