H+H Engineering Associates, LLC
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Via E-mail

February 6, 2023

Town of Simsbury
Planning and Land Use Department
933 Hopmeadow Street
Simsbury, CT 06070

Attn: George K. McGregor, AICP
Director of Community Planning and Development

RE: Engineering Comments
Vessel Multi-family Housing
Site Plan Application
446 Hopmeadow Street
Simsbury, CT 06070

Dear Mr. McGregor:

H+H Engineering Associates, LLC (H+H) is in receipt of the Town of Simsbury Engineering Department review comments dated January 27, 2023 regarding the Vessel Multi-family Housing Site Plan Application located at 446 Hopmeadow Street in Simsbury, CT 06070.

Below please find the original review comment, followed by our response in bold:

1. Please provide the basis for providing 94 parking spaces to support the proposed 80-unit multi-family development.

   Peak parking demand rates published in the industry standard ITE Parking Generation manual (5th edition) were reviewed to confirm the parking supply provided on the site is adequate. For land use code 221 (multi-family housing, mid rise), the weekday peak parking demand average rate is 0.75 spaces/bedroom which would yield a requirement of 60 spaces for 80 units. The Saturday peak parking demand average rate is 0.77 spaces/bedroom which would yield a requirement of 62 spaces for 80 units.

   Additionally, in accordance with Public Act 21-29 adopted by the Connecticut legislature, the maximum parking limitations for multi-family developments are listed below:

   - **One-bedroom units: A minimum of 1 parking space shall be provided for each one-bedroom unit.**
   - **Two-bedroom units: A minimum of 2 parking spaces shall be provided for each two-bedroom unit.**

The supporting parking calculation is provided below:

- **One-bedroom units: 77 one-bedroom units x 1 space/unit = 77 spaces.**
- **Two-bedroom units: 3 two-bedroom units x 2 spaces/unit = 6 spaces.**
  Minimum required parking spaces = 77 + 6 = 83 parking spaces

A total of 93 parking spaces are provided (see H+H response to comment #2 below) which includes the 83 minimum required resident parking spaces, and 10 additional overflow/guest parking spaces.

Therefore, the proposed 93 spaces on site well exceeds the rates published by ITE and will provide ample parking supply for the 80-unit development.

2. Two (2) 8-foot wide van accessible spaces are provided, whereas for a total of 76-100 total parking spaces, 4 total (3 standard+ 1 van) accessible parking spaces should be provided. Provide two additional accessible parking spaces for this project to comply with this requirement.

   Two additional accessible parking spaces will be added as required. As a result, the revised total number of parking spaces will be reduced from 94 to 93 parking spaces.

3. An encroachment permit shall be filed with the State of Connecticut Department of Transpo1iation for any work within the CT Route 10 Right-of-Way. Please provide a copy of all future communications with DOT regarding the development.

   All future correspondence with the CT DOT regarding the encroachment permit will be provided to the Town of Simsbury Engineering Department.

4. The stormwater report identifies infiltration rates in monitoring wells MW-1 and MW-2 as 40 in/hr. and 4 in/hr., respectively. The analysis halves these rates to serve as exfiltration design rates, which is consistent with the Connecticut DEEP Stormwater Quality Manual (CTSWQM). However, Engineering respectfully disagrees with the use of an exfiltration rate (20 in/hr.) given that Table 8-3 of CTSWQM states the maximum soil infiltration capacity for an infiltration basin is 5.0 in/hr. In regard to the recommended number of tests and resultant design assumptions, the CTSWQM states;

   > A minimum of three field tests and test pits or soil borings should be performed at each infiltration basin. The design of the basin should be based on the slowest rate obtained from the field tests performed at the site.

   Please revise the analysis to comply with the recommendations of the CTSWQM by utilizing the slowest rate obtained from field tests on this site.

