PROJECT OVERVIEWS

- CONCEPT PLAN
- SITE GRADING
- DRAINAGE
- STORMWATER MANAGEMENT
- SANITARY & WATER SUPPLY
- EROSION & SEDIMENT CONTROL
- STREET & DRIVEWAY
- COST ESTIMATE
PROJECT REQUIREMENTS

- One Building-structure between 10,000-12,000 square feet
- Outdoor recreation area approximately 10,000 square feet
- Outdoor parking for a minimum of 75 cars
- 25 feet setback from property

CURRENT SITE PLAN
PROPOSED EVENT
HOSTING VENUE

• Spacious
• Isolated
• Waterfront View
PRELIMINARY CONCEPT PLAN

- One 1-story Building – 10,800 sq.ft.
- 2 Outdoor Rec. Spaces – 22,300 sq.ft.
- Parking Lot – 35,000 sq.ft.
- Roadway – 1,200 ft long
FINAL CONCEPT PLAN

- One 1-story Building – 10,800 sq.ft.
- 2 Outdoor Rec. Spaces – 22,300 sq.ft.
- Parking Lot + Roadway – 150,000 sq.ft.
- Roadway – 2,200 ft long
- Wet Pond
- Total Developed Area = approx. 7 acres
1. HIGHEST ELEV @ 13.4
2. LOWEST ELEV @ 9.0
3. MAX. SLOPE 2% ON PAVED AREA
4. MIN. SLOPE 1%
5. MAX. 4:1 RATIO
MAIN BUILDING

- MAIN LEVEL FE 13.4
- HIGHEST ELEV. OF THE SITE
- 2% SLOPE AROUND BUILDING
- SUBLEVEL FE. 12.8
PARKING - ROUNDABOUT

- SITE GRADING

- DRAWING C-02.2

- 1% - 2% SLOPE
- ROUNDABOUT WITH 1% SLOPE
- MAX. 4:1 SLOPE RATIO
SITE GRADING

ENTRANCE - ROADWAY

SITE ENTRANCE

MIDDLE OF ENTRANCE ROAD

DRAWING C-02.3
ROAD PROFILE – Main Road

- 1% SLOPE ALONG THE ROAD
- HIGH ELEV POINT 13.0
- 2ND HIGH ELEV POINT 12.0
- LOW ELEV POINT 9.0
PIPE DESIGN

RATIONAL METHOD
• DRAINAGE AREAS
• RUNOFF COEFFICIENTS
• TIME OF CONCENTRATION
• INTENSITY

DESIGN CRITERIA
• MIN. 8” DIA.
• MIN. 2.5 FPS FLOW VEL.
• MAX. 10 FPS FLOW VEL.
• MATERIAL HDPE
• MIN. SLOPE 1%
• CATCHBASIN
• MANHOLE

OVERALL DESIGNS SUMMARY
• SMALLEST PIPE SIZE = 8” DIA.
• LARGEST PIPE SIZE = 24” DIA
• AVERAGE FLOW SPEED = 7.5 FPS
• 2 PIPES WITH >10 FPS
• AVG. SLOPE 1% - 2%
PIPE DESIGN NETWORK
Sample 1

DRAWING C-02.2
# PIPE DESIGN NETWORK

<table>
<thead>
<tr>
<th>Pipe</th>
<th>Pipe Length L (Ft)</th>
<th>Drainage Area (Acre)</th>
<th>Design Flow, Q (Cfs)</th>
<th>Design Pipe Size (In)</th>
<th>Min Slope Req’d</th>
<th>Design Slope</th>
<th>Flow Velocity (Fps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB-A1 → CB-A2</td>
<td>36.4</td>
<td>0.149</td>
<td>1.49</td>
<td>10</td>
<td>1.33%</td>
<td>1.5%</td>
<td>5.83</td>
</tr>
<tr>
<td>CB-A2 → CB-A3</td>
<td>65.86</td>
<td>0.118</td>
<td>2.66</td>
<td>12</td>
<td>1.58%</td>
<td>2.0%</td>
<td>7.60</td>
</tr>
<tr>
<td>CB-A3 → CB-A4</td>
<td>102.97</td>
<td>0.224</td>
<td>4.87</td>
<td>18</td>
<td>0.61%</td>
<td>1.0%</td>
<td>7.04</td>
</tr>
<tr>
<td>CB-A4 → MH-A1</td>
<td>35</td>
<td>0.150</td>
<td>6.27</td>
<td>18</td>
<td>1.02%</td>
<td>1.0%</td>
<td>7.04</td>
</tr>
</tbody>
</table>

