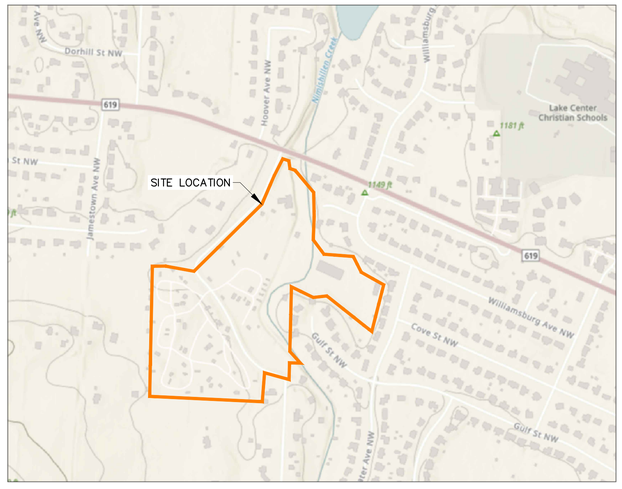
CLEARWATER PARK PARKING LOT
SITE IMPROVEMENT PLAN
12712 HOOVER AVE NW
UNIONTOWN, STARK COUNTY, OHIO 44685
AUGUST 2026



SITE LOCATION MAP



SITE VICINITY MAP

0 2,000 4,000

SCALE IN FEET

PROPERTY SURVEY LOCATION NOTE:

THE SUBJECT PROPERTIES DESCRIBED HEREON ARE SITUATED IN TOWNSHIP 12 (LAKE TWP.), RANGE 8, WITHIN SECTIONS 4 & 5 OF THE PLSS CONGRESS LANDS, STARK COUNTY, OHIO.

SHEET LIST

1	TITLE SHEET
2	PROPERTY LIMITS PLAN
3	EXISTING CONDITIONS
4	PROPOSED CONDITIONS
5	PROPOSED GRADING PLAN
6	EROSION & SEDIMENT CONTROL PLAN
7	EROSION & SEDIMENT CONTROL PLAN - DETAILS
8	SOIL RESTORATION DETAILS
9	PERMANENT SEEDING DETAILS

OWNER:
CLEARWATER PARK
12712 HOOVER AVE NW
UNIONTOWN, OHIO 44685

SURVEYOR:
BROEMSEN SURVEYING, INC.
140 GRAND TRUNK AVE SW
HARTVILLE, OHIO 44632
PHONE: (330) 877 1409
ATTN: DAVE BROEMSEN, P.S.

PREPARED BY:
RUBBER CITY ENGINEERING AND ENVIRONMENTAL, LLC
799 WHITE POND DRIVE, SUITES A, E
AKRON, OH 44320
PHONE: (330) 289 0092
ATTN: MICHAEL J. STEPIC, P.E.



DETAIL REFERENCE SYMBOL

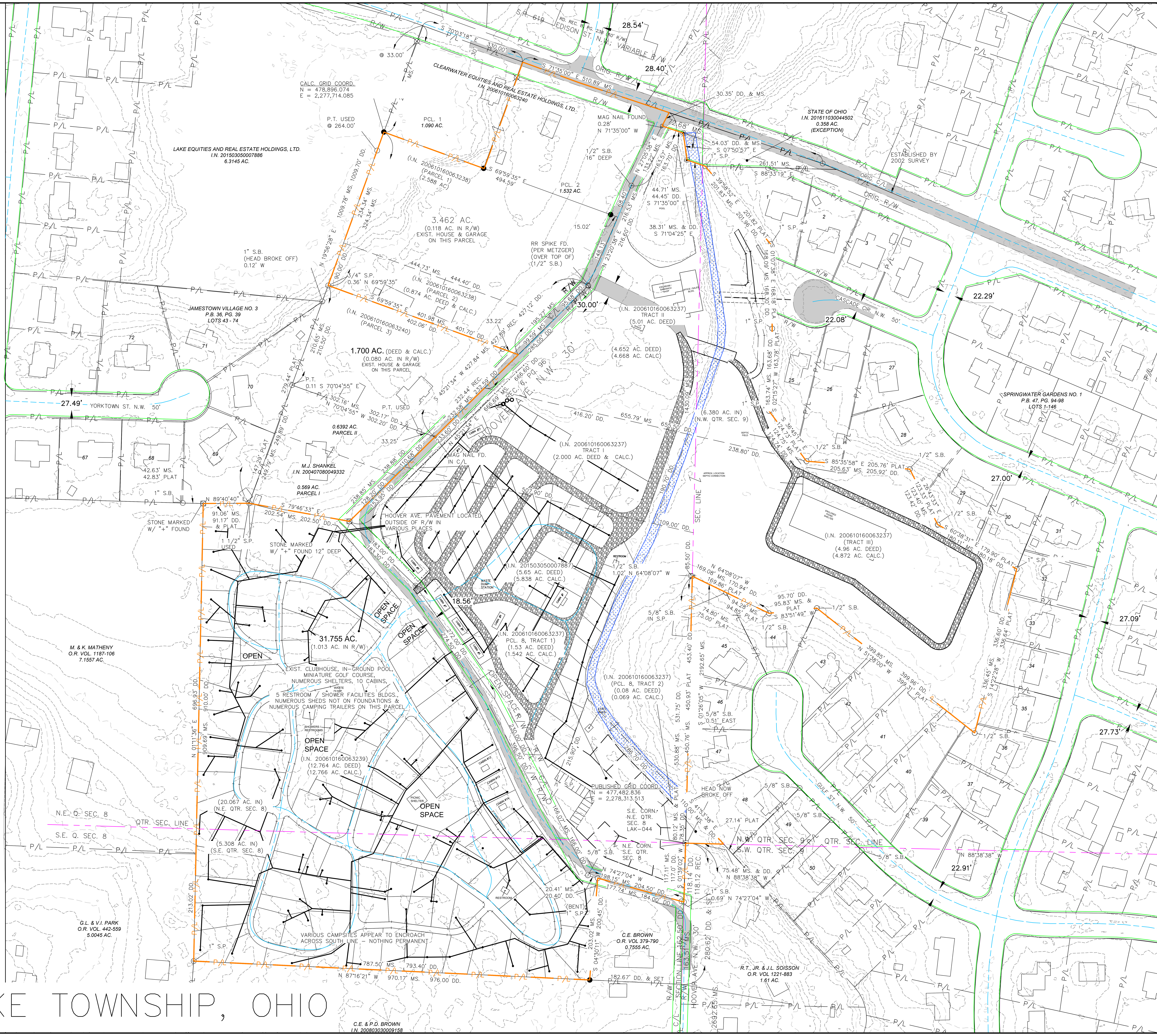
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Rubber City
Engineering and Environmental, LLC

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DATE: 10/21/2026
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CLEARWATER PARK & JELLYSTONE PARK CAMPGROUND
PARKING LOT SITE IMPROVEMENT PLAN
TITLE SHEET

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LAKE TOWNSHIP, OHIO

LEGEND

- EXISTING MAJOR CONTOUR (10-FT)
- EXISTING MINOR CONTOUR (2-FT)
- PROPERTY LINE
- SUBJECT PROPERTY BOUNDARY (36.8 ACRES)
- QUARTER SECTION LINE
- RIGHT-OF-WAY-LINES
- ROAD CENTERLINES
- EXISTING STRUCTURE
- EXISTING STREAM
- EXISTING LIMITS OF GRAVEL
- EXISTING LIMITS OF ASPHALT

SCALE IN FEET: 0 90 180

NOTES:

1. NO ADJACENT UNPLATTED LAND WITHIN 50 FEET OF SUBJECT TRACT'S PROPERTY LINES.
2. NO WATER/DRAINAGE FACILITIES.
3. TOTAL SITE ACREAGE: 36.8 ACRES.
4. BOUNDARIES ARE DERIVED FROM DAVID BROEMSEN SURVEYING ON 10/19/2026.

