

# CHAPTER 10

## AUTOMATED DATA PROCESSING

### OF CONCRETE

The purpose of the data system for which these instructions were prepared is to provide descriptive information about the materials used in highway work. Independent Assurance and concrete control tests shall be handled under the conventional method and using conventional forms.

Basically, the system is designed for coding test reports. For instance, in lieu of recording the Contractor's name and location, only a code is needed. The printout will show the Contractor's name and location. Code sheets have been included in this chapter for class purposes only. A complete list of codes may be obtained from the District Materials Section.

It is **very** important that all data entered on the Data Processing Forms be **correct**, in the proper blanks, and, most of all **legible**. Attached you will find a coding guide to be used for numeric and alphabetic characters. As a rule, numeric characters are recorded from the right to left, and alphabetic from the left to right. Please adhere to these standards.

### Form TL-28A Coding Form - Concrete Batch Report

The Hydraulic Cement Concrete Coding Form TL-28A contains three (3) records, A, B, and C. The plant record, A and B, is completed by the Producer's Technician, and the site record, C, is completed by the Project Inspector. The TL-28A is to accompany the first load of concrete delivered to the project. The load should not be tested or accepted until the TL-28A is received.

Under the job heading (Column 2), the Producer's Technician chooses a numerical (1-9) or alphabetical (A-Z) code for each day beginning with 1 or A, and then changes only if any item in A or B record changes (ex. yards<sup>3</sup>/meter<sup>3</sup> or pounds/kg of free water changes). If all the loads are identical, then the Producer's Technician would fill in the A & B record only once. The Project Inspector would continue recording the project data in record C, until he receives another TL-28A coding form from the Producer's Technician. The time batched would have to be shown on the producer's ticket. On the next day, the Technician should restart with 1 or A. The codes that are needed for completing record C are attached. On record A the water is in pounds (kilograms), and on record B the water is in gallons (liters).

If the plant is a central-mix plant, mark an "X" in Section B, Column 71. If the plant is a ready-mix plant, leave Section B, Column 71 blank. The Producer's Technician signs the TL-28A coding form in the upper right corner.

Always record from the right to left. For miscellaneous concrete, the TL-28A will not be required unless cylinders are cast. If cylinders are cast, it will be required to obtain information that is not included on Forms TL-13 or TL-26A. Independent Assurance samples are not to be recorded on the TL-28A.

The remaining spaces on the form are self-explanatory.

The Project Inspector submits the TL-28A to the District Materials Section for review and data entry. The District Materials Office retains the original and the Project Inspector retains a copy.

## **TL-13 Notice of Shipment of Concrete Cylinders**

The TL-13 is to be filled out by the person molding the cylinders and it shall be submitted with each cluster of acceptance cylinders. Under the cylinder column, the cylinder number should be the same as shown on the TL-28A, (ex. if it is listed in the 1st column, the last 2 spaces on the TL-28A, list it the same way on the TL-13). **Mark the sample number, project number, class of concrete and date cast on the cylinders.** The District Materials Office will pick up the cylinders.

## **Form TL-26A - Report of Structural Concrete**

Form TL-26A is to be filled in by the District Materials Section to record the compressive strengths of the cylinders.

The District Materials Office retains the original and the Project Inspector retains a copy. The Project Inspector sends a copy to the Contractor if a sample fails.

CODING OF CHARACTERS  
FOR DATA PROCESSING INPUT DATA

Alphabetic Characters  
Capital Letters Only

- |   |  |
|---|--|
| A Squared top not acceptable  | O Loop added at top to avoid confusion with numeric zero.                          |
| B Overhang top and bottom to avoid confusion with numerals 8 or 13. Center division required to avoid similarity with letter D. | P Overhang at top added for consistency with letters B, D and R.                   |
| C Deep curves to avoid similarity with left parenthesis.  | Q No special convention.   |
| D Overhang top and bottom to reduce confusion with numeral zero.  | R Overhang at top added for consistency with letters B, D and P.                   |
| E Straight leg  | S Serif added at top only to distinguish from numeral 5.                           |
| F Straight leg  | T No special convention  |
| G Emphasized serif reduces confusion with letter C or numerals 6 or zero  | U Parallel sides to distinguish from letter v.                                     |
| H Parallel sides  | V No special convention.   |
| I Serifs top and bottom are required.   | W Center division extends to top of letter. Rounded bottom should be avoided.      |
| J Top serif reduces confusion with letter U.  | X No special convention.   |
| K Slanting legs are joined at the center.   | Y Vertical leg bisects angle framed by top legs to avoid confusion with numeral 4. |
| L No special convention   | Z Horizontal bar is standard.  |
| M Legs spread at bottom, center division extends to bottom of letter. Rounded tops should be avoided.                           |  |
| N Parallel sides.   |  |

