

PHASE AND SEQUENCE DIAGRAM	Traffic Signal Head				Min Green	Passage	Yellow	Red Clear	Max. I	Seconds Per Actuation	Reduction	Time Before Reduction	Min. Gap	Recall	Memory
	1	2	3,4	5,6											
Phase A	GA, G	G	R	R	10	1			20					OFF	OFF
Phase A Clear	YA, G	G	R	R			4	1							
Phase B	G	G	G	R	10	5			19	20	50	100	3.5	OFF	ON
Phase B Clear	Y, R	Y, R	Y, R	R			4	1							
Phase C	R	R	R	G	10	1			16					OFF	OFF
Phase C Clear	R	R	R	Y, R			4	1							
Flash	Y	Y	Y	R											

GA = Green Arrow YA = Yellow Arrow * = Left On Green With Caution

GENERAL NOTES

- All highway marking shall be the responsibility of the Division of Traffic Engineering of the Bureau of Engineering, Department of Public Works, of Howard County, Maryland, and is not to be considered a part of this contract.
- The utilities shown on the construction plan are schematic only and are not to be considered complete. The contractor shall be responsible for notifying all utility companies prior to construction so that all utilities can be located in the field. The contractor shall locate existing utilities a minimum of two (2) weeks in advance of the construction operations in the vicinity of the utilities. Any damage incurred by the contractor shall be repaired immediately at the contractor's expense. See Section 4.09 of the General Specifications.
- All materials and workmanship employed under this contract shall conform with the "GENERAL SPECIFICATIONS FOR INSTALLATION OF EQUIPMENT FOR TRAFFIC SIGNALS FOR HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS" dated October 7, 1974; revised February 18, 1976.
- All disturbed areas shall be properly restored in accordance with Section 4.20 of the General Specifications.

CONTROLLER AND ACCESSORIES

- MEMA three phase modular controller with solid state circuitry and digital timing, similar to the Crouse-Hinds DM 400 Series Digital Controller unit, equivalent manufactured by Econolite Control Products, Inc., Eagle Signal Corporation or approved equal. The controller shall be capable of expansion to four phase operation.
 - Equipped with two (2) vehicular actuated modules.
 - Equipped with one (1) vehicular actuated module with volume density controls.
 - Vehicular actuated phase modules shall be capable of the following functions: Minimum Green, Passage Time, Yellow, All Red Clearance, Dual Maximum, Pedestrian Timing, Recall and Memory.
 - Vehicular actuated phase module with volume density controls shall be capable of the following functions: Minimum Green, Passage Time, Yellow, All Red Clearance, Dual Maximum, Pedestrian Timing, Seconds Per Actuation, Time to Reduce, Time Before Reduction, Minimum Gap, Recall and Memory.
 - Four phase signal overlap capability.
- Conflict Monitor and Solid State load switches.
- Ground mounted traffic controller Cabinet large enough to accommodate the above control equipment and detectors, and the future installation of coordination equipment. Coordination equipment may include a master traffic responsive coordination unit, secondary coordination unit and/or required interconnection equipment. The cabinet shall be furnished with a thermostatically controlled cabinet vent fan.
- Finish of the cabinet shall be all-weather bronze paint.
- Meter box shall be installed in vandal proof enclosure provided by the contractor.

UNDERGROUND WIRING

- Underground wiring shall be placed in new PVC Conduits under the road surface and in grass areas, as shown on the Contract Drawings.
- The conduit shall be sized to accommodate future wiring for pedestrian (WALK/DON'T WALK) signal heads, and pedestrian push button detectors.
- In addition to above, the conduit between the proposed traffic controller and the handbox opposite loop detector number 2 shall be sized to accommodate additional wires required for the traffic signal interconnection of proposed systems at Cradlerock Way (East) and Cradlerock Way (West).
- The contractor shall furnish an "as-built" drawing as per "General Specifications - 4.02b".