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Rubber City
Engineering and Environmental, LLC

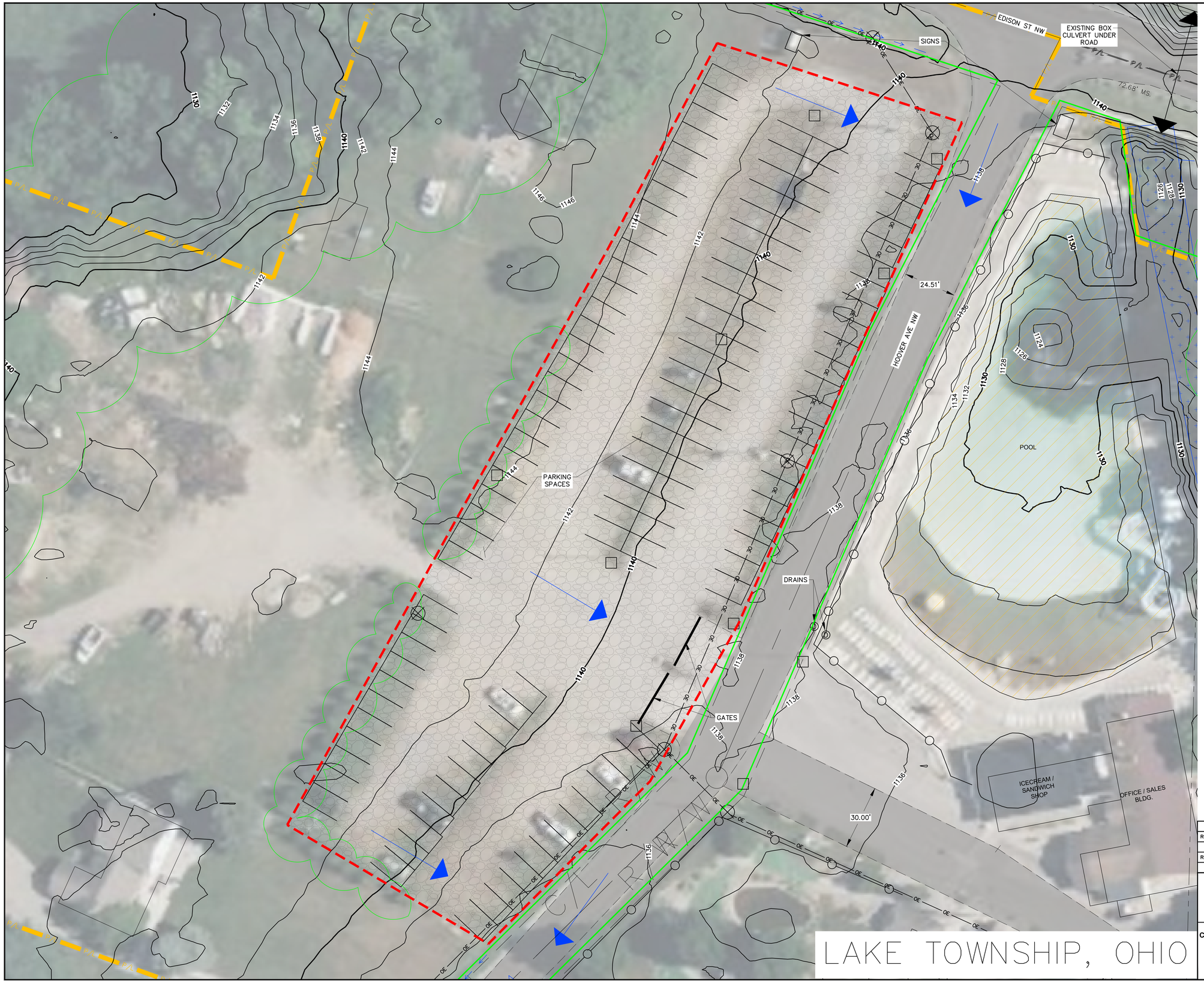
CLEARWATER PARK & JELLYSTONE PARK CAMPGROUND

PARKING LOT SITE IMPROVEMENT PLAN

PROPERTY LIMITS PLAN

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APPROVED BY:	TBS
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0 20 40

SCALE IN FEET

LEGEND

- 100 — EXISTING MAJOR CONTOUR (10-FT)
- EXISTING MINOR CONTOUR (2-FT)
- P/L P/L — PROPERTY LINE
- P/L P/L — SUBJECT PROPERTY BOUNDARY (36.8 ACRES)
- EXISTING VEGETATION
- OE OE — OVERHEAD ELECTRIC
- FENCE
- RIGHT-OF-WAY LINES
- EXISTING STRUCTURE
- EXISTING STREAM
- EXISTING POOL
- EXISTING LIMITS OF PARKING LOT
- EXISTING HEAVILY COMPACTED GRAVEL/GRASS AREA
- EXISTING LIMITS OF ASPHALT
- TELEPHONE POLE
- LIGHT POLE
- SURFACE WATER FLOW DIRECTION

NOTES:

1. EXISTING TOPOGRAPHY SHOWN WAS OBTAINED FROM THE OHIO GEOGRAPHICALLY REFERENCES INFORMATION PROGRAM (OGRIP).
2. PROPOSED DISTURBANCE ACTIVITIES INCLUDE THE FOLLOWING:
   - 2.1. MODIFICATION TO THE EXISTING POOL: FILLING OF THE DEEP END OF THE EXISTING POOL AND ADDITIONAL CONCRETE WORK WITHIN THE EXISTING POOL FOOTPRINT.
   - 2.2. ESTABLISHMENT OF A SOIL BORROW AREA: A TEMPORARY SOIL BORROW AREA WILL BE ESTABLISHED WITHIN THE EXISTING PARKING LOT WEST OF HOOVER AVENUE TO PROVIDE MATERIAL FOR THE PROPOSED POOL MODIFICATIONS. FINAL GRADES WITHIN THIS AREA WILL BE APPROXIMATELY 1 TO 3 FEET BELOW EXISTING GRADES, WITH SLOPES TRANSITIONING TO EXISTING UNDISTURBED GROUND ALONG THE WESTERN AND NORTHERN LIMITS OF THE DISTURBANCE BOUNDARY.
   - 2.3. REESTABLISHMENT OF THE PARKING LOT: FOLLOWING COMPLETION OF THE POOL FILLING ACTIVITIES, THE PARKING LOT WILL BE REESTABLISHED WITHIN THE FORMER SOIL BORROW AREA. APPROXIMATELY 20% OF THE DISTURBED AND FORMERLY IMPERVIOUS AREA WILL BE CONVERTED TO GRASS TO REDUCE THE TOTAL IMPERVIOUS AREA AND MEET THE APPLICABLE REDEVELOPMENT EXEMPTION CRITERIA FOR POST-CONSTRUCTION WATER QUALITY REQUIREMENTS.
3. BOUNDARIES ARE DERIVED FROM DAVID BROEMSEN SURVEYING ON 10/19/2026.

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Rubber City
Engineering and Environmental, LLC

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APPROVED BY: TBS
DATE: 10/19/2026
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CLEARWATER PARK & JELLYSTONE PARK CAMPGROUND

PARKING LOT SITE IMPROVEMENT PLAN

EXISTING CONDITIONS

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LAKE TOWNSHIP, OHIO

N

0 20 40

SCALE IN FEET

LEGEND

- 100 — EXISTING MAJOR CONTOUR (10-FT)
- EXISTING MINOR CONTOUR (2-FT)
- P/L P/L — PROPERTY LINE
- P/L P/L — SUBJECT PROPERTY BOUNDARY (36.8 ACRES)
- EXISTING VEGETATION
- OE OE — OVERHEAD ELECTRIC
- FENCE
- RIGHT-OF-WAY LINES
- BUILT-UP BARRIER TO PREVENT TRAFFIC IN GRASS (SEE NOTE 4)
- EXISTING STRUCTURE
- EXISTING STREAM
- EXISTING POOL
- EXISTING LIMITS OF ASPHALT
- PROPOSED HEAVILY COMPACTED GRAVEL PARKING LOT
- PROPOSED UNCOMPACTED NON-TRAFFIC GRASS AREA (0.42 ACRES)
- TELEPHONE POLE
- LIGHT POLE
- SURFACE WATER FLOW DIRECTION

NOTES:

1. EXISTING TOPOGRAPHY SHOWN WAS OBTAINED FROM THE OHIO GEOGRAPHICALLY REFERENCES INFORMATION PROGRAM (OGRIP).
2. PROPOSED DISTURBANCE ACTIVITIES INCLUDE THE FOLLOWING:
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3. BOUNDARIES ARE DERIVED FROM DAVID BROEMSEN SURVEYING ON 10/19/2026.
4. A COMBINATION OF DECORATIVE BOULDERS AND PARKING BUMPERS WILL BE USED TO CREATE A BARRIER TO ENSURE THE CONVERTED GRASS AREA WILL REMAIN AN UNCOMPACTED NON-TRAFFIC AREA.