   Two additional field tests (test pits or borings) will be performed in the bioretention basin, and two additional field tests (test pits or borings) will be performed in the Stormtech subsurface stormwater management system. Additionally, permeability tests will be conducted in the additional test pit/boring locations to confirm the design infiltration rates. Results will be provided to the Town of Simsbury Engineering Department upon completion. Once additional testing has

been completed, H+H with work with the Town of Simsbury Engineering Department to determine the most appropriate design infiltration rate and Stormwater Best Management Practice(s).

5. CB-5 has 2-feet of cover whereas Section 5 .2.1.g of the Town of Simsbury Highway Construction and Design Standards states "A minimum cover of 2.5 feet shall be provided for all drain pipes unless special designs, as approved by the Town Engineer, are utilized." Please revise accordingly.

   As noted, the minimum cover over the drainage pipe exiting CB-5 is approximately 2-feet at the catch basin, which increases to 2.5-feet approximately 10-feet from the catch basin. Additionally, the pipe material has been identified as Class IV RCP, which is suitable for less than 24" of cover (see attached LRFD fill height table for RCP).

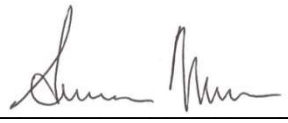
6. Provide a detail for the modular block retaining walls.

   A typical detail for the modular block retaining wall will be added to Sheet 11 of 12.

If you have any questions, please feel free to contact me at 860-980-8008 (office) or 413-579-4488 (mobile).

Sincerely,

H+H Engineering Associates, LLC



Seamus Moran, P.E.
Principal

2/6/2023
Date

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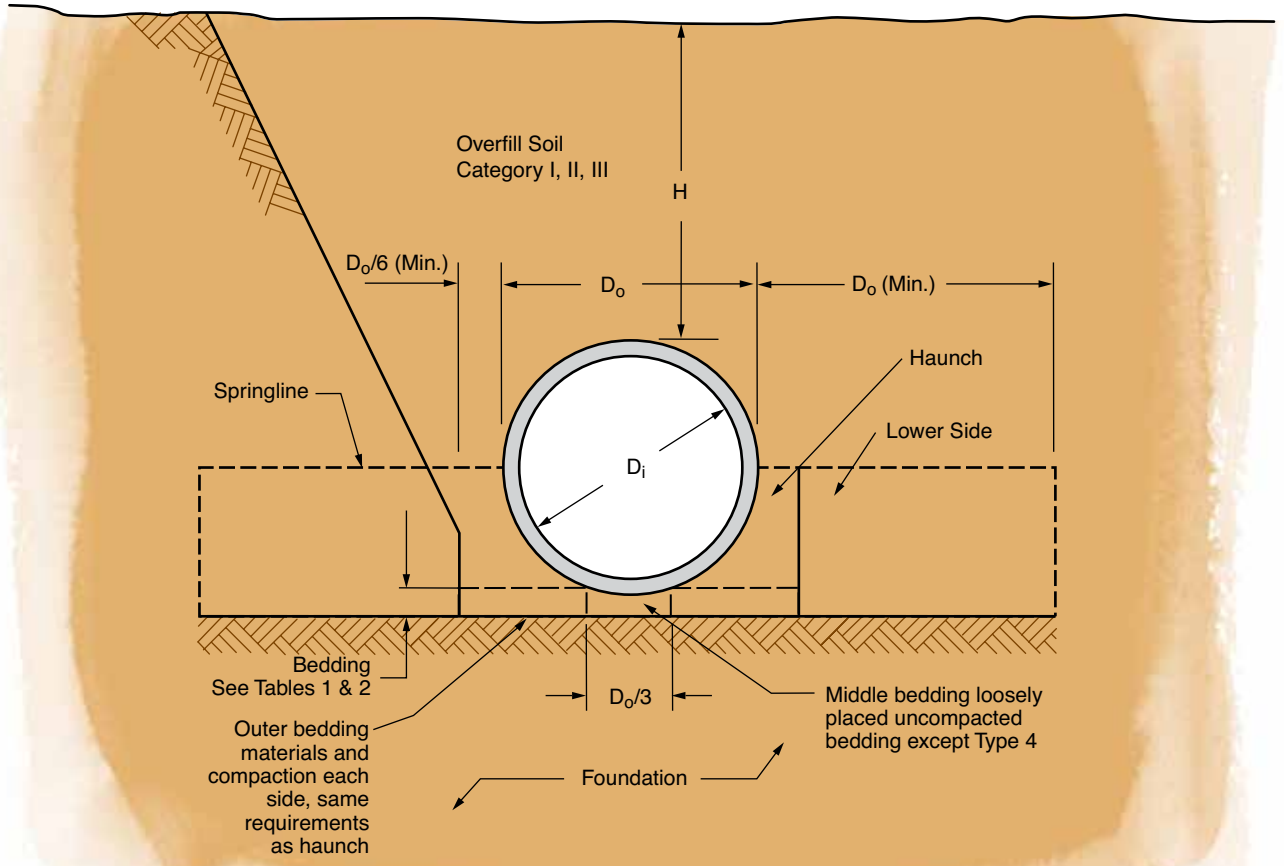
LRFD FILL HEIGHT TABLES

