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THE NEWS LETTER

OF THE

BUREAU OF PUBLIC ROADS

VOL. 2, NO. 6

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A. C. ROSE, EDITOR

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STATUS OF FEDERAL AID IN TEXAS OUTLINED BY THE CHIEF OF BUREAU

ON ACCOUNT OF THE INTEREST NOW CENTERING AROUND THE STATUS OF FEDERAL AID FOR HIGHWAYS IN TEXAS, MR. MACDONALD HAS MADE PUBLIC THE FOLLOWING STATEMENT:

"THERE HAS BEEN SOME MISUNDERSTANDING AS TO PREVIOUS ACTION OF THE BUREAU WITH REFERENCE TO FEDERAL-AID PARTICIPATION IN TEXAS. FEDERAL AID, IN THE STRICTLY LEGAL SENSE, HAS NOT BEEN WITHDRAWN. ON ACCOUNT OF EXISTING CONDITIONS, AMONG WHICH WAS THE LACK OF STATE FUNDS FOR NEW CONSTRUCTION, THE BUREAU CEASED TO APPROVE PROJECTS. THE TEXAS HIGHWAY DEPARTMENT HAS NOW REQUESTED A RESUMPTION OF THE APPROVAL OF PROJECTS FOR NEW CONSTRUCTION. MR. R. S. STERLING, CHAIRMAN OF THE TEXAS HIGHWAY DEPARTMENT, CONFERRED WITH THE BUREAU ON APRIL 7. THE AIMS OF THE TEXAS HIGHWAY DEPARTMENT AND THE BUREAU ARE APPARENTLY IN COMPLETE HARMONY. THE BUREAU IS NOW ENGAGED IN A VERY CAREFUL SURVEY OF BOTH THE FINANCIAL AND THE PHYSICAL ASPECTS OF THE FUTURE PROGRAM, AND THERE IS LITTLE DOUBT THAT THE APPROVAL OF PROJECTS WILL BE RESUMED AT AN EARLY DATE."

MR. E. W. JAMES LEFT WASHINGTON ON APRIL 13 TO REPRESENT THE HEADQUARTERS OFFICE OF THE BUREAU AND TO WORK WITH THE STATE HIGHWAY DEPARTMENT AND THE DISTRICT OFFICE OF THE BUREAU IN FORMULATING THE FUTURE PROGRAM BETWEEN THE STATE AND THE FEDERAL GOVERNMENT.

MR. MACDONALD LEFT WASHINGTON FOR TEXAS ON APRIL 20.

VIEWS ON TRAFFIC CONGESTION AND ITS RELIEF EXPRESSED BY MR. MACDONALD

WHILE IN PORTLAND, OREGON, ON THE BRIDGE HEARING MR. MACDONALD GAVE PUBLIC EXPRESSION TO HIS VIEWS CONCERNING METHODS FOR RELIEVING TRAFFIC CONGESTION. REFERRING TO THE TRAFFIC STUDIES MADE BY THE BUREAU IN CONGESTED AREAS, HE SAID, "IT QUICKLY DEVELOPED THAT THE MAIN CAUSES FOR CONGESTION, IN SO FAR AS IT WAS AFFECTED BY RURAL ROAD TRAFFIC, WERE: FIRST, LACK OF CONTINUITY OF ROUTES, SUCH AS STATE HIGHWAYS AND URBAN ARTERIES NOT CONNECTING PROPERLY; SECOND, LACK OF BY-PASSES BY WHICH THROUGH-TRAFFIC COULD ESCAPE CONGESTED PARTS OF THE CITY; AND THIRD, THE LARGE NUMBER OF JURISDICTIONS SOMETIMES EXISTING IN THE COUNTY IN WHICH THE CITY IS SITUATED."

CONTINUING, HE STATED HIS VIEWS WITH REGARD TO THE RELIEF OF CONGESTION EPIGRAMMATICALLY AS FOLLOWS:

"CONGESTION RESULTS NOT FROM A LARGE AMOUNT OF TRAFFIC MOVING, BUT FROM A LARGE AMOUNT OF TRAFFIC STOPPING.

"MOST REGULATION RETARDS MOVEMENT AND INCREASES HALTING, WHILE THE ONLY RELIEF POSSIBLE LIES IN FACILITIES FOR UNINTERRUPTED FLOW.

"IT IS IMPOSSIBLE TO RELIEVE TRAFFIC CONGESTION BY SIMPLY BUILDING WIDE HIGHWAYS IF THE TRAFFIC IS INTERRUPTED AT OTHER HIGHWAYS, STREETS OR GRADE INTERSECTIONS. IN FACT, THIS PROCEDURE PROBABLY RESULTS IN GREATER CONGESTION. RELIEF DOES NOT LIE IN WIDTH, BUT LIES IN DOING AWAY WITH INTERRUPTIONS.

"IT MAY SEEM IMPOSSIBLE, BUT IT IS A FACT THAT A HIGHWAY WILL DISCHARGE TRAFFIC AT 15 TO 20 MILES AN HOUR JUST AS FREELY AS AT 30 MILES AN HOUR. AT THE GREATER SPEED DRIVERS TAKE MORE ROOM FOR SAFETY.

"ONE OF THE BEST WAYS OF OBTAINING TRAFFIC RELIEF IN CONGESTED CENTERS IS TO DIVERT FROM THESE CENTERS TRAFFIC THAT DOES NOT BELONG THERE."

HEARINGS HELD ON PROPOSED PRIVATELY-OWNED TOLL BRIDGE
OVER THE COLUMBIA RIVER BELOW PORTLAND, OREGON

(NOT FOR RELEASE)

PUBLIC HEARINGS WERE HELD IN PORTLAND, OREGON, AND LONGVIEW, WASHINGTON, BETWEEN MARCH 15 AND 19, BY A TRIBUNAL, OF WHICH MR. MACDONALD WAS A MEMBER, REPRESENTING THE SECRETARIES OF WAR, COMMERCE AND AGRICULTURE, TO OBTAIN EVIDENCE AS TO THE FEASIBILITY, NECESSITY, AND PRACTICABILITY OF A PROPOSED PRIVATELY-OWNED TOLL BRIDGE OVER THE COLUMBIA RIVER IN THE VICINITY OF RAINIER, OREGON, AND LONGVIEW, WASHINGTON.