CODING OF CHARACTERS  
FOR DATA PROCESSING INPUT DATA

Numeric Characters

- |  |   |
|--|---|
| 0 Closed Circle                                | 6 Loop closed at bottom to avoid confusion with zero or lower case b.   |
| 1 Single Vertical Bar                          | 7 Crossbar considered confusing with letter Z.  |
| 2 No loop at bottom                            | 8 Made with two circles adjoining vertically to avoid confusion with special character ampersand and dollar sign. |
| 3 Curved lines, no straight top line           | 9 Straight leg  |
| 4 Open top to reduce confusion with 9          |   |
| 5 Vertical and top lines joined at right angle |   |

## CODE LIST FOR CURING METHODS

<u>CODE NO.</u>	<u>METHOD</u>
1	Liquid Membrane Seal
2	Polyethylene Sheeting
3	Burlap
4	Burlene
5	Wet Sand
6	Water Ponding
7	Steam
8	Heater Blanket

## CODE LIST FOR TYPE OF STRUCTURE

<u>CODE NO.</u>	<u>TYPE STRUCTURE</u>
1	Box Culvert and/or Appurtenances
2	Bridge (except deck)
3	Bridge Deck
4	Parapet Wall
5	Approach Slab
6	Retaining Wall
7	Curb and Gutter
8	Slope Paving
9	Ditch Paving
10	Sidewalk
11	Precast Piling
12	Precast Beams
13	Precast Miscellaneous
14	Sidewalk or Driveway
15	Miscellaneous
16	Pier Stem
17	Paving
18	Tunnel

**NOTES FOR MATERIALS DIVISION PERSONNEL  
CODES NOT ON MASTER CODE LIST  
CONCRETE CLASSIFICATIONS**

<u>CONCLASS</u>	<u>CODE</u>	<u>NUMERIC EQUIVALENT</u>
A3	1	1
A4	2	2
A5	3	3
B2	4	4
C1	5	5
T3	6	6
SPECIAL	7	7
PAVEMENT	8	8
A4 TUNNL	9	9
B2 TUNNL	A	10
E1 TUNNL	B	11
Y TUNNL	C	12
A3 FLYASH	D	13
A4 FLYASH	E	14
A5 FLYASH	F	15
B2 FLYASH	G	16
C1 FLYASH	H	17
T3 FLYASH	I	18
SPECFA	J	19
PAVEFA	K	20
A 4000	L	21
A 4000F (FLYASH)	M	22
*	N	23
*	O	24
A3SLAG	P	25
A4SLAG	Q	26
A5SLAG	R	27
B2SLAG	S	28
C1SLAG	T	29
T3SLAG	U	30
SPECSG	V	31
PAVSG	W	32
A6	X	33
A 4000S (SLAG)	Y	34
*	Z	35

**CEMENT CLASSIFICATIONS**

<u>CEMENT</u>	<u>NUMERIC EQUIVALENT</u>
I	1
II	2
III	3
IP	4
V	5
III MODIFIED	6

\* CODES RESERVED FOR FUTURE USE

FOR STUDY GUIDE PURPOSES ONLY. TO OBTAIN AN UP TO DATE LIST,  
PLEASE CONTACT YOUR DISTRICT MATERIALS OFFICE.