FOR CONCRETE PIPE

American
Concrete Pipe
Association

Standard Trench/Embankment Installation

Concrete pipe should be installed in accordance with the AASHTO LRFD Bridge Construction Specifications, Section 27 or ASTM C1479. Figure 1 shows the basic pipe and soil terminology.



There are four types of Standard Installations, each with its own soil and compaction requirements. Type 1 bedding provides the most support using highly compacted granular material, while Type 4 provides for less support allowing the use of silts and clay soils with little or no compaction. These four choices provide flexibility and versatility for the designer and contractor, as well as performance and economy for the owner that are not available with other types of pipe.

The soil and compaction requirements are provided in Table 1. Table 2 shows the equivalent soil designations per the Unified Soil Classification System (USCS) and AASHTO.

To facilitate your selection of the proper reinforced concrete pipe using the most beneficial Standard Installation for the conditions at the site, fill height tables are provided on the following pages. The required 0.01 inch crack D-Loads in units of lbs per linear foot per foot of diameter are provided numerically and the class of pipe per ASTM C76 (AASHTO M 170) meeting this requirement is designated by color of the cell.

Table 1: Standard Installation Soils and Minimum Compaction Requirements

Installation Type	Bedding Thickness	Haunch and Outer Bedding	Lower Side
Type 1	D_0/24 minimum, not less than 3" (75 mm) If rock foundation, use D_0/12 minimum, not less than 6" (150 mm)	95% Category I	90% Category I, 95% Category II, or 100% Category III
Type 2	D_0/24 minimum, not less than 3" (75 mm) If rock foundation, use D_0/12 minimum, not less than 6" (150 mm)	90% Category I or 95% Category II	85% Category I, 90% Category II, or 95% Category III
Type 3	D_0/24 minimum, not less than 3" (75 mm) If rock foundation, use D_0/12 minimum, not less than 6" (150 mm)	85% Category I, 90% Category II, or 95% Category III	85% Category I, 90% Category II, or 95% Category III
Type 4	No bedding required except if rock foundation, use D_0/12 minimum, not less than 6" (150 mm)	No compaction required, except if Category III, use 85%	No compaction required, except if Category III, use 85%

Reference: ASCE 15-98, "Standard Practice for Direct Design of Buried Precast Concrete Pipe Using Standard Installations (SIDD)", 1998.

