Appendix A Windshield Survey Report
Memo

Date: Monday, October 23, 2017

Project: Czech Village and Rockford Road Basins Stormwater Drainage Study

To: City of Cedar Rapids

From: Stephanie Then/HDR, Anthony Vecchi/HDR

Subject: Windshield Survey of Czech Village and Rockford Road Basins

Background
HDR conducted a windshield survey of several stormwater management features in the Czech Village and Rockford Road Basins on October 23rd, 2017. Photographs were taken and observations were noted at some of the hydraulic features associated with detention basins and open channel drainageways. The observations are summarized in the memo.
1. Overland Flow Path South of Evergreen Packing Equipment on 6th St SW
The overland flow area provides storage for local runoff from the surrounding businesses. The Altorfer Cat parking lot (south of the overland flow area) drains to local storm sewer that discharges in the overland flow area. As shown in Figure 2, the outlet for the local storm sewer is equipped with a flow meter.

Figure 1: Overland flow area at outlet of a local drainage pipe (outlet shown in Figure 2)

Figure 2: The 18” storm sewer outlet is equipped with a flow meter
2. Open Channel between 1222 and 1228 Wilson Ave SW

The open channel drainageway between 1222 and 1228 Wilson Ave SW (Figure 3) is on the west side of the Czech Village watershed. Figure 4 shows the upstream channel and box culvert. The box culvert is 5’ wide and approximately 24” high. It has a layer of sediment on the bottom of the culvert, so actual height is unknown. The downstream culvert inlet at 22nd Ave SW (shown in Figure 3) is a 54” corrugated metal pipe (CMP) with a projecting type inlet. The CMP culvert shows signs of corrosion and some deformation.

Figure 3: Open channel drainageway, looking downstream (north)

Figure 4: Open channel drainageway, looking upstream (south)
3. Alandale Park and Open Channel Drainageway
An open channel drainageway flows west, along the southern edge of Alandale park. When it reaches the south-west corner of the park, the channel makes a 90° bend to the right and continues flowing north, through an alley culvert, until it leaves the park via CMP culvert. The park area is shown in Figure 7. The park is approximately 2 acres and is low-lying compared to surrounding areas. The site is a potential area for detention.

The Alandale Park Alley culvert, shown in Figure 6, is a 60” CMP with flared head/end wall sections. The wall sections have deteriorated, with much of the wall cracked or missing. The CMP shows signs of corrosion and has some shape distortion at the outlet. Leaving the park is the 21st Ave SW culvert. This culvert is a 66” CMP with a flared headwall and a square endwall. The 21st Ave SW culvert shows similar deterioration as the Alandale Park Alley culvert.

Figure 5. Open Channel at SW corner of Alandale Park (looking north)
Figure 6. Culvert outlet at Alley on west side of Alandale Park

Figure 7. Alandale Park
Figure 8. Culvert outlet leaving Alandale Park, at 21st Ave SW
4. Open Channel and Culverts between 21st Ave SW and 20th Ave SW

The open channel drainageway flows north from 21st Ave SW to the Alley and then northeast from the Alley to 20th Ave SW. The channel has significant vegetation with over-growth blocking much of the Alley culvert. The Alley culvert is 66” equivalent arch CMP. There is approximately 10 inches of sediment at the base of the culvert. The culvert also shows signs of corrosion and deterioration.

The culvert under 20th Ave SW has been replaced recently. It is a 5’x7’ reinforced concrete box (RCB) culvert. A Filter Point Mat (concrete filled fabric blanket) serves as erosion control for both the upstream and downstream faces of the culvert.

Figure 9. Culvert inlet at Alley between 20th Ave SW and 21st Ave SW
Figure 10. Open channel south of 20th Ave SW

Figure 11. Culvert inlet south of 20th Ave SW
5. Open Channel North of 20th Ave SW
The open channel drainageway north of 20th Ave SW generally flows northeast before entering the storm sewer network at the alley between 19th Ave SW and 20th Ave SW. There is a 60 ft retaining wall on the right bank of the channel just before the storm sewer inlet (see Figure 12). The storm sewer inlet is a 54" RCP.

Figure 12. Open Channel at Alley between 19th Ave SW and 20th Ave SW

Figure 13. Storm sewer inlet at Alley between 19th Ave SW and 20th Ave SW
6. Open Channel South CRANDIC Railroad
The open channel drainageway south of CRANDIC Railroad flows through a series of culverts, before entering the storm sewer network at 6th St SW. The culverts at 9th St SW and 10th St SW are RCP and CMP, respectively, and both are projecting type. The right bank has heavy vegetation with mature trees. The culvert inlet at 6th St SW is a 60" RCP with at flared headwall.

Figure 14. Outlet of the 10th St SW culvert, near CRANDIC railroad
Figure 15. Open channel between 9th St SW and 6th St SW

Figure 16. Storm sewer inlet at 6th St SW
7. 12th Ave SW between 4th St SW and M St SW
The City identified 12th Ave SW between 4th St SW and M St SW as a problem area. Excessive flooding likely occurs for a variety of reasons, including lack of street curb, inefficient and debris-blocked inlets, and deficient storm sewer capacity. There is an empty 1/8th acre lot on the SW corner of the 12th Ave SW and M St SW intersection (Figure 18). The open lot may have potential for detention.

