

C. Site Utilities - Judith Nitsch Engineering, Inc.

As requested Judith Nitsch Engineering, Inc. (JNEI) has prepared this report describing the existing conditions of the site utilities (sewer, drain, water) at the Reading Memorial High School. To prepare this report, JNEI reviewed available "as-built" drawings and interviewed School Department and Town of Reading officials. JNEI also visited the site on August 1, 2002 in order to determine the presence of potential wetland resource areas.

C1. Storm Drainage

- The Reading Memorial High School is located on a steeply sloping site running along Oakland Street. The site is highest at the southern end and slopes downhill towards the play fields and field house at the northern end of the site. The existing school site is bounded to the north by Birch Meadow Drive, to the west by woods, Hartshorn Street and Bancroft Avenue, and to the east and south by residential properties, which are located across Oakland Street.
- The roof drains from the existing school buildings are collected by an underground site drainage system that connects into an 18-inch drain line that is located in Hartshorn Street and Bancroft Avenue. This 18-inch pipe connects into a 30-inch pipe that is located to the west of the existing baseball field. This 30-inch pipe discharges into a stream that is located to the north of the existing main baseball field. A 24-inch pipe, which also discharges into this stream, runs parallel to the 30-inch pipe. This 24-inch pipe collects stormwater runoff from the residential neighborhood areas that are located to the south-west of the playing fields.
- There is a 15-inch drainage pipe located in Oakland Street directly in front of the existing High School that increases to a 24-inch pipe at the intersection of Oakland Street and Waverly Road. This drain line discharges at a headwall into a stream channel located to the north of Birch Meadow Drive. The stormwater runoff appears to flow through this stream channel westerly to a 24-inch culvert that is located under Birch Meadow Drive. This culvert discharges into a second stream channel that is located between Birch Meadow Drive and the existing football field. This second stream channel changes direction directly across from the Coolidge Middle School and runs to the southwest (parallel to the north end zone of the football field). This stream ends at a 72"x44" culvert that runs towards the southwest. A 24-inch pipe and a 12-inch pipe, which are located under the baseball and softball fields adjacent to Birch Meadow Drive, connect into the 72"x44" culvert from Arthur B. Lord Drive and Birch Meadow Drive, respectively. This 72"x44" culvert discharges into a third stream channel that is located to the north of the existing main baseball field. A drainage swale that appears to discharge into the stream is located to the west of this baseball field. The stream exits the site through a 58"x36" culvert located under Birch Meadow Drive.
- The above mentioned drain lines and features are all part of the Town of Reading drainage collection system that serve the neighborhoods surrounding the school site.
- There is a depression located to the north of the last mentioned stream that the Town of Reading floods during the winter months by diverting water from the adjacent stream by the means of a dam/pipe system. This diverted water freezes and the Town uses the area as a skating pond. An overflow pipe exists at the northwest corner of this depression that discharges to a swale within Town of Reading Conservation Land located on the opposite side of Birch Meadow Drive. This depression appears to be the lowest part of the entire site.
- The entire site does not fall within an Aquifer Protection District. However, the area surrounding the skating pond, the stream located to the north of the baseball field and the swale located to the west

of the baseball field, fall within Flood Zone B as delineated on the FEMA Flood Insurance Rate Map for Community Panel Number 250211 001 B with an effective date of July 2, 1981. Flood Zone B are areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

- The Town of Reading Engineering Department indicated that the only drainage issue in the area is that in the early spring months the baseball field and surrounding areas become saturated with groundwater and become unusable well into the spring athletic season, preventing use of the fields.
- The Town of Reading School Department indicated that to the best of their knowledge there have been no problems with the storm drainage line exiting the buildings.

