Notes:

(1) BCPM calculates drop distance internally.

(2) Items in this category identified as sensitive by Georgetown Consulting Group, but not addressed by Commissions include
(B11) Riser Cable Investment
(B14) Conduit Material Investment per Foot
(B15) Spare Tubes per Route
(B16) Regional Labor Adjustment Factor
(B197-B200) Excavation & Restoration - Kentucky stated they accepted GCG propsal, but filed different numbers.
Kentucky and Louisiana accepted HM default inputs. These are not inputs into the BCPM.
BCPM differentiates coppper cable by gauge (24 & 26) and by aerial, buried and underground.
The investments for North & South Carolina reflect 24 gauge aerial.
BST Recommended inputs based on GCG.

(3) BCPM doesn't use 216 fibers. 288 fiber input entered for North & South Carolina. Also BCPM differentiates between aerial, buried, and underground; North & South Carolina inputs reflect aerial.

(4) This relates to the realtive mix of plant between aerial, buried and underground. BCPM internally calculates drops. Data entered for North and South Carolina is from the UNE studies.

(5) The South Carolina Commission ordered that the fill factors must be consistent with the UNE ordered values of 75% for feeder and 50% for distribution. However the sizing factors don't correspond to fill factors.
Thus, the South Carolina values are BellSouth's initial inputs.

(6) BCPM inputs are different and don't always correspond to the HM inputs for DLC costs.
GCG provided inputs for 3 types of DLC equipment. These inputs are their DISC and low density numbers.
Kentucky accepted HM as the model of choice, but they used BellSouth-specific inputs for DLC costing.

(7) Kentucky noted this investment is per 96 lines, not 120.

(8) These are not all of the inputs GCG have designated as sensitive, but represent the inputs where there is major disagreements between the HM defaults and GCG proposed. BCPM inputs don't correspond to HM inputs.
Kentucky accepted HM as the model of choice, but they used BellSouth-specific inputs for interoffice costing.

(9) These are not all of the inputs GCG have designated as sensitive, but represent the inputs where there is major disagreements between the HM defaults and GCG proposed. BCPM inputs don't correspond to HM inputs.

(10) Even though Kentucky ordered FCC authorized depreciation rates, they noted some values are not forward-looking.

Request: Provide the derivation of the $40.80 labor rate on Line 10 of schedule 4 provided during Georgetown Consulting Group's (GCG's) 7/15/98 presentation.

Response: The $40.80 is the directly assigned labor rate for an Installation and Maintenance technician (JFC 410X). This labor rate was developed based on extracts of 1995 data from the Financial Processor. This extract collects labor expense and hours and a PC application processes the information to produce labor rates. During processing, the actual costs for a given work group are accumulated by expenditure type (e.g., direct labor productive, premium, other employee, etc.). These actual costs are divided by the actual hours (classified productive hours for plant and engineering work groups and total productive hours for cost groups) reported by work group to determine the basic rates. A factor from the BellSouth Region TPIs is applied to inflate these rates to the study period 1997 - 1999.

The following are various cost components that make up labor rates:

Direct Labor - Productive (EXPENDITURE TYPE CODE (EXTC) KP1

Identifies the cost of the actual straight time wages paid to occupational work reporting employees during the month for regularly scheduled time and overtime spent performing productive work. Also includes the costs of salaries paid to management employees when performing productive work. Productive hours are used as the basis for Direct Labor Costs.

Direct Labor - Premium (EXTC KP2)
Identifies the cost of the actual wages paid to occupational work reporting employees during the month for premium hours.

Direct Labor - Other Employee (EXTC KP3)
Identifies the cost of the actual wages and salaries paid to occupational work reporting employees during the month for allowances and special differentials, merit awards, wage adjustments, team incentive awards, pay in lieu of vacation, etc.

Direct Labor – Annual Paid Absence (EXTC KP5)
Identifies the cost of a monthly pro rata share of payments to be made over the year to occupational work reporting employees for accrued costs of holidays, vacations, and excused days.

Direct Administration (EXTC KP6)
Identifies the costs of salaries paid during the month to the first level of supervision responsible for supervising occupational work reporting employees, and salaries and wages paid to employees and immediate supervisors who perform basic office services for occupational work reporting employees. Also included are the wages paid to occupational work reporting employees loaned to perform supervisory or clerical functions.