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Rubber City
Engineering and Environmental, LLC

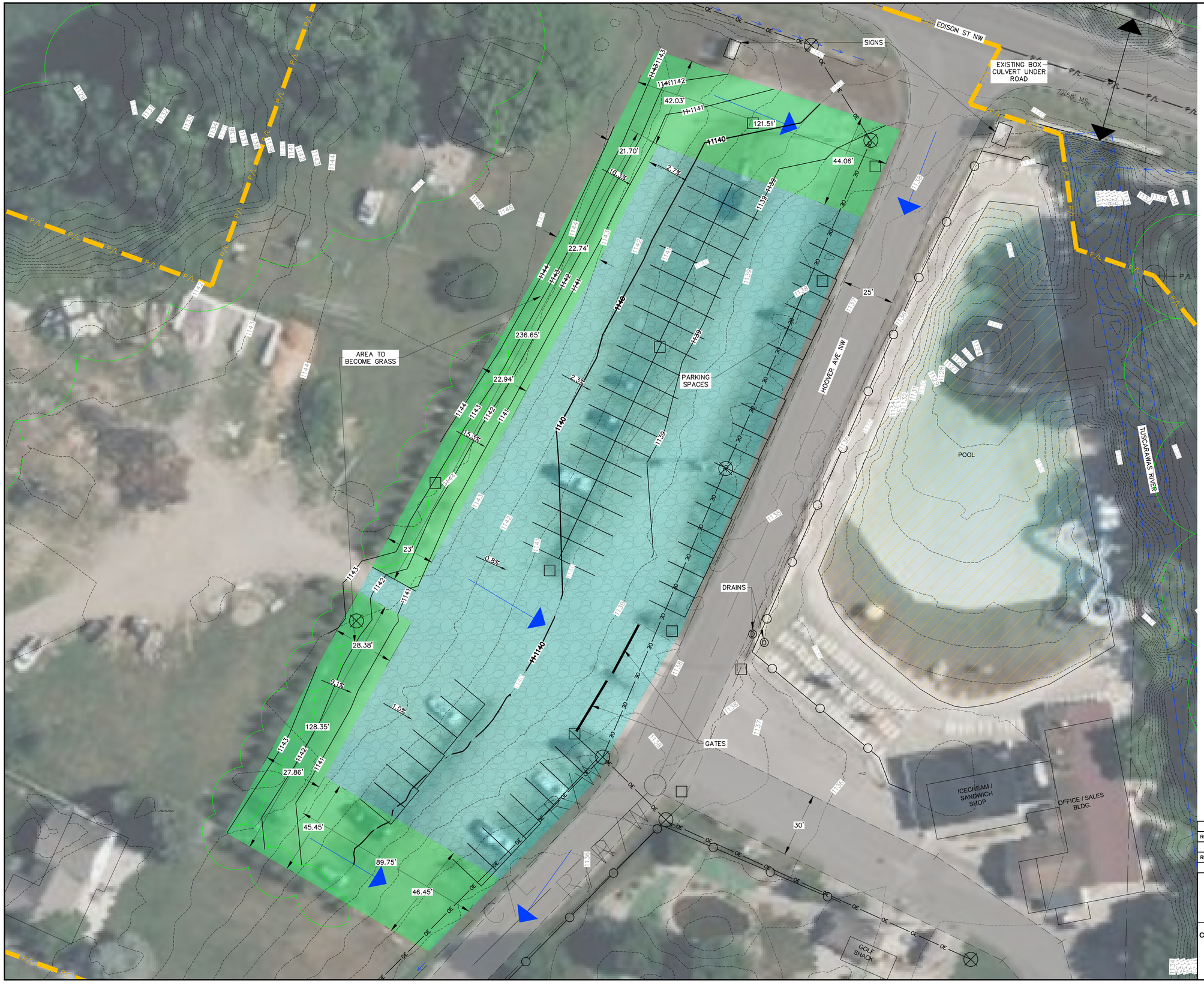
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CLEARWATER PARK & JELLYSTONE PARK CAMPGROUND

PARKING LOT SITE IMPROVEMENT PLAN

PROPOSED CONDITIONS

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SCALE IN FEET

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPERTY LINE
- SUBJECT PROPERTY BOUNDARY (36.8 ACRES)
- EXISTING VEGETATION
- OVERHEAD ELECTRIC
- FENCE
- EXISTING STRUCTURE
- EXISTING STREAM
- EXISTING POOL
- EXISTING LIMITS OF ASPHALT
- PROPOSED HEAVILY COMPACTED GRAVEL PARKING LOT
- PROPOSED UNCOMPACTED NON-TRAFFIC GRASS AREA (0.42 ACRES)
- TELEPHONE POLE
- LIGHT POLE
- EXISTING SURFACE WATER FLOW DIRECTION
- PROPOSED SURFACE WATER FLOW DIRECTION

NOTES:

1. EXISTING TOPOGRAPHY SHOWN WAS OBTAINED FROM THE OHIO GEOGRAPHICALLY REFERENCES INFORMATION PROGRAM (OGRIP).
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Rubber City
Engineering and Environmental, LLC

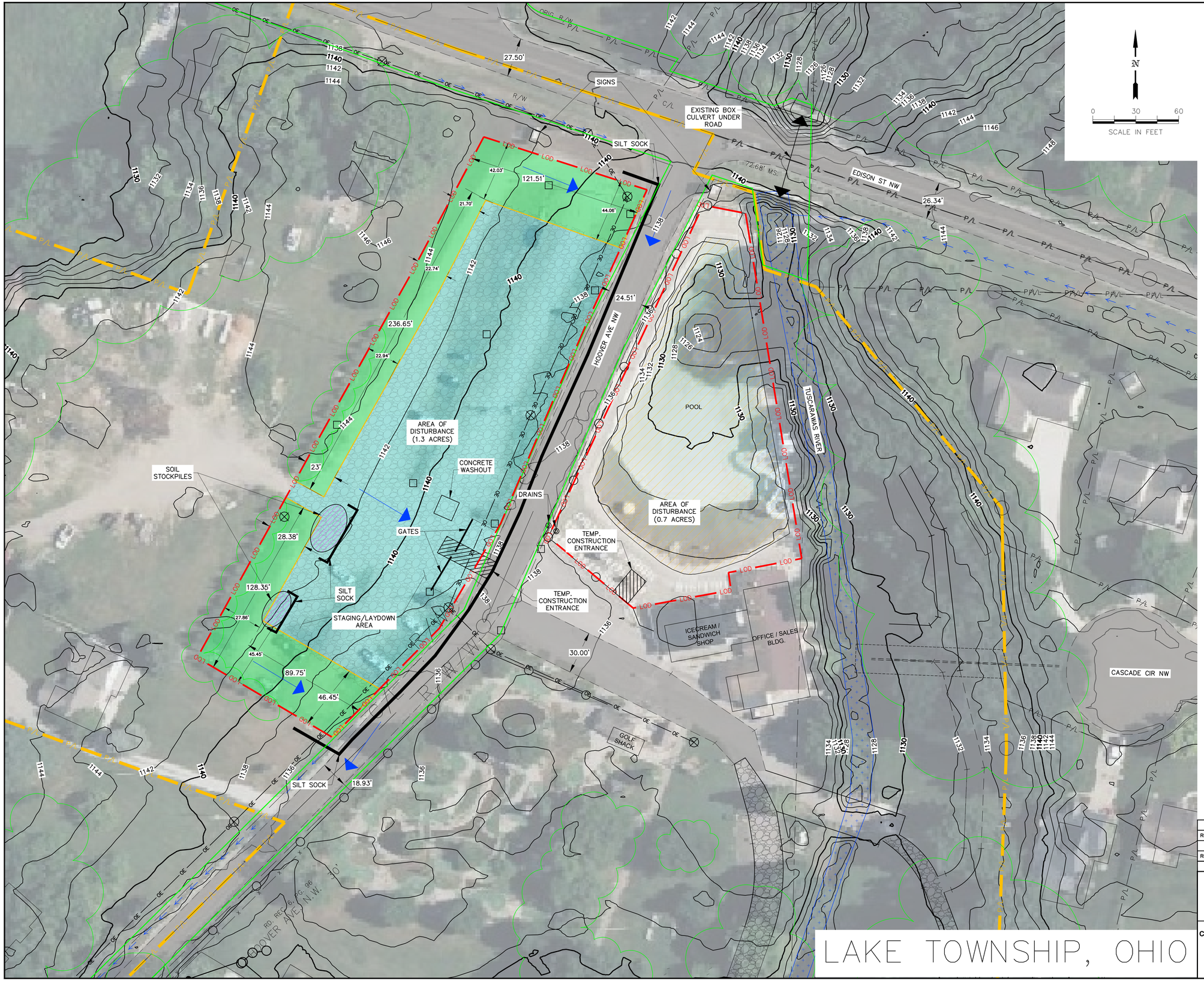
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CLEARWATER PARK & JELLYSTONE PARK CAMPGROUND

