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MEMORANDUM

TO: City of La Crosse Engineering Department

FROM: Kenton Brose, PE (Lic. WI, NC)

DATE: September 22, 2023

RE: Chalmer's Apartments
SEH No. CHALM 172741

BACKGROUND

SEH has completed preliminary design of stormwater management, grading and utility design for the Chalmer's Apartments project in La Crosse, WI. This memo details the design assumptions and decisions that have been made to date. We ask that the City of La Crosse Staff provide direction to us regarding the assumptions, questions, and recommendations put forth in this memo.

SANITARY SEWER & WATER DESIGN

The existing sanitary sewer lateral and water service for the existing building are assumed to be utilized in the post-development conditions.

A number of existing laterals appear on the utility maps provided by the City. Are there any records of which of these are active?

STORM SEWER DESIGN

Existing storm drainage on the site includes a 10" PVC roof drain connection from the existing building to the storm sewer in the easement north of the building. There is also a catch basin that drains to Pine St and overland flow to Pine St and 2nd St.

The proposed storm sewer design includes utilization of the existing 10" PVC connection up to the amount of existing flow and proposes a connection into 2nd St or Pine St from proposed building for remainder of the flow.

If it is the City's preference to eliminate the 10" PVC connection to reduce the total flow to the existing 12" pipe in the storm sewer easement, the plan can be revised to route all of the building roof flow to 2nd St or Pine St.

The small portion of site that is not rooftop will sheet flow off site into the adjacent street right-of-way.

Engineers | Architects | Planners | Scientists

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STORMWATER MANAGEMENT DESIGN

The existing conditions of the project site include an existing building with associated concrete and asphalt surfaces with some small portions of grass, as well as an unimproved lot that is gravel covered. It is assumed that the gravel covered portion is impervious and the total site existing condition is 95% impervious.

The proposed condition eliminates most of the concrete and asphalt, and all of the unimproved gravel area. Proposed conditions consist of a new building, associated walkways and green space around the perimeter of the site.

The stormwater management calculations for the site include runoff rate control, infiltration, and TSS reduction. The site falls under the redevelopment requirements for each of these items.

The conclusion of the stormwater analysis is that no basin or treatment devices will be needed to meet the requirements of the City of La Crosse stormwater ordinance.

Summary of these calculations is as follows:

Peak Discharge

Due to the reduction in total impervious area in post-development conditions, the peak runoff discharge rates will be reduced to below the pre-development peak runoff discharge rates for all of the following storm events without any stormwater treatment devices.

Storm Event	Flow Rate (cfs), Existing Conditions	Flow Rate (cfs), Proposed Conditions
1-year, 24-hour	7.52	6.89
2-year, 24-hour	8.74	8.14
10-year, 24-hour	13.17	12.66
100-year, 24-hour	22.51	22.14

Total Suspended Solids Reduction (TSS)

Since this project has been classified as redevelopment, 40% of the load from parking areas and roads must be reduced. The proposed project utilized existing road right-of-way and existing adjacent property for access and proposes underground parking. No surface parking areas or roadways are included in the proposed plan, so no TSS treatment is required.

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Infiltration

Total impervious area pre-development = 95%
 Total impervious area post-development = 81%

Existing

Runoff Volume Total (cf) at the Outfall							
Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)	Calculated CN*	Event Peak Flow (cfs)
73	08/28/81	0.04	0.2680	0.001	0.04	98.2	0.000
74	08/31/81	0.03	0	0.000	0.03	n/a	0.000
75	08/31/81	1.52	9409	0.823	0.27	97.5	0.637
76	09/07/81	0.89	4986	0.745	0.23	97.7	0.877
77	09/11/81	0.08	35.64	0.059	0.08	97.8	0.031
78	09/16/81	0.03	0	0.000	0.03	n/a	0.000
79	09/21/81	0.45	1997	0.590	0.18	97.9	0.220
80	09/24/81	0.90	5054	0.747	0.23	97.7	0.185
81	09/26/81	0.12	152.3	0.169	0.10	97.9	0.027
82	09/28/81	0.10	87.09	0.116	0.09	97.9	0.026
83	09/29/81	0.16	246.1	0.205	0.13	97.5	0.108
84	09/30/81	0.36	1366	0.504	0.18	97.8	1.201
85	10/01/81	0.01	0	0.000	0.01	n/a	0.000
86	10/04/81	0.15	220.6	0.196	0.12	97.6	0.049
87	10/05/81	0.04	0.2680	0.001	0.04	98.2	0.000
88	10/05/81	0.02	0	0.000	0.02	n/a	0.000
89	10/09/81	0.14	196.5	0.187	0.11	97.7	0.035
90	10/13/81	1.20	7161	0.793	0.25	97.6	0.485
91	10/15/81	0.02	0	0.000	0.02	n/a	0.000
92	10/17/81	0.95	5394	0.755	0.23	97.7	0.593
93	10/18/81	0.06	13.16	0.029	0.06	98.0	0.002
94	10/21/81	0.06	13.16	0.029	0.06	98.0	0.002
95	10/21/81	0.01	0	0.000	0.01	n/a	0.000
96	10/24/81	0.01	0	0.000	0.01	n/a	0.000
97	10/31/81	0.01	0	0.000	0.01	n/a	0.000
98	11/05/81	0.04	0.2680	0.001	0.04	98.2	0.000
99	11/15/81	0.07	22.80	0.043	0.07	97.9	0.003
100	11/18/81	0.05	5.653	0.015	0.05	98.1	0.002
101	11/19/81	0.26	666.5	0.341	0.17	97.4	0.021
102	11/23/81	0.18	301.1	0.222	0.14	97.4	0.033
103	11/25/81	0.89	4986	0.745	0.23	97.7	0.209
104	11/30/81	0.37	1449	0.521	0.18	97.8	0.055
105	12/03/81	0.16	246.1	0.205	0.13	97.5	0.024
106	12/14/81	0.01	0	0.000	0.01	n/a	0.000
107	12/20/81	0.11	119.2	0.144	0.09	97.9	0.012
108	12/26/81	0.04	0.2680	0.001	0.04	98.2	0.000
109	12/31/81	0.28	786.6	0.374	0.18	97.4	0.063
Minimum:		0.01	0	0.000	0.01	97.3	0.000
Maximum:		2.59	17202	0.883	0.30	98.2	4.210
Average:		0.29	1404	0.248	0.11	97.6	0.929
Total:		32.10	153030		11.82		