Direct Labor - Other Costs (EXTC KP4)
Identifies the costs incurred during the month for office, traveling and other costs of Facilities and Network Services employees whose wage and salary costs are direct labor or direct administration.

Direct Other Costs - Bellcore Billing (EXTC KP8)
Identifies the costs incurred during the month for Bellcore billing costs of Facilities and Network Services employees whose wage and salary costs are direct labor or direct administration.

Other Tools (Work Equipment) - Salaries and Wages (EXTC CQR)
Identifies the salary and wage portion of the costs associated with other equipment used by Facilities and Network Services employees (4XX0-9). 4XX0-9 represents Job Function Codes 1-9 for employees in Facilities and Network Services.

Other Tools (Work Equipment)- Benefits (EXTC CQS)
Identifies the benefit costs associated with other work equipment used by Facilities and Network Services employees (4XX0-9).

Other Tools (Work Equipment) - Rents (EXTC CQK)
Identifies the rent costs associated with other work equipment used by Facilities and Network Services employees (4XX0-9).

Other Tools (Work Equipment) - Other Expenses (EXTC CQL)
Identifies the other expense costs associated with other work equipment used by Facilities and Network Services employees (4XX0-9).

Motor Vehicle - Salary and Wage Distribution (EXTC CQM)
Identifies the salary and wage portion of the plant motor vehicle expenses for construction, removal or plant specific operations expense accounts based on the classified productive hours of the labor groups using the motor vehicles.

Motor Vehicle - Benefit Distribution (EXTC CQN)
Identifies the benefit portion of the plant motor vehicle expenses for construction, removal or plant specific operations expense accounts based on the classified productive hours of the labor groups using the motor vehicles.

Motor Vehicle - Rent Distribution (EXTC CQP)
Identifies the rent portion of the plant motor vehicle expenses for construction, removal or plant specific operational expense accounts based on the classified productive hours of the labor groups using the motor vehicle.

Motor Vehicle - Other Costs Distribution (EXTC CQQ)
Identifies the other cost portion of the plant motor vehicle expenses for construction, removal or plant specific operations expense accounts based on the classified productive hours of the labor groups using the motor vehicle.

Benefits (EXTC KPL)
Identifies the costs of the payroll-related benefits and taxes for active Facilities and Network Services employees. These costs include pension accruals; company matching portion of savings plan; dental, medical, and group insurance plan reimbursements; and company portion of social security and unemployment payroll taxes.

TOTAL PRODUCTIVE HOURS

Classified Productive Hours
This is defined as the number of employee hours reported to final accounting classifications.

Unclassified Productive Hours
This classification includes the hours of plant work devoted to activities of such a general nature that they are not assignable to specific accounting classifications. Unclassified activities include; conferences or meetings (including travel time) which are general in nature; first aid classes or safety meetings; paid time spent on union activities; paid time spent on quality of work life activities; time spent in a classroom (including travel time) for general or job specific training; and other unclassified activities such as attending assessment centers.

Attached to this response is the calculation of the directly assigned labor rate for JFC 410X.