PARKING LOT SITE IMPROVEMENT PLAN

PROPOSED GRADING PLAN

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0 30 60

SCALE IN FEET

N

LEGEND

- 100 — EXISTING MAJOR CONTOUR (10-FT)
- EXISTING MINOR CONTOUR (2-FT)
- P/L — P/L — PROPERTY LINE
- P/L — P/L — SUBJECT PROPERTY BOUNDARY (36.8 ACRES)
- EXISTING VEGETATION
- OE — OE — OVERHEAD ELECTRIC
- FENCE
- RIGHT-OF-WAY LINES
- BUILT-UP BARRIER TO PREVENT TRAFFIC IN GRASS (SEE NOTE 4)
- EXISTING STRUCTURE
- EXISTING STREAM
- EXISTING POOL
- HEAVILY COMPACTED GRAVEL/GRASS AREA
- ASPHALT
- PROPOSED UNCOMPACTED NON-TRAFFIC GRASS AREA (0.40 ACRES)
- LOD — LOD — LIMIT OF DISTURBANCE (2.0 ACRES)
- SILT SOCK
- TELEPHONE POLE
- LIGHT POLE
- SURFACE WATER FLOW DIRECTION

NOTES:

1. EXISTING TOPOGRAPHY SHOWN WAS OBTAINED FROM THE OHIO GEOGRAPHICALLY REFERENCES INFORMATION PROGRAM (OGRIP).
2. PROPOSED DISTURBANCE ACTIVITIES INCLUDE THE FOLLOWING:
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Engineering and Environmental, LLC

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APPROVED BY: TBS
DATE: 10/19/2026
REV. NO.: REV. 0
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CLEARWATER PARK & JELLYSTONE PARK CAMPGROUND

PARKING LOT SITE IMPROVEMENT PLAN

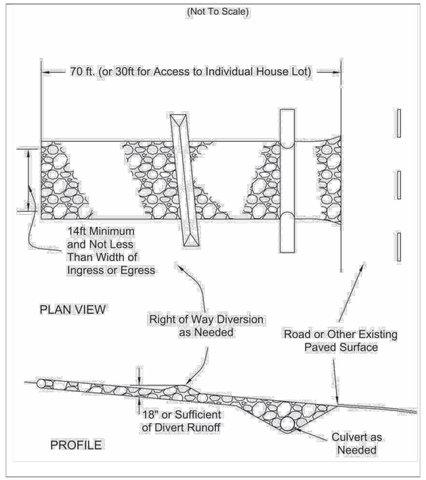
EROSION & SEDIMENT CONTROL PLAN

LAKE TOWNSHIP, OHIO

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Specifications
for

Construction Entrance



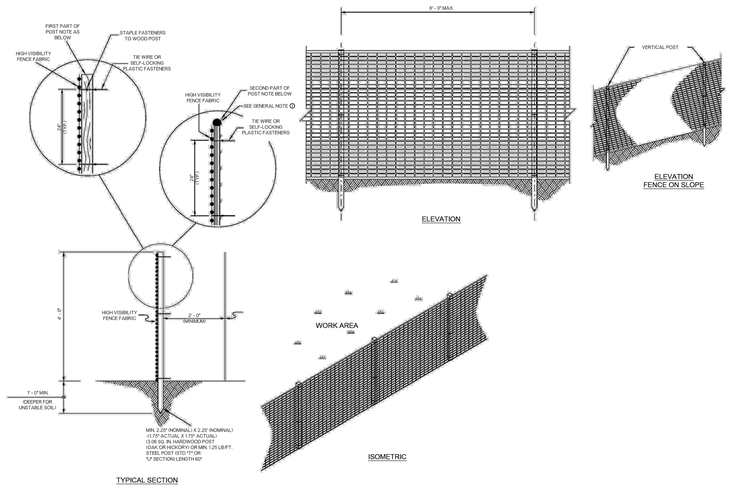
1. Stone Size—ODOT # 2 (1.5-2.5 inch) stone shall be used, or recycled concrete equivalent.
2. Length—The Construction entrance shall be as long as required to stabilize high traffic areas but not less than 70 ft. (exception: apply 30 ft. minimum to single residence lots).
3. Thickness -The stone layer shall be at least 6 inches thick for light duty entrances or at least 10 inches for heavy duty use.
4. Width -The entrance shall be at least 14 feet wide, but not less than the full width at points where ingress or egress occurs.
5. Geotextile -A geotextile shall be laid over the entire area prior to placing stone. It shall be composed of strong rot-proof polymeric fibers and meet the following specifications:

Figure 7.4.1

Geotextile Specification for Construction Entrance	
Minimum Tensile Strength	200 lbs.
Minimum Puncture Strength	80 psi.
Minimum Tear Strength	50 lbs.
Minimum Burst Strength	320 psi.
Minimum Elongation	20%
Equivalent Opening Size	EOS < 0.6 mm.
Permittivity	1×10-3 cm/sec.

6. Timing—The construction entrance shall be installed as soon as is practicable before major grading activities.
7. Culvert -A pipe or culvert shall be constructed under the entrance if needed to prevent surface water from flowing across the entrance or to prevent runoff from being directed out onto paved surfaces.
8. Water Bar -A water bar shall be constructed as part of the construction entrance if needed to prevent surface runoff from flowing the length of the construction entrance and out onto paved surfaces.
9. Maintenance -Top dressing of additional stone shall be applied as conditions demand. Mud spilled, dropped, washed or tracked onto public roads, or any surface where runoff is not checked by sediment controls, shall be removed immediately. Removal shall be accomplished by scraping or sweeping.
10. Construction entrances shall not be relied upon to remove mud from vehicles and prevent off-site tracking. Vehicles that enter and leave the construction-site shall be restricted from muddy areas.
11. Removal—the entrance shall remain in place until the disturbed area is stabilized or replaced with a permanent roadway or entrance.

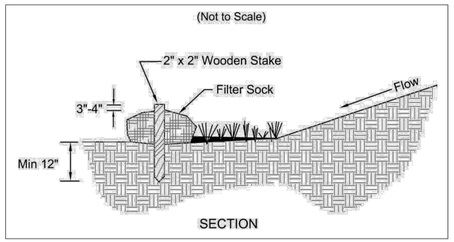
1 CONSTRUCTION ENTRANCE
8|11 NOT TO SCALE



4 CONSTRUCTION FENCE DETAIL
8|11 NOT TO SCALE

Specifications
for

Filter Sock



1. Materials – Compost used for filter socks shall be weed, pathogen and insect free and free of any refuse, contaminants or other materials toxic to plant growth. They shall be derived from a well-decomposed source of organic matter and consist of a particles ranging from 3/8" to 2".
2. Filter Socks shall be 3 or 5 mil continuous, tubular, HDPE 3/8" knitted mesh netting material, filled with compost passing the above specifications for compost products.

INSTALLATION:

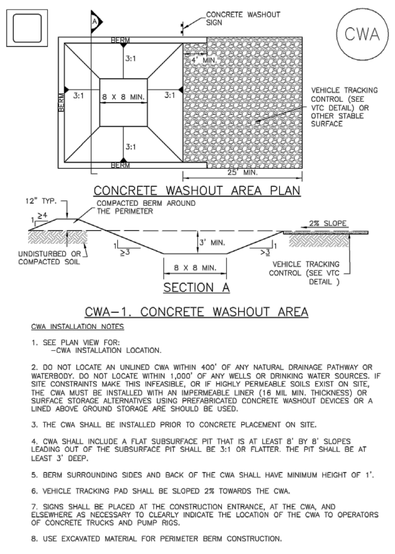
3. Filter socks will be placed on a level line across slopes, generally parallel to the base of the slope or other affected area. On slopes approaching 2:1, additional socks shall be provided at the top and as needed mid-slope.
4. Filter socks intended to be left as a permanent filter or part of the natural landscape, shall be seeded at the time of installation for establishment of permanent vegetation.
5. Filter Socks are not to be used in concentrated flow situations or in runoff channels.

MAINTENANCE:

6. Routinely inspect filter socks after each significant rain, maintaining filter socks in a functional condition at all times.
7. Remove sediments collected at the base of the filter socks when they reach 1/3 of the exposed height of the practice.
8. Where the filter sock deteriorates or fails, it will be repaired or replaced with a more effective alternative.
9. Removal – Filter socks will be dispersed on site when no longer required in such as way as to facilitate and not obstruct seedings.

