

# **INFORMATIONAL ITEM**

## **Finance Committee**

Meeting Date: May 2, 2023  
Submitted By: Thomas E. Hartye, PE., General Manager  
Prepared By: W. Scott Powell, CLGFO, Director of Finance  
Reviewed By: Billy Clarke, District Counsel  
Subject: Sewer System Development Fee Study

### **Background**

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On July 20, 2017 the North Carolina General Assembly signed into law N.C. General Statute 162A Article 8 (“Article 8”), which provides for the uniform authority to implement system development fees for public water and sewer systems in North Carolina. According to the statute, system development fees must be adopted in accordance with the conditions and limitations of Article 8. MSD contracted with the Raftelis Financial Consultants, Inc. (“Raftelis”) to perform the prescribed system development fee calculations for MSD(Exhibit 1). This report was made public on the MSD website on April 21<sup>th</sup>.

### **Discussion**

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System development fees are one-time charges assessed to new utility customers for their use of system capacity and serve as an equitable method by which to recover up-front system capacity costs from those using the capacity. They are calculated based on a cost analysis of the value of existing or planned infrastructure that is in place, or will be constructed, to serve new capacity demands, and the existing or additional capacity associated with these assets.

According to the statute, system development fees must be adopted in accordance with the conditions and limitations of Article 8. The system development fees must also be prepared by a financial professional or licensed professional engineer. Finally, the system development fee shall be updated at least every five years. The District last proposed a Sewer System Development increase was in FY2018.

Article 8 identifies 3 methods to calculate system development fees. Rafetlis used the Capacity Buy-In Method to calculate the District’s sewer system development fees due to its facilities having adequate capacity to accommodate anticipated future growth over the near term. Current findings of the study are as follows:

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- Single-family residential unit fee is proposed to increase from \$2,836 to \$6,495.
- Mobile home fees are proposed increase from \$2,836 to \$6,495.
- Multifamily residential unit fee would increase from \$1,900 to \$4,351.

The aforementioned Increase in fees is a direct result of current pricing of construction and investment in the District's infrastructure. Due to significant increase in the findings, staff is recommending the increases to be implemented over the next five years.

### **Staff Recommendation**

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Staff recommends to accept the study prepared by Raftelis and to incorporate the calculated increases over the next five years.



January 11, 2023

Board of Directors  
Metropolitan Sewerage District of Buncombe County, NC  
2028 Riverside Drive  
Asheville, NC 28804

**Subject: System Development Fee Update**

Dear MSD Board Members:

Raftelis Financial Consultants, Inc. (“Raftelis”) has completed an evaluation to develop cost-justified sewer system development fees for consideration by Metropolitan Sewerage District of Buncombe County (“MSD”). This report documents the results of the analysis, which is based on an approach for establishing system development fees set forth in North Carolina General Statute 162A Article 8 – “System Development Fees.” As one of the largest and most respected utility financial, rate, management, and operational consulting firms in the U.S., and having prepared system development fee calculations for utilities in North Carolina and across the U.S. since 1993, Raftelis is qualified to perform system development fee calculations for MSD.

The preparation of this report was developed by Raftelis for MSD based on a specific scope of work agreed to by both parties. In developing the conclusions contained within this report, Raftelis has relied on certain assumptions and information provided by MSD, who is most knowledgeable of the sewer system, its finances, etc. Raftelis has not independently verified the accuracy of the information provided by MSD. We believe such sources are reliable and the information obtained to be reasonable and appropriate for the analysis undertaken and the conclusions reached.

The purpose of this report is to summarize Raftelis’ conclusion related to cost justified sewer system development fees. It is not intended to address anything else associated with the system development fees, such as the administration of these fees, etc. The conclusions contained in this report are as of the stated date, for a specific use and purpose, and made under specific assumptions and limiting conditions. The reader is cautioned and reminded that the conclusions presented in this report apply only as to the effective date indicated. Raftelis makes no warranty, expressed or implied, with respect to the opinions and conclusions contained in this report. Any statement in this report involving estimates or matters of opinion, whether or not specifically designated, are intended as such, and not as representation of fact.