	A		B	C	D	E	F
1							
2							
3	INFLATION FACTOR 1995 TO 1996*		1.029				
4							
5	STATE REGION						
6	FG/FSG INSTALLATION AND MTCE - POTS						
7	WCT I&MPOTS						
8	JFC 410X						
9				1996	1996 to 1996	1995 to 1996	LEVELIZED
10				CLASSIFIED	INFLATION	INFLATION	1997-1999
11			1996	HOURLY COST	FACTOR	FACTOR	HOURLY COST
12	COMPONENT		DOLLARS**	(B/B32)	(B3)	(D50)	(C*D*E)
13		EXTC					
14	DIRECT LABOR - PRODUCTIVE	KP1	$ 276,989,766.16	$ 18.41	1.029	1.072719	$ 20.32
15	DIRECT LABOR - PREMIUM	KP2	$ 41,485,984.77	$ 2.76	1.029	1.072719	$ 3.04
16	DIRECT LABOR - OTHER EMPLOYEE	KP3	$ 12,679,092.95	$ 0.84	1.029	1.072719	$ 0.93
17	DIRECT LABOR - ANNUAL PAID ABSENCE	KP5	$ 32,941,416.73	$ 2.19	1.029	1.072719	$ 2.42
18	DIRECT ADMINISTRATION	KP6	$ 40,719,259.80	$ 2.71	1.029	1.072719	$ 2.99
19	TOTAL DIRECT LABOR (SUM L14-L18)		$ 404,795,520.41	$ 26.90	1.029	1.072719	$ 29.70
20	DIRECT LABOR - OTHER COSTS	KP4	$ 6,384,284.88	$ 0.42	1.029	1.072719	$ 0.47
21	DIRECT LABOR - OTHER COSTS - BC	KP8	$ -	$ -	1.029	1.072719	$ -
22	OTHER TOOLS - SALARIES	CQR	$ 845,333.50	$ 0.06	1.029	1.072719	$ 0.06
23	OTHER TOOLS - BENEFITS	CQS	$ 268,338.94	$ 0.02	1.029	1.072719	$ 0.02
24	OTHER TOOLS - RENTS	CQK	$ 245,153.44	$ 0.02	1.029	1.072719	$ 0.02
25	OTHER TOOLS - OTHER	CQL	$ 16,993,088.26	$ 1.13	1.029	1.072719	$ 1.25
26	MOTOR VEHICLES - SALARIES	CQM	$ 5,001,300.48	$ 0.33	1.029	1.072719	$ 0.37
27	MOTOR VEHICLES - BENEFITS	CQN	$ 1,482,062.91	$ 0.10	1.029	1.072719	$ 0.11
28	MOTOR VEHICLES - RENTS	CQP	$ 4,757,446.68	$ 0.32	1.029	1.072719	$ 0.35
29	MOTOR VEHICLES - OTHER	CQQ	$ 15,790,707.79	$ 1.05	1.029	1.072719	$ 1.16
30	BENEFITS	KPL	$ 99,610,423.00	$ 6.62	1.029	1.072719	$ 7.31
31	TOTAL DIRECTLY ASSIGNED (L19+SUM L20-L30)		$ 556,173,670.29	$ 36.96	1.029	1.072719	$ 40.80
32	TOTAL CLASSIFIED PROD HOURS		15,047,014.87				
33	*BELLSOUTH REGION TELEPHONE PLANT INDEXES						
34	**DATA EXTRACT FROM FINANCIAL PROCESSOR						
35							
36	EXTC - Expenditure Type Code						
37							
38							
39							
40	1997 - 1999 INFLATION RATE						
41	PLANT AND COST GROUPS		CUMMULATIVE				
42							
43	1997 - 3.5%		1.035000				
44							
45	1998 - 3.5%		1.071225	(1.035*1.035)			
46							
47	1999 - 3.8%		1.111932	(1.071225*1.038)			
48							
49					LEVELIZING FACTOR		
50			3.218157	/ 3 =	1.072719		

REQUEST: ARMIS 43-02 Schedule I. The schedule includes $ for Wages, Benefits,..., Other. Explain what is included in Other.

RESPONSE: Examples of expenses included in Other are:

1. Employee travel, relocation and tuition
2. Advertising
3. Collection agent commissions
4. Contributions and memberships
5. Contract labor and services
6. Office
7. Software and computer services
8. Depreciation and amortization
9. Materials

REQUEST: For the expense dollars reported in ARMIS, can churn or service order activity expenses be identified and removed?

RESPONSE: No. Currently, we do not have a mechanism to track expenses related to churn or service order activity specifically.

REQUEST: Breakdown the employees by year filed in first exparte by type of activity, that is executive, business office, and I and M, etc. Provide the information by state.

RESPONSE: Employees by activity is not readily available. Attachment 1 presents departmental breakdowns for 1994 through April 1998.

Departmental detail is omitted from state totals. In an effort to promote efficiency, the Company routinely centralized operations during the period covered by this request. Many groups centralized into one location and served multiple states. This created situations where departmental force level by state may contain misleading information. Therefore, only state totals are presented below.

No data is readily available prior to 1994.