THE HEARINGS WERE HELD IN ACCORDANCE WITH THE PROVISIONS OF THE ACT (PUBLIC - NO. 574) PASSED BY THE LAST CONGRESS GRANTING CONSENT TO W. D. COMER AND WESLEY VANDERCOOK TO CONSTRUCT, MAINTAIN, AND OPERATE A TOLL BRIDGE AT THIS LOCATION. THE ACT PROVIDED THAT THE **** "CONSTRUCTION OF SUCH A BRIDGE SHALL NOT BE COMMENCED NOR SHALL ANY ALTERATIONS OF SUCH BRIDGE BE MADE EITHER BEFORE OR AFTER ITS COMPLETION UNTIL THE PLANS AND SPECIFICATIONS FOR SUCH CONSTRUCTION OR ALTERATIONS HAVE BEEN FIRST SUBMITTED AND APPROVED BY THE SECRETARY OF WAR, THE SECRETARY OF COMMERCE, AND THE SECRETARY OF AGRICULTURE, ACTING JOINTLY, AND THEY, ACTING JOINTLY, SHALL DETERMINE WHETHER THE TYPES, DESIGNS, AND SPECIFICATIONS THEREOF ARE ADEQUATE, BASED UPON THE PROPOSED USE, VOLUME, AND WEIGHT OF TRAFFIC PASSING OVER SUCH BRIDGE, AND WHETHER THE HEIGHT AND CLEARANCE OF SUCH BRIDGE ARE ADEQUATE TO PROTECT THE COMMERCE ON SAID COLUMBIA RIVER, AND WHETHER THE LOCATION SELECTED IS FEASIBLE FOR THE ERECTION OF SUCH BRIDGE WITHOUT OBSTRUCTIONS IN NAVIGATION AND WITHOUT BEING DETRIMENTAL TO THE DEVELOPMENT OF INTERSTATE AND FOREIGN AS WELL AS DOMESTIC COMMERCE MOVING TO AND FROM THE PACIFIC OCEAN ON THE COLUMBIA RIVER TO THE INLAND WATERS OF THE STATES CONCERNED, AND WHETHER PUBLIC CONVENIENCE WILL BE SERVED BY SUCH A BRIDGE AS A CONNECTING LINK BETWEEN THE FEDERAL-AID HIGHWAY SYSTEMS OF THE STATES OF OREGON AND WASHINGTON."

REPRESENTING THE SEVERAL CABINET OFFICERS AT THE HEARING WERE THE CHAIRMAN, MAJOR R. T. COINER, IN CHARGE OF THE PORTLAND DISTRICT OFFICE OF THE U. S. ENGINEERS, FOR THE SECRETARY OF WAR; COLONEL E. LESTER JONES, DIRECTOR OF THE U. S. COAST AND GEODETIC SURVEY, FOR THE SECRETARY OF COMMERCE; AND MR. MACDONALD FOR THE SECRETARY OF AGRICULTURE.

EVIDENCE FOR AND AGAINST THE PROPOSED STRUCTURE WAS SUBMITTED TO THIS TRIBUNAL BY MUNICIPAL, COUNTY, STATE, SHIPPING, INDUSTRIAL, MOTOR VEHICLE, COMMERCIAL, AND OTHER INTERESTS INVOLVED. THE ENGINEER FOR THE BRIDGE PROPONENTS WAS JOSEPH E. STRAUSS OF THE STRAUSS BASCULE BRIDGE COMPANY OF CHICAGO, WHO ADVOCATED THE CONSTRUCTION OF THE BRIDGE AND DEFENDED THE PLANS WHICH CALL FOR A 750-FOOT MAIN CHANNEL SPAN AND A 155-FOOT CLEARANCE ABOVE MEAN LOW WATER.

A SUMMARY OF THE ARGUMENTS ADVANCED BY THE PROPONENTS AND OPPONENTS OF THE PROPOSED 135-FOOT-ABOVE-MEAN-HIGH-WATER TOLL BRIDGE FOLLOWS.

PROponents

THE BRIDGE WOULD:

PRODUCE STREET CONTINUITY ON BOTH SIDES OF THE RIVER BY CONNECTING A STREET IN LONGVIEW, WASHINGTON, WITH ONE IN RAINIER, OREGON.

PROVIDE A SHORTER CONNECTION BETWEEN THE PACIFIC COAST-HIGHWAYS IN WASHINGTON AND OREGON AND THUS STIMULATE AUTOMOBILE TRAVEL.

SERVE AS A PUBLIC CONVENIENCE AND ASSIST IN THE DEVELOPMENT OF THE LOCAL COMMUNITIES.

PROVIDE A LARGE AMOUNT OF WORK FOR LABORING MEN.

RELIEVE CONGESTION ON THE KELSO-PORTLAND SECTION OF THE PACIFIC HIGHWAY IN WASHINGTON AND FURNISH A SHORTER ROUTE.

OPponents

THE BRIDGE WOULD:

PREVENT THE FULL AND FREE USE OF THE RIVER TO COMMERCE WHICH NOW MOVES WITH AN ANNUAL VOLUME OF 5,000,000 TONS INTO AND OUT OF PORTS SITUATED ABOVE THE PROPOSED BRIDGE SITE AND WHICH IS INCREASING RAPIDLY IN VOLUME.

OBSTRUCT NAVIGATION BECAUSE OF THE 135-FOOT-ABOVE-MEAN-HIGH-WATER CLEARANCE WHICH WOULD PREVENT MANY VESSELS FROM REACHING PORTS ABOVE THE BRIDGE.

OBSTRUCT NAVIGATION BECAUSE OF THE INADEQUATE HORIZONTAL CLEARANCE OF THE PIERS IN FOGGY OR STORMY WEATHER.

CAUSE INCREASED ANNUAL SHIPPING COSTS DUE TO THE INCREASE IN THE OBSTRUCTION TO RIVER TRAFFIC.

ADVERSELY AFFECT THE PRODUCERS OF THE REGION BY REASON OF THE ADDED SHIPPING COSTS AND PREVENT THEM FROM COMPETING WITH PRODUCERS OF OTHER REGIONS.

IMPAIR THE DEVELOPMENT OF THE REGION BY REASON OF THE ADDED SHIPPING COSTS.

COUNTERACT THE REDUCTION OF RATES AND MARKETING COSTS MADE POSSIBLE BY LOCAL PRODUCERS AFTER YEARS OF EFFORT.

NULLIFY THE EXPENDITURES MADE BY THE PORT OF PORTLAND AND THE FEDERAL GOVERNMENT IN IMPROVING A CHANNEL 500 FEET WIDE BY 30 FEET DEEP, FROM PORTLAND TO THE SEA, THAT COST MORE THAN \$20,000,000 EXPENDED OVER A PERIOD OF 60 YEARS.

PREVENT THE COLUMBIA RIVER BASIN FROM RECEIVING THE FULL BENEFITS MADE POSSIBLE BY THE TOPOGRAPHY OF THE REGION.

CLASH WITH THE NATIONAL POLICY OF UTILIZING TO THE FULLEST EXTENT THE INLAND WATERWAYS OF THE UNITED STATES.

INCREASE TRANSPORTATION COSTS BY DECREASING THE DISTANCE OF LOW-COST SHIP HAUL FROM THE OCEAN TO A RIVER PORT.

CLASH WITH NATIONAL POLICY, AS EXPRESSED IN THE SHIPPING LAW OF 1920, WITH THE DECLARED OBJECT OF PROMOTING AND DEVELOPING PORTS AND TRANSPORTATION FACILITIES IN CONNECTION WITH WATER COMMERCE.

CLASH WITH INTERNATIONAL COMMERCIAL INTERESTS BY PLACING AN OBSTRUCTION BETWEEN THE FOREIGN AND COLUMBIA RIVER PORTS.

CLASH WITH THE DEMANDS OF NATIONAL PREPAREDNESS BY PLACING AN OBSTRUCTION TO RIVER NAVIGATION IN TIME OF WAR.

PERMIT PRIVATE INTERESTS TO REAP PROFITS FROM BRIDGE TOLLS MADE POSSIBLE BY HIGHWAYS CONSTRUCTED WITH PUBLIC FUNDS.