## Background

System development fees are one-time charges assessed to new utility customers for their use of system capacity and serve as an equitable method by which to recover up-front system capacity costs from those using the capacity. North Carolina General Statute 162A Article 8 (“Article 8”) provides for the uniform authority to implement system development fees for public water and sewer systems in North Carolina and was passed by the North Carolina General Assembly and signed into law on July 20, 2017. According to the statute, system development fees must be adopted in accordance with the conditions

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and limitations of Article 8. In addition, the system development fees must also be prepared by a financial professional or licensed professional engineer, qualified by experience and training or education, who, according to the Article, shall:

- Document in reasonable detail the facts and data used in the analysis and their sufficiency and reliability.
- Employ generally accepted accounting, engineering, and planning methodologies, including the buy-in, incremental cost or marginal cost, and combined cost methodologies for each service, setting forth appropriate analysis to the consideration and selection of an approach appropriate to the circumstances and adapted as necessary to satisfy all requirements of the Article.
- Document and demonstrate the reliable application of the methodologies to the facts and data, including all reasoning, analysis, and interim calculations underlying each identifiable component of the system development fee and the aggregate thereof.
- Identify all assumptions and limiting conditions affecting the analysis and demonstrate that they do not materially undermine the reliability of conclusions reached.
- Calculate a final system development fee per service unit of new development and include an equivalency or conversion table for use in determining the fees applicable for various categories of demand.
- Consider a planning horizon of not less than 5 years, nor more than 20 years.
- Use the gallons per day per service unit that the local governmental unit applies to its water or sewer system engineering or planning purposes for water or sewer, as appropriate, in calculating the system development fee.

MSD's existing system development fees (as of fiscal year 2023) were calculated according to the requirements of Article 8 and were implemented by MSD on July 1, 2018 for fiscal years ("FY") 2019 through FY 2023. However, Article 8 requires fees to be updated no less than once every five years. Therefore, updated cost justified sewer system development fees have been calculated for MSD and may be implemented by MSD beginning in FY 2024, and this letter report documents the results of the calculation of updated cost justified fees in accordance with the requirements of Article 8.

In general, system development fees are calculated based on (1) a cost analysis of the value of existing or planned infrastructure that is in place, or will be constructed, to serve new capacity demands, and (2) the existing or additional capacity associated with these assets. Article 8 is relatively explicit in the identification of infrastructure assets that may be included as part of the system development fee calculation, as the Article defines allowable assets to include the following, as provided in Section 201:

*"A water supply, treatment, storage, or distribution facility, or a wastewater collection, treatment, or disposal facility providing a general benefit to the area that facility serves and is owned or operated, or to be owned or operated, by a local governmental unit. This shall include facilities for the reuse or reclamation of water and any land associated with the facility."*

The method used to calculate system development fees for MSD included system facility assets that satisfy this definition.

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Article 8 references three methodologies that could be used to calculate system development fees. These include the buy-in method, the incremental cost method, and the combined cost method. A description of each of these methods is as follows:

### Capacity Buy-In Method:

Under the Capacity Buy-In Method, a system development fee is calculated based on the proportional cost of each user's share of existing system capacity. This approach is typically used when existing facilities provide adequate capacity to accommodate future growth. The cost of capacity is derived by dividing the estimated cost of existing facilities by the current capacity provided by existing facilities. Certain adjustments to the cost of existing facilities are made for developer contributed assets, grant funds, and the amount of outstanding debt.

### Incremental Cost Method:

Under the Incremental Cost (or Marginal Cost) Method, a system development fee is calculated based on a new customer's proportional share of the incremental future cost of system capacity. This approach is typically used when existing facilities have limited or no capacity to accommodate future growth. The cost of capacity is calculated by dividing the total cost of growth-related capital investments over a defined period by the additional capacity provided as a result of the investments.

### Combined Method:

Under the Combined Method, a system development fee is calculated based on the blended cost of both the existing and expanded system capacity. As such, it is a combination of the Capacity Buy-In and Incremental Cost methods. This method is typically used when existing facilities provide adequate capacity to accommodate a portion of the capacity needs of new customers, but where significant investment in new facilities to address a portion of the capacity needs of future growth is also anticipated, or where some capacity is available in parts of the existing system, but incremental capacity will be needed for other parts of the system to serve new customers at some point in the future.