BELLSOUTH TELECOMMUNICATIONS, INC.
Normalized Employee Levels

Department:	**1994**	**1995**	**1996**	**1997**	**April 1998**
Customer Operations	12,398	12,083	11,572	12,094	12,734
Network Operations	36,458	33,847	32,448	28,536	29,693
Finance	2,158	1,783	954	958	966
Interconnect Services	9,218	9,065	7,984	7,867	8,139
Public	979	787	772	-	-
Services/IT	6,864	5,917	4,335	3,082	2,288
All Other	2,035	2,164	1,504	1,548	1,215
TOTAL	70,110	65,646	59,569	54,085	55,035

State:					
Alabama	4,971	4,825	4,392	3,788	3,942
Florida	15,531	14,494	13,362	12,069	12,512
Georgia	10,240	10,088	9,375	8,334	8,657
Headquarters	11,538	10,649	9,043	8,823	8,419
Kentucky	2,889	2,675	2,405	2,203	2,271
Louisiana	5,401	4,953	4,509	4,095	4,238
Mississippi	3,312	2,910	2,687	2,317	2,400
North Carolina	5,693	5,432	5,121	4,635	4,689
South Carolina	3,686	3,321	3,070	2,741	2,725
Tennessee	6,849	6,299	5,605	5,080	5,182
Total	70,110	65,646	59,569	54,085	55,035

Request: Provide the Current Cost/Booked Cost (CC/BC) ratios and a description of the methodology and supporting data.

Response: Current Cost/Book Cost Ratios (CC/BC) are used to convert historical booked investments into current investments. The resulting current investment reflects the value required to reproduce the same investments at current dollar and productivity levels (improved technology is not considered). CC/BC ratios are developed from investment data detailed by account, by state, for all surviving vintages.

The CC/BC ratios are computed by dividing the current cost by the average book cost of a specific investment at a given point in time.

Current cost development must include the application of a relative index to investment data by vintage. That is, total investment by account at a given time is categorized by the year in which the investment was booked. The appropriate Telephone Plant Index (TPI) for each year is applied to the corresponding vintage investment, and then all vintage investment amounts are totaled for the account. This total is the current cost of the account.

A Telephone Plant Index is an average of costs at specific points or periods of time. It is an estimate of changes in costs relative to some base period, and demonstrates cost movements over a period of time. (BellSouth explained the derivation of TPIs in Question #2 of the June 25, 1998 request.)

Average book cost for an account for a given year is determined by calculating the average of the beginning of the year booked investment and the end of the year booked investment.

Attached to this response are the CC/BC ratios for each state.

SUMMARY OF CURRENT COST / BOOK COST RATIO

Description	Account	FRC	AL	FL	GA	KY	LA	MS	NC	SC	TN	BST
Motor Vehicles	2112		1.135	1.091	1.116	1.146	1.146	1.144	1.151	1.102	1.143	1.129
Aircraft	2113		1.527	0.000	1.235	0.000	0.000	0.000	0.000	0.000	0.000	1.277
Garage Work Equip	2115		1.349	1.353	1.393	1.261	1.388	1.379	1.333	1.297	1.362	1.352
Other Work Equip	2116		1.192	1.187	1.189	1.205	1.169	1.213	1.176	1.195	1.202	1.189
Buildings	2121	10	2.053	1.741	1.894	2.022	2.194	2.171	2.160	2.369	2.136	1.986
Office Support Equip	2123		1.162	1.246	1.185	1.233	1.226	1.167	1.126	1.231	1.115	1.180
Computers	2124	530	0.650	0.661	0.644	0.671	0.707	0.691	0.632	0.660	0.689	0.658
Analog-ESS	2211	77	1.377	1.414	1.396	1.355	1.415	1.335	1.517	1.370	1.487	1.408
Digital ESS	2212	377	0.998	1.001	0.998	1.013	1.015	1.005	0.997	0.994	1.009	1.003
Step-by-Step	2215		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Operator Systems	2220	117	0.992	0.985	0.975	0.975	0.988	0.986	0.979	0.984	0.991	0.984
Radio System	2231	67	1.258	1.159	1.224	1.345	1.350	1.330	1.127	1.249	1.399	1.302
Circuit-DDS	2232	157	0.946	0.952	0.944	0.948	0.941	0.939	0.942	0.939	1.004	0.955
Circuit-Other than DSS	2232	357	1.049	1.023	1.024	1.075	1.067	1.027	1.028	1.014	1.030	1.033
PBX	2341		0.976	0.988	0.972	0.970	0.974	0.975	0.973	0.976	1.001	0.980
Public Telephone	2351		1.120	1.069	1.069	1.194	1.090	1.059	1.133	1.155	1.105	1.098
Other Terminal Equipment	2362		1.051	1.069	1.093	1.048	1.056	1.035	1.055	1.083	1.042	1.067
Poles	2411	1	2.519	2.510	2.488	2.313	2.347	2.261	2.994	3.852	2.700	2.550
Aerial Cable-Metallic	2421	22	1.642	1.419	1.505	1.719	1.357	1.523	1.703	1.854	1.652	1.560
Aerial Cable-Fiber	2421	822	0.873	0.874	0.859	0.848	0.835	0.850	0.843	0.869	0.884	0.859
Underground Cable-Metallic	2422	5	1.635	1.496	1.577	1.604	1.538	1.600	1.578	1.550	1.653	1.560
Underground Cable-Fiber	2422	85,D5,F5,T5	0.790	0.778	0.778	0.795	0.778	0.772	0.767	0.752	0.816	0.780
Buried Cable-Metallic	2423	45	1.477	1.309	1.315	1.440	1.457	1.405	1.315	1.303	1.450	1.363
Buried Cable-Fiber	2423	845	0.952	0.932	0.923	0.935	0.933	0.931	0.942	0.932	0.946	0.934
Submarine Cable	2424	6	1.819	1.836	1.642	1.426	1.724	1.358	1.563	1.166	1.433	1.713
Intrabuilding Cable-Metal	2426	86	1.450	1.503	1.484	1.456	1.450	1.469	1.562	1.443	1.372	1.471
Intrabuilding Cable-Fiber	2426	52	0.977	0.862	0.856	0.961	0.826	0.935	0.828	0.773	0.882	0.859
Aerial Wire	2426	852	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Conduit Systems	2441	4	1.836	1.640	1.543	1.727	1.633	1.945	1.603	1.668	1.838	1.663
Station Apparatus	2311		1.010	1.051	1.036	1.015	1.011	1.008	1.012	1.039	1.025	1.033
Furniture	2122		1.499	1.421	1.347	1.354	1.519	1.501	1.374	1.412	1.368	1.403