C2. Wetland Resources

- JNEI has performed a preliminary investigation of the wetland resource areas at the Reading Memorial High School site. A check of the USGS Map indicates a perennial river runs through the High School site. Based on the USGS Map it is presumed under the Wetlands Protection Act and its regulations that the river is perennial. The perennial river noted on the USGS Map consists of the streams and stream channels that run through the site as noted in the Storm Drainage section. A 200-foot Riverfront Area as defined in the Wetland Protection Act is associated on either side of the river and development within the Riverfront Area is limited.
- On August 1, 2002, Joshua Alston and Sandra A. Brock, P.E. of JNEI visited the site to observe the existing conditions and investigate what wetland resource areas are located on the site. From the site observations JNEI has observed the following potential resource areas, and found that any work in or near those areas would require filing a Notice of Intent with the Town of Reading Conservation Commission under the Wetlands Protection Act:
 1. The stream channels noted previously are presumed to be part of a perennial river and would fall under the jurisdiction of the Wetlands Protection Act. JNEI did not observe flow within the stream channel located along Birch Meadow Drive at the intersection with Oakland Road and Waverly Road. Observable flow within the stream channel adjacent to the football field was not observed until approximately the location at which the stream changes direction across from the Coolidge Middle School. From this point downstream observable flow was observed to the 72"x44" culvert. Observable flow within the stream channel located to the north of the baseball field was observed to the 58"x36" culvert at Birch Meadow Drive. The area is in a drought condition so a determination if the stream in which no flow was observed is perennial or not can not be determined;
 2. There appears to be Bordering Vegetated Wetlands along the entire length of stream channels noted previously;
 3. There appears to be Bordering Vegetated Wetlands along the entire length of the drainage swale located to the west of the exiting baseball field; and
 4. A small isolated wetland may exist in the skating pond depression located near the daylight opening of the diversion pipe that the Town uses to fill the depression with water during the winter. This isolated wetland would be subject to filings with the Town of Reading Conservation Commission under the Town of Reading General Bylaws, Section 5.7.
- As part of the Notice of Intent filing, an alternative analysis would be required for all work within the Riverfront Area. The alternatives analysis would need to show practicable and substantially equivalent economic alternatives to the proposed project with less adverse effects on the interests of the Act. In addition, any proposed work including mitigation, can have no significant adverse impact on the Riv-

erfront Area. The site design will have to meet the performance standards of the Act and the Town of Reading Wetland Protection Regulations that at a minimum will consist of the following:

1. Within the 200-foot riverfront areas, the issuing authority may allow the alteration of up to 5,000 square feet or 10% of the riverfront area within the lot, whichever is greater;
2. At a minimum, a 100-foot wide area of undisturbed vegetation is provided from the mean annual high-water line along the river. If there is not a 100-foot wide area of undisturbed vegetation within the riverfront area, the existing vegetation cover shall be preserved or extended to the maximum extent feasible to approximate a 100-foot wide corridor of natural vegetation;
3. Under the local regulations, the Commission may require a Zone of Natural Vegetation bordering any wetland of sufficient width and vegetative community type to assure that silt and pollutants which may be carried by surface run-off shall not reach that wetland, but instead will be trapped by the natural mulch, soil and roots. Under most conditions, a zone width of a minimum of twenty-five feet would be considered sufficient to accomplish this purpose. A wider zone may be required, depending on specific site conditions; and
4. Areas for stormwater management systems to control stormwater runoff rates, treat stormwater runoff for total suspended solids and to recharge stormwater runoff to groundwater.

C3. Water Service

- There is an 8-inch water main located in the entire length of Oakland Road and in Birch Meadow Drive from Oakland Road to Arthur B. Lord Drive. The existing school service is connected to the 8-inch main in Oakland Road. From hydrant flow test data provided to JNEI from the Town of Reading Engineering Department of the water main located in Oakland Road, the static pressure was 65 PSI and flow rate of 2,350 GPM was observed at a radial pressure of 56 PSI. A 20-inch water main runs through the existing athletic fields from Arthur B. Lord Drive to Bancroft Avenue. A 12-inch dead end line connects to the 20-inch main within the school site and ends to the west of the existing school buildings. Two fire hydrants are connected to this 12-inch main. A 6-inch main from Hartshorn Street also ends at a fire hydrant that is also located to the west of the existing school buildings. The above water lines are all part of the Town of Reading water distribution system that serves the neighborhoods surrounding the school site.
- Asbestos cement pipe is considered a hazardous material. If any asbestos cement lines need to be removed, then the pipe material will need to be properly disposed of.
- The Town of Reading Engineering Department indicated that to the best of their knowledge there have been no problems with the water service in this area.
- The Town of Reading School Department indicated that to the best of their knowledge there have been no problems with the existing water service to the school.

