

Summary Statement:
The subject property (2151 Early Lane, Franklin, IN 46131) is being developed for use as a parking lot for employees and overflow parking for Quality Mill Supply located on the adjacent property (Lot 8) 2159 Early Lane. The intended use for the subject property is for parking. The primary use for the adjacent property (under the same ownership) is warehousing and distribution of manufactured materials. The total number of employees at the facility is currently 39. The total number of parking spaces for the business is now 77 of which 26 are located on the subject property. The population density for the subject property based on the parking number for the 1.47 Acre site is 17.7 persons/acre.

Site Description:
The site is currently under the ownership of Gilbert & Gilbert, LLC. The applicant for the site development permit is Force Design, Inc. located at 990 N. National Road, Columbus, IN 47201. The Certifying Engineer is Harold Force with Force Design, Inc. located at 990 N. National Road, Columbus, IN 47201 - email address: hforce@forceco.com - Phone No. (812) 372-8441. The primary contact person for this permit application is Mark Sevcik, engineer with Force Design, Inc. responsible for the plan and calculation preparation - email address: msevcik@forceco.com - Phone No. (812) 372-8441. The common address for the property is 2151 Early Lane, Franklin, IN 46131. The Legal description for the property is: Lot 9 in Early Interstate Park Section 2, an Addition to the City of Franklin as recorded in Plat Cabinet D, Page 869, in the Office of the Recorder of Johnson County, Indiana.

QUALITY MILL SUPPLY PARKING LOT

2151 EARLY LANE FRANKLIN, IN 46131



VICINITY MAP

SUBDIVISION:
ZONING:
SURROUNDING ZONING:

EARLY INTERSTATE PARK SECTION 2
LIGHT INDUSTRIAL (LI)
NORTH, EAST & WEST - LIGHT INDUSTRIAL (LI)
SOUTH - INSTITUTIONAL (IN)



EXISTING LEGEND

EX SANITARY SEWER MANHOLE + PIPE
EX WATER MAIN
EX STORM SEWER MANHOLE + PIPE
EX FIBER OPTIC LINE
EX TELEPHONE LINE
EX CABLE TELEVISION LINE
EX GAS LINE

SITE LEGEND

PROPERTY LINE
EASEMENT LINE
DEMOLITION

GENERAL NOTES

- APPROXIMATE PROPERTY BOUNDARY SHOWN ON THIS PLAN. CONTRACTOR TO PERFORM BOUNDARY SURVEY PRIOR TO BEGINNING CONSTRUCTION.
- ALL EROSION CONTROL MEASURES TO BE IN PLACE PRIOR TO THE START OF DEMOLITION.
- NOTIFY THE ENGINEER IN THE EVENT OR DISCOVERY OF ANY DISCREPANCIES FROM THE PLANS IN EXISTING CONDITIONS.
- THERE ARE NO SIGNIFICANT WOODED AREAS, ISOLATED TREES OR WETLANDS ON THE SITE.
- NO KNOWN CEMETERIES OR BURIAL SITES ARE LOCATED WITHIN THE SITE.
- THE EXISTING PROPERTY IS SERVED BY MUNICIPAL SEWER. THERE ARE NO EXISTING SEPTIC FIELDS WITHIN THE SITE.
- THE SITE IS SHOWN TO BE LOCATED WITHIN A ZONE X - AREA OF MINIMAL FLOOD HAZARD ON FEMA FIRM NO. 18081C0222D, EFFECTIVE DATE: AUGUST 2, 2007.



Force Design, Inc.

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DATES / REVISIONS

ISSUED FOR PERMIT 10/05/18



Harold Force

PROJECT
QUALITY MILL SUPPLY

PARKING LOT

FRANKLIN, INDIANA

SHEET TITLE
EXISTING CONDITIONS
& DEMOLITION PLAN

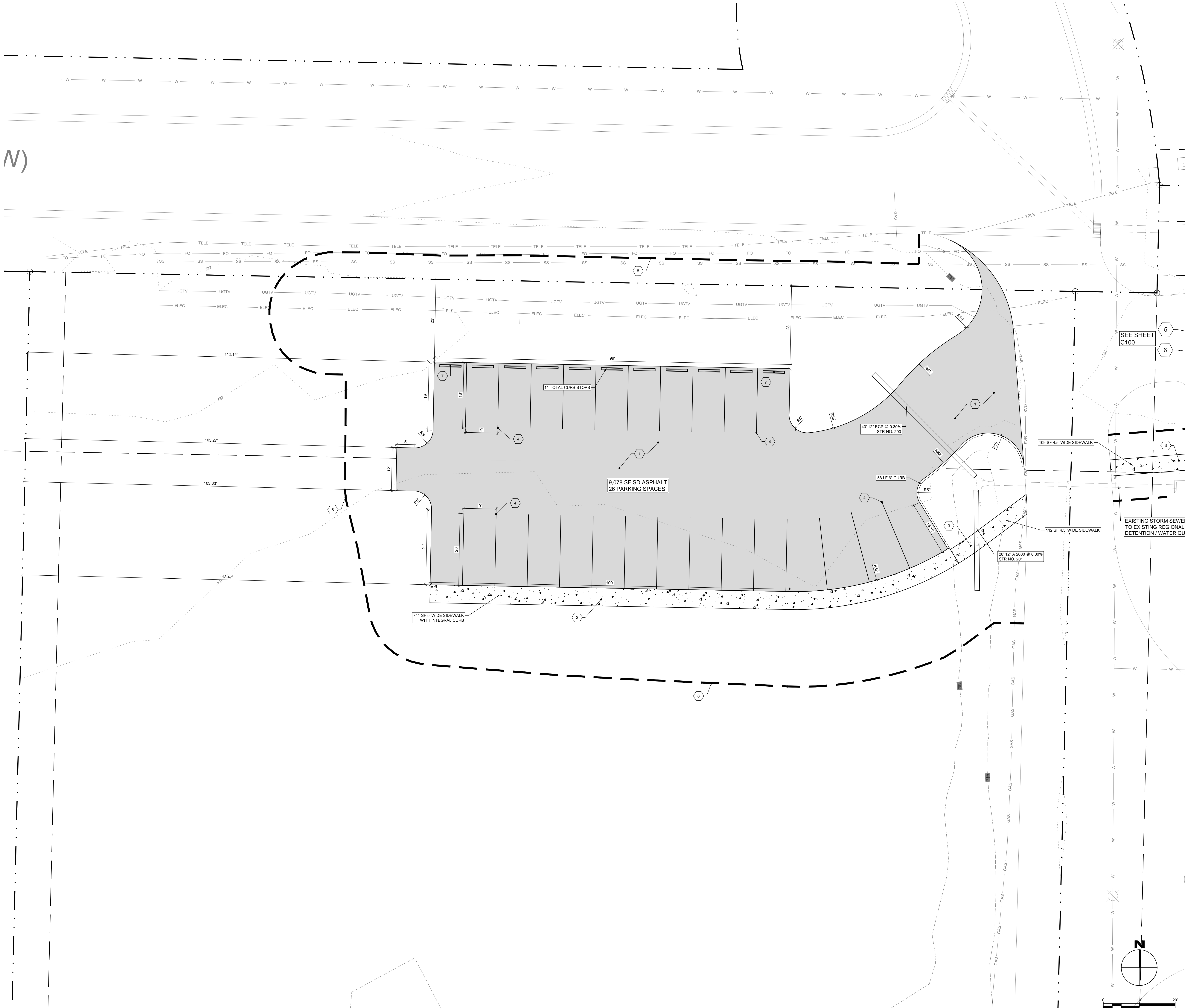
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CONSTRUCTION

PROJECT NUMBER
18391

SHEET NUMBER
C100
DRAWN BY
MSS



SITE KEY NOTES

- 1 STANDARD DUTY ASPHALT PAVING, SEE DETAIL 13 / C401
- 2 5' WIDE CONCRETE SIDEWALK WITH INTEGRAL CURB, SEE DETAIL 15 / C401
- 3 4'-6" WIDE CONCRETE SIDEWALK, SEE DETAIL 14 / C401
- 4 4' WIDE, PAINTED STRIPE, WHITE, (TYP) SEE DETAIL 18 / C401
- 5 4' WIDE, PAINTED STRIPE, BLUE, (TYP) SEE DETAIL 19 / C401
- 6 ACCESSIBLE PARKING SPACE, SEE DETAILS 16 & 17 / C401
- 7 CONCRETE CURB STOP (TYP)
- 8 CONSTRUCTION LIMITS