Book Year: 1995
Current Year: 1996

Request: Does BCPM assign geological data to a CBG?

Response: No. BCPM 3.1 does not assign geological data to the CBG. BCPM assigns terrain data to a microgrid which is much more granular than CBGs.

The following describes the process that BCPM 3.1 uses to assign geological data to the microgrid, and subsequently, to the ultimate/aggregate grids.

STEP 1: Build the Terrain file from the STATSGO data:
The process for assigning terrain data is as follows:

1) Use data from the U.S. Dept. of Agriculture: STATSGO
2) Draw the STATSGO areas from this data. There are multiple readings for terrain per area. Typically, there are several hundreds of areas in a state.
3) For each of the STATSGO areas: 1)determine the weighted average for each of the quantitative variables/attributes and the predominant value for each qualitative variable/attribute.

STEP 2: Allocate terrain attributes to microgrids.

1) Lay the BCPM 3.1 microgrids on top of these STATSGO areas.
2) If a microgrid covers only one STATSGO area, use that STATSGO area's resolved attributes. If a microgrid covers more than one STATSGO areas: 1)for quantitative attributes such as water depth, take the weighted average of the attributes where the weight is the fraction of the microgrid that each STATSGO area falls in:
3) For qualitative variables, e.g. rock hardness which has 3 values, hard, soft and normal, use the value of the attribute in that STASGO area that is the largest portion of the microgrid e.g. soft rock in 1/3 of the microgrid and 2/3 normal rock in that microgrid then assign normal rock to that microgrid.

There are 4 Quantitative variables for terrain: 1) minimum water table depth; 2) minimum bedrock depth; 3) minimum slope (no. of degrees off horizontal); and 4) maximum slope.
There are 2 Qualitative variables for terrain: 1) Surface Texture; 2) and Rock Hardness.

STEP 3: Assign Terrain Data to Ultimate/Aggregate Microgrids
For quantitative variables, produce a value for the ultimate grid that is a weighted average of the attribute where the weight is the area of the respective microgrids.
For qualitative attributes, determine the total area occupied by each value, and take the value associated with the highest sum of area, i.e. predominant value.

Request: Examine the sensitivity of BCPM 3.1 to changes in terrain.

Response:

We examined two scenarios, using West Virginia as our test base case for the default scenario since West Virginia has some of the most difficult terrain for laying plant. In the first scenario we used the BCPM 3.1 default values for terrain. In the second scenario, we used values that correspond to Normal terrain, i.e. minimize difficulties in placing plant. Results are as follows:

Sensitivity Analysis of Terrain

	Default Inputs West Virginia	Normal Inputs West Virginia	Difference
Total Monthly Cost per Line (Grid Level)	**$54.43**	**$49.96**	**$ 4.47**

Note that costs increase by $4.47 per month per line as a result of going from relatively easy placement to difficult placement. This corresponds to a 8.95% increase in costs. Clearly, monthly line costs are sensitive to changes in terrain attributes.