## CEMENT SOURCE

TABLE	CODE	NAME	CITY	STATE
CEMB	1	COPLAY	LIME KILN	MD
CEMB	2	BLUE CIRCLE ATLANTIC INC.	RAVENA	NY
CEMB	3	BLUE CIRCLE ATLANTIC INC.	VALENCIA	SP
CEMB	4	ATLANTIC	CHESAPEAKE	VA
CEMB	5	ATLANTIC	BALTIMORE	MD
CEMB	6	ROANOKE CEMENT CO.	CLOVERDALE	VA
CEMB	7	TARMAC-LONESTAR INC.	CHESAPEAKE	VA
CEMB	8	COPLAY	NAZARATH	PA
CEMB	9	IDEAL	CASTLE NAYNES	NC
CEMB	10	LEHIGH PORTLAND CEMENT CO.	UNIONBRIDGE	MD
CEMB	11	LEHIGH PORTLAND CEMENT CO.	ALLENTOWN	PA
CEMB	12	CAPITAL	MARTINSBURG	WV
CEMB	13	MARQUETTE	HAGERSTOWN	MD
CEMB	14	MEDUSA	YORK	PA
CEMB	15	DIXIE	KNOXVILLE	TN
CEMB	16	SANTEE	HOLLY HILL	SC
CEMB	17	UNIVERSAL ATLAS	BAHAMAS	GB
CEMB	18	LEHIGH PORTLAND CEMENT CO.	LEEDS	AL
CEMB	19	INDEPENDENT CEMENT CORP.	NAZARATH MILL	PA
CEMB	20	GIFFORD HILL	HARLEYVILLE	SC
CEMB	21	ALLENTOWN CEMENT CO.	EVANSVILLE	PA
CEMB	22	IDEAL	KNOXVILLE	TN
CEMB	23	TARMAC	HAGERSTOWN	MD
CEMB	24	LEHIGH VENEZULAN	PERTIGALETE	VZ
CEMB	25	INDEPENDENT CEMENT CORP.	HAGERSTOWN	MD
CEMB	26	TARMAC	ASLAND	SP
CEMB	27	BLUE CIRCLE ATLANTIC INC.	SAGUNTO	SP
CEMB	28	TARMAC	PERTIGALETE	VZ
CEMB	29	TARMAC	MILAKI	GR
CEMB	30	TARMAC	ELEFSU	GR
CEMB	31	TITAN	S.A.	GR
CEMB	32	HORNOS IBERICOS ALBA	ALMERIA	SP
CEMB	33	CEMENTOS APCOSCO SA	VERACUZ	MX
CEMB	34	LEHIGH-TAMPICO CEMENT CO.	AMPARO PAULA	MX
CEMB	35	TARMAC VENEZOLANA DE CEMENTOS	PERTIGALETE	VZ
CEMB	36	ALLENTOWN CEMENT CO.	EVANSVILLE	PA
CEMB	37	INDEPENDENT CEMENT	BEAUPORT	CA
CEMB	38	COPLAY CEMENT CO.	FREDERICK	MD
CEMB	39	LEHIGH PORTLAND CEMENT CO.	NORFOLK	VA
CEMB	40	HERCULES CEMENT CO.	STOCKERTOWN	MD
CEMB	41	KOSMOS CEMENT CO.	LOUISVILLE	KY
CEMB	42	INDEPENDENT CEMENT CORP.	BALTIMORE	MD
CEMB	43	BLUE CIRCLE ATLANTIC INC.	KAMARI	GR
CEMB	44	BLUE CIRCLE ATLANTIC INC.	ORIZABA	MX
CEMB	45	BLUE CIRCLE ATLANTIC BARRANQUILLA	COLUMBIA	SA
CEMB	46	BLUE CIRCLE ATLANTIC BARQUISIMETO	VENEZUELA	SA
CEMB	47	BLUE CIRCLE ATLANTIC INC.	ALCANCA	SP
CEMB	48	BLUE CIRCLE ATLANTIC CARTAGENA	COLUMBIA	SA
CEMB	49	BLUE CIRCLE ATLANTIC PERTIGALETE	VENEZUELA	SA
CEMB	50	LEHIGH PORTLAND CEMENT CO.	MITCHELL	IN
CEMB	51	COPLAY	SPEED	IN
CEMB	52	GIANT CEMENT CO.	HARLEYVILLE	SC

THIS IS A CODE LIST FOR INPUT DATA ONLY. CHECK WITH YOUR DISTRICT MATERIALS ENGINEER FOR AN APPROVED LIST OF SOURCES.