## System Development Fee Calculation

The Capacity Buy-In Method was used to calculate the sewer system development fees for MSD, since, in general, MSD's existing sewer treatment facilities have adequate capacity to accommodate the anticipated future growth over the near term. The following steps were completed to calculate the fees under the Capacity Buy-In Method:

1. The reproduction cost of existing system facilities was calculated and adjustments were made to derive a net reproduction cost estimate in accordance with Article 8. Adjustments to the calculated reproduction cost included deducting indexed accumulated depreciation, developer contributions, and outstanding debt.<sup>1</sup>
2. The unit cost of system capacity was estimated by dividing the net reproduction cost of existing system facilities by the current capacity of the system.
3. The amount of capacity associated with a service unit of new development was estimated. One equivalent residential unit ("ERU") was defined as the smallest service unit of new development.

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<sup>1</sup> According to Article 8, "the basis for the buy-in calculation for previously completed capital improvements shall be determined by using a generally accepted method of valuing the actual or reproduction costs of the capital improvement for which the buy-in fee is being collected less depreciation, debt credits, grants, and other generally accepted valuation adjustments."

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4. The system development fee for one service unit of development was calculated by multiplying the cost per unit of system capacity by the capacity associated with one ERU.
5. The calculated system development fee for one ERU was scaled for other categories of demand. The number of dwelling units per multi-family unit was used to scale system development fees for new multi-family connections. Meter capacity ratios were used to scale system development fees for other connection types from a base meter size. The base meter size of 5/8-inches was the smallest unit of new development (one ERU) that was used in the calculation.

*Step 1 – Estimate the Reproduction cost of System Facilities and Apply Adjustments*

System facilities owned and operated by MSD and allowable under Article 8 include a wastewater treatment plant, a network of over 960 miles of collector sewers, and 180 miles of interceptor lines connecting the collector sewers to the treatment plant.

The cost of land and easements are allowed to be included in the system development fee calculation under Article 8, and therefore were included as part of the reproduction cost of system facilities. The original cost of these assets was obtained from MSD's Annual Comprehensive Financial Report ("ACFR") dated June 30, 2022. The book value of land held by MSD was \$2,773,980, while the book value of its easements was \$11,435,322.

A fixed asset listing of wastewater treatment plant assets currently in service, as of June 30, 2022, was provided by MSD and used to estimate the reproduction cost of wastewater treatment plant assets. The listing was reviewed and the original cost of each asset, as contained in the fixed asset listing, was escalated to current (2022) dollars based on the year the asset was purchased and the corresponding escalation factor for that year. Escalation factors for each year were identified using the Handy Whitman Index of Public Utility Construction Costs, which provides an annual index value representing the relative change in public utility construction costs for each year from 1912 to 2022 for the South Atlantic Region. Using the Handy Whitman Index to estimate an asset's current reproduction cost is an industry-accepted method by which to estimate the current cost of system facilities. Using this approach, the reproduction cost of the wastewater treatment plant assets was estimated to be approximately \$310.7 million.

The reproduction cost of treatment plant assets was adjusted by indexed accumulated depreciation to derive the reproduction cost new less accumulated depreciation ("RCNLD") amount. The total indexed accumulated depreciation of treatment plant assets was estimated to be \$211.9 million, which was then deducted from the reproduction cost total resulting in an RCNLD cost for treatment plant assets of approximately \$98.8 million (\$310,668,949 – \$211,880,491).

The reproduction cost of MSD's collection system was estimated using the reproduction cost of interceptor pipe, collection system pipe, and manholes. These assets were included in the fee calculation because they are facilities that provide a general benefit to the area that the facility serves. The length of pipe and pipe diameters were gathered and used to estimate the reproduction cost of the existing interceptor and collection system. The unit cost of installed pipe for each pipe diameter was estimated based on recent material pricing data obtained from manufacturers and installation costs from recent contractor bids provided to MSD for installation of interceptor and collection system pipe. The length of pipe for each pipe diameter was then multiplied by the corresponding unit cost for materials and installation. The length of pipe, unit cost, and resulting estimated reproduction cost by pipe diameter is shown in Table 1.

