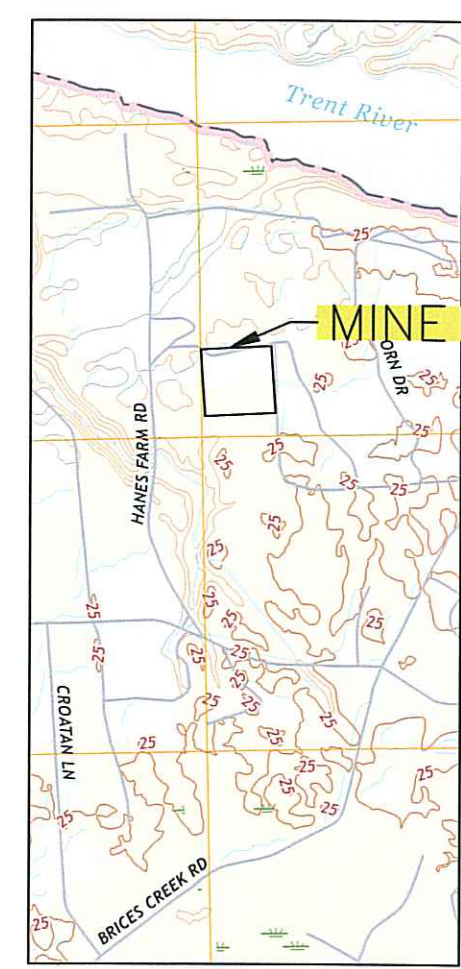


INDEX
 C INDEX, USGS AND COUNTY MAP
 P-0 MINE PARCEL LOCATION
 P-1 ADJOINING PROPERTY OWNERS
 P-2 ADJOINING PROPERTY OWNERS
 M-0 OVERALL MINE PLAN AND BUFFERS
 R MINE RECLAMATION PLAN
 ESC MINE EROSION AND SEDIMENT CONTROL PLAN

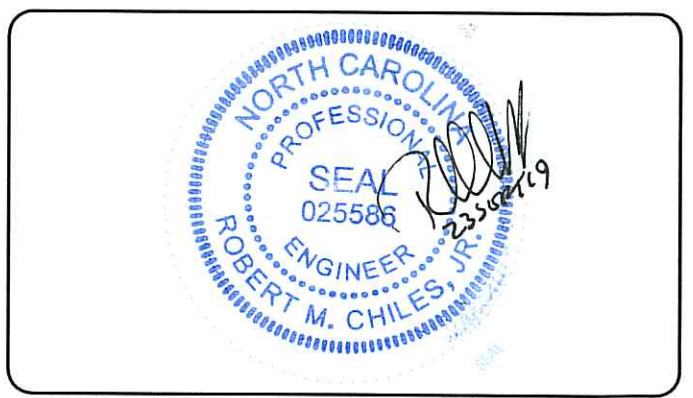
MINE OPERATOR/PERMITEE
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 RALPH PROVOST, INC
 1433 BELGRADE—SWANSBORO RD
 MAYSVILLE, NC 28555
 252-670-8055

ENGINEER
 ROBERT CHILES ENGINEERING
 417-A BROAD ST
 PO BOX 3496
 NEW BERN, NC 28564-3496
 252-637-4702



INSET
 (NTS)

General Notes

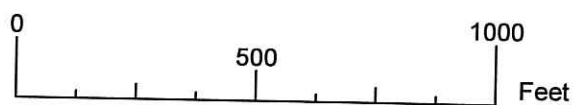


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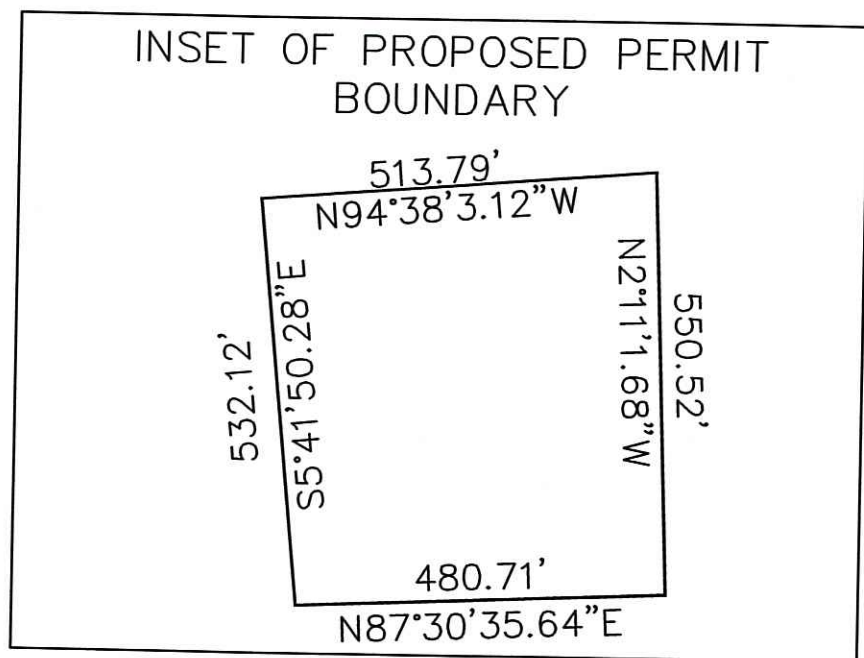
PROJECT

RALPH PROVOST
 HANES FARM SAND MINE
 CRAVEN COUNTY
 USGS 7.5' QUADRANGLE
 &
 NCDOT COUNTY MAP

RCE PROJECT NUMBER 2018073	Sheet C
Date 07/25/2019	
Scale As Noted	



TRENT RIVER



General Notes

1. TOPOGRAPHY FROM FIELD SURVEY BY ROBERT CHILES ENGINEERING, NEW BERN, NC
2. PROPOSED MINE SITE IS LOCATED IN FLOOD ZONE X (MINIMAL RISK) ACCORDING TO NC FLOOD RISK INFORMATION SYSTEM, MAP NUMBER 3720547800J, REVISED 07/02/2004

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 RALPH PROVOST, INC
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 ROBERT CHILES ENGINEERING
 417-A BROAD ST
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7-100-007
 N/F
 HANES, THEODORE L
 661 HANES FARM RD
 DB 3058 PG 0320