Table 3: Reinforced Pipe Classes for 0.01 inch Crack Per ASTM C 76 (lbs/ft/ft)

Class I	≤ 800
Class II	≤ 1000
Class III	≤ 1350
Class IV	≤ 2000
Class V	≤ 3000
Special Design	> 3000

Table 2: Equivalent USCS and AASHTO Soil Classifications for Standard Installation Soil Designations

Representative Soil Types			Percent Compaction	
SIDD	USCS	AASHTO	Standard Proctor	Modified Proctor
Gravelly Sand (Category I)	SW, SP, GW, GP	A1, A3	100 95 90 85 80 61	95 90 85 80 75 59
Sandy Silt (Category II)	GM, SM, ML, Also GC, SC with less than 20% passing #200 sieve	A2, A4	100 95 90 85 80 49	95 90 85 80 75 46
Silty Clay (Category III)	CL, MH, GC, SC	A5, A6	100 95 90 85 80 45	90 85 80 75 70 40
Not Allowed for Haunch or Bedding	CH	A7	100 95 90 45	90 85 80 40

Reference: ASCE 15-98, "Standard Practice for Direct Design of Buried Precast Concrete Pipe Using Standard Installations (SIDD)", 1998.

NOTES:
1. Compaction and soil symbols – i.e. "95% Category I" refers to Category I soil material with a minimum Standard Proctor compaction of 95%. See Table 2 for equivalent Modified Proctor values.
2. Soil in the outer bedding, haunch, and lower side zones shall be compacted to at least the same compaction as the majority of soil in the overfill zone.

Fill Height Tables are based on:
1. γs = 120 pcf
2. AASHTO HL-93 live load
3. Positive Projecting Embankment Condition - this gives conservative results in comparison to trench conditions

D-Load (lb/ft/ft) for Type 3 Bedding

Class I
Class II
Class III
Class IV
Class V
Special Design

Pipe Size (in)	Fill Height in Feet													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
12	1518	1369	947	817	805	838	896	964	902	1000	1098	1196	1294	1392
15	1459	1318	916	794	783	815	872	939	880	975	1070	1165	1260	1355
18	1384	1285	897	781	772	804	860	926	870	963	1057	1150	1243	1337
21	1247	1263	886	775	767	799	855	921	867	959	1051	1144	1236	1329
24	1229	1248	879	772	765	798	854	920	868	960	1051	1143	1235	1327
27	1372	1251	881	778	770	804	860	925	872	963	1055	1147	1238	1330
30	1500	1260	887	786	777	812	868	933	878	970	1061	1153	1245	1337
33	1378	1218	871	780	775	813	871	936	886	978	1070	1162	1254	1345
36	1276	1189	857	776	774	815	875	941	895	987	1079	1172	1264	1356
42	1119	1113	829	765	770	815	875	942	903	995	1087	1179	1271	1363
48	1004	992	808	758	770	817	879	946	913	1005	1097	1189	1281	1373
54	963	958	791	753	771	822	884	953	926	1018	1109	1201	1293	1385
60	991	937	778	751	775	828	891	961	939	1031	1123	1216	1308	1400
66	952	920	772	751	779	835	900	970	954	1046	1138	1231	1323	1416
72	898	905	768	751	786	843	909	981	969	1062	1154	1247	1340	1433
78	853	890	762	752	790	847	913	985	977	1070	1162	1255	1348	1440
84	816	878	758	754	794	852	918	991	986	1079	1171	1263	1355	1448
90	786	866	755	756	798	857	924	996	1076	1088	1180	1272	1364	1456
96	760	833	753	759	803	862	930	1003	1083	1097	1189	1281	1373	1464
102	739	814	761	769	813	872	939	1012	1092	1174	1198	1290	1382	1473
108	722	805	770	778	822	882	949	1022	1102	1184	1208	1299	1391	1482
114	708	813	779	788	832	892	959	1032	1112	1194	1277	1309	1400	1492
120	696	821	788	796	842	902	969	1042	1121	1203	1287	1319	1410	1501
126	687	829	798	806	852	912	979	1052	1131	1213	1297	1382	1420	1511
132	679	837	802	816	863	922	989	1062	1141	1223	1307	1391	1477	1521
138	673	845	800	826	873	932	999	1072	1152	1233	1317	1401	1487	1531
144	669	853	808	837	883	943	1010	1082	1162	1244	1327	1411	1497	1583