EXISTING LEGEND

- EX SANITARY SEWER MANHOLE + PIPE SS
- EX WATER MAIN W
- EX STORM SEWER MANHOLE + PIPE ST
- EX FIBER OPTIC LINE FO
- EX TELEPHONE LINE TELE
- EX CABLE TELEVISION LINE UGTV
- EX GAS LINE GAS

SITE LEGEND

- PROPERTY LINE
- EASEMENT LINE
- STANDARD DUTY ASPHALT PAVEMENT
- CONCRETE SIDEWALK

UTILITY LEGEND

- STORM SEWER PIPE

GENERAL NOTES

- APPROXIMATE PROPERTY BOUNDARY SHOWN ON THIS PLAN. CONTRACTOR TO PERFORM BOUNDARY SURVEY PRIOR TO BEGINNING CONSTRUCTION
- SEE SHEET C100 FOR ALL SETBACKS AND REQUIRED BUFFER YARDS
- THERE ARE NO EXISTING WOODED AREAS AND ISOLATED TREES OR WETLANDS WITHIN THE PROJECT LIMITS
- THERE ARE NO PROPOSED ABOVE GROUND STRUCTURES ASSOCIATED WITH THIS PROJECT
- THERE ARE NO POST-CONSTRUCTION AREAS FOR OUTDOOR STORAGE PROPOSED FOR THIS PROJECT
- THERE ARE NO PERMANENT DUMPSTER LOCATIONS ASSOCIATED WITH THIS PROJECT
- NO EXTERIOR LIGHTING IS TO BE A PART OF THIS PROJECT
- NO PERMANENT SIGNS ARE TO BE A PART OF THIS PROJECT
- ANY DIRECTIONAL AND INFORMATIONAL SIGNS PLACED DURING CONSTRUCTION SHALL BE REMOVED AT TIME OF SUBSTANTIAL COMPLETION

INTENDED USE:
THE 26 SPACE PARKING LOT IS TO BE USED FOR EMPLOYEE AND OVERFLOW PARKING FOR QUALITY MILL AND SUPPLY LOCATED ON THE ADJACENT LOT (LOT 8)



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Harold Force

PROJECT
QUALITY MILL SUPPLY

PARKING LOT

FRANKLIN, INDIANA

SHEET TITLE
SITE & UTILITY PLAN

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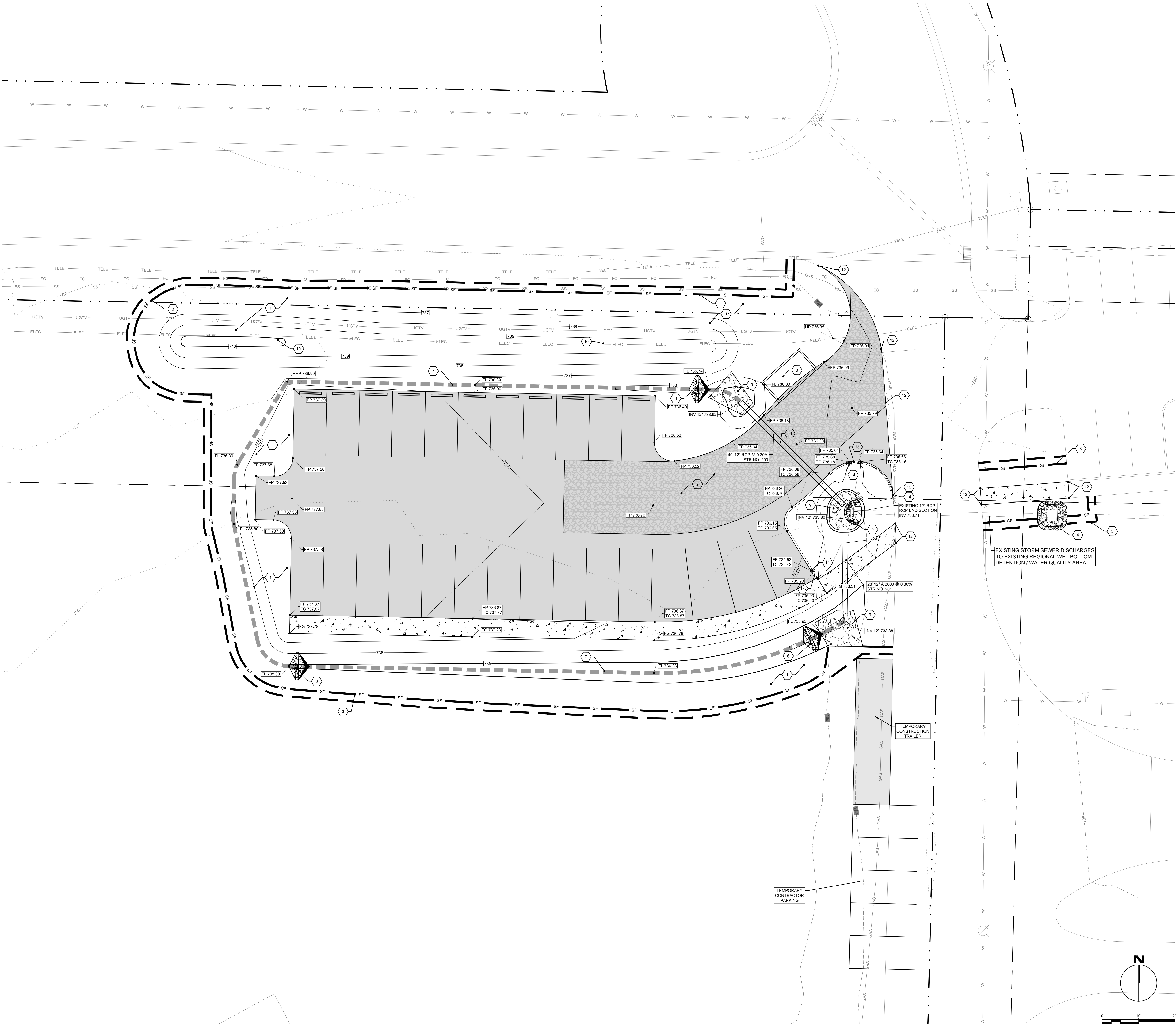
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PROJECT NUMBER
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C101
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MSS

Drawing file: \\nDesign\Projects\2018\18391 Quality Mill Supply Parking Lot\CAD Files\Site\18391.dwg Date: 08 Oct 2018 - 3:54pm



EROSION KEY NOTES

- 1 TEMPORARY / PERMANENT / DORMANT / FROST SEEDING, SEE DETAIL 1 / C401
- 2 TEMPORARY GRAVEL CONSTRUCTION ENTRANCE / EXIT, SEE DETAIL 2 / C401
- 3 TEMPORARY SILT FENCE, SEE DETAIL 3 / C401
- 4 TEMPORARY GRAVEL DONUT INLET PROTECTION, SEE DETAIL 4 / C401
- 5 TEMPORARY FILTER BERM SEE DETAIL 5 / C401
- 6 ROCK CHECK DAM, SEE DETAIL 6 / C401
- 7 EROSION CONTROL BLANKET, SEE DETAIL 7 / C401
- 8 TEMPORARY CONCRETE WASHOUT, SEE DETAIL 8 / C401
- 9 RIP-RAP ON FILTER FABRIC, SEE DETAIL 9 / C401
- 10 TEMPORARY TOPSOIL STOCKPILE LOCATION
- 11 STANDARD DUTY ASPHALT PAVEMENT
- 12 CONCRETE SIDEWALK

DRAINAGE KEY NOTES

- 13 FULL DEPTH GRANULAR BACKFILL, REQUIRED - SEE DETAIL 1 / C401
- 14 MATCH EXISTING GRADE
- 15 24" CURB CUT TO ALLOW DRAINAGE
- 16 BULL NOSE 6" CURB AT END

EXISTING LEGEND

- EX SANITARY SEWER MANHOLE + PIPE
- EX WATER MAIN
- EX STORM SEWER MANHOLE + PIPE
- EX FIBER OPTIC LINE
- EX TELEPHONE LINE
- EX CABLE TELEVISION LINE
- EX GAS LINE

GRADING LEGEND

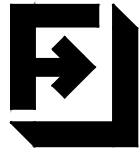
- TOP OF CURB / FINISH PAVEMENT ELEVATION
- INTERMEDIATE CONTOUR
- INDEX CONTOUR
- FINISH FLOOR ELEVATION
- FINISH GRADE ELEVATION
- FINISH PAVEMENT ELEVATION
- LIMITS OF CONSTRUCTION

