



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

April 11, 2024

To: Prospective Bidders

From: Jonathan W. Mitchell
Division Contract Engineer

DocuSigned by:
Jonathan W Mitchell
02B404268BC84C2...

Contract ID#: DC00453

WBS Element: BP3.R008.3

Subject: Addendum #1: DUPLIN BRIDGE 352

The Subject contract proposal contains the following addendum:

- 1- A special provision & pay item have been added for vibration monitoring. See the attached special provision & revised bid form.
- 2- Foundation recommendations have been included. See the attached.

****An Addendum has been added to Bid Express.****

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5505 BARBADOS BOULEVARD
CASTLE HAYNE, NC 28429-5647

Telephone: (910) 341-2001
Fax: (910) 675-0143
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
5505 BARBADOS BOULEVARD
CASTLE HAYNE, NC 28429-5647

CONTROL OF VIBRATION**(SPECIAL)**

Review and acceptance of any construction plan submittals does not relieve the Contractor of responsibility for damage or liability. Attention is directed to Articles 107-11 and 107-14 of the 2018 Standard Specifications for Roads and Structures.

Control of vibration is required during construction of Bridge 352 on SR 1004 over Hookers Branch and approaches. Utilize construction methods and equipment to avoid construction induced damage to the dam/spillway structure or nearby dwellings adjacent to Bridge 352. Use of vibratory compaction equipment is only allowed for compaction of fill and asphalt provided it doesn't cause damage to the dam/spillway structure and nearby dwellings.

Prequalified consultants for vibration monitoring (construction work code : 003129) can be found in the following link;

<https://www.ebs.nc.gov/VendorDirectory/search.html?s=pbs&a=new>

Submit a vibration monitoring plan to the Engineer for approval at least 30 days prior to any construction work. Vibration monitoring devices shall be placed in the field at least 7 days prior to beginning pile driving activities. Hold field meetings as needed.

Furnish and operate at least three vibration monitoring devices (engineering seismographs) placed at or near the dam/spillway structure and nearby dwellings. The vibration monitoring devices shall meet the following requirements.

- Calibrated within 12 months to the time monitoring is complete in the field
- Capable of recording full vibration waveforms in three perpendicular axes (vertical, transverse, and longitudinal) with a precision of at least 0.01 inches per second within the frequency range of four to 100 Hertz
- Capable of remote monitoring through the internet with an alarm to notify the ground vibration monitoring consultant immediately upon exceeding 0.5 inches per second for any single axis monitored

Continuous monitoring will be required during any particular phase of work that could generate detectable vibrations such as pile driving, paving and demolition of structure. Perform a pre-construction survey of dam/spillway structure before beginning of any construction and perform a post-construction survey of dam/spillway structure after all construction is completed. Survey report including photographic and/or video documentation shall be provided to the Department in a signed and sealed digital report by a Professional Engineer in the State of North Carolina and approved by the Department's Geotechnical Unit. Pre-construction report shall be provided to the Department as soon as available and post-construction report shall be provided to the Department within seven days of completing field work. Weekly transmittals of vibration data while the vibration monitoring units are in place in the field shall also be provided. All recorded vibration data shall be included in the post construction survey report.

Construction vibrations shall not exceed 0.5 inches per second for any single axis monitored. If vibration magnitudes exceed the specified limit, stop work immediately. Further evaluation will be required to assess potential damage to the dam/spillway structure or nearby dwellings and modify means and methods of work such as pile driving, paving and demolition of structure to reduce magnitudes of vibrations.

BASIS OF PAYMENT:

Payment will be made by the Lump Sum bid price for “Vibration Monitoring.” Such payment will be full compensation for all work described in this provision including, but not limited to, control of vibration, inspection of the structures, vibration monitoring, and submission of reports.