C4. Sanitary Sewer Service

- There is a 10-inch asbestos cement (A.C.) pipe sanitary sewer main that enters the site at the driveway at the intersection of Oakland Road and Birch Meadow Drive near the football field. The pipe runs to the southwest until it reaches the south corner of the field house, where it changes direction to the west. The 10-inch sewer main intersects two 8-inch sewer mains at a manhole near the existing baseball field. These 8-inch sewer mains enter the site from Birch Meadow Drive and Bancroft Avenue. The 10-inch sewer main increases to a 12-inch pipe at this manhole, continues westward and exits the site at the intersection of Birch Meadow Drive and John Carver Road. The above mentioned sewer lines are all part of the Town of Reading sewer collection system that serve the neighborhoods surrounding the school site.

- The Town of Reading Engineering Department indicated that to the best of their knowledge there have been no sewer back-ups and/or blockages with the sanitary sewer services in this area.
- The sanitary sewer service (8-inch vitrified clay pipe) for the original building appears to exit from the existing Boiler Room Building and connects to the 10-inch sanitary sewer main at a manhole located to the southeast of the existing field house. The sanitary sewer services for the addition buildings located to the south of the original school building are collected by a system that also connects to the 10-inch sanitary sewer main near the field house.
- The Town of Reading School Department indicated that to the best of their knowledge there have been no problems with the sanitary sewer service exiting the buildings.

C5. Electrical Distribution Service

- The existing underground primary electric service enters the school at the 1952 Building Segment A3 from an existing utility service pole located on Oakland Road. The distribution system is owned and maintained by the Reading Municipal Light Department.

C6. Natural Gas Distribution Service

- There is an existing small gas service for the school's kitchen stoves and oil boiler pilots. As shown on the existing record documents this service enters the school at the 1952 Building Segment A5 from an existing gas main located in Oakland Road. The gas main located in Oakland Road is a 6-inch low-pressure pipe that operates at a water column pressure of 12-inches. There is a 6-inch low pressure main (water column pressure of 12-inches) and an 8-inch high pressure main (60 psi Maximum Operating Pressure-MAOP) located in Birch Meadow Drive. The distribution system is owned and maintained by KeySpan Energy Delivery.

C7. Conclusions and Recommendations

- From the current research JNEI has determined that there are significant Town of Reading utility systems and wetland resource areas located within the school site as described above. Future development of the site should be designed so that the existing Town of Reading infrastructure is not affected and there is minimal alteration of areas within the 200-foot riverfront area and to bordering vegetated wetlands. Any stormwater management system designed for the future development of the site should utilize DEP's Stormwater Management Policy and use Best Management Practices (BMP's) to protect wetlands and waters from adverse water quality impacts of stormwater runoff.

- Once a program is determined the following tasks should be performed prior to the development of any design proposal:
 1. A detailed definitive site topographic survey by a Licensed Professional Surveyor should be performed;
 2. Wetland resource area delineation should be performed by a Wetland Specialist and a resource area report should be provided for permitting purposes; and
 3. Permeability testing and seasonal high ground water evaluation of possible stormwater management areas (detention/recharge areas) should be performed by a Geotechnical Engineer.

The existing Town of Reading water, sanitary sewer, and storm drainage systems may need to be repaired, relocated and/or upgraded if these mains are disturbed by the proposed development of the existing school site. Any design or replacement of the Town systems would need to be performed in conjunction with the Town of Reading Engineering Department. The existing building water, sanitary sewer, and storm drainage services may be reused depending on the proposed building service sizes and exit points.