2 FILTER SOCK
8|11 NOT TO SCALE

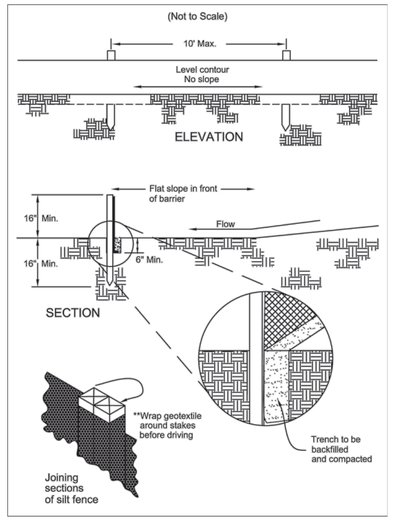
Concrete Washout Area (CWA) MM-1



5 CONCRETE WASHOUT
8|11 NOT TO SCALE

Specifications
for

Silt Fence



1. Silt fence shall be constructed before upslope land disturbance begins.
2. All silt fence shall be placed as close to the contour as possible so that water will not concentrate at low points in the fence and so that small swales or depressions that may carry small concentrated flows to the silt fence are dissipated along its length.
3. Ends of the silt fences shall be brought upslope slightly so that water ponded by the silt fence will be prevented from flowing around the ends.
4. Silt fence shall be placed on the flattest area available.
5. Where possible, vegetation shall be preserved for 5 feet (or as much as possible) upslope from the silt fence. If vegetation is removed, it shall be reestablished within 7 days from the installation of the silt fence.
6. The height of the silt fence shall be a minimum of 16 inches above the original ground surface.
7. The silt fence shall be placed in an excavated or sliced trench cut a minimum of 6 inches deep. The trench shall be made with a trencher, cable laying machine, slicing machine, or other suitable device that will ensure an adequately uniform trench depth.
8. The silt fence shall be placed with the stakes on the downslope side of the geotextile. A minimum of 8 inches of geotextile must be below the ground surface. Excess material shall lay on the bottom of the 6-inch deep trench. The trench shall be backfilled and compacted on both sides of the fabric.
9. Seams between sections of silt fence shall be spliced together only at a support post with a minimum 6-in. overlap prior to driving into the ground, (see details).
10. Maintenance—Silt fence shall allow runoff to pass only as diffuse flow through the geotextile. If runoff overtops the silt fence, flows under the fabric or around the fence ends, or in any other way allows a concentrated flow discharge, one of the following shall be performed, as appropriate: 1) the layout of the silt fence shall be changed, 2) accumulated sediment shall be removed, or 3) other practices shall be installed.

Sediment deposits shall be routinely removed when the deposit reaches approximately one-half of the height of the silt fence.

Silt fences shall be inspected after each rainfall and at least daily during a prolonged rainfall. The location of existing silt fence shall be reviewed daily to ensure its proper location and effectiveness. If damaged, the silt fence shall be repaired immediately.

Criteria for silt fence materials

1. Fence post – The length shall be a minimum of 32 inches. Wood posts will be 2-by-2-in. nominal dimensioned hardwood of sound quality. They shall be free of knots, splits and other visible imperfections, that will weaken the posts. The maximum spacing between posts shall be 10 ft. Posts shall be driven a minimum 16 inches into the ground, where possible. If not possible, the posts shall be adequately secured to prevent overturning of the fence due to sediment/water loading.
2. Silt fence fabric – See chart below.

Table 6.3.2 Minimum criteria for Silt Fence Fabric (ODOT, 2002)

FABRIC PROPERTIES	VALUES	TEST METHOD
Minimum Tensile Strength	120 lbs. (535 N)	ASTM D 4632
Maximum Elongation at 60 lbs	50%	ASTM D 4632
Minimum Puncture Strength	50 lbs (220 N)	ASTM D 4833
Minimum Tear Strength	40 lbs (180 N)	ASTM D 4533
Apparent Opening Size	≤ 0.84 mm	ASTM D 4751
Minimum Permittivity	1X10-2 sec.-1	ASTM D 4491
UV Exposure Strength Retention	70%	ASTM G 4355

3 SILT FENCE
8|11 NOT TO SCALE

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REV. NO.					

Rubber City
Engineering and Environmental, LLC

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CHECKED BY: TBS
APPROVED BY: TBS
DATE: 10/21/2026
REV. NO.: REV. 0
DRAWING NO.: 7

CLEARWATER PARK & JELLYSTONE PARK CAMPGROUND
PARKING LOT SITE IMPROVEMENT PLAN
EROSION & SEDIMENT CONTROL PLAN - DETAILS

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OHIO ENVIRONMENTAL PROTECTION AGENCY
RAINWATER AND LAND DEVELOPMENT MANUAL
CHAPTER 1.4 SOIL RESTORATION

DESIGN CRITERIA – TOPSOIL REPLACEMENT WITH SUBSOIL DECOMPACTION

COMPACTION ASSOCIATED WITH CONSTRUCTION ACTIVITY CAN EXTEND 12 TO 24 INCHES OR MORE BELOW THE SOIL SURFACE. THE LACK OF NATURAL RESTORATIVE PROCESSES (FOR EXAMPLE, FREEZE/THAW CYCLE, ROOT GROWTH) AT THIS DEPTH CAN RESULT IN A PERMANENT LOSS IN HYDRAULIC FUNCTION THAT IS NOT EASY TO RESTORE. SUBSOILING (ALSO REFERRED TO AS RIPPING OR DEEP TILLAGE) CAN ALLEVIATE DEEP COMPACTION. SUBSOILING IN CONJUNCTION WITH TOPSOIL REPLACEMENT RESTORES HYDRAULIC FUNCTION TO THE FULL SOIL PROFILE. USE TOPSOIL REPLACEMENT WITH SUBSOIL DECOMPACTION:

- ON GRADED OR COMPACTED PERVIOUS AREAS IN THE DEVELOPMENT,
- TO REDEVELOP PERVIOUS AREA ON SOIL THAT PREVIOUSLY SUPPORTED PAVEMENT OR STRUCTURES, AND/OR
- TO CONSTRUCT A POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICE (GRASS FILTER STRIP, ETC.) ON GRADED OR DISTURBED SOIL.

SOIL CONDITIONS FOR SUBSOILING

SUBSOILING INCREASES ROOTING DEPTH AND SOIL DRAINAGE BY APPLYING AN UPWARD FORCE THAT SHATTERS THE COMPACTED SOIL ABOVE IT. SOIL MUST BE DRY THROUGH THE SUBSOILING DEPTH TO ENSURE THE IMPLEMENT FRACTURES THE SOIL RATHER THAN COMPRESSES IT. THE TRAVEL SPEED AFFECTS THE PERFORMANCE AND SHOULD BE EVALUATED AND ADJUSTED AS THE WORK PROCEEDS.

SUBSOILING IMPLEMENTS

USE A COMMERCIALLY MANUFACTURED SOLID-SHANK SUBSOILER WITH WINGED TIPS DESIGNED TO FRACTURE THE SOIL LATERALLY AND VERTICALLY TO A DEPTH OF AT LEAST 24 INCHES. COMMON TILLAGE TOOLS (DISK, CHISEL PLOW, ETC.) ARE TOO SHORT AND NOT BUILT TO BE PULLED THROUGH DENSELY COMPACTED SOIL. EITHER A HEAVY-DUTY, AGRICULTURAL GRADE SUBSOILER WITH IN-LINE SHANKS OR A MULTI-SHANK RIPPER WITH WINGED TIPS AFFIXED TO A LARGE BULLDOZER IS RECOMMENDED. AGRICULTURAL PARAPLOWS AND V-RIPPERS MAY BE EFFECTIVE IF THEY HAVE SUFFICIENT DEPTH. SHANK SPACING WILL DEPEND UPON THE TYPE OF IMPLEMENT USED BUT SHOULD NOT EXCEED ONE AND A HALF (1.5) TIMES THE WORKING DEPTH.

DEPTH

THE SUBSOILER SHANKS WORK BY LIFTING SOIL AND SHOULD REACH JUST BELOW THE DEPTH OF COMPACTION. SUBSOIL TO A MINIMUM DEPTH OF 18 INCHES BELOW THE SURFACE. DEEPER TILLAGE MAY BE NECESSARY IF POST-GRADING FIELD TESTS (PENETROMETER OR BORINGS) INDICATE COMPACTION EXCEEDS 18 INCHES.