Request: Can the maintenance accounts be desegregated between ordinary repair and rearrangement and change?

Response: The maintenance accounts cannot be desegregated any further.

BellSouth Telecommunications, Inc.
Universal Service Funding
Responses to FCC Staff Questions of
July 15, 1998
Question 10

Request: Where does HAI apply labor costs in HAI R5.0a?

Response: (This response is provided by Georgetown Consulting Group.)

In most respects, there is no identified input or fixed value for labor costs within the spreadsheet "code" of HAI R5.0a. While labor is very much a factor in the inputs to HAI R5.0a, and therefore a significant element in developing UNE costs and USF values in HAI R5.0a, for most inputs labor is a sub-component rather than a specific separate input into the model.

The following lists each input for which labor is a known factor, and provides a discussion of the default input:

A. B1 - NID labor. This is one of the few instances in which labor is a specific separate input utilized by HAI R5.0a:

	Default Input
Residential NID basic labor	$15.00
Business NID basic labor	15.00

The Hatfield Input Portfolio ("HIP") explains how the above cost per NID was determined:

> The labor estimate assumes a crew installing network interface devices throughout a neighborhood (in coordination with the installation of drops, terminals, and distribution cables). A work time of 25 minutes was used, based on the opinion of a team of outside plant experts. A loaded labor rate of $35 per hour excludes exempt material loadings which normally include the material cost of the NID and Drops.

As noted previously by BellSouth, the loaded hourly rate of $35 used to develop the default input is significantly less than BellSouth's actual loaded hourly rate.

B. B3 - Aerial Drop Placement. The default input[1] consists entirely of labor costs. The HIP explains how the default input costs were determined:

> The opinions of expert outside plant engineers and estimators were used to project the amount of time necessary to attach a drop wire clamp at a utility pole, string the drop, and attach a drop wire clamp at the house or building. Labor to terminate the drop at the NID and the Block Terminal is included in the NID and Block Terminal investments respectively.
>
> The labor estimate assumes a crew installing aerial drop wires throughout a neighborhood (in coordination with the installation of NIDs, terminals, and distribution cables), and consists of 10 minutes per drop plus 10 minutes for each 50 ft. of drop strung. The loaded labor rate excludes exempt material loadings which normally include the material cost of the Aerial Drop Wire.

The HIP further notes that the direct loaded labor rate used to develop the default inputs for aerial drop placement is $35. As noted previously by BellSouth, the $35 used to develop the default input is significantly less than BellSouth's actual loaded hourly rate.

C. B3 - Buried Drop Placement, per foot. The default input, which is stated in terms of cost per foot of drop, assumes contractor placement of buried drops.

The following compares the range of price quotes reflected in the HIP to the default buried drop, per foot inputs:

	High Quote	Low Quote	Default Input	
Rural	$1.75	$0.55	$0.60	
Suburban	2.10	0.60	0.75 to 5.00	Default varies by density zone

For rural areas, which most directly affect the USF, it appears that the default input is at the very low end of the range of quotations claimed to have been received by the HAI authors.

D. B7 - aerial and buried terminal and splice per line. The default input includes material and labor cost, neither of which is separately quantified or identified in the HIP for this input.

---

[1] The default aerial drop placement input ranges from $11.67 to $23.33 per drop.

E. B10 - Copper Distribution Cable, cost per foot. While labor cost is not separately specified, the copper distribution cable per foot cost inputs do include labor costs. As stated in the HIP:

> Cable below 400 pairs:
>
> In the opinion of expert outside plant engineers whose experience includes writing and administering hundreds of outside plant "estimate cases" (large undertakings), material represents approximately 40% of the total installed cost. This is a widely used rule of thumb among outside plant engineers. Such expert opinions were also used to determine that the average engineering content for installed copper cable is 15% of the installed cost. The remaining 45% represents direct labor for placing and splicing cable, exclusive of the cost of splicing block terminals into the cable.
>
> Cable of 400 Pairs and Larger:
>
> As copper cable sizes become larger, engineering cost is based more and more on sheath feet, rather than cable size. The same is true for cable placing and splice set-up. Therefore the linear relationship between the number of copper pairs and installed cost is somewhat reduced. A review of many installed cable costs around the country were used by the engineering team to estimate the installed cost of copper cable for sizes of 400 pairs and larger.