SERVE ONLY AS A LOCAL CONVENIENCE TO THE DETRIMENT OF THE REGIONAL AND NATIONAL PUBLIC NECESSITY.

LINK TWO HIGHWAYS EQUALLY DISTANT FROM PORTLAND AND BOTH ADEQUATE TO ACCOMMODATE HIGHWAY TRAFFIC.

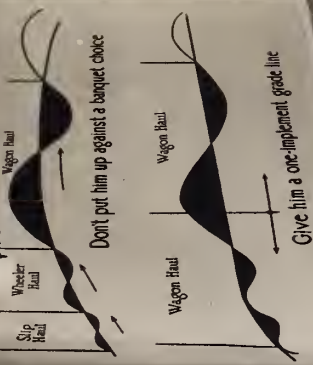
ESTABLISH A PRECEDENT FOR BRIDGES BETWEEN MAJOR PORTS AND THE SEA WHICH MIGHT RESULT IN UNTOLD DAMAGE TO OTHER PORTS SO SITUATED.

THE TRIBUNAL WILL MAKE A REPORT OF ITS FINDINGS TO THE THREE DESIGNATED CABINET OFFICERS BY WHOM A DECISION WILL BE RENDERED ON THE BASIS OF THE EVIDENCE ADDUCED.



GRADING ECONOMY

**YOUR JOB MR. ENGINEER:
TO GIVE THE CONTRACTOR
A GRADE HE CAN BUILD
ECONOMICALLY**



**OF EVERY DOLLAR
SPENT FOR HIGHWAYS
TWO BITS GOES FOR GRADING**



Grading time is
grading money
Stop-watch your
operations and turn
losses into profits



**YOUR JOB MR. CONTRACTOR:
TO FIT THE LOAD TO THE HAUL AND
KEEP 'EM COMING TO THE LOADER**

100 lbs
 200 lbs
 300 lbs
 400 lbs
 500 lbs
 600 lbs
 700 lbs
 800 lbs
 900 lbs
 1000 lbs

AVOID THIS GAP



GOVERNOR AL SMITH OPPOSES TOLL BRIDGES
IN NEW YORK STATE VETO MESSAGE

REPRINT FROM THE ENGINEERING NEWS-RECORD
VOL. 98, No. 14, PAGE 580, APRIL 7, 1927

"N.Y. GOVERNOR THINKS TIME PAST WHEN STATE SHOULD INCORPORATE SUCH
COMPANIES

"ON APRIL 1 GOV. SMITH OF NEW YORK VETOED THE LEGISLATIVE ACT AUTHORIZING THE THOUSAND ISLAND INTERNATIONAL BRIDGE CORPORATION TO BUILD A BRIDGE ACROSS THE ST. LAWRENCE RIVER NEAR COLLINS ISLAND, JEFFERSON COUNTY, OVER WELLESLEY ISLAND TO ONTARIO, CAN. IN HIS VETO MESSAGE THE GOVERNOR PRONOUNCED HIMSELF AGAINST FURTHER PRIVATE TOLL BRIDGE AUTHORIZATIONS, AND EXPRESSED THE BELIEF THAT WHEN TOLL BRIDGES ARE DESIRABLE OR NECESSARY THEY SHOULD BE BUILT BY PUBLIC FUNDS. HE SAID IN HIS MESSAGE:

GOVERNOR SMITH'S OBJECTIONS

"I THINK THE TIME IS PAST WHEN THE STATE SHOULD INCORPORATE COMPANIES OF THIS KIND. SUCH BRIDGES SHOULD BE BUILT EITHER FROM PUBLIC FUNDS OR THROUGH AN AGENCY SUCH AS THE PORT AUTHORITY OF NEW YORK, AUTHORIZED TO ISSUE BONDS AT A LOW RATE OF INTEREST AND LIMITED IN TOLLS TO THE AMOUNT NECESSARY TO RETIRE AND PAY INTEREST ON THE BONDS. EXPERIENCE WITH PRIVATE BRIDGES IS THAT THEY RESULT IN LARGE PROFITS TO STOCKHOLDERS AND OTHER PRIVATE PARTIES AND THE MAINTENANCE OF HIGH TOLLS. BEAR MOUNTAIN BRIDGE AT PEEKSKILL IS A GOOD EXAMPLE. THIS BRIDGE WAS INCORPORATED BY PRIVATE INDIVIDUALS WHO WERE GENUINELY INTERESTED IN AFFORDING A NEW MEANS OF ACCESS TO THE BEAR MOUNTAIN SECTION OF THE PALISADES STATE PARK AND THE SURROUNDING TERRITORY. THE MAXIMUM TOLLS WERE FIXED IN THE ACT. INTEREST ON PREFERRED STOCK WAS LIMITED TO 8 PER CENT BUT THE COMPANY WAS PERMITTED TO ISSUE SHARE FOR SHARE OF COMMON STOCK. THE BRIDGE WAS TO REVERT AT THE END OF THIRTY YEARS TO THE STATE AND THERE WERE PROVISIONS FOR RECAPTURE AT A GREATLY LOWERED PRICE IN THE COURSE OF THE THIRTY YEARS. IT IS ALREADY APPARENT THAT THE BRIDGE WILL NOT ONLY PAY THE 8 PER CENT ON THE BASIS OF TOLLS LESS THAN THE MAXIMUM PERMITTED TO BE CHARGED, BUT WILL PAY A LARGE RETURN ON THE STOCK, AND THAT IT WOULD BE A GOOD BUSINESS PROPOSITION, IF THE STATE HAD THE MONEY TO TAKE ADVANTAGE OF THE RECAPTURE CLAUSE. THE FACT IS THAT THE STATE DOES NOT HAVE THE MONEY AVAILABLE BECAUSE OF DEMANDS FOR OTHER PUBLIC IMPROVEMENTS, AND AS A RESULT A PROFIT WHICH OUGHT TO GO TO THE PUBLIC EITHER IN THE FORM OF REDUCED RATES OR IN THE FORM OF RETURNS WHICH COULD BE USED FOR OTHER IMPROVEMENTS NOW GOES INTO THE POCKETS OF PRIVATE OWNERS.

"PRIVATE BRIDGES OF THIS KIND BRING WITH THEM APPROACH AND TRAFFIC PROBLEMS WHICH IN THE END FALL ON THE STATE AND THE MUNICIPALITIES AND WHAT LOOKS AT FIRST LIKE A PURELY PRIVATE BUSINESS PROPOSITION BECOMES A PUBLIC PROBLEM OF TRAFFIC AND PLANNING AFFECTING ALL THE SURROUNDING TERRITORY. OBVIOUSLY, THESE RELATED PROBLEMS WHICH GO WITH SUCH A STRUCTURE CAN ONLY BE PROPERLY SOLVED BY A PUBLIC AUTHORITY.