EROSION INFORMATION

AREA OF DISTURBANCE: 0.41 AC
ULTIMATE RECEIVING WATER: YOUNGS CREEK - AMITY DITCH
FOR ANY QUESTIONS, PLEASE CONTACT OUR ENVIRONMENTAL COMPLIANCE COORDINATOR, BRYAN SCHAEFER AT (812) 372-8441

GENERAL NOTES

- 1. TOPSOIL DEPTH ASSUMED TO BE 6 INCHES.
- 2. THE SITE EARTHWORK ASSUMES THAT ANY STRUCTURAL BORROW MATERIAL, OR EXCESS SPOIL MATERIAL, SHALL BE OBTAINED FROM, OR DISPOSED OF ON SITE.
- 3. CONTRACTOR TO VERIFY ALL EXISTING PIPE SIZES AND INVERTS PRIOR TO THE START OF CONSTRUCTION AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION AND COMPLETION OF AN EROSION CONTROL PLAN COMPLIANT WITH ALL APPLICABLE AGENCIES, INCLUDING THE PRE, DURING & POST CONSTRUCTION PROCEDURES. CONTRACTOR WILL ALSO BE RESPONSIBLE FOR ALL REQUIRED EROSION CONTROL PERMITTING AND ON SITE INSPECTIONS AND REMEDIATION BOTH DURING AND AFTER COMPLETION OF CONSTRUCTION, UNTIL SUCH TIME THAT THE NOTICE OF TERMINATION HAS BEEN FILED AND ACCEPTED



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Harold Force
PROJECT
QUALITY MILL SUPPLY

PARKING LOT

FRANKLIN, INDIANA
SHEET TITLE
GRADING & EROSION
CONTROL PLAN

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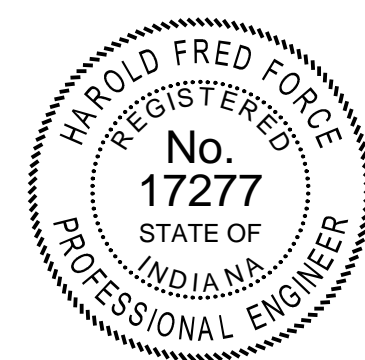
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Harold Force

PROJECT
QUALITY MILL SUPPLY

PARKING LOT

FRANKLIN, INDIANA

SHEET TITLE
LANDSCAPE PLAN

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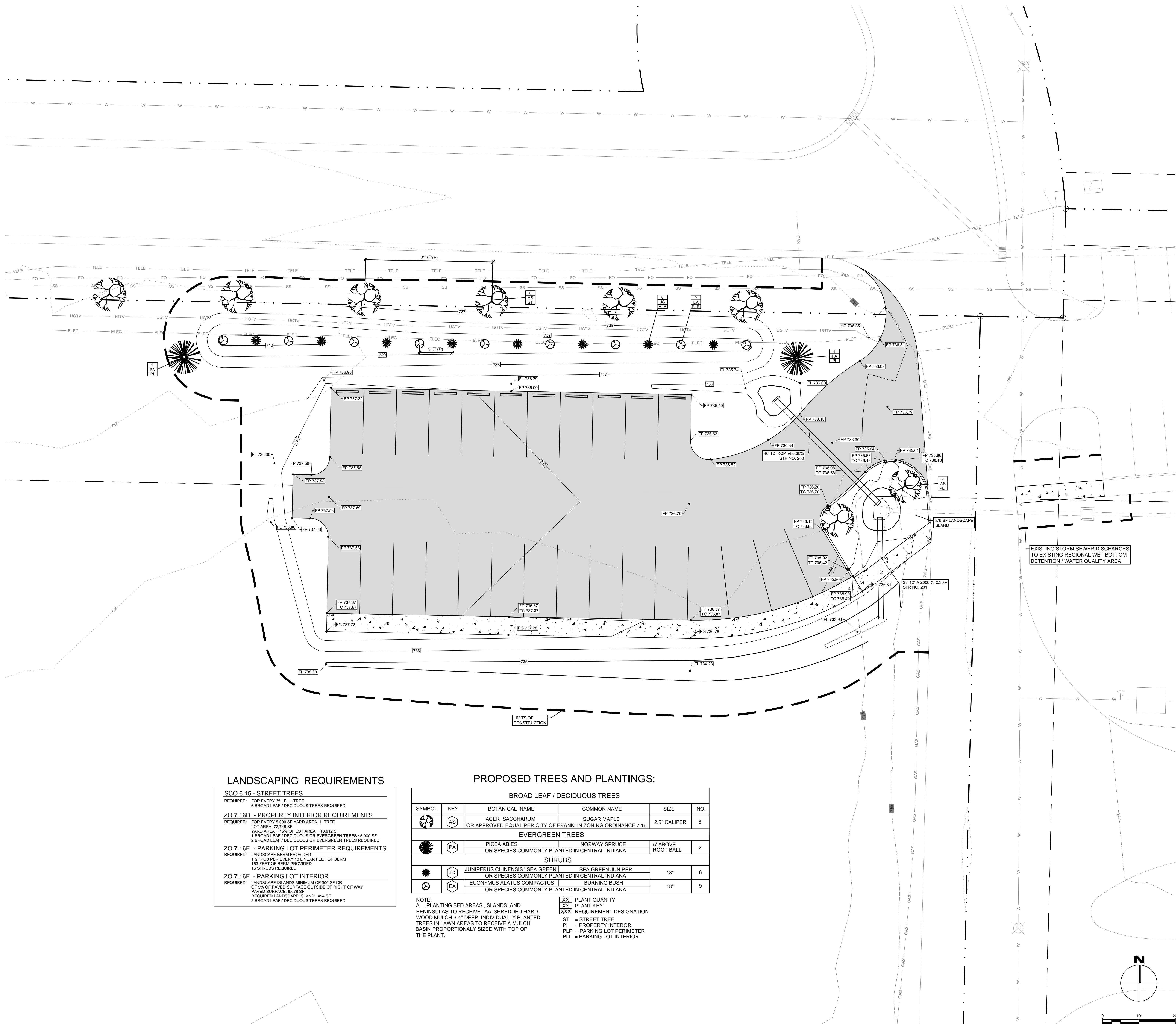
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CONSTRUCTION

PROJECT NUMBER
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SHEET NUMBER
C301

DRAWN BY
MSS



LANDSCAPING REQUIREMENTS

SCO 6.15 - STREET TREES

REQUIRED: FOR EVERY 35 LF, 1-TREE
6 BROAD LEAF / DECIDUOUS TREES REQUIRED

ZO 7.16D - PROPERTY INTERIOR REQUIREMENTS

REQUIRED: FOR EVERY 5,000 SF YARD AREA, 1-TREE
LOT AREA: 72,746 SF
YARD AREA = 15% OF LOT AREA = 10,912 SF
1 BROAD LEAF / DECIDUOUS OR EVERGREEN TREES / 5,000 SF
2 BROAD LEAF / DECIDUOUS OR EVERGREEN TREES REQUIRED

ZO 7.16E - PARKING LOT PERIMETER REQUIREMENTS

REQUIRED: LANDSCAPE BERM PROVIDED
1 SHRUB PER EVERY 10 LINEAR FEET OF BERM
163 FEET OF BERM PROVIDED
16 SHRUBS REQUIRED

ZO 7.16F - PARKING LOT INTERIOR

REQUIRED: LANDSCAPE ISLANDS MINIMUM OF 300 SF OR
OF 5% OF PAVED SURFACE OUTSIDE OF RIGHT OF WAY
PAVED SURFACE: 9,078 SF
REQUIRED LANDSCAPE ISLAND: 454 SF
2 BROAD LEAF / DECIDUOUS TREES REQUIRED

PROPOSED TREES AND PLANTINGS:

BROAD LEAF / DECIDUOUS TREES					
SYMBOL	KEY	BOTANICAL NAME	COMMON NAME	SIZE	NO.
	AS	ACER SACCHARUM	SUGAR MAPLE	2.5" CALIPER	8
OR APPROVED EQUAL PER CITY OF FRANKLIN ZONING ORDINANCE 7.16					
EVERGREEN TREES					
	PA	PICEA ABIES	NORWAY SPRUCE	5" ABOVE ROOT BALL	2
OR SPECIES COMMONLY PLANTED IN CENTRAL INDIANA					
SHRUBS					
	JC	JUNIPERUS CHINENSIS 'SEA GREEN'	SEA GREEN JUNIPER	18"	8
OR SPECIES COMMONLY PLANTED IN CENTRAL INDIANA					
	EA	EUONYMUS ALATUS COMPACTUS	BURNING BUSH	18"	9
OR SPECIES COMMONLY PLANTED IN CENTRAL INDIANA					

NOTE:
ALL PLANTING BED AREAS, ISLANDS, AND PENINSULAS TO RECEIVE "AA" SHREDDED HARD-WOOD MULCH 3-4" DEEP. INDIVIDUALLY PLANTED TREES IN LAWN AREAS TO RECEIVE A MULCH BASIN PROPORTIONALLY SIZED WITH TOP OF THE PLANT.