The HIP provides no guidance concerning the proportion of overall cost in cables that are 400 pairs and larger that is for labor.

Section 7 of the HIP, which discusses the application of regional labor adjustment factors, indicates that the default inputs assume a fully loaded direct labor cost of $55 per hour for heavy construction of outside plant cable.

F. B12 - Pole investment. The HIP indicates that $216 of the total default input of $417 is for labor cost.

BellSouth takes no issue with the default input for pole investment.

G. B49 - Copper feeder pole investment. See B12 - Pole investment.

H. B56 - Copper feeder cable investment. See B10 - Copper Distribution Cable, cost per foot.

I. B57 - Fiber feeder investment. Labor is a component of the default input, per the HIP:

> Splicing Engineering and Direct Labor are included in the cost of the Remote Terminal Installations, and the Central Office Installations, since field splicing is unnecessary with fiber cable pulls that are as long as 35,000 feet between splices.
>
> Placing Engineering and Direct Labor are estimated at $2.00 per foot, consisting of $0.50 in engineering per foot, plus $1.50 direct labor per foot. These estimates were provided by a team of Outside Plant Engineering and Construction experts.

The HIP does not provide the data or in any manner explain how those experts arrived at their estimates for the labor component of input B57.

J. B70 - Manhole investment, materials & labor. Based on Appendix B to the HAI Manual, labor is an unquantified component in the excavation & backfill for manhole investments.

K. B81 - Switch installation multiplier. While the factors used to develop this input are not identified, the HIP indicates that this multiplier is for engineering and labor.

L. B111 - EF&I, per hour. The default input of $55, per the HIP, is:

> This is a fully loaded labor rate used for the most sophisticated technicians. It includes basic wages and benefits, Social Security, Relief & Pensions, management supervision, overtime, exempt material and motor vehicle loadings. A team of experienced outside plant experts estimated this value.

M. B119 - Interoffice fiber cable investment, installed, per foot. See B57 - Fiber feeder investment.

N. B128 - Interoffice pole investment. See B12 - Pole investment.

O. B16 - Regional labor adjustment factor.
B16a - Regional labor adjustment factor weightings

For most inputs, rather than separately stating values for labor and material, the default input in HAI R5.0a is a combination of these costs. The labor sub-component of the default input includes costs for direct labor and for labor loadings.

In the spreadsheet "code" of the model, the default input is adjusted by application of (i) an input regional labor adjustment factor and (ii) the regional labor adjustment factor weighting, which applies the regional labor adjustment only to the assumed

portion of the combined [material, labor, loading] input that is direct labor.[2]

This is explained in Section 7 of the HIP and summarized below.

Where an input in the model consists of (i) material costs, (ii) direct labor and (iii) overhead loadings, algorithms are designed to apply the regional labor adjustment factor only to the direct labor component of the combined input. These algorithms are based on (a) the labor percentage of the default input and (b) the direct labor percentage of the labor component. The default inputs assume the following percentages and rates:

B3 - Buried drop installation
B70 - Copper manhole excavation and backfill
B73 - Fiber pullbox installation
B197 - Underground installation
B199 - Buried installation

Labor % of default input	25%
Direct labor % of labor component	50%
Regional labor adjustment weighting factor	12.5%

B10 - Installed copper distribution cable
B11 - Installed copper riser cable
B56 - Installed copper feeder cable
B38 - Installed SAI [indoor and outdoor] cost

Labor % of default input	45%
Direct labor % of labor component	36.4%
Regional labor adjustment weighting factor	16.4%

36.4% is based on $20 direct labor and $55 loaded labor rate.

[2] Note however that for a number of variables, HAI R5.0a continues to have hard-wired regional labor adjustment factor weightings and therefore does not apply the input weighting. For example, the weighted average drop investment per line in the distribution module is hard-wired with the 57.1% input factor. Weighted average drop inv. per line and installed NID case are also hard-wired in the distribution module. In the feeder module, installed manhole costs and installed pullbox costs are hard-wired at 12.5%.

There may be other variables for which the regional labor adjustment factor weighting input is hard-wired, rather than coded to utilize the user input in a particular run of the model.