"I HAVE JUST SIGNED A MEASURE SETTING UP A PUBLIC NON-PROFIT-MAKING BI-STATE AUTHORITY SIMILAR TO THE PORT AUTHORITIES OF NEW YORK AND ALBANY, TO BUILD THE CHAMPLAIN BRIDGE, AND ALSO A MEASURE PROVIDING FOR A STUDY OF A NIAGARA PORT AND FRONTIER AUTHORITY, WHICH, IF IT IS ESTABLISHED, WILL HAVE THE POWER TO PLAN JUST SUCH BRIDGES AS THIS WITHOUT PRIVATE PROFIT AND SOLELY IN THE PUBLIC INTEREST. I THINK THIS PROJECT AND SIMILAR BRIDGES, SUCH AS THE GRAND ISLAND BRIDGES, CAN WAIT UNTIL A PUBLIC AUTHORITY IS ESTABLISHED FOR THE PURPOSE. I SEE NO MORE REASON FOR A FRANCHISE TO A PRIVATE CORPORATION TO BUILD A BRIDGE OVER THE ST. LAWRENCE THAN I DO FOR A FRANCHISE OR LICENSE TO A PRIVATE CORPORATION TO DEVELOP THE STATE'S WATER POWER ON THAT STREAM."

- - - - -

"THE PRIVATE BILLS COMMITTEE OF THE CANADIAN PARLIAMENT, AT A RECENT SITTING REFUSED TO SANCTION THE APPLICATION OF THE PROMOTERS OF THE THOUSAND ISLAND INTERNATIONAL BRIDGE CORP. TO CONSTRUCT A BRIDGE OVER THE ST. LAWRENCE RIVER BETWEEN ROCKPORT, ONTARIO, AND COLLINS LANDING, NEW YORK. THE APPLICATION WAS STRENUOUSLY OPPOSED BY MAJOR GRAHAM BELL, DEPUTY MINISTER OF RAILWAYS AND CANALS, WHO POINTED OUT THAT WITH THE COMPLETION OF THE WELAND CANAL IT WOULD BE NECESSARY TO HAVE A BRIDGE ACROSS THE ST. LAWRENCE AT PRESCOTT OR BROCKVILLE, SO THAT IN WINTER ACCESS COULD BE HAD TO BOTH CANADIAN AND AMERICAN BOATS, OTHERWISE THE GRAIN WOULD GO TO OGDENSBURG AND BUILD UP AN AMERICAN PORT, AND SO AN EXPENDITURE OF \$110,000,000 ON THE WELAND CANAL WOULD BE LOST. CHARLES B. HIBBARD, NEW YORK BANKER, AND DR. C. E. STEINMAN, ENGINEER, WERE THE CHIEF SPOKESMEN FOR THE PROPOSED PROJECT."

1926 MOTOR VEHICLE REGISTRATION FEE TABLE REVISED

THE TABLE (M.V.-2-1926) ON PAGE 24 OF THE MARCH, 1927, NEWS LETTER, SHOWING THE MOTOR VEHICLE REVENUE RECEIPTS AND THEIR DISPOSITION FOR 1926, HAS BEEN REVISED IN CERTAIN MINOR DETAILS RELATING TO THE DISPOSITION OF THE GROSS RECEIPTS. THE CORRECTED TABLE WILL BE PUBLISHED IN THE MAY ISSUE OF PUBLIC ROADS.



CONSTRUCTION CERTAINTY

**LOWER BID PRICES
BY REDUCING CONTRACTORS' HAZARDS
ELIMINATE THESE SPECIFICATION CLAUSES**

**IF IN THE
JUDGEMENT OF
THE ENGINEER**

SAMPLE AND TEST ALL MATERIALS OF CONSTRUCTION

Sample a full car of Asphalt
Each Barrel 300 lbs
Every 1000 lbs of Concrete 1 cu yd
Every 1000 lbs of Cement
Every 1000 lbs of Cement

LOOK FOR DEFECTS WHILE THEY CAN STILL BE CORRECTED

Regulate thickness by frequent cross-sectioning of subgrade and surface and avoid the necessity of boring the finished pavement only to find it is thin

The greatest distresses are caused more often by low settlement and defective finish than by high subgrade

—But the stress is still increased — But the stress is still increased



PRESENT STATUS OF UNITED STATES HIGHWAY ROUTES I AND 10-N

CONTRIBUTED BY F. W. MILLS OF THE DIVISION OF DESIGN

(THIS ARTICLE IS THE BEGINNING OF A SERIES OF CONDITION SUMMARIES OF THE UNITED STATES HIGHWAY ROUTES. SUBSEQUENT INFORMATION WILL BE PUBLISHED FROM TIME TO TIME IN THE NEWS LETTER AS IT BECOMES AVAILABLE)

UNITED STATES HIGHWAY ROUTE I IS 76 PER CENT IMPROVED WITH GRAVEL OR THE HIGHER TYPES OF SURFACING OR PAVEMENT. LESS THAN 16 PER CENT CONSISTS OF EARTH OR UNIMPROVED ROAD. THIS ROUTE IS THE EXTREME EASTERN HIGHWAY OF THE COUNTRY AND FOLLOWS THE ATLANTIC SEABOARD PRACTICALLY THROUGHOUT ITS ENTIRE LENGTH, THE ONLY EXCEPTIONS WORTHY OF NOTE BEING IN NEW JERSEY AND IN THE CENTRAL ATLANTIC STATES. THE ROUTE EXTENDS FROM THE CANADIAN BOUNDARY AT FORT KENT, MAINE, FOR A DISTANCE OF 2,321 MILES TO MIAMI, FLORIDA. IT PASSES THROUGH BANGOR, PORTLAND, BOSTON, PROVIDENCE, NEW LONDON, NEW HAVEN, NEW YORK, TRENTON, PHILADELPHIA, BALTIMORE, WASHINGTON, RICHMOND, RALEIGH, COLUMBUS, AUGUSTA AND JACKSONVILLE.

A DETAILED STATEMENT OF THE CONDITION OF THE ROAD AS DETERMINED BY THE BUREAU SURVEY FOLLOWS:

ROUTE I

STATE	CITY OR TOWN	TYPE	MILES	
	:CANADIAN BORDER	:GRAVEL	65.40	
	: TO HOULTON	:GRAVEL UNDER		
	:	: CONSTRUCTION	6.33	
	:	:EARTH	49.59	
	:	:CITY PAVEMENT	<u>1.20</u>	122.52
	:HOULTON	:		
	: TO CALAIS	:EARTH	<u>90.00</u>	90.00
	:CALAIS	:GRAVEL	42.03	
	: TO MACHIAS	:BIT.MACADAM	7.9	
	:	:EARTH	8.87	
	:	:CITY PAVEMENT	<u>1.7</u>	60.50
MAINE	:MACHIAS	:CONCRETE	.76	
	: TO ELLSWORTH	:GRAVEL	50.01	
	:	:EARTH	13.89	
	:	:CITY PAVEMENT	<u>.2</u>	64.86

ROUTE 1 (CONTD.)