XX PLANT QUANTITY
XX PLANT KEY
XX REQUIREMENT DESIGNATION
ST = STREET TREE
PI = PROPERTY INTERIOR
PLP = PARKING LOT PERIMETER
PLI = PARKING LOT INTERIOR

1

PRACTICE 3.11
TEMPORARY SEEDING

REQUIREMENTS

Site and seedbed preparation: Graded and fertilizer applied.

Plant Species: Selected on the basis of quick germination, growth, and time of year to be seeded (see Exhibit 3.11-B).

Mix: Clean gran, straw, hay, wood, fine, etc., to protect seedbed and encourage plant growth.

Seeding Frequency: As often as possible following construction activity. Daily seeding of rough graded areas when the soil is loose and moist is usually most effective.

APPLICATION

(Exhibit 3.11-A and C)

Grade the site as specified in the construction plan.

SEEDING PREPARATION:

- Test soil to determine its nutrient levels. (Contact your county SWDC or Cooperative Extension office for assistance and soils information.)
- Fertilize as recommended by the soil test. If testing is not done, consider applying 400-600 lbs/acre of 12-12-12 analysis, or equivalent, fertilizer.
- Work the fertilizer into the soil 2-4 in., deep with a disk or rake operated across the slope.

SEEDING:

- Select a seeding mixture and rate from Exhibit 3.11-B, and plant at depth and on dates shown, including available soil testing analyses.)
- Apply seed uniformly with a drill or cutspreader-seeder or by broadcasting, and cover to the depth shown in Exhibit 3.11-B.
- Match seeded areas to increase seeding success. Anchor all mounds by comping or tacking. Use of nesting or erosion control blankets is possible, but may not be cost-effective for temporary seeding.

Exhibit 3.11-B, Temporary Seeding Recommendations

Seed species*	Rate/acre	Depth (in.)	Optimum soil pH
Wheat or rye	150 lbs.	1 to 1 1/2 in.	6.5 to 10.0
Spring oats	100 lbs.	1 in.	3.0 to 4.5
Annual ryegrass	40 lbs.	3/8 to 1 in.	3.0 to 5.1
			8.0 to 9.1

* Perennial species may be used as temporary cover, especially if the area to be seeded will remain idle for more than a year (Practice 3.12).

* Seeding time varies by climate but increases from the date of seeding table.

MAINTENANCE

- Inspect periodically after planting to see that vegetative stands are adequately established. Re-seed if necessary.
- Check for erosion damage after 2nd of rainfall and repair, reseed and mulch if necessary.
- Topdress fall seeded wheat or rye seedlings with 50 lbs/acre of nitrogen in February or March if nitrogen deficiency is apparent. (Exhibit 3.11-B shows only one-tenth fall seed rate.)

1

PRACTICE 3.13
DORMANT & FROST SEEDING

PURPOSES

- To provide early germination and soil stabilization in the spring.
- To reduce sediment runoff to downstream areas.
- To improve the visual aesthetics of the construction area.
- To repair previous seedings.

REQUIREMENTS

Site and seedbed preparation: Graded as needed, and lime and fertilizer applied.

Plant Species: Selected on the basis of soil type, adaptability to the region, and planned use of the area (see Exhibits 3.13-B and 3.13-C).

APPLICATION

(Exhibit 3.13-B and C)

SITE PREPARATION:

- Grade the site to a seedbed.
- Install needed erosion/water runoff control practices, such as temporary or permanent diversions, sediment basins, all fences, or straw bale dams (Practices 3.21, 3.22, 3.32, 3.74 or 3.75).

FOR DORMANT SEEDING:

Site and seedbed preparation and mulching can be done months ahead of actual seeding or if the existing ground is too erodible, seeding can be directly into it. Seeding dates: Dec. 1-40; 28 (north of US-40); Dec. 10-15 (south of US-40).

1. Broadcast Fertilizer as recommended by a soil test, or if testing was not done consider applying 400-600 lbs/acre of 12-12-12 analysis or equivalent, fertilizer.

2. Apply mulch upon completion of grading (Practice 3.15).

3. Select an appropriate seed species or mixture from Exhibit 3.13-B or Exhibit 3.13-C, and broadcast on top of the mulch and/or into existing ground cover at rate shown. Do not work the seed into the soil.

FOR FROST SEEDING:

Seed is broadcast over the prepared seedbed and incorporated into the soil at natural freeze-thaw action.

Seeding dates: Feb. 28-Mar. 28 (north of US-40); Feb. 15-Mar. 15 (south of US-40).

- Broadcast Fertilizer as recommended by a soil test, or if testing was not done consider applying 400-600 lbs/acre of 12-12-12 analysis or equivalent, fertilizer.
- Apply mulch upon completion of grading (Practice 3.15).
- Select an appropriate seed species or mixture from Exhibit 3.13-B or Exhibit 3.13-C, and broadcast on top of the mulch and/or into existing ground cover at rate shown. Do not work the seed into the soil.

Exhibit 3.13-B, Temporary Dormant or Frost Seeding Recommendations

Seed species*	Rate per acre
Wheat or rye	150 lbs.
Spring oats	100 lbs.
Annual ryegrass	40 lbs.

* Perennial species may be used as a temporary cover, especially if the area to be seeded will remain idle for more than a year (Practice 3.12).

Exhibit 3.13-C, Permanent Dormant of Frost Seeding Recommendations

This table provides several seed species. Additional seed species and mixtures are available commercially. When selecting a mixture, consider site conditions, including soil properties, depth, aspect and the tolerance of each species to shade and droughtiness.

Seed species*	Rate per acre	Optimum soil pH
1. Perennial ryegrass	50 to 75 lbs.	5.6 to 7.0
+ white or ladino clover*	1 to 2 lbs.	
2. Kentucky bluegrass	30 lbs.	5.5 to 7.5
+ Kentucky	6 lbs.	
+ timothy	6 lbs.	
+ perennial ryegrass	1 to 2 lbs.	
+ white or ladino clover*	1 to 2 lbs.	
3. Perennial ryegrass	50 to 75 lbs.	5.6 to 7.0
+ prairie switchgrass	20 to 45 lbs.	
4. Prairie switchgrass	50 to 75 lbs.	5.5 to 7.5
+ white or ladino clover*	1 to 2 lbs.	

STEP BANKS AND CUTS, LOW MAINTENANCE AREAS (NOT MOVED)

- Prairie switchgrass 50 to 75 lbs. | 5.5 to 7.5 || + white or ladino clover* | 1 to 2 lbs. | |
| 2. Prairie switchgrass | 50 to 75 lbs. | 5.5 to 7.5 |
| + red clover* | 10 to 20 lbs. | |

Revegetation (with US-40)

- Orchardgrass 20 to 30 lbs. | 5.6 to 7.0 || + red clover* | 10 to 20 lbs. | |
| 3. Orchardgrass | 20 to 30 lbs. | 5.6 to 7.0 |
| + red clover* | 10 to 20 lbs. | |

LAWS AND HIGH MAINTENANCE AREAS

- Bluegrass 10 to 20 lbs. | 5.5 to 7.5 || 2. Perennial ryegrass (with US-40) | 70 to 100 lbs. | 5.6 to 7.0 |
| 3. Prairie switchgrass (with US-40) | 100 to 200 lbs. | 5.6 to 7.5 |
| + bluegrass | 10 to 20 lbs. | |

CHANNELS AND AREAS OF CONCENTRATED FLOW

- Perennial ryegrass 10 to 20 lbs. | 5.6 to 7.0 || + white or ladino clover* | 1 to 2 lbs. | |
| 2. Kentucky bluegrass | 30 lbs. | 5.5 to 7.5 |
| + Kentucky | 6 lbs. | |
| + timothy | 6 lbs. | |
| + perennial ryegrass | 1 to 2 lbs. | |
| + white or ladino clover* | 1 to 2 lbs. | |
| 3. Prairie switchgrass | 50 to 75 lbs. | 5.5 to 7.5 |
| 4. Prairie switchgrass | 50 to 75 lbs. | 5.5 to 7.5 |
| + perennial bluegrass | 20 to 30 lbs. | |
| + Kentucky bluegrass | 20 to 30 lbs. | |

* For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring seeded, although the grass may be fall-seeded and the legume frost-seeded (Practice 3.15); and (c) if legumes are fall-seeded, do so no early fall.