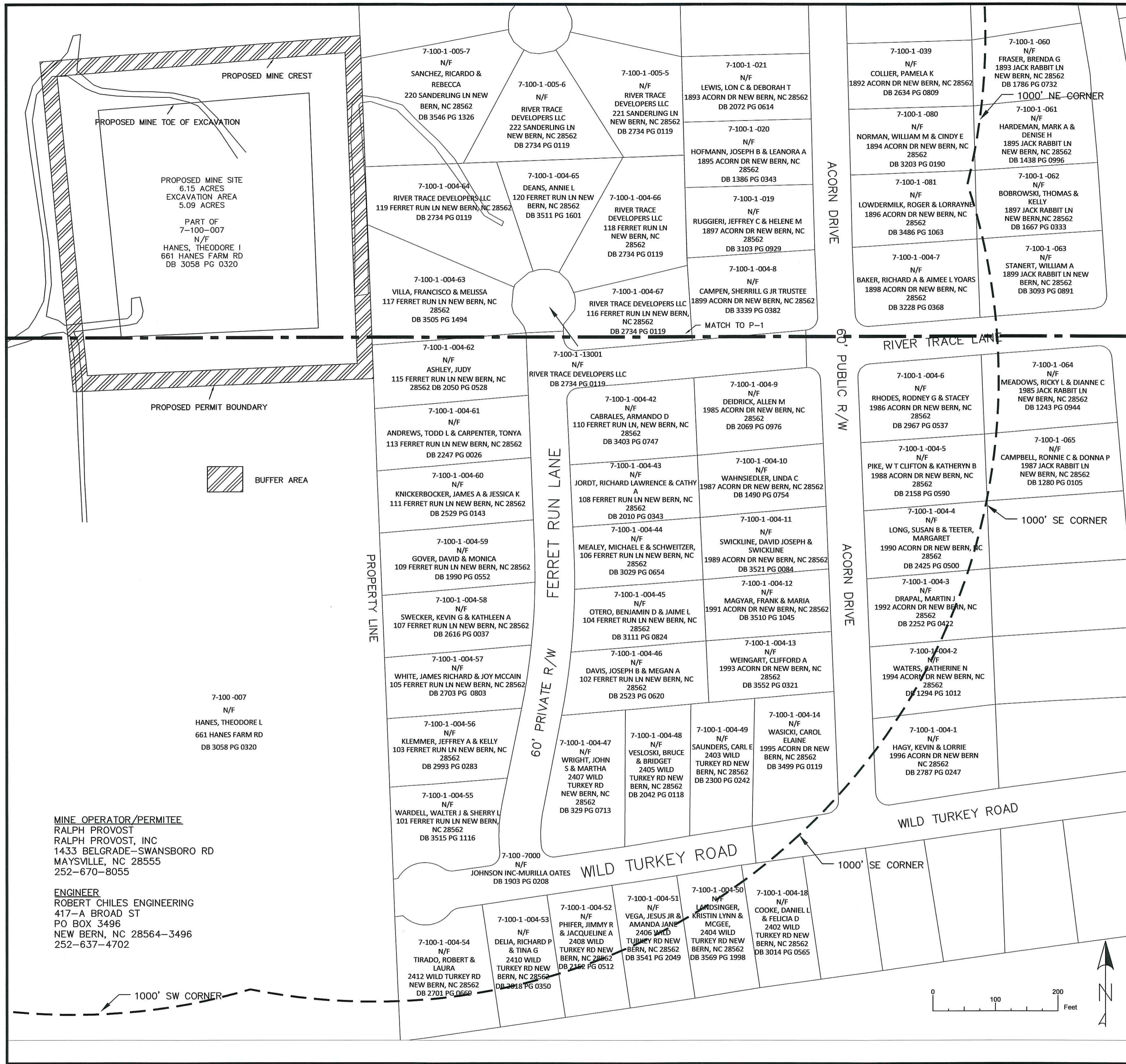


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PROJECT

RALPH PROVOST
 HANES FARM SAND MINE
 CRAVEN COUNTY
 MINE PARCEL LOCATION

RCE PROJECT NUMBER 2018073	Sheet P-0
Date 7/25/2019	
Scale 1" = 500'	



General Notes

1. ADJOINING PARCELS AND OWNER INFORMATION FROM CRAVEN COUNTY GIS



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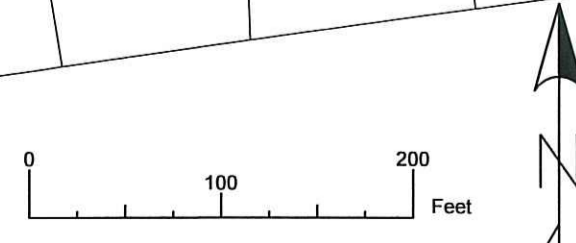
PROJECT

RALPH PROVOST
HANES FARM SAND MINE
CRAVEN COUNTY
ADJOINING PROPERTY OWNERS &
MINE PARCEL LOCATION

RCE PROJECT NUMBER 2018073	Sheet P2
Date 7/25/2019	
Scale 1" = 100'	

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MAYSVILLE, NC 28555
252-670-8055

ENGINEER
ROBERT CHILES ENGINEERING
417-A BROAD ST
PO BOX 3496
NEW BERN, NC 28564-3496
252-637-4702



SYMBOLS

BUFFER AREA

CHAIN LINK FENCE

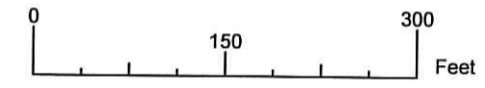
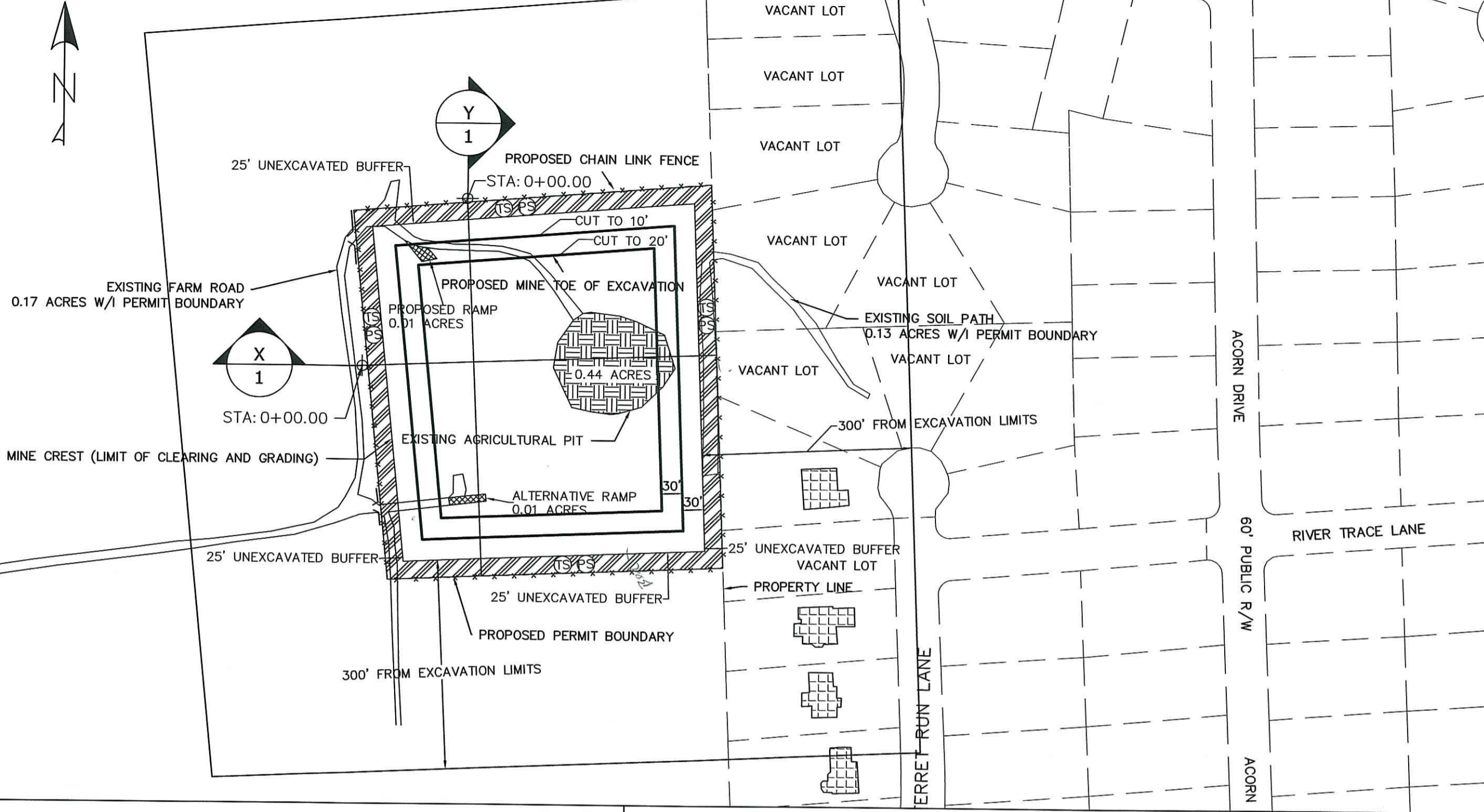
GATE IN CHAIN LINK FENCE