B1 - NID installation [residence and business]
B3 - Aerial drop installation

Labor % of default input	100%
Direct labor % of labor component	57.1%
Regional labor adjustment weighting factor	57.1%

57.1% is based on $20 direct labor and $35 loaded labor rate.

B57 - Installed fiber feeder cable cost

Regional labor adjustment weighting factor	36.4%

B12, B49, B128 - Pole investment

Regional labor adjustment weighting factor	51.8%

This attachment is 6 pages
36 page document.

DSC Communications Corporation

Litespan®

Access Platform

General System Description

OSP 363-205-200
Issue 12, July 1997

DSC Communications Corporation
1000 Coit Road, Plano, TX 75075-5813

Part I – Litespan-2000

1 Introduction

1.01 The Litespan-2000 system (Figure 1) is an advanced, highly flexible, next generation digital loop carrier (NGDLC). The Litespan-2000 system uses single-mode fiber and employs the synchronous optical network (SONET) signal format as the transmission medium between nodes. Each node can support two independent directions, known as east and west, of SONET transmission.

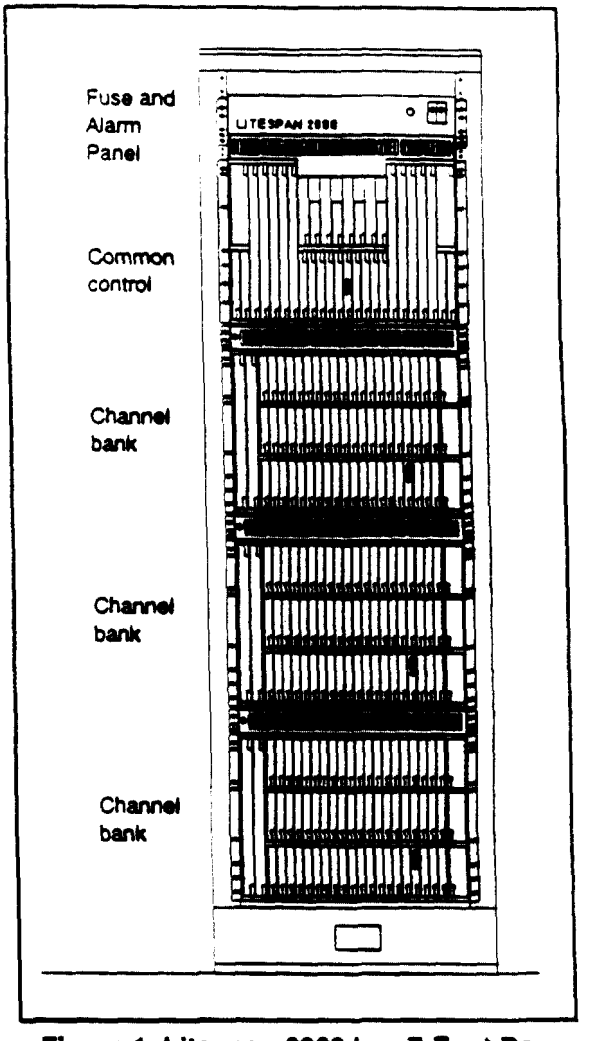

Figure 1. Litespan-2000 in a 7-Foot Bay

1.02 The Litespan-2000 system provides the following features:

- Support of narrowband (POTS, coin, specials, etc.) and wideband (DS1, T1, etc.) services
- Ability to transport and route DS1 signals from other digital loop carriers and remote switches
- Ability to transport and groom signals from SLC-96®, SLC Series 5®, or equivalent TR-008-compliant systems
- Support of OC-3 SONET transport between nodes
- Support of long-reach and intermediate-reach optics per TR-253
- Support for TR-057, TR-008, and TR-303 switch interfaces
- Assignable SONET transport bandwidth
- Software control of system administration, provisioning, operations, and maintenance
- Optional redundancy for protection of major subsystems with automatic switchover
- Support of Starspan, a fiber-in-the-loop (FITL) adjunct to Litespan, which extends Litespan services to the curb

2 Equipment

2.01 Each Litespan-2000 node consists of three major subsystems: a common control assembly (CCA), channel bank assemblies (CBA), and an assembly to distribute power.

Common Control Assembly

2.02 The common control assembly (Figure 2) houses three equipment groups: the common optical group, the common equipment group, and the common support group.