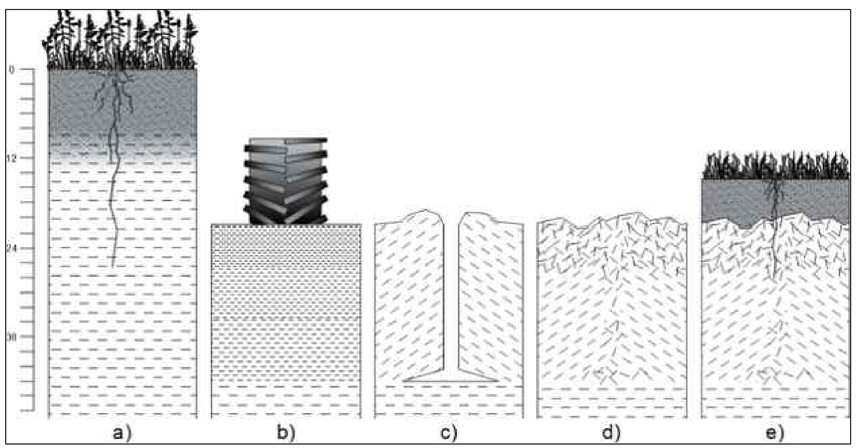


FIGURE 1.4.3 ILLUSTRATION OF TOPSOIL REPLACEMENT WITH SUBSOIL DECOMPACTION STEPS: A) ORIGINAL SOIL PROFILE; B) COMPACTED SUBSOIL AFTER REMOVING TOPSOIL; C) DECOMPACTION BY SUBSOILING; D) LOOSENED IN-SITU SUBSOIL; E) FINAL GRADE ACHIEVED WITH TOPSOIL REPLACED AND STABILIZED WITH GRASS

CONSTRUCTION SEQUENCE FOR TOPSOIL REPLACEMENT WITH SUBSOIL DECOMPACTION

ACCOMPLISH TOPSOIL REPLACEMENT WITH DECOMPACTION THROUGH THE FOLLOWING STEPS.

(1) PRIOR TO GRADING, REMOVE IN-SITU TOPSOIL TO THE DEPTH SPECIFIED IN THE CONSTRUCTION PLANS. AVOID OVER-EXCAVATION THAT MIXES HEAVY SUBSOIL WITH THE EXCAVATED TOPSOIL. RESERVE THE REMOVED TOPSOIL IN A STOCKPILE LOCATION SHOWN ON THE CONSTRUCTION PLANS WHERE IT WILL NOT INTERFERE WITH CONSTRUCTION ACTIVITY AND IS DISTANCED FROM SURFACE WATERS. INSTALL SEDIMENT CONTROL MEASURES AROUND THE TOPSOIL STOCKPILE AND, IF CONSTRUCTION WILL EXTEND BEYOND 21 DAYS, TEMPORARILY SEED OR COVER THE STOCKPILE.

(2) WHEN THE AREA TO BE RESTORED CAN BE PROTECTED FROM FURTHER DISTURBANCE BUT BEFORE REPLACING THE STOCKPILED TOPSOIL, SHATTER THE SOIL TO A MINIMUM DEPTH OF 18 INCHES WITH A SUBSOILER IMPLEMENT. FORM A TWO-DIMENSIONAL GRID OF DEEP-RIPPED CHANNELS WITH ONE OF THE DIRECTIONS FOLLOWING THE CONTOUR. FOR SLOPES STEEPER THAN 4:1, A SINGLE SUBSOILING PASS ALONG THE CONTOUR IS RECOMMENDED. LOCATE UNDERGROUND UTILITIES AND THE ROOT ZONE OF PRESERVED TREES PRIOR TO SUBSOILING.

(3) LOOSEN THE AT-GRADE SOIL TO A DEPTH OF SIX INCHES WITH AT LEAST TWO PERPENDICULAR PASSES OF A CHISEL PLOW OR RIPPER ATTACHMENT. THIS STEP IS CRITICAL. PLACING TOPSOIL DIRECTLY ONTO SMOOTH GRADED SOIL CAN STRATIFY THE SOIL, CREATING A PERCHED SATURATION ZONE IN THE TOPSOIL. THIS CONDITION WILL STRESS VEGETATION AND MAY RESULT IN EXCESSIVE SURFACE PONDING. TILLAGE OPENS THE GRADED SOIL SO THAT WATER WILL DRAIN THROUGH THE FULL SOIL PROFILE. ADDITIONALLY, IT ROUGHENS THE AT-GRADE SOIL TO PREVENT THE REPLACED TOPSOIL FROM SLIPPING.

(4) SPREAD TOPSOIL TO A MINIMUM TOTAL DEPTH OF SIX INCHES OVER THE LOOSE SUBSOIL USING LIGHTWEIGHT, TRACKED EQUIPMENT. TO ACHIEVE THE DESIRED ORGANIC MATTER CONTENT, AMEND THE REPLACED TOPSOIL. PLACE A ONE-INCH (THREE CUBIC YARD PER 1,000 SQUARE FEET) LAYER OF COMPOST (SEE SPECIFICATION) OVER THE TOPSOIL AND ROTOTILL TO A DEPTH OF SIX TO EIGHT INCHES UNTIL FULLY MIXED. THE FINAL SURFACE MAY BE LIGHTLY FIRMED OR LEVELED AS NECESSARY TO ACHIEVE GRADE AND A PROPER SEED BED. A SPADING MACHINE MAY BE MORE EFFECTIVE AT LOOSENING AND MIXING SOIL IN LESS PASSES COMBINING STEPS 3 AND 4.

(5) IMMEDIATELY SEED OR PLANT THE RESTORED AREA WITH VEGETATION APPROPRIATE FOR ITS LAND USE, THE REGIONAL CLIMATE, AND LOCAL SITE CONDITIONS (FOR EXAMPLE, FULL OR PARTIAL SUN). REFERENCE CHAPTER 7 FOR GUIDANCE ON STABILIZING SOIL WITH PERMANENT VEGETATION. USE BIODEGRADABLE EROSION CONTROL BLANKETS OR MULCH TO PROTECT THE BARE SOIL FROM EROSION AND ENSURE RAPID SEED GERMINATION. A VEGETATIVE COVER IS CONSIDERED ESTABLISHED WHEN BOTH (1) PLANTS CAN NO LONGER BE PULLED FREE FROM THE SOIL BY HAND; AND (2) 90 PERCENT COVER IS ACHIEVED. INSTALL SEDIMENT CONTROL MEASURES SUCH AS SILT FENCE ON THE RESTORED AREA AS NECESSARY.

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CLEARWATER PARK & JELLYSTONE PARK CAMPGROUND

PARKING LOT SITE IMPROVEMENT PLAN

SOIL RESTORATION DETAILS

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OHIO ENVIRONMENTAL PROTECTION AGENCY RAINWATER AND LAND DEVELOPMENT MANUAL

CHAPTER 1.4 SOIL RESTORATION – SEEDING

PRACTICE SPECIFICATION PERMANENT SEEDING

TIMING

1. PERMANENT SEED AREAS WITHIN 50 FEET OF SURFACE WATERS OF THE STATE WITHIN TWO DAYS OF REACHING FINAL GRADE AND ALL OTHER AREAS WITHIN SEVEN DAYS OF REACHING FINAL GRADE. DO NOT DELAY PERMANENT SEEDING OF ANY PORTION OF THE SITE AT FINAL GRADE, INCLUDING STORMWATER BASINS, WHILE CONSTRUCTION ON ANOTHER PORTION OF THE SITE IS BEING COMPLETED. COMPLETE PERMANENT SEEDING IN PHASES, IF NECESSARY.
2. PERMANENT SEED ANY AREAS THAT WILL LIE DORMANT FOR ONE YEAR OR MORE WITHIN SEVEN DAYS OF THE MOST RECENT DISTURBANCE.
3. CONDUCT PERMANENT SEEDING ACCORDING TO THE TIMEFRAMES IN TABLE 5.8.1.

TABLE 5.8.1 OHIO SEEDING DATES (ADAPTED FROM USDA–NRCS OHIO, 2019)

March 15 to May 31[1]	Spring permanent seeding window
June 1 to July 31	Permanent seeding with irrigation until 70% cover is established[2]
August 1 to September 15[1]	Fall permanent seeding window
September 16 to October 15	Permanent seeding with an additional 30 lb/ac of cereal rye[2]
October 15 to December 1	Permanent seeding is not recommended as seeds are likely to germinate but not be able to survive the winter. Use temporary stabilization until the spring window.
December 1 to March 14	Dormant permanent seeding coupled with mulch temporary stabilization[2,3]

Footnotes:
1. Spring and fall seeding dates may be extended two weeks beyond the date range listed based on a site–specific evaluation of the site and the local weather conditions at the time.
2. Seeding must be evaluated for adequate establishment after the following spring or fall seeding window.
3. Increase seeding rates by 50% for dormant seeding and follow mulch temporary stabilization specification.