BUILDING WITHIN 300' OF EXCAVATION LIMITS

EROSION AND SEDIMENT CONTROL:

TEMPORARY SEEDING

PERMANENT SEEDING



- General Notes**
1. PROPOSED AND ALTERNATIVE RAMP(S) WILL BE CONSUMED BY MINING
 2. EXISTING TOPOGRAPHY FROM FIELD SURVEY BY ROBERT CHILES ENGINEERING, NEW BERN, NC

MINE AREAS CHART

CATEGORY	AFFECTED ACREAGE
TAILINGS/SEDIMENT PONDS	N/A
STOCKPILES	N/A
WASTEPILES	N/A
PROCESSING AREA/HAUL ROADS	N/A (PRE-EXISTING)
MINE EXCAVATION	5.09
OTHER (BERMS AROUND EXCAVATION AREA)	0.29
TOTAL DISTURBED ACREAGE	5.38

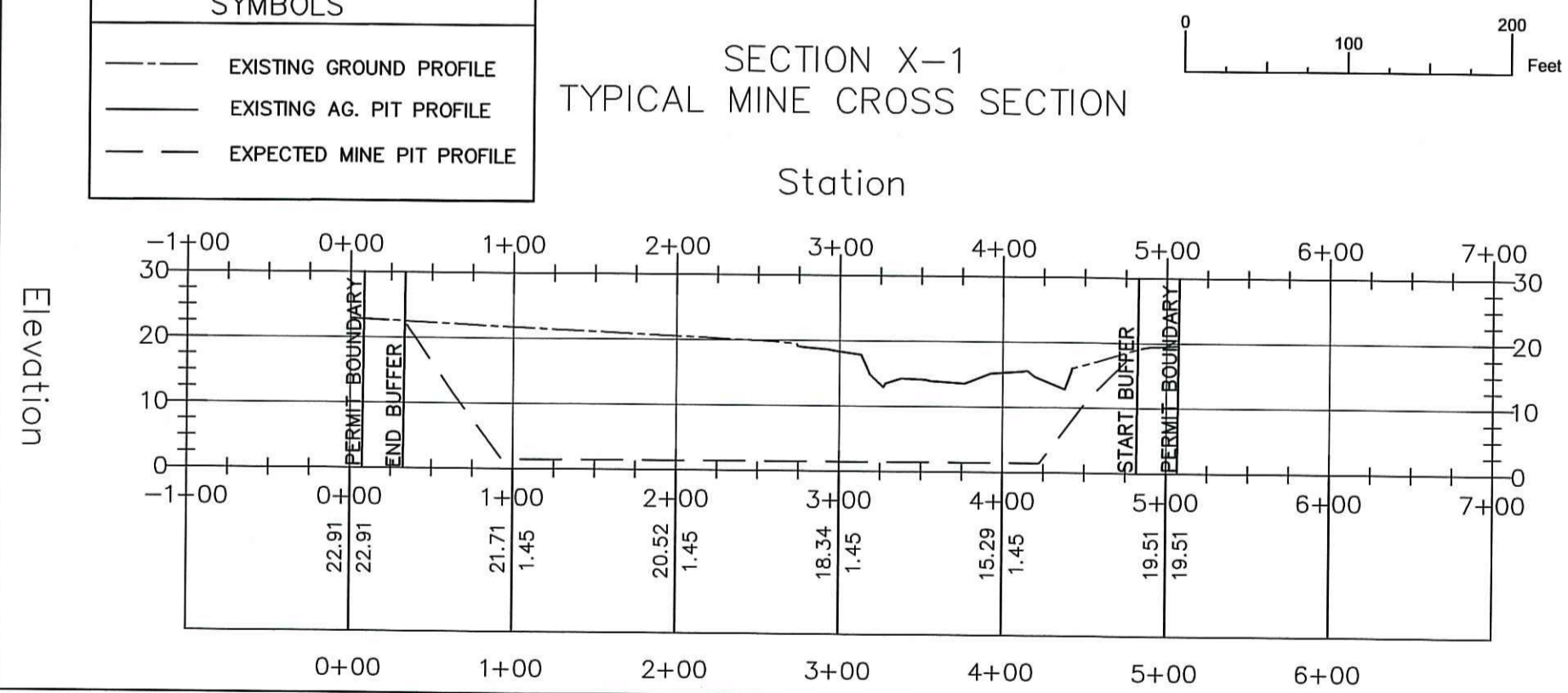
SYMBOLS

EXISTING GROUND PROFILE

EXISTING AG. PIT PROFILE

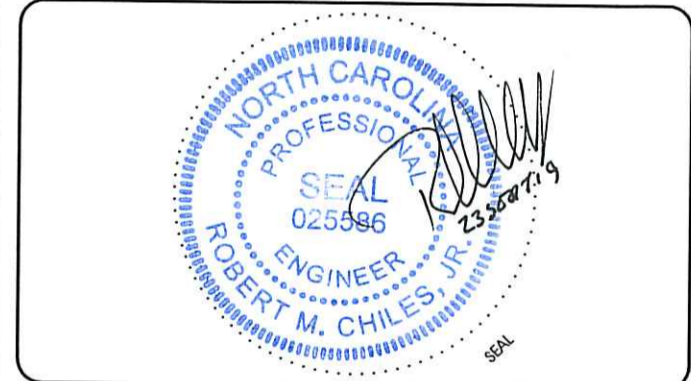
EXPECTED MINE PIT PROFILE

SECTION X-1
TYPICAL MINE CROSS SECTION



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RALPH PROVOST, INC
1433 BELGRADE-SWANSBORO RD
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252-670-8055