STATE	CITY OR TOWN	TYPE	MILES	
MAINE (CONTD.)	: ELLSWORTH	: CONCRETE	1.16	
	: TO BANGOR	: GRAVEL	23.72	
	:	: CITY PAVEMENT	2.0	26.88
	: BANGOR	: CONCRETE	.33	
	: VIA BELFAST	: GRAVEL	79.50	
	: THOMASTON	: BIT. MACADAM	53.75	
	: WISCASSET	: EARTH	.5	
	: TO PORTLAND	: CITY PAVEMENT	5.01	
	:	: BIT. CONCRETE	.13	
	:	: BRIDGE	.62	139.84
	: PORTLAND	: CONCRETE	32.53	
	: TO KITTERY	: BIT. MACADAM	11.85	
	:	: CITY PAVEMENT	9.1	
:	: DUAL PAVEMENT	1.20	54.68	
NEW HAMPSHIRE	: PORTSMOUTH	:		
	: TO NEWBURYPORT	: BIT. CONCRETE	17.00	17.00
MASSACHUSETTS	: N.H. STATE LINE	: CONCRETE	4.62	
	: VIA BOSTON	: BIT. MACADAM	21.68	
	: TO R.I. STATE	: RE INF. CONCRETE	30.22	
	: LINE	: CITY PAVEMENT	19.00	
	:	: BIT. CONCRETE	5.20	80.76
RHODE ISLAND	: MASS. STATE LINE	: RE INF. CONCRETE	6.09	
	: VIA PROVIDENCE	: CITY PAVEMENT	10.15	
	: TO WESTERLY	: BIT. CONCRETE	26.41	
	:	: ASPH. MACADAM	18.20	60.85
CONNECTICUT	: R.I. STATE LINE	: CONCRETE	78.39	
	: TO PORT CHESTER	: BIT. MACADAM	15.13	
	: AT N. Y. STATE	: CITY PAVEMENT	14.96	
	: LINE	: BIT. CONCRETE	10.63	
	:	: BRICK	.14	119.25
NEW YORK	: CONN. STATE LINE	:		
	: TO N. J. STATE	:		
	: LINE	: CITY PAVEMENT	27.00	27.00

ROUTE 1 (CONTD.)

STATE	CITY OR TOWN	TYPE	MILES	
NEW JERSEY	: N. Y. STATE LINE	: CONCRETE	19.323	
	: VIA BRUNSWICK	: BIT. MACADAM	1.11	
	: TO TRENTON	: REINF. CONCRETE AND		
	:	: SHEET ASPHALT	9.221	
	:	: CITY PAVEMENT	25.68	
	:	: BIT. CONCRETE	<u>14.296</u>	70.630
PENNSYLVANIA	: N. J. STATE LINE	: CITY PAVEMENT	24.00	
	: VIA PHILADELPHIA	:		
	: TO MARYLAND	: BLACK TOP AND		
	: STATE LINE	: CONCRETE	<u>59.00</u>	83.00
MARYLAND	: PENNSYLVANIA STATE	: BLACK TOP		
	: LINE VIA BALTO.	: AND		
	: TO D. C.	: CONCRETE	<u>94.00</u>	94.00
VIRGINIA	: D. C. LINE	: GRAVEL	74.00	
	: VIA FREDERICKS-	:		
	: BURG AND RICHMOND:	:		
	: TO N. C. STATE LINE:	: PAVEMENT	<u>141.00</u>	215.00
NORTH CAROLINA	VIRGINIA STATE	: CONCRETE	51.91	
	: LINE VIA RALEIGH	: GRAVEL	15.7	
	: TO S. C. STATE LINE:	: BIT. CONCRETE	29.5	
	:	: CITY PAVEMENT	7.5	
	:	: SAND ASPHALT	19.9	
	:	: TOP SOIL, OIL		
	:	: TREATED	53.3	
	:	: GRADED AND		
	: DRAINED	<u>4.5</u>	182.31	
SOUTH CAROLINA:	N. C. STATE LINE	: GRAVEL	17.71	
	: VIA CHESTERFIELD	: SAND CLAY	131.942	
	: CAMDEN	: CITY PAVEMENT	6.84	
	: COLUMBIA	: ASPHALT	15.09	
	: AIKEN	: UNIMPROVED	14.945	
	: TO GEORGIA STATE:	:		
	: LINE	: BRIDGES	<u>.80</u>	187.33

ROUTE 1 (CONTD.)

STATE	CITY OR TOWN	TYPE	MILES	
GEORGIA	: N.C. STATE LINE	: CONCRETE	35.197	
	: VIA AUGUSTA	: BIT. MACADAM	7.023	
	: SWAINSBORO	: EARTH	55.07	
	: LYONS	: SAND CLAY	55.133	
	: BAXLEY	: CITY PAVEMENT	4.850	
	: WAYCROSS	: BRIDGE	.135	
	: TO FLORIDA STATE	: SAND CLAY AND		
	: LINE	: GRAVEL, SURFACE		
		: TREATED	48.738	
		: GRADED AND		
	: DRAINED	<u>13.295</u>	220.44	
FLORIDA	: GEORGIA STATE LINE	: CONCRETE	29.835	
	: VIA JACKSONVILLE	: BIT. MACADAM	136.04	
	: ST. AUGUSTINE	: EARTH	112.21	
	: DAYTONA	: CITY PAVEMENT	23.8	
	: MELBOURNE	: BRICK	18.7	
	: FORT PIERCE	: SHEET		
	: PALM BEACH	: ASPHALT	68.26	
	: MIAMI	: BRIDGES	<u>7.43</u>	396.31

SUMMARY OF TYPES
ROUTE 1

	MILES	PER CENT
CONCRETE.....	595.97	25.7
GRAVEL.....	496.38	21.4
BITUMINOUS MACADAM.....	356.03	15.4
EARTH.....	347.93	15.0
SAND CLAY.....	194.95	8.4
CITY PAVEMENT.....	183.97	7.9
BITUMINOUS CONCRETE.....	103.17	4.4
BRICK.....	18.7	0.8
UNIMPROVED.....	14.95	0.6
BRIDGES.....	9.02	0.4
TOTAL	<u>2321.14</u>	<u>100.0</u>

UNITED STATES HIGHWAY 10-NORTH IS 66 PER CENT IMPROVED WITH GRAVEL AND THE INTERMEDIATE AND HIGH-TYPE PAVEMENTS. THE UNIMPROVED AND EARTH ROAD SECTIONS OF THIS ROUTE TOTAL 34 PER CENT. THIS IS NOT A TRANS-CONTINENTAL ROUTE BUT BEGINS AT DETROIT AND RUNS TO LUDINGTON, MICHIGAN, WHERE LAKE MICHIGAN IS CROSSED BY A FERRY TO MANITOWOC, WISCONSIN, AND THEN ACROSS WISCONSIN, MINNESOTA, NORTH DAKOTA, MONTANA, IDAHO AND WASHINGTON TO SEATTLE ON PUGET SOUND. THE TOTAL LENGTH IS 2,398 MILES.

A SUMMARY OF THE BUREAU SURVEY FOLLOWS:

ROUTE 10-NORTH

STATE	CITY OR TOWN	TYPE	MILES	
MICHIGAN	DETROIT	CONCRETE	84.74	
	VIA PONTIAC	GRAVEL	114.30	
	FLINT	MACADAM	1.07	
	SAGINAW	CITY PAVEMENT	.5	
	CLARE	BIT. CONCRETE	18.57	
	REED CITY	UNIMPROVED	12.00	
	TO LUDINGTON			<u>231.18</u>
	FERRY FROM LUDING-			
	TON TO MANITOWOC			
WISCONSIN	MANITOWOC	CONCRETE	131.4	
	VIA APPLETON	GRAVEL	150.5	
	WAUPACA	CITY PAVEMENT	10.9	
	STEVENS POINT			
	NEALVILLE			
	EAU CLAIRE			
TO HUDSON	UNIMPROVED	<u>27.7</u>	<u>320.5</u>	
MINNESOTA	WISCONSIN STATE			
	LINE VIA ST. PAUL			
	MINNEAPOLIS			
	ST. CLOUD			
	LITTLE FALLS			
	MOTLEY			
	WADENA	CONCRETE	125.03	
	DETROIT	GRAVEL	75.22	
	TO MOORHEAD AND	EARTH	63.97	
THE N. D. STATE	CITY PAVEMENT	17.71		
LINE	BIT. CONCRETE	<u>12.10</u>	<u>294.03</u>	

ROUTE 10-NORTH (CONTD.)