LOOPS AND DETECTORS

- The following new loops shall be installed:

Number	Dimensions	Phase
1	6' x 40' *	A
2	6' x 20'	B
3	6' x 10'	B
4, 5	6' x 40' *	C

- * Loops to be installed with 6' x 3' powerhead for detection of small vehicles.
- Loop 1 shall be wired to standard detector.
- Loops 2 and 3 shall be wired in parallel to a standard detector.
- Loops 4 and 5 shall be wired in parallel to a standard detector.
- All wiring shall be in accordance with manufacturer's recommendations for correct operation.
- Loops 1, 4, and 5 shall operate in presence mode.
- Loops 2 and 3 shall operate in pulse mode.
- Standard detectors shall be Sarasota 2158/MS, equivalent as manufactured by Crouse-Hinds, Econolite Control Products, Inc. or approved equal.

SIGNAL HEADS

- The contractor shall provide the following new signal heads:

Signal Number	Description
1	12" Diameter Red, Amber, and Green Indications. 12" Yellow and Green Left Turn Arrows.
2, 3, 4	12" Diameter Indications
5, 6	8" Diameter Amber and Green Indication

- All signals shall be painted bronze with M.A. Bruder & Sons, Inc. Seashore Gloss Trim 27721 Durendic Bronze Code 7557581 or equal.
- All signals shall be vertically mounted on the signal pole mast arms with an adjustable signal bracket equivalent to the "ASTRO-BRAC" Model 0-AB-101 by VePed Traffic Controls, Inc. or approved equal.