SEEDBED PREPARATION, FERTILIZER, AND LIME

1. PRIOR TO THE START OF SEEDING OPERATIONS, PERFORM SOIL TESTS TO DETERMINE SITE–SPECIFIC APPLICATION RATES FOR BOTH LIME AND FERTILIZER. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES OR SOIL RESTORATION MAY ALSO BE USED FOR CHEMICAL ANALYSES.
2. THE SOIL BEING SEEDED MUST BE OF SUFFICIENT TILTH WITH ADEQUATE NUTRIENTS AND WATER–HOLDING CAPACITY TO SUPPORT VEGETATION. THE SEEDBED SHOULD BE FIRM AND ROUGH WITH SMALL CLODS, MOIST AT THE SURFACE, AND FREE OF WEEDS AND COMPETING VEGETATION.
   a. IF THE SOIL HAS BECOME COMPACTED OR CRUSTED, LOOSEN IT TO A DEPTH OF THREE TO FIVE INCHES WITH A SUITABLE AGRICULTURAL OR CONSTRUCTION IMPLEMENT, SUCH AS A DISC HARROW, TINE HARROW, CHISEL PLOW, OR RIPPER. LEAVE THE SEEDBED IN LOOSE CONDITION UNTIL AFTER FERTILIZATION AND SEEDING. IF NECESSARY, FIRM IT WITH A CULTIPACKER.
   b. TRACK WALK SLOPED AREAS (GREATER THAN 3:1) LEAVING THE SURFACE IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. (SEE CHAPTER 5.5 SOIL ROUGHENING)
3. APPLY STARTER FERTILIZER AND LIME AS RECOMMENDED BY A SOIL TEST AND WORK INTO LOOSE SOIL. IF FERTILIZER IS NOT INCORPORATED, APPLY ONE–HALF THE RATE DESCRIBED ABOVE DURING SEEDBED PREPARATION AND REPEAT ANOTHER ONE–HALF RATE APPLICATION OF THE SAME FERTILIZER WITHIN THREE TO FIVE WEEKS AFTER SEEDING.

   WHEN NOT SPECIFIED BY A SOIL TEST, APPLY STANDARD COMMERCIAL FERTILIZER 10–20–10 EVENLY OVER THE SURFACE AT A STANDARD DRY APPLICATION RATE OF 20 POUNDS PER 1,000 SQUARE FEET. OTHER COMMERCIAL FERTILIZER MIXTURE RATIOS MAY BE APPLIED AT THE APPLICATION RATE SPECIFIC FOR THAT RATIO TO PROVIDE AN EQUIVALENT QUANTITY OF NUTRIENTS. ALL DRY OR LIQUID FERTILIZERS MUST BE FULLY LABELED, DELIVERED, AND STORED PER APPLICABLE LAWS AND REGISTERED WITH THE OHIO DEPARTMENT OF AGRICULTURE (ODA) IN ACCORDANCE WITH OHIO REVISED CODE (ORC) SECTION 905.33.

   WHEN NOT SPECIFIED BY A SOIL TEST, APPLY TWO TONS OF PULVERIZED AGRICULTURAL–GRADE LIME PER ACRE TO DEVELOP A SLIGHTLY ACIDIC GROWING ENVIRONMENT. EQUIVALENT LIMING MATERIALS DESCRIBED IN BULLETIN 472, OHIO AGRONOMY GUIDE, PUBLISHED BY THE OHIO STATE UNIVERSITY COOPERATIVE EXTENSION SERVICE (OSU EXTENSION) MAY ALSO BE USED. LIMING MATERIAL MUST BE FROM A MANUFACTURER LICENSED BY ODA IN ACCORDANCE WITH ORC SECTION 905.52.

SEED

1. SELECT A SEED MIX FROM TABLE 5.8.2 OR AN EQUIVALENT MIXTURE RECOMMENDED BY THE NATURAL RESOURCE CONSERVATION SERVICE – OHIO, OHIO DEPARTMENT OF NATURAL RESOURCES, OR OSU EXTENSION.
2. SEED MUST BE LABELED ACCORDING TO ODA REGULATIONS AND OHIO REVISED CODE SECTION 907.03.
3. LEGUME SEED MUST BE PROPERLY INOCULATED WITH NITROGEN–FIXING BACTERIA SPECIFICALLY PREPARED FOR THE SPECIES PRIOR TO SEEDING AND SHOULD BE APPLIED AT A RATE OF TWO POUNDS OF INOCULANT PER 100 POUNDS OF SEED. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING.

SEEDING METHODS

1. THOROUGHLY MIX ALL SEED AND EVENLY SOW THE SEED OVER 100 PERCENT OF THE PREPARED AREAS AT THE REQUIRED RATES. SEED MAY BE APPLIED BY DRY SEEDING, A MECHANIZED SEEDER, OR HYDROSEEDING.
2. DRY SEEDING MAY BE PERFORMED WITH A CONVENTIONAL DROP OR CYCLONE SEEDER. SEED SHALL BE INCORPORATED INTO THE SOIL WITHIN 24 HOURS OF SEEDBED PREPARATION TO A DEPTH OF ONE–QUARTER INCH BY RAKING OR DRAGGING OR WITH A CULTIPACKER OR SIMILAR IMPLEMENT TO ASSURE GOOD SEED–TO–SOIL CONTACT. SEED MAY ALSO BE COVERED WITH COMPOST OR ENGINEERED SOIL MEDIA APPLIED TO A MINIMUM DEPTH OF ¼ INCH OVER THE PREPARED AREAS. WHERE FEASIBLE, APPLY SEED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER USING HALF THE SEEDING RATE IN EACH DIRECTION. AFTER SEEDING, FIRM THE SOIL WITH CULTIPACKER OR SIMILAR IMPLEMENT
3. MECHANIZED SEEDERS MAY BE USED TO BURY THE SEED AT LEAST ONE–QUARTER INCHES. WHERE PRACTICAL, APPLY SEED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER, USING ONE–HALF OF THE SEEDING RATE IN EACH DIRECTION. ON SLOPING LAND, OPERATE SEEDING EQUIPMENT ON THE CONTOUR WHERE FEASIBLE.
4. HYDROSEEDING SHOULD FOLLOW A TWO–STEP PROCESS TO ENSURE THE SEED IS IN DIRECT CONTACT WITH THE SOIL. FIRST SEED AND FERTILIZE WITH 25 TO 30 PERCENT MULCH AND TACKIFIER ONTO SOIL IN THE FIRST LIFT. PLACE THE REMAINING 70 TO 75 PERCENT OF THE MULCH AND TACKIFIER OVER THE FIRST LIFT IN A SECOND APPLICATION. IF SEED, FERTILIZER, AND MULCH ARE APPLIED IN A SINGLE STEP, THE SEED RATES IN TABLE 5.7.2 SHOULD BE INCREASED BY 50 PERCENT TO COMPENSATE FOR SEEDS NOT HAVING DIRECT CONTACT WITH THE SOIL. HYDROSEEDING ALONE DOES NOT PROVIDE ADEQUATE EROSION CONTROL.

MULCHING

1. MULCH MATERIAL SHALL BE APPLIED IMMEDIATELY FOLLOWING PERMANENT SEEDING. APPLY THE MULCH MATERIAL BY HAND OR MECHANICALLY SO 85 TO 90 PERCENT OF THE SOIL SURFACE IS UNIFORMLY COVERED.
2. MULCH SHALL BE UNROTTEN CEREAL GRAIN STRAW APPLIED AT THE RATE OF TWO TONS PER ACRE, WOODCHIPS WITH A MINIMUM PARTICLE SIZE OF ¾ INCHES APPLIED TO A MINIMUM DEPTH OF TWO INCHES, WOOD–FIBER HYDRAULIC MULCH APPLIED TO THE MANUFACTURER'S SPECIFICATIONS AT A RATE OF 1,500 TO 2,000 POUNDS/ACRE WITH A TACKIFIER, OR ROLLED EROSION CONTROL MATTING APPLIED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

   WOOD FIBER HYDRAULIC MULCHES ARE GENERALLY SHORT–LIVED (LESS THAN 3 MONTHS) AND SHOULD ONLY BE USED DURING THE SPRING AND FALL SEEDING WINDOW. DO NOT APPLY HYDRAULIC MULCHES TO SHALLOW VEGETATED CHANNELS UNLESS USED WITH AN EROSION CONTROL BLANKET OR TO SATURATED SOILS.

   WOODCHIPS MUST BE MANUFACTURED EXPRESSLY FROM CLEAN RAW WOOD AND BE FREE OF CONTAMINANTS. DO NOT USE WOODCHIPS WHERE FLOWING WATER COULD WASH THEM AWAY.