Pay Item

Vibration Monitoring

Pay Unit

Lump Sum



DocuSigned by:

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10/27/2022

County: DUPLIN

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
ROADWAY ITEMS						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0022000000-E	225	UNCLASSIFIED EXCAVATION	11,200 CY		
0004	0036000000-E	225	UNDERCUT EXCAVATION	510 CY		
0005	0043000000-N	226	GRADING	Lump Sum	L.S.	
0006	0050000000-E	226	SUPPLEMENTARY CLEARING & GRUBBING	1 ACR		
0007	0134000000-E	240	DRAINAGE DITCH EXCAVATION	74 CY		
0008	0194000000-E	265	SELECT GRANULAR MATERIAL, CLASS III	650 CY		
0009	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	300 SY		
0010	0223000000-E	275	ROCK PLATING	360 SY		
0011	0248000000-N	SP	GENERIC GRADING ITEM TYPE I BRIDGE APPROACH FILL, STA. 29+35.00	Lump Sum	L.S.	
0012	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	70 TON		
0013	0321000000-E	300	FOUNDATION CONDITIONING GEOTEXTILE	200 SY		
0014	0335200000-E	305	15" DRAINAGE PIPE	260 LF		
0015	0335300000-E	305	18" DRAINAGE PIPE	148 LF		
0016	0448200000-E	310	15" RC PIPE CULVERTS, CLASS IV	116 LF		
0017	0449000000-E	310	*** RC PIPE CULVERTS, CLASS V 18"	56 LF		

County: DUPLIN

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0018	0995000000-E	340	PIPE REMOVAL	147 LF		
0019	1121000000-E	520	AGGREGATE BASE COURSE	300 TON		
0020	1330000000-E	607	INCIDENTAL MILLING	230 SY		
0021	1491000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0C	1,600 TON		
0022	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	1,600 TON		
0023	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	180 TON		
0024	2022000000-E	815	SUBDRAIN EXCAVATION	168 CY		
0025	2026000000-E	815	GEOTEXTILE FOR SUBSURFACE DRAINS	750 SY		
0026	2036000000-E	815	SUBDRAIN COARSE AGGREGATE	126 CY		
0027	2044000000-E	815	6" PERFORATED SUBDRAIN PIPE	750 LF		
0028	2070000000-N	815	SUBDRAIN PIPE OUTLET	2 EA		
0029	2077000000-E	815	6" OUTLET PIPE	12 LF		
0030	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	3 EA		
0031	2367000000-N	840	FRAME WITH TWO GRATES, STD 840.29	3 EA		
0032	2556000000-E	846	SHOULDER BERM GUTTER	220 LF		
0033	3030000000-E	862	STEEL BEAM GUARDRAIL	725 LF		
0034	3045000000-E	862	STEEL BEAM GUARDRAIL, SHOP CURVED	100 LF		

County: DUPLIN

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0035	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	5 EA		
0036	3195000000-N	862	GUARDRAIL END UNITS, TYPE AT-1	2 EA		
0037	3215000000-N	862	GUARDRAIL ANCHOR UNITS, TYPE III	4 EA		
0038	3287000000-N	862	GUARDRAIL END UNITS, TYPE TL-3	2 EA		
0039	3628000000-E	876	RIP RAP, CLASS I	130 TON		
0040	3649000000-E	876	RIP RAP, CLASS B	130 TON		
0041	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	550 SY		
0042	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	208 SF		
0043	4405000000-E	1110	WORK ZONE SIGNS (PORTABLE)	96 SF		
0044	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	76 SF		
0045	4422000000-N	1120	PORTABLE CHANGEABLE MESSAGE SIGN (SHORT TERM)	56 DAY		
0046	4430000000-N	1130	DRUMS	56 EA		
0047	4435000000-N	1135	CONES	38 EA		
0048	4445000000-E	1145	BARRICADES (TYPE III)	144 LF		
0049	4455000000-N	1150	FLAGGER	60 DAY		
0050	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	4 EA		
0051	4485000000-E	1170	PORTABLE CONCRETE BARRIER	1,386 LF		