POLES

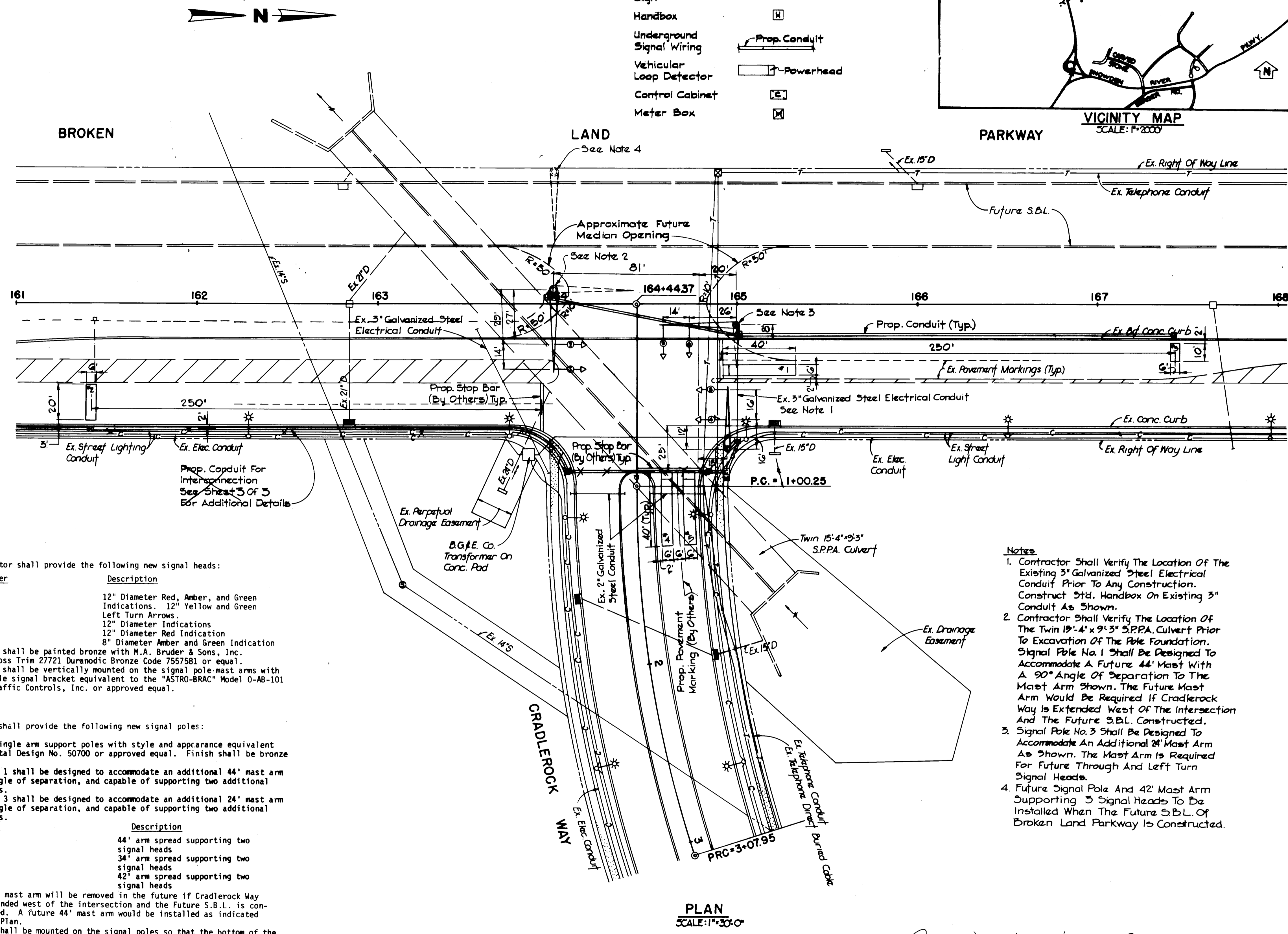
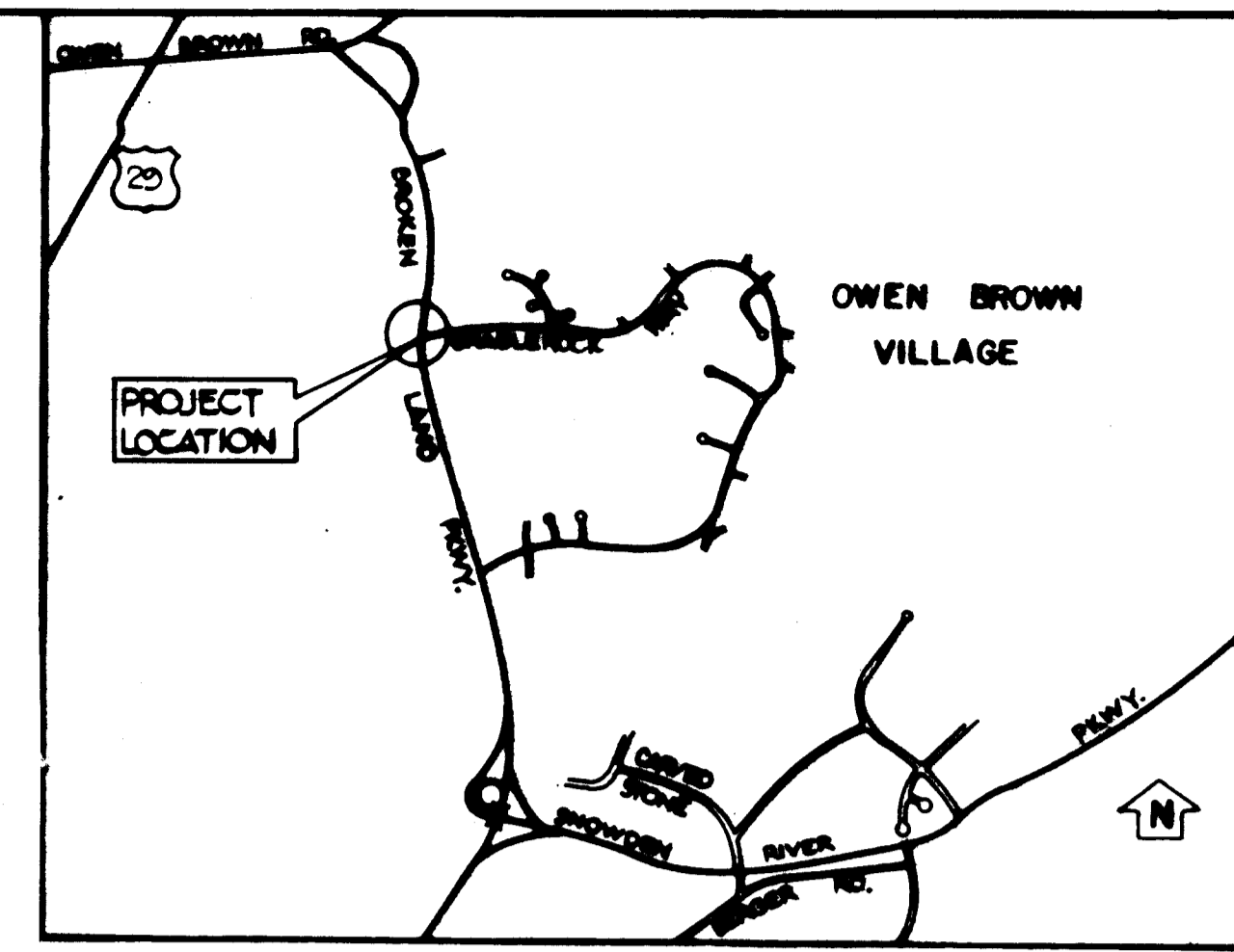
- The Contractor shall provide the following new signal poles:

- Three (3) single arm support poles with style and appearance equivalent to Union Metal Design No. 50700 or approved equal. Finish shall be bronze paint.
- Pole Number 1 shall be designed to accommodate an additional 44' mast arm with 90° angle of separation, and capable of supporting two additional signal heads.
- Pole Number 3 shall be designed to accommodate an additional 24' mast arm with 90° angle of separation, and capable of supporting two additional signal heads.
- | Pole Number | Description |
|-------------|--|
| 1 | 44' arm spread supporting two signal heads |
| 2 | 34' arm spread supporting two signal heads |
| 3 | 42' arm spread supporting two signal heads |

- ** The 44' mast arm will be removed in the future if Cradlerock Way is extended west of the intersection and the Future S.B.L. is constructed. A future 44' mast arm would be installed as indicated on the Plan.
- Mast arms shall be mounted on the signal poles so that the bottom of the signal head housing is not less than 15 feet nor more than 19 feet clearance above the roadway when using the "ASTRO-BRAC" adjustable signal bracket.

LEGEND

EXISTING	PROPOSED	FUTURE
Steel Pole	①	○
Mast Arm	→	→
Signal Head	⊙	⊙
Luminaire and Support	⊙	⊙
Sign	⊙	⊙
Handbox	⊙	⊙
Underground Signal Wiring	— Prop. Conduit	—
Vehicular Loop Detector	⊙ Powerhead	⊙
Control Cabinet	⊙	⊙
Meter Box	⊙	⊙



- Notes**
- Contractor Shall Verify The Location Of The Existing 3" Galvanized Steel Electrical Conduit Prior To Any Construction. Construct Std. Handbox On Existing 3" Conduit As Shown.
 - Contractor Shall Verify The Location Of The Twin 15'4" x 9'3" SPPA Culvert Prior To Excavation Of The Pole Foundation. Signal Pole No. 1 Shall Be Designed To Accommodate A Future 44' Mast With A 90° Angle Of Separation To The Mast Arm Shown. The Future Mast Arm Would Be Required If Cradlerock Way Is Extended West Of The Intersection And The Future S.B.L. Constructed.
 - Signal Pole No. 3 Shall Be Designed To Accommodate An Additional 24' Mast Arm As Shown. The Mast Arm Is Required For Future Through And Left Turn Signal Heads.
 - Future Signal Pole And 42' Mast Arm Supporting 3 Signal Heads To Be Installed When The Future S.B.L. Of Broken Land Parkway Is Constructed.

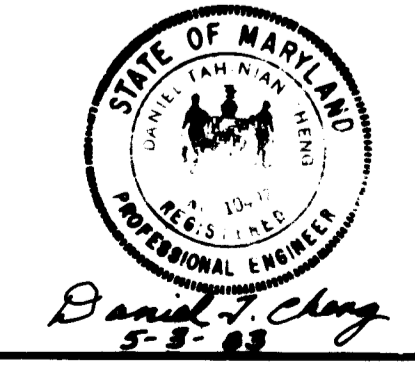
Revised 1972

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John F. Neuman 5-4-83
DIRECTOR OF PUBLIC WORKS DATE

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Johnson, Mirmiran & Thompson, P. A.
ENGINEERS - PLANNERS - SURVEYORS - LANDSCAPE ARCHITECTS
BOWENLEAKES CT. - BALTIMORE, MARYLAND - 21204 - (301) 661-8000



PLAN CONSTRUCTION OF TRAFFIC SIGNAL AND EQUIPMENT LIST

BROKEN LAND PARKWAY AT CRADLEROCK WAY (WEST)
CAPITAL PROJECT NO. T-7017
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

DRAWING	SCALE	DES. D.I.C.
NO. 1	1" = 30'	DRW. D.C.S.
OF 3		CHK.