![Diagram of Drainage Network](image.png)

**Drawing C-03.1**
### PIPE DESIGN NETWORK

<table>
<thead>
<tr>
<th>Pipe</th>
<th>Pipe Length L (Ft)</th>
<th>Drainage Area (Acre)</th>
<th>Design Flow, Q (Cfs)</th>
<th>Design Pipe Size (In)</th>
<th>Min Slope Req'd</th>
<th>Design Slope</th>
<th>Flow Velocity (Fps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB-A5 → CB-A6</td>
<td>64</td>
<td>0.080</td>
<td>0.801</td>
<td>8</td>
<td>1.25%</td>
<td>1.5%</td>
<td>5.02</td>
</tr>
<tr>
<td>CB-A6 → MH-A1</td>
<td>75</td>
<td>0.809</td>
<td>8.76</td>
<td>18</td>
<td>1.98%</td>
<td>2.0%</td>
<td>9.96</td>
</tr>
<tr>
<td>MH-A1</td>
<td>---</td>
<td>---</td>
<td>15.07</td>
<td>24</td>
<td>1.26%</td>
<td>1.5%</td>
<td>10.45</td>
</tr>
</tbody>
</table>

**Diagram Details:**
- **Proposed Grading**
- **Existing Grading**
- CB-A5: RIM EL 9.93, INV OUT 8.43
- CB-A6: RIM EL 8.53, INV IN 5.47, INV OUT 4.24
- MH-A1: RIM EL 10.04, INV IN 3.14

**Scale:**
- 2’
- 25’
PIPE DESIGN NETWORK
Sample 2

DRAWING C-02.2
## PIPE DESIGN NETWORK

<table>
<thead>
<tr>
<th>Pipe</th>
<th>Pipe Length, L (Ft)</th>
<th>Drainage Area (Acre)</th>
<th>Design Flow, Q (Cfs)</th>
<th>Design Pipe Size (In)</th>
<th>Min Slope Req'd</th>
<th>Design Slope</th>
<th>Flow Velocity (fps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB-WP1 → CB-WP2</td>
<td>26</td>
<td>0.600</td>
<td>6.03</td>
<td>18</td>
<td>0.9%</td>
<td>1.0%</td>
<td>7.04</td>
</tr>
<tr>
<td>CB-WP2 → CB-WP3</td>
<td>64.2</td>
<td>0.303</td>
<td>10.19</td>
<td>22</td>
<td>0.9%</td>
<td>1.0%</td>
<td>8.05</td>
</tr>
<tr>
<td>CB-WP3 → CB-WP4</td>
<td>26</td>
<td>0.118</td>
<td>1.18</td>
<td>8</td>
<td>2.7%</td>
<td>2.7%</td>
<td>6.74</td>
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<tr>
<td>CB-WP4 → CB-WP5</td>
<td>200</td>
<td>0.123</td>
<td>8.40</td>
<td>20</td>
<td>1.0%</td>
<td>1.0%</td>
<td>7.56</td>
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<tr>
<td>MH-WP1</td>
<td>67.8</td>
<td>---</td>
<td>16.96</td>
<td>24</td>
<td>1.6%</td>
<td>1.6%</td>
<td>10.79</td>
</tr>
</tbody>
</table>

### Diagram

- **Existing Grade:**
- **Proposed Grade:**
- **Points of Interest:**
  - 100YR-STORM EL: 2.69
  - 24H-STORM EL: 2.79
  - PERF. POOL EL: 1.88
  - Bottom of Pond EL: -2.50