ENGINEER
ROBERT CHILES ENGINEERING
417-A BROAD ST
PO BOX 3496
NEW BERN, NC 28564-3496
252-637-4702



ROBERT CHILES ENGINEERING

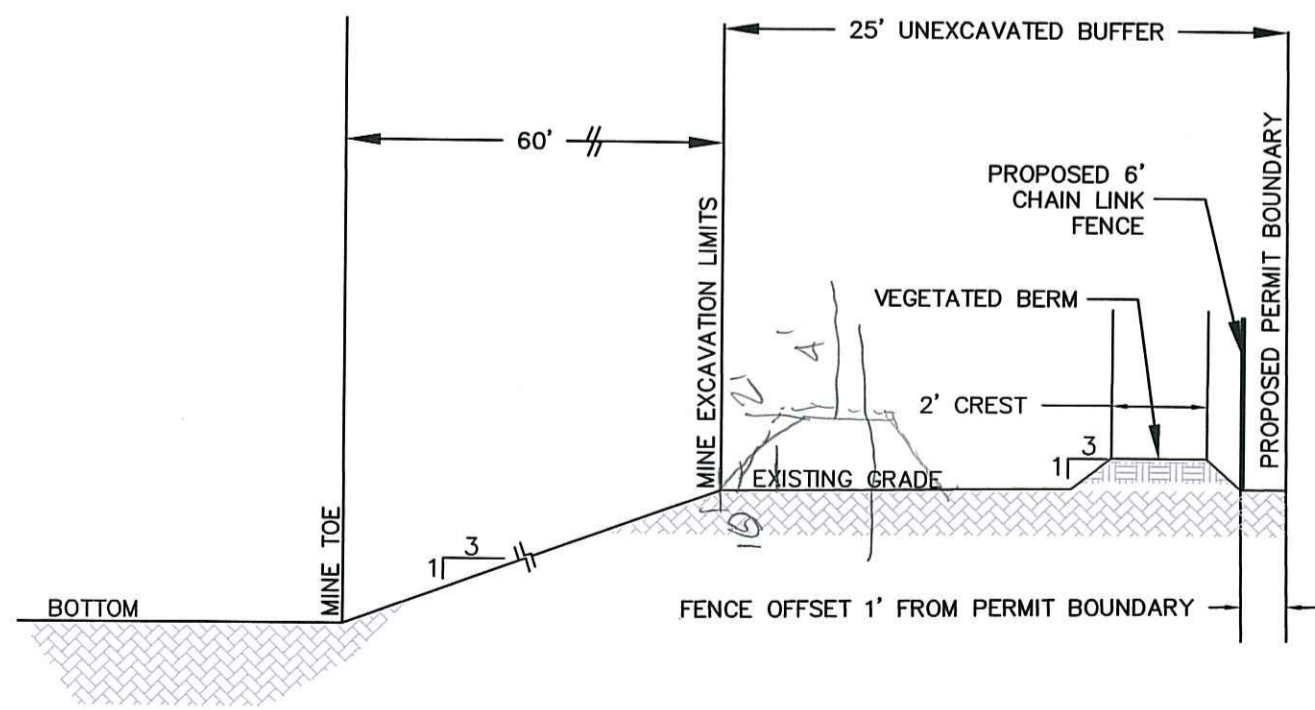
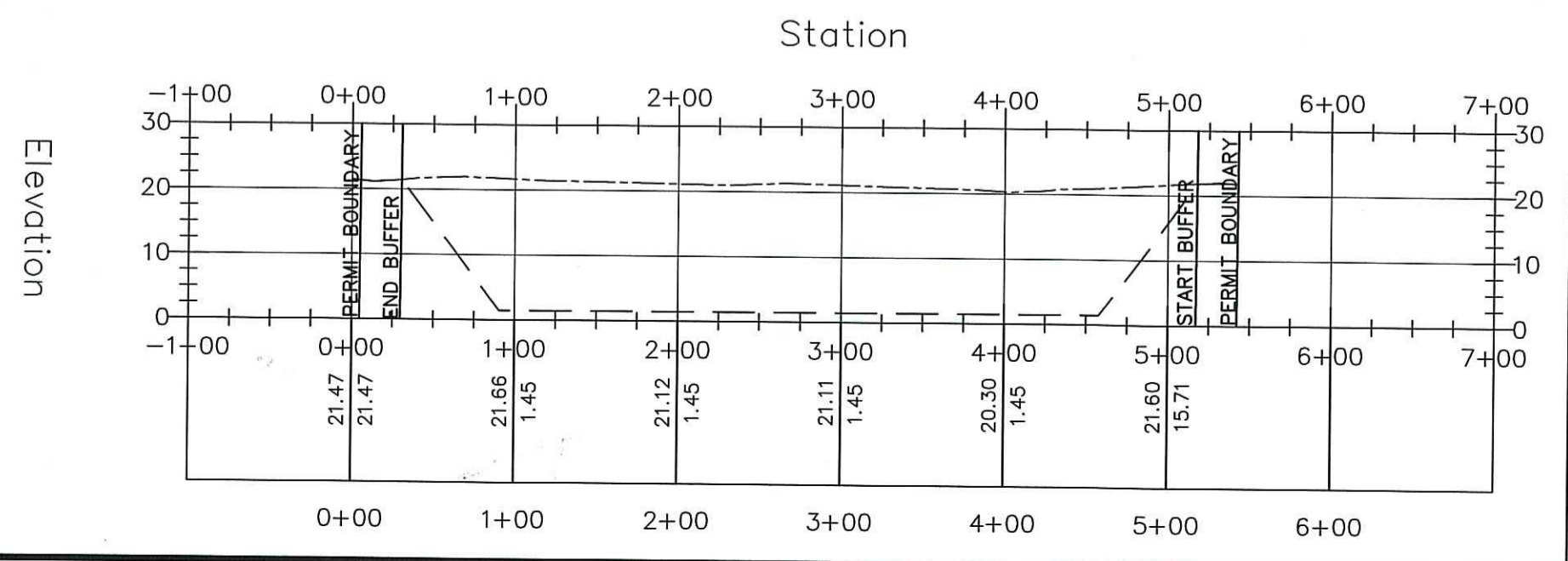
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PROJECT