NOTE: An oat or wheat comparison or nurse crop may be used with any of the above permanent seedings mixtures. If so, it is best to seed during the fall seeding period, especially after Sept. 15, and at the following rates: spring oats 4 to 34 lbs/acre; wheat no more than 1/2 lb/acre.

MAINTENANCE

- Inspect periodically, especially after 2nd of rainfall, until the stand is successfully established. (Characteristics of a successful stand include vigorous dark green or lush green seedlings; a successful stand include vigorous dark green or lush green seedlings with some plants, legumes, and grasses well inter-mixed; green leaves; and the plants remaining green throughout the summer, at least at the part base.)
- Plan to add fertilizer to the following growing season according to soil test recommendations.
- Repair damaged, bare or sparse areas by filling any gullies, re-tiling, over- or re-seeding, and mulching.
- If plant cover is sparse or patchy, review the plant materials chosen, soil fertility, moisture condition, and mulching; then repair the affected area either by over-seeding or by re-seeding and mulching after re-preparing the seedbed.
- If vegetation fails to grow, consider soil testing to determine acidity or nutrient deficiency problems. Contact your SWDC or Cooperative Extension office for assistance.)
- If additional fertilization is needed to get a satisfactory stand, do so according to soil test recommendations.

1

PRACTICE 3.12
PERMANENT SEEDING

REQUIREMENTS

Site and seedbed preparation: Graded, and lime and fertilizer applied.

Plant Species: Selected on the basis of soil type, soil pH, region of the state, time of year, and planned use of the area to be seeded (see Exhibit 3.12-C).

Mix: Clean gran, straw, hay, wood, fine, etc., to protect seedbed and encourage plant growth. The mulch may need to be anchored to reduce erosion.

Seeding Frequency: As often as possible following construction activity. Daily seeding of rough graded areas when the soil is loose and moist is usually most effective.

APPLICATION

(Exhibit 3.12-A, C and D)

Permanently seed all final grade areas (e.g., landscape terraces, drainage swales, erosion control structures, etc.) as each is completed and all areas where additional work is not scheduled for a period of more than a year.

SITE PREPARATION:

- Install practices needed to control erosion, sedimentation, and runoff prior to seeding. These include temporary and permanent diversions, sediment traps and basins, all fences, and straw bale dams (Practices 3.21, 3.22, 3.72, 3.74, and 3.75).
- Grade the site and fill in depressions that can collect water.
- Adjust topsoil to achieve the needed depth for establishment of vegetation (Practice 3.10).

SEEDING PREPARATION:

- Test soil to determine pH and nutrient levels. (Contact your county SWDC or Cooperative Extension office for assistance and soils information, including available soil testing services.)
- If soil pH is unfavorable for the species to be seeded, apply lime according to test recommendations.
- Fertilize as recommended by the soil test. If testing was not done, consider applying 400-600 lbs/acre of 12-12-12 analysis, or equivalent, fertilizer.
- Till the soil to obtain a uniform seedbed, working the fertilizer and lime into the soil 2-4 in., deep with a disk or rake operated across the slope (Exhibit 3.12-B).

SEEDING:

Optimum seeding dates are Mar. 1-May 10 and Aug. 10-Sept. 30. Permanent seeding done between May 10 and Aug. 10 may need to be irrigated. As an alternative, use temporary seeding (Practice 3.11) until the preferred date for permanent seeding.

- Select a seeding mixture and rate from Exhibit 3.12-C, based on site conditions, soil pH, intended land use, and expected level of maintenance.
- Apply seed uniformly with a drill or cutspreader-seeder (Exhibit 3.12-D) or by broadcasting, & cover to a depth of 1/4-1/2 in.
- If drilling or broadcasting, firm the seedbed with a roller or cutspreader.
- Match all seeded areas (Practice 3.15). Consider using erosion blankets on sloping areas (Practice 3.17). Seeding is done with a hydroseeder. Fertilizer and mulch can be applied with the seed in a slurry mixture.)

Exhibit 3.12-C, Permanent Seeding Recommendations

This table provides several seed species. Additional seed species and mixtures are available commercially. When selecting a mixture, consider site conditions, including soil properties (e.g., soil pH and drainage), slope aspect and the tolerance of each species to shade and droughtiness.

Seed species*	Rate per acre	Optimum soil pH
1. Perennial ryegrass	50 to 75 lbs.	5.6 to 7.0
+ white or ladino clover*	1 to 2 lbs.	
2. Kentucky bluegrass	30 lbs.	5.5 to 7.5
+ Kentucky	6 lbs.	
+ timothy	6 lbs.	
+ perennial ryegrass	1 to 2 lbs.	
+ white or ladino clover*	1 to 2 lbs.	
3. Perennial ryegrass	50 to 75 lbs.	5.6 to 7.0
+ prairie switchgrass	20 to 45 lbs.	
4. Prairie switchgrass	50 to 75 lbs.	5.5 to 7.5
+ white or ladino clover*	1 to 2 lbs.	

STEP BANKS AND CUTS, LOW MAINTENANCE AREAS (NOT MOVED)

- Prairie switchgrass 50 to 75 lbs. | 5.5 to 7.5 || + white or ladino clover* | 1 to 2 lbs. | |
| 2. Prairie switchgrass | 50 to 75 lbs. | 5.5 to 7.5 |
| + red clover* | 10 to 20 lbs. | |

Revegetation (with US-40)

- Orchardgrass 20 to 30 lbs. | 5.6 to 7.0 || + red clover* | 10 to 20 lbs. | |
| 3. Orchardgrass | 20 to 30 lbs. | 5.6 to 7.0 |
| + red clover* | 10 to 20 lbs. | |

LAWS AND HIGH MAINTENANCE AREAS

- Bluegrass 10 to 20 lbs. | 5.5 to 7.5 || 2. Perennial ryegrass (with US-40) | 70 to 100 lbs. | 5.6 to 7.0 |
| 3. Prairie switchgrass (with US-40) | 100 to 200 lbs. | 5.6 to 7.5 |
| + bluegrass | 10 to 20 lbs. | |

CHANNELS AND AREAS OF CONCENTRATED FLOW

- Perennial ryegrass 10 to 20 lbs. | 5.6 to 7.0 || + white or ladino clover* | 1 to 2 lbs. | |
| 2. Kentucky bluegrass | 30 lbs. | 5.5 to 7.5 |
| + Kentucky | 6 lbs. | |
| + timothy | 6 lbs. | |
| + perennial ryegrass | 1 to 2 lbs. | |
| + white or ladino clover* | 1 to 2 lbs. | |
| 3. Prairie switchgrass | 50 to 75 lbs. | 5.5 to 7.5 |
| 4. Prairie switchgrass | 50 to 75 lbs. | 5.5 to 7.5 |
| + perennial bluegrass | 20 to 30 lbs. | |
| + Kentucky bluegrass | 20 to 30 lbs. | |

* For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring seeded, although the grass may be fall-seeded and the legume frost-seeded (Practice 3.15); and (c) if legumes are fall-seeded, do so no early fall.

NOTE: An oat or wheat comparison or nurse crop may be used with any of the above permanent seedings mixtures. If so, it is best to seed during the fall seeding period, especially after Sept. 15, and at the following rates: spring oats 4 to 34 lbs/acre; wheat no more than 1/2 lb/acre.

MAINTENANCE

- Inspect periodically, especially after 2nd of rainfall, until the stand is successfully established. (Characteristics of a successful stand include vigorous dark green or lush green seedlings with some plants, legumes, and grasses well inter-mixed; green leaves; and the plants remaining green throughout the summer, at least at the part base.)
- Plan to add fertilizer to the following growing season according to soil test recommendations.
- Repair damaged, bare or sparse areas by filling any gullies, re-tiling, over- or re-seeding, and mulching.
- If plant cover is sparse or patchy, review the plant materials chosen, soil fertility, moisture condition, and mulching; then repair the affected area either by over-seeding or by re-seeding and mulching after re-preparing the seedbed.
- If vegetation fails to grow, consider soil testing to determine acidity or nutrient deficiency problems. Contact your SWDC or Cooperative Extension office for assistance.)
- If additional fertilization is needed to get a satisfactory stand, do so according to soil test recommendations.

1

PRACTICE 3.12
PERMANENT SEEDING

REQUIREMENTS

Site and seedbed preparation: Graded, and lime and fertilizer applied.