County: DUPLIN

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0052	4516000000-N	1180	SKINNY DRUM	16 EA		
0053	4685000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	9,272 LF		
0054	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	18,544 LF		
0055	4846000000-E	1205	POLYUREA PAVEMENT MARKING LINES (***, *** MILS) 4", 20 MILS	846 LF		
0056	4900000000-N	1251	PERMANENT RAISED PAVEMENT MARKERS	34 EA		
0057	5325600000-E	1510	6" WATER LINE	342 LF		
0058	5329000000-E	1510	DUCTILE IRON WATER PIPE FITTINGS	600 LB		
0059	5648000000-N	1515	RELOCATE WATER METER	2 EA		
0060	5649000000-N	1515	RECONNECT WATER METER	2 EA		
0061	5686500000-E	1515	WATER SERVICE LINE	126 LF		
0062	5800000000-E	1530	ABANDON 6" UTILITY PIPE	340 LF		
0063	6000000000-E	1605	TEMPORARY SILT FENCE	2,365 LF		
0064	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	70 TON		
0065	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	370 TON		
0066	6012000000-E	1610	SEDIMENT CONTROL STONE	115 TON		
0067	6015000000-E	1615	TEMPORARY MULCHING	5 ACR		
0068	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	400 LB		

County: DUPLIN

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0069	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEEDING	2 TON		
0070	6024000000-E	1622	TEMPORARY SLOPE DRAINS	200 LF		
0071	6029000000-E	SP	SAFETY FENCE	1,320 LF		
0072	6030000000-E	1630	SILT EXCAVATION	460 CY		
0073	6036000000-E	1631	MATTING FOR EROSION CONTROL	4,900 SY		
0074	6037000000-E	1629	COIR FIBER MAT	100 SY		
0075	6042000000-E	1632	1/4" HARDWARE CLOTH	95 LF		
0076	6071002000-E	1642	FLOCCULANT	125 LB		
0077	6071012000-E	1642	COIR FIBER WATTLE	550 LF		
0078	6071030000-E	1640	COIR FIBER BAFFLE	15 LF		
0079	6084000000-E	1660	SEEDING & MULCHING	6 ACR		
0080	6087000000-E	1660	MOWING	3 ACR		
0081	6090000000-E	1661	SEED FOR REPAIR SEEDING	50 LB		
0082	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	0.25 TON		
0083	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	125 LB		
0084	6108000000-E	1665	FERTILIZER TOPDRESSING	3.5 TON		
0085	6114500000-N	1667	SPECIALIZED HAND MOWING	10 MHR		

County: DUPLIN

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0086	6117000000-N	1675	RESPONSE FOR EROSION CONTROL	19 EA		
0087	6117500000-N	SP	CONCRETE WASHOUT STRUCTURE	2 EA		
STRUCTURE ITEMS						
0088	8182000000-E	420	CLASS A CONCRETE (BRIDGE)	80.8 CY		
0089	8210000000-N	422	BRIDGE APPROACH SLABS, STATION ***** (29+35.00 - L-)	Lump Sum	L.S.	
0090	8217000000-E	425	REINFORCING STEEL (BRIDGE)	12,552 LB		
0091	8328200000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** STEEL PILES (HP 12X53)	14 EA		
0092	8328400000-E	450	PILE DRIVING EQUIPMENT SETUP FOR *** GALVANIZED STEEL PILES (HP 14X102)	24 EA		
0093	8356000000-E	450	HP ** X ** GALVANIZED STEEL PILES (14 X 102)	2,120 LF		
0094	8364000000-E	450	HP 12 X 53 STEEL PILES	1,015 LF		
0095	8392500000-E	450	PREDRILLING FOR PILES	445 LF		
0096	8393000000-N	450	PILE REDRIVES	19 EA		
0097	8394000000-N	450	DYNAMIC PILE TESTING	3 EA		
0098	8475000000-E	460	TWO BAR METAL RAIL	485.75 LF		
0099	8517000000-E	460	1'*** X ***** CONCRETE PARAPET (1'-2"X2'-9.5")	500.75 LF		
0100	8608000000-E	876	RIP RAP CLASS II (2'-0" THICK)	425 TON		
0101	8622000000-E	876	GEOTEXTILE FOR DRAINAGE	470 SY		