RALPH PROVOST
HANES FARM SAND MINE
CRAVEN COUNTY
MINE PLAN

SECTION Y-1
TYPICAL MINE CROSS SECTION

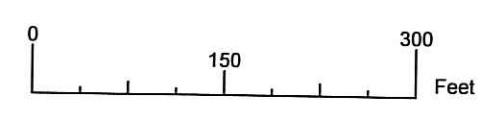
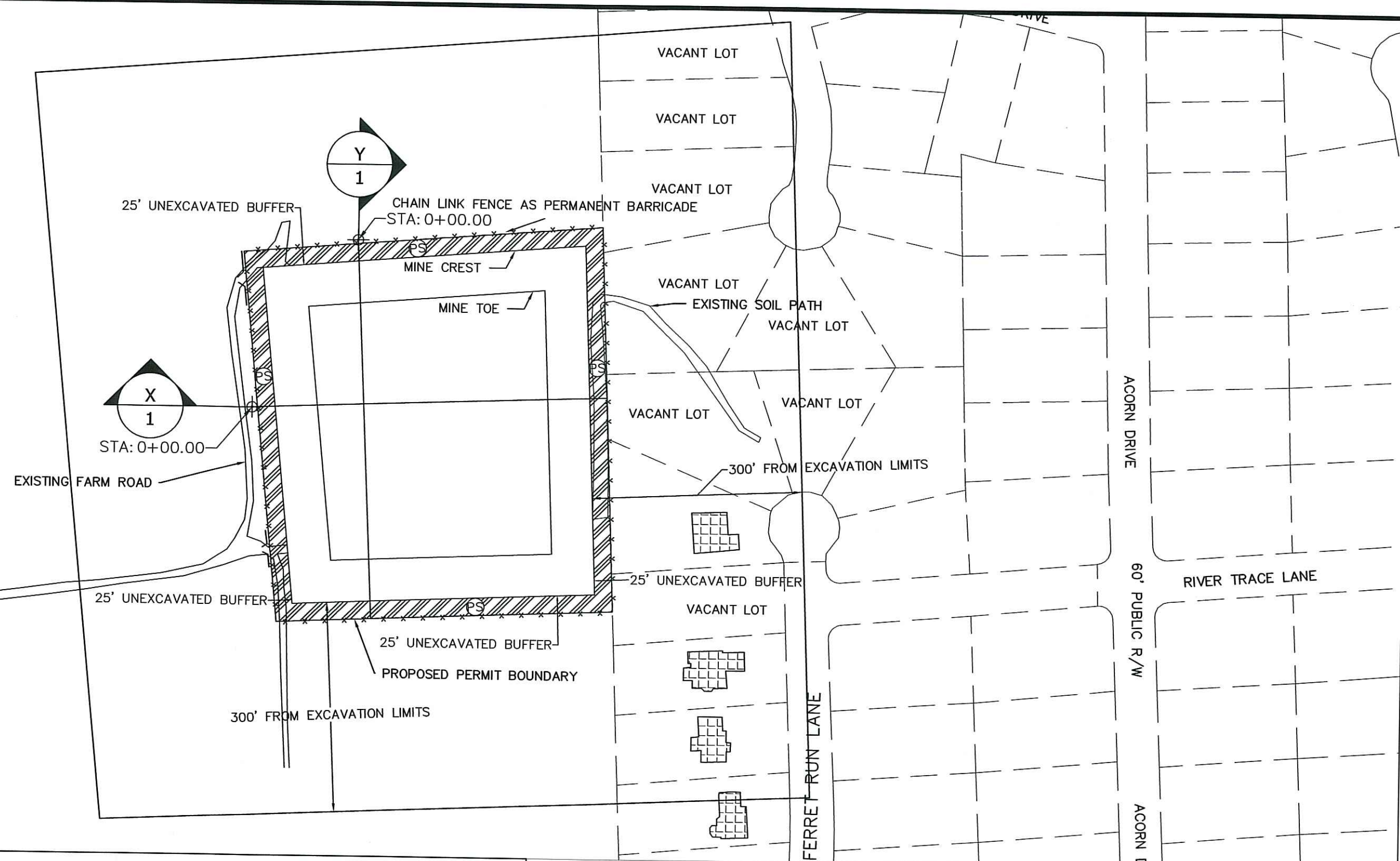


TYPICAL SECTION ALONG PERMIT BOUNDARY NTS

RCE PROJECT NUMBER 2018073	Sheet
Date 7/25/2019	M-0
Scale As Noted	

SYMBOLS

	BUFFER AREA
	CHAIN LINK FENCE
	GATE IN CHAIN LINK FENCE
	BUILDING WITHIN 300' OF EXCAVATION LIMITS
	EROSION AND SEDIMENT CONTROL: PERMANENT SEEDING



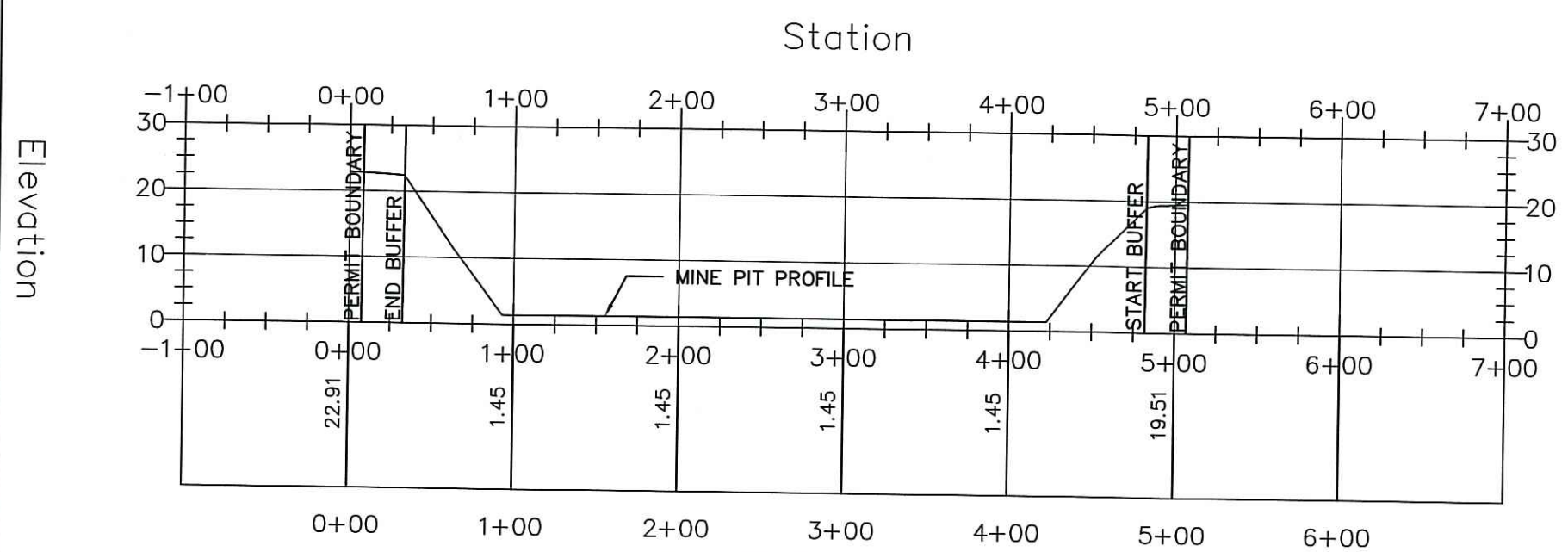
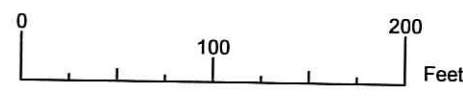
General Notes

1. THE PROPOSED AND ALTERNATIVE RAMP(S) AND PORTIONS OF THE EXISTING FARM ROAD AND EXISTING SOIL PATH LOCATED WITHIN EXCAVATION LIMITS WILL BE CONSUMED BY MINING

MINE AREAS CHART

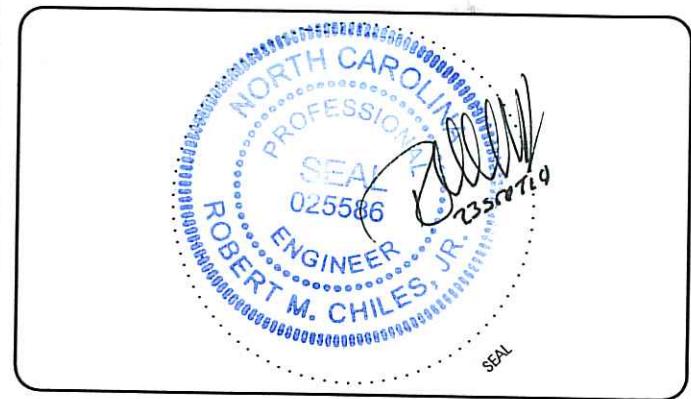
CATEGORY	AFFECTED ACREAGE
TAILINGS/SEDIMENT PONDS	N/A
STOCKPILES	N/A
WASTEPILES	N/A
PROCESSING AREA/HAUL ROADS	N/A (PRE-EXISTING)
MINE EXCAVATION	5.09
OTHER (BERMS AROUND EXCAVATION AREA)	0.29
TOTAL DISTURBED ACREAGE	5.38