**Drawing C-03.1**
STORMWATER MANAGEMENT

SYSTEMS

• UNDERGROUND RETENTION
  Approx. 3.34 acres
  Paved Area – Concrete/Asphalt

• WET POND
  Approx. 2.21 acres
  Lawn + Concrete/Asphalt

• DRYWELL
  Approx. 1.61 acres
  Unpaved Area – Lawn/Grass
  Away from any structure
DRYWELL

- 5 LOCATIONS
- 100-yr 24-hr STORM
- PRECAST CONCRETE
- STACKABLE UNIT
- 6’DIA. x 10’ /UNIT
- 1800 CFD/UNIT
- TOTAL OF 19 UNITS FOR THIS PROJECT
POND DESIGN

- Design based on 100-year 24 hour storm based on both Pre-D/Post-D peak flow
- Design for 1-year, 2-year, 10-year, 100-year storm
- Manage runoff from main road way
- Approx. drainage area ~ 2.21 acres
- Type III rainfall for White Plains
# POND DESIGN – CONT’D

<table>
<thead>
<tr>
<th>Volumes</th>
<th>(cu.ft)</th>
<th>(ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent Pool</td>
<td>3,109.2</td>
<td>0.071</td>
</tr>
<tr>
<td>Extended Detention</td>
<td>3,420.2</td>
<td>0.079</td>
</tr>
<tr>
<td>Stream Channel Protection - 1yr</td>
<td>3,543.3</td>
<td>0.081</td>
</tr>
<tr>
<td>Storage for 2-year</td>
<td>4,831.5</td>
<td>0.111</td>
</tr>
<tr>
<td>Overbank Flood Protection - 10yr</td>
<td>7,394.6</td>
<td>0.170</td>
</tr>
<tr>
<td>Extreme Flood Protection - 100yr</td>
<td>13,065.1</td>
<td>0.300</td>
</tr>
</tbody>
</table>

```
PROPOSED GRADING

24" HDPE - 60.0' @ 1.60%
I: 2.00 out

MH - WP1
RIM EL 11.64
INV IN 2.90

100YR - STORM EL 3.00
10YR - STORM EL 2.75
2YR - STORM EL 2.08

PERM.POOL EL 1.50

4' DEPTH

BOTTOM OF POND EL - 2.50
```

DRAWING C-03.1
SANITARY PIPE

- Assume 50 GPD/person use of water
- Peaking factor = 4
- Min. scouring velocity of 2.25 fps
- Min. pipe dia. 4”
- Pipe material PVC

WATER SUPPLY

- Pressurized
- 8” dia
- Fire hydrant discharge 1000 gpm
- Pipe material ductile-iron

| PIPE             | FLOW DEMAND (GPD/Person) | CAPACITY | PEAKING FACTOR | DESIGN FLOW (GPD) | DESIGN FLOW Q (cfs) | DESIGN PIPE SIZE (in) | PIPE MATERIAL | DESIGN SLOPE | FLOW VELOCITY (fps) |
|------------------|-------------------------|----------|----------------|-------------------|---------------------|------------------------|               |              |                  |
| MAIN BUILDING    | 50                      | 300      | 4              | 60,000            | 0.093               | 4                      | PVC           | 1.00%        | 2.37              |
DEFINITION & IMPORTANCE

- Erosion is movement of ground particles from multiple locations from natural causes
- Control is important due to potential damages and settlement downstream
CONSTRUCTION SCHEDULE

• PHASE 1 - CLEAR THE CONSTRUCTION SITE AND INSTALL CONSTRUCTION ENTRANCE

• PHASE 2 - PROCEED WITH INSTALLING SEDIMENT BASIN AND SILT FENCE.

• PHASE 3 - AT THE CONSTRUCTION ENTRANCE AND EXIT, INSTALL THE STORM DRAIN WITH THE BLOCK AND GRAVEL INLET PROTECTION. FOLLOW THIS UP WITH THE INSTALLATION OF THE TEMPORARY GRAVEL CONSTRUCTION ENTRANCE AND EXIT.

• PHASE 4 - ROUGH GRADE THE SITE AND BEGIN THE EARTHWORK WHILE STOCKPILING THE TOPSOIL AND INSTALLING THE OUTLET PROTECTION.