County: DUPLIN

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0102	8657000000-N	430	ELASTOMERIC BEARINGS	Lump Sum	L.S.	
0103	8763000000-E	430	3'-0" X 2'-0" PRESTRESSED CONC CORED SLABS	3,000 LF		
0104	8860000000-N	SP	GENERIC STRUCTURE ITEM VIBRATION MONITORING	Lump Sum	L.S.	

1512/Apr11/Q86404.05/D457336444000/E104

Total Amount Of Bid For Entire Project :



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION


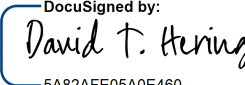
ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

DATE: October 26, 2022

MEMORANDUM TO: Chad Kimes, P.E.
Division Engineer

ATTENTION: Katie Hite, P.E., P.T.O.E.
Division Project Development Engineer

FROM:  David Hering, P.E.
Assistant State Geotechnical Engineer 
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STATE PROJECT: BP3.R008.1 (SF-300352)

F.A. PROJECT: N/A

COUNTY: Duplin

DESCRIPTION: Bridge No. 352 on -L- (SR 1004) over Hookers Branch

SUBJECT: Structure Foundation Recommendations

The Geotechnical Engineering Unit has completed the subsurface investigation and prepared the foundation design recommendations for the above structure and presents the following project data.

- Foundation Design Recommendation (2) pages
- Geotechnical Foundation Tables (1) pages
- Structure Inventory (10) pages
- Design Scour Elevation Letter (1) pages

Please call Jinyoung Park, P.E. at (984) 920-8908 or James Batts, P.E. at (984) 920-8909 if there are any questions concerning this memorandum.

DTH/JRB/JYP/DNA

Attachment

FOUNDATION RECOMMENDATIONS

WBS: BP3.R008

DESCRIPTION : Bridge No. 352 on SR 1004 over Hookers Branch

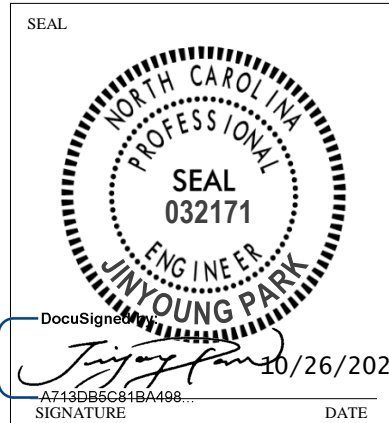
T.I.P. NO.: SF-300352

COUNTY: Duplin

STATION: 29+35.00 -L-

CONTRACT: _____

	INITIALS	DATE
DESIGN	JYP ds	10/26/22
CHECK	JRB	10/26/2022
APPROVAL	JRB	10/26/2022



BENT	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT 1	28+08.69 -L-	Cap on HP 12x53 Steel Piles	80 tons/pile	Bottom of Cap El. = 129.4 ft ± Estimated Length of Pile = 65 ft Number of Piles = 7
BENT 1	28+69.88 -L-	Cap on HP 14x102 Steel Piles	125 tons/pile	Bottom of Cap El. = 131.2 ft ± Point of Fixity = 108 ft Tip Elevation No Higher than = 99 ft Estimated Length of Pile = 80 ft Number of Piers = 8
BENT 2	29+30.00 -L-	Cap on HP 14x102 Steel Piles	125 tons/pile	Bottom of Cap El. = 131.5 ft ± Point of Fixity = 106 ft Tip Elevation No Higher than = 96 ft Estimated Length of Pile = 85 ft Number of Piers = 8
BENT 3	29+90.13 -L-	Cap on HP 14x102 Steel Piles	140 tons/pile	Bottom of Cap El. = 131.8 ft ± Point of Fixity = 97 ft Tip Elevation No Higher than = 86 ft Estimated Length of Pile = 100 ft Number of Piers = 8
END BENT 2	30+61.31 -L-	Cap on HP 12x53 Steel Piles	85 tons/pile	Bottom of Cap El. = 130.7 ft ± Estimated Length of Pile = 80 ft Number of Piles = 7