**SECTION X-1
TYPICAL MINE CROSS SECTION**

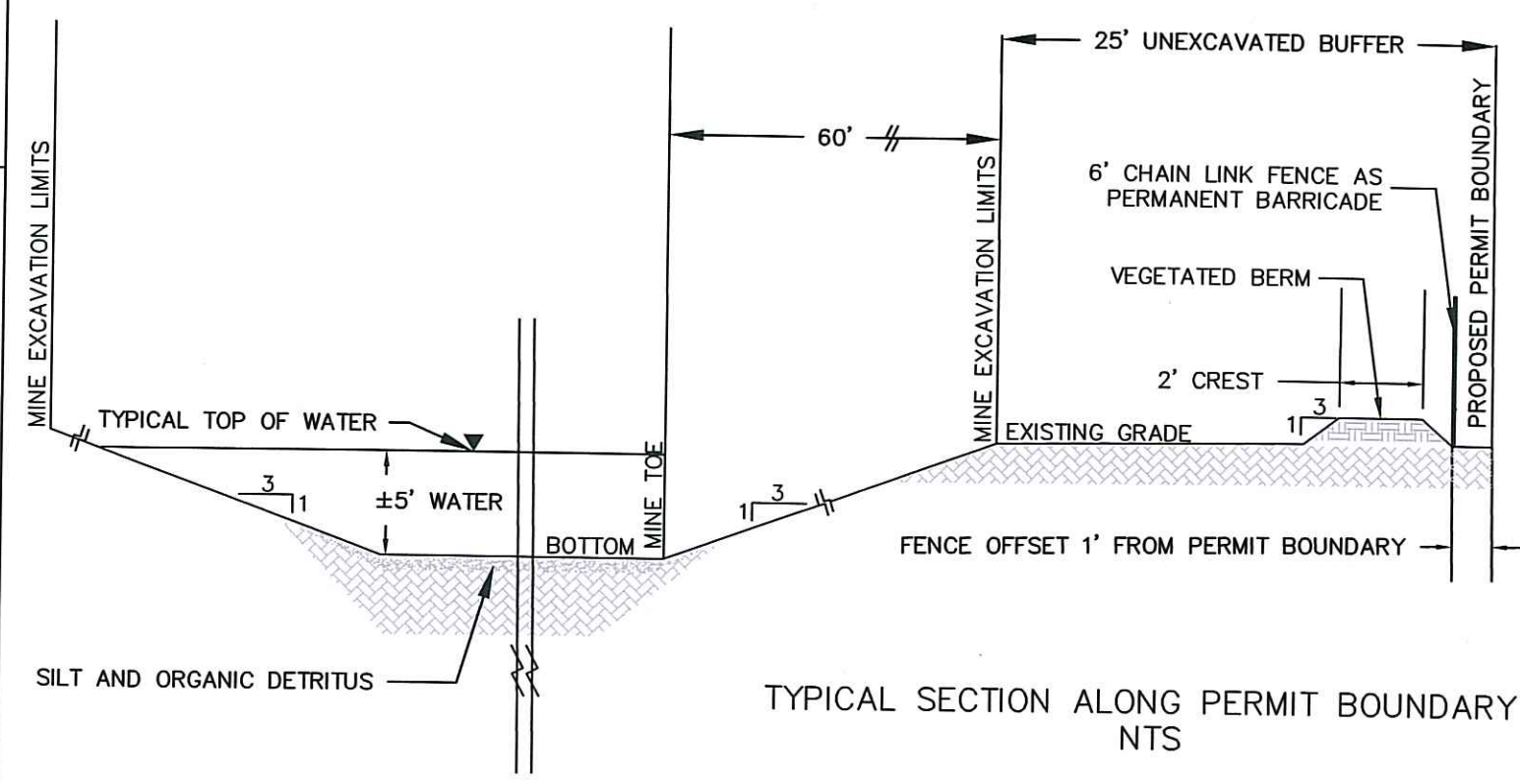
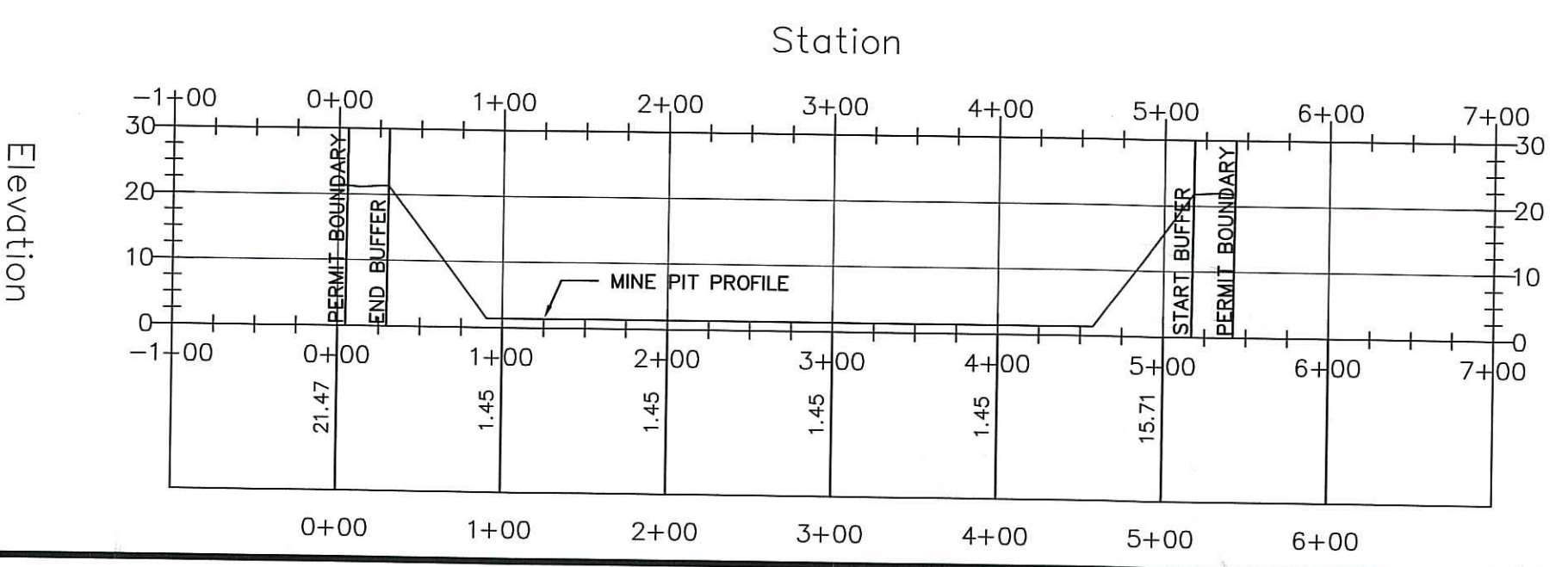


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 RALPH PROVOST
 RALPH PROVOST, INC
 1433 BELGRADE-SWANSBORO RD
 MAYSVILLE, NC 28555
 252-670-8055

ENGINEER
 ROBERT CHILES ENGINEERING
 417-A BROAD ST
 PO BOX 3496
 NEW BERN, NC 28564-3496
 252-637-4702



**SECTION Y-1
TYPICAL MINE CROSS SECTION**



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417A BROAD STREET
 PH: 252-637-4702
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PROJECT

RALPH PROVOST
 HANES FARM SAND MINE
 CRAVEN COUNTY
 MINE RECLAMATION PLAN

RCE PROJECT NUMBER 2018073	Sheet R
Date 7/25/2019	
Scale As Noted	

6.10 TEMPORARY SEEDING

DEFINITION Planting rapid-growing annual grasses, small grains, or legumes to provide initial, temporary cover for erosion control on disturbed areas. **PURPOSE** To temporarily stabilize denuded areas that will not be brought to final grade for a period of more than 30 working days. Temporary seeding controls runoff and erosion until permanent vegetation or other erosion control measures can be established. In addition, it provides residue for soil protection and seedbed preparation and reduces problems of mud and dust production from bare soil surfaces during construction.