   ORGANIC MULCH MATERIALS WITH CARBON TO NITROGEN (C:N) RATIOS OF LESS THAN 20:1 SUCH AS GRASS CLIPPINGS WILL RELEASE NITRATE–NITROGEN THAT COULD CAUSE WATER QUALITY IMPAIRMENTS AND SHOULD BE AVOIDED.
3. MULCH SHALL BE ANCHORED IMMEDIATELY AFTER PLACEMENT TO HOLD IT IN PLACE. THE FOLLOWING ARE ACCEPTABLE METHODS FOR ANCHORING MULCH.
   a. USE A STRAW CRIMPER OR SIMILAR COULTER–LIKE IMPLEMENT TO PUNCH THE STRAW MULCH INTO THE SOIL. SOIL PENETRATION SHOULD BE ABOUT THREE TO FOUR INCHES. CRIMPED STRAW SHALL GENERALLY BE LONGER THAN SIX INCHES (FINELY CHOPPED STRAW CANNOT BE CRIMPED). ON SLOPING LAND WHERE EQUIPMENT CAN OPERATE SAFELY, THE OPERATION SHOULD BE ON THE CONTOUR.
   b. COTTON, JUTE, OR SYNTHETIC NETTING MAY BE USED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS. PIN OR STAPLE NETTING PER THE MANUFACTURER'S RECOMMENDATIONS. DEGRADABLE NETTING IS RECOMMENDED FOR AREAS TO BE MOWED.
   c. HIGH POLYMER SYNTHETIC EMULSIONS OR ORGANIC BINDERS MAY BE USED AT THE MANUFACTURER'S RECOMMENDED APPLICATION RATES IF WEATHER CONDITIONS ARE COMPATIBLE WITH THE MANUFACTURER'S RECOMMENDATIONS. ALL APPLICATIONS OF SYNTHETIC OR ORGANIC BINDERS MUST BE CONDUCTED IN SUCH A MANNER THAT THERE IS NO DIRECT CONTACT WITH WATERS OF THE STATE. WEATHER FORECASTS MUST BE CONSIDERED TO ENSURE THE BINDERS WILL NOT BE WASHED INTO WATERS OF THE STATE. BINDERS MUST BE PHYSIOLOGICALLY HARMLESS AND NOT RESULT IN A PHYTOTOXIC EFFECT OR IMPEDE VEGETATION GROWTH.

ALL NON–ORGANIC OR NON–BIODEGRADABLE MULCH AND ANCHORING MATERIALS SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN THE PRACTICE IS TERMINATED.

IRRIGATION

1. THOROUGHLY WATER PERMANENT SEEDED AREAS AFTER SEED GERMINATION. APPLY A TOTAL RATE OF 300 GALLONS PER 1,000 SQUARE FEET IN AT LEAST TWO APPLICATIONS SPREAD OVER SEVEN DAYS. PERFORM A SECONDARY WATER APPLICATION SEVEN AND TEN DAYS AFTER THE PRIMARY APPLICATIONS. IF A ONE–HALF INCH OR GREATER OF RAINFALL OCCURS WITHIN THE IRRIGATION PERIOD,

   WATERING MAY BE OMITTED. IRRIGATION SEEDINGS PERFORMED BETWEEN JUNE 1 AND JULY 31 AT A RATE OF ONE–HALF INCH PER WEEK UNTIL 70% COVER IS ESTABLISHED.
2. IRRIGATE AT A RATE AND METHOD THAT WILL NOT ERODE SOIL OR DISLODGE MULCH COVER.

DORMANT SEEDING

1. DORMANT SEEDING MAY OCCUR IF SOIL MOISTURE CONDITIONS ALLOW ACCESS FOR SEEDING.
2. INCREASE ALL SEEDING RATES BY 50 PERCENT WHEN DORMANT SEEDING.
3. DORMANT SEEDING SHALL BE MULCHED SO THAT 100 PERCENT OF THE GROUND SURFACE IS UNIFORMLY COVERED WITH CEREAL GRAIN STRAW APPLIED AT THE RATE OF THREE TO FOUR TONS PER ACRE OR BONDED FIBER MATRIX HYDRAULICALLY APPLIED AT A RATE OF 3,500 TO 4,000 POUNDS PER ACRE. HYDROSEED AND STANDARD HYDRAULIC FIBER MULCH DO NOT SUFFICIENTLY PROTECT DORMANT SEEDED GROUND FROM EROSION.

TABLE 5.8.2 RECOMMENDED PERMANENT SEEDING MIXES AND SEEDING RATES.1 (ADAPTED FROM USDA–NRCS OHIO AND ODOT.

	Mix Use	Plant Species	Pure Live Seeding Rate (lb/ac)[2,3]	Percent of Mix
1	Multipurpose Lawn	Turf Type Fescue (*Festuca arundinadea*)	40	47
		Kentucky Bluegrass (*Poa pratensis*)	20	23
		Perennial Ryegrass (*Lolium perenne*)	25	30
		85 lb/ac total PLS rate		
2	Quick Cover	Kentucky Bluegrass (*Poa pratensis*)	15	41
		Creeping Red Fescue (*Festuca rubra*)	16.5	27
		Annual Ryegrass (*Lolium multiflorum*)	1.5	2
		Perennial Ryegrass (*Lolium perenne*)	19	30
		52 lb/ac total PLS rate		
3	Secondary Wildlife Benefits Cover	Kentucky Bluegrass (*Poa pratensis*)	11	18
		Orchardgrass (*Dactylis glomereto*)	22.5	37
		Annual Ryegrass (*lolium multiflorum*)	1.5	10
		Perennial Ryegrass (*Lolium perenne*)	19	31
		Red Clover (*Trifolium partum*)	2	4
		56 lb/ac total PLS rate		
4	Steep Slopes	Hard Fescue (*Festuca longifolia*)	55	55
		Creeping Red Fescue (*Festuca rubra*)	35	35
		Annual Ryegrass (*Lolium multiflorum*)	10	10
		100 lb/ac total PLS rate		
5	Meadow / Conservation Area[4]	New England Aster (*Symphyotrichum novae-angliae*), Partridge Pea (*Chamaecrista fasciculata*), Purple Coneflower (*Echinacea purpurea*), Rattlesnake Master (*Eryngium yuccifolium*), Ox-Eye Sunflower (*Heliopsis helianthoides*), Bergamot (*Monarda fistulosa*), Grey-Headed Coneflower (*Ratibida pinnata*), Orange Coneflower (*Rudbeckia fulgida*), Prairie Dock (*Silphium terebinthinaceum*), Whorled Rosinweed (*Silphium trifoliatum*), Stiff Goldenrod (*Solidago rigida*) (a mixture of 5 to 12 species with any one not to exceed 5% of the mix)	15	25
		Big Blue Stem (*Andropogon gerardii*)	2	3
		Little Blue Stem (*Schizachyrium scoparium*)	3	5
		Indian Grass (*Sorghastrumnutans*)	1	2
		Annual Ryegrass (*Lolium multiflorum*)	40	65
		61 lb/ac total PLS rate		

FOOTNOTES:

1. SMALL VARIATIONS WITHIN THE SEEDING RATES LISTED WITHIN THE PLANNED MIX ARE ACCEPTABLE SO LONG AS THE MIX INCLUDES ALL THE LISTED SPECIES, AND THE TOTAL PROPORTION OF THE SEED MIXTURE IS 100% OR MORE.
2. THE SEEDING RATES USED IN THIS DOCUMENT ASSUME THE SEED USED IS ALL VIABLE. ALL RATES LISTED IN THIS DOCUMENT ARE LISTED AS PURE LIVE SEED (PLS). THIS PLS RATE MUST BE ADJUSTED TO ACCOUNT FOR THE QUALITY OF THE SEED BEING USED.
3. PLS SEEDING RATES ARE TO BE INCREASED BY 20% IF THE METHOD OF SEEDING DOES NOT RESULT IN GOOD SOIL SEED CONTACT INCLUDED TO ACCOUNT FOR THE INCREASED RISK OF POOR EMERGENCE. FOR EXAMPLE, IF THE PLANNED METHOD INVOLVES BROADCAST SEEDING WITH NO ADDITIONAL ACTIVITIES TO IMPROVE SEED–TO–SOIL CONTACT.

THIS IS A GENERAL MIX. ECOREGION–SPECIFIC SEED MIXES ARE RECOMMENDED WHERE FEASIBLE

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CLEARWATER PARK & JELLYSTONE PARK CAMPGROUND

PARKING LOT SITE IMPROVEMENT PLAN

PERMANENT SEEDING DETAILS

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