## Concrete Plant Example Problem

It is the producer technician's responsibility to complete Lines A and B of the TL-28A coding form at the plant and send the form out to the state construction project site with the driver of the first load of concrete going to the project.

Using the information below and using Mix Design No. 4-7501-07 (see next page), fill in Lines A and B (upper portion) of the TL-28A coding form.

The contractor on project 0295-127-101,C501 orders 2 cubic yards of A-3 general concrete from B. M. Jones Ready Mix Plant in Richmond (Plant Code No. 4006) on January 12, 2007.

The cement is coming from Roanoke Cement Company in Cloverdale, VA. The producer code for Bedrock S&G is 4009 and for Smith Quarries is 4015. The code for MBAE Air Entraining Agent is 02.

The free moisture on the sand is 5% and on the Coarse Aggregate (No. 57) is 0.6%.

There were 70 mixing revolutions put on the mixer at the plant and 1 gallon of water per cubic yard was withheld.

**VIRGINIA DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION**

**STATEMENT OF HYDRAULIC CEMENT CONCRETE MIX DESIGN**

Submit one copy to the District Administrator, Virginia Department of Transportation. Approval must be received by the contractor from the Materials Division before work is begun. This mix design is approved for all projects of the Department for the class of concrete shown: Calendar Year 2007 Mix Design No. 4-7501-07

Producer B. M. JONES READY MIX Plant Location RICHMOND, VA Phone 804-555-1234  
 Type of Mix: Ready Mix X Job Mix \_\_\_\_\_ Date 01/05/2007

Mix Design - One Cubic Yard (Meter) Based on SSD Condition

Class of Concrete A3 GENERAL (E) Slump/ 3.5 In. \_\_\_\_\_ mm Air Content 6 %  
 \_\_\_\_\_ (M) Flow

Material	Type	Quantities		Source		Plant/Quarry Location
		lbs.	kg.	Code	Name	
Cement	<u>IP</u>	<u>588</u>	_____	<u>6</u>	<u>ROANOKE CEMENT CO</u>	<u>CLOVERDALE, VA</u>
Min. Admix. 1	_____	_____	_____	_____	_____	_____
Min. Admix. 2	_____	_____	_____	_____	_____	_____
Sand <sup>(1)</sup>		<u>1228</u>	_____	<u>4009</u>	<u>BEDROCK S &amp; G</u>	<u>RICHMOND, VA</u>
No. <u>57</u> Stone <sup>(1)</sup>		<u>1725</u>	_____	<u>4015</u>	<u>SMITH QUARRIES</u>	<u>RICHMOND, VA</u>
Gr./No. _____ Aggr. <sup>(1)</sup>		_____	_____	_____	_____	_____
Water <sup>(2)</sup>	<u>275</u> lbs.	<u>33</u>	_____	_____	<u>CITY WATER</u>	_____
Admixture (AE) <sup>(3)</sup>		<u>4.6</u>	_____	<u>2</u>	<u>MBAE 20 - MASTER BLDRS.</u>	<u>CLEVELAND, OHIO</u>
Admixture (Retarder) <sup>(3)</sup>		_____	_____	_____	_____	_____
Admixture (Other) <sup>(3)</sup>		_____	_____	_____	_____	_____

NOTES:

(1) The quantities of fine and coarse aggregates necessary to conform to specifications in regard to consistency and workability shall be determined by the method described in "Recommended Practice for Selecting Proportions for Normal Weight Concrete" (ACI-211.1) and the actual quantities used shall not deviate more than plus or minus 5 percent from such quantities.

(2) To provide minimum slump permissible in Table II-17 while satisfying placement and finishing requirements. A separate design shall be submitted for each slump desired.

(3) The quantity of admixture will not be approved or disapproved since it varies considerably and must be initially established by trial and error by the producer or contractor with subsequent adjustment during batching to maintain the desired results within the range specified.