**Table 1. Interceptor and Collection System Pipe Reproduction Cost by Pipe Diameter**

<b>Description</b>	<b>Length (ft)</b>	<b>Unit Cost</b>	<b>Reproduction Cost</b>
Miscellaneous	120,126	\$393.14	\$47,226,335
4"	66,872	\$393.14	26,289,975
6"	1,085,790	\$393.14	426,866,609
8"	3,665,390	\$393.14	1,441,009,131
10"	157,490	\$407.54	64,182,976
12"	257,039	\$421.93	108,453,880
15"	51,050	\$482.05	24,608,654
16"	34,443	\$549.68	18,932,973
18"	92,159	\$617.32	56,891,042
20"	36,993	\$684.95	25,338,247
21"	41,768	\$752.58	31,433,861
24"	104,437	\$820.21	85,660,323
27"	44,335	\$887.84	39,362,307
30"	94,889	\$955.47	90,664,347
36"	72,925	\$962.99	70,226,036
42"	15,794	\$1,817.24	28,701,996
48"	51,603	\$2,671.49	137,857,261
54"	6,803	\$3,525.74	23,986,991
60"	31,887	\$4,379.98	139,665,013
66"	<u>5,483</u>	\$5,234.23	<u>28,699,304</u>
<b>Total</b>	<b>6,037,278</b>		<b>\$2,916,057,262</b>

Note: Individual unit costs include both material and installation costs obtained from product manufacturers and recent contractor bids provided to MSD, respectively.

As shown in the table, the reproduction cost of interceptor and collection system pipe was estimated to be approximately \$2.9 billion. The reproduction cost of manholes was also included as part of the estimated reproduction cost of the collection system. MSD's collection system includes 34,029 manholes. The reproduction cost of a manhole was estimated using contractor bids provided to MSD for the installation of manholes as part of recent repair and replacement projects. The average cost to install a manhole was estimated to be roughly \$5,015; therefore, the reproduction cost of manholes within MSD's collection system was estimated to be \$170,671,184 ( $34,029 \times \$5,015$ ).

The total reproduction cost of MSD's collection system was estimated to be approximately \$3.1 billion (\$2,916,057,262 for the interceptors and collection piping and \$170,671,184 for manholes).

The reproduction costs of the interceptor and collection assets were then adjusted for depreciation using depreciation information contained in MSD's FY 2022 ACFR. For example, according to Note 4 of the ACFR, assets related to MSD's collection system were reported to be 24.6 percent depreciated (original cost of \$541,105,268, accumulated depreciation of \$133,018,216). Using the percentage of asset cost depreciated, the accumulated depreciation attributable to the reproduction cost of MSD's collection system assets was estimated to be \$758.8 million ( $\$3,086,728,446 \times 24.6\%$ ). These calculations are shown in Table 2.

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This amount was then adjusted by the accumulated depreciation of contributed assets, which was estimated to be 24.6 percent of its reproduction cost new ("RCN") cost; therefore, with the RCN cost of contributed assets estimated to be approximately \$363.6 million, the indexed accumulated depreciation on these assets was estimated to be \$89.4 million ( $\$363,631,307 \times 24.6\%$ ). This amount was subtracted from the accumulated depreciation of all interceptor and collection assets to estimate the indexed accumulated depreciation for non-contributed interceptor and collection system assets, which was calculated to be approximately \$669.4 million ( $\$758,800,802 - \$89,390,347$ ).

**Table 2. Calculation of Depreciation Adjustment for Interceptor and Collection Facilities**

<b>Description</b>	<b>Amount</b>
Original Cost	\$541,105,268
Accumulated Depreciation	\$133,018,216
Percent Depreciated	24.6%
Interceptor and Collection – RCN	\$3,086,728,446
Percent Depreciated	24.6%
Accumulated Depreciation – RCN	\$758,800,802
Accum Depr of Contributions – RCN	<u>-89,390,347</u>
Accum Depr – RCN, Net of Contributions	\$669,410,455

RCN = Reproduction cost new

In addition to depreciation, several additional adjustments were made to the RCNLD cost in accordance with Article 8, which included adjustments for developer contributed assets and outstanding debt, as described below.