Plant Species: Selected on the basis of soil type, soil pH, region of the state, time of year, and planned use of the area to be seeded (see Exhibit 3.12-C).

Mix: Clean gran, straw, hay, wood, fine, etc., to protect seedbed and encourage plant growth. The mulch may need to be anchored to reduce erosion.

Seeding Frequency: As often as possible following construction activity. Daily seeding of rough graded areas when the soil is loose and moist is usually most effective.

APPLICATION

(Exhibit 3.12-A, C and D)

Permanently seed all final grade areas (e.g., landscape terraces, drainage swales, erosion control structures, etc.) as each is completed and all areas where additional work is not scheduled for a period of more than a year.

SITE PREPARATION:

- Install practices needed to control erosion, sedimentation, and runoff prior to seeding. These include temporary and permanent diversions, sediment traps and basins, all fences, and straw bale dams (Practices 3.21, 3.22, 3.72, 3.74, and 3.75).
- Grade the site and fill in depressions that can collect water.
- Adjust topsoil to achieve the needed depth for establishment of vegetation (Practice 3.10).

SEEDING PREPARATION:

- Test soil to determine pH and nutrient levels. (Contact your county SWDC or Cooperative Extension office for assistance and soils information, including available soil testing services.)
- If soil pH is unfavorable for the species to be seeded, apply lime according to test recommendations.
- Fertilize as recommended by the soil test. If testing was not done, consider applying 400-600 lbs/acre of 12-12-12 analysis, or equivalent, fertilizer.
- Till the soil to obtain a uniform seedbed, working the fertilizer and lime into the soil 2-4 in., deep with a disk or rake operated across the slope (Exhibit 3.12-B).

SEEDING:

Optimum seeding dates are Mar. 1-May 10 and Aug. 10-Sept. 30. Permanent seeding done between May 10 and Aug. 10 may need to be irrigated. As an alternative, use temporary seeding (Practice 3.11) until the preferred date for permanent seeding.

- Select a seeding mixture and rate from Exhibit 3.12-C, based on site conditions, soil pH, intended land use, and expected level of maintenance.
- Apply seed uniformly with a drill or cutspreader-seeder (Exhibit 3.12-D) or by broadcasting, & cover to a depth of 1/4-1/2 in.
- If drilling or broadcasting, firm the seedbed with a roller or cutspreader.
- Match all seeded areas (Practice 3.15). Consider using erosion blankets on sloping areas (Practice 3.17). Seeding is done with a hydroseeder. Fertilizer and mulch can be applied with the seed in a slurry mixture.)

Exhibit 3.12-C, Permanent Seeding Recommendations

This table provides several seed species. Additional seed species and mixtures are available commercially. When selecting a mixture, consider site conditions, including soil properties (e.g., soil pH and drainage), slope aspect and the tolerance of each species to shade and droughtiness.

Seed species*	Rate per acre	Optimum soil pH
1. Perennial ryegrass	50 to 75 lbs.	5.6 to 7.0
+ white or ladino clover*	1 to 2 lbs.	
2. Kentucky bluegrass	30 lbs.	5.5 to 7.5
+ Kentucky	6 lbs.	
+ timothy	6 lbs.	
+ perennial ryegrass	1 to 2 lbs.	
+ white or ladino clover*	1 to 2 lbs.	
3. Perennial ryegrass	50 to 75 lbs.	5.6 to 7.0
+ prairie switchgrass	20 to 45 lbs.	
4. Prairie switchgrass	50 to 75 lbs.	5.5 to 7.5
+ white or ladino clover*	1 to 2 lbs.	

STEP BANKS AND CUTS, LOW MAINTENANCE AREAS (NOT MOVED)

- Prairie switchgrass 50 to 75 lbs. | 5.5 to 7.5 || + white or ladino clover* | 1 to 2 lbs. | |
| 2. Prairie switchgrass | 50 to 75 lbs. | 5.5 to 7.5 |
| + red clover* | 10 to 20 lbs. | |

Revegetation (with US-40)

- Orchardgrass 20 to 30 lbs. | 5.6 to 7.0 || + red clover* | 10 to 20 lbs. | |
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LAWS AND HIGH MAINTENANCE AREAS

- Bluegrass 10 to 20 lbs. | 5.5 to 7.5 || 2. Perennial ryegrass (with US-40) | 70 to 100 lbs. | 5.6 to 7.0 |
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| + bluegrass | 10 to 20 lbs. | |

CHANNELS AND AREAS OF CONCENTRATED FLOW

- Perennial ryegrass 10 to 20 lbs. | 5.6 to 7.0 || + white or ladino clover* | 1 to 2 lbs. | |
| 2. Kentucky bluegrass | 30 lbs. | 5.5 to 7.5 |
| + Kentucky | 6 lbs. | |
| + timothy | 6 lbs. | |
| + perennial ryegrass | 1 to 2 lbs. | |
| + white or ladino clover* | 1 to 2 lbs. | |
| 3. Prairie switchgrass | 50 to 75 lbs. | 5.5 to 7.5 |
| 4. Prairie switchgrass | 50 to 75 lbs. | 5.5 to 7.5 |
| + perennial bluegrass | 20 to 30 lbs. | |
| + Kentucky bluegrass | 20 to 30 lbs. | |

* For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring seeded, although the grass may be fall-seeded and the legume frost-seeded (Practice 3.15); and (c) if legumes are fall-seeded, do so no early fall.

NOTE: An oat or wheat comparison or nurse crop may be used with any of the above permanent seedings mixtures. If so, it is best to seed during the fall seeding period, especially after Sept. 15, and at the following rates: spring oats 4 to 34 lbs/acre; wheat no more than 1/2 lb/acre.

MAINTENANCE

- Inspect periodically, especially after 2nd of rainfall, until the stand is successfully established. (Characteristics of a successful stand include vigorous dark green or lush green seedlings with some plants, legumes, and grasses well inter-mixed; green leaves; and the plants remaining green throughout the summer, at least at the part base.)
- Plan to add fertilizer to the following growing season according to soil test recommendations.
- Repair damaged, bare or sparse areas by filling any gullies, re-tiling, over- or re-seeding, and mulching.
- If plant cover is sparse or patchy, review the plant materials chosen, soil fertility, moisture condition, and mulching; then repair the affected area either by over-seeding or by re-seeding and mulching after re-preparing the seedbed.
- If vegetation fails to grow, consider soil testing to determine acidity or nutrient deficiency problems. Contact your SWDC or Cooperative Extension office for assistance.)
- If additional fertilization is needed to get a satisfactory stand, do so according to soil test recommendations.

2

PRACTICE 3.01
TEMPORARY GRAVEL CONSTRUCTION ENTRANCE / EXIT PAD

PURPOSE

- To provide a stable entrance/exit condition from the construction site.
- To keep mud and sediment off public roads.

REQUIREMENTS

(Exhibit 3.01-A)

Material: 2-3 in. washed stone (INDOT CA No. 2) over a stable foundation. Thickness: 6 in. minimum. Width: 20 ft. minimum. Length: 100 ft. minimum. The length can be shorter for small sites such as for an individual home. Washing facility (optional): Level area with 3 in. washed stone minimum or permanent rock and waste water diverted to a sediment trap or basin (Practice 3.72). Geotextile fabric: Underlaid. May be used under wet conditions for soils within a high seasonal water table to provide greater bearing strength.

Exhibit 3.01-B, Plan of a temporary gravel construction entrance/exit pad.

Installation

(Exhibit 3.01-C)

- Avoid locating on steep slopes or at curves in public roads.
- Remove all vegetation and other objectionable material from the foundation area, and grade and crown for positive drainage.
- If slope towards the road exceeds 2%, construct a 6-ft.-high water bar (with) 5:1 side slopes across the foundation area about 15 ft. from the entrance to divert runoff away from the road (Practice 3.20) (see Exhibit 3.01-C).
- Install pipe under the pad if needed to maintain proper public road drainage.
- If wet conditions are anticipated, place geotextile fabric on the graded foundation to improve stability.
- Place stone to dimensions and grade shown in the erosion/sediment control plan, leaving the surface smooth and sloped for drainage.
- Divert all surface runoff and drainage from the stone pad to a sediment trap or basin.

Exhibit 3.01-C, Temporary construction entrance/exit pad with diversion ridge where grade exceeds 2%.

Maintenance

- Inspect entrance pad and sediment disposal area weekly and after 2nd of rainfall or heavy use.
- Reshape pad as needed for drainage and runoff control.
- Top dress with clean stone as needed.
- Immediately remove mud and sediment tracked or washed onto public roads by brushing or sweeping. Flushing should only be used if the water is conveyed into a sediment trap or basin.
- Repair any broken road pavement immediately.