Mineral Admixture #1 - sp.gr.	_____
Mineral Admixture #2 - sp.gr.	_____
Sand - Abs.	<u>0.5</u>
Sand - F.M.	<u>2.8</u>
Sand - sp.gr.	<u>2.64</u>
C.A. #1 - Abs.	<u>0.3</u>
C.A. #1 - sp.gr.	<u>2.59</u>
C.A. #1 Unit mass	<u>94.7</u> / _____
	Lbs./C.F. kg/C.M.
Aggr. #2 - Abs.	_____
Aggr. #2 - sp.gr.	_____
2nd F.A./C.A.-F.M./u.wt.	_____ / _____
	E M
Design W/C Ratio	<u>0.47</u>

Contractor B. M. JONES READY MIX, INC.  
(Name of Company)

By B. M. JONES  
(Certified Technician Preparing Form)

Producer Technician's Expiration Date 12/31/2012  
(Do Not Use Social Security Number)

**FOR DEPARTMENT USE ONLY**

Remarks: \_\_\_\_\_

Copies: District Materials Engineer  
 Project Inspector  
 Plant Inspector  
 Sub- Contractor and / or R.M. Producer

Checked by W. R. TAYLOR 1/5/07

Approved by H. R. JONES 1/5/07  
District Materials Engineer

Approved tentatively subject to the production of material meeting the requirements of the Specifications and Special Provisions.



## Calculations for Plant Example Problem

Cement Weight Calculation - Line A 38-41

588 lbs. (From TL-27) x 2 cubic yards = 1176 lbs. of cement for 2 cubic yards

Sand, SSD Weight Calculation - Line A 46-50

1228 lbs. (From TL-27) x 2 cubic yards = 2456 lbs. of sand for 2 cubic yards

Sand, Free Water Calculation - Line A 51-53

2456 lbs. of sand (Line A 46-50) x .05 (% Free Moisture in Sand expressed as a decimal) =  
122.8 (Rounded to nearest whole pound) = 123 lbs.

Coarse Aggregate (No.57), SSD Weight Calculation - Line A 60-64

1725 lbs. (From TL-27) x 2 cubic yards = 3450 lbs. of Coarse Aggregate for 2 cubic yards

Coarse Aggregate (No. 57), Free Water Calculation - Line A 65-67

3450 lbs. of C.A. (Line A 60-64) x .006 (% Free Moisture in C.A. expressed as a decimal) = 20.7  
(Rounded to nearest whole pound) = 21 lbs.

Total Allowable Water - Line B 13-16

33 gals. (From TL-27) x 2 cubic yards = 66.0 gallons

Water Added at Plant - Line B 20-23

123 lbs. of free water in sand + 21 lbs. of free water in C.A. = 144 lbs.

144 lbs. of free water in sand and C.A. ÷ 8.33 weight of one gallon of water in lbs. = 17.3 gals.

1 gallon of water per cubic yard withheld at plant x 2 cubic yards = 2 gals. of water withheld

66.0 gallons (Line B 13-16) - 19.3 gallons of free and withheld water = 46.7 gallons of  
water added at plant

A. E. Admixture - Line B 31-34

4.6 oz. (TL-27) x 2 cubic yards = 9.2 oz. of Air Entrained Admixture for 2 cubic yards

## Concrete Field Example Problem

Using the information below, fill in Line C (lower portion) of the TL-28A Coding Form and the Notice of Shipment of Concrete Cylinders Form TL-13.

The contractor on Project 0295-127-101,C501 has ordered 8 cubic yards of A-3 General concrete from B. M. Jones Ready Mix (Plant Code No. 4006) to be placed in a paved ditch. This is Load No. 1 batched at 2:00 p.m. on Truck No. 306.

When this load of concrete arrived on the project, the project inspector took the TL-28A from the mixer driver in order to fill out Line C on the form.

The mix was dry so the contractor told the mixer driver to add 4 gallons of water to the load and put 25 additional mixing revolutions on the drum.

The inspector took the temperature of the concrete and determined it to be 72°F. The inspector checked the slump by the slump cone method and found the slump to be 3.50 inches. The entrained air content was checked using a Type A Air Meter (Protex Air Meter) and was found to be 6.5%. This load met VDOT specifications and was accepted. The contractor began discharge at 2:45 p.m.

The average air temperature during pouring was 75°F.