Developer Contributed Assets:

MSD provided a listing of assets that were contributed or paid for by developers, and these assets were subtracted from the RCNLD cost, as these assets do not represent an investment in the system by MSD. The reproduction cost of contributed wastewater system assets was estimated to be \$363.6 million.

Outstanding Debt Credit:

A credit was applied to the RCNLD cost to reflect that the outstanding debt associated with system facilities will be repaid with user rates and charges. MSD's long-term outstanding debt is comprised of Revenue Bonds and a State Revolving Fund Loan and totaled roughly \$88.4 million, as of June 30, 2022, based on information contained in MSD's fiscal year FY 2022 ACFR. MSD indicated that it does not use system development fee revenues to make principal payments on outstanding debt. Instead, revenues from its user rates and charges are used to fund debt service payments. To avoid double charging new customers for the cost of qualifying assets under Article 8 that were funded in whole or in part by long-term debt, once with the assessment of the system development fee, then again with the assessment of user rates and charges to fund principal repayments on borrowings used to acquire these assets, the full amount of outstanding debt was netted against the RCNLD cost. Therefore, the portion of the upfront cost of qualifying assets funded with debt will be recovered with MSD's user rates and charges.



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The resulting adjustments to the system RCNLD cost for developer contributions and outstanding debt are shown in Table 3.

**Table 3. Calculation of Net System Cost**

<b>Description</b>	<b>Amount</b>
Asset Cost (RCN)	
Land	\$2,773,980
Easements	11,435,322
Treatment Plant	310,668,949
Collection System	<u>3,086,728,446</u>
Total Reproduction Cost New	\$3,411,606,697
Less: Accumulated Depreciation	<u>-881,290,945</u>
System Facilities RCNLD	\$2,530,315,752
Less: Developer Contributed Assets	-363,631,307
Less: Credit for Outstanding Debt	-88,373,590
<b>Net System Cost (RCNLD)</b>	<b><u>\$2,078,310,855</u></b>

*Step 2 – Calculate the Unit Cost of System Capacity*

The cost per unit of system capacity was calculated by dividing the adjusted RCNLD costs (derived in Step 1) by the system capacity. MSD’s average day system capacity is 40 million gallons per day (“MGD”). Therefore, the cost per unit of system capacity was calculated to be \$51.96 per gallon, per day ( $\$2,078,310,855 \div 40.0 \text{ MGD}$ ).

*Step 3 – Estimate the Amount of Capacity Per Service Unit of New Development*

The smallest service unit of new development was defined as one ERU. MSD indicated that the capacity demanded by one ERU, which represents a typical single-family residential dwelling, is 125 gallons per day (“GPD”).

*Step 4 – Calculate the System Development Fees for Single-Family and Multi-Family Residential Customers*

System development fees for single-family residential customers were calculated by multiplying the unit cost of capacity from Step 2 by the capacity associated with one ERU from Step 3. The calculations are provided in Table 4. The fee amount associated with one ERU corresponds to the capacity demands of the base meter size (5/8-inch) and is the maximum cost justified fee associated with a single-family residential dwelling.

**Table 4. Calculation of System Development Fees for One ERU/Base Meter Size**

<b>Description</b>	<b>Amount</b>
Net System Cost	\$2,078,310,855
System Average Day Capacity (MGD)	40.0
Unit Cost of Capacity (\$/gallon per day)	\$51.96
Capacity Required for 1 ERU (gallons per day)	125.0
<b>System Development Fee (for 1 ERU or a 5/8-inch meter)</b>	<b>\$6,494.72</b>