STATE	CITY OR TOWN	TYPE	MILES	
NORTH DAKOTA	MINNESOTA STATE			
	LINE AT FARGO			
	VIA VALLEY CITY			
	JAMESTOWN	CONCRETE	4.83	
	BISMARCK	GRAVEL	114.69	
	DICKINSON	EARTH	270.11	
	TO BEACH AND THE	CITY PAVEMENT	4.42	
	MONTANA LINE	ASPHALT	<u>2.89</u>	397.00
MONTANA	NORTH DAKOTA STATE			
	LINE VIA GLENDIVE			
	MILES CITY			
	BILLINGS			
	LIVINGSTON			
	BUTTE	CONCRETE	17.00	
	ANACONDA	GRAVEL	375.8	
	DEER LODGE	BIT. CONCRETE	4.32	
	GARRISON	UNIMPROVED	324.1	
	DRUMMOND	GRADED AND		
	MISSOULA	DRAINED	<u>76.80</u>	798.02
IDAHO	MONTANA STATE LINE	CONCRETE	18.18	
	VIA WALLACE	GRAVEL	9.39	
	KELLOGG	CR. STONE	37.79	
	COEUR D'ALENE	GRADED AND		
	TO WASHINGTON	DRAINED	11.02	
	STATE LINE	UNIMPROVED	<u>7.70</u>	84.08
WASHINGTON	IDAHO STATE LINE			
	VIA SPOKANE			
	DAVENPORT			
	COULEE	CONCRETE	93.00	
	WATERVILLE	GRAVEL	211.85	
	BLEWETT	CITY PAVEMENT	23.75	
	TO SEATTLE	UNIMPROVED	<u>28.7</u>	357.30

SUMMARY OF TYPES
ROUTE 10-NORTH

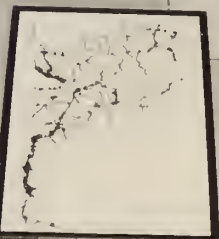
	MILES	PER CENT
CONCRETE.....	474.26	19.1
GRAVEL.....	1090.61	44.0
EARTH.....	421.90	17.1
CITY PAVEMENT.....	57.28	2.3
BITUMINOUS CONCRETE.....	37.88	1.1
UNIMPROVED.....	<u>400.20</u>	<u>16.4</u>
TOTAL.....	<u>2482.13</u>	<u>100.0</u>



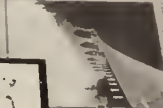
TRAFFIC SERVICE IS NOT COMPLETE UNTIL THE DANGER SPOTS HAVE BEEN ERADICATED



A Dangerous Grade Crossing



Accident record maps locate the dangerous places on the highway system



Bad Road Signage at Highway

TRAFFIC SERVICE

CONSTRUCTION AND MAINTENANCE - YES BUT THE HIGHEST DUTY OF EVERY HIGHWAY DEPARTMENT IS TRAFFIC SERVICE



TRAFFIC IS NOT ADEQUATELY SERVED IF IT IS BLOCKED BY SNOW



FOR PERFECT SERVICE - THESE TOO



Good Road Work



Efficient Roadwork



Good Road Work



Good Road Work



GENERAL PRACTICE IN THE SELECTION OF BRIDGE TYPES
AS INDICATED BY A REVIEW OF FEDERAL-AID PROJECTS

CONTRIBUTED BY THE BRIDGE SECTION OF THE DIVISION OF DESIGN

A STATEMENT OF THE GENERAL PRACTICE IN THE SELECTION OF BRIDGE TYPES IN THIS COUNTRY, AS INDICATED BY A RECORD OF FEDERAL-AID PROJECTS, WAS RECENTLY COMPILED IN RESPONSE TO A REQUEST FOR INFORMATION MADE BY SIR E. OWEN WILLIAMS OF LONDON, ENGLAND, AND IT IS PRESENTED BELOW IN THE BELIEF THAT IT MAY BE OF INTEREST TO THE BRIDGE ENGINEERS OF THE BUREAU.

"BOTH CONCRETE AND STRUCTURAL STEEL ARE USED TOGETHER ON NEARLY ALL MAJOR BRIDGES. THE SUBSTRUCTURE IS USUALLY MADE OF CONCRETE EITHER PLAIN OR REINFORCED, THE SHORT APPROACH SPANS AND THE FLOOR SLAB ON THE MAIN SPANS OF REINFORCED CONCRETE, AND THE MAIN SPANS OF STRUCTURAL STEEL. WHERE AN ARCH STRUCTURE IS SUITABLE, REINFORCED CONCRETE IS GENERALLY USED. REINFORCED CONCRETE TRESTLES ARE GENERALLY USED FOR LONG LOW STRUCTURES AS CROSSINGS OVER SWAMPS AND WIDE SHALLOW FLOOD PLAINS WHERE ICE DOES NOT CONSTITUTE A MENACE, ALTHOUGH TREATED TIMBER TRESTLES ARE ALSO USED IN SUCH LOCATIONS.

"THE GENERAL PRACTICE MAY BE SUMMARIZED AS FOLLOWS:

1. FOR SMALL OPENINGS 7 TO 8 SQUARE FEET AND LESS.
 - A. REINFORCED CONCRETE BOXES
 - B. REINFORCED CONCRETE SLABS ON PLAIN ABUTMENT WALLS
 - C. SEMI-CIRCULAR OPENINGS OF PLAIN OR REINFORCED CONCRETE
 - D. REINFORCED CONCRETE PIPE
 - E. CAST IRON PIPE
 - F. VITRIFIED CLAY PIPE ENCASED IN PLAIN CONCRETE
 - G. GALVANIZED METAL PIPE (WHERE ROAD IS NOT TO BE HARD SURFACED)
 - H. TREATED TIMBER CULVERTS (VERY LIMITED USE ONLY)

2. OPENINGS GREATER THAN 7 TO 8 SQUARE FEET AND UP TO 12-FOOT SPAN.
 - A. REINFORCED CONCRETE BOXES
 - B. REINFORCED CONCRETE SLAB ON PLAIN OR REINFORCED CONCRETE, OR STONE MASONRY ABUTMENTS
 - C. IN WARM REGIONS NOT SUBJECT TO DRIFT, MULTIPLE BOX CULVERTS OF REINFORCED CONCRETE

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

REPORT ON THE PROGRESS OF RESEARCH

IN THE DEPARTMENT OF PHYSICS

FOR THE YEAR 1954

BY THE FACULTY

AND THE STUDENTS

OF THE DEPARTMENT

OF PHYSICS

UNIVERSITY OF CHICAGO

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1955

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3. SPANS FROM 12 FEET TO 20 FEET.
 - A. REINFORCED CONCRETE SLABS, ON PLAIN OR REINFORCED CONCRETE ABUTMENTS
 - B. REINFORCED CONCRETE T-BEAMS, ON PLAIN OR REINFORCED CONCRETE ABUTMENTS
 - C. LIMITED USE OF REINFORCED CONCRETE SLABS ON STEEL I-BEAM: STRINGERS WITH PLAIN OR REINFORCED CONCRETE ABUTMENTS
 - D. IN WARM REGIONS NOT SUBJECT TO DRIFT, MULTIPLE BOX CULVERTS OF REINFORCED CONCRETE.