Design Quality Control Cylinders were cast by the inspector at 2:55 p.m. and were numbered 1, 1A and 1B. The cylinders were placed in a curing box for 24 hours. The low field storage temperature was 65°F and the high field storage temperature was 75°F.

The paved ditch was cured using polyethylene sheeting.



FORM TL-13  
REV. 2/98

VIRGINIA DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION

NOTICE OF SHIPMENT OF CONCRETE CYLINDER

PROJECT NUMBER			PLANT			LOAD NO.			DATE TAKEN			FIRST CYLINDER SAMPLE		SECOND CYLINDER SAMPLE		THIRD CYLINDER SAMPLE	
ROUTE	CO.	SECT.	TYPE	PLANT NO.	PLANT	LOAD NO.	YY	MM	DD	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
0295	127	101	C501	4008	01	070318	07	03	18	01	01	01	48405051	56575859	64656667	1A	1B

CLASS OF CONCRETE A 3 GENERAL

SUBMITTED BY PROJECT INSPECTORS NAME

# Chapter 10

## Study Problems

### Concrete Plant Study Problem

Using the information below and the TL-27 Mix Design on the next page, fill in lines A & B (upper portion) of the TL-28A Coding Form.

The contractor on project U000-106-101,C501 is going to place 80 cubic yards of A-4, Retarded Concrete, in a bridge deck on August 18, 2007. This project is under Standard (English) Specifications.

The concrete will be supplied by Capitol Ready Mix and will be furnished by means of ten, 8 cubic yard loads.

The concrete will be batched from Mix Design No. 4-2905-07 (attached) and this will be Job No. 1.

The plant code for Capitol Ready Mix is (4119). The code for Gray Cement is (10). The Producer Code for Hilltop S&G is (4001) and for Bluestone Quarry is (4007). The code for Air 20 Air Entraining Agent is (06) and for Slo-Go Retarder is (03).

The free moisture on the sand is 6.0% and on the 57 Aggregate is 0.2%.

There were 70 mixing revolutions put on the loads at the plant and 1 gallon of water per cubic yard held out of each load.

**VIRGINIA DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION**

**STATEMENT OF HYDRAULIC CEMENT CONCRETE MIX DESIGN**

Submit one copy to the District Administrator, Virginia Department of Transportation. Approval must be received by the contractor from the Materials Division before work is begun. This mix design is approved for all projects of the Department for the class of concrete shown: Calendar Year 2007 Mix Design No. 4-2905-07

Producer CAPITOL READY MIX Plant Location PETERSBURG, VA Phone 804-555-2000  
Type of Mix: Ready Mix X Job Mix \_\_\_\_\_ Date 08/09/2007

Mix Design - One Cubic Yard (Meter) Based on SSD Condition

Class of Concrete A4 RETARDED (E) Slump/ 3 In. \_\_\_\_\_ mm Air Content 6.5 %  
(M) Flow

Material	Type	Quantities		Code	Source Name	Plant/Quarry Location
		lbs.	kg.			
Cement	<u>IP</u>	<u>635</u>	_____	<u>10</u>	<u>GRAY CEMENT</u>	<u>ROANOKE, VA</u>
Min. Admix. 1	_____	_____	_____	_____	_____	_____
Min. Admix. 2	_____	_____	_____	_____	_____	_____
Sand <sup>(1)</sup>		<u>946</u>	_____	<u>4001</u>	<u>HILLTOP S &amp; G</u>	<u>PETERSBURG, VA</u>
No. <u>57</u> Stone <sup>(1)</sup>		<u>1922</u>	_____	<u>4007</u>	<u>BLUESTONE QUARRY</u>	<u>DINWIDDIE CO., VA</u>
Gr./No. _____ Aggr. <sup>(1)</sup>		_____	_____	_____	_____	_____
Water <sup>(2)</sup>	<u>271</u> lbs.	<u>32.5</u>	gal.	_____	<u>DEEP WELL</u>	<u>ON SITE</u>
Admixture (AE) <sup>(3)</sup>		<u>5</u>	oz.	<u>6</u>	<u>AIR 20 MASTER BLDRS.</u>	<u>RICHMOND, VA</u>
Admixture (Retarder) <sup>(3)</sup>		<u>25</u>	oz.	<u>3</u>	<u>SLO-GO 75 MASTER BLDRS.</u>	<u>RICHMOND, VA</u>
Admixture (Other) <sup>(3)</sup>		_____	oz.	_____	_____	_____

NOTES: \_\_\_\_\_

(1) The quantities of fine and coarse aggregates necessary to conform to specifications in regard to consistency and workability shall be determined by the method described in "Recommended Practice for Selecting Proportions for Normal Weight Concrete" (ACI-211.1) and the actual quantities used shall not deviate more than plus or minus 5 percent from such quantities.