CONDITIONS WHERE PRACTICE APPLIES

On any cleared, unvegetated, or sparsely vegetated soil surface where vegetative cover is needed for less than 1 year. Applications of this practice include diversions, dams, temporary sediment basins, temporary road banks, and topsoil stockpiles.

PLANNING CONSIDERATIONS

Annual plants, which sprout and grow rapidly and survive for only one season, are suitable for establishing initial or temporary vegetative cover. Temporary seeding preserves the integrity of earthen sediment control structures such as dikes, diversions, and the banks of dams and sediment basins. It can also reduce the amount of maintenance associated with these devices. For example the frequency of sediment basin cleanouts will be reduced if watershed areas, outside the active construction zone, are stabilized. Proper seedbed preparation, selection of appropriate species, and use of quality seed are as important in this practice as in Practice 6.11, PERMANENT SEEDING.

Failure to follow established guidelines and recommendations carefully may result in an inadequate or short-lived stand of vegetation that will not control erosion. Temporary seeding provides protection for no more than 1 year, during which time permanent stabilization should be initiated.

SPECIFICATIONS

Complete grading before preparing seedbeds and install all necessary erosion control practices, such as dikes, waterways and basins. Minimize steep slopes because they make seedbed preparation difficult and increase the erosion hazard. If soils become compacted during grading, loosen them to a depth of 6-8 inches using a ripper, harrow, or chisel plow.

SEEDBED PREPARATION

Good seedbed preparation is essential to successful plant establishment. A good seedbed is well-pulverized, loose, and uniform. Where hydroseeding methods are used, the surface may be left with a more irregular surface of large clods and stones.

LIMING - Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1 to 1 1/2 tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.

FERTILIZER - Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

SURFACE ROUGHENING - If recent tillage operations have resulted in a loose surface, additional roughening may not be required except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by disking, raking, harrowing, or other suitable methods. Groove or furrow slopes steeper than 3:1 on the contour before seeding (Practice 6.03, SURFACE ROUGHENING).

PLANT SELECTION

Select an appropriate species or species mixture from Table 6.10a, for seeding in late winter and early spring, Table 6.10b for summer, and Table 6.10c for fall.

SEEDING Evenly apply seed using a cyclone seeder (broadcast), drill, cultipacker seeder, or hydroseeder. Use seeding rates given in Tables 6.10a-6.10c. Broadcast seeding and hydroseeding are appropriate for steep slopes where equipment cannot be driven. Hand broadcasting is not recommended because of the difficulty in achieving a uniform distribution. Small grains should be planted no more than 1 inch deep, and grasses and legumes no more than 1/2 inch. Broadcast seed must be covered by raking or chain dragging, and then lightly firmed with a roller cultipacker. Hydroseeded mixtures should include a wood fiber (cellulose) mulch.

MULCHING

The use of appropriate mulch will help ensure establishment under normal conditions and is essential to seeding success under harsh site conditions (Practice 6.14, MULCHING).

Harsh site conditions include:
 -seeding in fall for winter cover (wood fiber mulches are not considered adequate for this use), slopes steeper than 3:1,
 -excessively hot or dry weather
 -adverse soils (shallow, rocky, or high in clay or sand), and
 -areas receiving concentrated flow. If the area to be mulched is subject to concentrated waterflow, as in channels, anchor mulch with netting (Practice 6.14, MULCHING).

MAINTENANCE

RESEED AND MULCH AREAS WHERE SEEDING EMERGENCE IS POOR, OR WHERE EROSION OCCURS, AS SOON AS POSSIBLE. DO NOT MOW. PROTECT FROM TRAFFIC AS MUCH AS POSSIBLE.

TABLE 6.10A TEMPORARY SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING SEEDING MIXTURE

SPECIES RATE (LB/ACRE)
 RYE (GRAIN) 120
 ANNUAL LESPEDEZA (KOBÉ) 50 OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE.

SEEDING DATES DEC. 1 - APR. 15

SOIL AMENDMENTS FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER.

MULCH APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKLING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

TABLE 6.10B TEMPORARY SEEDING RECOMMENDATIONS FOR SUMMER SEEDING MIXTURE

SPECIES RATE (LB/ACRE)
 GERMAN MILLET 40

SEEDING DATES APR. 15 - AUG. 15

SOIL AMENDMENTS FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER. MULCH APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKLING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

TABLE 6.10C TEMPORARY SEEDING RECOMMENDATIONS FOR FALL SEEDING MIXTURE

SPECIES RATE (LB/ACRE)
 RYE (GRAIN) 120
 SEEDING DATES AUG. 15 - DEC. 30
 SOIL AMENDMENTS FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER. MULCH APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKLING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBÉ IN LATE FEBRUARY OR EARLY MARCH.

6.11 PERMANENT SEEDING

DEFINITION Controlling runoff and erosion on disturbed areas by establishing perennial vegetative cover with seed.

PURPOSE To reduce erosion and decrease sediment yield from disturbed areas, and to permanently stabilize such areas in a manner that is economical, adapts to site conditions and allows selection of the most appropriate plant materials.

CONDITIONS WHERE PRACTICE APPLIES

Fine-graded areas on which permanent, long-lived vegetative cover is the most practical or most effective method of stabilizing the soil. Permanent seeding may also be used on rough-graded areas that will not be brought to final grade for a year or more. Areas to be stabilized with permanent vegetation must be seeded or planted within 30 working days or 120 calendar days after final grade is reached, unless temporary stabilization is applied.

PLANNING CONSIDERATIONS

Vegetation controls erosion by protecting bare soil surfaces from raindrop impact and by reducing the velocity and volume of overland flow. The most common and economical means of stabilizing disturbed soils is by seeding grasses and legumes. The advantages of seeding over other means of establishing plants include the smaller initial cost, lower labor input, and greater flexibility of method. The disadvantages of seeding include:

- potential for erosion during the establishment stage,
- the need to reseed areas that fail to establish,
- seasonal limitations on suitable seeding dates, and
- a need for water and appropriate temperatures during germination and early growth. The probability of successful plant establishment can be maximized through good planning, knowledge of the soil characteristics (Table 6.11a), selection of suitable plant materials for the site, good seedbed preparation, adequate liming and fertilization, and timely planting and maintenance.

SELECTING PLANT MATERIAL Climate, soils, and topography are the major factors affecting the suitability of plants for a particular site. All three of these factors vary widely across North Carolina.

