
Table of Contents

Chapter One -- Right-Of-Way Preparation

Preliminary Investigation.....	1-1
Clearing and Grubbing.....	1-2
Removal of Structures and Obstructions.....	1-2
Building and Foundation Removal	
Inspection and Removal of Asbestos	
Bridge Removal	
Pipe and Sewer Removal	
Pavement and Miscellaneous Removal	

Chapter Two -- Soils Identification and Classification

Pedology.....	2-2
Origin and Geology of Soils	
Soil Profiles	
Soil Composition and Texture	
Soil Classification	
Field Identification and Classification of Soils	
Rock and Shale Embankment.....	2-18
Principal Rock Types	
Indiana Geology	
Rock	
Shale, Shale and Soft Rock Mixtures, or Soft Rock	
Other Embankment and Fill Materials.....	2-21
Borrow	
B Borrow	
Structural Backfill	
Rock Backfill	
Aggregate Materials.....	2-22
Aggregate Bases	
Subbase	
Aggregate Pavement or Shoulders	
Synthetic Materials.....	2-22
Coal Combustion By-Products	
Crushed Glass	
Recycled Concrete Pavement	
Recycled Foundry Sand	

Chapter Three -- Excavation

Common Excavation.....	3-1
Submitting Samples	
Preparing the IT 530	
Rock Excavation.....	3-3
Exploratory drilling	
Rock Pre-Splitting	
Explosives	
Primary Blasting	
Restrictions	
Finished Grade	
Unclassified Excavation.....	3-5
Waterway Excavation	
Class Y Excavation	
Class X Excavation	
Wet Excavation	
Dry Excavation	
Foundation Excavation, Unclassified	
Disposal of Excavated Material.....	3-6
Suitable Material	
Unsuitable Material	
Excess Material	
Borrow.....	3-7
Contractor Responsibilities.....	3-8
Preparing a Borrow Pit.....	3-8
Peat Excavation.....	3-9
Treatment of Existing Fills	
Treatment by Removal	
Treatment by Displacement	
Peat Disposal	

Chapter Four -- Excavation Construction Requirements

General Preparation.....	4-1
General Requirements.....	4-3
Equipment.....	4-4
Hauling	
Spreading	
Compacting	

Chapter Five -- Embankment Construction

Rock Embankment.....	5-1
Lift Requirements	
Compaction Methods	
Shale and Soft Rock Embankments.....	5-2
Lift and Compaction Requirements	

Embankments on Hillside and Slopes.....	5-3
Embankment over Existing Roads.....	5-3
Treatment of Existing Roadbeds.....	5-4
Density Control.....	5-5
Settlement Control.....	5-6
Method of Measurement.....	5-7

Chapter Six -- Measurement and Earthwork Calculations

Contract Quantity Payment.....	6-1
Measured Quantity Payment.....	6-2
Measurement and Earthwork Calculations.....	6-2
Cross-Sections.....	6-2
Volumes.....	6-3

Chapter Seven -- Subgrade Construction

Construction Requirements.....	7-2
Fine Grading.....	7-2
Density Testing.....	7-3
Proofrolling.....	7-4
Chemical Modification of Soils.....	7-4
Subgrade Treatments.....	7-5
Moisture Control.....	7-6
Exceptions.....	7-6
Drainage.....	7-7
Measurement and Payment.....	7-7
Summary.....	7-7

Chapter Eight -- Finishing

Shoulders.....	8-1
Ditches.....	8-1
Slopes.....	8-1
Earth Graded Roads.....	8-2
Final Trimming and Cleaning.....	8-2
Measurement and Payment.....	8-3

Chapter Nine -- Special Fill and Backfill

B Borrow Fill and Backfill.....	9-1
Materials	
Flowable Mortar Substitution	
Construction Requirements	
Mechanical Compaction	

Embankment for Bridges	
B Borrow Around Bents	
Aggregate for End Bent Backfill	
Unbalanced Backfill	
Spandrel Filling	
Method of Measurement	
Basis of Payment	
Flowable Backfill.....	9-5
Proportioning	
Flow	
Dynamic Cone Penetrometer	
Dry Unit Weight	
Mixing Equipment	
Placement	
Limitation of Operations	
Method of Measurement	
Basis of Payment	

Chapter Ten -- Aggregate Bases

Aggregate Base.....	10-1
Preparation of Subgrade	
Temperature Limitations	
Spreading	
Compacting	
Checking and Correcting Base	
Priming	
Method of Measurement	
Basis of Payment	
Subbase.....	10-2
Preparation of subgrade	
Temperature Limitations	
Spreading	
Compacting	
Checking and Correcting Base and Surface	
Method of Measurement	
Basis of Payment	
Aggregate Pavements or Shoulders.....	10-4
Preparation of Subgrade	
Temperature Limitations	
Spreading	
Compacting	
Checking and Correcting Base	
Dust Palative	
Method of Measurement	
Basis of Payment	

Chapter Eleven -- Soils Field Procedures Using the Sand Cone Method

Apparatus.....	11-2
Cone Correction and Bulk Density Factors.....	11-3
Procedure.....	11-4

Chapter Twelve -- Nuclear Gauge Testing

Nuclear Gauge.....	12-2
Basic Gauge Components	
Source Rod.....	12-4
Daily Standard Count.....	12-5
Procedure	
Frequency	
Recording the Count	
Daily Standard Count Graphs.....	12-7
Backscatter Density Testing.....	12-7
When to Use	
Test Site Selection	
Procedure	
Direct Transmission Density Testing.....	12-9
When to Use	
Site Selection and Preparation	
Gauge Hole	
Procedure	
Inconsistent Readings.....	12-11
Regular Maintenance.....	12-12
Preventing Gauge Damage	
Nuclear Gauges Do's and Don'ts.....	12-13
Field Use of the Nuclear Gauge.....	12-14

Chapter Thirteen -- Family of Curves and Other One-Point Proctor Procedures

Maximum Dry Density.....	13-1
Family of Curves.....	13-1
One-Point Proctor.....	13-2
Example Problem.....	13-2