(2) To provide minimum slump permissible in Table II-17 while satisfying placement and finishing requirements. A separate design shall be submitted for each slump desired.

(3) The quantity of admixture will not be approved or disapproved since it varies considerably and must be initially established by trial and error by the producer or contractor with subsequent adjustment during batching to maintain the desired results within the range specified.

Mineral Admixture #1 - sp.gr. \_\_\_\_\_  
Mineral Admixture #2 - sp.gr. \_\_\_\_\_  
Sand - Abs. 0.3  
Sand - F.M. 2.52  
Sand - sp.gr. 2.64

C.A. #1 - Abs. 0.3  
C.A. #1 - sp.gr. 2.63  
C.A. #1 Unit mass 101.7 / \_\_\_\_\_  
Lbs./C.F. kg/C.M.

Aggr. #2 - Abs. \_\_\_\_\_  
Aggr. #2 - sp.gr. \_\_\_\_\_  
2nd F.A./C.A.-F.M./u.wt. \_\_\_\_\_ / \_\_\_\_\_  
E M

Design W/C Ratio 0.43

Contractor CAPITOL READY MIX  
(Name of Company)

By I. M. CERTIFIED  
(Certified Technician Preparing Form)

Producer Technician's Expiration Date 12/31/2012  
(Do Not Use Social Security Number)

**FOR DEPARTMENT USE ONLY**

Remarks: \_\_\_\_\_

Copies: District Materials Engineer  
Project Inspector  
Plant Inspector  
Sub- Contractor and / or R.M. Producer

Checked by G. R. JONES 8-9-07

Approved by M. J. CLARK 8-9-07  
District Materials Engineer

Approved tentatively subject to the production of material meeting the requirements of the Specifications and Special Provisions.



## Concrete Field Study Problem

Using the information below, fill in Line C of the TL-28A Coding Form and the TL-13 Form.

A subcontractor on Project U000-106-101,C501 orders 8 cubic yards of A3 general concrete from Capitol Ready Mix (VDOT Plant Code No. 4119) on June 23, 2007. This concrete will be placed in a sidewalk. This load is Load No. 1, batched at 12:30 p.m. on Truck No. 135.

The mix had dried up some in transit, so the contractor told the mixer driver to add 4 gallons of water to the load. 25 additional revolutions were put on the drum.

The load was then turned over to the VDOT inspector for testing. The temperature of the concrete was 78°F. The slump was 4.00 inches. Using a Type B Air Meter, the entrained air content was found to be 5.5%. These test results met VDOT specification requirements for this class of concrete, so discharge of this load began at 1:15 p.m.

Design Quality Control Cylinders were cast by the inspector at 1:20 p.m. The inspector numbered these cylinders 6, 6A and 6B. The cylinders were then placed in a curing box for 24 hours. The low field storage temperature was 70°F and the high field storage temperature was 76°F.

The average air temperature during pouring was 66°F.

This sidewalk was cured using polyethylene sheeting.



FORM TL-13

REV. 2/96

**VIRGINIA DEPARTMENT OF TRANSPORTATION  
MATERIALS DIVISION  
NOTICE OF SHIPMENT OF CONCRETE CYLINDER**

PROJECT NUMBER		PLANT				LOAD NO.			DATE TAKEN			FIRST CYLINDER SAMPLE			SECOND CYLINDER SAMPLE			THIRD CYLINDER SAMPLE																
																					ROUTE	CO.	SECT.	TYPE	17	18	19	20	21	22	23	24	25	26
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	56	57	58	59	64	65	66	67

CLASS OF CONCRETE \_\_\_\_\_

SUBMITTED BY \_\_\_\_\_