NOTES ON PLANS & COMMENTS

See Following Pages

FOUNDATION RECOMMENDATION NOTES ON PLANS

- 1) FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 2) OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 1. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

FOUNDATION RECOMMENDATION COMMENTS

- 1) 1.5:1 (H:V) SLOPE AT THE END BENT NO. 1 IS OK WITH SLOPE PROTECTION AND UNDERCUT EXCAVATION.
- 2) 1.5:1 (H:V) SLOPE AT THE END BENT NO. 2 IS OK WITH SLOPE PROTECTION.
- 3) USE TYPE II - MODIFIED BRIDGE APPROACH FILL DETAILS (ROADWAY STANDARD DRAWING 422.02) AT EACH END BENT.
- 4) THERE IS NO DESIGN SCOUR ELEVATIONS AT BENT NO. 1 AND BENT NO. 2.
- 5) THE DESIGN SCOUR ELEVATION FOR BENT NO. 3 IS 114.0 FT.
- 6) NO WAITING PERIOD IS REQUIRED BEFORE BEGINNING END BENT NO. 2 CONSTRUCTION.
- 7) USE A SINGLE ROW OF PLUMB PILES AT ALL BENT.
- 8) VIBRATION SHALL BE MONITORED AT WATER SPILLWAY DURING BRIDGE CONSTRUCTION.

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) # (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1, Piles 1-7	80	131.43	65			135							
Bent 1, Piles 1-8	125	132.23	80		99.0	170							
Bent 2, Piles 1-8	125	132.53	85		96.0	170							
Bent 3, Piles 1-8	140	132.83	100	112	86.0	190		25.0	97.8	20			
End Bent 2, Piles 1-7	85	132.68	80			145		35.0	95.0	16			

*Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

**RDR =
$$\frac{\text{Factored Resistance} + \text{Factored Downdrag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \text{Nominal Downdrag Resistance} + \frac{\text{Nominal Scour Resistance}}{\text{Scour Resistance Factor}}$$

SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
End Bent 1, Piles 1-7	MAYBE	70	3		
Bent 1, Piles 1-8	YES	85			
Bent 2, Piles 1-8	MAYBE	90			
Bent 3, Piles 1-8	YES	105			
End Bent 2, Piles 1-7	MAYBE	85			

*EST = Pile order lengths from estimated pile lengths; PDA = Pile order lengths based on PDA testing. For groups of end bents/bents with pile order lengths based on PDA testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the PDA.

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) # (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1, Piles 1-7	78			0.60			
Bent 1, Piles 1-8	125			0.75			
Bent 2, Piles 1-8	125			0.75			
Bent 3, Piles 1-8	140			0.75		1.5	1.00
End Bent 2, Piles 1-7	85			0.60			

*Factored Dead Load is factored weight of pile above the ground line.


PROJECT NO. BP3.R008.1 (SF-300352)

DUPLIN COUNTY

STATION: 29+35.00 -L-

NOTES:

- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Jinyoung Park, PE # 032171) on 10-26-2022.
- Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
- The Engineer will determine the need for PDA Testing when PDAs may be required.

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						<p align="center">PILE FOUNDATION TABLES</p>
	SIGNATURE _____	DATE _____	REVISIONS			SHEET NO.	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO. 1	BY: _____	DATE: _____	NO. 3	BY: _____	DATE: _____	TOTAL SHEETS
	NO. 2			NO. 4			