* Note: NRCS does not recommend using CN method for rains < 0.5 in.
 See 'PreDevelopment Areas and CN' Help for more info.

Proposed

Runoff Volume Total (cf) at the Outfall							
Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)	Calculated CN*	Event Peak Flow (cfs)
73	08/28/81	0.04	1.193	0.004	0.04	98.3	0.001
74	08/31/81	0.03	0.3485	0.002	0.03	98.6	0.000
75	08/31/81	1.52	8241	0.721	0.42	95.8	0.558
76	09/07/81	0.89	4582	0.685	0.28	97.1	0.806
77	09/11/81	0.08	78.80	0.131	0.07	98.4	0.069
78	09/16/81	0.03	0.3485	0.002	0.03	98.6	0.000
79	09/21/81	0.45	2140	0.633	0.17	98.2	0.235
80	09/24/81	0.90	4636	0.695	0.28	97.1	0.170
81	09/26/81	0.12	332.6	0.369	0.08	98.9	0.059
82	09/28/81	0.10	190.8	0.254	0.07	98.7	0.056
83	09/29/81	0.16	537.2	0.447	0.09	98.8	0.236
84	09/30/81	0.36	1648	0.609	0.14	98.4	1.449
85	10/01/81	0.01	0.03872	0.001	0.01	99.5	0.000
86	10/04/81	0.15	481.7	0.427	0.09	98.8	0.106
87	10/05/81	0.04	1.193	0.004	0.04	98.3	0.001
88	10/05/81	0.02	0.1549	0.001	0.02	99.1	0.000
89	10/09/81	0.14	429.1	0.408	0.08	98.8	0.075
90	10/13/81	1.20	6383	0.708	0.35	96.5	0.432
91	10/15/81	0.02	0.1549	0.001	0.02	99.1	0.000
92	10/17/81	0.95	4909	0.687	0.30	96.9	0.540
93	10/18/81	0.06	29.58	0.066	0.06	98.4	0.004
94	10/21/81	0.06	29.58	0.066	0.06	98.4	0.005
95	10/21/81	0.01	0.03872	0.001	0.01	99.5	0.000
96	10/24/81	0.01	0.03872	0.001	0.01	99.5	0.000
97	10/31/81	0.01	0.03872	0.001	0.01	99.5	0.000
98	11/05/81	0.04	1.193	0.004	0.04	98.3	0.000
99	11/15/81	0.07	50.71	0.096	0.06	98.4	0.006
100	11/18/81	0.05	13.07	0.035	0.05	98.4	0.006
101	11/19/81	0.26	1082	0.553	0.12	98.6	0.034
102	11/23/81	0.18	657.1	0.486	0.09	98.8	0.072
103	11/25/81	0.89	4582	0.685	0.28	97.1	0.192
104	11/30/81	0.37	1709	0.614	0.14	98.4	0.065
105	12/03/81	0.16	537.2	0.447	0.09	98.8	0.053
106	12/14/81	0.01	0.03872	0.001	0.01	99.5	0.000
107	12/20/81	0.11	260.7	0.315	0.08	98.8	0.025
108	12/26/81	0.04	1.193	0.004	0.04	98.3	0.000
109	12/31/81	0.28	1188	0.564	0.12	98.6	0.095
Minimum:		0.01	0.03872	0.001	0.01	94.8	0.000
Maximum:		2.59	15284	0.785	0.56	99.5	3.887
Average:		0.29	1384	0.301	0.11	96.8	0.805
Total:		32.10	150881		12.06		

* Note: NRCS does not recommend using CN method for rains < 0.5 in.
 See 'PreDevelopment Areas and CN' Help for more info.

Existing Stay-On = 11.82 in.

Existing infiltration volume = 11.82 in. * 2.072 acres * 43,560 sf/acre * 1ft/12in. = 88,902 cf

Required Stay-On:

60% of pre-development infiltration volume = 0.60 * 88,902 cf = 53,341 cf

Proposed Stay-On = 12.06 in.

Proposed infiltration volume = 12.06 in. * 2.072 acres * 43,560 sf/acre * 1ft/12in = 90,708 cf

Proposed infiltration volume > required stay-on. Infiltration requirement is met without treatment device.

Thank you for your time and attention to this project. We look forward to discussing the proposed design in further detail. Please don't hesitate to contact Kenton Brose at 608.235.5250 or kbrose@sehinc.com with any questions, comments, or concerns.