• PHASE 5 - COMPLETE FINAL GRADING FOR ROADS, PARKING AND BUILDINGS

• PHASE 6- AFTER THE SITE IS STABILIZED, REMOVE THE TEMPORARY MEASURES AND INSTALL THE PERMANENT VEGETATION ON THE DISTURBED AREAS.
Components

- **Silt Fence**
  - Intercepts sediment laden runoff from small drainage areas of disturbed soil by temporarily ponding the sediment laden runoff allowing settlement to occur.

- **Stone & Block Inlet Protection**
  - Temporary barriers that are established around inlets in a variety of forms, such as a fence or excavation.

- **Sediment Basin**
  - All water within the disturbed area is directed to it to acquire the disturbed or eroded soil that comes from rainstorms.
COMPONENTS – CONT’D

- Stabilized Construction Access
  - Access points are typically located at any point where there is incoming or outgoing traffic flow from a construction site

- Check Dam
  - Reduce the amount of erosion at construction sites – more specifically, drainage channels
TRAFFIC CONTROL DESIGN

- Speed limit of 20 mph
- No traffic signal device necessary, using stop signs instead
- 45ft dia. Roundabout
- 18 Different road signs
- One-way 2-lane traffic within the site
- Road curvature is designed for 40-feet long fire truck (fama.org)

<table>
<thead>
<tr>
<th>Lane Width Main Roadway</th>
<th>15'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lane Width Interior Roadway</td>
<td>13'</td>
</tr>
<tr>
<td>Speed Limit Driveway</td>
<td>20 mph</td>
</tr>
<tr>
<td>Speed Limit Roundabout</td>
<td>15 mph</td>
</tr>
<tr>
<td>Number of Parking Spaces</td>
<td>80</td>
</tr>
<tr>
<td>Number of Handicap Parking Spaces</td>
<td>4</td>
</tr>
<tr>
<td>Size Per Parking Space</td>
<td>18' x 8'</td>
</tr>
</tbody>
</table>
# TOTAL BREAKDOWN

<table>
<thead>
<tr>
<th>Description</th>
<th>Material</th>
<th>Labor</th>
<th>Equipment</th>
<th>Total</th>
<th>Total Incl O&amp;P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm Drainage</td>
<td>$70,871</td>
<td>$22,682</td>
<td>$4,936</td>
<td>$98,531</td>
<td>$118,563</td>
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<tr>
<td>Sanitary</td>
<td>$9,698</td>
<td>$8,181</td>
<td>$721</td>
<td>$18,600</td>
<td>$23,992</td>
</tr>
<tr>
<td>Pressurized Pipe</td>
<td>$45,517</td>
<td>$15,605</td>
<td>$3,673</td>
<td>$64,795</td>
<td>$78,022</td>
</tr>
<tr>
<td>Earth Work</td>
<td>---</td>
<td>$15,331</td>
<td>$47,307</td>
<td>$62,637</td>
<td>$75,584</td>
</tr>
<tr>
<td>Storm Management Pond</td>
<td>$22,056</td>
<td>$75,969</td>
<td>$24,506</td>
<td>$122,531</td>
<td>$149,428</td>
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<tr>
<td>Road Way</td>
<td>$340,502</td>
<td>$425,628</td>
<td>$85,126</td>
<td>$851,256</td>
<td>$945,840</td>
</tr>
<tr>
<td>Parking</td>
<td>$142,120</td>
<td>$99,484</td>
<td>$42,636</td>
<td>$284,240</td>
<td>$323,000</td>
</tr>
<tr>
<td>Erosion and Sedimentary Control</td>
<td>$15,155</td>
<td>$19,774</td>
<td>$1,278</td>
<td>$36,207</td>
<td>$47,024</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$645,919</strong></td>
<td><strong>$682,654</strong></td>
<td><strong>$210,182</strong></td>
<td><strong>$1,538,798</strong></td>
<td><strong>$1,761,454</strong></td>
</tr>
</tbody>
</table>
THANK YOU!