3

PRACTICE 3.74
SILT FENCE (SEDIMENT FENCE)

PURPOSE

To retain sediment from small, sloping disturbed areas by reducing the velocity of sheet flow.

NOTE: Sil fence captures sediment by ponding water to allow deposition, not by filtration. Although the practice usually works best in conjunction with temporary basins, traps, or diversions, it can be sufficiently effective to be used alone. A sil fence is not recommended for use as a diversion, but is a useful access to a stream, channel or anywhere that concentrated flow is anticipated.

REQUIREMENTS

(Exhibit 3.74-A and C)

Drainage Area: Limited to 1/4 acre per 100 ft. of fence; further restricted by slope (see Exhibit 3.74-B).

Location: Fence nearly level, approximately following the land contour, and at least 10 ft. from top of slope to provide a broad, shallow ponding area.

French: 8 in. minimum depth, flat-bottom or v-shaped, filled with compacted soil or gravel to bury lower portion of fence and support the anchor fence fabric.

Support posts: 2 x 4-in. hardwood posts (if used) or steel fence posts set at least 1 ft. deep. (Steel posts should protrude for bettering fabric.)

Spacing of posts: 8 ft. maximum if fence supported by wire, 4 ft. for extra-strength fabric without wire backing.

Fence height: High enough so depth of impounded water does not exceed 1 1/2 ft. at any point along fence line.

Support wire (optional): 1/4 gauge, 6 in. wire fence (needed if using standard-strength fabric).

Fence fabric: Woven or non-woven geo- textile fabric with specified filtering efficiency and tensile strength (see Exhibit 3.74-C) and contains UV inhibitors and stabilizers to ensure 6-mo. minimum life at temperatures 0° to 120° F.

* If looks shall be installed in sil fence every 100'

* Some commercial sil fences come ready to install, with support posts attached and requiring no wire support.

Exhibit 3.74-C, Specifications Minimums for Sil Fence Fabric

Physical Property	Woven Fabric	Non-woven fabric
Filtering efficiency	90%	85%
Tensile strength at 2% elongation	200 lbs./in.	200 lbs./in.
Stitch strength	200 lbs./in.	200 lbs./in.
Extra strength	200 lbs./in.	200 lbs./in.
Barry flow rate	1.5 gal/min./sq. ft.	1.5 gal/min./sq. ft.
Water flow rate	2.0 gal/min./sq. ft.	2.0 gal/min./sq. ft.
UV tolerance	10%	85%

Outlet (optional): To allow for side-slope flow without overtopping fence. Placed along fence line to limit water depth to 1 to 1 1/2 ft. maximum. Outlet: 1 ft. high maximum, wet width -4 ft. maximum; splash pad -5 ft. wide, 3 ft. long, 1 ft. thick minimum.

INSTALLATION

SITE PREPARATION:

- Plan for the fence to be at least 10 ft. from the toe of the slope to provide a sediment storage area.
- Provide access to the area a sediment cleanout will be needed.
- Outlet CONSTRUCTION (OPTIONAL):
 - Determine the appropriate location for a reinforced, stabilized bypass flow outlet.
 - Set the outlet elevation so that water depth cannot exceed 1 to 1 1/2 ft. at the outlet point along the fence line.
 - Locate the outlet well support posts no more than 4 ft. apart, and install a horizontal brace between them. (Wire height should be no more than 1 ft. and water depth no more than 1 to 1 1/2 ft. anywhere along the fence.)
 - Excavate the foundation for the outlet splash pad to minimum of 1 ft. deep, 5 ft. wide and 8 ft. long on level ground.
 - Fill the excavated foundation with INDOT CA No. 1 stone, being careful that the finished surface blends with the surrounding area, allowing no overfill.
 - Stabilize the area around the pad.

OUTLET CONSTRUCTION (OPTIONAL):

- Along the entire intended fence line, dig an 8 in. deep flat-bottomed or v-shaped trench.
- On the down-slope side of the trench, drive the wood or steel support posts at least 1 ft. into the ground, spacing them no more than 8 ft. apart. If the fence is supported by wire or 6 in. if extra strength fabric is used without support wire. Adjust spacing, if necessary, to ensure that posts are set at the low points along the fence line. (NOTE: If the fence has pre- attached posts or stakes, drive them deep enough so the fabric is satisfactory in the trench as described in step 4.)
- Fasten support wire fence to the outside side of the posts, extending it 8 in. into the trench.
- Run a continuous length of geotextile fabric in front of the support wire and posts avoiding joints, particularly at the top of the trench.
- If a joint is necessary, nail the overlap to the nearest post with a nail.
- Place the bottom 1 ft. of the trench on level ground, extending the remaining 4 in. toward the up-slope.
- Backfill the trench with compacted earth or gravel.

NOTE: If using a pre-packed commercial sil fence rather than constructing one, follow the manufacturer's installation instructions.

Exhibit 3.74-D, Detailed example of sil fence installation.

Maintenance

- Inspect the sil fence periodically and after 2nd of rainfall.
- If fence fabric tears, starts to decompose or in any way becomes ineffective, replace the affected portion immediately.
- Remove deposited sediment when it reaches half the height of the fence at its lowest point or is causing the fabric to bulge.
- Take care to avoid undermining the fence during clean out.
- After the contributing area has been stabilized, remove the fence and sediment deposits, bring the disturbed area to grade, and stabilize.

4

GRAVEL DONUT INLET PROTECTION

Purpose

(Exhibit 3.04-A)

* To reduce the risk of erosion at a storm drain inlet, allowing full use of the drain system during the construction period.

Requirements

(Exhibit 3.04-B)

Contributing drainage area: 1 acre maximum.

Capacity: Rainfall from a 2-in. frequency, 24-hr. duration storm event entering a storm drain without bypass flow.

Height of inlet: 12 in. above top of drain.

Ground for drain: INDOT CA No. 1 suitable fine, INDOT CA No. 5.

Slope of drain: Outside, 2:1 or flatter; inside 3:1 or flatter.

Exhibit 3.04-B, Perspective view of a gravel donut inlet protection with a temporary side down slope.

Exhibit 3.04-C, Cross-section view of a gravel donut inlet protection.

Installation

- Excavate to 8 in. deep and minimum 1.5 ft. wide area immediately in front of the storm drain.
- Install the gravel donut area by use of a gravel (INDOT CA No. 1) to a depth of 2 ft. above the top of the inlet and having 2:1 ft. flatter inside slope and 3:1 or flatter inside slope (the bottom of the gravel donut area is level with the finished area). The top of the gravel ring on the drainage side of the inlet should be 6 in. below ground elevation to Centerline of the drain.
- Excavate the area from the toe of the slope to the toe of the gravel donut extending a 2:1 or flatter slope.
- After the gravel donut area has been stabilized, remove and make needed repairs to the drain.

Maintenance

- Inspect the structure after each storm event, removing sediment and making needed repairs immediately.
- When the contributing drainage area has been stabilized, remove and properly dispose of any waste sediment and construction materials, and stabilize.

5

ROCK FILTER BERM

Purpose

(Exhibit 3.04-A)

* To reduce the risk of erosion at a storm drain inlet, allowing full use of the drain system during the construction period.

Requirements

(Exhibit 3.04-B)

Contributing drainage area: 1 acre maximum.

Capacity: Rainfall from a 2-in. frequency, 24-hr. duration storm event entering a storm drain without bypass flow.

Height of inlet: 12 in. above top of drain.

Ground for drain: INDOT CA No. 1 suitable fine, INDOT CA No. 5.

Slope of drain: Outside, 2:1 or flatter; inside 3:1 or flatter.

Exhibit 3.04-B, Perspective view of a gravel donut inlet protection with a temporary side down slope.

Exhibit 3.04-C, Cross-section view of a gravel donut inlet protection.

Installation

- Excavate to 8 in. deep and minimum 1.5 ft. wide area immediately in front of the storm drain.
- Install the gravel donut area by use of a gravel (INDOT CA No. 1) to a depth of 2 ft. above the top of the inlet and having 2:1 ft. flatter inside slope and 3:1 or flatter inside slope (the bottom of the gravel donut area is level with the finished area). The top of the gravel ring on the drainage side of the inlet should be 6 in. below ground elevation to Centerline of the drain.
- Excavate the area from the toe of the slope to the toe of the gravel donut extending a 2:1 or flatter slope.
- After the gravel donut area has been stabilized, remove and make needed repairs to the drain.