4. SPANS FROM 20 FEET TO 50 FEET.
 - A. REINFORCED CONCRETE T-BEAMS, ON PLAIN OR REINFORCED CONCRETE ABUTMENTS
 - B. REINFORCED CONCRETE SLAB ON ROLLED STEEL I-BEAMS, WITH PLAIN OR REINFORCED CONCRETE ABUTMENTS

5. SPANS FROM 50 FEET TO 100 FEET.
 - A. LOW RIVETED TRUSSES, WITH REINFORCED CONCRETE FLOOR SLABS
 - B. PLATE GIRDERS WITH REINFORCED CONCRETE FLOOR SLABS

6. SPANS OVER 100 FEET.

RIVETED THROUGH OR DECK TRUSSES WITH REINFORCED CONCRETE FLOOR SLABS

"THE USE OF ARCHES IS LIMITED TO LOCATIONS WHERE AMPLE HEADROOM AND WHERE ROCK OR OTHER UNQUESTIONABLE FOUNDATION MATERIAL IS AVAILABLE. THEY ARE GENERALLY OF REINFORCED CONCRETE AND ARE BUILT IN PRACTICALLY ALL SPAN LENGTHS UP TO ABOUT 250 FEET.

"ON STRUCTURAL STEEL BRIDGES, TIMBER FLOORS WITH A BITUMINOUS WEARING SURFACE ARE SOMETIMES USED, BUT IN THESE CASES THE STRUCTURAL STEEL IS ALMOST ALWAYS SO DESIGNED THAT A CONCRETE FLOOR MAY BE PLACED ON THE STRUCTURE AT SOME FUTURE DATE WITHOUT OVERSTRESSING THE MEMBERS.

"FLOORS ON MOVABLE BRIDGES ARE GENERALLY OF TIMBER BUT IN A FEW RECENT CASES REINFORCED CONCRETE SLABS HAVE BEEN USED ON STRUCTURES OF THIS TYPE.

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"THE FOLLOWING APPROXIMATE PROPORTIONS OF THE TOTAL COST OF BRIDGE CONSTRUCTION REPRESENTING RESPECTIVELY CONCRETE AND STEEL CONSTRUCTION ON FEDERAL-AID WORK HAVE BEEN PREPARED FROM THE COST DATA OF THE BUREAU FOR THE PAST YEAR.

"OF THE TOTAL VALUE OF BRIDGE PROJECTS COSTING OVER \$70,000 EACH, 30 TO 40 PER CENT REPRESENTED THE COST OF CONCRETE CONSTRUCTION, AND 60 TO 70 PER CENT STRUCTURAL STEEL CONSTRUCTION.

"OF THE TOTAL VALUE OF BRIDGE PROJECTS COSTING LESS THAN \$70,000 EACH, BUT MORE THAN \$10,000 EACH, 60 TO 70 PER CENT REPRESENTED CONCRETE CONSTRUCTION, AND 30 TO 40 PER CENT STEEL CONSTRUCTION.

"OF THE TOTAL VALUE OF BRIDGE PROJECTS COSTING LESS THAN \$10,000 EACH, FROM 80 TO 90 PER CENT REPRESENTED CONCRETE CONSTRUCTION, AND 10 TO 20 PER CENT STEEL CONSTRUCTION."

STATES WITH CONTINUOUSLY IMPROVED TRANS-STATE HIGHWAYS

CONTRIBUTED BY THE DIVISION OF DESIGN

A RECENT STUDY OF THE CONDITION LOGS OF THE FEDERAL-AID HIGHWAY SYSTEM INDICATES THAT 28 STATES WILL HAVE COMPLETED BY SEPTEMBER, 1927, CONTINUOUSLY IMPROVED TRANS-STATE HIGHWAYS IN TWO DIRECTIONS. THESE WILL BE: CALIFORNIA, CONNECTICUT, DELAWARE, FLORIDA, IDAHO, ILLINOIS, INDIANA, MAINE, MARYLAND, MASSACHUSETTS, MISSISSIPPI, MISSOURI, MICHIGAN, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, OHIO, OREGON, PENNSYLVANIA, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, WASHINGTON, WEST VIRGINIA AND WISCONSIN. TEN OTHER STATES SHOULD BE USING BY NEXT SEPTEMBER A SINGLE TRANS-STATE HIGHWAY IMPROVED THROUGHOUT THEIR ENTIRE LENGTH OR BREADTH. THESE WILL BE: ALABAMA, ARIZONA, ARKANSAS, COLORADO, GEORGIA, IOWA, KENTUCKY, LOUISIANA, MINNESOTA AND UTAH.

RESISTANCE OF FRANKI CONCRETE PILES TESTED IN FRANCE
(FROM LE GENIE CIVIL, DEC. 4, 1926, PAGE 543)

CONTRIBUTED BY THE DIVISION OF DESIGN
TRANSLATED AND ABSTRACTED BY C. S. JARVIS

THE NEED FOR PILES OF HIGH BEARING POWER IN TREACHEROUS SOIL HAS DEVELOPED A SPECIAL KIND OF CAST-IN-PLACE CONCRETE PILE THAT HAS WITHSTOOD VERY SEVERE TESTS IN FRANCE.

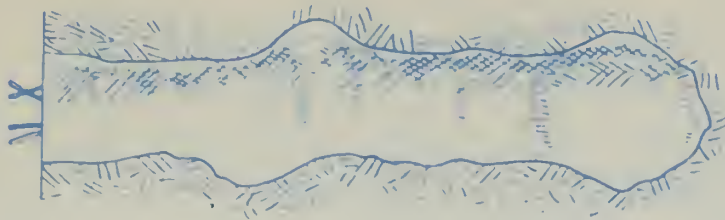
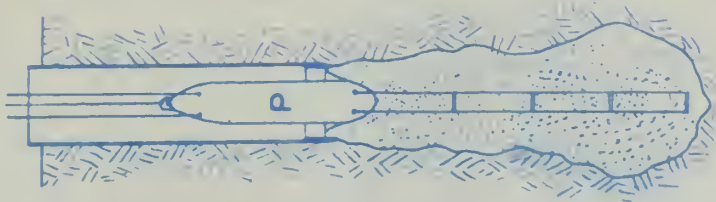
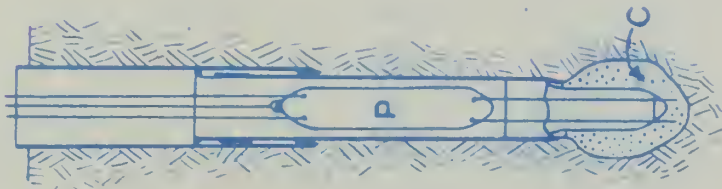
THE METAL CASING CONSISTS OF TELESCOPIC SECTIONS (T OF THE FIGURE) AND A CONICAL DRIVING POINT (C) WHICH ARE DRIVEN INTO THE SOIL BY A CYLINDRICAL DROP-HAMMER (M) OPERATING WITHIN THE LOWER SECTION. AFTER THE REQUIRED DEPTH HAS BEEN ATTAINED, THE DRIVING POINT AND HAMMER ARE HOISTED TO THE SURFACE, AND THE FIRST CONCRETE IS DEPOSITED. A SPECIAL CYLINDRICAL TAMPING HAMMER (P) OPERATING ON SMALL GUIDE RODS WITH THEIR LOWER ENDS ALWAYS SUBMERGED IN THE CONCRETE, DEVELOPS THE REQUIRED LATERAL PRESSURE BY SUCCESSIVE BLOWS AS THE CASING IS LIFTED. THE GUIDE RODS REMAIN IN THE CONCRETE AS REINFORCEMENT.