Figure 17. Looking east at 12th Ave SW

Figure 18. Empty lot at SW corner of 12th Ave SW and M St SW intersection
8. Detention Basin at Linwood Cemetery
A small detention basin stores local runoff from Linwood Cemetery. The outlet is an 8" PVC pipe that connects to the storm sewer just north of the detention basin. The basin could be expanded to provide storage for upstream storm sewer.

Figure 19. Detention basin at Linwood Cemetery
9. Cedar Pond
Cedar Pond is located upstream in the Rockford Road watershed near the intersection of Williams Blvd SW and Edgewood Rd SW. This pond, basin number 671, is filled with prairie grass and trees as shown in Figure 20. There are three inlets and a rectangular concrete outlet structure. This structure, shown in Figure 21, is approximately 100” tall, 6’ wide, and 6’ deep. The structure has a 6” plastic drain tile entering below the ground, rectangular openings on three faces approximately 50” above the ground, a 30” tall v-notch weir, and an open top with a grate.

Figure 20: Cedar Pond interior vegetation
Figure 21: Cedar Pond outlet structure
10. 25th St and Wilson Ave Detention Basin
Detention Basin C-403 is located at the intersection of 25th St SW and Wilson Ave. This detention area has one inlet at the south end of Probst Ct and an outlet structure near the south east corner of the lot. The area is grassed and appears to be mowed everywhere except for an area between the inlet and outlet, shown in Figure 22. The inlet had approximately 6” of standing water, as shown in Figure 23, which may limit to the effectiveness of the detention basin. The outlet includes a 6” plastic draintile entering at the bottom of the structure and a circular opening with a grate at the top of the structure, shown in Figure 24.

Figure 22: 25th St and Wilson Ave Detention
Figure 23: Detention Basin Inlet with ponding

Figure 24: Detention Basin outlet structure
11. Open Channel Drainageway between Newport Dr and 18th St South of Wilson Ave
A section of open channel drainageway is located south of Wilson Ave between Newport Dr and 18th St. The drainageway, shown in Figure 25, runs at the southern edge of property lines and is surrounded by trees and other vegetation.

Figure 25: Drainageway between Newport Dr and 18th St
12. Open Channel Drainageway between 18th St and Wilson Ave
A section of open channel drainageway is located between 18th St and Wilson Ave. The drainageway goes under 18th St and runs east and north toward Wilson Ave. The culvert at 18th St is shown in Figure 26 and Figure 27. This section of open channel drainageway is less covered by trees and vegetation than the upstream section, as shown in Figure 28.

Figure 26: Upstream culvert on west side of 18th St

Figure 27: Downstream culvert on east side of 18th St
Figure 28: Drainageway between 18th St and Wilson Ave
13. Open Channel Drainageway North of Probst Dr and West of 23rd St
A section of open channel drainageway is located north of Whispering Pines Ct and Probst Dr and west of 23rd St. This drainageway, runs through private property under dense tree cover as shown in Figure 29. The drainageway terminates at a field inlet near the intersection of 23rd St and Shady Grove Rd, shown in Figure 30.

Figure 29: Drainageway north of Whispering Pines Ct

Figure 30: Drainageway field inlet
14. 18th Street Detention Basin
This detention basin, located north of Milligan Ct between Balsam Dr and 18th St, was constructed in 2017 as shown in Figure 31. Debris was found to be blocking the primary opening of the outlet structure, shown in Figure 32.
15. Open Channel Drainageway East of 18th St Detention Basin
An open channel drainageway is located east of 18th St and immediately downstream of the 18th St Detention Basin, as shown in Figure 33. The channel runs from 18th St to Rockford Rd through a line of trees and other vegetation.

Figure 33: Open Channel drainageway east of 18th St Detention Basin
16. Autozone Detention Basin
A detention basin is located near 16th Ave and Rockford Rd, as shown in Figure 34. The basin, number 635, receives drainage from the Autozone parking lot to the west and an open channel drainageway to the north. Mowing and maintenance practices for this detention basin have resulted in all inlets and outlets being grown over by grass, as shown at one inlet in Figure 35.

Figure 34: Autozone Detention Basin

Figure 35: Autozone Detention Basin blocked inlet
17. Cedar Rapids Kernels Parking Lot
The Cedar Rapids Kernels parking lot located west of the baseball field has four surface inlets. Through the surface grates on these inlets, it was clear that the inlets were connected by a pipe carrying runoff from the northwest corner of the parking lot counter-clockwise to the northeast corner of the parking lot. No storage vaults were visible through these grates.

18. Reed Park
Reed Park is located west of 6th St between 5th Ave and 7th Ave near Taylor Elementary School. This park, shown in Figure 36 will be considered as a potential location for retention or a different kind of peak flow reduction stormwater management practice.

Figure 36: Reed Park
19. Undeveloped Area between 16th Ave and Shady Grove Rd
An area of undeveloped land is located between 16th Ave and Shady Grove Rd near a newly developed block. This area, shown in Figure 37, is higher than Shady Grove but did include a temporary detention basin according to the City’s Infrastructure database. This location will be considered as a potential location for a more permanent detention basin.

Figure 37: Shady Grove Rd Undeveloped Area