Maintenance

- Inspect the structure after each storm event, removing sediment and making needed repairs immediately.
- When the contributing drainage area has been stabilized, remove and properly dispose of any waste sediment and construction materials, and stabilize.

5

ROCK FILTER BERM

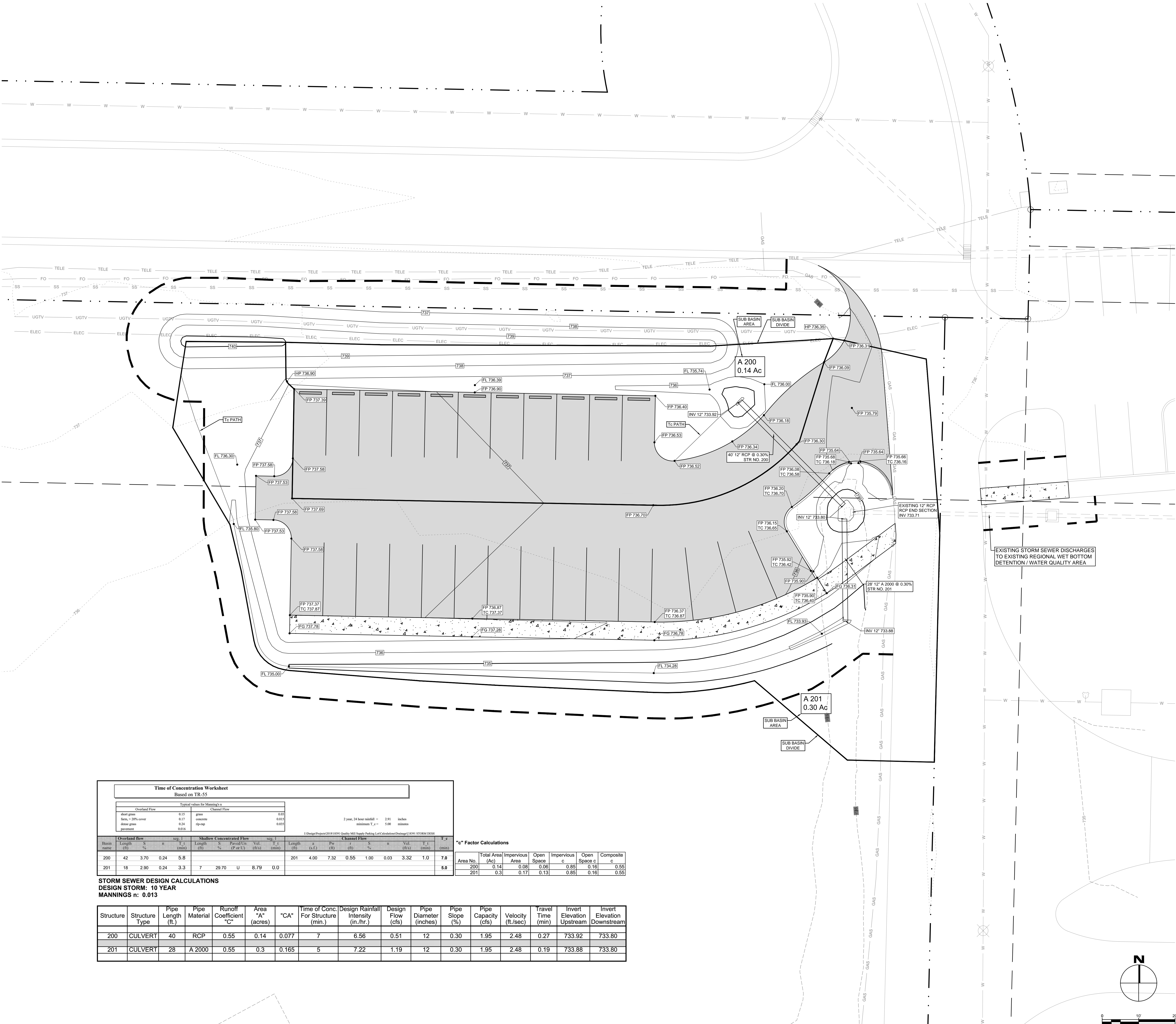
Purpose

(Exhibit 3.04-A)

* To reduce the risk of erosion at a storm drain inlet, allowing full use of the drain system during the construction period.

Requirements

(Exhibit 3.



DRAINAGE KEY NOTES

- 13 FULL DEPTH GRANULAR BACKFILL REQUIRED - SEE DETAIL 1 / C401
- 14 MATCH EXISTING GRADE
- 15 24" CURB CUT TO ALLOW DRAINAGE
- 16 BULL NOSE 6" CURB AT END

EXISTING LEGEND

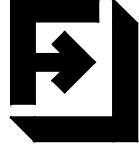
- EX SANITARY SEWER MANHOLE + PIPE
- EX WATER MAIN
- EX STORM SEWER MANHOLE + PIPE
- EX FIBER OPTIC LINE
- EX TELEPHONE LINE
- EX CABLE TELEVISION LINE
- EX GAS LINE

GRADING LEGEND

- TOP OF CURB / FINISH PAVEMENT ELEVATION
- INTERMEDIATE CONTOUR
- INDEX CONTOUR
- FINISH FLOOR ELEVATION
- FINISH GRADE ELEVATION
- FINISH PAVEMENT ELEVATION
- LIMITS OF CONSTRUCTION

GENERAL NOTES

- STORM SEWER DESIGN BASED ON 10 YEAR EVENT USING THE CITY OF FRANKLIN RAINFALL DATA.
- DESIGN CALCULATIONS BASED ON THE RATIONAL METHOD.
- DRAINAGE DESIGN PERFORMED IN ACCORDANCE WITH THE CITY OF FRANKLIN STORMWATER MANAGEMENT ORDINANCE AND THE JOHNSON COUNTY STORMWATER TECHNICAL MANUAL.
- STORM SEWER STRUCTURE NUMBERS AND DRAINAGE AREA NUMBERS CORRELATE WITH THE NUMBERS FOUND IN THE DRAINAGE DESIGN CALCULATIONS.



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DATES / REVISIONS
ISSUED FOR PERMIT 10/05/18



Harold Force
PROJECT
QUALITY MILL SUPPLY

PARKING LOT

FRANKLIN, INDIANA
SHEET TITLE
DRAINAGE DESIGN
PLAN

This drawing and all information contained herein is considered PRIVATE AND CONFIDENTIAL pursuant to the Non-Disclosure Agreement as executed between FORCE and Quality Mill Supply

This drawing and all information contained herein is considered PRIVATE AND CONFIDENTIAL pursuant to the Non-Disclosure Agreement as executed between FORCE and all invited sub-contractors

NOT RELEASED FOR
CONSTRUCTION

PROJECT NUMBER
18391

SHEET NUMBER
C500
DRAWN BY
MSS

Time of Concentration Worksheet											
Based on TR-55											
Overland Flow						Channel Flow					
Typical values for Manning's n											
short grass		0.15		grass		0.05		2 year, 24 hour rainfall = 2.91 inches minimum T _c = 5.00 minutes			
firm > 20% cover		0.17		concrete		0.015					
dense grass		0.24		rip-rap		0.035					
porous		0.016									
Overland Flow						Shallow Concentrated Flow					
seg. 1		seg. 1		seg. 1		seg. 1		seg. 1		seg. 1	
Basin name	Length (ft)	S	n	Length (ft)	S	Paved Un. (ft or in)	Vel. (ft/s)	Length (ft)	S	n	Vel. (ft/s)
201	42	3.70	0.24	5.8				201	4.00	7.32	0.55
200	18	2.90	0.24	3.3	7	29.70	U	8.79	0.0	0.03	3.32
											1.0
											7.0
											5.0

STORM SEWER DESIGN CALCULATIONS																
DESIGN STORM: 10 YEAR																
MANNINGS n: 0.013																
Structure	Structure Type	Pipe Length (ft.)	Pipe Material	Runoff Coefficient "C"	Area "A" (acres)	"CA"	Time of Conc. For Structure (min.)	Design Rainfall Intensity (in./hr.)	Design Flow (cfs)	Pipe Diameter (inches)	Pipe Slope (%)	Pipe Capacity (cfs)	Velocity (ft./sec)	Travel Time (min)	Invert Elevation Upstream	Invert Elevation Downstream
200	CULVERT	40	RCP	0.55	0.14	0.077	7	6.56	0.51	12	0.30	1.95	2.48	0.27	733.92	733.80
201	CULVERT	28	A 2000	0.55	0.3	0.165	5	7.22	1.19	12	0.30	1.95	2.48	0.19	733.88	733.80