ENLARGED SECTIONS AT VARIOUS DEPTHS RESULT FROM THE UNEQUAL COMPRESSION OF THE SOIL LAYERS, DUE EITHER TO THEIR INHERENT WEAKNESS OR TO THE AMOUNT OF TAMPING TO WHICH THE SUCCESSIVE LAYERS OF CONCRETE ARE SUBJECTED. AS A CONSEQUENCE, THE RESISTANCE OF THE PILE IS MULTIPLIED SEVERAL FOLD AS COMPARED WITH THE ORDINARY SMOOTH TYPE.

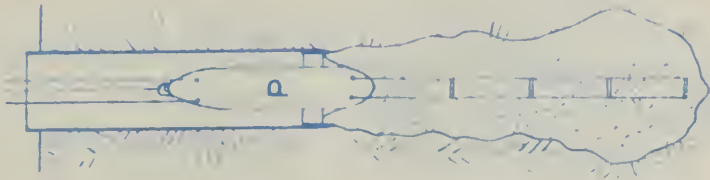
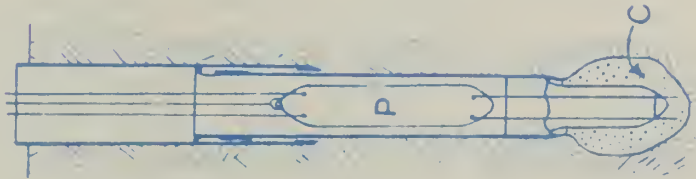
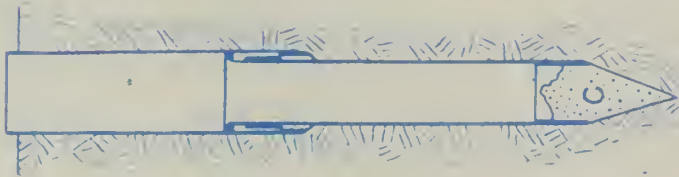
THE FIRST EXPERIENCE WITH THIS TYPE OF PILING WAS AT THE BANQUE DAUCHI GINKO IN TOKYO, JAPAN, DURING APRIL, 1926. ONE PILE 11 METERS LONG IN GOOD SOIL WAS TESTED UP TO 230 METRIC TONS.

THE FIRST SETTLEMENT OF 1 MILLIMETER OCCURRED AT 100 TONS; AT 160 TONS THE TOTAL SETTLEMENT WAS 3 MILLIMETERS; AT 200 TONS IT BECAME 5 MILLIMETERS; AND AT 230 TONS IT WAS 8 MILLIMETERS.

IN THE CONSTRUCTION OF THE CHURCH OF THE SACRED HEART AT KOEKELBERG, NEAR BRUSSELS, INVESTIGATIONS WERE CONDUCTED TO COMPARE VARIOUS TYPES OF BEARING PILES. THE FOUNDATION SOIL WAS VERY UNSTABLE, COMPRISING THE FOLLOWING LAYERS PROGRESSIVELY FROM THE SURFACE: SANDY CLAY, 5 METERS; FINE SAND, 0.5 METER; SOFT CLAY, 4 METERS; THENCE PLASTIC CLAY TO AN INDEFINITE DEPTH.



SUCCESSIVE STAGES IN THE CONSTRUCTION OF FRANKI CONCRETE PILING



SUCCESSIVE STAGES IN THE CONSTRUCTION OF FRANKI CONCRETE PILING

IN SPITE OF THE UNFAVORABLE CONDITIONS THE APPLIED LOAD ON A FRANKI PILE 11.65 METERS IN LENGTH WAS GRADUALLY INCREASED FROM 47 TO 212 TONS WITHOUT ANY SETTLEMENT. AT A LOADING OF 250 TONS A TOTAL DISPLACEMENT OF 3 MILLIMETERS WAS OBSERVED; AT 301 TONS, 4 MILLIMETERS; AND AT 335 TONS, THE MAXIMUM LOADING, 6 MILLIMETERS. THE PILE ROSE 3 MILLIMETERS AFTER THE LOAD WAS REMOVED.

AS A CONSEQUENCE OF SUCH TESTS, A TOTAL LENGTH OF 11,000 METERS OF THIS TYPE OF PILING WAS USED, WITH A DESIGNED WORKING LOAD OF 60 TO 80 TONS GENERALLY, OR 100 TONS FOR THE FOUNDATIONS OF THE CENTRAL DOME.

ON VERY BOGGY LAND NEAR ANTWERP, BELGIUM, THIS SAME TYPE OF PILING WAS TESTED IN A 5-METER LENGTH, PLACED IN SOIL DESCRIBED - BEGINNING AT THE SURFACE - AS 1 METER OF EARTH FILL, 1 METER OF BLACK PEAT, 2 METERS OF WATER-BEARING GREEN SAND, 4 METERS OF FINE SAND, AND 1 METER OF ALLUVIUM. THE SETTLEMENT INCREASED FROM 1 MILLIMETER AT 62-TONS LOADING TO 2 MILLIMETERS AT 98 TONS, 4 MILLIMETERS AT 133 TONS, 5 MILLIMETERS AT 152 TONS, AND FINALLY 8 MILLIMETERS AT 250 TONS. A LOADING OF 205 TONS SUSTAINED FOR 310 HOURS FAILED TO PRODUCE ANY ADDITIONAL SETTLEMENT, BUT WHEN THE ENTIRE LOAD WAS REMOVED THE PILE ELEVATION INCREASED 3 MILLIMETERS, INDICATING A PERMANENT NET SETTLEMENT OF 5 MILLIMETERS.

(NOTE BY TRANSLATOR: THE ORDINARY PRACTICE AS DEFINED BY THE STANDARD HIGHWAY BRIDGE SPECIFICATIONS OF THE A.A.S.H.O. LIMITS THE LOADING ON CONCRETE PILES TO FROM 25 TO 35 TONS, AND SETTLEMENT TO 1/4 INCH (6.1/3 MILLIMETERS) IN 48 HOURS UNDER DOUBLE THE DESIGNED LOADING)