To simplify plant selection, a KEY TO PERMANENT SEEDING MIXTURES is presented in Table 6.11b. To find seeding specifications for a specific site, follow this key through the different steps to the appropriate seeding number. Seeding mixtures recommended here are designed for general use and are well proven in practical field situations. They are designed to produce maximum stabilization and minimize the amount of maintenance and repair required. LAND USE is a primary consideration in planning permanent seedings. For this purpose land use, whether residential, industrial, commercial, or recreational, can be divided into two general categories:

- (1) High-maintenance areas are mowed frequently, limed and fertilized regularly, and either
 - potential for erosion during the establishment stage,
 - the need to reseed areas that fail to establish,
 - seasonal limitations on suitable seeding dates, and
 - a need for water and appropriate temperatures during germination and early growth. The probability of successful plant establishment can be maximized through good planning, knowledge of the soil characteristics (Table 6.11a), selection of suitable plant materials for the site, good seedbed preparation, adequate liming and fertilization, and timely planting and maintenance.
- (2) require maintenance to an aesthetic standard (e.g., home lawns).
 Grasses used for these situations are long-lived perennials that form a tight sod and are fine-leaved and attractive in appearance. They must be well-adapted to the geographic area where they are planted and able to endure the stress of frequent mowing. Sites where high-maintenance vegetative cover is desirable include homes, industrial parks, schools, churches, and recreational areas.

Low-maintenance areas are mowed infrequently or not at all, and do not receive lime and fertilizer on a regular basis. Plants must persist with little maintenance over long periods of time. Grass and legume mixtures are favored for these sites because legumes are a source of soil nitrogen. Mixed stands are also more resistant to adverse conditions. Sites suitable for low-maintenance vegetation include steep slopes, stream or channel banks, some commercial properties, and "utility" turf areas such as roadbanks.

SEEDBED PREPARATION

The soil on a disturbed site must be amended to provide an optimum environment for seed germination and seedling growth. The surface soil must be loose enough for water infiltration and root penetration. The pH (acidity or alkalinity) of the soil must be such that it is not toxic and nutrients are available - preferably between 6.0 and 6.5. Sufficient nutrients - added as fertilizer - must be present. It is as important to add lime as to add fertilizer. Lime is used primarily as a pH, or acidity, modifier, but it also supplies calcium and magnesium, which are important plant nutrients. By increasing soil pH it also makes other nutrients more available to plants. At the same time, it prevents aluminum toxicity by decreasing the solubility of soil aluminum. Many soils in North Carolina are high in aluminum, which stunts plant growth. After seed is in place, it must be protected with a mulch to hold moisture and modify temperature extremes, while preventing erosion during seedling establishment.

VEGETATION

Availability of seed and plant materials is an important consideration of any construction stabilization effort. Throughout North Carolina, climate, economics, construction schedule delays and accelerations, and other factors present difficult challenges in specifying the different vegetation needed for site stabilization. To help resolve this issue, vegetative stabilization requires consideration in three categories:

- (1) Immediate Stabilization - nurse crop varieties (note: temporary mulching may be utilized for immediate stabilization if outlined on approved plans and construction sequence.)
- (2) Primary Stabilization - plant varieties providing cover up to 3 years with a specified maintenance program
- (3) Long Term Stabilization - plant varieties providing protective cover with maintenance levels selected by the owner

TABLE 6.11A PERMANENT SEEDING RECOMMENDATIONS FOR IMMEDIATE STABILIZATION/NURSE CROPS

SPECIES, RATE (LB/ACRE)
 RYE (GRAIN), 40
 WHEAT, 30
 GERMAN MILLET/BROWNTOP MILLET, 10
 SUDANGRASS (HYBRIDS), 15
 KOBÉ LESPEDEZA/KOREAN LESPEDEZA, 10
 SOIL AMENDMENTS: FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER
 MAINTENANCE: RE-FERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RE-SEED, RE-FERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

TABLE 6.11B PERMANENT SEEDING RECOMMENDATIONS FOR PRIMARY STABILIZATION (NON-NATIVE SPECIES)

SPECIES, RATE (LB/ACRE)
 SERICEA LESPEDEZA, 15
 CENTIPEDE GRASS, 5-10
 KY 31 TALL FESCUE, 100
 BERMUDA GRASS, 25
 SOIL AMENDMENTS: FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER
 MAINTENANCE: RE-FERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RE-SEED, RE-FERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

TABLE 6.11C-D PERMANENT SEEDING RECOMMENDATIONS FOR PRIMARY STABILIZATION (NATIVE SPECIES)

SPECIES, RATE (LB/ACRE) WHEN MIXED WITH 4 OTHER SPECIES
 SWITCH GRASSES, 3
 INDIAN GRASSES, 6
 BIG BLUESTEM (EARL), 6
 LITTLE BLUESTEM, 6
 SWEET WOODRICK, 2
 RICE CUTGRASS, 5
 INDIAN WOODDATS, 2
 VIRGINIA WILD RYE, 5
 SOFT RUSH, 2
 SEDGES, 2
 SOIL AMENDMENTS: FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER
 MAINTENANCE: RE-FERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RE-SEED, RE-FERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE. NATIVE WARM SEASON GRASSES REQUIRE SIX OR MORE MONTHS TO GERMINATE UNDER OPTIMUM CONDITIONS. IF THEY ARE PLANTED IN THE SUMMER, THEN A WHOLE YEAR WILL HAVE TO PASS BEFORE THEY GERMINATE. WITH THE NATIVE VARIETIES, THE SEED MIX SHOULD BE IN THE RANGE OF A TOTAL OF 15 POUNDS PER ACRE. DEPENDING ON AVAILABILITY OF NATIVE SEEDS ADAPTABLE TO NORTH CAROLINA, THE PERCENTAGE OF A PARTICULAR VARIETY USED MAY BE REDUCED OR INCREASED ACCORDINGLY. ALTHOUGH DIVERSITY IS DESIRABLE, IT IS IMPERATIVE THAT THE PRIMARY CROP DEVELOP AND BECOME AN EFFECTIVE PROTECTIVE COVER. IN ADDITION TO THE NATIVE SPECIES MIX, ADDITIONAL NURSE CROP SPECIES MUST BE INCLUDED TO PROVIDE IMMEDIATE STABILIZATION AND AN ADEQUATE GROUND COVER.

General Notes



ROBERT CHILES ENGINEERING
 ENGINEERS • CONSULTANTS • MARINE SURVEYORS
 NC BELS FIRM F-1392 417A BROAD STREET
 PO BOX 3496 PH: 252-637-4702
 NEW BERN, NC 28564 FX: 252-637-3100

PROJECT
 RALPH PROVOST
 HANES FARM SAND MINE
 CRAVEN COUNTY
 MINE EROSION AND SEDIMENT
 CONTROL PLAN

RCE PROJECT NUMBER 2018073	Sheet
Date 7/25/2019	ESC-1
Scale N/A	

MINE OPERATOR/PERMITEE
 RALPH PROVOST
 RALPH PROVOST, INC
 1433 BELGRADE-SWANSBORO RD
 MAYSVILLE, NC 28555
 252-670-8055
 ENGINEER
 ROBERT CHILES ENGINEERING
 417-A BROAD ST
 PO BOX 3496
 NEW BERN, NC 28564-3496
 252-637-4702