The scaling factor for multifamily residential dwelling units was estimated to be 0.67 of an ERU based on the analysis completed by Raftelis for MSD in 2018. This scaling factor was calculated by comparing the average day water demand for a typical single-family dwelling unit with the corresponding demand of a typical multifamily residential dwelling unit. The average day demand for a typical single-family unit was estimated by analyzing historical (FY 2014 to FY 2017) annual water consumption data attributable to single-family residential accounts served by MSD. The average day demand for a typical multifamily unit was estimated by analyzing historical (FY 2015 to FY 2017) annual water consumption for a sample of multifamily accounts within MSD's service area, and then dividing the consumption by the number of dwelling units associated with each multifamily account. Using this approach, the historical average day consumption for a single-family dwelling was estimated to be approximately 109.4 gallons per day ("GPD"). The historical average day consumption for a multifamily unit was estimated to be 73.4 GPD. Therefore, the scaling of capacity attributable to multifamily units was calculated to be 0.67 (73.4 GPD ÷ 109.4 GPD). The resulting system development fee for multifamily connections per dwelling unit is shown in Table 5.

The 2018 update to MSD's system development fees also included the evaluation of historical (FY 2015 to FY 2017) water use per dwelling unit for a sample of mobile home customers. The estimated water use per unit for mobile homes was compared to the average use for a typical single-family dwelling unit. The results of this comparison indicated mobile home water use per dwelling unit was approximately 1.3 times the water use of a typical single-family dwelling unit. This higher dwelling unit usage for mobile homes may have been due to higher occupancy in mobile homes, potential leaks in the private mobile home water lines, and potentially older and less efficient fixtures in the mobile home units as compared to a typical single-family dwelling unit.

Prior to 2018, MSD had charged new mobile home connections a system development fee that is 70 percent of the fee for a new single-family residential connection. Based on the water usage analysis, MSD elected to increase the scaling factor for mobile home connections to 100 percent of the system development fee for a single-family connection, beginning July 1, 2018.

MSD informed Raftelis that recent water usage data from mobile home and single-family units indicates that average day demand from mobile home units continues to exceed average demand from single-family units; therefore, it is appropriate to keep the demand scaling between a mobile home unit and a single-family residential connection at 1.0 times for this update to the system development fees.

#### *Step 5 – Calculate the System Development Fees for Commercial and Industrial Customers*

The system development fees for commercial and industrial customers were developed by scaling the system development fee for a 5/8" meter size (one ERU) to larger meter sizes using rated meter

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capacities for each meter size, as published by the American Water Works Association.<sup>2</sup> The meter scaling factors are shown in Table 5, along with the fee amounts, which were calculated by multiplying the system development fee for one ERU by the demand scaling factors for each meter size.

## Summary

The calculated system development fees shown in Table 5 represent the updated maximum cost justified level of system development fees that MSD may charge according to Article 8. If MSD chooses to assess fees that are less than those shown in the table, the adjusted fee amounts should still reflect the scaling factors by meter size, as shown in Table 5.

**Table 5. Calculated System Development Fees and Associated Scaling Factors**

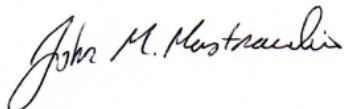
<b>Meter Size / Customer Type</b>	<b>Rated Meter Capacity (GPM)</b>	<b>Scaling Factor</b>	<b>Fee Amount</b>
5/8"	20	1.0	\$6,495
3/4"	30	1.5	\$9,742
1"	50	2.5	\$16,237
1-1/2"	100	5.0	\$32,474
2"	160	8.0	\$51,958
3"	320	16.0	\$103,916
4"	500	25.0	\$162,368
6"	1,000	50.0	\$324,736
8"	1,600	80.0	\$519,395
10"	4,200	210.0	\$1,363,891
12"	5,300	265.0	\$1,721,101
Multifamily Unit	n/a	0.67	\$4,351
Mobile Home	n/a	1.0	\$6,495

GPM = Gallons per minute

Raftelis appreciates the opportunity to assist MSD with the update of its system development fees. Should you have questions or need any additional information, please do not hesitate to contact me at 518-391-8944.

Sincerely,

RAFTELIS FINANCIAL CONSULTANTS, INC.



**John M. Mastracchio, ASA, CFA, P.E.**  
Executive Vice President

<sup>2</sup> Principles of Water Rates, Fees, and Charges, Manual M1, 7th Edition, American Water Works Association, Table VII.2-5, p. 338.